San Diego County Air Pollution Control District

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AIR POLLUTION CONTROL DISTRICT GOVERNING BOARD
AGENDA
THURSDAY, MAY 14, 2026, AT 3:00 PM
1600 PACIFIC HIGHWAY ROOM 302 SAN DIEGO, CA 92101

SPECIAL MEETING

Members of the public can attend the meeting in-person or access the meeting using the following Zoom meeting credentials below:

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ORDER OF BUSINESS

A. **Roll Call**

B. **Agenda Items**

1. UPDATE ON STRATEGIES TO REDUCE INDIRECT SOURCE EMISSIONS FROM WAREHOUSES AND DISTRIBUTION CENTERS IN SAN DIEGO COUNTY
Item Type: *Action*
Recommended By: *Michael Watt, Chief, Emission Reduction Strategies*
Overview: *This item was continued from the 4/9/26 Governing Board meeting.*

In 2019, California Assembly Bill 423 (Gloria, 2019) (AB 423) amended State law to include a requirement for the San Diego County Air Pollution Control District (District) to "consider adopting an indirect source rule to address pollution from mobile sources that is associated with stationary sources, such as ports, warehouses, and distribution centers." The Clean Air Act defines an indirect source as "...a facility, building, structure, installation, real property, road, or highway which attracts, or may attract, mobile sources of pollution" but does not include direct sources of emissions associated with these locations (42 U.S.C. §7410(a)(5)(C)), as codified in California Health and Safety Code Section 40100.6.5(a)(6). Pursuant to AB 423, starting in November 2021, staff began evaluation of potential strategies to reduce emissions from indirect sources such as ports, warehouses, and distribution centers located

throughout San Diego County.

In April 2025, the District released a report titled "Warehouse Indirect Source Rule (ISR) Framework Supplement", also referred to as the "Supplement" (Attachment B). The Supplement presented an update to pertinent sections found in the initial ISR report titled "Options and Considerations for Reducing Indirect Source Emissions at Warehouses, Distribution Centers, and Ports", also referred to as the "ISR Framework" (Attachment A) for warehouses and distribution centers. The Supplement also provided new or updated information through analysis that was either directed by the Governing Board, Planning and Policy Committee, and/or discussed through the Warehouse Working Group (WWG).

The Supplement and the in-depth technical analysis it contains helped inform the District's current evaluation of the feasibility of adopting a warehouse ISR in San Diego County. To present this evaluation, on January 16, 2026, the District released a final report titled "Strategies to Reduce Indirect Source Emissions at Warehouses and Distribution Centers White Paper', also referred to as the "White Paper" (Attachment C). The follow is a summary of the findings and considerations that informed the conclusions of the White Paper. See the referenced sections for more detailed discussions on each item.

- *The estimated emission reductions from a potential warehouse ISR in San Diego County are projected to be significantly less than the reductions anticipated from other rulemakings (White Paper, Section 3.1).*
- *The estimated public health benefits, both regionwide and in under-resourced communities, of a potential warehouse ISR are less than the benefits anticipated from recent and potential future rulemakings (White Paper, Section 3.2).*
- *The estimated compliance costs of a potential warehouse ISR are greater than the costs anticipated from other rulemakings (White Paper, Section 3.3).*
- *The estimated cost-effectiveness values of a potential warehouse ISR significantly exceed those for other District rulemakings, as well as cost-effectiveness thresholds used in other air districts (White Paper, Section 3.4).*
- *A substantial percentage of the facilities identified as "warehouses" in the District's inventory may not be conducting warehousing activities. This will likely reduce the number of facilities that would potentially be subject to a potential warehouse ISR (White Paper, Section 3.5).*
- *The estimated one-time and on-going District costs for rule development and administration are substantial, in light of current fiscal uncertainty (White Paper, Section 3.6).*
- *A warehouse ISR in San Diego County modeled after the South Coast Air Quality Management District (SCAQMD) Rule 2305, which is the only warehouse ISR that has withstood litigation to date, is anticipated to require significant District staff effort for program implementation, outreach, and compliance/enforcement activities (White Paper, Section 3.7).*
- *SCAQMD Rule 2305 was developed with the goal of reducing regional emissions to attain the federal and State Ozone and PM2.5 ambient air quality standards while achieving localized emission reductions as a co-benefit (White Paper, Section 4.1).*
- *The District considered applicable comments received (White Paper, Section 4.2).*
- *An analysis of warehouse buildings located in under-resourced communities compared*

to the rest of the county demonstrated that a majority of potential warehousing locations (over 70%) are located outside of identified under-resourced communities (White Paper, Section 4.3.2).

- *Other State activities, such as Assembly Bill 98 and a possible statewide ISR if adopted in the future, would likely achieve and support mobile source emission reductions from warehousing operations (White Paper, Section 4.4).*
- *Other potential non-regulatory alternatives for consideration, such as a focused Transport Refrigeration Unit (TRU) incentive program, may provide comparable emission reductions at lower costs and/or resources than anticipated with an ISR (White Paper, Section 5.0).*

As detailed above and in the White Paper, the District's analysis supports prioritizing the alternative strategies detailed in Section 5.0 of the report. These strategies offer a practical, efficient, and cost-effective path to achieving emission reductions, advancing compliance with State and federal air quality standards, and improving conditions in communities most impacted by pollution.

One alternative evaluated in Section 5.0 includes a focused Transport Refrigeration Unit (TRU) incentive program, which if successful, could provide comparable emission reductions, both regionally and at the community level, to those anticipated with a warehouse ISR. The District believes such a strategy could be administered more quickly than an ISR, at a lower cost, and could potentially achieve comparable diesel emission reductions in areas where the public congregates (i.e., grocery stores, restaurants, schools, healthcare facilities, etc.).

Given the relatively high estimated cost of implementing a local rule, staff believes that focusing on these alternatives represents the most efficient use of resources at this time. To maintain flexibility and transparency, the District will designate a potential warehouse ISR as a "Further Study Measure" in the upcoming District-prepared plan to attain State ozone standards (i.e., Regional Air Quality Strategy (RAQS)). This ensures the measure remains under active review, with status updates provided to stakeholders as part of the regular RAQS development process. If future evaluations confirm that the measure is both feasible and cost-effective, formal rulemaking activities would commence when appropriate and it may be considered for adoption.

Should the selected alternative strategies encounter delays or fail to deliver expected results, the District can reassess the need for a local warehouse ISR, taking into account statewide developments and implementation progress. This approach balances immediate action with long-term adaptability, ensuring the District remains positioned to achieve air quality goals efficiently and equitably.

Requested Action:

1. *Pursuant to the District's analysis in the Warehouse Indirect Source Rule (ISR) Framework Supplement and Strategies to Reduce Indirect Source Emissions at Warehouses and Distribution Centers White Paper, direct the Air Pollution Control Officer to prioritize alternative strategies (as detailed in Section 5.0 of the White Paper) to reduce emissions from indirect sources at warehouses and distribution centers to advance compliance with state and federal air quality standards and improve conditions in communities most impacted by air pollution.*

C. **Air Pollution Control Officer Report**

D. **Planning and Policy Committee Report**

E. **Adjournment**

Supporting Documents: Attachments and supporting documentation for items listed on this agenda can be viewed online on the Air Pollution Control District Governing Board webpage or at the San Diego County Air Pollution Control District, 10124 Old Grove Road, San Diego, CA 92131

Virtual Access Option: Members of the public who wish to attend the meeting virtually may visit the Air Pollution Control District Governing Board online for meeting information and participation instructions or, send an email to APCDPublicComment@sdapcd.org

In-Person Public Comments: Any person wishing to speak to the Governing Board on a specific agenda item must file a Request to Speak form with the Clerk prior to the scheduled start time of the meeting (for non-agenda public comments) or prior to the time the item is called for discussion (for specific agenda items). Hardcopy forms can be obtained at the meeting from the Clerk.

Virtual Public Comments: Any person wishing to speak to the Governing Board on a specific agenda item must file a Request to Speak form with the Clerk prior to the scheduled start time of the meeting (for non-agenda public comments) or prior to the time the item is called for discussion (for specific agenda items). Persons attending the meeting virtually who wish to address the Governing Board on an item to be considered at this meeting, or on non-agenda items, may submit a Request to Speak form by visiting the Air Pollution Control District Governing Board online webpage.

Written Public Comments: Written comments may be submitted to the Air Pollution Control District Governing Board online webpage. Any written materials to be shared with the Board may be emailed to APCDPublicComment@sdapcd.org to the San Diego County Air Pollution Control District, 10124 Old Grove Road, San Diego, CA 92131. When emailing your comments, please include the meeting date and agenda item. All written comments received prior to the close of the meeting will be made part of the meeting record. Comments received 24 hours prior to the start of the meeting will be posted online with the meeting materials.

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Air Pollution Control District Governing Board

San Diego County Air Pollution Control District

AGENDA ITEM #B.1

DATE: **May 14, 2026**

TO: SAN DIEGO COUNTY AIR POLLUTION CONTROL DISTRICT GOVERNING BOARD

SUBJECT:
UPDATE ON STRATEGIES TO REDUCE INDIRECT SOURCE EMISSIONS FROM WAREHOUSES AND DISTRIBUTION CENTERS IN SAN DIEGO COUNTY

REQUESTED ACTION:

1. Pursuant to the District's analysis in the Warehouse Indirect Source Rule (ISR) Framework Supplement and Strategies to Reduce Indirect Source Emissions at Warehouses and Distribution Centers White Paper, direct the Air Pollution Control Officer to prioritize alternative strategies (as detailed in Section 5.0 of the White Paper) to reduce emissions from indirect sources at warehouses and distribution centers to advance compliance with state and federal air quality standards and improve conditions in communities most impacted by air pollution.

OVERVIEW:
This item was continued from the 4/9/26 Governing Board meeting.

In 2019, California Assembly Bill 423 (Gloria, 2019) (AB 423) amended State law to include a requirement for the San Diego County Air Pollution Control District (District) to "consider adopting an indirect source rule to address pollution from mobile sources that is associated with stationary sources, such as ports, warehouses, and distribution centers." The Clean Air Act defines an indirect source as "...a facility, building, structure, installation, real property, road, or highway which attracts, or may attract, mobile sources of pollution" but does not include direct sources of emissions associated with these locations (42 U.S.C. §7410(a)(5)(C)), as codified in California Health and Safety Code Section 40100.6.5(a)(6). Pursuant to AB 423, starting in November 2021, staff began evaluation of potential strategies to reduce emissions from indirect sources such as ports, warehouses, and distribution centers located throughout San Diego County.

In April 2025, the District released a report titled "Warehouse Indirect Source Rule (ISR) Framework Supplement", also referred to as the "Supplement" (Attachment B). The Supplement presented an update to pertinent sections found in the initial ISR report titled "Options and Considerations for Reducing Indirect Source Emissions at Warehouses, Distribution Centers, and Ports", also referred to as the "ISR Framework" (Attachment A) for warehouses and distribution centers. The Supplement also

provided new or updated information through analysis that was either directed by the Governing Board, Planning and Policy Committee, and/or discussed through the Warehouse Working Group (WWG).

The Supplement and the in-depth technical analysis it contains helped inform the District's current evaluation of the feasibility of adopting a warehouse ISR in San Diego County. To present this evaluation, on January 16, 2026, the District released a final report titled "Strategies to Reduce Indirect Source Emissions at Warehouses and Distribution Centers White Paper', also referred to as the "White Paper" (Attachment C). The follow is a summary of the findings and considerations that informed the conclusions of the White Paper. See the referenced sections for more detailed discussions on each item.

- The estimated emission reductions from a potential warehouse ISR in San Diego County are projected to be significantly less than the reductions anticipated from other rulemakings (White Paper, Section 3.1).
- The estimated public health benefits, both regionwide and in under-resourced communities, of a potential warehouse ISR are less than the benefits anticipated from recent and potential future rulemakings (White Paper, Section 3.2).
- The estimated compliance costs of a potential warehouse ISR are greater than the costs anticipated from other rulemakings (White Paper, Section 3.3).
- The estimated cost-effectiveness values of a potential warehouse ISR significantly exceed those for other District rulemakings, as well as cost-effectiveness thresholds used in other air districts (White Paper, Section 3.4).
- A substantial percentage of the facilities identified as "warehouses" in the District's inventory may not be conducting warehousing activities. This will likely reduce the number of facilities that would potentially be subject to a potential warehouse ISR (White Paper, Section 3.5).
- The estimated one-time and on-going District costs for rule development and administration are substantial, in light of current fiscal uncertainty (White Paper, Section 3.6).
- A warehouse ISR in San Diego County modeled after the South Coast Air Quality Management District (SCAQMD) Rule 2305, which is the only warehouse ISR that has withstood litigation to date, is anticipated to require significant District staff effort for program implementation, outreach, and compliance/enforcement activities (White Paper, Section 3.7).
- SCAQMD Rule 2305 was developed with the goal of reducing regional emissions to attain the federal and State Ozone and PM2.5 ambient air quality standards while achieving localized emission reductions as a co-benefit (White Paper, Section 4.1).
- The District considered applicable comments received (White Paper, Section 4.2).
- An analysis of warehouse buildings located in under-resourced communities compared to the rest of the county demonstrated that a majority of potential warehousing locations (over 70%) are located outside of identified under-resourced communities (White Paper, Section 4.3.2).
- Other State activities, such as Assembly Bill 98 and a possible statewide ISR if adopted in the future, would likely achieve and support mobile source emission reductions from warehousing operations (White Paper, Section 4.4).

- Other potential non-regulatory alternatives for consideration, such as a focused Transport Refrigeration Unit (TRU) incentive program, may provide comparable emission reductions at lower costs and/or resources than anticipated with an ISR (White Paper, Section 5.0).

As detailed above and in the White Paper, the District's analysis supports prioritizing the alternative strategies detailed in Section 5.0 of the report. These strategies offer a practical, efficient, and cost-effective path to achieving emission reductions, advancing compliance with State and federal air quality standards, and improving conditions in communities most impacted by pollution.

One alternative evaluated in Section 5.0 includes a focused Transport Refrigeration Unit (TRU) incentive program, which if successful, could provide comparable emission reductions, both regionally and at the community level, to those anticipated with a warehouse ISR. The District believes such a strategy could be administered more quickly than an ISR, at a lower cost, and could potentially achieve comparable diesel emission reductions in areas where the public congregates (i.e., grocery stores, restaurants, schools, healthcare facilities, etc.).

Given the relatively high estimated cost of implementing a local rule, staff believes that focusing on these alternatives represents the most efficient use of resources at this time. To maintain flexibility and transparency, the District will designate a potential warehouse ISR as a "Further Study Measure" in the upcoming District-prepared plan to attain State ozone standards (i.e., Regional Air Quality Strategy (RAQS)). This ensures the measure remains under active review, with status updates provided to stakeholders as part of the regular RAQS development process. If future evaluations confirm that the measure is both feasible and cost-effective, formal rulemaking activities would commence when appropriate and it may be considered for adoption.

Should the selected alternative strategies encounter delays or fail to deliver expected results, the District can reassess the need for a local warehouse ISR, taking into account statewide developments and implementation progress. This approach balances immediate action with long-term adaptability, ensuring the District remains positioned to achieve air quality goals efficiently and equitably.

FISCAL IMPACT:

There is no immediate fiscal impact associated with today's requested action. As described within the White Paper, District estimated costs of approximately $500,000 for socioeconomic and environmental analyses associated with potential development and implementation of a warehouse ISR have been partially incorporated in the Air Pollution Control Officer's Adopted FY 2025-26 budget. If directed to pursue a warehouse ISR, these costs as well as additional estimated costs of approximately $335,000 for development of a web-based reporting system and legal costs may be incorporated as part of the Air Pollution Control Officer's Proposed FY 2026-2027 budget.

ENVIRONMENTAL STATEMENT:

Pursuant to Section 15060(c)(2) of the California Environmental Quality Act (CEQA) Guidelines, CEQA applies only to government actions that will result in a direct or reasonably foreseeable indirect physical change in the environment. Consideration of a potential ISR to reduce emissions from

warehouses and distribution centers in San Diego County, and proposed recommendations, is not a project subject to CEQA; CEQA does not apply to this action. Additionally, if the Governing Board approves the alternative strategies outlined in Section 5.0 of the White Paper, District grants to incentivize replacement of diesel TRUs or trucks with zero-emission TRUs or trucks is categorically exempt under CEQA Guidelines Section 15308 as an action taken to assure the protection of the environment. For any grants supporting charging infrastructure, CEQA review of individual construction projects will be analyzed at the appropriate time. If recommended to proceed with a rule by the Governing Board, District staff will evaluate the proposed rule under CEQA during project development and will propose CEQA recommendations for the Governing Board's consideration when the District returns with final proposed documents.

PREVIOUS RELEVANT BOARD ACTIONS:
October 12, 2023 (F.2), Update on District Indirect Source Activities; June 8, 2023 (E.3), Provide Update and Seek Direction on Potential Strategies to Reduce Indirect Source Emissions from Warehouses, Distribution Centers, and Ports in San Diego County; August 11, 2022 (E.3), Update on the San Diego County Air Pollution Control District's Evaluation of an Indirect Source Rule.

PUBLIC ENGAGEMENT AND OUTREACH:
Between September 2023 and October 2024, staff conducted 10 virtual public meetings with WWG participants, comprising almost 20 hours of in-depth, technical conversations about indirect source emissions. The WWG was composed of key local community, environmental, industrial, and government stakeholders interested in the freight and warehousing sectors, community health, and air quality. Participation in the WWG meetings included representatives from at least 90 different organizations, public agencies, or companies. Feedback from these meetings is summarized in Attachment B. Additionally, the District released the White Paper for public review on January 16, 2026 (revision released February 25, 2026). Since the release of the Supplement in April 2025, staff also continued to meaningfully engage with various industry and environmental stakeholders to elicit feedback on the District's consideration of strategies to reduce indirect source emissions from warehouses. This included meetings held with the County of San Diego Environmental Justice Working Group, members of the Industrial Environmental Association (IEA), Commercial Real Estate Development Association (NAIOP), and Port of San Diego. Staff also presented an update on the White Paper to the Portside and International Border Community Steering Committees in March 2026.

EQUITY IMPACT STATEMENT
Today's item supports the District's vision of 'Clean Air for All' by providing information about potential emission control strategies to help attain national ozone standards and reduce air pollution emissions in communities across the region.

RECOMMENDED BY:
Michael Watt, Chief, Emission Reduction Strategies

CONTACT PERSON(S):

Name: Nick Cormier, Supervising Air Resources Specialist
Phone: (858) 586-2798
Email: Nick.Cormier@sdapcd.org

ATTACHMENTS:
Item B1_AttA_ISR Framework (English).pdf
Item B1_AttB_ISR Framework Supplement.pdf
Item B1_AttC_ISR White Paper.pdf
Item B1_AttD_ISR Background.pdf
Item B1_Public Comment_Various.pdf

San Diego County
Air Pollution
Control District

Options and Considerations for Reducing Indirect Source Emissions at Warehouses, Distribution Centers, and Ports

May 2023

SAN DIEGO COUNTY
AIR POLLUTION CONTROL DISTRICT
10124 Old Grove Road
San Diego, CA 92131

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1.0 INTRODUCTION

1.1 BACKGROUND

In 2019, California Assembly Bill 423 (Gloria, Statutes of 2019) added specified duties to the San Diego County Air Pollution Control District (District) including a requirement to *"consider adopting an indirect source rule to address pollution from mobile sources that is associated with stationary sources such as ports, warehouses, and distribution centers"* (California Health & Safety Code Section 40100.6.5(a)(6)). An indirect source is defined in the Clean Air Act as *"…a facility, building, structure, installation, real property, road, or highway which attracts, or may attract, mobile sources of pollution."* (42 U.S.C. §7410(a)(5)(C)).

Accordingly, the District has evaluated potential strategies to control and reduce indirect source emissions from warehouses, distribution centers and ports in accordance with State and federal law. This report presents staff's findings to date and provides an opportunity to gain public input and direction from the Governing Board on the preferred nature and scope of the District's potential indirect source rule or program. Any future rulemaking that staff may be directed to pursue would be subject to a public process including public outreach, environmental and socioeconomic analyses, and future consideration of adoption by the Governing Board.

1.2 INDIRECT SOURCE AIR POLLUTION FROM WAREHOUSES AND PORT OPERATIONS

Air pollution from the ships, locomotives, trucks, and other heavy equipment that moves freight throughout San Diego County adversely affects our communities and the region at large and is a public health concern. Medium and heavy-duty trucks alone make up only 1% of all vehicles in San Diego County but emit 13% of all diesel particulate matter (DPM), a major component of fine particulate matter (PM) in the region, which contributes to lung cancer and aggravates asthma. Moreover, medium and heavy-duty trucks emit 15% of all oxides of nitrogen (NOx), which is a precursor to regional ozone and particulate pollution and contributes to respiratory and other illnesses. San Diego County does not yet meet the federal or State ozone standards or the State fine PM standard and must further reduce air pollution to reach attainment.

Sources such as warehouses, distribution centers and ports are primary destinations for trucks engaged in delivering, loading and/or unloading cargo.[1] These freight hubs indirectly cause air pollution due to the emissions from diesel-fueled trucks, trains, ships, off-road equipment, and other mobile sources they attract, including trucks with diesel-fueled refrigeration systems used for transporting perishable goods. Moreover, freight facilities commonly use diesel-fueled cargo handling equipment (such as forklifts and yard tractors) to maneuver cargo onsite and transfer it onto or off the trucks, trains, and ships. Employee passenger vehicles also contribute to the facility's indirect source emissions. For ports, ocean-going vessels are the largest contributor of indirect source emissions.[2] Heavy-duty diesel trucks are the largest contributor to the indirect

[1] The terms "warehouse" and "distribution center" are sometimes used interchangeably, as both serve as storage facilities for goods and products. A distribution center, in addition to storing products, also distributes them to wholesalers, retailers, and end customers.

[2] Ocean-going vessels emit over 60% of the indirect source emissions from Ports, according to SCAQMD's analyses of its Rule 2305 (Warehouse Indirect Source Rule-Warehouse Actions and Investments to Reduce Emissions Program). See page 2-2 at http://www.aqmd.gov/docs/default-source/Agendas/Governing-Board/2018/2018-may4-032.pdf.

source emissions associated with warehouses and distribution centers.[3] The widespread emergence of online purchasing and rapid delivery services is contributing to a strong demand for warehouse space near populated areas, heightening concerns over the potential impacts on air quality and public health.[4] These concerns emphasize the need for actions to help minimize the public health impacts caused by freight operations in our region.

1.3 DISTRICT AUTHORITY TO REGULATE INDIRECT SOURCES

1.3.1 State Law

Health & Safety Code. The District's authority to regulate indirect sources of air pollution, such as warehouses and ports, is codified in the California Health and Safety Code (H&SC) including Sections 39002, 40000, 40001, 40702, 40716, 40920, and 40100.6.5. A district may, for example, *"adopt and implement regulations to…reduce or mitigate emissions from indirect and areawide sources of air pollution"* (H&SC §40716(a)(1)).[5] The District may also collect fees to recover its costs to regulate indirect sources (H&SC §42311(g)).

AB 423. AB 423 (Gloria, Statutes of 2019), as previously stated, amended State law to expressly require the District to *"consider adopting an indirect source rule to address pollution from mobile sources that is associated with stationary sources, such as ports, warehouses, and distribution centers"* (H&SC §40100.6.5(a)(6)).

AB 617 Portside Community. In 2019, the California Air Resources Board (CARB) selected the Portside Community of Barrio Logan, West National City, Logan Heights, and Sherman Heights to develop and implement a community emissions reduction plan (CERP) pursuant to AB 617 (Garcia, Statutes of 2017). The District worked with a Community Steering Committee to prepare the Portside CERP, which was adopted by the District Governing Board in July 2021 and by CARB in October 2021. Exposure to diesel pollution from stationary and mobile operations, including freight, is a key concern reflected throughout the Portside CERP. To help address this concern, the CERP includes a District commitment to evaluate the feasibility of adopting a rule to control emissions from indirect sources such as warehouses, distribution centers, and port terminals.

AB 617 International Border Community. In 2021, CARB selected the International Border Community of San Ysidro and Otay Mesa to develop and implement a CERP pursuant to AB 617. District staff are working with an International Border Community Steering Committee to identify the community's key air quality concerns and potential strategies to address them, for inclusion in a future proposed CERP. Committee members have raised concerns over the rising demand for warehouse and distribution space in the international border region, which adds to existing high volumes of trucks crossing the border daily and contributes to some of the worst DPM

[3] Heavy-duty trucks emit over 90% of the indirect source emissions from warehouses with at least 100,000 sq ft. of indoor floor space, according to SCAQMD's analyses of its Rule 2305 (Warehouse Indirect Source Rule-Warehouse Actions and Investments to Reduce Emissions Program). See page 2-2 at http://www.aqmd.gov/docs/default-source/Agendas/Governing-Board/2018/2018-may4-032.pdf.

[4] See CBS News, *Otay Mesa continues to grow as a commerce hub* (Feb. 8, 2023) and *Proposed project could bring thousands of diesel trucks to Barrio Logan, locals not happy* (Dec. 4, 2022); available at https://www.cbs8.com, accessed Mar.16, 2023.

[5] Letter from Ellen M. Peter, Chief Counsel of the California Air Resources Board to Wayne Nastri, Executive Officer of the South Coast Air Quality Management District, dated May 6, 2021, attaching letter from Robert Swanson, on behalf of California Attorney General Rob Bonta, to Ellen M Peter, entitled "Legality of South Coast Air Quality Management District Proposed Rules 2305 and 316 - Facility-Based Mobile Source Measure for Warehouse Distribution Centers." Dated, 6 May 2021.

pollution in the state. To help address these concerns, the Committee is considering including a warehouse indirect source measure as part of the future proposed International Border CERP, mirroring and supporting the corresponding measure in the Portside CERP.

1.3.2 Federal Law

The District's indirect source authority is reinforced in the Clean Air Act, which, as previously stated, defines an indirect source as "…a facility, building, structure, installation, real property, road, or highway which attracts, or may attract, mobile sources of pollution." (42 U.S.C. §7410(a)(5)(C)). Federal law allows an indirect source review program to be included in the State Implementation Plan to attain national clean air standards (42 U.S.C. §7410(a)(5)(A)(i)). An indirect source review program is defined as a *"facility-by-facility review of indirect sources of air pollution"* and includes, but is not limited to, *"measures as are necessary to assure, or assist in assuring, that a new or modified indirect source will not attract mobile sources of air pollution, the emissions from which would cause or contribute to air pollution concentrations that exceed a national primary ambient air quality standard or prevent maintenance of any such standard.* (42 U.S.C. §7410(a)(5)(D)).

2.0 STAFF ACTIVITIES & FINDINGS

Starting in November 2021, District staff began work to evaluate the feasibility of various actions to address indirect sources of pollution, particularly warehouses, distribution centers, and ports. Staff began by reviewing rules from other districts, and then conducted meetings with stakeholders and subject matter experts to determine what sort of actions could be feasible for the region.

To date, District staff has conducted 49 meetings with various stakeholders, including community groups, warehouse owners, other jurisdictions and other internal District divisions. Feedback from those initial meetings included requests to:

- Minimize the administrative burden and costs for those affected by any new rule, and to the extent feasible, avoid duplicative requirements with existing or proposed State or federal mobile source regulations;
- Include as many warehouses as possible that are close to residents or vulnerable populations;
- Provide a suite of compliance options for those subject to the regulation; and
- Ensure any rule or agreement (i.e. Memorandum of Understanding (MOU)) would not impede the ability to access incentive funding.

Given the feedback from these initial meetings, staff has been researching the potential feasibility of developing a rule similar to South Coast Rule 2305 for warehouses and a Memorandum of Understanding (MOU) with the Port of San Diego, and are requesting feedback from stakeholders and the Governing Board to guide the process as it moves forward. To help inform those decisions by stakeholders and the Governing Board, staff conducted the activities outlined in Sections 2.1 through 2.4 in this document.

2.1 SAN DIEGO WAREHOUSE INVENTORY ANALYSIS

District staff obtained information from a commercial real estate analytics firm to identify the number, size, and location of existing warehouses in the San Diego region.[6] There are approximately 6,700 warehouses throughout the region, ranging in size from less than 1,000 sq ft. to 3.3 million sq ft. of indoor floor space. The population of warehouses in various size categories is listed in Table 1. Warehouses with at least 100,000 sq ft. of indoor floor space represent less than 4% of all warehouses yet account for more than 28% of the total warehousing space in the region.

Table 1
Warehouse Population in San Diego County[7]

Size Category (Indoor Floor Space)	Number of Warehouses	Square Footage
≥ 250,000 square feet (sq. ft.)	27	14,654,930
≥ 150,000 to < 250,000 sq. ft.	81	15,077,654
≥ 100,000 to < 150,000 sq. ft.	135	15,986,960
≥ 50,000 to < 100,000 sq. ft.	414	28,401,882
< 50,000 sq. ft.	6,080	87,121,334
Total:	**6,737**	**161,242,760**

Figure 1 shows the locations of all warehouses in the region, which tend to be concentrated in areas with access to transportation infrastructure and customer markets. The location of warehouses is overlaid on a map showing the region's CalEPA CalEnviroscreen (4.0) scores.[8] The region's under-resourced communities are generally shaded in red, orange, and yellow in the figure.

[6] The update to the Governing Board in August 2022 regarding the status of the District's indirect source program included data obtained through the San Diego Association of Governments (SANDAG). This data included industrial warehouses only. The data provided in Table 1 is more comprehensive, current, and approximately double the amount of facilities previously presented. It includes industrial facilities (e.g. warehouse, distribution, manufacturing, refrigeration/cold storage, truck terminal) and flex facilities (e.g. light distribution, light manufacturing).

[7] The warehouse inventory is based on information provided by CoStar Realty Information Inc. and comprises buildings classified as warehouse, distribution, manufacturing, refrigeration/cold storage, truck terminal, or flex (i.e., includes light distribution and light manufacturing and at least half of the building floor area is used as office space).

[8] Under-resourced communities throughout the state were identified by CalEPA using its CalEnviroScreen (4.0) tool, which evaluates communities using environmental, public health, and socioeconomic indicators to determine their health burdens. Communities are given a percentile score (out of 100%) to show how they compare to the rest of the state. Communities receiving the highest 25% of scores statewide are designated as disadvantaged (i.e. under-resourced) communities, and are generally indicated in the map as shaded in red, orange, or yellow. These include, but are not limited to, the Portside and the International Border communities.

Figure 1
Warehouse Locations in San Diego County

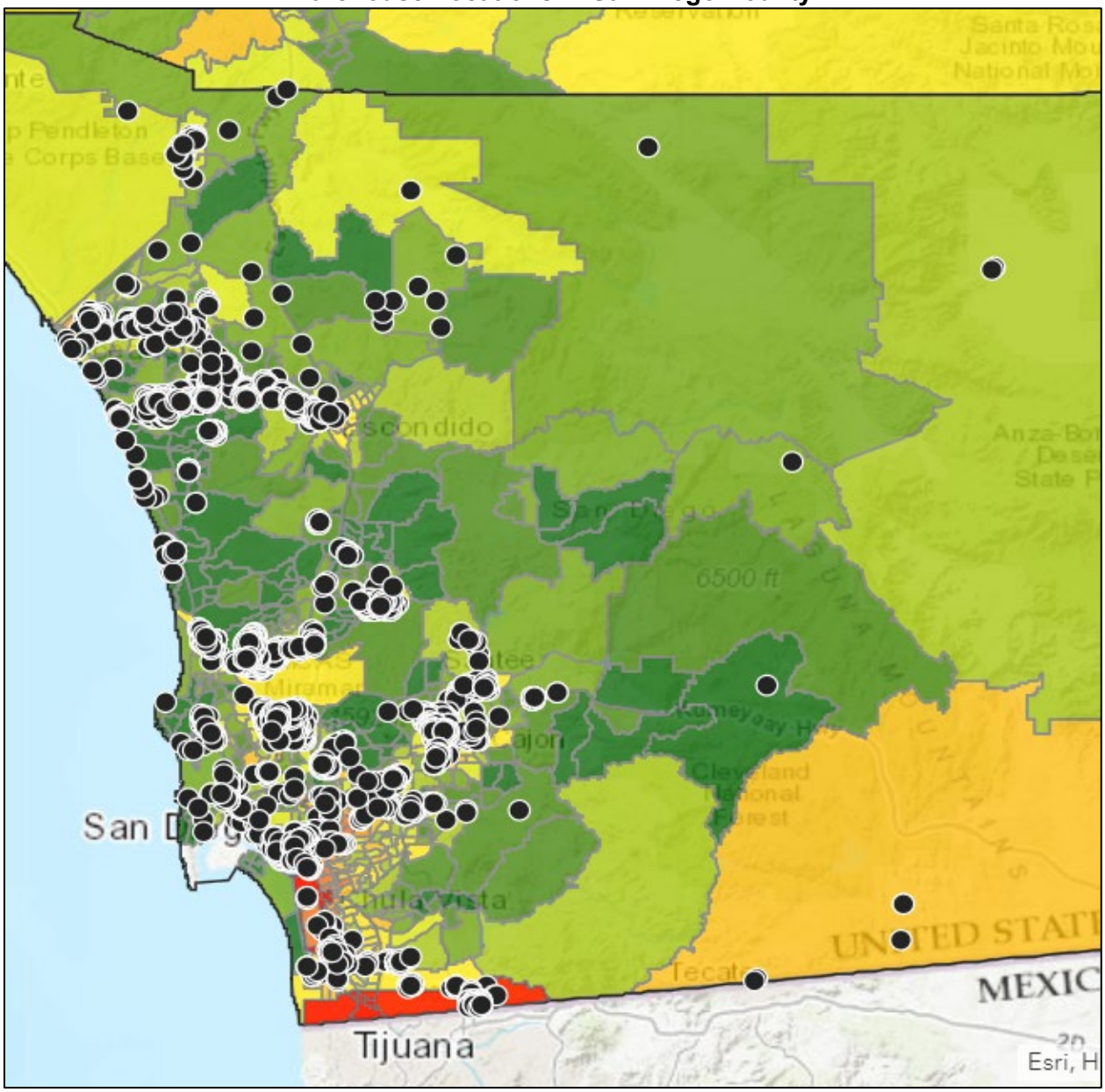


Table 2 below summarizes the warehouse population count (by warehouse size) in under-resourced communities in San Diego County, including the Portside and International Border communities. Table 3 below presents the same information as Table 2 but summarizes the information by warehouse total floor area.

Table 2
Warehouse Population in Under-Resourced Communities in San Diego County

Size Category (Indoor Floor Space)	International Border	Portside	Other Under-Resourced Communities	Total
≥ 250,000 square feet (sq. ft.)	7	1	3	**11**
≥ 150,000 to < 250,000 sq. ft.	23	2	7	**32**
≥ 100,000 to < 150,000 sq. ft.	31	2	9	**42**
≥ 50,000 to < 100,000 sq. ft.	68	32	50	**150**
< 50,000 sq. ft.	299	487	835	**1,621**
Total:	**428**	**524**	**904**	**1,856**

Table 3
Warehouse Total Floor Area in Under-Resourced Communities in San Diego County

Size Category (Indoor Floor Space)	International Border (sq. ft.)	Portside (sq. ft.)	Other Under-Resourced Communities (sq. ft.)	Total (sq. ft.)
≥ 250,000 square feet (sq. ft.)	5,914,592	340,566	2,380,903	**8,636,061**
≥ 150,000 to < 250,000 sq. ft.	4,610,991	371,000	1,177,932	**6,159,923**
≥ 100,000 to < 150,000 sq. ft.	3,606,598	234,248	1,015,256	**4,856,102**
≥ 50,000 to < 100,000 sq. ft.	4,699,764	2,037,876	3,460,352	**10,197,992**
< 50,000 sq. ft.	5,879,094	5,063,832	11,947,368	**22,890,294**
Total:	**24,711,039**	**8,047,522**	**19,981,811**	**52,740,372**

2.2 INDIRECT SOURCE RULE FEASIBILITY ANALYSIS

District staff researched the rules of other air districts to identify and evaluate concepts for potentially regulating indirect source emissions from existing and new freight hubs in the San Diego region. Staff's findings are presented below.

2.2.1 Indirect Source Rule Adopted by SJVAPCD

In December 2005, the San Joaquin Valley Air Pollution Control District (SJVAPCD) became the first air agency in the nation to control emissions from indirect sources by adopting Rule 9510 (Indirect Source Review), which addresses emissions growth from new land development in the Central Valley.[9] Developers are required to mitigate their construction and operational emissions

[9] SJVAPCD's eight-county jurisdiction covers all of San Joaquin, Stanislaus, Merced, Madera, Fresno, Kings, and Tulare Counties and the Valley air basin portion of Kern County.

by specified percentages, or pay mitigation fees if the emissions are not reduced by the required amount, and the resulting proceeds are used by the air district to fund emission reduction projects.

Rule 9510 plays a significant role in the SJVAPCD's overall emission reduction efforts. However, the rule does not apply to existing freight facilities, which are an important consideration for the San Diego region. Furthermore, it involves individual project-by-project reviews of all types of new land development, which is well outside the scope of the District's current measure and programmatic capabilities. Additionally, environmental documents for regionally significant projects are already screened for possible air quality concerns through the District's existing California Environmental Quality Act (CEQA) review program, which the District anticipates expanding in the years ahead. For these reasons, SJVAPCD's rule was not prioritized for further evaluation or consideration at this time.

2.2.2 Warehouse Indirect Source Rule Adopted by SCAQMD

In May 2021, the South Coast Air Quality Management District (SCAQMD) adopted Rule 2305 (Warehouse Indirect Source Rule—Warehouse Actions and Investments to Reduce Emissions (WAIRE) Program), a first-of-its-kind air district rule to help reduce DPM and NOx emissions specifically from the freight sector in the Greater Los Angeles region.[10] The SCAQMD also adopted companion Rule 316 (Fees for Rule 2305), establishing fees paid by the regulated warehouses to fund the air district's implementation and administration of Rule 2305.

Applicability & Requirements. SCAQMD's Rule 2305 applies to about 3,300 warehouses in that region, comprising all facilities with 100,000 sq ft. or more of indoor floor space in a single building that may be used for warehousing activities. Affected warehouses must earn a certain number of points annually, depending on the number of truck trips made to and from the warehouse each year as tracked by the operator.[11] To earn points, warehouses must complete any combination of items from a menu of several different implementation measures, including buying and/or using zero-emission or ultra-low NOx on-road trucks, zero-emission cargo handling equipment, zero-emission charging and fueling infrastructure, solar panels, or indoor particulate filters for nearby sensitive land uses.[12] Alternatively, warehouse operators may prepare and implement site-specific custom plans of onsite or offsite actions (within the operator's control) that are not on the menu. Or facilities may choose to pay a mitigation fee to SCAQMD rather than, or in conjunction with, implementing a custom plan or menu items; the resulting proceeds are used to fund clean technology projects that are primarily deployed in impacted communities.

Reporting is also required by SCAQMD's rule. Warehouse owners must submit a one-time Warehouse Operations Notification that includes basic information about their building and tenants. Warehouse operators must submit a one-time Initial Site Information Report about their operations and associated truck activity. Warehouse operators must also submit annual WAIRE Reports providing truck trip data and demonstrating how their facility complied during the previous

[10] SCAQMD's four-county jurisdiction covers all of Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino Counties.

[11] Trucks are categorized by their classification. Larger Class 8 trucks are weighted 2.5 times due to higher emissions.

[12] Points assigned to each menu option are constructed based on options available to warehouses with at least 100,000 sq. ft of indoor floor space and would need to be adjusted accordingly for smaller facilities if they would be subject to the rule in the future.

year.[13] SCAQMD has developed an online reporting tool to assist facilities in meeting these reporting requirements.

Rule implementation began January 1, 2022, and is phased in over several years, beginning with the largest warehouses (greater than or equal to 250,000 sq ft.). Full rule implementation will be complete in 2024. Recent reporting from California Assistant Attorney General Robert Swanson, in response to current litigation, indicates more than 75% of regulated warehouses comply with Rule 2305 provisions without the need to purchase zero-emission or near-zero emission trucks.[14]

Litigation. The California Trucking Association (CTA) filed a lawsuit in federal court in August 2021, seeking to invalidate SCAQMD's Rules 2305 and 316.[15] Additional parties have intervened in the lawsuit. In support of SCAQMD, the State of California intervened on behalf of the Office of the Attorney General and CARB, Earthjustice intervened on behalf of a coalition of environmental and community groups, and Natural Resources Defense Council, Communities for a Better Environment, and Environmental Defense Fund also intervened. Airlines for America (A4A) intervened on behalf of CTA.

CTA and A4A claim the rules (1) exceed air district authority because the rules apply to existing sources and interfere with city and county authority over land use decisions; (2) are preempted by federal law including (a) the Clean Air Act preemption of state and local regulations setting motor vehicle emissions standards, and (b) the Federal Aviation Authorization and Administration Act's prohibition of state and local regulations on the prices, routes, or services of motor carriers, and (c) the Airline Deregulation Act's similar prohibition of state and local regulations on the prices, routes, or services of air carriers; and (3) impose an improper regulatory fee under Proposition 26, which was an amendment to Article XIIIC of the California Constitution.

In January 2023, the CTA and A4A filed a Motion for Summary Judgment on the Clean Air Act and Airline Deregulation Act claims. The SCAQMD and their supporting intervenors argued the rules are not preempted because they do not relate to the control of emissions from motor vehicles, do not impose an emissions standard, do not require the purchase of vehicles, and at most have a tenuous, remote, or peripheral effect on air carrier prices, routes, or services. A hearing was held on April 17, 2023. The Court has not issued a ruling and has not indicated when a ruling can be expected. The SCAQMD and State of California stated they intend to file their own Motion for Summary Judgment. District staff are tracking developments and will keep the Governing Board apprised.

Benefits & Costs. SCAQMD has reported that its Rule 2305 reduces NOx emissions in that region by an estimated 468 to 936 tons per year depending on which menu options are implemented.[16] The maximum annual cost of compliance is estimated at $979 million (in 2018 dollars) if all warehouses in that air district implement the highest-cost menu item (solar panel installations). Total public health benefits are estimated to outweigh the total regulatory costs by a ratio of about 3:1 in terms of avoided premature deaths, hospitalizations, respiratory effects, and lost workdays.

[13] However, warehouses greater than or equal to 100,000 sq. ft. in size that use less than 100,000 sq. ft. for warehousing activity, or with multiple tenants (not under the same parent company) where no operator uses more than 50,000 sq. ft. for warehousing activity, only must comply with the reporting requirements; they are not required to annually earn points or take other emission-reducing actions to comply with the rule.

[14] Barry, C. (2023, April 18). Judge Mulls EPA SIP Approval of L.A. Warehouse Rule in Preemption Case. *InsideEPA.com*.

[15] California Trucking Association v. South Coast Air Quality Management District et al, Case 2:21-cv-06341.

[16] See http://www.aqmd.gov/docs/default-source/Agendas/Governing-Board/2021/2021-May7-027.pdf.

Alternatives Considered. SCAQMD considered and ultimately rejected potential alternative measures before adopting Rule 2305 and its menu-based points system, which was found to be the least administratively burdensome for facilities and the air district. The alternatives considered included:

- Local government measures, where local governments could decide to tailor indirect source emission reduction strategies through their land use authority. This alternative was rejected due to the potential uncertainty in implementation by local governments.

- Facility-wide emission caps, giving warehouses the flexibility to individually determine how to reduce their emissions to meet a specified cap. This alternative lacked public support and was found to be too administratively burdensome to implement and track.

- Truck fleet certification program, allowing fleet owners to voluntarily certify their fleets as cleaner than otherwise required by CARB regulations while requiring warehouses to use a prescribed amount of certified fleets. This alternative lacked board member support and was considered too complex to set up, administer and track by the air district.

2.2.3 Feasibility of Warehouse Indirect Source Rule for San Diego Region

District staff preliminarily reviewed the potential feasibility of adopting a local rule similar to SCAQMD's warehouse indirect source rule regulating warehouses of 100,000 sq. ft. and larger (and fees to recover rule administration and enforcement costs), considering technological, environmental, and economic factors. Staff's findings are presented below and suggest such a rule and associated administrative fees are feasible and could be successfully implemented in San Diego County, providing much-needed emission reductions from the freight sector. However, such a rule is predicted to be the costliest measure the District has ever enacted in terms of the compliance costs per pound of reduced emissions. If the Governing Board directs staff to proceed with rule development, further technical analyses including socioeconomic and environmental impact studies and public review would be conducted in accordance with State law to further assess and verify feasibility prior to rule adoption.

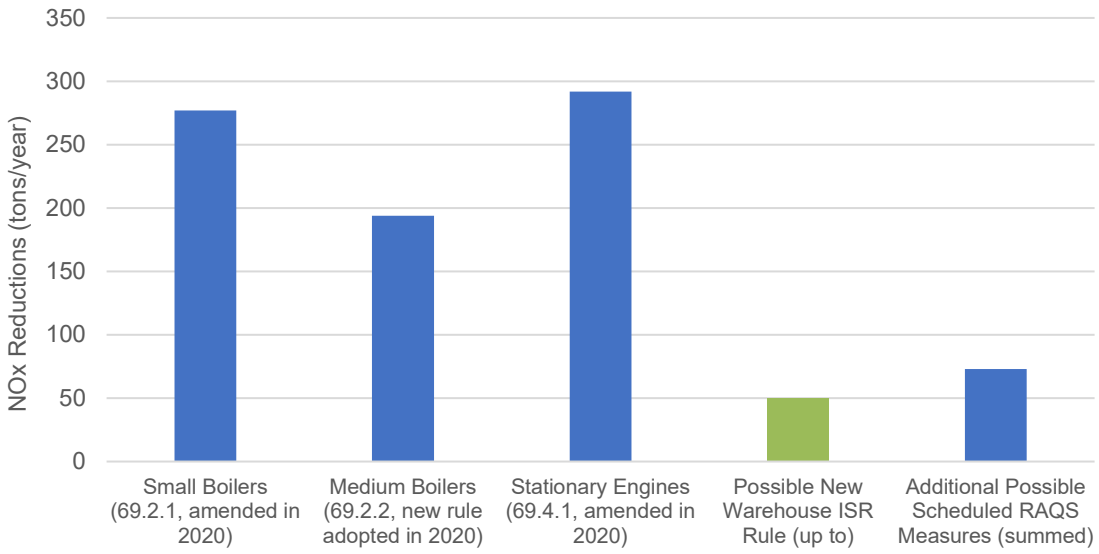
Technical Feasibility. A menu of several different compliance options is provided in SCAQMD's rule, as previously stated. Some options involve the purchase and use of heavy-duty (Class 8) zero-emission vehicles (ZEVs), for which the market is still emerging.[17] However, they are increasingly available as more manufacturers are beginning to offer them in response to regulatory and incentive programs (highlighted in Section 2.4) and were therefore included as a compliance option. Additionally, phase-in periods of the proposed rule are intended to accommodate their increasing availability over time as the market expands. However, if a similar menu-based rule is pursued for the San Diego region, the Governing Board could direct a periodic technology review, including staff recommendations to update the menu of emissions-reducing actions, if warranted. Moreover, warehouse operators would have other potential compliance options that are currently available. These include ultra-low NOx heavy-duty trucks, smaller zero-emission trucks, zero-emission yard trucks, solar panels, charging/fueling infrastructure, and indoor air filtration systems.

Air Quality & Health Benefits. Adopting a local rule similar to SCAQMD's warehouse indirect source rule would be expected to provide comparable air quality and public health benefits to the

[17] Currently there are 8 commercially available models of zero-emission tractors with more coming, as reported by CARB during a public workshop on Feb. 13, 2023.

San Diego region, in proportion to our smaller population of warehouses with at least 100,000 sq. ft. of indoor floor space (approximately 240 here vs. 3,300 in SCAQMD). If adopted, a local rule could be expected to reduce NOx emissions by as much as 50 tons per year (i.e. 0.2% of baseline regionwide NOx emissions in 2023), and diesel particulate matter emissions by as much as 0.27 tons per year (i.e. 0.1% of baseline regionwide diesel particulate matter emissions in 2023), based on preliminary estimates. Figure 2 below illustrates emission reduction benefits from recent (and proposed future) stationary source rulemakings compared to potential reductions estimated from a possible new warehouse indirect source rule. In July 2020 the District adopted rules that reduce NOx emissions from small boilers (Rule 69.2.1) by 277 tons per year, medium boilers (Rule 69.2.2) by 194 tons per year, and stationary engines (Rule 69.4.1) by 292 tons per year upon full rule implementation. These emission reductions are also presented in relation to possible future emission reductions from measures scheduled for rule development activity in the District's most recent air quality plan to attain state ozone standards ("2022 Regional Air Quality Strategy" (RAQS)). A comparison of the cost-effectiveness of these same previous/future measures can be found below in the *Compliance Costs and Cost-Effectiveness* portion of this section of the document.

Figure 2
NOx Reduction Comparison to Recent/Possible Rulemakings



Anticipated air quality benefits of a potential warehouse indirect source rule are further visualized in Figures 3 and 4 below. Figure 3 presents total regionwide NOx emissions along with anticipated NOx reductions as a result of a proposed warehouse indirect source rule (shown in green). Figure 4 presents emission reductions to be achieved through CARB regulations (in blue) as discussed further in Section 2.4.2, alongside a scenario that combines reductions to be achieved through CARB regulations in addition to a warehouse indirect source rule (in green), if pursued. Substantial emission reductions will be achieved from CARB regulations alone. However, a local warehouse indirect source rule would further reduce NOx emissions above and beyond existing conditions.[18] Moreover, the resulting public health benefits would be expected to outweigh the potential costs of compliance by a ratio of up to 2.5:1, like SCAQMD's rule. As many as 16

[18] The delta between the blue and green bars in Figure 4 (i.e. emission reductions possible through a warehouse indirect source rule) is expected to be far smaller in practice due to CARB's recent adoption of the Advanced Clean Fleets regulation in April 2023, which will now require zero-emission trucks for many trucking fleets through 2045.

premature deaths, 317 asthma attacks, and 1,092 lost workdays would be estimated to be avoided over a ten-year period as a result of a local rule in the San Diego region.[19]

Figure 3
San Diego County Regionwide NOx Emissions (tons per year)[20]

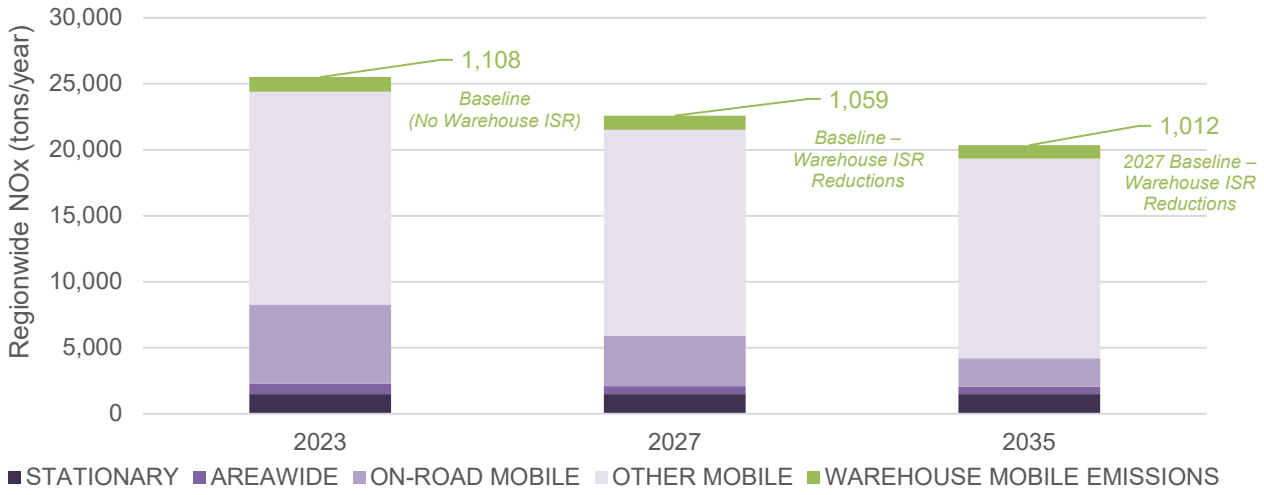
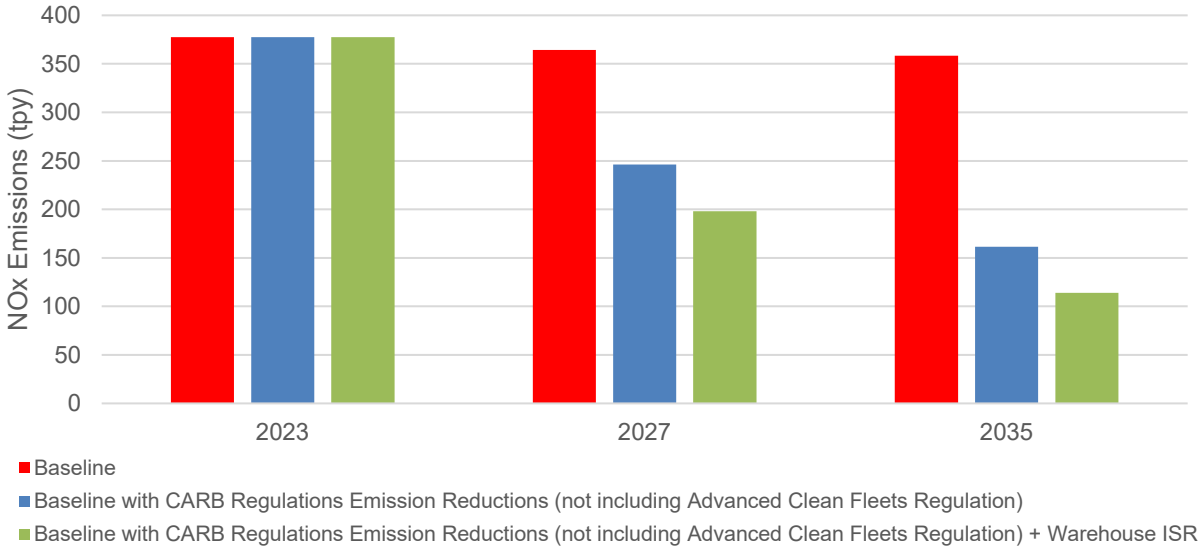


Figure 4
Estimated Warehouse Indirect Source NOx Emissions in San Diego County (from warehouses ≥ 100,000 square ft. in size)[21]



[19] Potential health benefits were estimated using SCAQMD Final Socioeconomic Impact Assessment (SIA), May 2021, scaled in proportion to our smaller population of warehouses with at least 100,000 sq. ft. of indoor floor space.

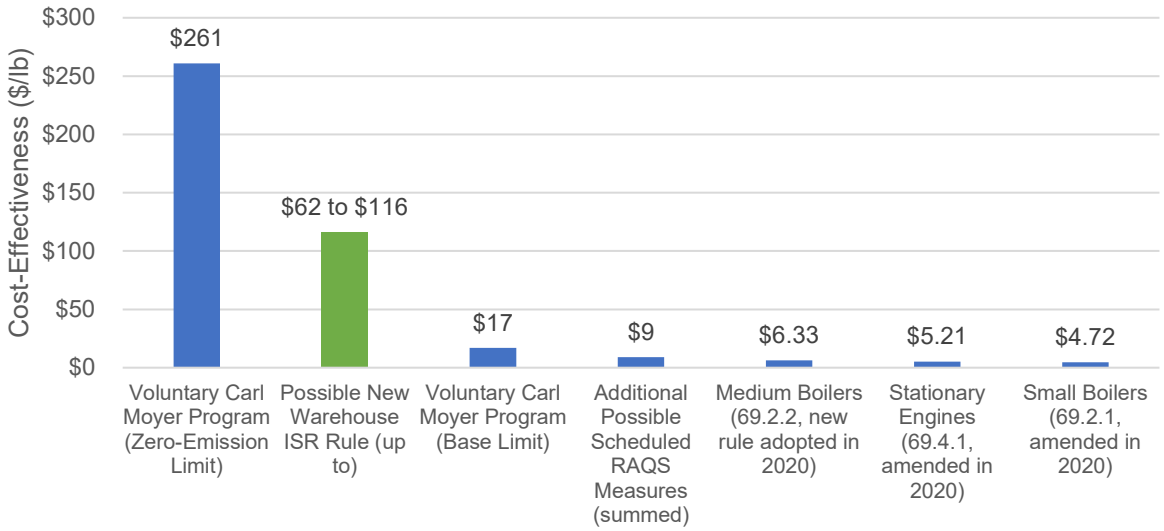
[20] Warehouse emissions from facilities above 100,000 square feet.

[21] The emission reductions from a potential local warehouse rule were estimated based on SCAQMD's emission reduction estimates for that region under its Rule 2305, scaled in proportion to San Diego County's smaller population of warehouses with at least 100,000 sq. ft. of indoor floor space.

Compliance Costs and Cost-Effectiveness. Average annual compliance costs incurred by each local warehouse is estimated to be between $14,400 and $26,100 per year. Actual costs would vary depending on the site-specific actions taken to reduce emissions. According to SCAQMD, costs for most compliance options are anticipated to be about 0.5% of the total operating costs of each warehouse. SCAQMD also noted that the most expensive compliance option a warehouse operator is likely to select is the mitigation fee, which at SCAQMD equates to $0.83 per square foot per year according to that air district's rulemaking analyses. Overall, this translates to an estimated maximum compliance cost of about $83,000 per year for a smaller warehouse with 100,000 sq ft. of floor space, and could rise to $830,000 per year for a larger warehouse with 1 million sq ft. If rulemaking is directed by the Governing Board, the District's proposed mitigation fee would be calculated during the rule development process.

Cost-effectiveness is typically expressed in terms of total compliance costs (dollars) per unit of emissions reduced (tons or pounds). The cost-effectiveness value in this case is difficult to calculate due to the dozens of options that would be available for compliance. Preliminary estimates of cost-effectiveness for a proposed rule in San Diego County currently range between $62 to $116 per pound of NOx reduced.[22] As illustrated in Figure 5 below, recent (and proposed) stationary source rulemakings are resulting in greater emission reductions at lower costs. For instance, in July 2020 when the District adopted NOx rules for small boilers (Rule 69.2.1), medium boilers (Rule 69.2.2), and stationary engines (Rule 69.4.1), all three rulemakings were achieved with cost-effectiveness values under $7 per pound of emissions reduced. Similar low cost-effectiveness values are also anticipated from previously identified measures found within the District's recently adopted 2022 Regional Air Quality Strategy (RAQS).

Figure 5
Cost-Effectiveness Comparison to Recent/Proposed Rulemakings and Incentive Programs



[22] Warehouses are assumed to gravitate towards the lowest cost options for their specific situations, as reported by SCAQMD. As such, no warehouse would be expected to comply in a costlier manner than the mitigation fee option, which has an estimated cost-effectiveness of about $100,000 per ton ($50 per pound) of NOx reduced for this option according to SCAQMD at the time of its rulemaking. Mitigation fee amounts for San Diego County could vary. SCAQMD noted in their 2022 Air Quality Management Plan (AQMP) that most compliance options available in Rule 2305 were analyzed with a cost-effectiveness below $315,000 per ton ($157.50 per pound)

If adopted, a warehouse indirect source rule is anticipated to be the costliest (or least cost-effective) measure the District has ever enacted, significantly exceeding the cost effectiveness values of the District's existing and possible future prohibitory rules (up to $6 per pound), as well as EPA's guidance threshold for NOx control measures ($2.50 per pound).[23] Though high, the preliminary cost-effectiveness estimates are comparable to the cost-effectiveness values of mobile source regulations recently adopted by CARB, and as shown in Figure 5 above, lower than the cost-effectiveness values for voluntary adoptions of zero-emission equipment found in incentive funding programs that the District administers.

District Costs for Rule Development and Administration. The District's costs to proceed with rule development, if directed, are partially incorporated in the District's FY 2023-24 Recommended Budget. Existing staff would lead the rule development process. Additional one-time costs of approximately $250,000 would be expected to be incurred to prepare a socioeconomic impact assessment and CEQA compliance documentation using technical consultants with expertise in those areas.[24]

In addition to the rule development costs, the District would also incur future costs associated with the ongoing rule administration, outreach, and enforcement activities, including:

- Labor costs for staff time to: receive and process the three types of reports that would be required by such a rule; verify compliance through desk audits and onsite inspections; conduct significant outreach and training on the rule and its requirements; and administer an incentive program funded by collected mitigation fees to deploy clean technology projects benefitting impacted communities. For example, the District estimates between 0.2 and 3.8 hours of staff time would be necessary for each report received, if a rule similar to SCAQMD Rule 2305 were to be adopted and implemented locally. Each report received would consist of review by a Division Chief, Supervising Air Resources Specialist, Air Quality Specialist, and an Air Quality Inspector II. The estimated review time per report does not include additional elements that would be conducted by the District, including proactive outreach opportunities and small business assistance. Although an exhaustive analysis has not been done, initial estimates indicate the additional staff time for the various compliance and outreach activities will likely result in the need for at least two additional staff positions at the District to administer a potential warehouse indirect source program.

- The District anticipates that to administer a warehouse indirect source rule similar to SCAQMD Rule 2305, three reports would be required of facilities subject to the San Diego rule. This includes: a one-time warehouse operations notification report (preliminarily estimated at approximately $100 per facility), a one-time initial site information report (preliminarily estimated at approximately $300 per facility), and an annual compliance report (preliminarily estimated at approximately $600 per facility for each reporting year). Preliminary estimated costs of such reports would be further refined and decreased/increased as needed during the rule development process to ensure District implementation costs would be adequately recovered.

[23] Further information can be found in Section 1.1.3 of the District's *2020 Reasonably Available Control Technology Demonstration for the National Ambient Air Quality Standards for Ozone in San Diego County*, available at: https://www.sdapcd.org/content/dam/sdapcd/documents/grants/planning/Att%20B%20(RACT).pdf

[24] https://abag.ca.gov/sites/default/files/documents/2021-02/Planning%20Cost%20Guide%20Final%2009-02-2020.pdf

- Services and supply costs, primarily for information technology as reporting by warehouses would likely be conducted through a new District web portal, estimated to cost $200,000 to develop initially and $25,000 annually to maintain. Like SCAQMD, the District estimates an additional fee (per report) would be necessary to recover costs associated to maintain the new District web portal.

As authorized by State law, these future costs could be recovered through an accompanying proposed revision to District Rule 40 setting a schedule of fees to be paid by regulated warehouses when submitting their reports. If staff were directed to complete the rule development process, cost estimates would be presented at public workshops and to the Governing Board in the future when draft warehouse indirect source and fee rules are proposed for adoption. This would include costs for additional District staffing, if warranted, for rule administration, enforcement, and outreach, as well as costs to develop and maintain a web portal for warehouse reporting. These costs would also be incorporated in the District's future annual budgets, as appropriate.

Staff's Conclusions. If the Governing Board were to direct staff to proceed with rule development, the findings presented above suggest a District rule similar to SCAQMD's warehouse indirect source rule regulating warehouses of 100,000 sq. ft. and larger and associated fees to recover the District's rule administration costs could be successfully implemented in San Diego County to improve air quality and protect public health. However, the rule would likely be the costliest (or least cost-effective) measure the District has ever enacted, and further technical analyses including socioeconomic and environmental impact studies and public review would need to be conducted in accordance with State law to assess potential impacts and analyze feasibility prior to rule adoption.

A rule (if pursued) would achieve emission reductions from a significant source of air pollution, the freight sector, and contribute toward the timely attainment of federal and State ozone and State particulate pollution standards and associated health benefits in communities throughout the region. It would also provide regulatory consistency for warehouses in adjacent air districts and trade corridors using an established regulatory model. Moreover, it would support many actions occurring at the federal, state, and local levels to spur development and deployment of zero-emission and other clean technologies in pursuit of clean air and climate goals.

2.2.4 Additional Considerations

Legislation. California Assembly Bill 1372 (Alvarez, 02/17/23) would block CARB's enforcement of any requirements to buy and use heavy-duty zero-emission vehicles operating at the land ports of entry on the California-Mexico border. CARB could resume enforcement starting in 2026 under certain conditions. In its current form (as introduced), the bill is contrary to the District's mission and the goals and actions of multiple agencies that support deployment of zero-emission vehicles, especially in port-adjacent communities suffering greater health risks from diesel pollution. Additional pieces of legislation have also been proposed recently that could affect future siting of new warehousing facilities statewide, thus representing a changing legislative landscape around the sector overall. In accordance with the District's Legislative Policy, staff has advocated and will continue to advocate for bill amendments that align with the agency's mission to meet clean air standards and reduce air pollution burdens, especially in our most vulnerable communities.

Smaller Warehouses. Warehouses smaller than 100,000 sq ft. of floor space are not subject to SCAQMD's rule and would not be covered in this region if an analogous rule were pursued for

San Diego County. However, nearly 30% of all warehousing space in San Diego County would still be subject to a local rule covering warehouses 100,000 sq ft and larger.[25]

Additional analysis would be required prior to including smaller warehouses in a local rule. Specifically, the District would need to research the ability of warehouses smaller than 100,000 sq. ft. to implement the menu of compliance measures that is in the SCAQMD rule to reduce emissions, and if certain measures are infeasible, to find alternative compliance options. This analysis is critical to the legal defense of the rule from potential claims of federal preemption. It is expected that with fewer emissions sources, limited operating parameters, and space limitations, smaller warehouses likely have fewer menu options, or potentially different menu options, available to them. But because warehouses are often clustered, and actions by regulated larger warehouses may affect fleets that also serve smaller warehouses, a proposed rule regulating warehouses 100,000 sq. ft. and larger could provide localized benefits to residences and other sensitive receptors adjacent to smaller warehouse operations.

Following rule adoption (if pursued) and once the necessary District resources and regulatory infrastructure are in place to administer the new program, future efforts could focus on possibly expanding the rule or implementing other non-regulatory strategies (such as an incentive program) to reduce indirect source emissions from warehouses smaller than 100,000 sq ft. Further, in the initial rulemaking, if pursued, the Governing Board could direct staff to include a provision that requires one-time reporting by smaller warehouses (for example, those with at least 50,000 sq. ft. of floor space), providing basic information about their location and operations that would help inform possible future strategies to further control indirect source emissions from warehouses.

Possible State Implementation Plan (SIP) Rule Submittal. If directed to pursue a local warehouse indirect source rule, the District would likely submit the rule (if adopted by the Governing Board) for inclusion into the San Diego County portion of the California SIP. Its inclusion in the SIP will help ensure the rule is federally enforceable as a SIP-strengthening measure and provide critically needed NOx and particulate matter emission reductions to the San Diego region to support timely attainment of criteria pollutant standards.

2.3 PORT OF SAN DIEGO

The Port of San Diego is a seaport that operates two marine cargo terminals, two cruise ship terminals, and the leases of hundreds of tenant businesses along the San Diego Bay. The Port's National City Marine Terminal (NCMT) receives about 130-160 vessel calls annually,[26] and focuses on automobile importing and exporting. The Tenth Avenue Marine Terminal (TAMT) receives about 90-110 vessel calls annually[27] and processes refrigerated containers of perishable goods, dry bulk cargo such as cement or fertilizer, and breakbulk commodities (oversized, non-containerized cargo such as windmill blades or large generators). Truck trips at each terminal varies year-to-year but were recently estimated by the Port at over 40,000 annual

[25] SCAQMD Rule 2305 covers approximately 50% of all warehousing space in their respective region, which indicates they generally have larger warehousing facilities in comparison to San Diego County warehousing facilities.

[26] Port of San Diego. *National City Marine Terminal: Port of San Diego & Pasha Automotive Services At Berth Port Plan* (November 30, 2021). https://ww2.arb.ca.gov/sites/default/files/2022-05/San%20Diego%20-%20National%20City%20Marine%20Terminal%20-%20Original%20Plan%20%28non-ADA%29.pdf

[27] Port of San Diego. *Tenth Avenue Marine Terminal: Port of San Diego At Berth Port Plan* (November 30, 2021). https://ww2.arb.ca.gov/sites/default/files/2022-05/San%20Diego%20-%20Tenth%20Avenue%20Marine%20Terminal%20-%20Original%20Plan%20%28non-ADA%29.pdf

truck trips per terminal.[28] The B Street Cruise Ship Terminal receives about 90-100 ship calls annually,[29] while the smaller Broadway Cruise Ship Terminal receives about 12-14 vessel calls annually.[30]

Port operations and associated activities rely on ocean-going vessels, commercial harbor craft, cargo-handling equipment, and heavy-duty vehicles and equipment, most of which are powered by diesel engines that produce air pollution impacting port-adjacent neighborhoods. In fact, currently most of the cancer risk (84%) from air pollution in the Portside Community is due to DPM.[31] However, sources of DPM in the Portside community emanate from a variety of sources both on and off Port tidelands, including commercial harbor craft, locomotives, ocean-going vessels, on-road mobile sources, transport refrigeration units, stationary sources, and air pollution transported from on and off-road mobile sources in Mexico.

2.3.1 Maritime Clean Air Strategy

On October 12, 2021, the Port of San Diego Board of Port Commissioners approved the Maritime Clean Air Strategy (MCAS), a strategic planning document to help the Port identify and prioritize future projects and initiatives to reduce emissions while supporting efficient and modern maritime operations. Key MCAS goals include:

- 40% of the Port's annual cargo truck trips being performed by zero-emission trucks by June 30, 2026, increasing to 100% by 2030, five years ahead of state requirements.
- 100% of cargo handling equipment being zero emission by 2030.

2.3.2 Potential Memorandum of Understanding (MOU)

District staff worked extensively with the Port in the development of the MCAS. The MCAS identifies important goals and opportunities, on an ambitious timeline, to advance the Port's clean air efforts. However, the path to implementation is complex and is expected to face financial, infrastructure, and operational challenges. District staff has been working with the Port to establish a path forward through these challenges by exploring opportunities for formalizing some of the implementing mechanisms into an MOU. An MOU allows the District and the Port to consider the inclusion of emissions reducing actions that could not be directly required through a rulemaking because of potential limitations in the District's authority over emissions sources at the Port.

Furthermore, an MOU could allow for the expedited adoption of emissions reducing measures because it involves fewer procedural requirements compared to a rule development process. As with the warehouse indirect source rule, an indirect source rule specific to port operations would need to contain alternative emissions reducing measures (i.e. menu of available compliance

[28] Port of San Diego. *Final Heavy-Duty Zero-Emission Truck Transition Plan, Version 1.0* (June 30, 2022). Appendix A, Page A-18. https://pantheonstorage.blob.core.windows.net/environment/Final-Zero-Emission-Truck-Transition-Plan.pdf

[29] Port of San Diego. *B Street Cruise Ship Terminal: Port of San Diego At Berth Port Plan* (November 30, 2021). https://ww2.arb.ca.gov/sites/default/files/2022-05/San%20Diego%20-%20B-Street%20Pier%20-%20Original%20Plan%20%28non-ADA%29.pdf

[30] Port of San Diego. *Broadway Street Cruise Ship Terminal: Port of San Diego At Berth Port Plan* (November 30, 2021).https://ww2.arb.ca.gov/sites/default/files/2022-05/San%20Diego%20-%20Broadway%20Pier%20-%20Original%20Plan%20%28non-ADA%29.pdf

[31] CARB, May 24, 2022, *San Diego Regional and Portside Community Modeling Presentation to the Portside Community Steering Committee* [PowerPoint Slides]. https://www.sdapcd.org/content/dam/sdapcd/documents/capp/meetings/portside-csc/052422/III.%20CARB%20SD%20Portside%20Risk%20Modeling_Eng.pdf

options) and verify feasibility of those options. Due to the time needed to develop these alternatives, the rule development process may not be able to match the aggressive timelines in the MCAS. Additionally, it's estimated that 73% of the Port's NOx and 87% of its DPM emissions are created by ocean-going vessels and commercial harbor craft,[32] which are sources that are challenging to regulate at the local level and may better be addressed with an MOU approach. Overall, operations at the Port of San Diego (as of 2016) comprised approximately 2.5% of regionwide NOx emissions, and 6.2% of regionwide DPM emissions.

To date no air district has adopted an indirect source rule for port operations. SCAQMD has recently pivoted from MOU negotiations with the Ports of Los Angeles and Long Beach to rule development as referenced in Section 2.3.3 below. Any local indirect source rule for the Port of San Diego will have to carefully navigate international and federal laws to determine legal authority. Also, as is often the case with first-in-kind regulations, an indirect source rule would likely face a legal challenge. The SCAQMD will be attempting to navigate this landscape in their rule development process but are still in the early phases.

Thus, as an effective next step, staff propose building off its collaborative work with the Port of San Diego by pursuing an MOU to partner on emissions reduction, facilitative, and health-protective mitigation measures that could support more expedient emission reduction opportunities along the Port tidelands. An MOU, if pursued, can be developed more quickly than a rule and is considered more suitable for facilitative and incentive-based measures that can help to achieve air quality goals. Also, it can provide more flexibility to allocate incentive funding from the District to such projects that may still be considered surplus to regulation, whereas a rule would significantly limit such funding opportunities.

Examples of direct emission reduction projects could include commitments from the Port to achieve quantifiable emission reductions from projects within the Port Tidelands that replace diesel-fueled equipment with newer, cleaner technology or fuels. Facilitative projects are likely to include actions that cannot easily quantify emission reductions, such as enhanced outreach opportunities, installation of zero-emission charging/fueling infrastructure, or additional measures that might incentivize the adoption of zero-emission equipment. Health protective mitigation projects could include commitments to enhance existing air purifier/air monitoring programs, or enhanced enforcement of existing/new truck routes in the Portside area.

Accordingly, and contingent upon the Port agreeing with any proposed MOU, District staff propose returning to the Governing Board in Q4 2023 with proposed MOU language with the Port that includes emission reduction commitments, facilitative measures, health-protective mitigation measures, and reporting requirements to reduce Port indirect source emissions. The MOU would also require approval by the Port of San Diego Board of Commissioners in the same timeframe. The District and the Port will release the draft MOU language for public comment prior to any Board action.

2.3.3 Future Update to Governing Board

If directed to pursue an MOU by the Governing Board, staff propose to return to the Governing Board in Q4 2023 with an update on MOU development, including either proposed MOU language, or with recommendations as to how to proceed. For example, if MOU development is not prompt and successful, i.e., if a proposed MOU is not ready to be executed by Q4 2023, the Board could direct staff to extend the negotiation period for an MOU to be developed, or to shift

[32] Port of San Diego 2016 Maritime Air Emissions Inventory, June 2018. Table ES-1. https://pantheonstorage.blob.core.windows.net/environment/2016-Maritime-Air-Emissions-Inventory.pdf

efforts to investigating a future rulemaking applicable to the Port of San Diego/Port Tenants and their indirect source emissions. Staff are tracking similar efforts of the SCAQMD, which was previously working to develop an MOU with the Ports of Los Angeles and Long Beach, which are the two busiest marine container ports in the nation and the largest source of NOx emissions in that air district. However, an MOU was never completed, and in February 2022 the SCAQMD embarked upon rulemaking.

SCAQMD is thus currently developing a proposed indirect source rule for commercial marine ports, with an initial focus on container terminals. The rule will be considered for adoption in 2024, and a subsequent rulemaking is planned for non-containerized terminals. The District will be actively tracking the SCAQMD process moving forward.

2.4 OTHER FEDERAL, STATE, & LOCAL ACTIVITIES

Many other actions are being taken at the federal, state, and local levels to encourage and accelerate the heavy-duty ZEV market and reduce emissions from the freight sector. A few key examples are presented below. A warehouse indirect source rule, if pursued, as well as a potential MOU with the Port of San Diego, would achieve emission reductions that are above and beyond these other programs and would contribute additional air quality benefits to help meet clean air standards in the San Diego region.

2.4.1 U.S. EPA

In December 2022, the U.S. Environmental Protection Agency (EPA) adopted more stringent emissions standards that will reduce NOx emissions from heavy-duty vehicles starting with model year 2027 (88 FR 15). EPA's rule established more stringent NOx standards compared to today's standards and requires lower NOx emissions over a wider range of operating conditions. Moreover, EPA's rule lengthened emissions-related warranty periods. Further, EPA recently proposed two additional rulemakings as part of its Clean Truck Plan to further reduce truck emissions including greenhouse gases.[33]

2.4.2 CARB

CARB has recently adopted several regulations, and is developing others, to further control and reduce emissions from heavy-duty vehicles. A few of these statewide regulations are further described below. Any future District rulemaking that staff would be directed to pursue would be designed to achieve surplus emission reductions beyond CARB's regulations and facilitate the implementation of CARB rules by encouraging early adoption of rule requirements.

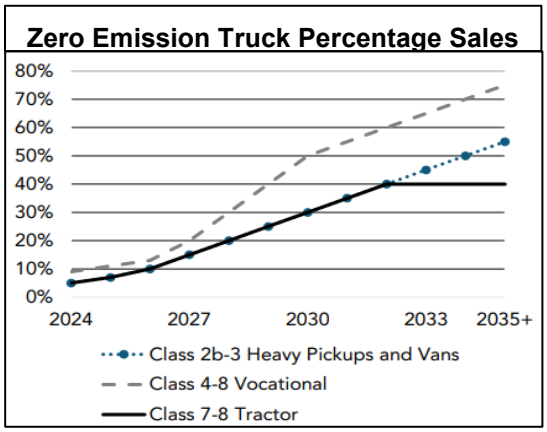
Omnibus Regulation. In September 2021, CARB adopted the Heavy-Duty Low NOx Omnibus Regulation that requires new trucks that use fossil fuels to include the most effective emissions control technology during the state's transition to electric trucks. The regulation cuts NOx emissions by 75% starting with 2024 models sold in the state,[34] and by 90% starting with 2027 models. The regulation also includes provisions to ensure trucks meet standards under real-world conditions and extends warranties.

[33] www.epa.gov/regulations-emissions-vehicles-and-engines/clean-trucks-plan.

[34] In a February 2023 workshop, CARB noted manufacturers may have difficulty in meeting standards for 2024-2025 model year truck engines and as such is providing more flexibility for these model years.

Heavy-Duty Truck Inspection & Maintenance. In December 2021, CARB adopted a heavy-duty vehicle inspection and maintenance (HD I/M) regulation, ensuring emissions control systems on heavy-duty trucks are functioning as intended and well-maintained throughout their vehicle life, cutting air pollution. Implementation began in January 2023 and requires regular testing on nearly all heavy-duty vehicles operating in California. All covered vehicles, including out-of-state registered vehicles and trucks crossing international borders, must demonstrate compliance to legally operate in California. The Department of Motor Vehicles will block registration on California-based trucks that do not comply.

Advanced Clean Trucks. In June 2020, CARB adopted its Advanced Clean Trucks regulation to ensure expanding supplies of zero-emission trucks. Truck manufacturers must sell zero-emission vehicles as a growing percentage of sales in all vehicle classes starting in 2024, as can be seen in the graphic on the right. Six additional states have adopted CARB's Advanced Clean Trucks regulation and more states are in the process of doing so. These united efforts are expected to further expand the zero-emission supply chain, leading to increased economies of scale and lower costs.



Advanced Clean Fleets (ACF)
In April 2023, CARB adopted the ACF regulation to require fleets that are well suited for electrification to transition to ZEVs where feasible. The regulation requires (1) 100% zero-emission drayage trucks, last mile delivery, and government fleets by 2035, (2) 100% zero-emission refuse trucks and local buses by 2040, and (3) 100% zero-emission capable utility fleets by 2040. Due to the recent adoption of this regulation, the impacts of this action in regard to a local warehouse indirect source rule are still being analyzed by District staff. However, it is anticipated that the ACF and Advanced Clean Trucks regulations will both significantly increase the number of zero-emission heavy-duty trucks in operation throughout San Diego County, whether or not a local warehouse indirect source rule is pursued.

2.4.3 DISTRICT

Financial Incentives. Through its "Clean Air for All" program,[35] the District has invested over $159 million since 1999 in businesses, the community, and local government to encourage and accelerate the adoption of clean technologies in mobile sources associated with freight hubs and other indirect sources. These incentive grant programs are primarily funded by the State and include:

- Carl Moyer Program, which replaces heavy-duty diesel vehicles and engines with electric and other cleaner technologies;
- Community Air Protection Incentives, which prioritize deployment of zero-emission technologies and infrastructure within under-resourced communities;
- Zero-Emission Truck Pilot Project, which encourages the purchase or lease of zero-emission heavy-duty trucks in the Portside Community; and

[35] https://www.sdapcd.org/content/sdapcd/grants/moyer.html.

- Proposition 1B Goods Movement Emissions Reduction Program, which upgrades heavy-duty diesel trucks and other equipment involved in freight movement to cleaner technologies.

While the District has been successful with grant programs historically, zero-emission focused programs have had a more difficult time attracting viable projects. As these technologies mature District staff anticipates more interest in those programs. Applicants will need to be aware of the tight timelines and restrictions created by the new state and federal regulatory landscape and opportunities for incentives will continue to be limited.

Mobile Source Enforcement Program. To help address air pollution from mobile sources, the District signed an MOU with CARB to enforce certain mobile source regulations in the San Diego region on CARB's behalf. As a result, the District has the first and most comprehensive Mobile Source Enforcement Program of any air district in the state. The MOU granted the District the authority to conduct inspections of on-road and off-road vehicles and equipment for purposes of enforcing the following statewide mobile source regulations in San Diego County:

- Truck and Bus Regulation;
- Heavy-Duty Vehicle Inspection Program;
- Transport Refrigeration Units;
- Commercial Vehicle and School Bus Idling;
- Off-road Vehicles; and
- Commercial Harbor Craft.

These CARB regulations focus on reducing pollutants that form ozone and cause exposure to toxic DPM, which adversely impacts public health especially in under-resourced communities.

3.0 POTENTIAL TIMELINE

Following its consideration of the information contained herein, if the Governing Board were to direct staff to pursue a local warehouse indirect source rule for warehouses 100,000 square feet and above and/or an MOU with the Port of San Diego, the projected timeline for completing future actions is as follows:

Table 4
Tentative Timeline of Warehouse Indirect Source Rule Development Actions (if pursued)

Throughout	- Public outreach and stakeholder engagement
Q3 2023	- Refine/continue collecting facility information; - Initiate procurement process to secure a contractor to prepare required CEQA and SIA documentation
Q1 2024	- Complete facility and background information collection, refine rule language
Q2 2024	- Start CEQA/SIA preparation process (Environmental Impact Report (EIR) anticipated, ~12-18 months to complete) - Draft rule released for public workshop(s) and comments;
Q4 2024	- Enhanced outreach and engagement (i.e. AB 617 Steering Committees, affected facilities, trade groups, etc.)
Q1 2025	- Complete draft CEQA environmental analysis; release for public comment; respond to comments

Q2 2025	- Governing Board consideration of proposed final rule and final CEQA environmental analysis

Table 5
Tentative Timeline of Port/APCD MOU Actions (if pursued)

Q3 2023	- Further refine measures/actions with the Port of San Diego to be included in MOU; - Public outreach and engagement
Q4 2023	- District Governing Board consideration of proposed MOU (or extend negotiation period/direct staff to pursue other options);
Q1 2024	- Port of San Diego Board of Port Commissioners consideration of proposed MOU (if applicable)

San Diego County
Air Pollution
Control District

Warehouse Indirect Source Rule (ISR) Framework Supplement

APRIL 2025

SAN DIEGO COUNTY
AIR POLLUTION CONTROL DISTRICT
10124 Old Grove Road
San Diego, CA 92131

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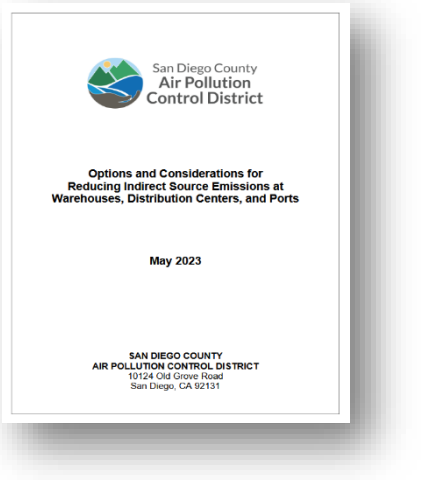
EXECUTIVE SUMMARY

Introduction

This "Warehouse Indirect Source Rule (ISR) Framework Supplement" (or Supplement) presents staff's findings to date and provides an opportunity to gain public input and direction from the Governing Board on the preferred nature and scope of any potential District rule or program. Note that this Supplement provides an informational update only and does not present the District's recommendations to the Governing Board regarding a potential warehouse ISR for San Diego County.

Background



Starting in November 2021, the San Diego County Air Pollution Control District (SDAPCD or District) staff began work pursuant to California Assembly Bill (AB) 423 (Gloria, 2019) to evaluate the feasibility of various actions to address indirect sources of pollution, particularly warehouses and distribution centers. More specifically, AB 423 required the District to "***consider*** adopting an indirect source rule to address pollution from mobile sources that is associated with stationary sources, such as ports, warehouses, and distribution centers." In May 2023, District staff prepared a report titled "Options and Considerations for Reducing Indirect Source Emissions at Warehouses, Distribution Centers, and Ports," also referred to as the "ISR Framework" (Attachment A), and presented the preliminary findings at the June 2023 Governing Board meeting.

This "Warehouse Indirect Source Rule (ISR) Framework Supplement" (or Supplement) presents an update to pertinent sections found in the initial ISR Framework for warehouses and distribution centers. This Supplement also provides new or updated information through analysis that was either directed by the Governing Board, Planning and Policy Committee, and/or discussed through the Warehouse Working Group (WWG). Consequently, staff believes that the Governing Board's consideration and acceptance of this Supplement, together with the initial ISR Framework and WWG meeting series, will fulfill the requirement set forth by AB 423 to consider an ISR for warehouse and distribution centers.

Comments

Comments regarding this Supplement may be submitted in writing no later than **May 15, 2025**. Please submit all written comments to APCDRules@sdapcd.org.

Warehouse Working Group (WWG) Meetings and Activities

As directed by the Governing Board, between September 2023 and October 2024, staff conducted 10 virtual public meetings with WWG participants, comprising almost 20 hours of in-depth, technical conversations about indirect source emissions. Over 90 stakeholders were invited, comprising of key local community, environmental, industrial, and government



stakeholders, to collect varying perspectives from a wide variety of stakeholders. The group was not typically able to reach a consensus on most topics. While such agreements were not anticipated, the WWG nonetheless continually provided thoughtful and meaningful information for the District's consideration.

One area of general agreement was for a non-regulatory incentive option(s) to be available in some capacity. Staff presented a possible three-tiered strategy for such incentive opportunities to the WWG, and feedback was generally well-received by industry, environmental groups, and trucking and logistics companies.

From industry's perspective, several topics were frequently elevated for further analysis including: (1) better evaluating the impacts and emission reductions associated with CARB mobile source regulations, (2) concerns whether identified warehouses were actually engaging in goods movement activity, (3) Zero-Emission Vehicle (ZEV) truck and infrastructure availability issues, (4) difficulty in tracking truck activity at potentially subject facilities, and (5) noting the unique circumstances of warehousing activity along the international border.

From the environmental perspective, comments included: (1) ensuring that Community Emissions Reduction Plan (CERP) goals are prioritized to further improve the health and wellness of residents in disadvantaged communities, (2) consider the possible cumulative impact of many smaller warehouses clustered around sensitive receptors, and (3) developing an ISR (as opposed to a voluntary incentive program) could potentially provide more certainty for achieving emission reductions if framed in a way that could target such facilities in disadvantaged communities.

From an implementation perspective, the District highlighted several topics throughout the WWG meeting series including the following: (1) the importance and difficulty of achieving regionwide emission reductions in a manner that does not run afoul of federal preemption issues while achieving localized emission reductions, and (2) continued following of the SCAQMD's implementation of their Rule 2305 to prepare for future challenges if a rulemaking is locally pursued (Section 2.1).

Stakeholder Comments for District Consideration

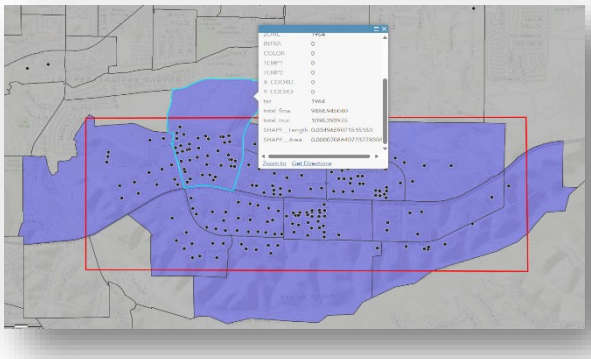


Stakeholders were engaged throughout the WWG process. Though the District received much feedback, four alternative concepts/comments were received for consideration as alternatives to, or in modification of, a possible warehouse ISR in San Diego County. These four concepts along with summarized responses are listed in the table below, with more detailed descriptions included in this Supplement (Section 2.1.5).

Comment/Concept	District Response (summarized)
Appointment System at Otay Mesa Port of Entry *(An appointment system at the International Border could provide more emission reduction benefits from reduced idling times at the ports of entry.)*	"Induced Demand" needs further evaluation. Further assessment of pilot project in Calexico is necessary to determine extent of benefits/feasibility of expansion to other areas.
Industry Warehouse Analysis *(Truck volumes in SD County areas with warehouses are not higher than other high traffic areas affected by diesel particulate matter; other disadvantaged communities in SD County could benefit most by electrification.)*	Freeway truck counts being used as the basis for analysis is a concern. Utilizing "normal" traffic data in place of "truck" traffic data may not be appropriate.
ISR vs. Incentive Analysis *(An incentive program aimed at electrifying light commercial vehicles instead of an ISR could provide a better overall reduction in NOx and PM2.5.)*	Targeted incentive programs within certain communities could achieve similar emission reductions as a possible ISR, but at a greater capital cost, and primarily subsidized by District grant programs. Number of vehicles needed to achieve equivalent emission reductions, as well as funding availability, are also significant barriers.
Focus on Localized Sensitive Receptor Impacts *(An ISR should regulate warehouses 100k sq ft or more countywide, and all warehouses in disadvantaged communities of any size operating within 1,000 ft of a sensitive receptor.)*	Regulating warehouses smaller than 100,000 sq ft poses significant logistical and legal challenges to implementation. Compliance options may be severely limited with smaller warehouses being encompassed. Uncertainty regarding land-use changes in a neighborhood, as well as whether smaller warehouses are truly goods-movement related activities, are also a complicating factor.

Truck Trip Rate Analysis

In response to Governing Board direction, staff developed a novel truck trip rate analysis using truck trip data specific to San Diego County to estimate truck trip rates for warehouses of different sizes. Truck trip rates are critical for estimating baseline emissions from warehousing activities. Using baseline emissions, other estimates including emission reductions, cost-effectiveness, and public health benefits of proposed strategies can be calculated.



Staff estimated truck trip rates for various sizes of warehouses and truck classes. To do this, a map was developed with known potential warehouse locations based on data acquired from commercial real estate analytics firm CoStar. Transportation analysis zones (TAZs), with San Diego Association of Governments (SANDAG) modeled truck activity data that was used to support the most recently adopted 2021 Regional Plan, were also included. For TAZs that included one or more warehouse buildings in that zone, total truck volumes, number of warehouses, warehouse square footage, and average warehouse size were tabulated. This was done for 10 specific warehouse clusters found throughout San Diego County and was statistically evaluated (via correlation coefficients) to determine the strength of the relationship between warehouse floor area and total truck volume. The results of the analysis showed a strong positive correlation, i.e., as warehouse square footage increases truck volume also proportionately increases. Conversely, the opposite is also true, that as warehouse square footage decreases, the truck volume also proportionally decreases.

Staff differentiated the total daily truck volumes into various truck classes (light-heavy, medium-heavy, and heavy-heavy duty) using modeled truck volume data along street segments in the San Diego region. Additionally, adjustment factors were developed to account for uncertainties in the datasets including: (1) facilities potentially not conducting warehousing activities, and (2) the total truck volumes servicing warehouses as opposed to trucks used for other purposes.

From the analysis, staff estimated the countywide average daily truck trip rates per 1,000 sq ft for various warehouse sizes as shown in the table below.[1]

Warehouse Floor Area (sq ft)	Class 2B to 5 Daily Truck Trip Rate (per 1,000 sq ft)	Class 6 to 7 Daily Truck Trip Rate (per 1,000 sq ft)	Class 8 Daily Truck Trip Rate (per 1,000 sq ft)
100k and greater	0.05	0.02	0.08
50k to <100k	0.09	0.03	0.14
25k to <50k	0.12	0.04	0.19
12.5k to <25k	0.15	0.05	0.23
<12.5k	0.31	0.09	0.48
County average (all sizes)	**0.14**	**0.04**	**0.22**

The results indicate that for each truck class the daily truck trip rates increase as warehouse floor area decrease. However, this does **not** mean that smaller warehouses generally receive more truck visits than larger warehouses. This is because the estimated number of truck trips are calculated with floor area and the applicable truck trip rate for a specific warehouse size category.[2]

Staff then compared these truck trip rates to the rates estimated by the South Coast Air Quality Management District (SCAQMD) when they developed their warehouse Rule 2305. The SCAQMD rates range from 0.12 to 0.75 trucks per 1,000 sq ft. All the estimated truck trip rates derived in this analysis are less than 1.0 trips per 1,000 sq ft for each warehouse size category.

[1] Preliminary estimates subject to change.

[2] See Table 6, Section 2.3.6 – Truck Trip Rate Analysis Results.

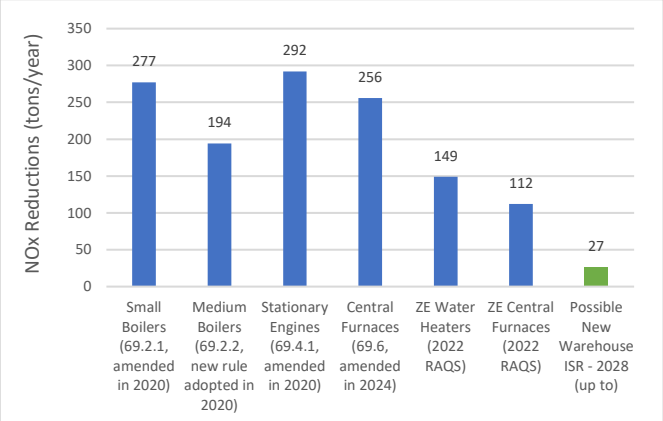
This is significant because the trip rates derived from the District's analysis using San Diego County-specific traffic data are within the range of the trip rates developed by the SCAQMD and other references. Taken together with other considerations, staff determined that it was reasonable and appropriate to use the truck trip rates calculated using the methodology explained in this Supplement (Section 2.3) to estimate baseline emissions from warehousing activities in the San Diego region.

Air Quality and Health Benefits

Using the estimated truck trip rates listed in the table above, SANDAG Vehicle Miles Traveled data, building floor area, and composite truck emission factors developed using data from the California Air Resources Board (CARB), staff estimated baseline emissions for nitrogen oxide (NOx) and particulate matter (PM2.5) for the baseline year scenarios of 2028 and 2032. These years reflect the anticipated implementation start date if a proposed ISR would be first implemented (2028), and when all subject facilities would be fully phased in (2032). To account for CARB mobile source regulations already in effect, staff incorporated scaling factors from CARB. Baseline emissions from warehouses in San Diego County subject to a possible ISR are estimated to be 17 - 36 tons per year of NOx, and 0.3 - 0.7 tons per year of PM2.5, depending on the applicability threshold used.[3]

Staff also conservatively calculated the possible emission reductions a warehouse ISR may achieve if developed for San Diego County. In line with Governing Board direction, staff evaluated applicability thresholds for two size ranges: warehouses with floor area of 100,000 sq. ft. or more, and warehouses with floor area of 50,000 sq. ft. or more. For each applicability threshold, staff evaluated three best-case emission reductions scenarios, which comprise of: (1) Scenario 1, where all facilities select the Low-NOx truck option to comply; (2) Scenario 2, where all facilities select the ZEV truck option to comply; and (3) Scenario 3, where facilities select a combination of options such as Low-NOx trucks, ZEV trucks, or other compliance options (e.g., solar panels, air filters, mitigation fee) that are consistent with how facilities are complying with Rule 2305 in the SCAQMD. Because Scenarios 1 and 2 limit compliance options, which would be critical components to include in a potential warehouse ISR to avoid federal preemption issues, staff evaluated possible emission reductions based on the more "realistic" Scenario 3.

Possible NOx emission reduction estimates compared to those achieved by other regulations recently adopted by the District are included in the graph to the right. Estimated emission reductions from warehouses in San Diego County subject to a potential ISR are between 13 - 27 tons per year of NOx, and 0.1 - 0.3 tons per year of PM2.5, depending on the applicability threshold used (Section 2.4.3). It's important to note that this analysis assumes that all the facilities identified in the various size



[3] Approximately 0.15% of the regionwide NOx emission inventory (23,587 tons/year), and 0.01% of the regionwide PM2.5 emission inventory (7,531 tons/year), per CARB CEPAM2019v1.04.

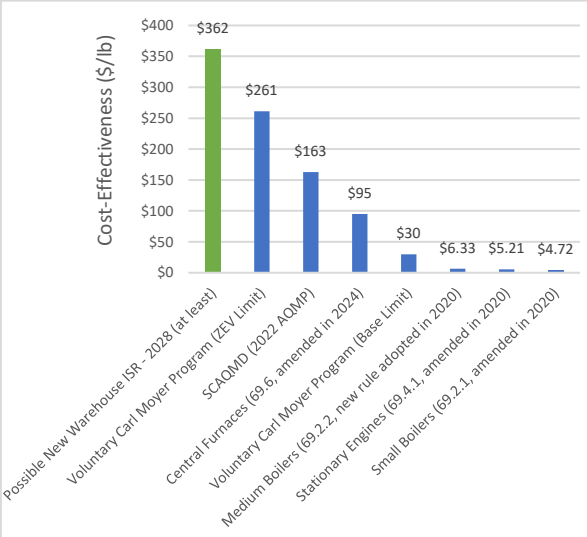
categories conduct warehousing activities and would be subject to a potential warehouse ISR. However, a portion of these facilities may likely be conducting non-warehousing activities (e.g., retail, office, or other light commercial use) in buildings classified as warehouses, and thus would not be subject to a potential warehouse ISR. Therefore, the baseline emissions, and consequently emission reductions, are likely to be ***less in practice*** than the estimated values, and should be considered best-case estimates.

Possible health benefits associated with a potential warehouse ISR, based on the estimated emission reductions presented above, were tabulated using the EPA CO-Benefits Risk Assessment Health Impacts Screening and Mapping Tool (COBRA). Implementation of a potential warehouse ISR could result in avoiding between 25 and 68 health-related incidences per year, and a potential savings of $313k to $1.1 million per year in associated healthcare costs, depending on the applicability threshold used and baseline year evaluated (Section 2.4.4).

Compliance Costs and Cost-Effectiveness

Total annual compliance costs were derived from SCAQMD information on average costs and WAIRE menu items implemented to comply with their Rule 2305. Average annual compliance costs that would be incurred by each local warehouse subject to a possible ISR are estimated to be between $29,000 and $49,000 per year.

State law requires air districts to evaluate cost-effectiveness of proposed rules, which is typically expressed in terms of total compliance costs (dollars) per units of emissions reduced (tons or pounds). Cost-effectiveness values were estimated using the total annual compliance costs and the estimated emission reductions listed above. Preliminary cost-effectiveness estimates for a potential warehouse ISR in San Diego County currently range between $362 to $464/lb of NOx reduced in 2028. The cost-effectiveness values are estimated to increase to a range between $485 and $622/lb in 2032 as NOx emission reductions are anticipated to decrease each year due to increasing emission benefits from various CARB mobile source regulations. The estimated cost-effectiveness for a possible ISR now far exceeds the cost-effectiveness values estimated for recent District rulemakings, as well as for incentive-based projects within the Carl Moyer program, which are generally recognized as some of the highest cost-effectiveness values for achieving emission reductions (Section 2.5).



District Costs for Rule Development and Administration

Staff re-evaluated potential costs associated with Rule Development, implementation, and administration of a possible warehouse ISR in San Diego County, including ongoing rule administration, outreach, possible litigation defense, and enforcement activities (Section 2.6). Such costs include the items listed below, which are subject to revision during a possible future rulemaking process. While "direct" costs associated with implementation of the program could be recouped through District fees, other "one-time" costs would likely not be recoupable.

- Approximately $250,000 (one-time) to prepare required CEQA documentation.
- Approximately $250,000 (one-time) to prepare required socioeconomic impact assessment documentation.
- Up to $900,000 per year (ongoing) for additional staff to administer the program (e.g., report evaluation, compliance, outreach activities).
- Approximately $200,000 (one-time) to develop a new District web portal.
- Approximately $25,000 per year (ongoing) to annually maintain the District web portal.
- Approximately $135,000 (one-time) for District/County legal costs to defend a possible ISR if litigated.
- Unknown outside legal counsel costs if a possible ISR is litigated (if necessary).
- Approximately $75,000 per year (ongoing) for enhanced enforcement-related actions (if necessary).

Staff believes ongoing staff costs associated with the direct implementation of the program (e.g., costs associated with reviewing, evaluating, and enforcing standard rule provisions) could be recouped by District fees. However, costs associated with CEQA document development, socioeconomic impact assessment development, web portal development, internal/external legal counsel, and enhanced enforcement activities may not be recouped through fees alone, though legal judgements and enforcement agreements could potentially recoup some costs incurred.

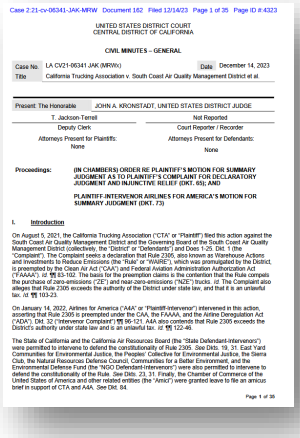
Additional Considerations

Since the ISR Framework was prepared, several additional considerations in relation to a possible warehouse ISR in San Diego County have developed (Section 2.7). They include the following:

- **Litigation involving SCAQMD Rule 2305** – Courts granted summary judgement to the SCAQMD and denied plaintiffs' claims. To date, no other appeals have been filed.

- **EPA approval of Rule 2305** – While the EPA approved the rule as a measure strengthening the State Implementation Plan (SIP), full approval was not granted due to specific deficiencies. Thus, the EPA cannot assign emission credit in the SIP until such deficiencies are resolved.

- **WAIRE Program Implementation Update** – In October 2024, SCAQMD released results of the 2nd year of Rule 2305 implementation. Highlights include: warehouses are earning more WAIRE points than required; the WAIRE Program is reducing emissions and facilitating new actions/business



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UNITED STATES DISTRICT COURT
CENTRAL DISTRICT OF CALIFORNIA

CIVIL MINUTES – GENERAL

Case No. LA CV21-06341 JAK (MRWx) Date December 14, 2023
Title California Trucking Association v. South Coast Air Quality Management District et al.

Present: The Honorable JOHN A. KRONSTADT, UNITED STATES DISTRICT JUDGE

T. Jackson-Terrell — Deputy Clerk — Attorneys Present for Plaintiffs: None
Not Reported — Court Reporter / Recorder — Attorneys Present for Defendants: None

Proceedings: (IN CHAMBERS) ORDER RE PLAINTIFF'S MOTION FOR SUMMARY JUDGMENT AS TO PLAINTIFF'S COMPLAINT FOR DECLARATORY JUDGMENT AND INJUNCTIVE RELIEF (DKT. 69); AND

PLAINTIFF-INTERVENOR AIRLINES FOR AMERICA'S MOTION FOR SUMMARY JUDGMENT (DKT. 73)

I. Introduction

On August 5, 2021, the California Trucking Association ("CTA" or "Plaintiff") filed this action against the South Coast Air Quality Management District and the Governing Board of the South Coast Air Quality Management District (collectively, the "District" or "Defendants") and Does 1-25. Dkt. 1 (the "Complaint"). The Complaint seeks a declaration that Rule 2305, also known as Warehouse Actions and Investments to Reduce Emissions (the "Rule" or "WAIRE"), which was promulgated by the District, is preempted by the Clean Air Act ("CAA") and Federal Aviation Administration Authorization Act ("FAAAA"). Id. ¶¶ 83-102. The basis for the preemption claims is the contention that the Rule compels the purchase of zero-emissions ("ZE") and near-zero-emissions ("NZE") trucks. Id. The Complaint also alleges that Rule 2305 exceeds the authority of the District under state law, and that it is an unlawful tax. Id. ¶¶ 103-23.

On January 14, 2022, Airlines for America ("A4A" or "Plaintiff-Intervenor") intervened in this action, asserting that Rule 2305 is preempted under the CAA, the FAAAA, and the Airline Deregulation Act ("ADA"). Dkt. 32 ("Intervenor Complaint") ¶¶ 86-121. A4A also contends that Rule 2305 exceeds the District's authority under state law and is an unlawful tax. Id. ¶¶ 122-46.

The State of California and the California Air Resources Board (the "State Defendant-Intervenors") were permitted to intervene to defend the constitutionality of Rule 2305. See Dkts. 19, 31. East Yard Communities for Environmental Justice, the Peoples' Collective for Environmental Justice, the Sierra Club, the Natural Resources Defense Council, Communities for a Better Environment, and the Environmental Defense Fund (the "NGO Defendant-Intervenors") were also permitted to intervene to defend the constitutionality of the Rule. See Dkts. 23, 31. Finally, the Chamber of Commerce of the United States of America and other related entities (the "Amici") were granted leave to file an amicus brief in support of CTA and A4A. See Dkt. 84.

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models to support zero-emissions technologies; significant staff efforts required for program implementation; most common compliance options utilized are ZE hostlers and near-zero emission truck visits; and significant outreach and compliance/enforcement activities have been required.

- **CARB Mobile Source Regulations** – CARB has adopted many mobile source regulations, and three in particular (Advanced Clean Trucks, Advanced Clean Fleets, and a possible future ZE Truck Measure) could all reduce emissions at indirect sources such as warehouses if implemented.[4] The Supplement provides information and updates as to the status of these three regulatory actions.

- **Assembly Bill (AB) 98** – In September 2024, AB 98 was enacted in California to apply to new and expanded warehouses that are proposed for any floor size, though more requirements apply to proposed facilities over 250,000 sq. ft. in size. Such requirements include but are not limited to: (1) requiring minimum standards to minimize impacts to sensitive receptors, and (2) prohibiting local agencies from approving such facilities without such standards incorporated. While existing warehouses may not be directly impacted, its impact on the warehouse industry statewide is still unclear.

- **District Study of Warehouse facilities in Portside community** – In December 2024, staff conducted an informal case study of warehouses in the Portside Community located in the vicinity of a specific sensitive receptor. In all, staff researched 70 buildings classified in the CoStar inventory as a "warehouse" to better determine how many facilities may be conducting goods-movement related activities that may be subject to a possible warehouse ISR. The findings concluded that: (1) many facilities did not appear to be doing prototypical goods-movement activities, (2) uncertainty whether smaller facilities would have adequate pathways to comply with a possible ISR similar in scope to SCAQMD Rule 2305, and (3) 14% of the 70 facilities researched may likely be conducting goods-movement related activities. If these results are extrapolated for the warehouse inventory countywide, then the possible ISR emission reduction estimates presented above may very likely be a best-case scenario.

Staff's Conclusions

Over the past 2 years, in response to Governing Board direction, staff has prepared the ISR Framework, convened a multi-stakeholder working group (WWG), and prepared this Supplement, among other activities. This work included development of a truck trip rate analysis specific to the San Diego region (Section 2.3), baseline emissions, potential emission reductions and public health benefits (Section 2.4), and cost-effectiveness values (Section 2.5). Together, these estimates help inform the District's evaluation of a potential warehouse ISR, the impacts for AB 617 communities and countywide, as well as challenges with implementation (EHC Comment Letter). Staff believes the Governing Board's consideration and acceptance of this Supplement, together with the initial ISR Framework and WWG meeting series, will fulfill the requirement set forth by AB 423 to consider an ISR for warehouse and distribution centers.

[4] By letter dated January 13, 2025, CARB withdrew their request for a waiver from the EPA for the Advanced Clean Fleets Regulation. https://www.epa.gov/system/files/documents/2025-01/ca-acf-carb-withdrawal-ltr-2025-1-13.pdf

In line with commitments made with the WWG, this Supplement will be released for public comment for 30 days. Following this public comment period, the District intends to present its findings to the Governing Board, including any feedback received from stakeholders during the public comment period.

1.0 INTRODUCTION

This "Warehouse Indirect Source Rule (ISR) Framework Supplement" (or Supplement) presents staff's findings to date and provides an opportunity to gain public input and direction from the Governing Board on the preferred nature and scope of any potential District rule or program. Note that this Supplement provides an informational update only and does not present the District's recommendations to the Governing Board regarding a potential warehouse ISR for San Diego County.

1.1 BACKGROUND

Starting in November 2021, the San Diego County Air Pollution Control District (SDAPCD or District) staff began work pursuant to California Assembly Bill (AB) 423 (Gloria, 2019) to evaluate the feasibility of various actions to address indirect sources of pollution, particularly warehouses and distribution centers. More specifically, AB 423 required the District to "***consider*** adopting an indirect source rule to address pollution from mobile sources that is associated with stationary sources, such as ports, warehouses, and distribution centers." In May 2023, District staff prepared a report titled "Options and Considerations for Reducing Indirect Source Emissions at Warehouses, Distribution Centers, and Ports," also referred to as the "ISR Framework" (Attachment A), and presented the preliminary findings at the June 2023 Governing Board meeting.

This "Warehouse Indirect Source Rule (ISR) Framework Supplement" (or Supplement) presents an update to pertinent sections found in the initial ISR Framework for warehouses and distribution centers. This Supplement also provides new or updated information through analysis that was either directed by the Governing Board, Planning and Policy Committee, and/or discussed through the Warehouse Working Group (WWG). Consequently, staff believes that the Governing Board's consideration and acceptance of this Supplement, together with the initial ISR Framework and WWG meeting series, will fulfill the requirement set forth by AB 423 to consider an ISR for warehouse and distribution centers.

1.2 JUNE 2023 GOVERNING BOARD MEETING

On June 8, 2023, District staff provided an update to the Governing Board on potential strategies to reduce indirect source emissions from warehouses, distribution centers, and ports in San Diego County, considering relevant factors such as existing mobile source regulations and Federal Clean Air Act preemption limitations. Staff's findings presented in the ISR Framework suggested that a warehouse indirect source rule and associated administrative fees for facilities above 100,000 square feet in size, akin to South Coast Air Quality Management District (SCAQMD) Warehouse Rule 2305, are potentially feasible in San Diego County. A local rule could provide emission reductions from the freight sector, but only if facilities opted to utilize menu strategies such as purchasing new or using advanced technology vehicles. However, such a rule was predicted to be the costliest measure the District has ever considered in terms of the compliance costs per pound of reduced emissions, based strictly on a ratio of SCAQMD data for San Diego County at the time. Proceeding with a rule (i.e., the first option under consideration) would have required further technical analyses to be conducted, including socioeconomic and environmental

impact studies and public review, in accordance with State law to further assess and verify feasibility prior to rule adoption.

The second option the Governing Board considered was to direct staff to pursue rule development of a warehouse indirect source rule as outlined above and incorporate additional requirements for facilities between 50,000 and 100,000 square feet in size to also submit a one-time informational report to the District as part of a proposed rulemaking. Warehousing facilities under 100,000 square feet in size are not currently regulated by any air district, as they may not be able to sufficiently comply using the available menu of options. Consequently, it was determined that additional analysis would be necessary to determine if there are multiple viable compliance options that may be available to warehouses under 100,000 square feet – a significant determinant for ensuring an ISR is not a de-facto purchase mandate, which could be legally challenging at the local level to adopt.

The Board also considered a third option, to direct staff to continue with proactive engagement and convene a working group of community and industry stakeholders. This working group would consider and develop potential alternative regulatory and non-regulatory strategies that could further reduce indirect source emissions at the community level, including approaches for warehouses between 50,000 to 100,000 square feet in size. This approach would allow more conversations, analysis, and brainstorming with affected stakeholders on other possible methods for reducing indirect source emissions from warehousing facilities. This approach would also allow for continued implementation of various federal, State, and local measures including California Air Resources Board (CARB) mobile source regulations and District financial incentive programs to proceed. Additionally, it would allow additional time to evaluate pending litigation for a similar regulatory measure in the SCAQMD, and a corresponding pending approval of the same measure by the U.S. Environmental Protection Agency (EPA) at the federal level, to be resolved prior to SDAPCD pursuing local rulemaking activities.

The Board approved staff's recommendation to convene a working group, otherwise known as the Warehouse Working Group (WWG). As part of its direction, the Board instructed staff to (1) prioritize under-resourced communities, (2) consider smaller warehouses and warehouses near sensitive receptors (e.g., residences, hospitals, schools, etc.), and (3) return at the October 2023 Governing Board meeting with a timeline for action and proposed composition of the working group.

1.3 AUGUST 2023 PLANNING AND POLICY COMMITTEE MEETING

On August 2, 2023, District staff presented the draft timeline and potential composition of WWG participants, as well as a WWG Purpose Statement, to the SDAPCD Planning and Policy Committee. Feedback received by the Committee and stakeholders included requests to (1) expedite the projected timeline for possible regulatory action where feasible, (2) de-linking the timelines for possible regulatory and non-regulatory actions to accelerate implementation, (3) add representation to the list of possible working group participants, specifically from Tijuana-based organizations such as the Mexican Consulate and North/East San Diego County, and (4) begin developing proactive public messaging strategies on indirect sources and their corresponding emissions. Staff incorporated this feedback into attachments for the Board's consideration at the October Board meeting.

1.4 OCTOBER 2023 GOVERNING BOARD MEETING

On October 12, 2023, District staff presented an informational update to the Governing Board on the establishment of the WWG, potential working group participants, and a proposed tentative timeline for action as detailed in the Board letter attachment "Warehouse Working Group (WWG) Tentative Timeline and Possible Working Group Participants."[5] The proposed scope and goal of the working group were provided in the attachment "Warehouse Working Group Purpose Statement."[6] Feedback received from the Governing Board included adding representation from public health and/or physician groups to the working group participant list, a status update on the SCAQMD Rule 2305 litigation, and expanded outreach to communities impacted by warehousing activities.

[5] Attachment B: WWG Timeline And Working Group Participants
[6] Attachment C: Warehouse Working Group Purpose Statement

2.0 STAFF ACTIVITIES AND FINDINGS

To help inform the District's evaluation of a potential warehouse ISR, and as directed by the Governing Board, staff conducted the activities outlined in this Section.

2.1 WAREHOUSE WORKING GROUP (WWG) MEETINGS AND ACTIVITIES

As directed by the Governing Board, between September 2023 and October 2024, staff conducted 10 virtual public meetings with WWG participants, comprising almost 20 hours of in-depth, technical conversations about indirect source emissions.



2.1.1 WWG Participants

The WWG was composed of key local community, environmental, industrial, and government stakeholders interested in the freight and warehousing sectors, community health, and air quality. Participation in the WWG meetings included representatives from at least 90 different organizations, public agencies, or companies, as listed in Table 1.[7]

[7] Not all entities listed in the table participated in every WWG meeting.

Table 1 – WWG Meeting Participants

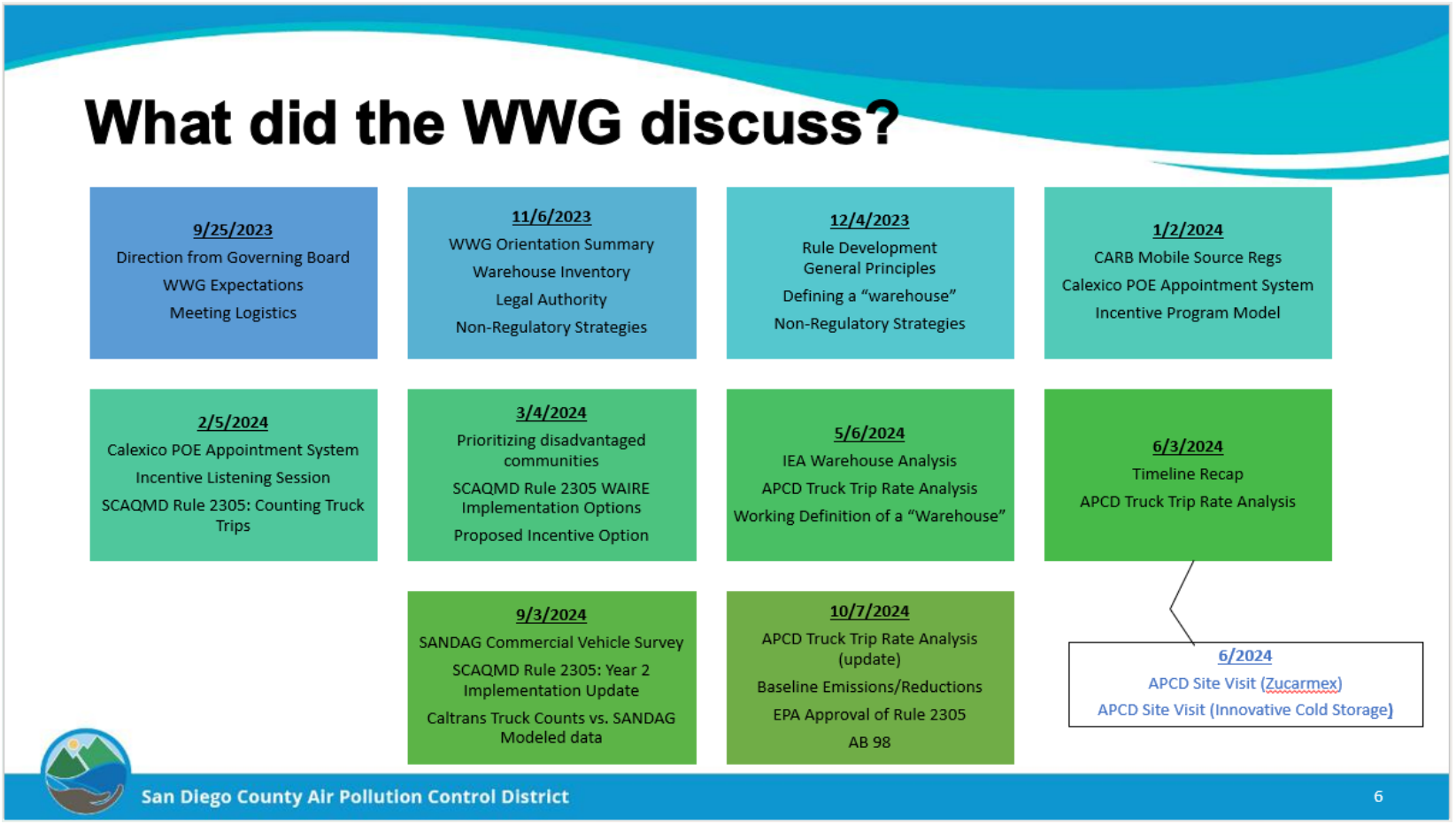
Company/Agency/Organization	Company/Agency/Organization	Company/Agency/Organization
1st Response Plumber	Fedex	Restoration Management Co.
AECOM	First Onsite	Rush Enterprises
Airlines for America	General Dynamics NASSCO	SA Recycling
Alliance Environmental Group, LLC	GSI Environmental	Same Day Restoration
AMW General Contracting, Inc.	Harborside Refrigerated Services	San Diego Chamber of Commerce
Ascent Environmental, Inc	High Standards Abatement	San Diego County Building and Construction Trades Council
BAE Systems	Hunter Properties	San Diego Gas & Electric
Beveridge & Diamond PC	IDS Real Estate Group	San Diego North Economic Development Council
Biocom California	Industrial Environmental Association	San Diego State University
California Air Resources Board	Innovative Cold Storage Enterprises	San Diego Working Waterfront
California Construction Superior	International Brotherhood of Electrical Workers - Local 569	SANDAG
California Department of Justice	International Warehouse Logistics Association	South Coast Air Quality Management District
California Environmental Justice Alliance	Kaiser Permanente	Scripps Health
Caltrans	M.S. Hatch Consulting	San Diego Working Waterfront
Casa Familiar	Majestic Realty Co.	ServiceMaster Restore
Center on Policy Initiatives	McCormick-JWC Construction & Consulting	Sierra Club
ChargePoint	Montrose Environmental	Sonoma Technology
Choice Management Solutions, Inc.	Murphy Development Co.	SSA Marine
City of La Mesa	NAIOP San Diego	Star Flood Restoration
City of National City	National Enterprises, Inc.	State of Baja
City of San Diego	NorthStar Contracting Group, Inc.	Strategic HOA
Climate Action Campaign	NV5 Global, Inc.	Suja Life, LLC
Coast to Coast Restoration	Otay Mesa Chamber of Commerce	Superior Abatement Services, Inc.
County of San Diego	P.W. Stephens Environmental, Inc	TRC Companies, Inc.
CVE Corp.	Pasha Automotive Services	U.S. Department of State
Dexcore Restoration	Pernicano Realty and Management, Inc.	U.S. Environmental Protection Agency
Dole Fresh Fruit	Port of San Diego	U.S. Navy
Earthjustice	Premier Restoration Services, Inc.	University of California, San Diego
Environmental Health Coalition	Prologis	US Foods, Inc.
ESQUER San Diego	Quality Lift Trucks	Vert Environmental

2.1.2 Overview of Topics Discussed

Figure 1 shows a timeline of the WWG meetings and discussion topics, which are discussed in more detail below.[8]

[8] The referenced slide is from an update presented at the District's Planning and Policy Committee (PPC) meeting held on October 10, 2024. A video of the PPC meeting can be viewed on the District's YouTube page, https://www.youtube.com/watch?v=eUgz5zcQf9c.

Figure 1 – WWG Meeting Topics



At the outset of the WWG, staff devoted significant time to providing baseline knowledge on the topic of an indirect source rule, including why the District was discussing the topic, the direction provided by the Governing Board, expectations for the group, and determining the logistics of meeting cadence.

- Baseline knowledge discussed included:
    - Background on the definition of an indirect source and discussion of types of pollution from those sources.
    - An overview of the inventory of warehouses in San Diego County that were identified using data from CoStar, which is a commercial real estate analytics firm.
    - Better understanding the legal authority and limitations that the District has for controlling indirect source emissions.
    - Potential non-regulatory strategies that could also result in emission reductions.
- Staff provided necessary background about how the District develops a rule, a complicated process that many participants were not already familiar with.

Subsequent meetings included topics such as:

- The definition of a "warehouse" was discussed frequently at meetings, culminating with staff providing a working definition of a warehouse for the purposes of the WWG and any subsequent analysis.
- Different non-regulatory strategies were also discussed at multiple meetings, such as unique incentive programs, or ways to amend existing programs to achieve emission reductions from the warehouse sector. This culminated with staff presenting a potential three-tiered incentive approach for reducing emissions at warehouses while prioritizing such actions for under-resourced communities (see Three-Tier Incentive Funding Plan section below).
- CARB staff presented information on how their statewide mobile source regulations will reduce emissions in the coming years regionwide as well.[9]
- In early 2024, an appointment system project in the conceptual phase for the Calexico East Port of Entry was discussed. Such a project was promoted as a potential strategy that could reduce emissions around the San Diego County border crossings by reducing idling and border wait times.
- Staff provided frequent updates to the WWG about how the SCAQMD warehouse ISR was proceeding, including legal updates, implementation, and approval status with the EPA. This included how SCAQMD counts truck visits for the purposes of their local rule, compliance options, and SCAQMD resources dedicated to implement the program.
- Staff convened a listening session with local trucking and logistics companies to better understand how and what incentive programs could best help stakeholders.
- With the assistance of the Otay Mesa Chamber of Commerce, staff conducted two site visits to warehouses in the Border area to better understand their operations, opportunities, and limitations.

[9] By letter dated January 13, 2025, CARB withdrew their request for a waiver from the EPA for the Advanced Clean Fleets Regulation, https://www.epa.gov/system/files/documents/2025-01/ca-acf-carb-withdrawal-ltr-2025-1-13.pdf.

- The WWG discussed an alternative warehouse analysis, completed and presented by representatives of the Industrial Environmental Association (IEA), on what a non-regulatory or regulatory strategy could achieve.
- In the final meetings of the WWG, staff discussed an analysis of what a possible regulatory approach in San Diego County might achieve. To do that, the WWG discussed more technical aspects that support such an analysis, which include:
    - Determining local truck trip rates for warehouses throughout the County (by size and by region), as well as baseline emissions and possible emission reductions that could be achieved from a potential rulemaking.
    - A recent survey of commercial vehicle activity in San Diego County by the San Diego Association of Governments (SANDAG) that provided the WWG with valuable information about the warehousing and transportation sector specific to the county.
- Finally, at the last WWG meeting held in October 2024, staff presented a preliminary high-level analysis of the truck trip rate and emission estimates, noted recent approvals by the EPA of SCAQMD's warehouse Rule 2305, and the passage and Governor's signature of Assembly Bill 98, which will require new or expanded warehouses of all sizes statewide to meet minimum requirements moving forward.

Three-Tier Incentive Funding Plan

On March 4, 2024, staff presented to the WWG a preliminary three-tiered incentive concept as the primary non-regulatory strategy to incentivize emission reductions from warehouses and distribution centers in a timely manner, as summarized below and in Figure 2.[10]

The first tier would incentivize new zero-emission vehicle (ZEV) truck purchases in under-resourced communities by expanding the existing Portside Short Haul Zero-Emission Truck Pilot program to areas outside of the Portside Community.[11] Amendments made to the program could expand funding opportunities to warehouse entities and trucking companies that serve warehouses that operate in under-resourced communities outside of Portside and allow them to purchase new ZEV trucks. In line with feedback received from stakeholders, the District could consider including additional requirements to this program, such as targeting only warehouse operations in disadvantaged communities that are located within 1,000 feet of a sensitive receptor. An amendment to the existing program would require approval by the AB617 Community Steering Committees (CSC) and CARB prior to implementation.

The second tier, which already exists today through the Clean Air for All Grant program, would continue to incentivize infrastructure purchases for new ZEV charging opportunities for warehouse and trucking companies. The program currently allows for grants of up to $5 million for the installation of infrastructure serving disadvantaged communities, and up to $1 million for all other infrastructure projects. This funding has no cost-effectiveness limits and has a sliding scale for the grant received. Infrastructure projects can receive 60-100% of the cost paid for depending on if it has solar/wind systems incorporated; is publicly accessible or installed by a public entity; serves a port, railyard, or freight facility; is near a sensitive receptor; serves public school bus charging/fueling; or supports communal heavy-duty truck charging opportunities. Like

[10] https://www.sdapcd.org/content/dam/sdapcd/documents/rules/warehouse-work-group/030424/presentation-030424.pdf

[11] https://www.sdapcd.org/content/sdapcd/grants/grants-equipment/heavy-duty-trucks/zero-emission-truck-pilot-project.html

ZEV truck funding, in line with feedback received from stakeholders, the District could consider including additional requirements to this program, such as targeting only warehouse operations in disadvantaged communities that are located within 1,000 feet of a sensitive receptor.

Lastly, the third tier would be considered by the District if a warehouse ISR were to be developed, and mitigation fees were collected as a method of compliance. The third tier would expand the District's existing Zero Emission Truck Pilot Program to ensure warehouse entities and trucking companies operating outside of under-resourced communities would be eligible to apply for new ZEV trucks. Because no AB617 funding would be accrued or used in this tier, as the funding would be generated strictly from mitigation fees, CSC and CARB approval would likely not be necessary.

Figure 2 – Preliminary Incentive Strategy

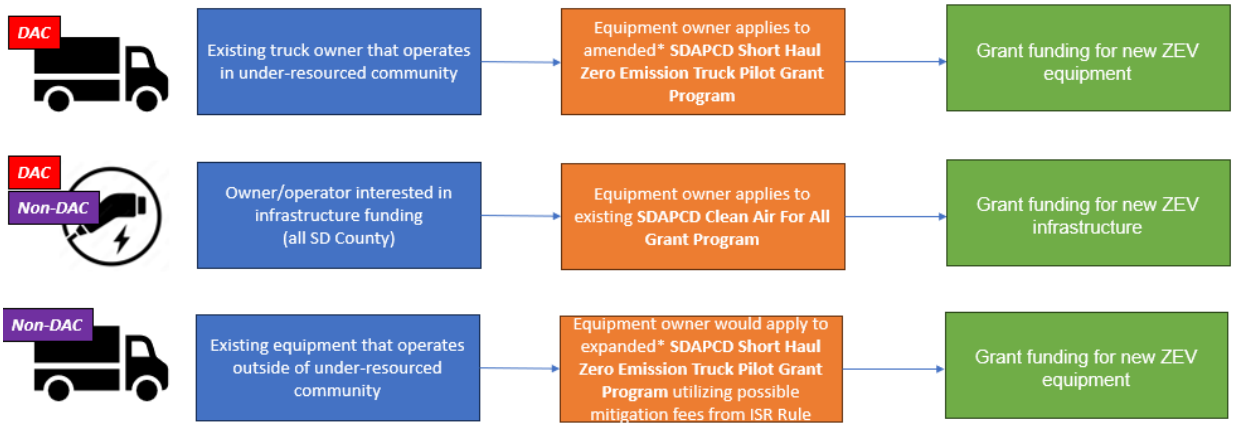


Figure 2 illustrates how this three-tiered approach may work. The top row represents the process for a warehouse owner or trucking company that has trucks operating in an under-resourced community in San Diego County. The entity would apply for the amended ZEV Truck Pilot Program and receive funding to make a ZEV truck purchase. The middle row represents the process for owners/operators wanting to install ZEV infrastructure. Owners/operators in or outside of an under-resourced community would apply to the existing Clean Air for All grant program and receive funding to install the necessary ZEV charging stations. The last row would represent the process of a warehouse owner or trucking company applying for ZEV trucks operating outside of an under-resourced community in the county. These fleets would need to apply for an expanded version of the ZEV pilot program, which could be expanded if a corresponding ISR was developed to collect mitigation fees. The fees collected would then incentivize the purchase of ZEV trucks that may not be subject to the same rule.

2.1.3 Summary of WWG Feedback

The WWG was convened by design to collect varying perspectives from a wide variety of stakeholders. As such, the group was not typically able to reach a consensus on most topics. While such agreements were not anticipated, the WWG nonetheless continually provided thoughtful and meaningful information for the District's consideration in a courteous and respectful manner. The District thanks all WWG participants for the considerable time and role in this effort.

One topic that had some general agreement was for the ability of a non-regulatory incentive option(s) to be available in some capacity. Staff presented the possible three-tiered strategy for such incentive opportunities referenced above to the WWG, and feedback was generally well-received by industry, environmental groups, and trucking and logistics companies.

From industry's perspective, several topics were frequently elevated for further analysis. These included better evaluating the impacts and emission reductions associated with CARB mobile source regulations, concerns whether warehouses identified in the CoStar data were actually engaging in goods movement activity, Zero-Emission Vehicle (ZEV) truck and infrastructure feasibility and availability issues, difficulty in tracking truck activity at potentially subject facilities, and noting the unique circumstances of warehousing activity along the international border.

From the environmental perspective, a comment was frequently elevated for the Community Emissions Reduction Plan (CERP) goals to be prioritized to further improve the health and wellness of residents in disadvantaged communities, and to consider the possible cumulative impact of many smaller warehouses clustered around sensitive receptors. It was also suggested that a rule (as opposed to a voluntary incentive program) could potentially provide more certainty for achieving emission reductions and could result in more localized emission reductions if framed in a way that could target such facilities in disadvantaged communities.

From an implementation perspective, the District highlighted the importance and difficulty of achieving regionwide emission reductions in a manner that does not run afoul of federal preemption issues while also achieving localized emission reductions. Staff continues to learn from SCAQMD's implementation of their Rule 2305 to prepare for future challenges if a rulemaking is pursued.

2.1.4 Key WWG Comments

The following are key comments received during the WWG meetings. For reference, all comments received, meeting documents, video recordings, and other materials are available on the District's WWG webpage.[12]

Potential ISR Requirements

The WWG discussions spent considerable time on how a potential ISR may work, including:

- Determining an appropriate definition of a "warehouse." This is important for warehouse operators because some warehouse facilities may be engaged in activities other than goods movement. For the purposes of WWG discussions, "warehouse" means a building that stores cargo, goods, or products on a short- or long-term basis for later distribution to businesses and/or retail customers.[13]
- The warehouse owner/operator may not directly control the truck fleets that serve the facility. Warehouse owners have expressed that there are many different models of how warehouse operations are controlled.
- The pollutants a potential ISR may regulate, including NO_X and Diesel Particulate Matter.

[12] https://www.sdapcd.org/content/sdapcd/rules/warehouse-work-group.html

[13] SCAQMD, Rule 2305, Warehouse Indirect Source Rule – Warehouse Actions and Investments to Reduce Emissions (WAIRE) Program, May 7, 2021, p. 2305-3, https://www.aqmd.gov/docs/default-source/rule-book/reg-xxiii/r2305.pdf?sfvrsn=21

- Consideration for smaller warehouses, including if there are viable (and/or different) compliance options available that differ from large warehouses, different timelines, and what is considered a "small" warehouse.
- Specific options for warehouses in under-resourced communities and/or near sensitive populations or receptors (e.g., schools, parks, etc.), if a possible rule could be more stringent in such areas, or if the menu of compliance options could differ.

ISR Implementation Challenges

The WWG also heard and discussed implementation challenges that are likely to be encountered if an ISR were to be developed, including but not limited to the following:

- Today, truck trips are generally not controlled by the owner or operator of the warehouse. Concerns from business and truck owners about technological feasibility, including zero-emission truck range, vehicle weight and load capacity, vehicle availability, and current lack of available and standardized charging infrastructure. While truck trips could potentially be controlled through new or amended contracts with servicing fleets requiring Near-Zero Emissions (NZE) or Zero-Emission Vehicle (ZEV) truck visits, these may not be possible for all facilities.
- Developing an ISR in a way that minimizes the chances of it being overturned in court if litigated. SCAQMD Rule 2305 is the only warehouse ISR to date that has been challenged and successfully defended in court, and diverging from its pathway could subject a local ISR to legal risk.
- Unexpectedly low reporting and compliance rates for SCAQMD Rule 2305 suggesting either SCAQMD overestimated the number of subject facilities or there are many warehouse operators that are not reporting.

Potential Benefits of an ISR

Throughout the WWG process, stakeholders considered several benefits of proceeding with an ISR, including but not limited to the following:

- Residents' desire to immediately reduce emissions from warehousing activities in under-resourced communities, as included in the two local AB 617 CERPs.
- Perceived regulatory certainty for regulating emissions from warehouses located near residences in a way that a voluntary incentive program may not be able to achieve.
- Potential regional benefits from reducing ozone precursors and particulate matter (PM), and how each could help achieve state and federal ozone and PM standards.
- Co-benefits of an ISR could further reduce greenhouse gas (GHG) emissions and diesel particulate matter (DPM). However, currently there is uncertainty if an ISR could legally directly regulate toxic or GHG emissions.

Uncertainties and Unknowns Relating to an ISR

The WWG also discussed many unknowns in relation to a possible ISR, including but not limited to the following:

- Difficulties identifying warehousing facilities that conduct warehousing activities and not other types of operations (e.g., manufacturing, retail, etc.).
- Truck destinations, total truck population, total vehicle miles traveled (VMT), truck trips, and overall emissions in San Diego County specifically.
- The difficulty of quantifying actions in an ISR into actual emission reductions and resulting health benefits for San Diego County.
- District costs to implement an ISR, considering system development, staffing, permitting, inspection, and other administrative costs that would be required, and how those costs would be recovered.
- Other additional resources needed to implement an ISR (e.g., website development, enhanced outreach to stakeholders, enforcement actions, potential litigation costs to defend an ISR, etc.).
- Whether large warehouse operators might opt to move into multiple smaller warehouses (and in greater quantities of warehouses) to circumvent becoming subject to a local ISR with a specific square footage applicability threshold.
- Consideration of whether an ISR specifically in San Diego County would result in tenants moving their operations out of the county or state, or into Mexico to avoid becoming subject to a local ISR. If operations were moved into Mexico or a neighboring county, those emissions may potentially continue to impact San Diego air quality.
- The uncertainty over the number and types of compliance menu options that would need to be included to ensure viability and avoid preemption issues. Also, some of the potential compliance options (e.g., installation of solar panels or charging infrastructure) may not result in immediate localized NOx and PM emission reductions.

Alternatives to an ISR

The WWG was asked to convey alternative concepts (both regulatory and non-regulatory) that could reduce indirect source emissions from warehouses and distribution centers in relation to comments considered by the Governing Board. Some of the concepts explored during the WWG include the following:

- Modification of current District incentive programs for trucks to include warehouse-visiting trucks regionwide and in under-resourced communities. The existing Zero-Emission truck pilot program, which currently only allows the purchase of trucks benefitting the Portside community, could be modified to include trucks that operate at the International Border and other under-resourced communities, to couple alongside other existing local, State, and federal incentives to replace diesel trucks and vehicle miles traveled with zero emission alternatives.
- Enhancement of the District's current enforcement efforts to reduce emissions from mobile sources through a revised Memorandum of Understanding with CARB to increase enforcement of existing mobile source regulations for trucks.
- Other actions taken by local agencies such as land use ordinances to restrict the location of warehouses. For example, the District does not have the regulatory authority to amend zoning or building codes for warehouses. However, the District could advocate and work alongside relevant public agencies, such as the City of San Diego, to adopt an ordinance that would apply specific zoning standards or building codes in the AB 617 Portside and International Border communities that would help to address existing and new warehousing activity impacts. While such efforts have been taken already at the State level with the passage of AB 98, a local ordinance could be more stringent in requiring

additional mandates for new and/or significantly renovated warehouses below 250,000 square feet in size, or in locations adjacent to sensitive receptors.
- Supporting/advocating for the development of a truck reservation system at the Otay Mesa ports of entry, which supporters contend could reduce truck idling emissions at the international border.

General Comments

The WWG discussed other general comments, including but not limited to the following:

- Concern about the costs of an ISR and the resulting increased costs of goods that could be passed onto consumers.
- Concern about the healthcare costs of affected residents if warehouse emissions continue at current rates and locations.

2.1.5 Stakeholder Comments for District Consideration

Appointment System at the Otay Mesa Port of Entry (POE)

A representative from the Otay Mesa Chamber of Commerce commented at various WWG meetings that the District should pursue/be the lead advocate for an appointment system at the Otay Mesa Port of Entry (POE), rather than pursuing development of a warehouse ISR. The idea being that such a system would result in greater emission reduction benefits due to the possibility of reduced idling times of trucks waiting in line to cross the border.

At the WWG meeting on February 5, 2024, Caltrans staff presented a proposed feasibility study concept to develop a joint operation system for the Calexico East POE.[14] If completed, the project would also debut the first land POE appointment system for commercial vehicles and potentially passenger vehicles. The project proposes to relay border conditions such as wait times and incident information to border crossers through a mobile application. In doing so, the traveling public will have access to traffic conditions and could plan their trips accordingly. Using current border conditions, the system is also envisioned to allow commercial vehicle border users to pay for a designated appointment window to cross the border. If successful, this pilot has the potential to be scalable by expanding to other POEs and is envisioned as a possible model that other POEs could utilize along the northern and southern borders in the United States. This system could also expand upon appointment systems that are currently being used at the nation's seaports and introduce proven technologies to land POEs. Caltrans is still in the preliminary stages of developing the feasibility study.

District staff believes that while the anticipated result of greater efficiency could be an improvement to air quality, the concept of induced demand may also need to be further evaluated if any pilot projects proceed locally or outside San Diego County. There is the potential that improved efficiency in the movement of freight crossing the POE may induce more truck or passenger vehicle travel in the binational region. Additional combustion-related activity could consequently negate some, if not all, of the emission reductions anticipated from an appointment system.

[14] https://www.sdapcd.org/content/dam/sdapcd/documents/rules/warehouse-work-group/020524/Caltrans-presentation.pdf

Additionally, the appointment system in Calexico is in its early conceptual stages and is at least several years away from being designed, built, and fully implemented at the Calexico East POE. If the system is built and implemented, additional time would be needed to assess the effectiveness and feasibility of the pilot project, and to evaluate if the effectiveness could make it worthy of expansion to other POEs including those in the Otay Mesa region. Moving forward, the District will continue to monitor the progress of the Calexico pilot project in parallel to any strategies developed associated with reducing emissions from warehouses.

Industry Warehouse Analysis (IEA)

At the WWG meeting on May 6, 2024, an IEA representative presented a warehouse analysis they prepared to determine the relationship between warehousing activities, truck volume, and diesel particulate matter (DPM) in certain San Diego County census tracts.[15] The analysis methodology included a review of CalEnviroScreen census tract data (average DPM and traffic percentiles), identifying warehouse buildings using Google Earth, and a review of Caltrans annual average daily truck volumes (2016).[16]

The analysis came to several conclusions, including the following: truck volumes in San Diego County areas with warehouses do not appear to be higher than other high traffic/DPM affected areas in San Diego County; models show a steady "floor" for overall PM2.5 emissions as the transition to electric/zero-emission continues; and that the disadvantaged communities of El Cajon and Escondido would benefit most from electrification due to substantial NOx and ozone emission reductions.

District staff provided comments on the presentation slides and spreadsheet used for their analysis.[17] One comment was that the data used to support the conclusion that warehouses have little to no correlation to high levels of DPM in various communities was limited. The primary concern was that freeway truck counts were used as the basis for the analysis and not surface street truck activity data. Because the Caltrans truck counts are for specific junctions along the various freeways in the County, the destinations of these trucks cannot be determined.

Another District staff comment was that most general vehicle traffic is not powered with diesel fuel, and consequently, any comparisons of "normal" traffic data with "truck" traffic data as was done in the analysis may not be appropriate. A more focused comparison may be to analyze the level of truck activity in the same areas and determine the impact of DPM emissions from other emission sources (e.g., off-road, marine, cargo handling, etc.). Doing so may provide a better comparison as to the level of impact trucks are having in these same neighborhoods.

[15] https://www.sdapcd.org/content/dam/sdapcd/documents/rules/warehouse-work-group/050624/IEA-presentation-050624.pptx

[16] https://www.sdapcd.org/content/dam/sdapcd/documents/rules/warehouse-work-group/050624/IEA_Warehouse_Analysis_05.16.24.xlsx

[17] Attachment D: Industry Warehouse ISR Analysis

ISR vs Incentive Analysis (IEA)

An IEA member prepared an ISR vs Incentive Analysis and submitted it to the District via email on June 26, 2024.[18] The analysis was done referencing emissions data from EMFAC (modeled year 2022), SANDAG 2022 Commercial Vehicle survey data, GO-Biz data, CARB Advanced Clean Fleets estimate of affected vehicle classes, International Council on Clean Transportation, US Energy Information Association, and United States IRS (for commercial clean vehicle tax credit).

The analysis compares two scenarios for estimating mobile source emissions reductions (and associated costs) of NOx and PM2.5 from electrifying diesel/gasoline-powered commercial vehicles. The first scenario is an incentive-based program that offers to replace light commercial vehicles (<8,500 lbs GWR) for businesses recognized by the State of California as Construction, Wholesale, Manufacturer, and Transportation NAICS codes within the AB 617-recognized Portside and Border Communities, the Cities of El Cajon and Escondido, which according to CalEnviroScreen share similar socio-economic factors as other AB 617 communities as well as elevated ambient ozone levels. The second scenario is the current model of an ISR that matches the scope of vehicle classes (medium/heavy duty trucks) and stationary facilities as listed in SCAQMD Rule 2305.

The analysis suggests that an incentive program aimed at electrifying light commercial vehicles could provide a better overall reduction in NOx and PM2.5 as well a better reduction cost on a per ton basis than an ISR. The analysis also suggests that promulgating either solution would be at a substantial cost to the District and regulated community for a relatively marginal reduction in overall pollutants. The analysis concludes that a program aimed at providing financial assistance to small business owners operating within either of the communities listed would likely provide some material benefit to those who would not otherwise be able to electrify their fleets ahead of the timelines outlined by CARB regulations and the Portside Community CERP/MCAS.

The analysis notes that there are an estimated total number of 10,123 light commercial vehicles (<8,500 lbs GVWR) servicing the Construction, Wholesale, Manufacturing, and Transportation industries in the Portside and International Border Communities, and the cities of El Cajon and Escondido. The analysis further concludes that emissions of PM and NOx are estimated to be reduced by 0.6 and 34.2 tons per year respectively at a cost of $465 million to replace all these vehicles with ZE equipment. In comparison, under the ISR Scenario, there are an estimated total number of 930 medium and heavy vehicles (<8,500 lbs GVWR) servicing the Construction, Wholesale, Manufacturing, and Transportation industries in the same communities and cities. Emissions of PM and NOx are estimated to be reduced by 0.5 and 33.3 tons per year respectively at a cost of $432 million to replace all these vehicles with ZE equipment.

According to the analysis, while a targeted incentive program aimed at replacing light commercial vehicles in the Portside and International Border Communities, and El Cajon and Escondido may achieve similar emission reductions as a potential warehouse ISR, it would be achieved at a greater capital cost ($465 vs $432 million). These costs would be covered (at least partially) by District grant programs, whereas an ISR would focus more costs onto the affected facilities. In addition, the number of vehicles (10,123) that would need replacement under the Incentives Scenario is more than ten times the number of vehicles (930) that would need replacement under the ISR Scenario for a roughly equivalent emission reduction total. The scale of having to replace

[18] Attachment E: ISR vs Incentive Analysis

more than 10,000 vehicles under the proposed Incentives Scenario far exceeds the number of heavy-duty trucks funded in the District's current Incentives Program to date over a period of 20+ years. Incentivizing every truck owner to switch to ZE equipment, even at little to no capital costs, is likely to be a challenge based on recent trends in ZE applications received by the District. Another challenge would be that future AB 617 grant funds for at least 3-5 years would need to be reallocated completely to the Incentives Scenario to fund just the number of vehicles anticipated in one AB 617 community. Consequently, those funds would no longer be available for other clean air projects in the Portside and International Border communities, which would further delay efforts in realizing other CERP goals. For these reasons, staff does not consider the proposed Incentive Scenario to be feasible for the District to fully implement. However, staff are planning to further explore incentive opportunities for light-duty commercial vehicles that may be the most viable candidates to convert to ZE technology.

EHC Comment Letter

The Environmental Health Coalition (EHC) proposed in their September 27, 2024 comment letter to the District that a local warehouse ISR (if one is pursued) should regulate warehouse facilities county-wide with floor area of 100,000 sq ft or more, and all warehouse and distribution facilities (regardless of size) that are located in a disadvantaged community and operating within 1,000 feet of a sensitive receptor. The letter defines "sensitive receptor" as schools, parks & playgrounds, health clinics/hospitals, daycares, and senior nursing centers/housing.[19]

The letter notes that there are an estimated total of 701 warehouse and distribution facilities with 100,000 sq ft or more floor area and/or are located within 1,000 feet of a sensitive receptor located in disadvantaged communities. The letter shows two examples (Figures 1 and 3) of warehouses within 1,000 feet of a sensitive receptor located in disadvantaged communities. Figure 1 in the letter shows a circle with a 1,000-foot radius around the Barrio Senior Villas Affordable Senior Housing Complex in Barrio Logan. The size of the warehouses located within the designated circle range from 1,800 to 56,000 sq ft. Similarly, Figure 3 in the letter shows another 1,000-foot radius circle around Kimball Elementary School in National City. The size of the warehouses located within the designated circle range from 1,600 to 38,000 sq ft.

District staff believes that regulating warehouses smaller than 100,000 sq ft of floor space poses significant logistical and legal challenges that may not be adequately addressed within already federally approved ISRs. The SCAQMD Rule 2305 was developed with a menu of compliance options specifically for warehouse facilities with floor area of 100,000 sq ft or more due to the type of activities occurring at facilities of this size. However, those compliance menu options that would be needed in a potential ISR may not be feasible for smaller warehouse operators to implement. Options such as installing solar panels or charging infrastructure may not be feasible for smaller facilities where adequate space is not available. Additionally, such options may be prohibited if a warehouse tenant doesn't control property aspects for their own building and would require a landlord to agree to such improvements. In the case of smaller warehouses, such constraints are further exacerbated as warehouse size decreases and facilities get used for multiple purposes (e.g., manufacturing, storage, office space, etc.). Consequently, purchasing ZE equipment may also not be feasible if charging infrastructure cannot be installed onsite, or is not readily available for public use. The inability for a smaller facility to implement at least some of the compliance menu options could result in any potential warehouse ISR being considered a potential de-facto

[19] https://legistarweb-production.s3.amazonaws.com/uploads/attachment/pdf/2905225/Item_D3__Public_Comment_1.pdf

purchase mandate and raise federal preemption concerns. There are also concerns that land-use changes (such as new sensitive receptors moving into a neighborhood) interacting with such requirements could present a fluid/dynamic regulatory environment, which consequently may result in the scenario of previously exempt warehouses becoming subject to a possible ISR even if their operations have not changed.

Also, there is added uncertainty as to the inventory of warehouses smaller than 50,000 sq ft. Due to smaller floor area and less space for the storage of goods, smaller facilities may instead be used for conducting non-warehousing activities (e.g., retail, office, or other light commercial use) that would not be subject to a potential ISR. To further evaluate this, the District prepared a small case study of facilities classified as warehouses in the CoStar data that are located within the vicinity of the Barrio Senior Villas complex. The goal of the study was to better determine the types of operations occurring at these smaller facilities. A summary of that analysis is included in Section 2.7.4. Based on staff's observational assessment of the area researched, approximately 14% (10 out of 70) of the CoStar warehouse inventory in the sample area may be conducting prototypical warehouse operations. Additional information and analysis would be needed to determine the number of smaller facilities conducting warehousing activities in the county.

2.2 SITE VISITS AND STAKEHOLDER OUTREACH

In June 2024, staff coordinated with the Otay Mesa Chamber of Commerce to conduct site visits to two warehousing locations (Zucarmex and Innovative Cold Storage Enterprises) in the International Border region of San Diego County. Given the unique aspects of logistics operations in this area, these site visits were completed to help staff better understand how each facility in this area operates, how and what type of trucks visit the facilities, and other opportunities and/or constraints that such facilities may have in complying with a possible ISR and/or incentive program. The District appreciates both companies for their time, information shared, and willingness to accommodate staff to visit and learn more about their operations.

In addition to the WWG meetings and the aforementioned site visits, staff also conducted 79 meetings to date with various stakeholders, including community groups, the Portside and International Border Community Steering Committees, warehouse owners, other jurisdictions and other internal District divisions to facilitate public outreach and to elicit feedback to help inform the ISR evaluation process. The District thanks each stakeholder for their time and collaboration.

2.3 TRUCK TRIP RATE ANALYSIS

2.3.1 Introduction

The goals of the District's truck trip rate analysis were to address the Governing Board's direction to obtain truck trip data specific to San Diego County and estimate truck trip rates for warehouses of different sizes. Truck trip rates are critical for estimating baseline emissions from warehousing activities (Section 2.4.3). Using baseline emissions, other estimates including emission reductions (Section 2.4.3), cost-effectiveness (Section 2.5), and public health benefits (Sections 2.4.4) of proposed strategies can be calculated.

Within the SCAQMD, operators at warehouses with floor area of 100,000 square feet (sq ft) or more subject to Rule 2305 are required to track and report truck trip information to the air district. Operators in San Diego County are not similarly required to do so because there is no current

District rule that applies to warehousing operations. The District considered developing a survey to elicit information from warehouse operators voluntarily. However, due to the time and resources needed to develop and distribute the survey, and the uncertainty of receiving the minimum number of responses needed to establish a representative sample size of the warehouse population in the region, a survey was not pursued. A voluntary warehouse operator survey was developed and distributed in the SCAQMD region prior to the development of Rule 2305, and participation was low with a 16% response rate (63 of 400 surveys sent).[20] For these reasons, in addition to the unavailability of actual truck trip data, staff used modeling data based on existing traffic data to estimate truck trip rates specific to the San Diego region.

Staff estimated truck trip generation rates for various sizes of warehouses and truck classes. To do this, a map including warehouse locations and transportation analysis zones with SANDAG's modeled truck activity data was created. This data was analyzed as described in Sections 2.3.2 through 2.3.5 with the results discussed in Section 2.3.6.

2.3.2 Warehouse Inventory

As described in the ISR Framework, staff obtained information from CoStar, a commercial real estate analytics firm, to identify the number, size, and location of existing warehouse buildings in the San Diego region. According to the CoStar data, there are approximately 6,700 warehouse buildings throughout the region, ranging in size from less than 1,000 square feet (sq ft) to 3.3 million sq ft of indoor floor space. While the CoStar data classifies these buildings as warehouses, further investigation would be needed for each individual facility to determine if goods movement-related activity is being conducted at that location. A map of the locations of these warehouse buildings was then developed by GIS staff with the Planning and Development Services Department of the County of San Diego.[21]

2.3.3 Transportation Modeling Data

The truck trip rate analysis presented in this Supplement was based on transportation activity-based modeling (ABM) data obtained from the San Diego Association of Governments (SANDAG). ABM2+ is the most recent version of the SANDAG ABM designed for application in the 2021 Regional Plan with 2016 as the base year. The District acknowledges that ABM2+ is modeling data instead of actual truck counts and the data is several years old. Nonetheless, it is the most recent publicly available dataset that staff can utilize for a comprehensive truck trip rate analysis of the entire region and is consistent with the most recently adopted regional transportation plan. The District notes that the ABM2+ data presented within this document are being evaluated for proof-of-concept to understand truck activity with the best information currently available. Should the Governing Board direct staff to pursue an ISR, the District would work closely with SANDAG to procure Version ABM3 data when it is made available, and update the truck trip rates accordingly. Version ABM3, which will have updated data with a more recent base year than 2016, is currently under development to support the upcoming 2025 Regional Plan and is anticipated to be released in 2025.

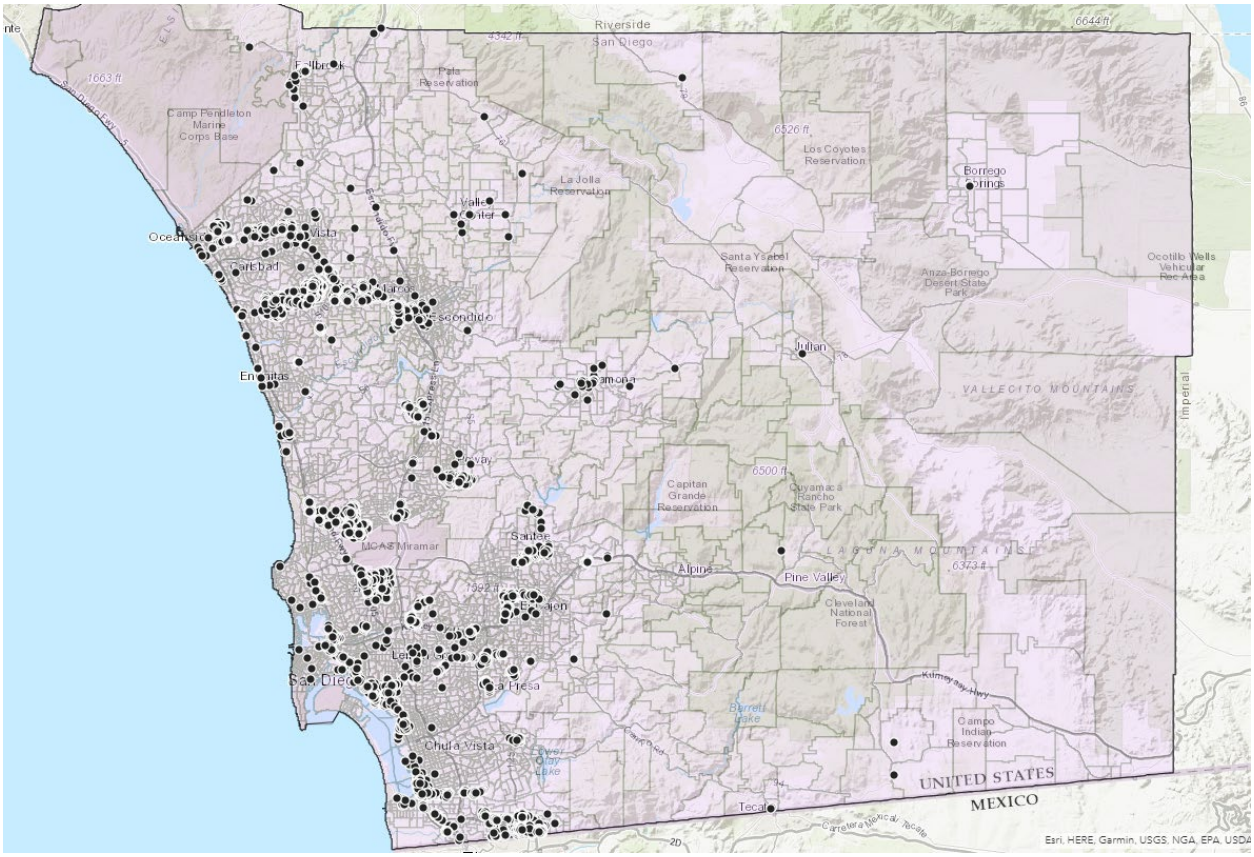
[20] SCAQMD High Cube Warehouse Truck Trip Study, White Paper Summary of Business Survey Results, p. 1, https://www.aqmd.gov/docs/default-source/ceqa/handbook/high-cube-warehouse-trip-rate-study-for-air-quality-analysis/business-survey-summary.pdf?sfvrsn=2

[21] ISR Framework, Figure 1, p. 6, Attachment A

Transportation Analysis Zones (TAZ)

During the WWG process, SANDAG staff recommended that the District utilize ABM2+ data in the form of Transportation Analysis Zones (TAZ) to evaluate truck activity within specific areas where warehouse buildings are located. The TAZ data was then incorporated into the District's warehouse map (Figure 3). Each TAZ is identified with a polygon shape on the map and contains the modeled total truck volume (using ABM2+ data) that are entering and exiting the TAZ on a typical day in San Diego County. The TAZ is the unit of geography most used in conventional transportation planning models. Zones are constructed by census block information. Most often the critical information is the number of automobiles per household, household income, and employment within these zones. This information helps to further the understanding of trips that are produced and attracted within the zone.[22]

Figure 3 – Map of TAZs Modeled for San Diego County in Relation to CoStar Warehouse Locations



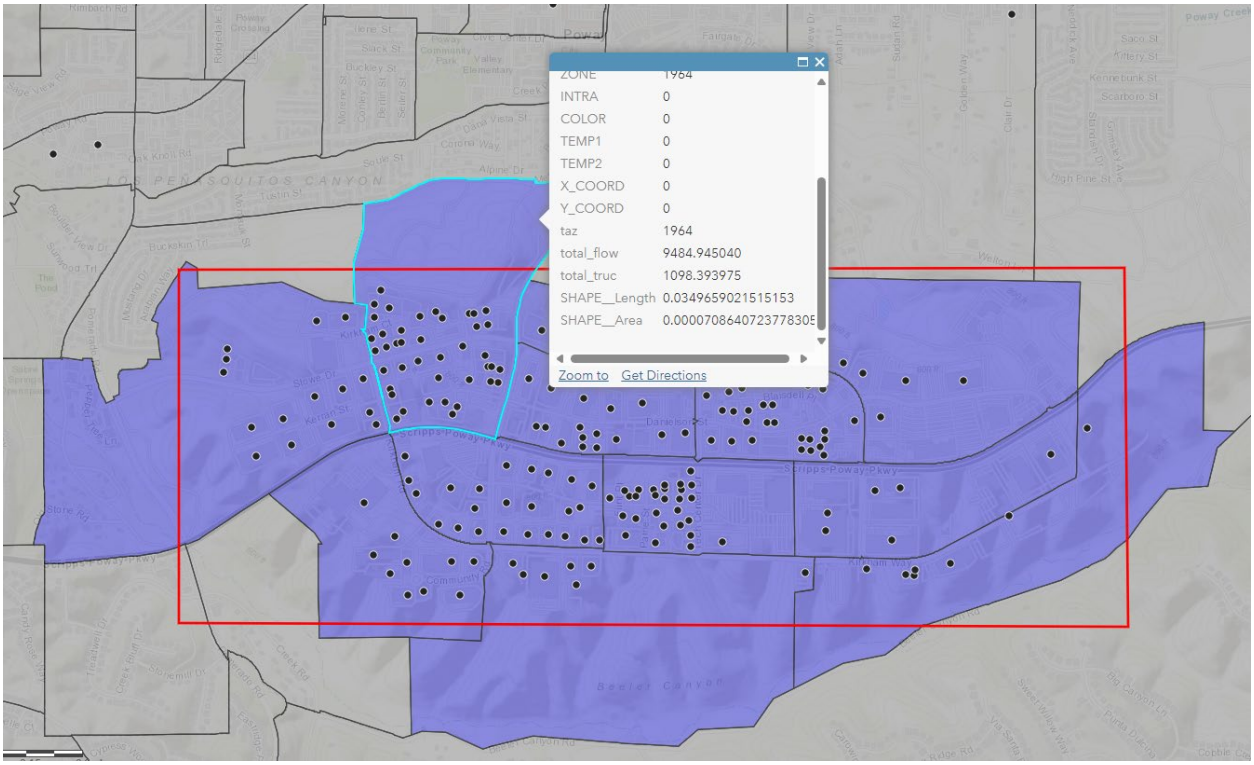
Of the approximately 5,000 TAZs modeled for the San Diego region, 819 zones containing one or more warehouse buildings were identified using the warehouse inventory compiled from the CoStar database.

Figure 4 shows a zoomed in map of the TAZs (shaded in purple) located in a part of the county where warehouses are clustered in the same area (denoted with a red box). In this example, the

[22] https://en.wikipedia.org/wiki/Traffic_analysis_zone

highlighted sample zone (TAZ #1964) has an adjacent information box listing the data for that specific zone. For this TAZ, the total truck volume entering and exiting the zone (labeled as "total_truc") is approximately 1,098 trucks per day. The total truck volume is the sum of all light-, medium-, and heavy-heavy duty trucks servicing warehousing and non-warehousing operations entering and exiting the TAZ.[23]

Figure 4 – Example TAZs

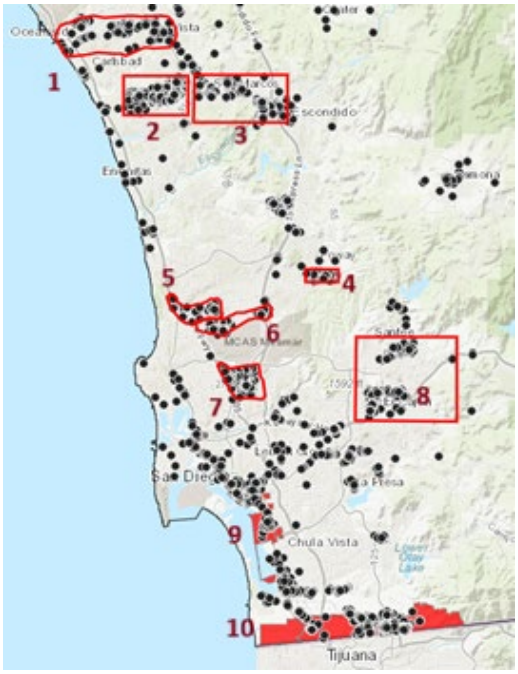


Warehouse Clusters

The TAZs were then grouped into 10 areas of the county where general warehouse clusters are located (Figure 5).

[23] The total truck volume only includes truck trips starting or ending in each TAZ and does not include passthrough trips. Freeway traffic would not be included in the total truck volume unless there is direct access from a TAZ to the freeway.

Figure 5 – Map of Warehouse Clusters in San Diego County



The warehouse clusters indicated in red on the map include the following areas: (1) Oceanside and Vista, (2) Carlsbad and Vista, (3) San Marcos and Escondido, (4) Poway, (5) Sorrento Valley, (6) Miramar, (7) Kearny Mesa, (8) Santee and El Cajon, (9) Portside Community (AB 617), and (10) International Border Community (AB 617).[24]

For each of the 819 TAZs identified with one or more warehouse buildings in the zone, the total truck volumes, number of warehouse buildings, and building square footage were tabulated, and the average warehouse building size for the TAZ was calculated. The TAZs were then grouped by average warehouse building size, and the total aggregate warehouse building square footage and truck volume for each warehouse size category were calculated. The process was completed for each of the 10 warehouse clusters with the results listed in Appendix A: Daily Truck Volumes For Each Warehouse Cluster.

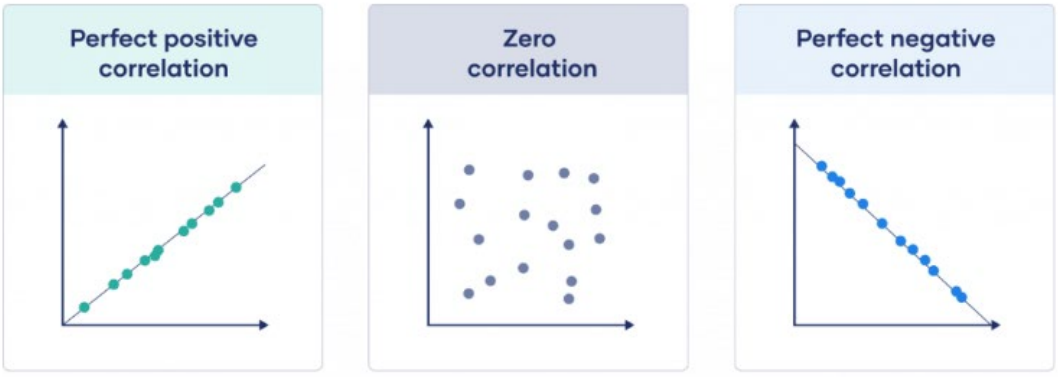
2.3.4 Correlation Coefficients

The correlation coefficients were calculated for each warehouse cluster to determine if there is a relationship between warehouse floor area and truck volumes, and how strong that relationship is, if any. A correlation coefficient is a number between -1 and 1 that indicates the strength and direction of a relationship between variables (Figure 6). In other words, it reflects how related two or more variables are within a dataset. A correlation coefficient of 1 indicates a perfect positive correlation, which means that when one variable changes, the other variable changes in the same direction. A correlation coefficient of 0 indicates that there is no relationship between the variables.

[24] The TAZs located within the AB617 Portside and International Border Communities were identified using the census tracts of both communities. The other warehouse clusters were designated using approximate boundaries to group warehouses located within the same city or area.

A correlation coefficient of -1 indicates a perfect negative correlation, which means that when one variable changes, the other variables change in the opposite direction.[25]

Figure 6 – Correlation Coefficient



As listed in Table 2, nine of the ten clusters in the analysis have correlation coefficient values that are 0.78 or greater. The overall trend is that warehouse floor area (square footage) and total truck volume have a strong positive correlation. This means that as warehouse square footage increases, the truck volume also proportionately increases. Conversely, the opposite would be true as well, that as warehouse square footage decreases, the truck volume also proportionally decreases. Due to this strong correlation between warehouse size and truck volume, staff determined that the methodology presented in this Supplement to estimate truck trip rates specific to the San Diego region is appropriate.

Table 2 – Correlation Coefficients

Cluster	Correlation Coefficient (Total Trucks vs Floor Area)
Oceanside and Vista	0.78
Carlsbad and Vista	0.97
San Marcos and Escondido	0.996
Poway	0.96
Sorrento Valley	0.80
Miramar	0.97
Kearny Mesa	0.96
Santee and El Cajon	0.61
Portside	0.82
International Border	0.84

[25] https://www.scribbr.co.uk/stats/correlation-coefficient-meaning/

2.3.5 Methodology for Estimating Truck Trip Rates

Light-, Medium-, and Heavy-Heavy Duty Truck Volumes

SANDAG ABM2+ data did not classify the types and classes of trucks entering and leaving each TAZ zone evaluated. Consequently, it was necessary to differentiate this truck activity for each TAZ zone to calculate emission estimates based on a fleet distribution consistent with the trucks operating within San Diego County. The aggregate total daily truck volumes for each warehouse size category were separated into light-heavy (LHD), medium-heavy (MHD), and heavy-heavy duty (HHD) truck volumes using the information summarized in Table 3. As listed, the daily LHD, MHD, and HHD truck volumes are 46.8%, 19.7% and 33.5% respectively of the total truck volumes tabulated in Section 2.3.3.[26]

Table 3 – Total Daily Trucks on Nearby Street Segments

Warehouse Floor Area	Total Daily LHD Trucks	Total Daily MHD Trucks	Total Daily HHD Trucks	Total Daily Trucks
100k and Greater Sq Ft	17,546	7,821	14,492	39,859
50k to 100k Sq Ft	32,130	14,036	22,356	68,522
25k to 50k Sq Ft	52,263	21,986	39,273	113,521
12.5k to 25k Sq Ft	79,975	33,617	58,394	171,986
Less Than 12.5k Sq Ft	87,810	36,139	58,366	182,315
Total	**269,723**	**113,599**	**192,880**	**576,203**
% of total	**46.8%**	**19.7%**	**33.5%**	**100.0%**

Adjustment Factors

With truck volume and warehouse floor area data, truck trip rates can then be calculated. However, due to the limitations of the CoStar and SANDAG datasets discussed below and to address concerns brought up by the WWG, it was necessary to account for certain data gaps by developing adjustment factors for this analysis.

Adjustment for Warehousing Activities

The CoStar data has information on approximately 6,700 buildings throughout San Diego County classified for warehousing type use. While these facilities may potentially be engaged in warehousing activities, additional information, which is currently not available to the District, would be needed to confirm the operations at each facility. Thus, some stakeholders in the WWG repeatedly noted that staff had yet to identify the specific facilities conducting warehousing activities as opposed to those conducting manufacturing, retail, or other non-warehousing activities. Staff acknowledges this and will work on refining the warehouse inventory by identifying the facilities used for warehousing activities if an ISR were pursued. Nonetheless, to account for this uncertainty within the CoStar warehouse inventory, an adjustment factor was developed to

[26] Derived from the SANDAG ABM2+ truck volumes along more than 2,000 local street segments located near warehouses in the San Diego region.

estimate the floor area being used for warehousing activities with the following information derived from the CoStar data:

- Buildings classified as warehouse, distribution, or refrigeration/cold storage, which collectively are 54.7% of the total warehouse building floor area in the county; and[27]
- Single tenant occupancies (3,270 warehouse buildings), which is 48.5% of the total warehouse buildings inventory (6,737 warehouse buildings). Multi-tenant occupancies may increase the likelihood of the building, or portions of the building being used for non-warehousing activities.

For calculating truck trip rates in this analysis, it is estimated that at least 26.5% (54.7% x 48.5%) of the aggregate building floor area in each TAZ is likely used for warehousing activities. It should be noted that staff considers this a conservative value since an even greater percentage of the identified warehouse buildings may not be conducting warehousing/goods movement-related operations and would thus not be subject to a possible ISR.[28] There is also the possibility that so few truck trips occur at these facilities that their activity would be considered de minimis and consequently would be exempt from possible ISR requirements.

Adjustment for Trucks Servicing Warehouses

The portion of the total truck volumes that visit warehouses cannot be determined with certainty unless individual reports or facility surveys were completed. To account for this uncertainty, adjustment factors were developed with data from the SANDAG 2022 Commercial Vehicle Survey (CVS) to estimate the composition of the fleets that potentially service warehouses in San Diego County.

SANDAG 2022 Commercial Vehicle Survey

Beginning in the spring of 2022 through January 2023, ETC Institute and a consultant RSG worked with SANDAG to conduct a multistep CVS in San Diego County. Two types of surveys were deployed. An establishment survey collected data about business operations that lead to truck movements. This survey collected information on business characteristics (e.g., industry, employment), shipping and receiving behavior, vehicle fleet composition, and the extent of commercial vehicle operations. A truck travel diary survey collected data about the vehicles' drivers, such as the types of businesses they are employed by and their daily travel. This survey featured multiple data retrieval options, including an app-based option installed on ETC Institute smart devices to collect data about truck driver behavior. The data included vehicle type, where vehicles start and end their day, and the details of each individual trip and stops made over the course of a day (e.g., activity at each stop, trip route, and stop duration).[29]

The comprehensive approach to data collection for the CVS generated a significant volume of valuable information about commercial vehicle and Transportation Network Company travel patterns. This, in turn, provides an in-depth understanding of travel behavior in the San Diego

[27] Floor area: warehouse = 69,448,402 sq ft; distribution = 17,707,003 sq ft; refrigeration/cold storage = 1,009,066 sq ft; total (entire CoStar inventory) = 161,242,760 sq ft.
[28] See Section 2.7.4.
[29] SANDAG 2022 Commercial Vehicle Survey, November, 22, 2023, p. 1, https://www.sandag.org/-/media/SANDAG/Documents/PDF/data-and-research/applied-research-and-performance-monitoring/surveys/commercial-vehicle-survey-report-2022.pdf

region, which will be crucial for future transportation planning and policy-making decisions, in particular for what the region plans to do about warehouses.[30] Utilizing localized data that is also built into SANDAG regional transportation plans and modeling is especially beneficial for the District.

Transportation and Warehousing Sector

The information for the "Transportation" industry group categorized in the CVS was used because that industry group includes the Transportation and Warehousing sector (NAICS codes 48 and 49).[31] The Transportation and Warehousing sector includes industries providing transportation of passengers and cargo, warehousing and storage for goods, scenic and sightseeing transportation, and support activities related to modes of transportation.[32]

The percentages of the total truck volume entering and exiting each TAZ for the Light-Duty Commercial Vehicle (LCV), Single-Unit Truck (SUT), and Multiunit Truck (MUT) categories were then calculated using the CVS data as shown in Table 4. These categories are also referred to as light-, medium-, and heavy-heavy duty vehicles respectively. In comparison to the Transportation industry, other industry groups such as Construction, Education/Public/Other Services, and Info/FIRE/Professional Services account for higher portions of the MUTs surveyed. However, commercial vehicles operated in these industry groups would not be regulated by a local ISR applicable to warehouses and distribution centers.

Table 4 – Estimated Number of Commercial Vehicles in the San Diego Region[33]

Industry Group	LCV	SUT	MUT	LCV %	SUT %	MUT %
Agriculture/Mining	455	104	92	0.3%	0.2%	0.3%
Manufacturing	4,450	2,161	1,188	3.0%	3.3%	3.3%
Industrial/Utilities	934	213	197	0.6%	0.3%	0.6%
Retail	6,061	5,582	3,140	4.1%	8.5%	8.8%
Wholesale	6,171	2,447	1,975	4.2%	3.7%	5.5%
Construction	16,758	5,295	12,385	11.4%	8.1%	34.8%
Transportation	6,149	1,969	3,193	**4.2%**	**3.0%**	**9.0%**
Info/FIRE/Professional Services	34,584	20,801	5,019	23.5%	31.7%	14.1%
Education/Public/Other Services	41,254	20,641	8,122	28.0%	31.4%	22.8%
Medical/Health Services	21,652	5,159	132	14.7%	7.9%	0.4%
Leisure/Accommodations and Food	8,801	1,337	176	6.0%	2.0%	0.5%
Total	***147,269***	***65,709***	***35,619***	***100%***	***100%***	***100%***

Other Assumptions

In addition, and as referenced above, the number of trucks were assumed to be half of the total volume for a particular TAZ, meaning that the number of trucks entering a zone is the same as the number of trucks exiting that same zone. Also, two trips were assigned per truck, i.e., a truck entering the zone is one trip and then exiting is another trip.

[30] Commercial Vehicle Survey, p. 3
[31] Commercial Vehicle Survey, Table 2, p. 13
[32] https://www.census.gov/naics/?input=48&year=2022&details=48
[33] Adapted from the Commercial Vehicle Survey, Table 12, p.27.

Equations

Equations [1] through [3] were used to calculate the daily truck trip rates for light-heavy (Class 2B to 5), medium-heavy (Class 6 and 7), and heavy-heavy duty trucks (Class 8).

Equation [1]:[34]
Daily trip rate, light-heavy duty trucks (Class 2B to 5)
= [(0.5) x (total trucks) x (46.8%) x (4.2%) x (2 trips/truck)]
÷ [(floor area sq ft) x (26.5%) ÷ 1,000]

Equation [2]:[35]
Daily trip rate, medium-heavy duty trucks (Class 6 to 7)
= (0.5) x (total trucks) x (19.7%) x (3.0%) x (2 trips/truck)
÷ [(floor area sq ft) x (26.5%) ÷ 1,000]

Equation [3]:[36]
Daily trip rate, heavy-heavy duty trucks (Class 8)
= (0.5) x (total trucks) x (33.5%) x (9.0%) x (2 trips/truck)
÷ [(floor area sq ft) x (26.5%) ÷ 1,000]

2.3.6 Truck Trip Rate Analysis Results

Table 5 lists the estimated countywide average daily truck trip rates per 1,000 sq ft for various warehouse sizes. The average daily truck trip rates for each of the 10 warehouse clusters are listed in Appendix B: Warehouse Cluster Truck Trip Rates.

Table 5 – Average Daily Truck Trip Rates for San Diego County*

Warehouse Floor Area (sq ft)	Class 2B to 5 Daily Truck Trip Rate (per 1,000 sq ft)	Class 6 to 7 Daily Truck Trip Rate (per 1,000 sq ft)	Class 8 Daily Truck Trip Rate (per 1,000 sq ft)
100k and greater	0.05	0.02	0.08
50k to <100k	0.09	0.03	0.14
25k to <50k	0.12	0.04	0.19
12.5k to <25k	0.15	0.05	0.23
<12.5k	0.31	0.09	0.48
County average (all sizes)	**0.14**	**0.04**	**0.22**

*Preliminary estimates subject to change.

[34] Gross vehicle weight rating (GVWR) for light-heavy duty trucks: Class 2B - 8,501 to 10,000 lbs; Class 3 - 10,001 to 14,000 lbs; Class 4 - 14,001 to 16,000 lbs; and Class 5 - 16,001 to 19,500 lbs.
[35] GVWR for medium-heavy duty trucks: Class 6 - 19,501 to 26,000 lbs; and Class 7 - 26,001 to 33,000 lbs.
[36] GVWR for heavy-heavy duty trucks: Class 8 - greater than 33,000 lbs.

The trend in the results shows that for each truck class the daily truck trip rates increase as warehouse floor area decreases. This does **not** necessarily mean that smaller warehouses generally receive more truck visits compared to larger warehouses. The estimated truck trips are calculated with floor area and the applicable truck trip rate for a specific warehouse size category.

For example, using the trip rates listed in Table 5, a 166k sq ft warehouse, with a rate of 0.08 Class 8 truck trips per 1,000 sq ft, results in an estimated 14 (rounded) truck trips per day (166,181 x 0.08 / 1,000). In comparison, an 8.5k sq ft warehouse, with a rate of 0.48 Class 8 truck trips per 1,000 sq ft, results in an estimated 4 truck trips per day (8,550 x 0.48 / 1,000). In this example, an 8.5k sq ft warehouse with a truck trip rate six times greater than the rate for a 166k sq ft warehouse (0.48 vs 0.08 trips per 1,000 sq ft) results in fewer estimated daily Class 8 truck trips (4 vs 14 trips). As shown in Table 6, the estimated daily truck trips for each truck class decrease as warehouse building floor area decreases.

Table 6 – Average Daily Truck Trips for San Diego County*

Warehouse Floor Area (sq ft)	Average Warehouse Floor Area[37] (sq ft)	Class 2B to 5 Daily Truck Trips	Class 6 to 7 Daily Truck Trips	Class 8 Daily Truck Trips	Total Daily Truck Trips
100k and greater	166,181	8.9	2.7	13.7	**25.2**
50k to <100k	67,190	6.2	1.9	9.6	**17.7**
25k to <50k	33,762	4.2	1.3	6.4	**11.8**
12.5k to <25k	18,527	2.8	0.9	4.3	**8.0**
<12.5k	8,550	2.7	0.8	4.1	**7.6**

*Preliminary estimates subject to change.

For comparison, Table 7 lists the truck trip rates estimated by the SCAQMD when they developed their warehouse Rule 2305.[38] SCAQMD estimated trip rates for Class 4-7 and Class 8 trucks for 3 warehouse categories: those with floor area of 200k sq ft or more, warehouses between 100 and 200k sq ft, and cold storage facilities 100k sq ft or more. The estimated rates developed by the SCAQMD range from 0.12 to 0.75 daily truck trips per 1,000 sq ft.

[37] Average floor area for all warehouse buildings in each warehouse size category in San Diego County.

[38] SCAQMD, Rule 2305, Staff Report, Table 5, p. 47

Table 7 - SCAQMD R2305 Trip Rates

Category or Building Size	Class 4 - 7 (daily truck trips per 1,000 sq ft)	Class 8 (daily truck trips per 1,000 sq ft)
≥200k sq ft	0.12	0.33
≥100k to <200k sq ft	0.14	0.21
Cold storage (≥100k sq ft)	0.29	0.75

All the truck trip rates estimated in staff's analysis are less than 1.0 trips per 1,000 sq ft for each warehouse size category. This is significant because the trip rates derived from this analysis, which utilized San Diego County-specific traffic data as requested by the Governing Board, are within the range of the trip rates listed in other references.[39] Due to the proximity in scale with other referenced trip rates, the overall strong positive correlation between truck volume and building floor area, and the unavailability of reported truck trip rate information from warehouse operators, staff determined that it was reasonable and appropriate to use the truck trip rates calculated in the TAZ-based analysis (as described above) to estimate baseline emissions from warehousing activities in the San Diego region.

2.4 AIR QUALITY AND HEALTH BENEFITS

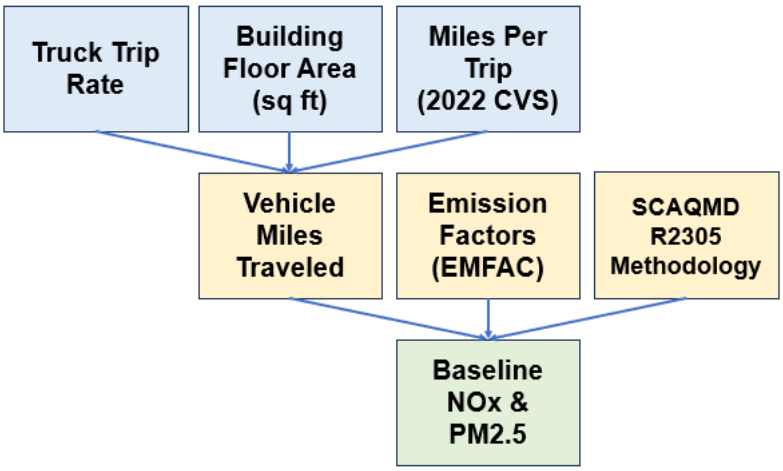
2.4.1 Methodology for Estimating Baseline Emissions

Figure 7 illustrates an overview of the methodology for estimating baseline emissions using the results from the truck trip rate analysis in the preceding section. Baseline emissions for nitrogen oxide (NOx) and particulate matter (PM2.5) were calculated with the methodology used by the SCAQMD during the development of their warehouse Rule 2305.[40]

[39] Appendix C: Other Referenced Truck Trip Rates

[40] SCAQMD, Rule 2305, Warehouse Indirect Source Rule – Warehouse Actions and Investments to Reduce Emissions (WAIRE) Program, Staff Report, May 2021, pp. 47-50, http://www.aqmd.gov/docs/default-source/Agendas/Governing-Board/2021/2021-May7-027.pdf?sfvrsn=10

Figure 7 – Baseline Emissions Methodology



Vehicle Miles Traveled (VMT)

The total vehicle miles traveled (VMT) were calculated with warehouse building floor area, the truck trip rates derived with the TAZ-based analysis, and the weighted average truck trip lengths per vehicle class referenced from the SANDAG CVS (light = 8.6 miles, medium = 7.0 miles, heavy = 14.0 miles).[41] The weighted average truck trip lengths account for the relative importance or frequency of some factors in the data collected in the survey. The weighted average truck trip lengths were used in this analysis because the values are slightly more conservative than the non-weighted average trip lengths.

Baseline Years 2028 and 2032

Because emission benefits are anticipated to occur from various CARB mobile source regulations, the baseline emissions from warehousing activities in San Diego County are forecasted to decrease over time even if a local warehouse ISR is not developed for the region. To account for baseline emissions that may decrease with each subsequent year and to determine the level of emission reductions a potential warehouse ISR may achieve in a future year, calendar year 2028 was evaluated as the first baseline emissions year. Baseline year 2028 was based on the scenario of the Governing Board directing the District in 2025 to proceed with the development of a warehouse ISR. This would be followed by 1.5 to 2 years for the rule development process to be completed with a projected rule adoption date in 2027. Using a similar three-year phased-in compliance schedule as provided in SCAQMD Rule 2305, the first initial compliance period for Phase 1 facilities subject to a potential ISR would be calendar year 2028. Baseline year 2032 was also evaluated as the year when all subject facilities would be fully phased into the ISR.[42]

[41] Commercial Vehicle Survey, Table 17, p. 45

[42] Phase 1 (largest facilities): phased-in compliance periods 2028 through 2030. Phase 2 (medium facilities): phased-in compliance periods 2029 through 2031. Phase 3 (smallest facilities): phased-in compliance periods 2030 to 2032. Calendar year 2032 also aligns with the region's current attainment deadline to attain the 2015 federal ozone standard of 70 parts per billion (ppb).

Emission Rates and Scaling Factors

Baseline composite truck emission rates (ER) were calculated for heavy-duty trucks (Class 2B-5, Class 6-7, and Class 8) for calendar years 2028 and 2032 using CARB's EMFAC2021.[43] EMFAC2021 provides activity and emission rates for all on-road vehicles that operate within California. However, the analysis presented here is limited to those categories most likely to deliver goods to and from warehouses.[44] Composite truck emission rates were calculated as the sum of each truck category's emissions rate multiplied by its corresponding VMT and then divided by the total sum of VMTs.[45]

In addition, and in response to WWG stakeholder concerns about the emission reductions from mobile source regulations with a possible ISR, scaling factors (SF) were provided by CARB staff in October 2024.[46] These scaling factors were used to adjust the estimated emission rates to account for the emission benefits forecasted to occur from CARB and federal regulations that are not included in EMFAC2021 (see Equation [5]). The additional CARB regulations accounted for in this analysis with the use of these scaling factors are the Clean Miles Standard Program (CMS), Advanced Clean Cars II (ACCII), and Clean Truck Check (also known as Heavy-Duty Inspection and Maintenance, HDIM). In addition, the Federal Clean Trucks Plan (CTP) is also accounted for in this analysis. Thus, the estimated baseline emissions are the net emissions after the state and federal regulations are in effect.

Note that the emission benefits that would have been anticipated from CARB's Advanced Clean Fleets Regulation (ACF) are not included in this Supplement due to CARB's withdrawal of their request for a waiver from the EPA. See section on the Advanced Clean Fleets Regulation (ACF).

Equations

Per the SCAQMD Rule 2305 methodology, Class 8 truck emissions were reduced by an adjustment factor of 22.2% to account for multi-stop trips made in between warehouses by trucks.[47] Also, the potential idling emissions associated with warehousing activities were estimated using idling emissions factors derived from EMFAC2021 and the ratio of warehouse truck VMT to the total VMT for these truck classes.[48] Using Equations [4] through [7] below, the daily NOx and PM2.5 running and idling exhaust emissions were calculated for calendar years 2028 and 2032. The total NOx and PM2.5 emissions were then converted from tons per day to tons per year using 312 operational days per year.[49]

Equation [4]:
VMT Associated with Warehouses = Warehouse size (ksf) x trip rates (trips/ksf) x miles/trip

[43] https://arb.ca.gov/emfac/
[44] SCAQMD, Rule 2305, Staff Report, Table 7, p. 48
[45] SCAQMD, Rule 2305, Staff Report, footnote 79, p. 48
[46] Appendix D: EMFAC2021 Off-Model Scaling Factors
[47] Derived from Southern California Association of Governments, Industrial Warehousing Study, Task 4. Understanding Facility Operations, April 2018, Table 3.4, p. 3-24, https://scag.ca.gov/sites/main/files/file-attachments/task4_understandingfacilityoperations.pdf.
[48] SCAQMD, Rule 2305, Staff Report, p. 49
[49] CARB, Advanced Clean Fleets Regulation, Staff Report: Initial Statement of Reasons, August 30, 2022, footnote 337, p. 148, https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2022/acf22/isor2.pdf

Equation [5]:[50]

Composite Truck Emission Rate (ER)

$$= [ER_1 \times VMT_1 \times (SF_{CMS})_1 \times (SF_{ACCII})_1 \times (SF_{HDIM})_1 \times (SF_{CTP})_1 \times (SF_{ACF})_1 + \ldots$$
$$\ldots + ER_n \times VMT_n \times (SF_{CMS})_n \times (SF_{ACCII})_n \times (SF_{HDIM})_n \times (SF_{CTP})_n \times (SF_{ACF})_n]$$
$$\div [VMT_1 + \ldots + VMT_n]$$

Equation [6]:

Running Exhaust Emissions Associated with Warehouses

$$= ER_{Class\ 8} \times Warehouse\ VMT_{Class\ 8} \times (1\text{-}0.222)$$
$$+ ER_{Class\ 6\text{-}7} \times Warehouse\ VMT_{Class\ 6\text{-}7}$$
$$+ ER_{Class\ 2B\text{-}5} \times Warehouse\ VMT_{Class\ 2B\text{-}5}$$

Equation [7]:

Idling Exhaust Emissions Associated with Warehouses

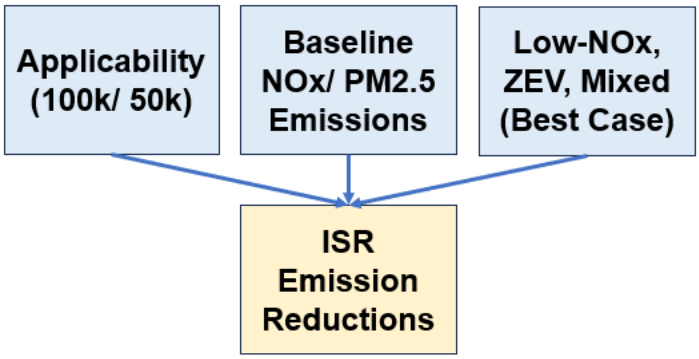
$$= (Warehouse\ VMT_{Class\ 8} \div Total\ VMT_{Class\ 8}) \times Idling\ ER_{Class\ 8} \times (1\text{-}0.222)$$
$$+ (Warehouse\ VMT_{Class\ 6\text{-}7} \div Total\ VMT_{Class\ 6\text{-}7}) \times Idling\ ER_{Class\ 6\text{-}7}$$
$$+ (Warehouse\ VMT_{Class\ 2B\text{-}5} \div Total\ VMT_{Class\ 2B\text{-}5}) \times Idling\ ER_{Class\ 2B\text{-}5}$$

A summary of the baseline emission estimates can be found in Section 2.4.3.

2.4.2 Methodology for Estimating Emission Reductions

Figure 8 illustrates an overview of the methodology for estimating NOx and PM2.5 emission reductions. With baseline emissions calculated, potential emission reductions were conservatively calculated that may be achieved if a warehouse ISR was developed for San Diego County.

Figure 8 – Emission Reductions Methodology



In line with the Governing Board's direction, the applicability threshold for a possible warehouse ISR was assessed for two size ranges: warehouses with floor area of 100k sq ft or more, and warehouses with floor area of 50k sq ft or more. For each applicability threshold (100k and 50k sq ft), three best-case emissions reduction scenarios were evaluated.

[50] The scaling factors for CARB's Advanced Clean Fleets (ACF) regulation were adjusted to 1.0 (i.e., no emission benefits) due to CARB's withdrawal for a waiver from the EPA.

- **Scenario 1** – 100% of subject facilities select the Low-NOx trucks option, which would result in a 90% NOx emissions reduction compared to standard diesel trucks operating today.[51]

- **Scenario 2** – 100% of subject facilities select the ZEV trucks option, which would result in 100% NOx and PM2.5 emissions reduction (no tailpipe NOx and PM2.5 emissions) compared to standard diesel trucks operating today.

- **Scenario 3** – Subject facilities select Low-NOx trucks, ZEV trucks, or other compliance options using the same compliance option implementation percentages reported per Rule 2305 for the SCAQMD region.[52] Near-Zero Emissions (NZE), also referred to as Low-NOx, truck visits account for 40% of the total earned WAIRE Points in SCAQMD for Phase 2 facilities (150k to <250k sq ft), compliance year 2023. Furthermore, zero-emission (ZE) yard hostler usage and ZE truck acquisitions and visits account for 38% of the total WAIRE points earned to date.[53]

Courts have concluded that providing a menu of compliance options similar to SCAQMD Rule 2305 is a critical aspect to avoiding federal preemption issues and de-facto purchase mandates. Consequently, any potential warehouse ISR that the District may develop would need to provide a menu of compliance options for facilities to choose from, including those which may not directly reduce NOx and PM emissions (e.g., installation of solar panels or charging infrastructure). Two of the control options evaluated are best-case scenarios that would result in direct emission reductions assuming all subject facilities select Scenario 1 (100% Low-NOx), or all select Scenario 2 (100% ZEV). Thus, Scenarios 1 and 2 would potentially result in the maximum level of emission reductions that a potential ISR could achieve. While these are presented for reference, the District believes these emission reduction estimates would not occur in practice based on the options that facilities are utilizing to comply with SCAQMD Rule 2305.

Scenario 3 (Low-NOx, ZEV, Other) was thus evaluated as a potential "achieved-in-practice," i.e., more realistic, scenario based on the reported implementation rates in the SCAQMD region of certain Low-NOx and ZE compliance options that would result in direct emission reductions at subject facilities. Scenario 3 also reflects the true cost of compliance because it accounts for facilities accruing WAIRE points through the "Other" category, which includes alternative options such as mitigation fees and air filtration installations. It's important to note that Scenario 3 is an approximation only and was based on the reported implementation rates in the SCAQMD region, which is the best information currently available. Due to multiple compliance options that would be available in a potential warehouse ISR that operators may select from, and other characteristics unique to the San Diego region (e.g., warehouse size distribution), staff cannot forecast the implementation rates that may occur for future years in the San Diego region.

[51] NOx standards for heavy-duty engines: EPA = 0.20 g/bhp-hr; CARB certified Optional Low-NOx = 0.02 g/bhp-hr. PM2.5 emission reductions are not credited under Scenario 1 because diesel and natural gas engines are certified to the same emissions standard, and thus there are no reductions to be claimed. However, significant reductions of diesel PM emissions, which are a subset of PM2.5 emissions, would be anticipated as a co-benefit from the transition of diesel fuel to natural gas combustion.

[52] Appendix F: Average Annual Compliance Costs, Figure F1, (Phase 2, 2023).

[53] The implementation of the other compliance options, including ZE infrastructure and usage, mitigation fee and air filters (collectively 22% of the total earned WAIRE Points), are not anticipated to result in direct emission reductions at subject facilities.

2.4.3 Emissions Analysis Results

Tables 8 and 9 list the estimated NOx and PM2.5 emission baselines for calendar years 2028 and 2032 respectively, and the corresponding estimated emission reductions for Scenario 1 (100% Low-NOx), Scenario 2 (100% ZEV), and Scenario 3 (Low-NOx, ZEV, Other) for those two baseline years.

As listed in Table 8, under Scenario 3 for the 2028 baseline year, a local warehouse ISR, if adopted, could be expected to reduce total NOx emissions by as much as 13 to 27 tons per year, and total PM2.5 emissions by as much as 0.1 to 0.3 tons per year in San Diego County.

As listed in Table 9, under Scenario 3 for the 2032 baseline year, the total NOx emission reductions are expected to be approximately 10 to 20 tons per year, and total PM2.5 emission reductions to be 0.1 to 0.2 tons per year in San Diego County.[54]

For the purposes of presenting emissions and reduction estimates in this Supplement, three areas were evaluated: Portside Community, International Border Community, and the rest of San Diego County.[55]

Best-Case Estimates

It's important to note there is a possibility that may likely decrease the estimated baseline emissions and reductions listed in Tables 8 and 9. This analysis assumes that all the facilities identified in the various size categories conduct warehousing activities and would be subject to a potential warehouse ISR. However, a portion of these facilities may likely be conducting non-warehousing activities (e.g., retail, office, or other light commercial use) in buildings classified as warehouses, and thus would not be subject to a potential warehouse ISR. While the District used a conservative adjustment factor to account for such non-warehousing activities when estimating truck trip rates (Adjustment Factors), a greater percentage of the warehouse inventory may not be conducting goods movement-related activities, and thus would not be subject to a potential ISR.[56]

Therefore, the baseline emissions, and consequently emission reductions, are likely to be ***less in practice*** than the estimated values listed in Tables 8 and 9. Consequently, the values in Tables 8 and 9 should be considered best-case estimates.

[54] NOx and PM2.5 emission reductions are anticipated to further decrease each year due to increasing emission benefits from various CARB mobile source regulations.
[55] If a warehouse ISR rulemaking is pursued, estimates for the 10 warehouse clusters would also be presented (see Section 2.3.3 on Warehouse Clusters).
[56] See Section 2.7.4 - District Study of Warehouse Facilities in the Portside Community.

Table 8 – 2028 Baseline Emissions and Reductions*

Region	ISR Applicability Threshold (sq ft)	Warehouse Count	Baseline Emissions		Scenario 1 (Low-NOx) Emission Reductions[57]		Scenario 2 (ZEV) Emission Reductions		Scenario 3 (Low-NOx, ZEV, Other) Emission Reductions	
			NOx (tons per year)	PM2.5 (tons per year)	NOx (tons per year)	PM2.5 (tons per year)	NOx (tons per year)	PM2.5 (tons per year)	NOx (tons per year)	PM2.5 (tons per year)
Portside	100k and greater	5	0.4	0.01	0.3	N/A	0.4	0.01	0.3	0.003
International Border	100k and greater	46	3.2	0.06	2.9	N/A	3.2	0.06	2.4	0.02
County w/o AB617	100k and greater	192	13.8	0.27	12.4	N/A	13.8	0.27	10.2	0.10
Total	**100k and greater**	**243**	**17.4**	**0.33**	15.6	N/A	17.4	0.33	**12.8**	**0.13**
Portside	50k and greater	29	1.4	0.03	1.2	N/A	1.4	0.03	1.0	0.01
International Border	50k and greater	102	5.7	0.11	5.2	N/A	5.7	0.11	4.2	0.04
County w/o AB617	50k and greater	526	29.0	0.56	26.1	N/A	29.0	0.56	21.4	0.21
Total	**50k and greater**	**657**	**36.1**	**0.69**	32.5	N/A	36.1	0.69	**26.7**	**0.26**

*Preliminary estimates subject to change.

[57] NOx standards for heavy-duty engines: EPA = 0.20 g/bhp-hr; CARB certified Optional Low-NOx = 0.02 g/bhp-hr. PM2.5 emission reductions are not credited under Scenario 1 because diesel and natural gas engines are certified to the same emissions standard, and thus there are no reductions to be claimed. However, significant reductions of diesel PM emissions, which are a subset of PM2.5 emissions, would be anticipated as a co-benefit from the transition of diesel fuel to natural gas combustion.

Table 9 – 2032 Baseline Emissions and Reductions*

Region	ISR Applicability Threshold (sq ft)	Warehouse Count	Baseline Emissions		Scenario 1 (Low-NOx) Emission Reductions[58]		Scenario 2 (ZEV) Emission Reductions		Scenario 3 (Low-NOx, ZEV, Other) Emission Reductions	
			NOx (tons per year)	PM2.5 (tons per year)	NOx (tons per year)	PM2.5 (tons per year)	NOx (tons per year)	PM2.5 (tons per year)	NOx (tons per year)	PM2.5 (tons per year)
Portside	100k and greater	5	0.3	0.01	0.2	N/A	0.3	0.01	0.2	0.002
International Border	100k and greater	46	2.4	0.06	2.2	N/A	2.4	0.06	1.8	0.02
County w/o AB617	100k and greater	192	10.3	0.25	9.3	N/A	10.3	0.25	7.6	0.09
Total	**100k and greater**	**243**	**13.0**	**0.31**	11.7	N/A	13.0	0.31	**9.6**	**0.12**
Portside	50k and greater	29	1.0	0.02	0.9	N/A	1.0	0.02	0.8	0.009
International Border	50k and greater	102	4.3	0.10	3.9	N/A	4.3	0.10	3.2	0.04
County w/o AB617	50k and greater	526	21.6	0.52	19.5	N/A	21.6	0.52	16.0	0.20
Total	**50k and greater**	**657**	**26.9**	**0.64**	24.2	N/A	26.9	0.64	**19.9**	**0.24**

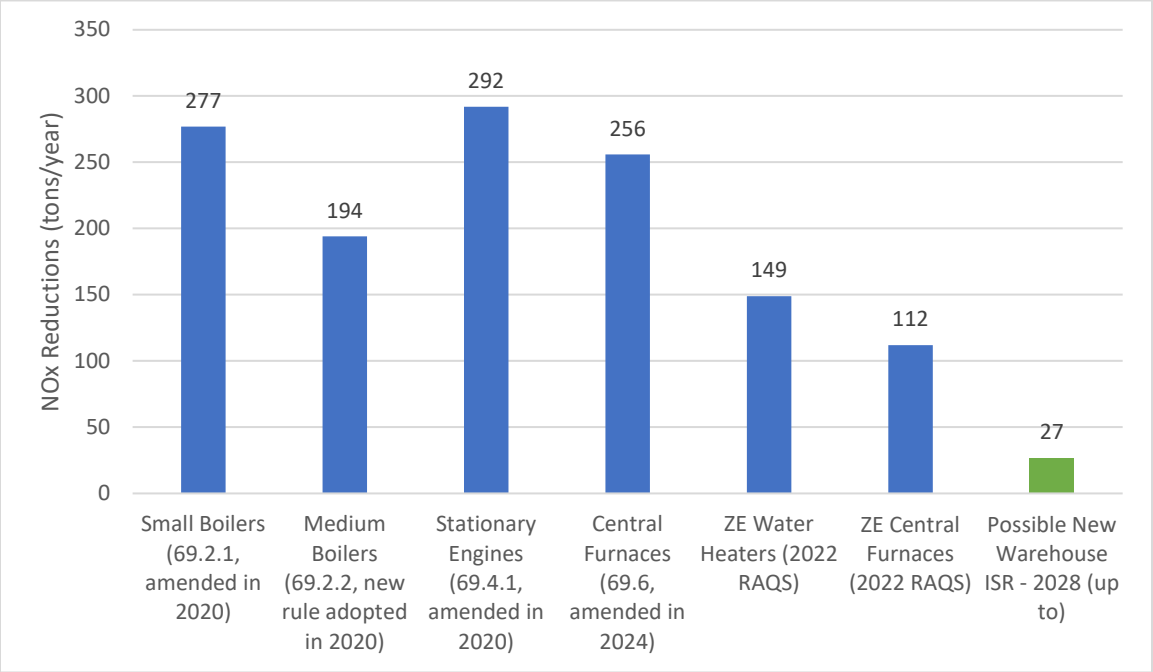
*Preliminary estimates subject to change.

Recent and Possible Rulemakings

For contextual reference, Figure 9 below illustrates the emission reduction benefits from recent and possible future stationary source rulemakings compared to potential reductions estimated from a possible new warehouse ISR. In July 2020, the District adopted rules that are estimated to reduce NOx emissions upon full rule implementation from small boilers (Rule 69.2.1) by 277 tons per year, medium boilers (Rule 69.2.2) by 194 tons per year, and stationary engines (Rule 69.4.1) by 292 tons per year. Also, in November 2024 the District adopted amendments to its central furnace rule (Rule 69.6) that are estimated to reduce NOx emissions by 256 tons per year upon full rule implementation.

[58] NOx standards for heavy-duty engines: EPA = 0.20 g/bhp-hr; CARB certified Optional Low-NOx = 0.02 g/bhp-hr. PM2.5 emission reductions are not credited under Scenario 1 because diesel and natural gas engines are certified to the same emissions standard, and thus there are no reductions to be claimed. However, significant reductions of diesel PM emissions, which are a subset of PM2.5 emissions, would be anticipated as a co-benefit from the transition of diesel fuel to natural gas combustion.

Figure 9 – Estimated NOx Reduction Comparison to Recent/Possible Rulemakings



A similar graph to Figure 9 was previously included in the ISR Framework.[59] However, the chart has now been updated to reflect new emission reduction estimates for a potential ISR (in green), as well as the addition of the central furnace measure most recently adopted, and two other potential measures explained below.

Estimated emission reductions for two "further study measures" outlined in the District's most recent air quality plan to attain state ozone standards, the "2022 Regional Air Quality Strategy" (RAQS), were also included for reference. As noted in the 2022 RAQS, these control measures require a more detailed analysis and more time to assess potential adoption/implementation in San Diego County. While they will be evaluated during the next three years by staff, forthcoming State regulations could mandate the need to amend corresponding local rules in a shorter timeframe. For Further Study Measure FS-7, Zero-Emission Water Heaters, the possible incorporation of zero-emission standards for all new/existing water heaters has the potential to reduce NOx emissions by at least 149 tons per year (0.4 tons per day), if such limits were determined to be feasible, cost-effective, and adopted. For Further Study Measure FS-10, Zero-Emission Central Furnaces, the possible incorporation of zero-emission standards for all new/existing fan-type central furnaces has the potential to reduce NOx emissions by at least 112 tons per year (0.3 tons per day), if such limits were determined to be feasible, cost-effective, and adopted.[60]

The two further study measures identified (if adopted) would provide much needed NOx emission reductions in under-resourced communities and the region at large, and directly in the homes of all citizens countywide where the public spends most of their time. They would also provide

[59] ISR Framework, Figure 2, p. 11, Attachment A

[60] SDAPCD, 2022 Revision of the Regional Air Quality Strategy, Attachment I, pp. I-10 and I-12, https://www.sdapcd.org/content/dam/sdapcd/documents/grants/planning/Att.%20A%20-%202022%20RAQS.pdf.

significant NOx reductions to help support attainment of near-term federal attainment deadlines in 2032.

In addition, the estimated NOx emission reductions for the adopted District rules described above ranged between 55% and 67% of baseline emissions. In comparison, as listed in Table 8, a potential warehouse ISR is estimated to result in a NOx emission reduction of 74% (26.7 ÷ 36.1). Though the percentage of NOx emissions reduced from baseline emissions are estimated to be greater for a potential warehouse ISR than those from other District rules, the absolute NOx emissions reduced from an ISR are estimated to be less due to the lesser estimated baseline NOx emissions attributed to warehousing activities.

ISR Framework Emission Reduction Estimates

The preliminary emission reduction estimates presented in the ISR Framework were 50 tons per year for NOx, and 0.27 tons per year for DPM, which are greater than the estimates presented here.[61] The preliminary ISR Framework estimates were based on the best available information at the time, which consisted of scaling of the SCAQMD emission reduction estimates in proportion to the District's smaller population of warehouses with at least 100,000 sq. ft. of indoor floor space. The difference between the emission reduction estimates was anticipated due to the different methodologies used between the ISR Framework and this Supplement.

2.4.4 Public Health Benefits

Public health benefits in 2028 and 2032 that could be anticipated from a potential warehouse ISR were estimated using the EPA's CO-Benefits Risk Assessment Health Impacts Screening and Mapping Tool (COBRA).[62] The NOx and PM2.5 emission reductions under Scenario 3 (Low-NOx, ZEV, Other) were used as inputs for the COBRA screening tool to calculate the economic value of the health benefits associated with those anticipated emission reductions. Scenario 3 was used because the emission reductions were the most realistic estimate of the three scenarios evaluated. Table 10 summarizes some of the preliminary results of the COBRA tool if a warehouse ISR was adopted. This includes the changes in certain health incidences, which are the number of events that would be avoided per year because of the emission reductions, and the low and high value monetary health benefits, i.e., avoided healthcare costs and lost productivity corresponding with those avoided health incidences.[63] In other words, these values indicate the potential health benefits that would be forgone if a potential warehouse ISR as evaluated in this Supplement is not adopted by the District.

[61] ISR Framework, p. 11, Attachment A
[62] https://cobra.epa.gov/
[63] See Appendix E: EPA COBRA Output Tables for additional information about the total health benefits estimated.

Table 10 – Total Health Benefits for Scenario 3 (Low-NOx, ZEV, Other)*

Year	ISR Applicability Threshold (sq ft)	Change in Incidence (per year)				Total Health Benefits (per year)	
		Minor Restricted Activity Days	School Loss Days	Work Loss Days	Health Related Incidences (up to)[64]	Low Value	High Value
2028	100k and greater	6.3	17.0	1.1	32.6	$410,984	$514,534
2028	50k and greater	13.1	35.4	2.2	67.9	$854,940	$1,068,368
2032	100k and greater	5.1	12.7	0.9	24.6	$312,957	$395,797
2032	50k and greater	10.4	26.4	1.8	51.0	$646,898	$816,603

*Preliminary estimates subject to change.

2.5 COMPLIANCE COSTS AND COST-EFFECTIVENESS

The total annual compliance costs for San Diego County were estimated using a weighted annual cost of $0.26/sq ft derived from SCAQMD's information on average costs and WAIRE Menu Items implemented.[65] As listed in Table 11, the average annual compliance costs that would be incurred by each local warehouse are estimated to be between $29,000 and $49,000 per year. Actual costs would vary depending on the site-specific actions taken to reduce emissions. The District acknowledges these compliance costs are higher than initially estimated in the ISR Framework ($14,400 to $26,100 per year).[66] This increase in the estimated compliance costs was due to a greater average cost per square feet used in this Supplement than the costs used in the ISR Framework ($0.10 to $0.14/sq ft).[67]

State law requires air districts to evaluate the cost-effectiveness of proposed rules.[68] Cost-effectiveness is typically expressed in terms of total compliance costs (dollars) per unit of emissions reduced (tons or pounds). Cost-effectiveness values, expressed in dollars per pound of NOx emissions reduced ($/lb), were estimated using the total annual compliance costs and the emission reductions listed in Tables 8 and 9 for Scenario 3.[69]

[64] Health related incidences include the following: total mortality; nonfatal heart attacks; infant mortality; total hospital admits, all respiratory; total emergency room visits, respiratory; total asthma onset; total asthma symptoms; emergency room visits, asthma; lung cancer; hospital admits (cardio-cerebro/peripheral vascular disease, Alzheimer's disease, Parkinson's disease); stroke; total hay fever/rhinitis; cardiac arrest, out of hospital; and emergency room visits, all cardiac. See Appendix E: EPA COBRA Output Tables.

[65] Appendix F: Average Annual Compliance Costs

[66] ISR Framework, p. 13, Attachment A

[67] Average compliance costs used for the ISR Framework were derived from: SCAQMD, Final Socioeconomic Impact Assessment for Proposed Rule 2305 – Warehouse Indirect Source Rule – Warehouse Actions and Investments To Reduce Emissions (WAIRE) Program and Proposed Rule 316 – Fees for Rule 2305, May 2021, p. ES-9, http://www.aqmd.gov/docs/default-source/Agendas/Governing-Board/2021/2021-May7-027.pdf?sfvrsn=10.

[68] California Health and Safety Code Section 40703

[69] For Scenarios 1 and 2, see Appendix G: Cost-Effectiveness Scenarios 1 & 2.

As listed in Table 11, preliminary cost-effectiveness estimates for a potential warehouse ISR in San Diego County currently range between $362 to $464/lb of NOx reduced in 2028. The cost-effectiveness values are estimated to increase to a range between $485 and $622/lb in 2032 as NOx emission reductions are anticipated to decrease each year due to increasing emission benefits from various CARB mobile source regulations.[70]

Table 11 – Compliance Costs and Cost-Effectiveness for Scenario 3 (Low-NOx, ZEV, Other)*

ISR Applicability Threshold (sq ft)	Warehouse Count	Total Floor Area (sq ft)	Total Cost (per year)	Average Cost Per Warehouse (per year)	2028 Cost-Effectiveness ($/lb)	2032 Cost-Effectiveness ($/lb)
100k and greater	243	45,719,544	$11,932,039	$49,103	$464	$622
50k and greater	657	74,121,426	$19,344,457	$29,444	$362	$485

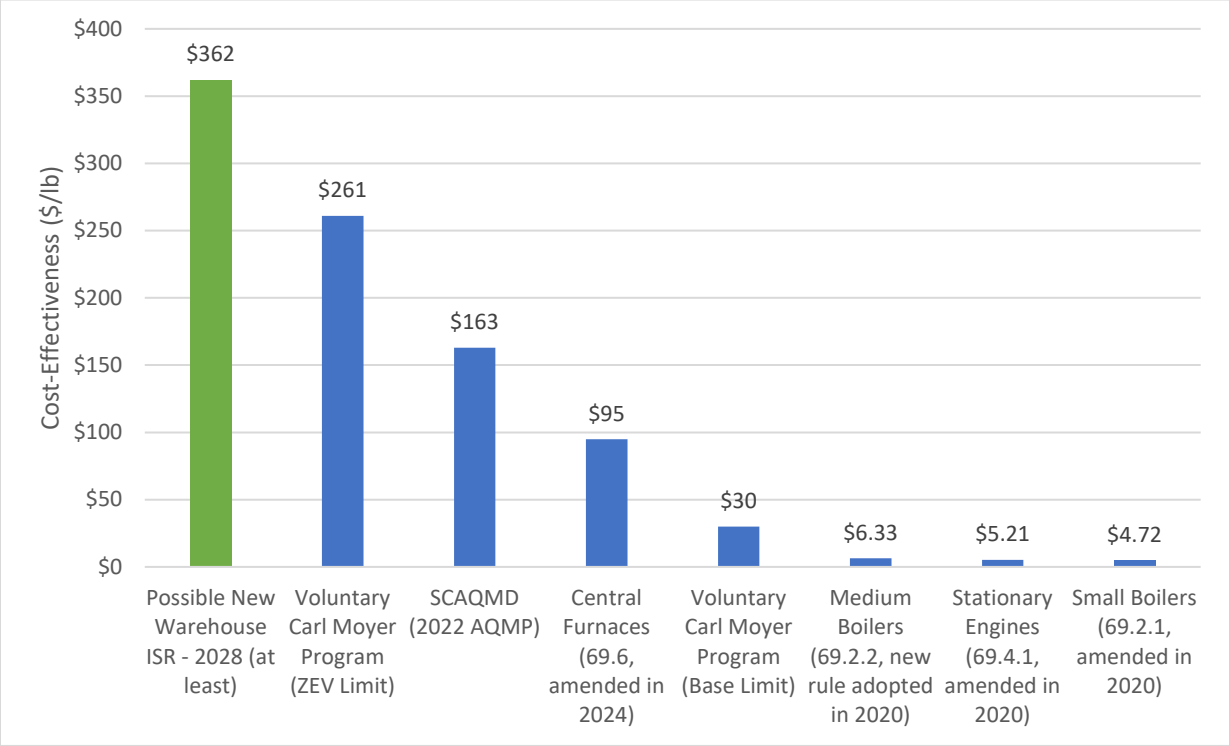
*Preliminary estimates subject to change.

Figure 10 below, which updates a similar graph in the ISR Framework, compares recent stationary source rulemaking cost-effectiveness figures in relation to the estimated cost-effectiveness of a possible ISR in San Diego County.[71] The estimated cost-effectiveness for a possible ISR exceeds the cost-effectiveness estimated for these recent rulemakings, as well as for incentive-based projects within the Carl Moyer program, which is generally recognized as some of the highest cost-effectiveness values for achieving emission reductions. In July 2020 when the District adopted NOx rules for small boilers (Rule 69.2.1), medium boilers (Rule 69.2.2), and stationary engines (Rule 69.4.1), all three rulemakings were estimated with cost-effectiveness values under $7 per pound of emissions reduced. Similar low cost-effectiveness values are also anticipated from previously identified measures found within the District's recently adopted 2022 Regional Air Quality Strategy (RAQS).

[70] The cost-effectiveness values for PM2.5 emissions reduced may be estimated with future rulemaking of a potential warehouse ISR. Staff anticipates those cost-effectiveness values to be considerably greater than the values presented for NOx due to the lesser estimated PM2.5 emission reductions.

[71] ISR Framework, Figure 5, p. 13, Attachment A

Figure 10 – Cost-Effectiveness Comparison to Recent Rulemakings and Incentive Programs



Notably, staff have also included SCAQMD's new health-based rule development cost-effectiveness threshold within the revised figure above, which equates to $325,000/ton of NOx reduced ($163/lb, rounded).[72] The SCAQMD uses this screening criteria to evaluate possible NOx emission reduction measures and determine the measures that are cost-effective to pursue rulemaking. The SCAQMD does note that their threshold is not an absolute method for determining to proceed with rule development action. In comparison, the cost-effectiveness of a possible new warehouse ISR in San Diego County, calculated at a minimum of $362/lb, is more than double the SCAQMD's new health-based threshold.[73]

2.6 DISTRICT COSTS FOR RULE DEVELOPMENT AND ADMINISTRATION

Staff preliminarily reviewed the potential feasibility of adopting a local ISR like the SCAQMD Rule 2305 regulating warehouses of 100,000 sq ft and larger (and fees to recover rule implementation and enforcement costs), considering technological, environmental, and economic factors.[74] The following are the updated estimates for District's rule development costs and future costs

[72] SCAQMD, 2022 Air Quality Management Plan, December 2, 2022, p. 4-76, https://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2022-air-quality-management-plan/final-2022-aqmp/final-2022-aqmp.pdf?sfvrsn=16

[73] The average cost-effectiveness for SCAQMD Rule 2305 was approximately $235/lb. District staff derived this value from SCAQMD, Rule 2305, Staff Report, Table 23, p. 77.

[74] ISR Framework, pp. 14-15, Attachment A

associated with the ongoing rule implementation, outreach, possible litigation defense, and enforcement activities. These preliminary updated cost estimates may be revised during any future rulemaking processes.

- Additional one-time costs of approximately $250,000 would be expected to be incurred to prepare a socioeconomic impact assessment and CEQA compliance documentation using technical consultants with expertise in those areas. *(No Change from ISR Framework)*
- Preliminary estimates indicate that the additional staff time for the various compliance and outreach activities will likely result in the need for at least two additional full-time staff positions at the District to administer a potential warehouse indirect source program if an ISR were to be developed to regulate warehouses of 100,000 sq ft and larger, and at least six additional full-time staff positions if an ISR were to be developed to regulate warehouses of 50,000 sq. ft. and larger, given the 3x increase in number of facilities that could potentially be regulated. Estimated salary and benefits for the additional six positions is estimated at up to $900,000 in ongoing costs. *(Change from ISR Framework)*
- Services and supply costs, primarily for information technology, as reporting by warehouses would likely be conducted through a new District web portal, are estimated to cost $200,000 to develop initially and $25,000 annually to maintain. (*No Change from ISR Framework)*
- District legal costs may also be incurred if an ISR were to be litigated. The District estimates up to 0.5 full-time equivalent (FTE) positions, estimated around $135,000 in one-time costs, may be required for legal assistance during litigation. Based on feedback received from the SCAQMD, outside legal counsel may also be necessary at a to-be-determined cost. *(Change from ISR Framework)*
- District may incur additional costs in relation to additional enforcement-related actions necessary to ensure facilities are complying. The District estimates up to 0.5 FTE positions, estimated around $75,000 in ongoing costs, may be required. While staff has accounted for general inspector-related work in preliminary fee estimates, such work may not fully account for unanticipated costs stemming from large-scale enforcement-related actions across hundreds of facilities. Such work would likely be focused on additional staffing/workload for Civil Action Investigators who would be tasked with overseeing any Notices of Violation (NOVs) that are issued. SCAQMD noted in a recent update that over 350 NOVs had been issued as of October 2024, which is approximately 10% of the total facilities (3,655 warehouses) potentially subject to Rule 2305 requirements.[75] A similar metric in San Diego County would anticipate between 20 to 60 NOVs being issued for enforcement-related action if a possible warehouse ISR were developed, depending on the threshold of square footage size ultimately used (100k sq ft or 50k sq ft).
- The District anticipates that to administer a warehouse indirect source rule like SCAQMD Rule 2305, three reports would be required of facilities subject to the San Diego rule. This includes:
    - One-time warehouse operations notification report (preliminarily estimated at approximately $100 per facility)*(No Change from ISR Framework),*
    - One-time initial site information report (preliminarily estimated at approximately $300 per facility)*(No Change from ISR Framework),* and
    - An annual compliance report (preliminarily estimated at approximately $600 per facility for each reporting year)*(No Change from ISR Framework)*.

[75] SCAQMD, 2nd Annual WAIRE Report, October 2024, pp. 6 and 28, https://www.aqmd.gov/docs/default-source/planning/fbmsm-docs/annual_report_waire_program_102024.pdf?sfvrsn=9

- Staff believes ongoing staff costs associated with the direct implementation of the program (e.g., costs associated with reviewing, evaluating, and enforcing standard rule provisions) could be recouped by District fees. However, costs associated with CEQA document development, socioeconomic impact assessment development, web portal development, internal/external legal counsel, and enhanced enforcement activities, may not be recouped through fees alone (though legal judgements and enforcement agreements could potentially recoup some costs incurred).

2.7 ADDITIONAL CONSIDERATIONS

2.7.1 Update on SCAQMD Warehouse Rule 2305

In May 2021, the SCAQMD adopted Rule 2305 (Warehouse Indirect Source Rule - Warehouse Actions and Investments to Reduce Emissions (WAIRE) Program), a first-of-its-kind air district rule to help reduce NOx and DPM emissions specifically from the freight sector in the Greater Los Angeles region. The SCAQMD also adopted companion Rule 316 (Fees for Rule 2305), establishing fees paid by the regulated warehouses to fund the air district's implementation and administration of Rule 2305.[76]

Any potential warehouse ISR for San Diego County would likely be modeled after SCAQMD Rule 2305 since currently it is the only rule in existence that regulates indirect source emissions from warehousing activities. In that rule, warehouse owners and operators are required to implement certain actions to reduce impacts from their operations. Since local districts cannot directly regulate trucks or truck trips, Rule 2305 offers a menu of options, such as installing solar panels or zero-emission charging infrastructure, providing neighboring residents with air filters, and paying a mitigation fee, in addition to reducing emissions from truck trips to their facilities. If a potential warehouse ISR for San Diego County were to be developed, it is critical for the ISR to include a menu of compliance options to be legally enforceable by the District.

Litigation

The California Trucking Association (CTA) filed a lawsuit in federal court in August 2021 seeking to invalidate SCAQMD's Rules 2305 and 316. Additional parties intervened in the lawsuit. Intervenors defending Rule 2305 included the State of California, CARB, East Yard Communities for Environmental Justice, the Peoples' Collective for Environmental Justice, the Sierra Club, the Natural Resources Defense Council, Communities for a Better Environment, and the Environmental Defense Fund. Airlines for America intervened on behalf of CTA. The lawsuit alleged that SCAQMD Rules are federally preempted, violate Proposition 26, and that SCAQMD does not have authority over existing warehouses, among other claims. On December 14, 2023, the court granted summary judgment to SCAQMD et al. and denied the plaintiffs' claims.[77] As of December 2024, no further appeals have been filed.

[76] See ISR Framework for more information about SCAQMD Rule 2305, pp. 8-10, Attachment A.
[77] https://www.uschamber.com/assets/documents/CTA-MSJ-Order.pdf

EPA's Approval of Rule 2305

On September 11, 2024, the U.S. Environmental Protection Agency (EPA) approved Rule 2305 as a SIP strengthening measure rather than a full approval. Though the EPA made clear that the rule was nonetheless still federally enforceable, full approval of the rule was not granted due to specific deficiencies identified by the EPA. These deficiencies included: two ambiguous definitions that cite California Code of Regulations that have not been approved in the State Implementation Plan (SIP); the rule's inclusion of a sunset clause, meaning if the rule were to sunset in the future, it had the potential to interfere with reasonable further progress or attainment of the National Ambient Air Quality Standards, and represented a potential inconsistency with the Clean Air Act; and, two instances in the rule of a concept known as "unbounded director's discretion," which potentially allows an air district to undermine enforceability of a SIP regulation.[78]

Due to these deficiencies, the EPA could not assign credit in the SIP for the emission reductions anticipated from Rule 2305 up and until the deficiencies are resolved; something SCAQMD may seek to rectify in future rule amendments. While Rule 2305 withstood a legal challenge in federal court, the court's decision does not preclude other lawsuits from being filed to challenge the EPA's approval of Rule 2305 into the SIP. As of December 2024, no further appeals or litigation have been filed.

WAIRE Program Implementation Update

On October 18, 2024, SCAQMD staff presented a summary of their "2nd Annual Report for the Warehouse Actions and Investments to Reduce Emissions (WAIRE) Program" at their Mobile Source Committee meeting.[79] The report provides an overview of the WAIRE Program's implementation from Rule 2305 adoption on May 7, 2021, through August 31, 2024. Below is an overview and key highlights from the presentation.[80]

Overview

- Rule 2305 is in 3rd year of implementation
- WAIRE Program is an innovative rule and is continuing to grow and evolve
- Overall, warehouses that have submitted reports in WAIRE Program are over-complying (earning more WAIRE points than required)
- WAIRE Program phase-in is continuing, and compliance is improving
- WAIRE Program is reducing emissions, and facilitating new actions and business models to support zero emissions technology

Key Highlights

- Almost 5,400 operators subject to Rule 2305
    - Industry is dynamic, and warehouse leases are commonly only a few years in duration
- Significant staff effort required for program implementation

[78] Federal Register, 89 FR 73568, https://www.govinfo.gov/content/pkg/FR-2024-09-11/pdf/2024-20349.pdf
[79] SCAQMD, Mobile Source Committee Meeting Agenda, October 18, 2024, presentation slides, pp. 88 – 99, http://www.aqmd.gov/docs/default-source/Agendas/Mobile-Source/msc-agenda-101824.pdf?sfvrsn=18
[80] https://www.youtube.com/live/VVxxaz2nozk?si=-jcuzLDS4MlyOd-W&t=1684

    - Reporting software
    - Data management
    - Report auditing
- Options selected in the Initial Site Information Reports (ISIR) indicate facilities planned to take advantage of flexibility in rule
    - Mitigation fees are rarely selected
- Warehouse operators in the WAIRE Program are finding it feasible to comply with the rule
- Most common options are ZE hostler usage and Near-Zero Emissions (NZE) truck visits
- ZEV trucks and infrastructure are growing because of Rule 2305.
- WAIRE Mitigation Fee Program
    - About 4% of all WAIRE Points earned
    - WAIRE Mitigation Program will reduce emissions in communities near warehouses that paid the fees
    - Solicitations and project awards subject to approval by Governing Board following public process
- Reporting Progress
    - Phase 1 facilities (≥250,000 sq ft)
        - 43% of 2022 Annual WAIRE Reports (AWR) submitted
        - 41% of 2023 AWRs submitted
    - Phase 2 facilities (≥150,000 - <250,000 sq ft)
        - 28% of 2023 AWRs submitted
    - This is a new program, and reporting rates are expected to continue improving as industry adapts
- Outreach Statistics Since Rule Adoption
    - 21,875+ compliance advisory mailers sent to warehouse facility owners and operators
    - 10,300+ calls and emails to WAIRE Program Hotline
    - 73,700+ visits to the WAIRE program website[81]
    - 7,700+ views of training videos (outside of webinars)
    - 140+ in-person and virtual webinar presentations
    - 83,800+ informational emails sent about WAIRE Program resources
    - 3,400+ warehouse operators visited in-person (as of October 9, 2024)
- Recent Compliance and Enforcement
    - In September 2023, Compliance Advisory sent out to over 5,000 addresses
    - Approximately 377 Notices of Violation (NOV) issued (failure to submit ISIR and/or AWR reports) in 4 waves
    - Next Steps
        - Continue enforcement efforts
        - Continue providing compliance assistance and resolution of NOVs
        - Evaluate whether additional resources are needed long-term for enforcement efforts
- Next Steps
    - Continue enforcement efforts (Phase 1 & 2 non-reporters)
    - Outreach to Phase 3 owners and operators
    - Continue to review/audit reported information (Phases 1 & 2)
    - Continue to update WAIRE POP reporting software
    - Make WAIRE Program data publicly available

[81] www.aqmd.gov/waire

2.7.2 CARB Mobile Source Regulations

The State of California has the regulatory authority to directly regulate the sources of pollution that make indirect sources an issue, including trucks, marine vessels, rail locomotives, and cargo handling equipment. Many of these state regulations were recently adopted to include zero-emission requirements that will begin soon. The District anticipates these CARB regulations (both existing and future) to continue to improve air quality throughout the region, and particularly in under-resourced communities, where indirect sources (such as warehouses) are a concern to community members. Three of these CARB regulations are discussed in more detail below.

Advanced Clean Trucks Regulation (ACT)

In June 2020, CARB adopted its Advanced Clean Trucks (ACT) Regulation to ensure expanding supplies of zero-emission trucks. Truck manufacturers must sell zero-emission vehicles as a growing percentage of sales in all vehicle classes starting in 2024. Ten additional states have adopted CARB's ACT regulation, and to date four other states are in the process of doing so.[82] These united efforts are expected to further expand the zero-emission supply chain, leading to increased economies of scale and lower costs. In 2023, the EPA granted a waiver of preemption for the ACT regulation allowing CARB to enforce the regulation.[83]

Advanced Clean Fleets Regulation (ACF)

In April 2023, CARB adopted the Advanced Clean Fleets (ACF) Regulation to require fleets that are well suited for electrification to transition to ZEVs where feasible. The regulation requires (1) 100% zero-emission drayage trucks, last mile delivery, and government fleets by 2035, (2) 100% zero-emission refuse trucks and local buses by 2040, and (3) 100% zero-emission capable utility fleets by 2040.

Because the ACF regulation requirements are more stringent than EPA requirements, a waiver from EPA is required for CARB to implement the ACF regulation. By letter dated November 15, 2023, CARB submitted a request that the EPA grant a waiver of preemption for the ACF on-road regulations and an authorization for the ACF off-road regulations, as elements of the regulation apply to off-road engines and equipment, specifically off-road yard tractors. The EPA conducted a public hearing on August 14, 2024, to receive comments concerning CARB's request.[84]

By letter dated January 13, 2025, CARB withdrew their request for a waiver from the EPA.[85] Due to the withdrawal, CARB does not have the authority to enforce the requirements of the ACF regulation for drayage truck operators, and federal and privately owned fleets. These fleet categories are thus no longer required to be transitioned to ZE vehicles. Consequently, the anticipated emission benefits that would have been achieved through implementation of the ACF regulation, including those from the turnover of truck fleets servicing warehousing operations, have not been accounted for in this analysis. CARB's plans to address the impacts from the waiver withdrawal are to be determined.

[82] https://www.electrictrucksnow.com/states#:~:text=States%20that%20have%20signed%20the%20100%25%20zero-emission%20truck,...%204%20NEW%20JERSEY%20...%205%20MASSACHUSETTS%20

[83] 88 FR 20688, https://www.govinfo.gov/content/pkg/FR-2023-04-06/pdf/2023-07184.pdf

[84] 89 FR 57151, https://www.govinfo.gov/content/pkg/FR-2024-07-12/pdf/2024-15343.pdf

[85] https://www.epa.gov/system/files/documents/2025-01/ca-acf-carb-withdrawal-ltr-2025-1-13.pdf

Zero-Emission Truck Measure

One example of a future CARB regulation is the Zero-Emission Truck measure outlined in the 2022 SIP, which aims to accelerate zero-emission adoption beyond existing measures (including ACF). CARB is evaluating a variety of options to achieve this commitment including, but not limited to, differentiated registration fees for higher emitting vehicles, increase vehicle turnover by requiring vehicles to be scrapped after reaching the end of their useful lives, introduction of differentiated fees that offset the battery electric and hydrogen fuel cell vehicle purchase price differential by collecting fees on higher emitting vehicles, and a potential statewide indirect source rule. Some of these options would require expanded authority for CARB (such as a request for a waiver from the EPA) or collaboration with air districts.[86]

2.7.3 Assembly Bill 98 (Carrillo and Reyes)

Assembly Bill 98 (AB 98) was passed by the California state legislature in late August 2024 and signed by Governor Newsom on September 29, 2024.[87] AB 98 will apply to new and expanded warehouses that are proposed for any floor size, though more requirements apply to proposed facilities over 250,000 sq ft in size.

In summary, AB 98 will: (1) prescribe statewide warehouse standards for new or expanded logistics use developments to minimize impacts on certain "sensitive receptors," as specified; (2) prohibit cities and counties from approving new or expanded logistics use developments unless they meet specified standards; (3) require cities and counties to update their circulation elements by January 1, 2028 to include specified truck routes, except that certain local agencies in the Inland Empire must comply with this requirement by January 1, 2026; and (4) provide for enforcement of circulation update requirements by the Attorney General.

As AB 98 is written to date, the bill will primarily affect new and expanded warehouse operations throughout the state. Existing warehouse operations may not be as impacted. Thus, there may still be opportunities to benefit from a rulemaking and/or incentive programs for the San Diego region.

2.7.4 District Study of Warehouse Facilities in the Portside Community

In response to stakeholder feedback, in December 2024 staff conducted an informal case study of warehouse buildings that are located within the general vicinity of a specific sensitive receptor in the Portside Community (Barrio Senior Villas).[88] In all, approximately 70 warehouse buildings located in the area were identified using the CoStar inventory and were further researched and reviewed by staff. This research was conducted to determine the number of facilities identified with the CoStar inventory that may be conducting goods movement-related activities and would potentially be subject to a possible warehouse ISR. Certain physical characteristics of a warehouse building (e.g., dock doors, grading, and room for trucks to park) were used to evaluate the potential for trucking activity occurring there. Staff used a combination of internet searches, Google Earth, and other available information to preliminarily assess the type of operations being

[86] CARB, Discussion Draft 2025 Mobile Source Strategy, October 11, 2024, https://ww2.arb.ca.gov/sites/default/files/2024-10/Discussion_Draft_2025_Mobile_Source_Strategy.pdf
[87] https://legiscan.com/CA/text/AB98/id/3020126
[88] 2322 Newton Ave, San Diego, 92113

conducted at the 70 sample facilities, in particular those with floor areas less than 50,000 sq ft. See Attachment F: District Sample Warehouse Study for the analysis.

Note that this case study is not intended to be considered an official determination of whether a listed facility may (or may not) be subject to a potential warehouse ISR if developed. Additional information from each facility subject to a potential warehouse ISR, including any required reports and details about the facility would be needed to make such a determination. The analysis consisted of staff's observations based on the tools utilized and is only intended to provide additional information about the different types of operations observed within the sample area.

For the 70 sample warehouse buildings researched, the following is a summary of staff's preliminary findings:

- Average size of the warehouse buildings in the area evaluated is 11,334 sq ft.
- The largest warehouse building is approximately 52,000 sq ft in size.
- 32 facilities (45%) have dock doors that are accessible either on-site or from the street, that would suggest a prototypical warehouse operation. Conversely, 38 facilities (55%) do not have such doors.
- 34 facilities (48%) have multiple tenants, suggesting the site may be used for multiple purposes other than warehousing/logistics.
- 45 facilities (64%) do not appear to be involved in goods movement activities, and would likely not be subject to a possible ISR.
    - These activities include but are not limited to:
        - Auto repair
        - Boat repair
        - Auto/Boat storage
        - Pool/Billiards hall
        - Educational facility
        - Storage for traffic control equipment
        - Metal repair shop
        - Bakery
        - Residential housing
        - Church
        - Youth and Community Center
        - Art gallery
        - Event space rental
        - Towing operation
        - Recycling operation
- 41 facilities (58%) have limited space such that a truck could not easily enter/park on-site.
- 43 facilities (61%) either had "no" or "unlikely" space to install EV infrastructure on-site.

From these findings, staff determined that for many of these smaller facilities, additional information would be needed to determine if they are truly conducting typical warehousing activities, and the level of trucking activity occurring at those locations. Many of these facilities have limited space to allow for parking a truck on-site, therefore limiting the option to install charging infrastructure at the facility. As a result, it is unclear whether these facilities would have reasonable and adequate compliance options to choose from in a possible warehouse ISR similar to SCAQMD Rule 2305. Both observations suggest that regulating warehouses smaller than 50,000 sq ft in size may be challenging both legally and practically.

Figure 11 shows the 70 warehouse building locations (in blue) assessed around the sensitive receptor selected in the sample area in the Portside Community. Figure 12 shows within the same sample area the warehouse building locations (in yellow) that staff identified as likely to be subject to a possible warehouse ISR due to their size and characteristics. The red dot on both maps indicates the location of the sensitive receptor assessed.

Figure 11 – Warehouse Building Locations Assessed

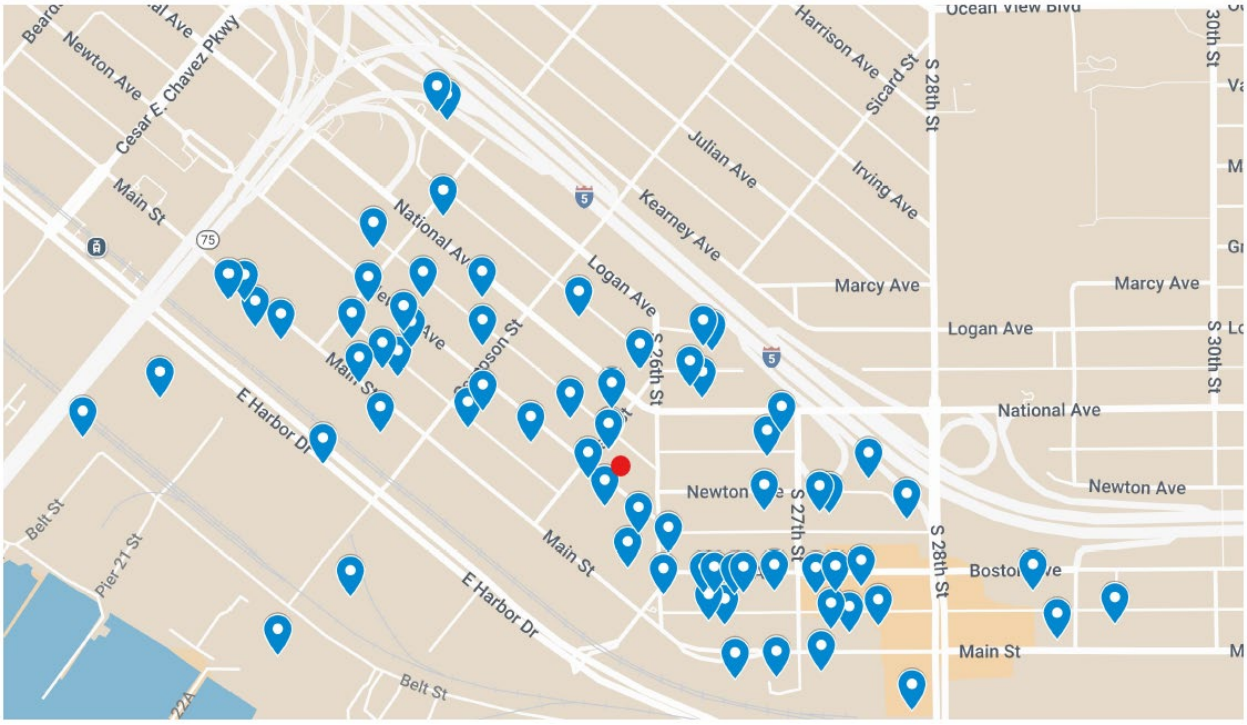
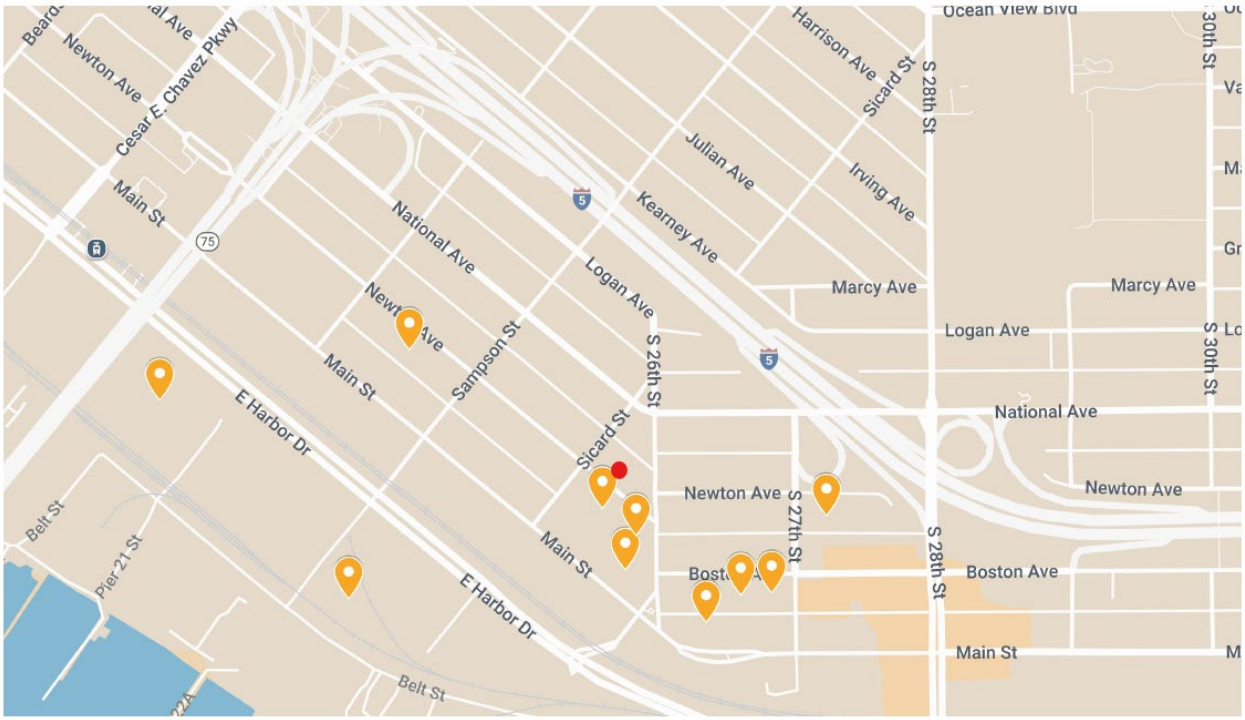


Figure 12 – Warehouse Building Locations Potentially Subject to a Possible ISR (if developed)



The assessment was based on several observations and/or factors including: tenant business name, facility appeared to be involved in goods movement activity, sufficient room for trucks to park, and single tenant occupancy. Based on staff's observational assessment of the area researched, approximately 14% (10 out of 70) of the CoStar warehouse inventory in the sample area may be conducting prototypical warehouse operations. This suggests that the possible ISR emission reductions presented in this Supplement are very likely to be best-case estimates.

2.8 STAFF'S CONCLUSIONS

At the June 2023 meeting, the Governing Board instructed staff to prioritize under-resourced communities and consider smaller warehouses and warehouses near sensitive receptors (e.g., residences, hospitals, schools, etc.). To respond to this direction, staff convened the WWG over the past year to discuss these aspects. Additionally, in response to Governing Board direction, staff developed a truck trip rate analysis using modeled transportation data specific to the San Diego region (Section 2.3). The estimated truck trip rates allowed for the calculation of potential baseline emissions and reductions, public health benefits (Section 2.4), and cost-effectiveness values (Section 2.5). These estimates were then used to help inform the District's evaluation of a potential warehouse ISR and the impacts for the AB 617 communities and countywide. In addition, the challenges of regulating warehouses near sensitive receptors and smaller warehouses were considered (EHC Comment Letter). Staff believes the Governing Board's consideration and acceptance of this Supplement, together with the initial ISR Framework and WWG meeting series,

will fulfill the requirement set forth by AB 423 to consider an ISR for warehouse and distribution centers.

In line with commitments made with the WWG, this Supplement will be released for public comment for 30 days. Following this public comment period, the District intends to present its findings to the Governing Board, including any feedback received from stakeholders during the public comment period.

APPENDIX A: DAILY TRUCK VOLUMES FOR EACH WAREHOUSE CLUSTER

Table A1 – Daily Truck Volumes by Warehouse Size for Each Cluster

Cluster	Average Warehouse Floor Area (sq ft)	Warehouse Count	Total Floor Area (sq ft)	Total Trucks Per Day	Average Warehouse Size (sq ft)
Oceanside and Vista	100k and Greater	8	851,664	1,459	106,458
	50k to <100k	21	1,397,812	863	66,562
	25k to <50k	78	2,474,187	4,234	31,720
	12.5k to <25k	236	4,083,326	8,552	17,302
	<12.5k	108	876,038	5,093	8,111
	Total	***451***	***9,683,027***	***20,200***	***21,470***
Carlsbad and Vista	100k and Greater	15	1,921,287	1,960	128,086
	50k to <100k	105	6,290,514	16,755	59,910
	25k to <50k	223	7,425,091	15,202	33,296
	12.5k to <25k	303	6,288,688	14,918	20,755
	<12.5k	2	23,122	255	11,561
	Total	***648***	***21,948,702***	***49,091***	***33,871***
San Marcos and Escondido	100k and Greater	0	0	0	N/A
	50k to <100k	2	149,815	612	74,908
	25k to <50k	72	2,472,125	5,999	34,335
	12.5k to <25k	268	4,495,538	10,615	16,774
	<12.5k	620	5,707,356	15,151	9,205
	Total	***962***	***12,824,834***	***32,377***	***13,331***
Poway	100k and Greater	6	835,301	1,020	139,217
	50k to <100k	47	3,279,200	4,221	69,770
	25k to <50k	54	2,223,727	2,270	41,180
	12.5k to <25k	94	1,642,595	2,797	17,474
	<12.5k	0	0	0	N/A
	Total	***201***	***7,980,823***	***10,308***	***39,706***
Sorrento Valley	100k and Greater	0	0	0	N/A
	50k to <100k	53	3,176,307	3,385	59,930
	25k to <50k	53	1,814,763	4,133	34,241
	12.5k to <25k	88	1,798,033	4,529	20,432
	<12.5k	13	142,170	882	10,936
	Total	***207***	***6,931,273***	***12,929***	***33,484***
Miramar	100k and Greater	0	0	0	N/A

Cluster	Average Warehouse Floor Area (sq ft)	Warehouse Count	Total Floor Area (sq ft)	Total Trucks Per Day	Average Warehouse Size (sq ft)
	50k to <100k	38	2,473,152	3,004	65,083
	25k to <50k	156	5,146,046	6,810	32,987
	12.5k to <25k	279	5,308,304	9,551	19,026
	<12.5k	187	2,070,425	2,447	11,072
	Total	***660***	***14,997,927***	***21,811***	***22,724***
Kearny Mesa	100k and Greater	3	557,994	969	185,998
	50k to <100k	23	1,685,677	1,671	73,290
	25k to <50k	91	2,986,107	5,617	32,814
	12.5k to <25k	276	5,086,723	8,605	18,430
	<12.5k	67	750,849	2,651	11,207
	Total	***460***	***11,067,350***	***19,512***	***24,059***
Santee and El Cajon	100k and Greater	0	0	0	N/A
	50k to <100k	2	143,150	394	71,575
	25k to <50k	165	5,190,970	5,459	31,460
	12.5k to <25k	200	3,735,069	5,537	18,675
	<12.5k	315	2,563,619	11,281	8,138
	Total	***682***	***11,632,808***	***22,670***	***17,057***
Portside Community	100k and Greater	6	692,315	1,039	115,386
	50k to <100k	11	612,648	1,187	55,695
	25k to <50k	43	1,526,138	3,701	35,492
	12.5k to <25k	110	1,869,459	3,143	16,995
	<12.5k	276	1,966,753	7,921	7,126
	Total	***446***	***6,667,313***	***16,990***	***14,949***
International Border Community	100k and Greater	36	5,910,420	2,469	164,178
	50k to <100k	101	6,836,830	5,077	67,691
	25k to <50k	55	2,074,592	1,844	37,720
	12.5k to <25k	106	1,923,577	2,712	18,147
	<12.5k	4	26,162	204	6,541
	Total	***302***	***16,771,581***	***12,306***	***55,535***

Below are a few highlights from the data listed in Table A1.

Cluster with the greatest:

- Number of warehouses (962): San Marcos and Escondido
- Total floor area (21,948,702 sq ft): Carlsbad and Vista
- Total trucks per day (49,091): Carlsbad and Vista
- Average warehouse floor size (55,535 sq ft): International Border Community

APPENDIX B: WAREHOUSE CLUSTER TRUCK TRIP RATES

Table B1 – Average Daily Truck Trip Rates for the Warehouse Clusters*

Cluster	Warehouse Floor Area (sq ft)	Class 2B to 5 Daily Truck Trip Rate (per 1,000 sq ft)	Class 6 to 7 Daily Truck Trip Rate (per 1,000 sq ft)	Class 8 Daily Truck Trip Rate (per 1,000 sq ft)
Oceanside and Vista	100k and greater	0.13	0.04	0.19
	50k to <100k	0.05	0.01	0.07
	25k to <50k	0.13	0.04	0.19
	12.5k to <25k	0.15	0.05	0.24
	<12.5k	0.43	0.13	0.66
	Cluster average (all sizes)	**0.15**	**0.05**	**0.24**
Carlsbad and Vista	100k and greater	0.08	0.02	0.12
	50k to <100k	0.20	0.06	0.30
	25k to <50k	0.15	0.05	0.23
	12.5k to <25k	0.17	0.05	0.27
	<12.5k	0.81	0.25	1.24
	Cluster average (all sizes)	**0.16**	**0.05**	**0.25**
San Marcos and Escondido	100k and greater	N/A	N/A	N/A
	50k to <100k	0.30	0.09	0.46
	25k to <50k	0.18	0.05	0.27
	12.5k to <25k	0.17	0.05	0.27
	<12.5k	0.20	0.06	0.30
	Cluster average (all sizes)	**0.19**	**0.06**	**0.29**
Poway	100k and greater	0.09	0.03	0.14
	50k to <100k	0.09	0.03	0.15
	25k to <50k	0.08	0.02	0.12

Cluster	Warehouse Floor Area (sq ft)	Class 2B to 5 Daily Truck Trip Rate (per 1,000 sq ft)	Class 6 to 7 Daily Truck Trip Rate (per 1,000 sq ft)	Class 8 Daily Truck Trip Rate (per 1,000 sq ft)
	12.5k to <25k	0.13	0.04	0.19
	<12.5k	N/A	N/A	N/A
	Cluster average (all sizes)	**0.10**	**0.03**	**0.15**
Sorrento Valley	100k and greater	N/A	N/A	N/A
	50k to <100k	0.08	0.02	0.12
	25k to <50k	0.17	0.05	0.26
	12.5k to <25k	0.19	0.06	0.28
	<12.5k	0.46	0.14	0.70
	Cluster average (all sizes)	**0.14**	**0.04**	**0.21**
Miramar	100k and greater	N/A	N/A	N/A
	50k to <100k	0.09	0.03	0.14
	25k to <50k	0.10	0.03	0.15
	12.5k to <25k	0.13	0.04	0.20
	<12.5k	0.09	0.03	0.13
	Cluster average (all sizes)	**0.11**	**0.03**	**0.16**
Kearny Mesa	100k and greater	0.13	0.04	0.20
	50k to <100k	0.07	0.02	0.11
	25k to <50k	0.14	0.04	0.21
	12.5k to <25k	0.12	0.04	0.19
	<12.5k	0.26	0.08	0.40
	Cluster average (all sizes)	**0.13**	**0.04**	**0.20**
Santee and El Cajon	100k and greater	N/A	N/A	N/A
	50k to <100k	0.20	0.06	0.31

Cluster	Warehouse Floor Area (sq ft)	Class 2B to 5 Daily Truck Trip Rate (per 1,000 sq ft)	Class 6 to 7 Daily Truck Trip Rate (per 1,000 sq ft)	Class 8 Daily Truck Trip Rate (per 1,000 sq ft)
	25k to <50k	0.08	0.02	0.12
	12.5k to <25k	0.11	0.03	0.17
	<12.5k	0.32	0.10	0.50
	Cluster average (all sizes)	**0.14**	**0.04**	**0.22**
Portside Community	100k and greater	0.11	0.03	0.17
	50k to <100k	0.14	0.04	0.22
	25k to <50k	0.18	0.05	0.27
	12.5k to <25k	0.12	0.04	0.19
	<12.5k	0.30	0.09	0.46
	Cluster average (all sizes)	**0.19**	**0.06**	**0.29**
International Border Community	100k and greater	0.03	0.01	0.05
	50k to <100k	0.05	0.02	0.08
	25k to <50k	0.07	0.02	0.10
	12.5k to <25k	0.10	0.03	0.16
	<12.5k	0.57	0.17	0.88
	Cluster average (all sizes)	**0.05**	**0.02**	**0.08**

*Preliminary estimates subject to change.

APPENDIX C: OTHER REFERENCED TRUCK TRIP RATES

The following are truck trip rates referenced from other sources to provide a comparison to the results from the truck trip analysis described in this Supplement.

In 2013, SCAQMD conducted a survey of about 400 warehouse operators in their region. A total of 63 operators responded, which is a response rate of about 16%. Table C1 lists the minimum, maximum, and average rates reported in the survey.[89] The overall trip rate is for trips from all vehicles (including cars), and truck trip rate is for trucks only. The reported truck trip rates range from 0.05 to 1.76 trucks trips per 1,000 sq ft., with an average rate of 0.53.

Table C1 - SCAQMD Business Survey

Statistical Measure	Overall Trip Rate (daily trips per 1,000 sq ft)	Truck Trip Rate (daily trips per 1,000 sq ft)
Minimum	0.33	0.05
Maximum	3.41	1.76
Average	1.22	0.53

The truck trip rates shown in Table C2 are from a study prepared by the Institute of Transportation Engineers (ITE) in 2016 in support of SCAQMD's development of their warehouse Rule 2305.[90] The estimated rates for trucks and 5 or more axle trucks are for 3 warehouse categories: transload and short-term storage, cold storage, and fulfillment center. These rates range from 0.233 to 0.836 trucks per 1,000 sq ft.

Table C2 - ITE Warehouse Study

Category	Trucks Daily Trips Per 1,000 sq ft	5+ Axle Trucks Daily Trips Per 1,000 sq ft
Transload & Short-Term Storage	0.454	0.233
Cold Storage	0.836	0.749
Fulfillment Center	0.717	0.242

[89] SCAQMD High Cube Warehouse Truck Trip Study, White Paper Summary of Business Survey Results, June 2014, Table 10, p. 10, https://www.aqmd.gov/docs/default-source/ceqa/handbook/high-cube-warehouse-trip-rate-study-for-air-quality-analysis/business-survey-summary.pdf?sfvrsn=2

[90] Institute of Transportation Engineers, High-Cube Warehouse Vehicle Trip Generation Analysis, October 2016, Table 5, p. 13, https://www.aqmd.gov/docs/default-source/ceqa/handbook/high-cube-warehouse-trip-rate-study-for-air-quality-analysis/ite_highcubewarehousestudy_10-2016.pdf

Table C3 lists the truck trip rates from ITE's "Trip Generation Manual, 10th Edition."[91] Except for the rate for High-Cube Fulfillment Center Warehouse at 1.37, the other truck rip rates listed on this table range from 0.10 to 0.64.

Table C3 - ITE Trip Rates

Category	Daily Truck Trips Per 1,000 sq ft
Warehousing	0.19
Mini-Warehouse	0.17
High-Cube Transload & Short-Term Storage Warehouse	0.10
High-Cube Fulfillment Center Warehouse	1.37
High-Cube Parcel Hub Warehouse	0.64
High-Cube Cold Storage Warehouse	0.12

[91] ITE, Trip Generation Manual, 10th Edition, p. 1, https://www.troutdaleoregon.gov/media/14881

APPENDIX D: EMFAC2021 OFF-MODEL SCALING FACTORS

The EMFAC2021 off-model scaling factors for San Diego County were provided to the District from CARB staff via email on October 15, 2024.

List of Abbreviations

CMS	Clean Miles Standard Program
ACCII	Advanced Clean Cars II
HDIM	Clean Truck Check, also known as Heavy-Duty Inspection and Maintenance
CTP	Federal Clean Trucks Plan
ACF	Advanced Clean Fleets Regulation[92]

Table D1 - EMFAC2021 Scaling Factors, SD County, NOx, Calendar Year 2028

Calendar Year	Vehicle Category	fuel_type	Pollutant_Process_x	CMS CR	ACCII CR	HDIM CR	CTP CR	ACF CR
2028	LHD1	Gasoline	NOx_TOTEX	1	1	1	1	1
2028	LHD1	Diesel	NOx_TOTEX	1	1	1	1	1
2028	LHD2	Gasoline	NOx_TOTEX	1	1	1	1	1
2028	LHD2	Diesel	NOx_TOTEX	1	1	1	1	1
2028	T6 CAIRP Class 4	Diesel	NOx_TOTEX	1	1	0.622605074	0.997238308	1
2028	T6 CAIRP Class 5	Diesel	NOx_TOTEX	1	1	0.617841209	0.997411732	1
2028	T6 Instate Delivery Class 4	Diesel	NOx_TOTEX	1	1	0.72606175	0.998458492	1
2028	T6 Instate Delivery Class 5	Diesel	NOx_TOTEX	1	1	0.644336061	0.997986567	1
2028	T6 Instate Other Class 4	Diesel	NOx_TOTEX	1	1	0.743335078	0.998340821	1
2028	T6 Instate Other Class 5	Diesel	NOx_TOTEX	1	1	0.628087707	0.997680306	1
2028	T6 OOS Class 4	Diesel	NOx_TOTEX	1	1	0.682847326	0.97767121	1
2028	T6 OOS Class 5	Diesel	NOx_TOTEX	1	1	0.64973267	0.976397879	1
2028	T6 CAIRP Class 6	Diesel	NOx_TOTEX	1	1	0.596974128	0.995849249	1
2028	T6 CAIRP Class 7	Diesel	NOx_TOTEX	1	1	0.643303458	0.99595826	1
2028	T6 Instate Delivery Class 6	Diesel	NOx_TOTEX	1	1	0.686750406	0.998120036	1

[92] The scaling factors for CARB's Advanced Clean Fleets (ACF) regulation were adjusted to 1.0 (i.e., no emission benefits) due to CARB's withdrawal for a waiver from the EPA.

Calendar Year	Vehicle Category	fuel_type	Pollutant_Process_x	CMS CR	ACCII CR	HDIM CR	CTP CR	ACF CR
2028	T6 Instate Delivery Class 7	Diesel	NOx_TOTEX	1	1	0.696680653	0.998811855	1
2028	T6 Instate Other Class 6	Diesel	NOx_TOTEX	1	1	0.669584025	0.998016241	1
2028	T6 Instate Other Class 7	Diesel	NOx_TOTEX	1	1	0.751711506	0.998063576	1
2028	T6 Instate Tractor Class 6	Diesel	NOx_TOTEX	1	1	0.776032804	0.997941183	1
2028	T6 Instate Tractor Class 7	Diesel	NOx_TOTEX	1	1	0.80541071	0.998304335	1
2028	T6 OOS Class 6	Diesel	NOx_TOTEX	1	1	0.649345504	0.96570784	1
2028	T6 OOS Class 7	Diesel	NOx_TOTEX	1	1	0.670213188	0.973778457	1
2028	T7 CAIRP Class 8	Diesel	NOx_TOTEX	1	1	0.382405534	0.991739631	1
2028	T7 NNOOS Class 8	Diesel	NOx_TOTEX	1	1	0.419031825	0.946174123	1
2028	T7 NOOS Class 8	Diesel	NOx_TOTEX	1	1	0.407611127	0.939388268	1
2028	T7 Tractor Class 8	Diesel	NOx_TOTEX	1	1	0.489344964	0.997537998	1

Table D2 - EMFAC2021 Scaling Factors, SD County, PM2.5, Calendar Year 2028

Calendar Year	Vehicle Category	fuel_type	Pollutant_Process_x	CMS CR	ACCII CR	HDIM CR	CTP CR	ACF CR
2028	LHD1	Gasoline	PM2.5_TOTEX	1	1	1	1	1
2028	LHD1	Diesel	PM2.5_TOTEX	1	1	1	1	1
2028	LHD2	Gasoline	PM2.5_TOTEX	1	1	1	1	1
2028	LHD2	Diesel	PM2.5_TOTEX	1	1	1	1	1
2028	T6 CAIRP Class 4	Diesel	PM2.5_TOTEX	1	1	0.784827929	0.999921719	1
2028	T6 CAIRP Class 5	Diesel	PM2.5_TOTEX	1	1	0.800631512	0.999890028	1
2028	T6 Instate Delivery Class 4	Diesel	PM2.5_TOTEX	1	1	0.617705423	1	1
2028	T6 Instate Delivery Class 5	Diesel	PM2.5_TOTEX	1	1	0.64096161	0.999861375	1
2028	T6 Instate Other Class 4	Diesel	PM2.5_TOTEX	1	1	0.634557396	0.999956931	1
2028	T6 Instate Other Class 5	Diesel	PM2.5_TOTEX	1	1	0.714905857	0.999914987	1
2028	T6 OOS Class 4	Diesel	PM2.5_TOTEX	1	1	0.758272225	0.999048098	1
2028	T6 OOS Class 5	Diesel	PM2.5_TOTEX	1	1	0.801924807	0.998766153	1
2028	T6 CAIRP Class 6	Diesel	PM2.5_TOTEX	1	1	0.819349587	0.999781623	1
2028	T6 CAIRP Class 7	Diesel	PM2.5_TOTEX	1	1	0.776197888	0.999679631	1
2028	T6 Instate Delivery Class 6	Diesel	PM2.5_TOTEX	1	1	0.631513808	0.999963531	1
2028	T6 Instate Delivery Class 7	Diesel	PM2.5_TOTEX	1	1	0.651763924	0.999955514	1
2028	T6 Instate Other Class 6	Diesel	PM2.5_TOTEX	1	1	0.669111797	0.99996989	1
2028	T6 Instate Other Class 7	Diesel	PM2.5_TOTEX	1	1	0.643276858	0.999904641	1
2028	T6 Instate Tractor Class 6	Diesel	PM2.5_TOTEX	1	1	0.628396949	0.999942915	1
2028	T6 Instate Tractor Class 7	Diesel	PM2.5_TOTEX	1	1	0.626685794	1	1
2028	T6 OOS Class 6	Diesel	PM2.5_TOTEX	1	1	0.800668587	0.999065526	1
2028	T6 OOS Class 7	Diesel	PM2.5_TOTEX	1	1	0.781524314	0.998441511	1

Calendar Year	Vehicle Category	fuel_type	Pollutant_Process_x	CMS CR	ACCII CR	HDIM CR	CTP CR	ACF CR
2028	T7 CAIRP Class 8	Diesel	PM2.5_TOTEX	1	1	0.517120069	0.99992398	1
2028	T7 NNOOS Class 8	Diesel	PM2.5_TOTEX	1	1	0.540201337	0.999328287	1
2028	T7 NOOS Class 8	Diesel	PM2.5_TOTEX	1	1	0.518182257	0.999291103	1
2028	T7 Tractor Class 8	Diesel	PM2.5_TOTEX	1	1	0.573669456	0.999981856	1

Table D3 - EMFAC2021 Scaling Factors, SD County, NOx, Calendar Year 2032

Calendar Year	Vehicle Category	fuel_type	Pollutant_Process_x	CMS CR	ACCII CR	HDIM CR	CTP CR	ACF CR
2032	LHD1	Gasoline	NOx_TOTEX	1	1	1	1	1
2032	LHD1	Diesel	NOx_TOTEX	1	1	1	1	1
2032	LHD2	Gasoline	NOx_TOTEX	1	1	1	1	1
2032	LHD2	Diesel	NOx_TOTEX	1	1	1	1	1
2032	T6 CAIRP Class 4	Diesel	NOx_TOTEX	1	1	0.539860577	0.960806427	1
2032	T6 CAIRP Class 5	Diesel	NOx_TOTEX	1	1	0.540597448	0.963419545	1
2032	T6 Instate Delivery Class 4	Diesel	NOx_TOTEX	1	1	0.62609491	0.979237501	1
2032	T6 Instate Delivery Class 5	Diesel	NOx_TOTEX	1	1	0.558710922	0.975311808	1
2032	T6 Instate Other Class 4	Diesel	NOx_TOTEX	1	1	0.631284726	0.976582087	1
2032	T6 Instate Other Class 5	Diesel	NOx_TOTEX	1	1	0.542868681	0.970984168	1
2032	T6 OOS Class 4	Diesel	NOx_TOTEX	1	1	0.613130909	0.847769686	1
2032	T6 OOS Class 5	Diesel	NOx_TOTEX	1	1	0.586894461	0.839304851	1
2032	T6 CAIRP Class 6	Diesel	NOx_TOTEX	1	1	0.516424662	0.949855215	1
2032	T6 CAIRP Class 7	Diesel	NOx_TOTEX	1	1	0.551117869	0.948801237	1
2032	T6 Instate Delivery Class 6	Diesel	NOx_TOTEX	1	1	0.59508444	0.97666703	1
2032	T6 Instate Delivery Class 7	Diesel	NOx_TOTEX	1	1	0.648135759	0.989681916	1
2032	T6 Instate Other Class 6	Diesel	NOx_TOTEX	1	1	0.569868504	0.973754649	1
2032	T6 Instate Other Class 7	Diesel	NOx_TOTEX	1	1	0.690150902	0.983581724	1
2032	T6 Instate Tractor Class 6	Diesel	NOx_TOTEX	1	1	0.676820702	0.9747113	1
2032	T6 Instate Tractor Class 7	Diesel	NOx_TOTEX	1	1	0.762989636	0.987384225	1
2032	T6 OOS Class 6	Diesel	NOx_TOTEX	1	1	0.583049982	0.808613328	1
2032	T6 OOS Class 7	Diesel	NOx_TOTEX	1	1	0.579835254	0.853477865	1

Calendar Year	Vehicle Category	fuel_type	Pollutant_Process_x	CMS CR	ACCII CR	HDIM CR	CTP CR	ACF CR
2032	T7 CAIRP Class 8	Diesel	NOx_TOTEX	1	1	0.341700604	0.935980161	1
2032	T7 NNOOS Class 8	Diesel	NOx_TOTEX	1	1	0.390620447	0.769604729	1
2032	T7 NOOS Class 8	Diesel	NOx_TOTEX	1	1	0.375674202	0.801041585	1
2032	T7 Tractor Class 8	Diesel	NOx_TOTEX	1	1	0.412475791	0.970595135	1

Table D4 - EMFAC2021 Scaling Factors, SD County, PM2.5, Calendar Year 2032

Calendar Year	Vehicle Category	fuel_type	Pollutant_Process_x	CMS CR	ACCII CR	HDIM CR	CTP CR	ACF CR
2032	LHD1	Gasoline	PM2.5_TOTEX	1	1	1	1	1
2032	LHD1	Diesel	PM2.5_TOTEX	1	1	1	1	1
2032	LHD2	Gasoline	PM2.5_TOTEX	1	1	1	1	1
2032	LHD2	Diesel	PM2.5_TOTEX	1	1	1	1	1
2032	T6 CAIRP Class 4	Diesel	PM2.5_TOTEX	1	1	0.797055513	0.997340062	1
2032	T6 CAIRP Class 5	Diesel	PM2.5_TOTEX	1	1	0.799418848	0.998066635	1
2032	T6 Instate Delivery Class 4	Diesel	PM2.5_TOTEX	1	1	0.641410907	0.998909981	1
2032	T6 Instate Delivery Class 5	Diesel	PM2.5_TOTEX	1	1	0.671629302	0.998574504	1
2032	T6 Instate Other Class 4	Diesel	PM2.5_TOTEX	1	1	0.668975306	0.998996463	1
2032	T6 Instate Other Class 5	Diesel	PM2.5_TOTEX	1	1	0.743538002	0.998325213	1
2032	T6 OOS Class 4	Diesel	PM2.5_TOTEX	1	1	0.789484865	0.987675902	1
2032	T6 OOS Class 5	Diesel	PM2.5_TOTEX	1	1	0.813380509	0.986058392	1
2032	T6 CAIRP Class 6	Diesel	PM2.5_TOTEX	1	1	0.814895867	0.997656526	1
2032	T6 CAIRP Class 7	Diesel	PM2.5_TOTEX	1	1	0.775940388	0.995669708	1
2032	T6 Instate Delivery Class 6	Diesel	PM2.5_TOTEX	1	1	0.660933104	0.999014574	1
2032	T6 Instate Delivery Class 7	Diesel	PM2.5_TOTEX	1	1	0.639475323	0.998851023	1
2032	T6 Instate Other Class 6	Diesel	PM2.5_TOTEX	1	1	0.71014897	0.998825849	1
2032	T6 Instate Other Class 7	Diesel	PM2.5_TOTEX	1	1	0.645847491	0.997865884	1
2032	T6 Instate Tractor Class 6	Diesel	PM2.5_TOTEX	1	1	0.655771137	0.998054314	1
2032	T6 Instate Tractor Class 7	Diesel	PM2.5_TOTEX	1	1	0.624186604	0.998684722	1
2032	T6 OOS Class 6	Diesel	PM2.5_TOTEX	1	1	0.813209638	0.988725073	1
2032	T6 OOS Class 7	Diesel	PM2.5_TOTEX	1	1	0.789917843	0.986344264	1

Calendar Year	Vehicle Category	fuel_type	Pollutant_Process_x	CMS CR	ACCII CR	HDIM CR	CTP CR	ACF CR
2032	T7 CAIRP Class 8	Diesel	PM2.5_TOTEX	1	1	0.503835842	0.998694815	1
2032	T7 NNOOS Class 8	Diesel	PM2.5_TOTEX	1	1	0.536777104	0.994080544	1
2032	T7 NOOS Class 8	Diesel	PM2.5_TOTEX	1	1	0.512868429	0.995392112	1
2032	T7 Tractor Class 8	Diesel	PM2.5_TOTEX	1	1	0.558710836	0.999465527	1

APPENDIX E: EPA COBRA OUTPUT TABLES

Table E1 – 2028, Scenario 3, 100k sq ft Threshold

Total Health Benefits		
	$410,984	$514,534
	Low Value	High Value
	Change in Incidence	Monetary Value
Total Mortality	**0.024 / 0.031**	**$352,237 / $455,787**
Mortality, All Cause (PM)	0.006 / 0.013	$90,300 / $193,850
Mortality, O3 Short-term Exposure (O3)	0.001	$11,250
Mortality, O3 Long-term Exposure (O3)	0.017	$250,687
Nonfatal Heart Attacks (PM)	**0.004**	**$346**
Infant Mortality (PM)	**0.000**	**$717**
Total Hospital Admits, All Respiratory	**0.003**	**$61**
Hospital Admits, All Respiratory (PM)	0.001	$18
Hospital Admits, All Respiratory (O3)	0.002	$42
Total Emergency Room Visits, Respiratory	**0.046**	**$75**
Emergency Room Visits, Respiratory (PM)	0.004	$6
Emergency Room Visits, Respiratory (O3)	0.043	$70
Total Asthma Onset	**0.203**	**$15,459**
Asthma Onset (PM)	0.020	$1,554
Asthma Onset (O3)	0.182	$13,905
Total Asthma Symptoms	**31.008**	**$10,535**
Asthma Symptoms, Albuterol Use (PM)	3.707	$2
Asthma Symptoms, Chest Tightness (O3)	7.522	$2,902
Asthma Symptoms, Cough (O3)	8.873	$3,423
Asthma Symptoms, Shortness of Breath (O3)	3.796	$1,464
Asthma Symptoms, Wheeze (O3)	7.111	$2,743
Emergency Room Visits, Asthma (O3)	**0.000**	**$0**
Lung Cancer (PM)	**0.001**	**$23**
Hospital Admits, Cardio-Cerebro/Peripheral Vascular Disease (PM)	**0.001**	**$29**
Hospital Admits, Alzheimers Disease (PM)	**0.003**	**$75**
Hospital Admits, Parkinsons Disease (PM)	**0.000**	**$9**
Stroke (PM)	**0.000**	**$27**
Total Hay Fever/Rhinitis	**1.284**	**$1,431**
Hay Fever/Rhinitis (PM)	0.128	$143
Hay Fever/Rhinitis (O3)	1.156	$1,288
Cardiac Arrest, Out of Hospital (PM)	**0.000**	**$7**
Emergency Room Visits, All Cardiac (PM)	**0.002**	**$4**
Minor Restricted Activity Days (PM)	**6.336**	**$797**
School Loss Days (O3)	**16.965**	**$28,811**
Work Loss Days (PM)	**1.081**	**$342**
Total PM Health Effects	**11.295 / 11.302**	**$94,398 / $197,948**
Total O3 Health Effects	**45.667**	**$316,585**

Table E2 – 2028, Scenario 3, 50k sq ft Threshold

Total Health Benefits		
	$854,940	$1,068,368
	Low Value	High Value
	Change in Incidence	Monetary Value
Total Mortality	**0.050 / 0.065**	**$732,500 / $945,928**
Mortality, All Cause (PM)	0.013 / 0.027	$186,119 / $399,547
Mortality, O3 Short-term Exposure (O3)	0.002	$23,466
Mortality, O3 Long-term Exposure (O3)	0.036	$522,915
Nonfatal Heart Attacks (PM)	**0.008**	**$712**
Infant Mortality (PM)	**0.000**	**$1,478**
Total Hospital Admits, All Respiratory	**0.006**	**$126**
Hospital Admits, All Respiratory (PM)	0.001	$38
Hospital Admits, All Respiratory (O3)	0.005	$89
Total Emergency Room Visits, Respiratory	**0.097**	**$157**
Emergency Room Visits, Respiratory (PM)	0.007	$12
Emergency Room Visits, Respiratory (O3)	0.089	$145
Total Asthma Onset	**0.422**	**$32,207**
Asthma Onset (PM)	0.042	$3,203
Asthma Onset (O3)	0.380	$29,004
Total Asthma Symptoms	**64.589**	**$21,975**
Asthma Symptoms, Albuterol Use (PM)	7.641	$5
Asthma Symptoms, Chest Tightness (O3)	15.690	$6,053
Asthma Symptoms, Cough (O3)	18.508	$7,140
Asthma Symptoms, Shortness of Breath (O3)	7.918	$3,055
Asthma Symptoms, Wheeze (O3)	14.833	$5,723
Emergency Room Visits, Asthma (O3)	**0.001**	**$0**
Lung Cancer (PM)	**0.001**	**$47**
Hospital Admits, Cardio-Cerebro/Peripheral Vascular Disease (PM)	**0.002**	**$61**
Hospital Admits, Alzheimers Disease (PM)	**0.007**	**$154**
Hospital Admits, Parkinsons Disease (PM)	**0.001**	**$18**
Stroke (PM)	**0.001**	**$56**
Total Hay Fever/Rhinitis	**2.676**	**$2,981**
Hay Fever/Rhinitis (PM)	0.264	$295
Hay Fever/Rhinitis (O3)	2.411	$2,687
Cardiac Arrest, Out of Hospital (PM)	**0.000**	**$14**
Emergency Room Visits, All Cardiac (PM)	**0.004**	**$8**
Minor Restricted Activity Days (PM)	**13.058**	**$1,642**
School Loss Days (O3)	**35.387**	**$60,098**
Work Loss Days (PM)	**2.229**	**$705**
Total PM Health Effects	**23.280 / 23.295**	**$194,566 / $407,994**
Total O3 Health Effects	**95.259**	**$660,374**

Table E3 – 2032, Scenario 3, 100k sq ft Threshold

Total Health Benefits		
	$312,957	$395,797
	Low Value	High Value
	Change in Incidence	Monetary Value
Total Mortality	**0.018 / 0.024**	**$268,692 / $351,532**
Mortality, All Cause (PM)	0.005 / 0.011	$72,240 / $155,079
Mortality, O3 Short-term Exposure (O3)	0.001	$8,437
Mortality, O3 Long-term Exposure (O3)	0.013	$188,015
Nonfatal Heart Attacks (PM)	**0.003**	**$277**
Infant Mortality (PM)	**0.000**	**$574**
Total Hospital Admits, All Respiratory	**0.002**	**$46**
Hospital Admits, All Respiratory (PM)	0.001	$15
Hospital Admits, All Respiratory (O3)	0.002	$32
Total Emergency Room Visits, Respiratory	**0.035**	**$57**
Emergency Room Visits, Respiratory (PM)	0.003	$5
Emergency Room Visits, Respiratory (O3)	0.032	$52
Total Asthma Onset	**0.153**	**$11,672**
Asthma Onset (PM)	0.016	$1,243
Asthma Onset (O3)	0.137	$10,428
Total Asthma Symptoms	**23.442**	**$7,901**
Asthma Symptoms, Albuterol Use (PM)	2.966	$2
Asthma Symptoms, Chest Tightness (O3)	5.641	$2,176
Asthma Symptoms, Cough (O3)	6.654	$2,567
Asthma Symptoms, Shortness of Breath (O3)	2.847	$1,098
Asthma Symptoms, Wheeze (O3)	5.333	$2,058
Emergency Room Visits, Asthma (O3)	**0.000**	**$0**
Lung Cancer (PM)	**0.000**	**$18**
Hospital Admits, Cardio-Cerebro/Peripheral Vascular Disease (PM)	**0.001**	**$24**
Hospital Admits, Alzheimers Disease (PM)	**0.003**	**$60**
Hospital Admits, Parkinsons Disease (PM)	**0.000**	**$7**
Stroke (PM)	**0.000**	**$22**
Total Hay Fever/Rhinitis	**0.970**	**$1,080**
Hay Fever/Rhinitis (PM)	0.103	$114
Hay Fever/Rhinitis (O3)	0.867	$966
Cardiac Arrest, Out of Hospital (PM)	**0.000**	**$5**
Emergency Room Visits, All Cardiac (PM)	**0.001**	**$3**
Minor Restricted Activity Days (PM)	**5.068**	**$637**
School Loss Days (O3)	**12.723**	**$21,608**
Work Loss Days (PM)	**0.865**	**$274**
Total PM Health Effects	**9.036 / 9.042**	**$75,518 / $158,357**
Total O3 Health Effects	**34.251**	**$237,439**

Table E4 – 2032, Scenario 3, 50k sq ft Threshold

Total Health Benefits		
	$646,898	$816,603
	Low Value	High Value
	Change in Incidence	Monetary Value
Total Mortality	**0.038 / 0.050**	**$555,220 / $724,926**
Mortality, All Cause (PM)	0.010 / 0.022	$147,991 / $317,697
Mortality, O3 Short-term Exposure (O3)	0.001	$17,490
Mortality, O3 Long-term Exposure (O3)	0.027	$389,739
Nonfatal Heart Attacks (PM)	**0.007**	**$566**
Infant Mortality (PM)	**0.000**	**$1,175**
Total Hospital Admits, All Respiratory	**0.005**	**$96**
Hospital Admits, All Respiratory (PM)	0.001	$30
Hospital Admits, All Respiratory (O3)	0.004	$66
Total Emergency Room Visits, Respiratory	**0.072**	**$118**
Emergency Room Visits, Respiratory (PM)	0.006	$9
Emergency Room Visits, Respiratory (O3)	0.067	$108
Total Asthma Onset	**0.317**	**$24,164**
Asthma Onset (PM)	0.033	$2,547
Asthma Onset (O3)	0.283	$21,617
Total Asthma Symptoms	**48.520**	**$16,379**
Asthma Symptoms, Albuterol Use (PM)	6.076	$4
Asthma Symptoms, Chest Tightness (O3)	11.694	$4,511
Asthma Symptoms, Cough (O3)	13.794	$5,322
Asthma Symptoms, Shortness of Breath (O3)	5.901	$2,277
Asthma Symptoms, Wheeze (O3)	11.055	$4,265
Emergency Room Visits, Asthma (O3)	**0.000**	**$0**
Lung Cancer (PM)	**0.001**	**$37**
Hospital Admits, Cardio-Cerebro/Peripheral Vascular Disease (PM)	**0.002**	**$48**
Hospital Admits, Alzheimers Disease (PM)	**0.005**	**$122**
Hospital Admits, Parkinsons Disease (PM)	**0.001**	**$14**
Stroke (PM)	**0.001**	**$45**
Total Hay Fever/Rhinitis	**2.007**	**$2,237**
Hay Fever/Rhinitis (PM)	0.210	$234
Hay Fever/Rhinitis (O3)	1.797	$2,003
Cardiac Arrest, Out of Hospital (PM)	**0.000**	**$11**
Emergency Room Visits, All Cardiac (PM)	**0.003**	**$6**
Minor Restricted Activity Days (PM)	**10.383**	**$1,305**
School Loss Days (O3)	**26.374**	**$44,792**
Work Loss Days (PM)	**1.772**	**$561**
Total PM Health Effects	**18.511 / 18.523**	**$154,708 / $324,413**
Total O3 Health Effects	**70.999**	**$492,190**

APPENDIX F: AVERAGE ANNUAL COMPLIANCE COSTS

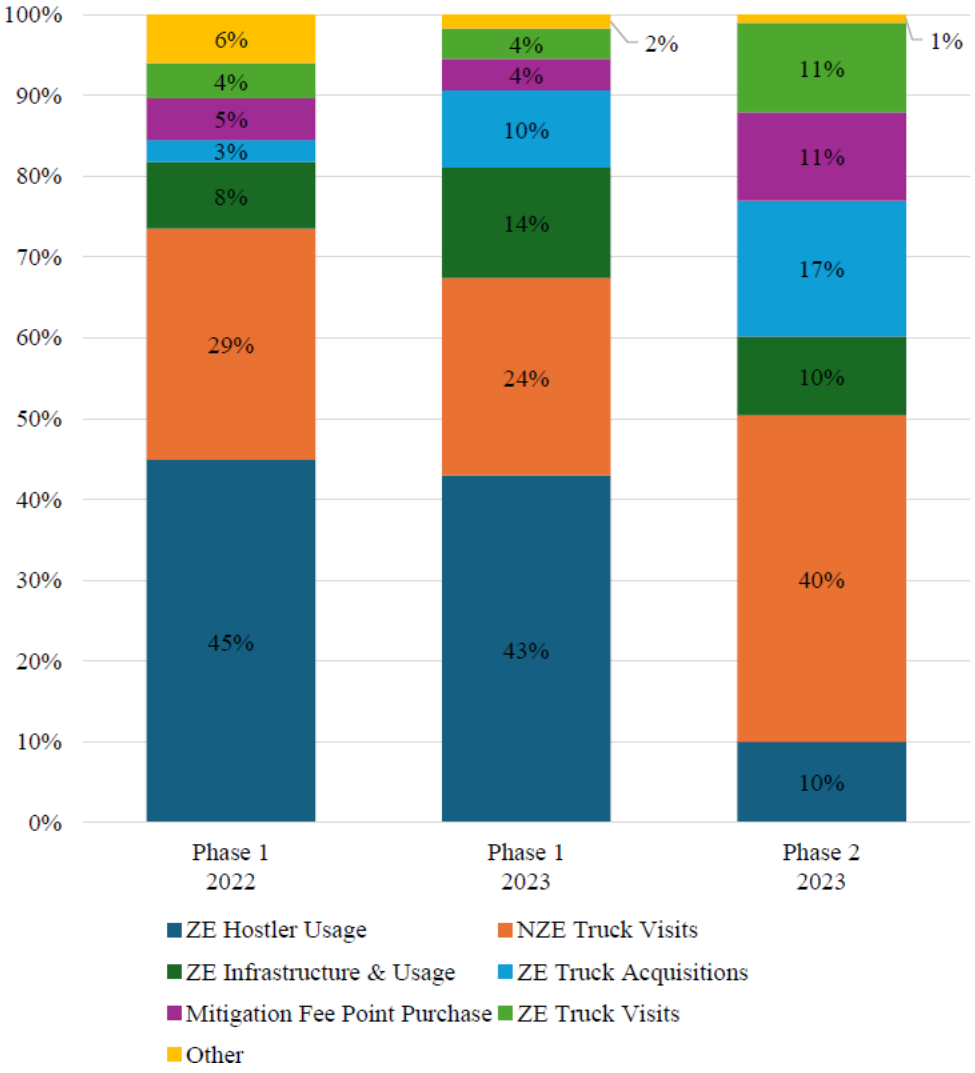
Referenced from the SCAQMD's cost information, Table F1 shows discounted total costs over a ten-year compliance time horizon (2022 – 2031).[93] It also shows a cost summary for each compliance scenario including net present value (assuming 1% discount rate), average annual cost, and a weighted average annual cost per square foot of warehouse space after taking into account equipment acquisition from CARB's Advanced Clean Trucks, Low NOx Omnibus. The total costs presented here are inclusive of all administrative costs and fees related to compliance.[94]

Table F1 – Total Cost Summary of Each Compliance Scenario (2022-2031) After Accounting for CARB's ACT and Low NOx Omnibus Regulation[95]

	Equipment	Discounted Total Costs - NPV (1%) (in millions)	Discounted Total Costs - NPV (4%) (in millions)	Average Annual Cost (in millions)	Average Annual Cost ($/sq. ft)
Sc1	NZE Class 8	$1,225.7	$1,102.6	$127.2	$0.16
Sc2	NZE Class 8	$1,345.1	$1,219.9	$139.2	$0.17
Sc3	NZE Class 8	$430.2	$374.4	$45.2	$0.06
Sc4	NZE Class 8	$887.4	$749.5	$94.1	$0.12
Sc5	ZE Class 8	$1,067.2	$941.8	$111.5	$0.14
Sc6	ZE Class 6 & 8	$1,799.3	$1,603.8	$187.3	$0.23
Sc7	Mitigation Fee	$6,298.0	$5,264.0	$670.2	$0.83
Sc7a	Mitigation Fee	$1,097.7	$985.5	$114.0	$0.14
Sc8	NZE Class 6	$1,785.0	$1,627.1	$184.3	$0.23
Sc9	NZE Class 6	$553.6	$467.6	$58.7	$0.07
Sc10	ZE Class 6	-$114.9	-$87.3	-$12.6	-$0.02
Sc11	Solar	$9,796.9	$9,712.2	$979.0	$1.21
Sc12	ZE Class 8	$8,117.5	$7,445.5	$836.7	$1.04
Sc13	ZE Class 2b-3	$803.2	$752.8	$82.1	$0.10
Sc14	ZE Class 2b-3	$1,128.8	$978.3	$118.7	$0.15
Sc15	Filter System	$5,985.7	$5,056.7	$634.7	$0.79
Sc16	Filter	$5,862.9	$4,953.4	$621.6	$0.77
Sc17	TRU	$54.2	$45.8	$5.7	$0.70
Sc18	Yard Trucks	$1,152.6	$1,028.7	$120.0	$0.15

[93] SCAQMD, Rule 2305, Staff Report, p. 64
[94] SCAQMD, Rule 2305, Staff Report, p. 71
[95] SCAQMD, Rule 2305, Staff Report, Table 20, p. 72

Figure F1 - Total Earned WAIRE Points Menu Items and Mitigation Fees (Normalized)[96]



[96] SCAQMD, 2nd Annual WAIRE Report, Appendix B, Figure A-5, p. 39

Table F2 – Total Cost Summary of Each Compliance Scenario (Adapted)[97]

Compliance Scenario	Equipment	Scenario Description	Average Annual Compliance Cost (per sq ft)	Earned WAIRE Points[98] (% of total)	Weighted Average Annual Compliance Cost (per sq ft)
Low-NOx Trucks					
Sc1	NZE Class 8	NZE Class 8 truck acquisitions and subsequent visits from those trucks	$0.16		
Sc2	NZE Class 8	NZE Class 8 truck acquisitions and subsequent visits from those trucks (early purchase)	$0.17		
Sc3	NZE Class 8	NZE Class 8 truck acquisitions (funded by Carl Moyer program) and subsequent visits from those trucks	$0.06		
Sc4	NZE Class 8	NZE Class 8 truck visits from non-owned fleets	$0.12		
Sc8	NZE Class 6	NZE Class 6 truck acquisitions and subsequent visits from those trucks	$0.23		
Sc9	NZE Class 6	NZE Class 6 truck visits from non-owned fleets	$0.07		
Average			**$0.14**	**40%**	**$0.05**
ZEV Hostlers and Trucks					
Sc5	ZE Class 8	ZE Class 8 truck visits from non-owned fleets	$0.14		
Sc6	ZE Class 6&8	Level 3 charger installations followed by ZE Class 6 & Class 8 truck acquisitions and subsequent visits from those trucks, using installed chargers	$0.23		
Sc10	ZE Class 6	ZE Class 6 truck visits from non-owned fleets	$(0.02)		
Sc13	ZE Class 2b-3	ZE Class 2b-3 truck acquisitions and subsequent visits from those trucks	$0.10		

[97] Adapted from Table F1.

[98] Derived from Figure F1 for Phase 2 facilities (150k to <250k sq ft , first compliance period in 2023). Earned WAIRE Points for the smallest facilities subject to Rule 2305 (Phase 3, 100k to <150k sq ft, first compliance period in 2024) will be presented in a subsequent SCAQMD Annual WAIRE Report anticipated to be released in 2025.

Compliance Scenario	Equipment	Scenario Description	Average Annual Compliance Cost (per sq ft)	Earned WAIRE Points[98] (% of total)	Weighted Average Annual Compliance Cost (per sq ft)
Sc14	ZE Class 2b-3	ZE Class 2b-3 truck visits from non-owned fleets	$0.15		
Sc18	Yard Trucks	ZE Hostler Acquisitions and Usage	$0.15		
Average			**$0.13**	**38%**	**$0.05**
ZEV Infrastructure					
Sc11	Solar	Rooftop solar panel installations and usage	$1.21		
Sc12	ZE Class 8	Hydrogen station installations followed by ZE Class 8 truck acquisitions and subsequent visits from those trucks, using the hydrogen station	$1.04		
Sc17	TRU	TRU plug installations and usage in cold storage facilities	$0.70		
Average			**$0.98**	**10%**	**$0.10**
Mitigation Fee					
Sc7	Mitigation Fee	Pay Mitigation Fee	$0.83		
Sc7a	Mitigation Fee	Pay Mitigation Fee and account for NZE trucks visiting the facility incentivized from the WAIRE Mitigation Program	$0.14		
Average			**$0.49**	**11%**	**$0.05**
Filters					
Sc15	Filter System	Filter System Installations	$0.79		
Sc16	Filter	Filter Purchases	$0.77		
Average			**$0.78**	**1%**	**$0.01**
Total				**100%**	**$0.26**

APPENDIX G: COST-EFFECTIVENESS SCENARIOS 1 & 2

For comparative purposes, the estimated countywide cost-effectiveness values for Scenario 1 (100% Low-NOx) and Scenario 2 (100% ZEV) are listed in Tables G1 and G2 respectively. **Note that Scenarios 1 and 2, in which all subject facilities implement either the same 100% Low-NOx or 100% ZEV compliance options, are best-case scenarios only and would *not* occur in practice.** This is because a potential warehouse ISR would need to provide multiple compliance options as modeled after the SCAQMD Rule 2305 for the ISR to be legally enforceable by the District. Therefore, in practice all subject facilities would most likely not select the same compliance option as each facility would have the choice to implement the appropriate compliance option(s) specific to their operations.

The cost-effectiveness values range between $154 to $198/lb in 2028, and $206 to $265/lb in 2032 for Scenario 1; and between $128 to $165/lb in 2028, and $172 to $221/lb in 2032 for Scenario 2. These estimated cost-effectiveness values for Scenarios 1 and 2 are less than those for Scenario 3 (Low-NOx, ZEV, Other) due to the lesser average costs of $0.14 and $0.13/sq ft respectively used in this analysis.[99]

Table G1 – Compliance Costs and Cost-Effectiveness for Scenario 1 (100% Low-NOx)*

ISR Applicability Threshold (sq ft)	Warehouse Count	Total Floor Area (sq ft)	Total Cost (per year)	Average Cost Per Warehouse (per year)	2028 Cost-Effectiveness ($/lb)	2032 Cost-Effectiveness ($/lb)
100k and greater	243	45,719,544	$6,172,138	$25,400	$198	$265
50k and greater	657	74,121,426	$10,006,393	$15,230	$154	$206

*Preliminary estimates subject to change.

Table G2 – Compliance Costs and Cost-Effectiveness for Scenario 2 (100% ZEV)*

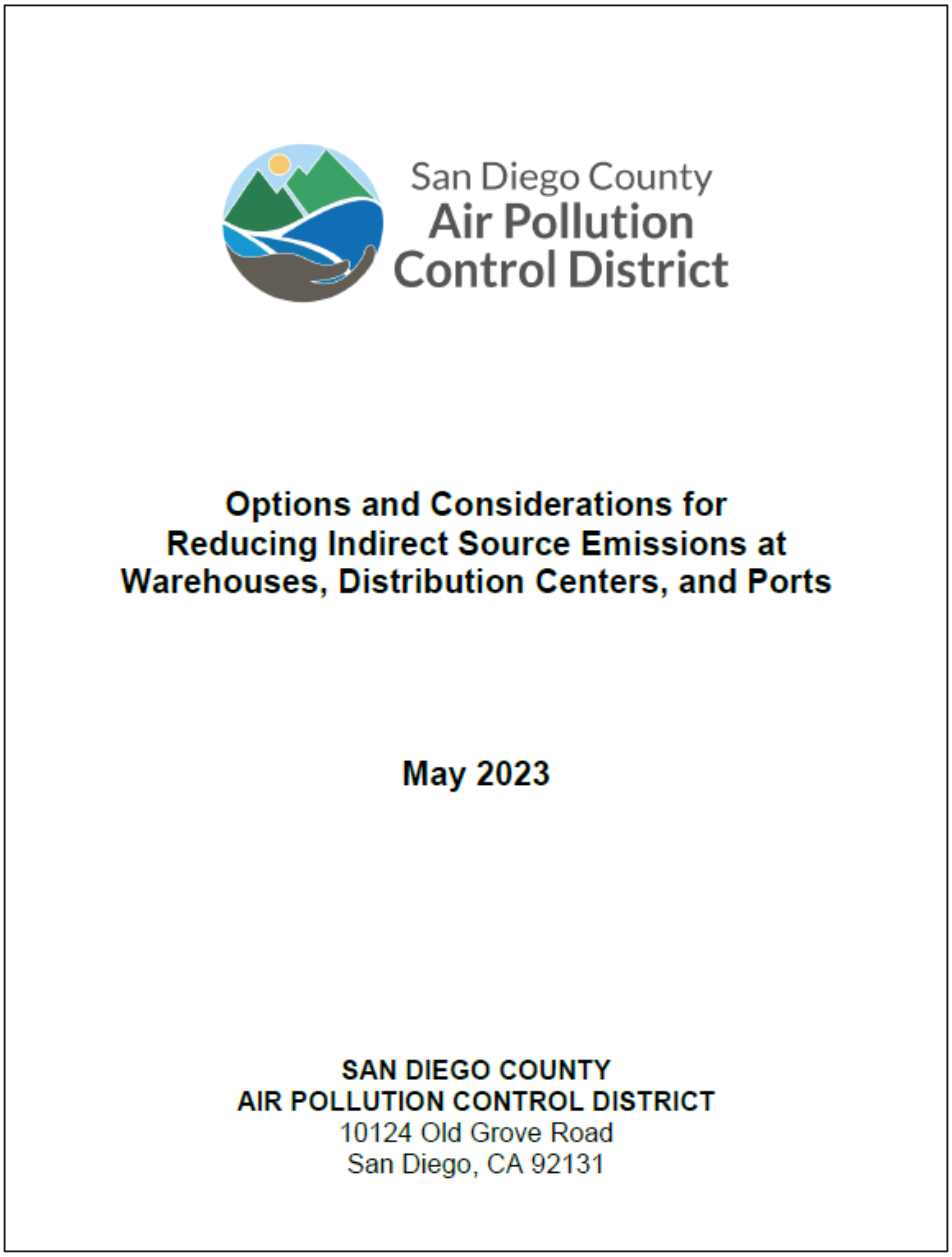
ISR Applicability Threshold (sq ft)	Warehouse Count	Total Floor Area (sq ft)	Total Cost (per year)	Average Cost Per Warehouse (per year)	2028 Cost-Effectiveness ($/lb)	2032 Cost-Effectiveness ($/lb)
100k and greater	243	45,719,544	$5,714,943	$23,518	$165	$221
50k and greater	657	74,121,426	9,265,178	$14,102	$128	$172

*Preliminary estimates subject to change.

[99] Appendix F: Average Annual Compliance Costs

ATTACHMENT A: OPTIONS AND CONSIDERATIONS FOR REDUCING INDIRECT SOURCE EMISSIONS AT WAREHOUSES, DISTRIBUTION CENTERS, AND PORTS (or ISR FRAMEWORK)

Click here to view Attachment A in pdf format.[100]



[100] https://www.sdapcd.org/content/dam/sdapcd/documents/rules/warehouse-work-group/references/isr-framework-english.pdf

ATTACHMENT B: WWG TIMELINE AND WORKING GROUP PARTICIPANTS

Click here to view Attachment B in pdf format.[101]

WAREHOUSE WORKING GROUP (WWG) TENTATIVE TIMELINE AND POSSIBLE WORKING GROUP PARTICIPANTS

	Regulatory Strategies	Non-Regulatory Strategies
August 2023	- Planning and Policy Committee Update on Warehouse Working Group (Timeline of Actions, Purpose Statement) - Identify and get tentative commitments from potential Warehouse Working Group Participants - Initiate procurement process to secure contractor(s) to prepare required CEQA and SIA documentation (~10 months to complete)	
September 2023	- Introductory meeting(s) with potential Warehouse Working Group participants - Facility and background information collection (ongoing)	- Identify potential non-regulatory strategies in introductory meeting(s) with potential Warehouse Working Group participants.
October 2023	- Governing Board Update on Warehouse Working Group (Board Letter, Timeline of Actions, Purpose Statement) - Introductory meeting(s) with potential Warehouse Working Group participants - Public Outreach, Engagement, and Meaningful Input Opportunities o AB617 Portside Steering Committee o AB617 International Border Steering Committee o EJ Community Impacted in East County o EJ Community Impacted in North County o SDAPCD Environmental Justice Partnership o APCD-Industrial Working Group (AIWG) o Possible Affected Warehouse Owners/Operators - Public Outreach (Email/Social Media Announcements to announce Kickoff Warehouse Working Group Meeting) - Facility and background information collection (ongoing)	- Identify potential non-regulatory strategies in introductory meeting(s) with potential Warehouse Working Group participants.
November 2023	- Warehouse Working Group Formal Kickoff Meeting (Virtual, 1x monthly, 2 hours) with the following possible topics: o June 2023, August 2023, and October 2023 Governing Board & Planning and Policy Committee Direction/Feedback o Warehouse Inventory (Small, under-resourced communities; proximity to sensitive receptors; prioritization) o Overview of legal authority (federal preemption; Proposition 26; no land use authority) o Other possible strategies (incentives, new concepts, etc.) o Concept for APCD Truck Trip Survey - Facility and background information collection (ongoing)	- Identify potential non-regulatory strategies in meeting(s) with potential Warehouse Working Group participants.

-1-
Subject to Change

[101] https://www.sdapcd.org/content/dam/sdapcd/documents/rules/warehouse-work-group/092523/timeline-participants.pdf

ATTACHMENT C: WAREHOUSE WORKING GROUP PURPOSE STATEMENT

Click here to view Attachment C in pdf format.[102]

San Diego County Air Pollution Control District

Warehouse Working Group Purpose Statement

Purpose
The purpose of the Warehouse Working Group (WWG) is to offer input to the San Diego County Air Pollution Control District (SDAPCD) regarding potential regulatory and non-regulatory strategies to reduce air pollution and public health impacts from heavy-duty trucks and other indirect sources associated with warehouses and distribution centers in the San Diego region, with priority to those facilities in under-resourced communities.

Line of Reporting
The WWG may make recommendations to SDAPCD staff and the SDAPCD Planning and Policy Committee. The SDACPD Planning and Policy Committee may report those recommendations to the SDAPCD Governing Board.

Membership
The WWG membership will represent a balanced range of stakeholder interests with on-the-ground knowledge and information about the freight sector and community air quality impacts including, but not limited to, community groups and residents, warehouse owners and operators, trucking companies, government agencies, and other interested parties. In inviting members, SDAPCD will strive to ensure both community/environmental and freight/warehouse stakeholder interests are adequately represented. A membership roster will be available on the SDAPCD website. SDAPCD may augment WWG membership if additional expertise or perspective is desired.

Responsibilities
Members are expected to regularly participate in WWG meetings, review meeting materials provided by SDAPCD, and share information and provide feedback based on their respective areas of expertise. Additionally, members are asked to regularly communicate information about WWG developments to their respective constituencies, and actively seek perspectives to share in WWG discussions. The level of commitment for members is anticipated to be 1 – 4 hours per month.

Members are not asked to seek consensus in their advice to the SDAPCD. However, SDAPCD staff will record areas of agreement, as well as the diverse perspectives when there is not agreement. Staff will work to integrate the WWG's advice, and input from other interested parties including the public, into the development of proposed indirect source control strategies for warehouses and distribution centers, as appropriate. The SDAPCD Governing Board has final decision-making authority.

Meeting Information
Meetings will be held virtually and administered by SDAPCD. Links to meeting materials will be made available on a new dedicated webpage on the SDAPCD website. Meeting times will be determined based on member availability. Members of the public will be allowed to speak on any item within the area of focus for the meeting. Meeting agendas will be posted no later than 48 hours in advance of the meetings. Live language interpretation will be available at each meeting provided such services are needed. SDAPCD staff may require limiting the amount of time for public and/or member comment to ensure meetings are run efficiently.

Meeting Decorum
To ensure WWG meetings are effective and inclusive, all members agree to recognize and adhere to the following meeting rules and guidelines of participation: (1) Create space for everyone to contribute, (2) Only one person speaks at a time, (3) Listen to each other, (4) Respect each other's opinions, knowledge, and perspectives, and (5) Be conscious of time constraints. Meetings will be moderated either by SDAPCD staff or a professional/impartial facilitator.

Duration of Existence
The WWG will function on an on-going basis, subject to annual review by the SDAPCD.

-1-

[102] https://www.sdapcd.org/content/dam/sdapcd/documents/rules/warehouse-work-group/092523/purpose-statement.pdf

ATTACHMENT D: INDUSTRY WAREHOUSE ISR ANALYSIS

Click here to view Attachment D in pdf format.[103]

APCD Preliminary Comments on IEA Warehouse ISR Analysis Slide Deck and Excel Spreadsheet
11/30/2023

APCD appreciates the opportunity to provide feedback. Overall, we have the following main takeaways:

1. There remain large data gaps in making a strong correlation between the stated findings, which is that warehouses have little/no correlation to high levels of DPM in various communities.
    - No surface street truck activity data is a primary concern. However, it's possible that SANDAG truck volume data could fill in this gap.

   IEA Response: Agreed that a lack of surface street truck activity data is a challenge in this analysis. Hopefully the District can share the data that they found from SANDAG – and ideally it would be actual counts vs modeled street traffic.

2. The comparison to "normal" traffic data and "truck" traffic data may not be appropriate.
    - Percent of traffic data does not necessarily equate or compare to emissions from such vehicles. For examples, trucks make up a very small percent of traffic activity but emit higher emissions than typical passenger vehicles. An assessment that reviews *emissions* between the two could better address that dynamic.

   IEA Response: Agreed, the graphs have been revised to show count of trucks on the roads rather than percentage.

    - Most general vehicle traffic is not powered by diesel; consequently, making any assumptions between "normal" vehicle traffic and DPM seems off-base. A more appropriate and focused comparison might be to look at the level of truck activity in the same areas but attempt to determine the impact of DPM emissions from other emission sources (i.e. off-road, marine, cargo handling, etc.). Doing so could present a better comparison as to the level of impact trucks are having in these same neighborhoods, to perhaps make the findings stronger.

   IEA Response: Agreed, we spoke with CARB staff who worked on EMFAC and while they walked us through the EMFAC methodology and source of the data, we could not replicate a result that made sense. CalEnviroScreen, for all of SD County, had approximately 132 tons of DPM allocated throughout the census tracts. At CARB's recommendation, use of Diesel PM2.5 without any other calculations yielded results in EMFAC that were much higher. That said, it was useful in that we now know the universe of vehicle classes used in the on-road diesel portion of emissions and the breakdown of emission sources by class. While we may not be able to single out the portion of on-road DPM on CalEnviroScreen, we may be able to infer the proportionality of on-road mobile source emissions associated with the classes most likely to be used by warehouses and distribution centers within SD County.

3. We would encourage taking this feedback to improve the study and allowing APCD to review once again before having this be presented to the WWG group and/or AB617 Steering committees.

Technical Comments on PowerPoint:

1. Slide 2 - The problem statement in the PPT presentation Slide 2 indicates this review is focused on the degree that warehouses are responsible for DPM in specific census tracts.
    - It would be useful to expand that statement to also look at NOx levels in specific census tracts as well, since NOx is a precursor to ozone, and it's possible any proposed warehouse rule would also be investigating NOx reductions to assist in attainment of federal ozone standards.

   IEA Response: Agreed. Although the scope of the CalEnviroScreen data set used in this study does not include NOx, EMFAC and CEPAM model outputs for annual NOx emissions as well and can support NOx forecasting.

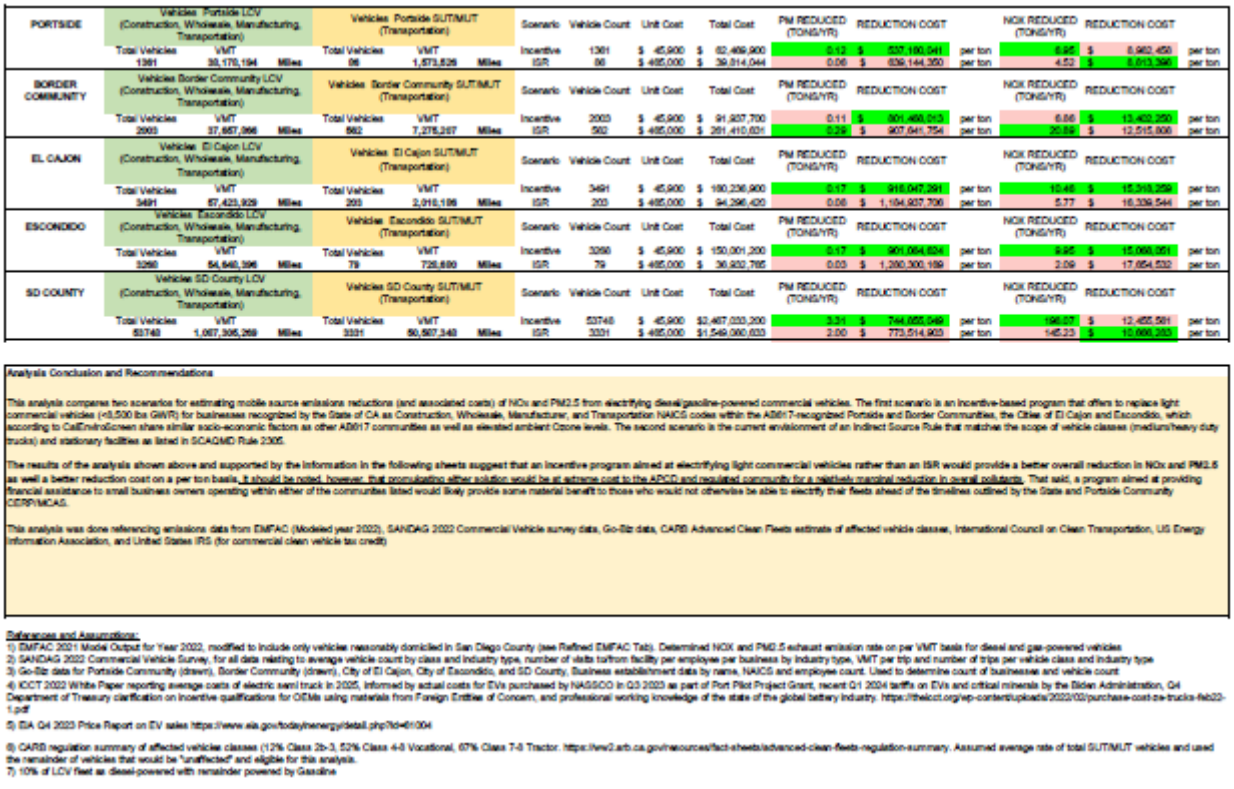
    - The same concern exists regarding the follow-up question on Slide 2, which is whether additional regulation on warehouse facilities provide material improvement to DPM emissions in those census tracts. However, answering this question could be difficult to conclusively answer, given that any reduction in NOx levels might not be seen in the immediate area of the census tract; ozone is mainly created in the inland foothill areas of the County.

   IEA Response: Agreed, it will be difficult to ascertain any given census tract's contribution to the total measured zone concentrations at monitoring stations in the County.

[103] Staff's preliminary comments on the IEA Warehouse ISR Analysis (PowerPoint and Excel) as of 1/5/2024, https://www.sdapcd.org/content/dam/sdapcd/documents/rules/warehouse-work-group/references/industry-warehouse-isr-analysis.pdf.

ATTACHMENT E: ISR VS INCENTIVE ANALYSIS

Click here to view Attachment E in pdf format.[104]



	Vehicles: Portside LCV (Construction, Wholesale, Manufacturing, Transportation)			Vehicles: Portside SUT/MUT (Transportation)			Scenario	Vehicle Count	Unit Cost	Total Cost	PM REDUCED (TONS/YR)	REDUCTION COST		NOX REDUCED (TONS/YR)	REDUCTION COST	
PORTSIDE	Total Vehicles	VMT		Total Vehicles	VMT		Incentive	1301	$ 45,900	$ 62,469,900	0.12	$ 537,180,041	per ton	6.95	$ 9,062,456	per ton
	1301	39,176,194	Miles	86	1,573,826	Miles	ISR	86	$ 465,000	$ 39,914,044	0.06	$ 639,144,350	per ton	4.52	$ 8,813,396	per ton
	Vehicles: Border Community LCV (Construction, Wholesale, Manufacturing, Transportation)			Vehicles: Border Community SUT/MUT (Transportation)			Scenario	Vehicle Count	Unit Cost	Total Cost	PM REDUCED (TONS/YR)	REDUCTION COST		NOX REDUCED (TONS/YR)	REDUCTION COST	
BORDER COMMUNITY	Total Vehicles	VMT		Total Vehicles	VMT		Incentive	2003	$ 45,900	$ 91,937,700	0.11	$ 801,468,013	per ton	6.66	$ 13,402,200	per ton
	2003	37,667,066	Miles	502	7,276,207	Miles	ISR	502	$ 465,000	$ 261,410,631	0.29	$ 907,641,754	per ton	30.89	$ 12,515,806	per ton
	Vehicles: El Cajon LCV (Construction, Wholesale, Manufacturing, Transportation)			Vehicles: El Cajon SUT/MUT (Transportation)			Scenario	Vehicle Count	Unit Cost	Total Cost	PM REDUCED (TONS/YR)	REDUCTION COST		NOX REDUCED (TONS/YR)	REDUCTION COST	
EL CAJON	Total Vehicles	VMT		Total Vehicles	VMT		Incentive	3491	$ 45,900	$ 160,236,900	0.17	$ 916,047,291	per ton	10.46	$ 15,313,259	per ton
	3491	57,423,929	Miles	203	2,016,106	Miles	ISR	203	$ 465,000	$ 94,296,420	0.06	$ 1,164,937,706	per ton	5.77	$ 16,339,544	per ton
	Vehicles: Escondido LCV (Construction, Wholesale, Manufacturing, Transportation)			Vehicles: Escondido SUT/MUT (Transportation)			Scenario	Vehicle Count	Unit Cost	Total Cost	PM REDUCED (TONS/YR)	REDUCTION COST		NOX REDUCED (TONS/YR)	REDUCTION COST	
ESCONDIDO	Total Vehicles	VMT		Total Vehicles	VMT		Incentive	3290	$ 45,900	$ 150,991,200	0.17	$ 901,064,824	per ton	9.95	$ 15,060,051	per ton
	3290	54,640,396	Miles	79	726,899	Miles	ISR	79	$ 465,000	$ 36,922,785	0.03	$ 1,200,300,189	per ton	2.09	$ 17,654,532	per ton
	Vehicles: SD County LCV (Construction, Wholesale, Manufacturing, Transportation)			Vehicles: SD County SUT/MUT (Transportation)			Scenario	Vehicle Count	Unit Cost	Total Cost	PM REDUCED (TONS/YR)	REDUCTION COST		NOX REDUCED (TONS/YR)	REDUCTION COST	
SD COUNTY	Total Vehicles	VMT		Total Vehicles	VMT		Incentive	53748	$ 45,900	$2,467,033,200	3.31	$ 744,955,049	per ton	196.07	$ 12,465,581	per ton
	53748	1,067,395,269	Miles	3331	50,507,340	Miles	ISR	3331	$ 465,000	$1,549,060,033	2.00	$ 773,514,903	per ton	145.23	$ 10,666,253	per ton

Analysis Conclusion and Recommendations

This analysis compares two scenarios for estimating mobile source emissions reductions (and associated costs) of NOx and PM2.5 from electrifying diesel/gasoline-powered commercial vehicles. The first scenario is an incentive-based program that offers to replace light commercial vehicles (<8,500 lbs GWR) for businesses recognized by the State of CA as Construction, Wholesale, Manufacturer, and Transportation NAICS codes within the AB617-recognized Portside and Border Communities, the Cities of El Cajon and Escondido, which according to CalEnviroScreen share similar socio-economic factors as other AB617 communities as well as elevated ambient Ozone levels. The second scenario is the current envisionment of an Indirect Source Rule that matches the scope of vehicle classes (medium/heavy duty trucks) and stationary facilities as listed in SCAQMD Rule 2305.

The results of the analysis shown above and supported by the information in the following sheets suggest that an incentive program aimed at electrifying light commercial vehicles rather than an ISR would provide a better overall reduction in NOx and PM2.5 as well a better reduction cost on a per ton basis. It should be noted, however, that promulgating either solution would be at extreme cost to the APCD and regulated community for a relatively marginal reduction in overall pollutants. That said, a program aimed at providing financial assistance to small business owners operating within either of the communities listed would likely provide some material benefit to those who would not otherwise be able to electrify their fleets ahead of the timelines outlined by the State and Portside Community CERP/MCAS.

This analysis was done referencing emissions data from EMFAC (Modeled year 2022), SANDAG 2022 Commercial Vehicle survey data, Go-Biz data, CARB Advanced Clean Fleets estimate of affected vehicle classes, International Council on Clean Transportation, US Energy Information Association, and United States IRS (for commercial clean vehicle tax credit)

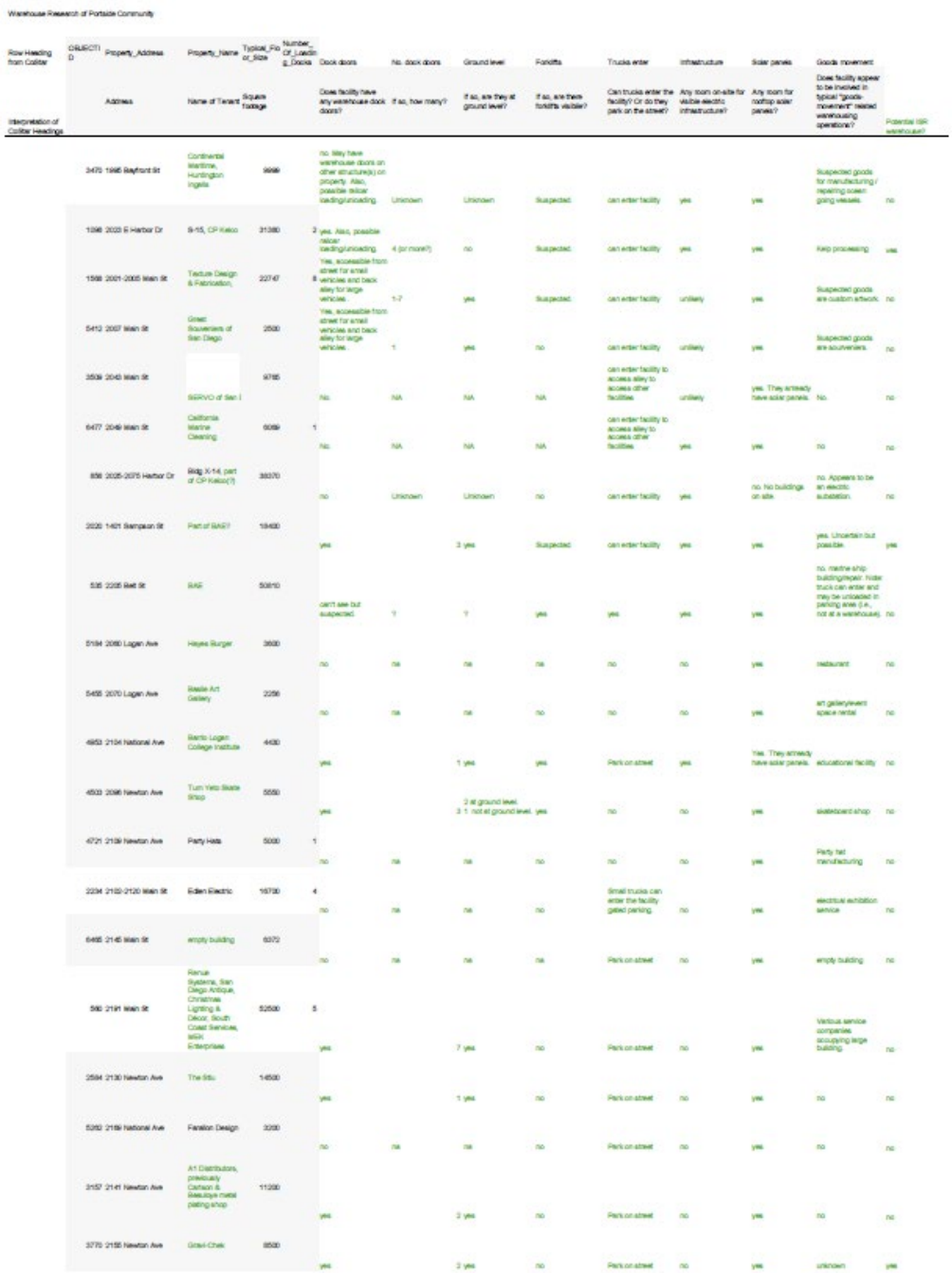
References and Assumptions:

1) EMFAC 2021 Model Output for Year 2022, modified to include only vehicles reasonably domiciled in San Diego County (see Refined EMFAC Tab). Determined NOX and PM2.5 exhaust emission rate on per VMT basis for diesel and gas-powered vehicles
2) SANDAG 2022 Commercial Vehicle Survey, for all data relating to average vehicle count by class and industry type, number of visits to/from facility per employee per business by industry type, VMT per trip and number of trips per vehicle class and industry type
3) Go-Biz data for Portside Community (drawn), Border Community (drawn), City of El Cajon, City of Escondido, and SD County, Business establishment data by name, NAICS and employee count. Used to determine count of businesses and vehicle count
4) ICCT 2022 White Paper reporting average costs of electric semi truck in 2025, informed by actual costs for EVs purchased by NASSCO in Q3 2023 as part of Port Pilot Project Grant, recent Q1 2024 tariffs on EVs and critical minerals by the Biden Administration, Q4 Department of Treasury clarification on incentive qualifications for OEMs using materials from Foreign Entities of Concern, and professional working knowledge of the state of the global battery industry. https://theicct.org/wp-content/uploads/2022/03/purchase-cost-zx-trucks-feb22-1.pdf
5) EIA Q4 2023 Price Report on EV sales https://www.eia.gov/todayinenergy/detail.php?id=61004
6) CARB regulation summary of affected vehicles classes (12% Class 2b-3, 53% Class 4-8 Vocational, 67% Class 7-8 Tractor. https://ww2.arb.ca.gov/resources/fact-sheets/advanced-clean-fleets-regulation-summary. Assumed average rate of total SUT/MUT vehicles and used the remainder of vehicles that would be "unaffected" and eligible for this analysis.
7) 10% of LCV fleet as diesel-powered with remainder powered by Gasoline

[104] The ISR vs Incentive Analysis (Excel) was prepared by an IEA member and submitted to the District via email on June 26, 2024. The attachment contains the information from the "Analysis Summary" worksheet, https://www.sdapcd.org/content/dam/sdapcd/documents/rules/warehouse-work-group/references/isr-vs-incentive-analysis.pdf.

ATTACHMENT F: DISTRICT SAMPLE WAREHOUSE STUDY

Click here to view Attachment F in pdf format.[105]



Warehouse Research of Portside Community

Row Heading from Collbr	OBJECTID	Property_Address	Property_Name	Typical_Floor_Size	Number_Of_Loading_Docks	Dock doors	No. dock doors	Ground level	Forklifts	Trucks enter	Infrastructure	Solar panels	Goods movement	
Interpretation of Collbr Headings		Address	Name of Tenant	Square Footage		Does facility have any warehouse dock doors?	If so, how many?	If so, are they at ground level?	If so, are there forklifts visible?	Can trucks enter the facility? Or do they park on the street?	Any room on-site for visible electric infrastructure?	Any room for rooftop solar panels?	Does facility appear to be involved in typical "goods movement" related warehousing operations?	Potential ISR warehouse?
		3470 1995 Bayfront St	Continental Maritime, Huntington Ingalls	9999		no. May have warehouse doors on other structure(s) on property. Also, possible rollup loading/unloading	Unknown	Unknown	Suspected	can enter facility	yes	yes	Suspected goods for manufacturing / repairing ocean going vessels	no
		1298 2023 E Harbor Dr	9-15, CP Kelco	31380	2	yes. Also, possible rollup loading/unloading	4 (or more?)	no	Suspected	can enter facility	yes	yes	Kelp processing	yes
		1598 2001-2005 Main St	Texture Design & Fabrication,	22747	8	Yes, accessible from street for small vehicles and back alley for large vehicles.	1-7	yes	Suspected	can enter facility	unlikely	yes	Suspected goods are custom artwork	no
		5412 2007 Main St	Great Souvenirs of San Diego	2500		Yes, accessible from street for small vehicles and back alley for large vehicles.	1	yes	no	can enter facility	unlikely	yes	Suspected goods are souvenirs	no
		3506 2043 Main St		9785						can enter facility to access alley to access other facilities.				
			SSRVO of San I			No.	NA	NA	NA		unlikely	yes. They already have solar panels.	No.	no
		6477 2049 Main St	California Marine Cleaning	9089	1					can enter facility to access alley to access other facilities.				
						No.	NA	NA	NA		yes	yes	no	no
		856 2025-2075 Harbor Dr	Bldg X-14, part of CP Kelco(?)	39370		no	Unknown	Unknown	no	can enter facility	yes	no. No buildings on site.	no. Appears to be an electric substation.	no
		2026 1401 Bampaon St	Part of BAE?	19400		yes		2 yes	Suspected	can enter facility	yes	yes	yes. Uncertain but possible.	yes
		535 2205 Bell St	BAE	53810		can't see but suspected	?	?	yes	yes	yes	yes	no. marine ship building/repair. Note: trucks can enter and may be unloaded in parking area (i.e., not at a warehouse).	no
		5194 2060 Logan Ave	Hayes Burger	3600		no	na	na	na	no	no	yes	restaurant	no
		5456 2070 Logan Ave	Reside Art Gallery	2256		no	na	na	no	no	no	yes	art gallery/event space rental	no
		4953 2104 National Ave	Barrio Logan College Institute	4400		yes		1 yes	yes	Park on street	yes	Yes. They already have solar panels.	educational facility	no
		4503 2096 Newton Ave	Turn Yelo Skate Shop	5550		yes		2 at ground level. 3 ? not at ground level.	yes	no	no	yes	skateboard shop	no
		4721 2139 Newton Ave	Party Hats	5000	1	no	na	na	no	no	no	yes	Party hat manufacturing	no
		2234 2102-2120 Main St	Eden Electric	16700	4	no	na	na	no	Small trucks can enter the facility gated parking	no	yes	electrical exhibition service	no
		5465 2145 Main St	empty building	6372		no	na	na	na	Park on street	no	yes	empty building	no
		560 2191 Main St	Renue Systems, San Diego Antique, Christmas Lighting & Décor, South Coast Services, and Enterprises	52500	5	yes		7 yes	no	Park on street	no	yes	Various service companies occupying large building	no
		2584 2130 Newton Ave	The Silo	14500		yes		1 yes	no	Park on street	no	yes	no	no
		5262 2159 National Ave	Fanalon Design	3200		no	na	na	no	Park on street	no	yes	no	no
		3157 2141 Newton Ave	A1 Distributors, previously Carlson & Blaisdale metal plating shop	11200		yes		2 yes	no	Park on street	no	yes	no	no
		3775 2150 Newton Ave	Grind-Chek	8500		yes		2 yes	no	Park on street	no	yes	unknown	yes

[105] https://www.sdapcd.org/content/dam/sdapcd/documents/rules/warehouse-work-group/references/sample-warehouse-study.pdf

San Diego County
Air Pollution
Control District

Strategies to Reduce Indirect Source Emissions at Warehouses and Distribution Centers White Paper

January 2026
Revised February 20, 2026

SAN DIEGO COUNTY
AIR POLLUTION CONTROL DISTRICT
10124 Old Grove Road
San Diego, CA 92131

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EXECUTIVE SUMMARY

Introduction

This "Strategies to Reduce Indirect Source Emissions at Warehouses and Distribution Centers White Paper" (or White Paper) presents the District's evaluation of a potential warehouse indirect source rule (ISR) and other alternative strategies for San Diego County.

Background

In November 2021, the San Diego County Air Pollution Control District (SDAPCD or District) staff began work pursuant to California Assembly Bill (AB) 423 (Gloria, 2019) to evaluate the feasibility of various actions to address indirect sources of pollution, particularly warehouses and distribution centers. More specifically, AB 423 required the District to "consider adopting an indirect source rule to address pollution from mobile sources that is associated with stationary sources, such as ports, warehouses, and distribution centers."

In addition to the requirements of AB 423, AB 617 (Garcia, 2017) requires the California Air Resources Board (CARB) and the air districts to develop and implement Community Emission Reduction Plans (CERPs) to reduce exposures and emissions in communities that are the most impacted by poor air quality. Accordingly, one of the strategies in the CERP for the Portside Community (July 2021) is for the District to evaluate and, if feasible, propose a new rule to control emissions from indirect sources.[1] Similarly, one of the strategies in the CERP for the International Border Community (March 2024) is for the District to develop and advocate for rules or other strategies that reduce emissions from indirect sources, including heavy-duty trucks in Otay Mesa and San Ysidro.[2]

In May 2023, District staff prepared a report titled "Options and Considerations for Reducing Indirect Source Emissions at Warehouses, Distribution Centers, and Ports," also referred to as the "ISR Framework," and presented the preliminary findings at the

[1] Portside Community Emissions Reduction Plan, July 2021, Action C3, p. 156, https://www.sdapcd.org/content/dam/sdapcd/documents/capp/cerp/Portside-Environmental-Justice-CERP-July-2021.pdf

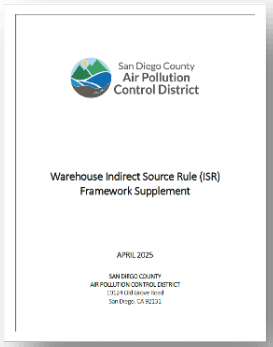
[2] International Border Community Emissions Reduction Plan, March 2024, Heavy-Duty Vehicles/Strategy 5, p. 50, https://www.sdapcd.org/content/dam/sdapcd/documents/capp/meetings/int--border/reports/IBCSC%20CERP%2003.29.24.pdf

June 2023 Governing Board meeting.[3] The ISR Framework provided an update on staff's research and evaluation of the District's legal authority to regulate indirect sources, other California air districts' indirect source rules, warehouse building inventory in San Diego County, an overview of the possible rule development process, and ongoing activities associated with a potential Memorandum of Understanding (MOU) with the San Diego Unified Port District (Port District).

In June 2023, the Governing Board approved staff's recommendation to convene a working group, otherwise known as the Warehouse Working Group (WWG), to further engage with stakeholders and to evaluate additional concepts to reduce emissions from warehouses and distribution centers. As part of its direction, the Governing Board also instructed staff to (1) prioritize under-resourced communities, (2) consider smaller warehouses and warehouses near sensitive receptors (e.g., residences, hospitals, schools, etc.), and (3) return to the October 2023 Governing Board meeting with a timeline for action and proposed composition of the working group. The Governing Board also directed staff to pursue an MOU with the Port District that includes emissions reduction, facilitative, and health protective mitigation measures.

In October 2023, staff presented an informational update to the Governing Board on the establishment of the WWG, potential working group participants, and a proposed tentative timeline for action as detailed in the Board letter attachment "Warehouse Working Group (WWG) Tentative Timeline and Possible Working Group Participants." The proposed scope and goal of the working group were provided in the attachment "Warehouse Working Group Purpose Statement." Feedback received from the Governing Board included adding representation from public health and/or physician groups to the working group participant list, a status update on the SCAQMD Rule 2305 litigation, and expanded outreach to communities impacted by warehousing activities. Staff subsequently convened 10 virtual public WWG meetings between September 2023 and October 2024, comprising over 20 hours of in-depth, technical conversations with subject matter experts and engaged stakeholders.

[3] SDAPCD, Options and Considerations for Reducing Indirect Source Emissions at Warehouses, Distribution Centers, and Ports [ISR Framework], May 2023, https://www.sdapcd.org/content/dam/sdapcd/documents/rules/warehouse-work-group/references/isr-framework-english.pdf



In April 2025, District staff prepared a report titled "Warehouse Indirect Source Rule (ISR) Framework Supplement."[4] The report, also referred to as the Supplement, presents an update to pertinent sections found in the initial ISR Framework for warehouses and distribution centers. The Supplement also provides new or updated information through analysis that was either directed by the Governing Board, Planning and Policy Committee, and/or discussed through the WWG.

In June 2025, District staff presented a proposed MOU with the Port District for the Governing Board's consideration. The MOU incorporated voluntary commitments that will: (1) support installation of charging infrastructure for zero-emission vehicles and equipment; (2) further the transition to zero-emission cargo handling equipment; (3) continue and enhance the SDAPCD zero-emission truck pilot program and Port District zero-emission truck activities; (4) prioritize access to incentives and grants to help achieve shared Portside emission reduction goals; (5) reduce emissions from ocean going vessels and commercial harbor craft; (6) enhance public participation and transparency on Port District and SDAPCD projects in the Portside area; and (7) create additional opportunities to maximize air quality benefits from the Port's Maritime Industrial Impact Funding. The Governing Board approved the District to approve and enter into the MOU during the meeting. In July 2025, the Board of Port Commissioners also approved the MOU. On August 4, 2025, the MOU between the SDAPCD and the Port District became effective.

Findings and Considerations

The following is a summary of the findings and considerations that informed the conclusions of this White Paper. See the referenced sections for more detailed discussions on each item.

- The estimated emission reductions from a potential warehouse ISR in San Diego County are projected to be significantly less than the reductions anticipated from other rulemakings (Section 3.1).
- The estimated public health benefits, both regionwide and in under-resourced communities, of a potential warehouse ISR are less than the benefits anticipated from recent and potential future rulemakings (Section 3.2).

[4] SDAPCD, Warehouse Indirect Source Rule (ISR) Framework Supplement, April 2025, https://www.sdapcd.org/content/dam/sdapcd/documents/rules/warehouse-work-group/april-2025/isr-framework-supplement.pdf

- The estimated compliance costs of a potential warehouse ISR are greater than the costs anticipated from other rulemakings (Section 3.3).
- The estimated cost-effectiveness values of a potential warehouse ISR significantly exceed those for other District rulemakings, as well as cost-effectiveness thresholds used in other air districts (Section 3.4).
- A substantial percentage of the facilities identified as "warehouses" in the District's inventory may not be conducting warehousing activities. This will likely reduce the number of facilities that would potentially be subject to a potential warehouse ISR (Section 3.5).
- The estimated one-time and on-going District costs for rule development and administration are substantial in light of current fiscal uncertainty (Section 3.6).
- A warehouse ISR in San Diego County modeled after the South Coast Air Quality Management District (SCAQMD) Rule 2305, which is the only warehouse ISR that has withstood litigation to date, is anticipated to require significant District staff effort for program implementation, outreach, and compliance/enforcement activities (Section 3.7).
- SCAQMD Rule 2305 was developed with the goal of reducing regional emissions to attain the federal and state Ozone and PM2.5 ambient air quality standards while achieving localized emission reductions as a co-benefit (Section 4.1).
- The District considered applicable comments received (Section 4.2).
- An analysis of warehouse buildings located in under-resourced communities compared to the rest of the county demonstrated that a majority of potential warehousing locations (over 70%) are located outside of identified under-resourced communities (Section 4.3.2).
- Other state activities, such as Assembly Bill 98 and a possible statewide ISR if adopted in the future, would likely achieve and support mobile source emission reductions from warehousing operations (Section 4.4).
- A third-party study that analyzed SCAQMD's WAIRE Program (Rule 2305) to date, which noted inconsistencies in reported data and the benefits that can be directly attributed to Rule 2305, and other findings (Section 4.5).
- Other potential non-regulatory alternatives for consideration, such as a focused Transport Refrigeration Unit (TRU) incentive program, may provide comparable emission reductions at lower costs and/or resources than anticipated with an ISR (Section 5.0).

Conclusion

The District believes the analysis outlined in this White Paper supports prioritizing the alternative strategies detailed in Section 5.0. These strategies are expected to reduce emissions, help meet state and federal air quality goals, and improve air quality in communities most impacted by pollution. Given the relatively high estimated cost of implementing a local rule and the potential for a future statewide Indirect Source Rule (ISR), the District believes focusing on these alternatives represents the most efficient use of resources at this time.

As part of future planning, the District will designate a potential warehouse ISR as a "Further Study Measure" in the upcoming Regional Air Quality Strategy (RAQS). This ensures the measure remains under active review, with status updates provided to stakeholders as part of the regular RAQS development process. If future analysis demonstrates that the measure is both feasible and cost-effective, it may be considered for adoption.

Should the selected alternative strategies experience delays or fail to achieve intended outcomes, the District can reassess the appropriateness of a local warehouse ISR, taking into account any statewide ISR developments and implementation progress.

1.0 INTRODUCTION

This “Strategies to Reduce Indirect Source Emissions at Warehouses and Distribution Centers White Paper” (or White Paper) presents the District’s evaluation of a potential warehouse indirect source rule (ISR) and other alternative strategies for San Diego County.



2.0 BACKGROUND

2.1 Assembly Bill 423

In November 2021, the San Diego County Air Pollution Control District (SDAPCD or District) staff began work pursuant to California Assembly Bill (AB) 423 (Gloria, 2019) to evaluate the feasibility of various actions to address indirect sources of pollution, particularly warehouses and distribution centers. More specifically, AB 423 required the District to "consider adopting an indirect source rule to address pollution from mobile sources that is associated with stationary sources, such as ports, warehouses, and distribution centers."

2.2 Assembly Bill 617

In addition to the requirements of AB 423, AB 617 (Garcia, 2017) requires the California Air Resources Board (CARB) and the air districts to develop and implement Community Emission Reduction Plans (CERPs) to reduce exposures and emissions in communities that are the most impacted by poor air quality. Accordingly, one of the strategies in the CERP for the Portside Community (July 2021) is for the District to evaluate and, if feasible, propose a new rule to control emissions from indirect sources.[5] Similarly, one of the strategies in the CERP for the International Border Community (March 2024) is for the District to develop and advocate for rules or other strategies that reduce emissions from indirect sources, including heavy-duty trucks in Otay Mesa and San Ysidro.[6]

2.3 August 2022 Governing Board Meeting

In August 2022, staff provided an informational update to the Governing Board on their research and evaluation to date including the District's legal authority to regulate indirect sources, other California air districts' indirect source rules, warehouse building inventory in San Diego County, stakeholder feedback, an overview of the rule development

[5] Portside Community Emissions Reduction Plan, July 2021, Action C3, p. 156, https://www.sdapcd.org/content/dam/sdapcd/documents/capp/cerp/Portside-Environmental-Justice-CERP-July-2021.pdf

[6] International Border Community Emissions Reduction Plan, March 2024, Heavy-Duty Vehicles/Strategy 5, p. 50, https://www.sdapcd.org/content/dam/sdapcd/documents/capp/meetings/int--border/reports/IBCSC%20CERP%2003.29.24.pdf

process, and ongoing rule development activities associated with the evaluation of a potential indirect source rule.

2.4 May 2023 – ISR Framework

In May 2023, District staff prepared a report titled "Options and Considerations for Reducing Indirect Source Emissions at Warehouses, Distribution Centers, and Ports," also referred to as the "ISR Framework." and presented the preliminary findings at the June 2023 Governing Board meeting.[7] The ISR Framework provided an update on staff's research and evaluation of the District's legal authority to regulate indirect sources, other California air districts' indirect source rules, warehouse building inventory in San Diego County, an overview of the possible rule development process, and ongoing activities associated with a potential Memorandum of Understanding (MOU) with the San Diego Unified Port District (Port District).

The conclusion of the ISR Framework suggested that a warehouse ISR and associated administrative fees for facilities above 100,000 square feet in size are potentially feasible and could be successfully implemented in San Diego County. It was also determined that while a local ISR could provide some emission reductions from the freight sector, such a rule was estimated to be the costliest measure the District has ever enacted in terms of the compliance costs per pound of reduced emissions. The ISR Framework further informed the public and the Governing Board that if staff were to proceed with rule development, further technical analyses (including required socioeconomic and environmental impact studies), and public review would be necessary in accordance with State law to further assess and verify feasibility prior to rule adoption.

2.5 June 2023 Governing Board Meeting

In June 2023, the Governing Board approved staff's recommendation to convene a working group, otherwise known as the Warehouse Working Group (WWG), to further engage with stakeholders and to evaluate additional concepts to reduce emissions from warehouses and distribution centers. As part of its direction, the Governing Board also instructed staff to (1) prioritize under-resourced communities, (2) consider smaller warehouses and warehouses near sensitive receptors (e.g., residences, hospitals, schools, etc.), and (3) return to the October 2023 Governing Board meeting with a timeline

[7] SDAPCD, Options and Considerations for Reducing Indirect Source Emissions at Warehouses, Distribution Centers, and Ports [ISR Framework], May 2023, https://www.sdapcd.org/content/dam/sdapcd/documents/rules/warehouse-work-group/references/isr-framework-english.pdf

for action and proposed composition of the working group. The Governing Board also directed staff to pursue an MOU with the San Diego Unified Port District (Port District) that includes emissions reduction, facilitative, and health protective mitigation measures.

2.6 August 2023 Planning and Policy Committee Meeting

On August 2, 2023, District staff presented the draft timeline and potential composition of WWG participants, as well as a WWG Purpose Statement, to the SDAPCD Planning and Policy Committee. Feedback received by the Committee and stakeholders included requests to (1) expedite the projected timeline for possible regulatory action where feasible, (2) de-linking the timelines for possible regulatory and non-regulatory actions to accelerate implementation, (3) add representation to the list of possible working group participants, specifically from Tijuana-based organizations (such as the Mexican Consulate) and North/East San Diego County, and (4) begin developing proactive public messaging strategies on indirect sources and their corresponding emissions. Staff incorporated this feedback into attachments for the Board's consideration at the October Board meeting.

2.7 October 2023 Governing Board Meeting

In October 2023, staff presented an informational update to the Governing Board on the establishment of the WWG, potential working group participants, and a proposed tentative timeline for action as detailed in the Board letter attachment "Warehouse Working Group (WWG) Tentative Timeline and Possible Working Group Participants." The proposed scope and goal of the working group were provided in the attachment "Warehouse Working Group Purpose Statement." Feedback received from the Governing Board included adding representation from public health and/or physician groups to the working group participant list, a status update on the SCAQMD Rule 2305 litigation, and expanded outreach to communities impacted by warehousing activities.

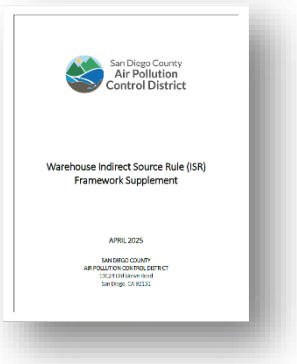
2.8 Warehouse Working Group Meetings

As directed by the Governing Board, between September 2023 and October 2024, staff conducted 10 virtual public meetings with Warehouse Working Group (WWG) participants, comprising almost 20 hours of in-depth, technical conversations about indirect source emissions. Over 90 stakeholders were invited, comprising of key local community, environmental, industrial, and government stakeholders, to collect varying perspectives from a wide variety of stakeholders. The group was not typically able to

reach a consensus on most topics. While such agreements were not anticipated, the WWG nonetheless continually provided thoughtful and meaningful information for the District's consideration.

2.9 April 2025 – ISR Framework Supplement

In April 2025, District staff prepared a report titled "Warehouse Indirect Source Rule (ISR) Framework Supplement."[8] The report, also referred to as the Supplement, presented an update to pertinent sections found in the initial ISR Framework for warehouses and distribution centers. The Supplement also provided new or updated information through analysis that was either directed by the Governing Board, Planning and Policy Committee, and/or discussed through the WWG.



2.10 June 2025 Governing Board Meeting

In June 2025, District staff presented a proposed MOU with the Port District for the Governing Board's consideration. The MOU incorporated voluntary commitments that will: (1) support installation of charging infrastructure for zero-emission vehicles and equipment; (2) further the transition to zero-emission cargo handling equipment; (3) continue and enhance the SDAPCD zero-emission truck pilot program and Port District zero-emission truck activities; (4) prioritize access to incentives and grants to help achieve shared Portside emission reduction goals; (5) reduce emissions from ocean going vessels and commercial harbor craft; (6) enhance public participation and transparency on Port District and SDAPCD projects in the Portside area; and (7) create additional opportunities to maximize air quality benefits from the Port's Maritime Industrial Impact Funding. The Governing Board approved the District to approve and enter into the MOU during the meeting. In July 2025, the Board of Port Commissioners also approved the MOU. On August 4, 2025, the MOU between the SDAPCD and the Port District became effective.

[8] SDAPCD, Warehouse Indirect Source Rule (ISR) Framework Supplement, April 2025, https://www.sdapcd.org/content/dam/sdapcd/documents/rules/warehouse-work-group/april-2025/isr-framework-supplement.pdf

3.0 SUPPLEMENT FINDINGS

The following are findings outlined in the Supplement that support the conclusion of this White Paper.

3.1 Emission Reductions

The estimated emission reductions from a potential warehouse ISR in San Diego County are projected to be significantly less than the reductions anticipated from other rulemakings.

3.1.1 Countywide

With an applicability threshold for warehouses 100,000 square feet or larger, the estimated maximum emission reductions from warehouses in San Diego County subject to a potential ISR are 13 tons per year of nitrogen oxide (NOx), and 0.1 tons per year of particulate matter (PM2.5). If the applicability threshold is lowered to warehouses 50,000 square feet or larger, the estimated maximum emission reductions from warehouses are 27 tons per year NOx, and 0.3 tons per year PM2.5.

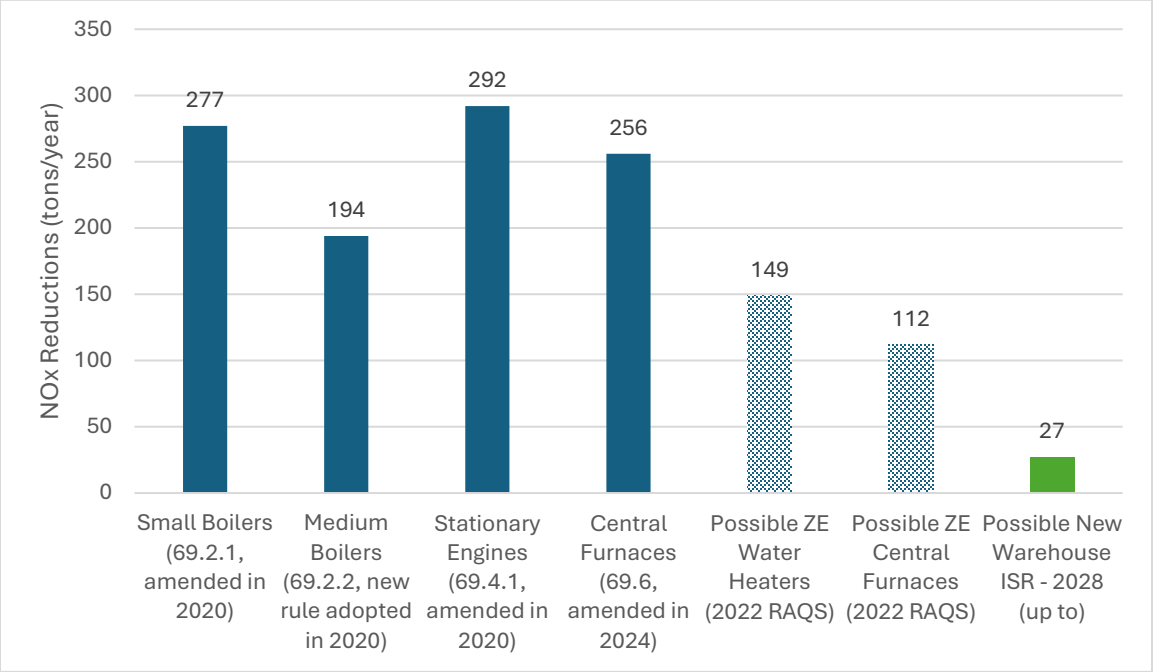
It's important to note that actual baseline emissions, and consequently emission reductions, are likely to be less in practice for a potential local warehouse ISR than the estimated values presented in the Supplement and should be considered best-case estimates. The analysis assumes that all the facilities identified in the various size categories conduct warehousing activities, and all would be subject to a potential warehouse ISR. However, based upon a case study of a specified geographic area conducted by staff and discussed in the Supplement, a significant portion of these facilities countywide are highly likely to be conducting non-warehousing activities (e.g., retail, office, or other light commercial use) in buildings classified as warehouses, and thus would not be subject to a potential warehouse ISR.[9] While the District used a conservative adjustment factor to account for such non-warehousing activities when estimating truck trip rates, a greater percentage of the warehouse inventory may not be conducting goods movement-related activities, and thus would not be subject to a potential ISR.

By way of comparison of recent rulemaking reductions to a potential warehouse ISR, in July 2020, the District adopted rules that are estimated to reduce NOx emissions upon full rule implementation from small boilers (Rule 69.2.1) by 277 tons per year, medium boilers (Rule 69.2.2) by 194 tons per year, and stationary engines (Rule 69.4.1) by 292 tons per year. Also, in November 2024 the District adopted amendments to its central

[9] Ibid., Section 2.7.4, pp. 46-49

furnace rule (Rule 69.6) that are estimated to reduce NOx emissions by 256 tons per year upon full rule implementation (Figure 1).

Figure 1 – Estimated NOx Reduction Comparison to Recent/Possible Future Rulemakings[10]



For future rulemakings, the District must evaluate rulemaking projects based on reducing emissions, improving public health, and supporting the attainment of the federal ozone standards as quickly as possible. For example, the estimated emission reductions for two "further study measures" outlined in the District's most recent air quality plan to attain state ozone standards, the "2022 Regional Air Quality Strategy" (RAQS), were also included in the Supplement and Figure 1. As noted in the 2022 RAQS, these control measures require a more detailed analysis to assess potential adoption/implementation in San Diego County. While they are scheduled to be evaluated during the next three years by staff, forthcoming State regulations could also mandate the need to amend corresponding local rules in a shorter timeframe.

For Further Study Measure FS-7, Zero-Emission Water Heaters, the possible incorporation of zero-emission standards for all new/existing water heaters has the potential to reduce NOx emissions by at least 149 tons per year (0.4 tons per day), if such

[10] Ibid., Figure 9, p. 36

limits were determined to be feasible, cost-effective, and adopted.[11] Proportioning this estimated emission reduction by population at the community level, this equates to 0.16% reduction in NOx in comparison to the baseline emission inventory for the Portside Community.[12] As shown in Section 3.1.2, a warehouse ISR could potentially reduce 0.07% of the NOx emission inventory for Portside, meaning Measure FS-7 could potentially provide more emission reductions to the Portside community than an ISR, if implemented. Similarly, the emission reductions associated with a zero-emission water heater rule equate to 0.48% reduction in NOx in comparison to the baseline emission inventory for the International Border Community.[13] Note that because this measure is not a current rulemaking and additional analysis will be needed, these are preliminary estimates that are subject to change.

For Further Study Measure FS-10, Zero-Emission Central Furnaces, the possible incorporation of zero-emission standards for all new/existing fan-type central furnaces has the potential to reduce NOx emissions by at least 112 tons per year (0.3 tons per day), if such limits were determined to be feasible, cost-effective, and adopted.[14] Proportioning this estimated emission reduction by population at the community level, this equates to 0.12% reduction in NOx in comparison to the baseline emission inventory for the Portside Community.[15] As noted above, this measure would also reduce more NOx in the Portside community than a warehouse ISR. Similarly, the emission reductions associated with a zero-emission central furnace rule equate to 0.36% reduction in NOx in comparison to the baseline emission inventory for the International Border Community.[16] Note that because this measure is not a current rulemaking and additional analysis will be needed, these are preliminary estimates that are subject to change.

The two further study measures identified (if determined to be feasible, cost-effective, and adopted) could provide NOx emission reductions in under-resourced communities and the region at large, and directly within the homes of all residents countywide, including in

[11] Approximately 0.63% of the regionwide NOx emission inventory (23,587 tons/year), per CARB CEPAM2019v1.04. The estimated emission reductions from a potential warehouse ISR are approximately 0.06% to 0.11% of the regionwide NOx emission inventory.
[12] Portside Community population = 53,049, Portside CERP, p.17; 2021 SD County population = 3,274,954, https://usafacts.org/data/topics/people-society/population-and-demographics/our-changing-population/state/california/county/san-diego-county/?endDate=2021-01-01&startDate=2010-01-01; NOx percent reduction = (1.62% x 149 tpy) / (1,462 tpy)
[13] International Border Community population = 64,400, International Border CERP, p. 22; 2024 SD County population = 3,298,799, https://www.california-demographics.com/san-diego-county-demographics; NOx percent reduction = (1.95% x 149 tpy) / (606 tpy)
[14] Approximately 0.47% of the regionwide NOx emission inventory (23,587 tons/year), per CARB CEPAM2019v1.04. The estimated emission reductions from a potential warehouse ISR are approximately 0.06% to 0.11% of the regionwide NOx emission inventory.
[15] NOx percent reduction = (1.62% x 112 tpy) / (1,462 tpy)
[16] NOx percent reduction = (1.95% x 112 tpy) / (606 tpy)

under-resourced communities. The measures could also provide greater NOx emission reductions to help support attainment of near-term federal ozone attainment deadlines in 2032.[17]

As shown in Figure 1 and discussed above, the estimated NOx emission reductions anticipated from a potential warehouse ISR are significantly less than the reductions from past rulemakings and the two further study measures discussed above. With limited resources available at the District to do rulemakings, it is necessary for the District to prioritize rulemaking projects that can effectively achieve both localized and regionwide emission reductions to the greatest extent practicable.

3.1.2 AB 617 Communities

In more localized areas where emission inventories have been quantified, staff determined the estimated emission benefits a potential ISR may achieve within the Portside and International Border Communities.

Portside Community

The Portside Community Emissions Reduction Plan (CERP) includes a baseline emission inventory for the entire community, including stationary, areawide, on-road, and off-road sources (Table 1).

Table 1 – 2018 Community Baseline Criteria Emissions Summary[18]

Source Category	NOx (tons/year)	ROG (tons/year)	PM_{10} (tons/year)	$PM_{2.5}$ (tons/year)
Off-road mobile	**922.4** (63.1%)	**317.8** (25.5%)	**36.2** (5.0%)	**34.4** (17.7%)
On-road mobile	**462.8** (31.6%)	**259.9** (20.8%)	**69.5** (9.5%)	**32.1** (16.6%)
Stationary Sources	**50.6** (3.5%)	**215.1** (17.2%)	**33.2** (4.6%)	**8.5** (4.4%)
Area Sources	**26.6** (1.8%)	**455.0** (36.5%)	**589.2** (80.9%)	**118.9** (61.3%)
Total (tons/year)	**1462.4**	**1247.8**	**728.1**	**193.9**

NOx: Nitrogen Oxides

ROG: Reactive Organic Gases

PM_{10}: Particulate Matter 10 Microns or Smaller

$PM_{2.5}$: Particulate Matter 2.5 Microns or Smaller

[17] Supplement, Section 2.4.3, pp. 33-37

[18] Portside CERP, Table 5, p. 37

Approximately 1,462 tons per year of NOx and 193 tons per year of PM2.5 are emitted within the Portside community. The maximum possible emission reductions associated with an ISR that were estimated within the Supplement for the Portside Community are up to 1.0 tons per year of NOx and 0.01 tons per year of PM2.5.[19] These equate to 0.07% reduction in NOx and 0.005% reduction in PM2.5, in comparison to the baseline emission inventory for the Portside Community. As previously mentioned, other potential future measures under consideration such as Zero-Emission Water Heaters and Zero-Emission Central Furnaces, are anticipated to result in a combined 0.28% reduction in NOx for the Portside community, in comparison to the baseline emission inventory for the Portside community, which is four times greater than what is anticipated from an ISR. These results suggest that an ISR, as proposed, may not provide significant local emission reduction benefit, and thus may not be an effective control strategy specifically for the Portside Community.

International Border Community

The International Border CERP includes a baseline emission inventory for the entire community, including stationary, areawide, on-road, and off-road sources (Table 2).

Table 2 – Summary of NOx, ROG, PM10, and PM2.5 Base Year 2021 Emissions in the Community[20]

Source Category	NOx		ROG		PM_{10}		$PM_{2.5}$	
Stationary	66	11%	209	29%	59	4%	47	4%
Areawide	14	2%	234	33%	1,227	93%	149	11%
On-Road	148	24%	129	18%	15	1%	6	0%
Off-Road	379	63%	147	20%	12	1%	12	1%
Total (tons per year)	606		720		1,313		213	

Approximately 606 tons per year of NOx and 213 tons per year of PM2.5 are emitted within the International Border community. The maximum possible emission reductions associated with an ISR that were estimated within the Supplement for the International Border Community are up to 4.2 tons per year of NOx and 0.04 tons per year of PM2.5.[21] These equate to 0.69% reduction in NOx and 0.02% reduction in PM2.5, in comparison to the baseline emission inventory for the International Border Community. As previously mentioned, other potential future measures under consideration, such as Zero-Emission Water Heaters and Zero-Emission Central Furnaces, are anticipated to result in a combined 0.84% reduction in NOx for the International Border community in comparison

[19] Supplement, Table 8, p. 34
[20] International Border CERP, Table 3, p. 19
[21] Supplement, Table 8, p. 34

to the baseline emission inventory for the International Border community, which is greater than what is anticipated from an ISR. These results suggest that an ISR, as proposed, may not provide as great of a local emission reduction benefit in comparison to other potential rulemakings under consideration, and thus may not be the most effective near-term control strategy specifically for the International Border Community.

3.2 Public Health Benefits

The estimated public health benefits, both regionwide and in under-resourced communities, of a potential warehouse ISR are less than the benefits anticipated from recent and potential future rulemakings.

3.2.1 Countywide

Quantifying the emission reductions to the anticipated health benefits using the EPA's CO-Benefits Risk Assessment Health Impacts Screening and Mapping Tool (COBRA) tool, implementation of a potential warehouse ISR could result in avoiding between 25 and 68 health-related incidences per year, and a potential savings of $313k to $1.1 million per year in associated regionwide healthcare costs, depending on the applicability threshold used and baseline year evaluated (Table 3).

Table 3 – Total Health Benefits for Scenario 3 (Low-NOx, ZEV, Other)[22]

Year	ISR Applicability Threshold (sq ft)	Change in Incidence (per year)				Total Health Benefits (per year)	
		Minor Restricted Activity Days	School Loss Days	Work Loss Days	Health Related Incidences (up to)[23]	Low Value	High Value
2028	100k and greater	6.3	17.0	1.1	32.6	$410,984	$514,534
2028	50k and greater	13.1	35.4	2.2	67.9	$854,940	$1,068,368
2032	100k and greater	5.1	12.7	0.9	24.6	$312,957	$395,797
2032	50k and greater	10.4	26.4	1.8	51.0	$646,898	$816,603

[22] Supplement, Table 10, p. 38

[23] Health related incidences include the following: total mortality; nonfatal heart attacks; infant mortality; total hospital admits, all respiratory; total emergency room visits, respiratory; total asthma onset; total asthma symptoms; emergency room visits, asthma; lung cancer; hospital admits (cardio-cerebro/peripheral vascular disease, Alzheimer's disease, Parkinson's disease); stroke; total hay fever/rhinitis; cardiac arrest, out of hospital; and emergency room visits, all cardiac (Appendix A – EPA COBRA Output Tables).

For comparison, the District's recent amendment to Rule 69.6 (Natural Gas-Fired Fan-Type Central Furnaces), which was estimated to reduce 256 tons per year of NOx regionwide, was anticipated to result in an estimated reduction of 617 negative health-related incidences per year in San Diego County. The potential regionwide savings of Rule 69.6 were estimated at $5.8 to $13.1 million per year in associated healthcare costs.[24]

As discussed in the previous section, Further Study Measure FS-7, Zero-Emission Water Heaters, has the potential to reduce NOx emissions by at least 149 tons per year (Section 3.1.1). Quantifying the emission reductions to the anticipated health benefits using the EPA's COBRA tool results in an estimated reduction of 625 negative health-related incidences per year in San Diego County.[25] The potential regionwide savings of the measure are estimated at $4.5 to $5.3 million per year in associated healthcare costs (Appendix A – EPA COBRA Output Tables).

Also discussed in the previous section, Further Study Measure FS-10, Zero-Emission Central Furnaces, has the potential to reduce NOx emissions by at least 112 tons per year (Section 3.1.1). Quantifying the emission reductions to the anticipated health benefits using the EPA's COBRA tool results in an estimated reduction of 470 negative health-related incidences per year in San Diego County. The potential regionwide savings of the measure are estimated at $3.4 to $4.0 million per year in associated healthcare costs (Appendix A – EPA COBRA Output Tables).

3.2.2 AB 617 Communities

Portside Community

As mentioned above, a warehouse ISR is projected to potentially reduce approximately 0.07% of the NOx Portside emission inventory per year, and 0.005% of the PM2.5 Portside inventory per year, in a best-case scenario. Quantifying the emission reductions to the anticipated health benefits using the EPA's COBRA tool results in small improvements in mortality, heart attacks, infant mortality, emergency room visits, asthma onset, and stroke (Appendix A – EPA COBRA Output Tables). When summed together, the change in health-related incidences is less than five overall per year (Table 4).

[24] SDAPCD, Final Staff Report – Amendments to Rule 69.6 Natural Gas-Fired Fan-Type Central Furnaces, November 4, 2024, Table 3, p. D-19, https://legistarweb-production.s3.amazonaws.com/uploads/attachment/pdf/2961677/Item_E3_AttD_Rule_69.6_Staff_Report.pdf

[25] https://cobra.epa.gov/

Table 4 – Portside Community Health Benefits for Scenario 3 (Low-NOx, ZEV, Other)

Year	ISR Applicability Threshold (sq ft)	Change in Incidence (per year)				Total Health Benefits (per year)	
		Minor Restricted Activity Days	School Loss Days	Work Loss Days	Health Related Incidences (up to)[26]	Low Value	High Value
2028	50k and greater	0.5	1.3	0.08	4.4	$32,075	$40,129

Note: Preliminary estimates subject to change.

International Border Community

As mentioned above, a warehouse ISR is projected to potentially reduce approximately 0.69% of the NOx International Border emission inventory per year, and 0.02% of the PM2.5 International Border inventory per year, in a conservative, best-case scenario. Quantifying the emission reductions to the anticipated health benefits using the EPA's COBRA tool results in some improvements in mortality, heart attacks, infant mortality, emergency room visits, asthma onset, and stroke (Appendix A - EPA COBRA Output Tables). When summed together, the change in health-related incidences is approximately 19 overall (Table 5).

Table 5 – International Border Community Health Benefits for Scenario 3 (Low-NOx, ZEV, Other)

Year	ISR Applicability Threshold (sq ft)	Change in Incidence (per year)				Total Health Benefits (per year)	
		Minor Restricted Activity Days	School Loss Days	Work Loss Days	Health Related Incidences (up to)[27]	Low Value	High Value
2028	50k and greater	2.0	5.6	0.35	18.6	$134,297	$167,663

Note: Preliminary estimates subject to change.

3.3 Compliance Costs

The estimated compliance costs of a potential warehouse ISR are greater than the costs anticipated from other rulemakings.

[26] Footnote 23
[27] Footnote 23

The average annual compliance costs that would be incurred by each local warehouse subject to a potential ISR are estimated to be between $29,000 and $49,000 per year. This equates to a total maximum estimated regionwide compliance cost between $11.9 to $19.3 million per year (Table 6).

Table 6 – Compliance Costs and Cost-Effectiveness for Scenario 3 (Low-NOx, ZEV, Other)[28]

ISR Applicability Threshold (sq ft)	Warehouse Building Count	Total Floor Area (sq ft)	Total Cost (per year)	Average Cost Per Warehouse (per year)	2028 Cost-Effectiveness ($/lb)	2032 Cost-Effectiveness ($/lb)
100k and greater	243	45,719,544	$11,932,039	$49,103	$464	$622
50k and greater	657	74,121,426	$19,344,457	$29,444	$362	$485

Note: Preliminary estimates subject to change.

For comparison, the District's new Rule 67.26 (Commercial Charbroiling Operations), adopted in August 2025, was estimated to incur a total countywide compliance cost of $790k to $2.6 million per year.[29] Another point of comparison is the District's Rule 69.2.2 (Medium Boilers, Process Heaters, and Steam Generators), which was adopted in 2020. Rule 69.2.2 was estimated to incur a total countywide compliance cost of $3.1 million per year (adjusted to 2024 dollars).[30] Both figures are substantially less than the estimated compliance costs of a potential warehouse ISR.

3.4 Cost-Effectiveness

The estimated cost-effectiveness values of a potential warehouse ISR significantly exceed those for other District rulemakings, as well as cost-effectiveness thresholds used in other air districts.

[28] Supplement, Table 11, p. 39

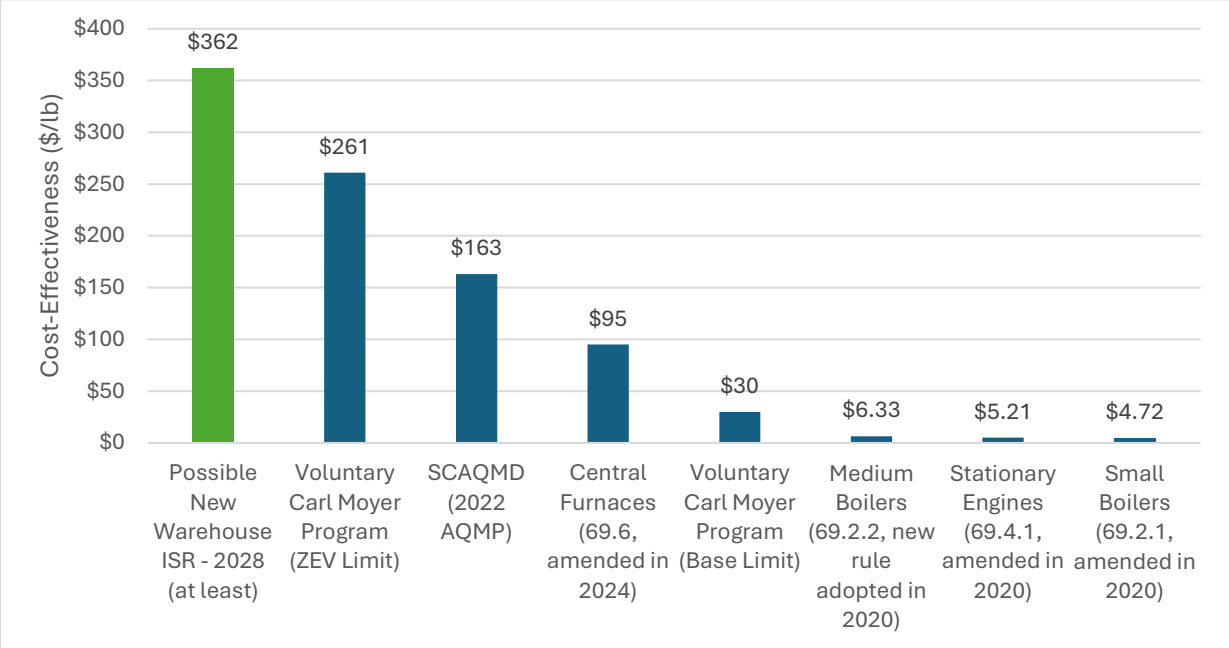
[29] SDAPCD, Final Staff Report – Proposed New Rule 67.26 – Commercial Charbroiling Operations & Corresponding Amendments to Rules 11, 12, and 40, July 2025, Tables 4 and 5, pp. G-16 and G-17, https://www.sdapcd.org/content/dam/sdapcd/documents/rules/rule-workshops/081425/Rule-67.26-Staff-Report.pdf. Estimated range of total compliance costs is (137 x $19,027/yr) and (137 x $5,768/yr).

[30] SDAPCD, Rule 69.2.2 (Medium Boilers, Process Heaters, and Steam Generators), Board Package, Attachment C - Incremental Cost-Effectiveness Analysis, Table 1, p. C-1, https://www.sdapcd.org/content/dam/sdapcd/documents/rules/rule-archive/2020/Rules-69.2.2-11-12-Board-Package.pdf. The total annualized cost was adjusted from 2018 to 2024 dollars using the ratio of the respective average consumer price indices for those years, https://inflationdata.com/Inflation/Consumer_Price_Index/HistoricalCPI.aspx?reloaded=true.

As noted in the Supplement, preliminary cost-effectiveness estimates for a potential warehouse ISR in San Diego County currently range between $362 to $464/lb of NOx reduced in 2028. The cost-effectiveness values are estimated to increase to a range between $485 and $622/lb in 2032 as NOx emission reductions are anticipated to decrease each year due to increasing emission benefits from various CARB mobile source regulations.[31]

The estimated cost-effectiveness value for a potential ISR (between $362 and $622/lb) greatly exceeds the cost-effectiveness values estimated for other recent District rulemakings ($95/lb or less). The estimated cost-effectiveness value for a potential ISR also exceeds the value for incentive-based projects within the Carl Moyer program (approximately $261/lb), which are generally recognized as some of the highest cost-effectiveness values for achieving emission reductions (Figure 2).

Figure 2 – Cost-Effectiveness Comparison to Recent Rulemakings and Incentive Programs[32]



In regulating and controlling air quality, a higher cost-effectiveness value is generally considered as a negative indicator since it requires more money (either by the emitter, or by the District) to achieve emission reductions on a per pound basis. For example, a cost-effectiveness value of $100/lb is considered less favorable than $10/lb, because it would

[31] Supplement, Section 2.5, p. 39
[32] Ibid., Figure 10, p. 40

cost the emitter or the District ten times as much as the second value to achieve the same level of emission reductions.

California Health and Safety Code Section 40703 requires that prior to adopting any regulation or rule, air pollution control districts shall consider, pursuant to Health and Safety Code Section 40922, and make available to the public its findings related to the cost-effectiveness of a control measure, as well as the basis for the findings and the considerations involved. Air districts typically try to minimize economic impacts to the extent practicable when controlling emissions. Since a potential ISR in San Diego County is likely to far exceed the cost-effectiveness of other recent rulemakings and incentive programs, the District could likely achieve the same emission reductions through other programs at a far lower cost to implement (either by industry compliance, or voluntarily through District incentive programs).

Additionally, a new health-based rule development cost-effectiveness threshold found at the South Coast Air Quality Management District (SCAQMD), which equates to $325,000/ton of NOx reduced ($163/lb, rounded), is also included in Figure 2 for comparison. While each air district's cost-effectiveness threshold differs, SCAQMD is generally recognized as having one of the highest, if not the highest, rule development cost-effectiveness threshold in the nation due to that district's need to reduce air pollution even at extremely high costs. The SCAQMD uses this screening criteria to evaluate and screen out possible NOx emission reduction measures to determine the measures that are cost-effective to pursue rulemaking.

The cost-effectiveness of a possible new warehouse ISR in San Diego County, estimated at a minimum of $362/lb, is more than double the SCAQMD's new health-based threshold of $163/lb.[33] Thus, based on their health-based rule development cost-effectiveness threshold of $163/lb, it stands to reason that the SCAQMD may have prioritized other compliance or implementation options, i.e., alternatives to their warehouse Rule 2305, if the cost-effectiveness for their rule was as high as the estimated value for a potential warehouse ISR for San Diego ($362/lb).

District staff derived the cost-effectiveness values estimated for Rule 2305 to be an average of $235/lb to $261/lb.[34] These derived values are greater than the SCAQMD's new health-based threshold of $163/lb. Although the estimated average cost-effectiveness of SCAQMD Rule 2305 was greater than their health-based threshold of $163/lb used for rule development purposes, the SCAQMD does note that their threshold

[33] Ibid., Section 2.5, pp. 38-40

[34] SCAQMD, Rule 2305, Warehouse Indirect Source Rule – Warehouse Actions and Investments to Reduce Emissions (WAIRE) Program, Staff Report, May 2021, Table 23, p. 77, http://www.aqmd.gov/docs/default-source/Agendas/Governing-Board/2021/2021-May7-027.pdf?sfvrsn=10

is neither considered a starting point for control costs, nor an absolute cap, and is thus not an absolute method for determining to proceed with rule development action.[35]

The Supplement's minimum cost-effectiveness estimate of $362/lb is also greater than SCAQMD's estimates for Rule 2305 because the total annual compliance costs for San Diego County were estimated using a weighted annual cost of $0.26/sq ft.[36] This increase in the estimated compliance costs was due to a greater average cost per square feet used in the Supplement ($0.26/sq ft) than the average costs presented in SCAQMD's Socioeconomic Impact Assessment report, which staff derived as $0.10 to $0.14/sq ft.[37] For comparison, the average annual costs estimated for SCAQMD's Rule 2305 range from -$0.02/sq ft (the lowest cost scenario, Scenario 10: ZE Class 6 Visits from a Non-owned Fleet) up to $1.21/sq ft (the highest cost scenario, Scenario 11: Solar Panel Installations). According to the SCAQMD, the maximum cost warehouse operators would be expected to incur in complying with Rule 2305 is $0.83/sq ft/yr resulting from the mitigation fee scenario.[38]

The weighted annual cost ($0.26/sq ft) used in the Supplement was derived as a potential "achieved-in-practice," i.e., more realistic, scenario based on the reported implementation rates in the SCAQMD region of certain Low-NOx and ZE compliance options that would result in direct emission reductions at subject facilities. The scenario also reflects the true cost of compliance because it accounts for facilities accruing WAIRE points through the "Other" category, which includes alternative options such as mitigation fees and air filtration installations. It's important to note that the scenario is an approximation only and was based on the reported implementation rates in the SCAQMD region, which is the best information currently available. Due to multiple compliance options that would be available in a potential warehouse ISR that operators may select from, and other characteristics unique to the San Diego region (e.g., warehouse size distribution), staff cannot forecast the implementation rates that may occur for future years in the San Diego region.[39]

These points illustrate how emission reductions, costs, and overall benefits of a rule are generally unique to each air district, and how a rule may achieve varying results in different regions. The SCAQMD, and other air districts that might adopt warehouse ISRs in the future, may achieve greater benefits with an ISR than estimated for San Diego County due to the number of large warehouses (100,000 sq ft or larger) in each region.

[35] SCAQMD, 2022 Air Quality Management Plan, December 2, 2022, p. 4-76, https://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2022-air-quality-management-plan/final-2022-aqmp/final-2022-aqmp.pdf?sfvrsn=16
[36] Supplement, Section 2.5, p. 38
[37] Ibid., footnote #67, p. 38
[38] SCAQMD, Rule 2305, Socioeconomic Impact Assessment, pp. ES-6 and ES-7
[39] Supplement, Section 2.4.2, p. 32

SCAQMD has over 3,000 large warehouses, and Bay Area AQMD has over 1,000. In comparison, there are approximately 240 large warehouse buildings in San Diego County.

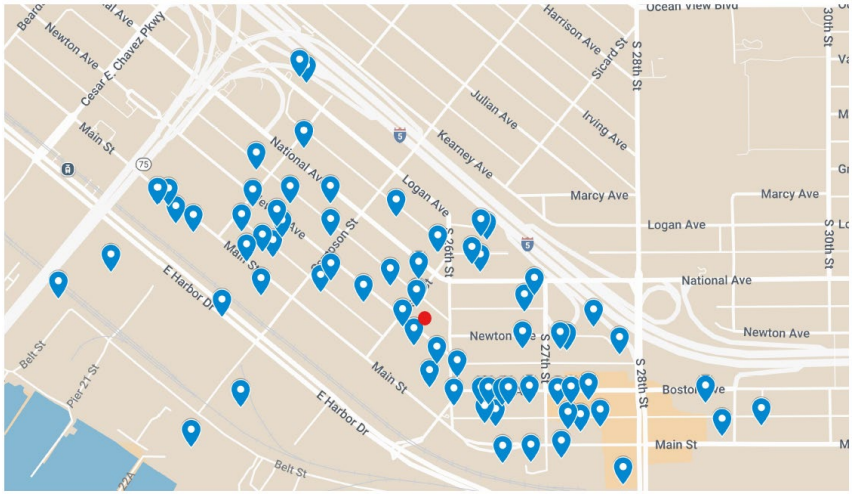
3.5 District Study of Warehouse Facilities in the Portside Community

A substantial percentage of the facilities identified as "warehouses" in the District's inventory may not be conducting warehousing activities. This will likely reduce the number of facilities that would potentially be subject to a potential warehouse ISR.

As noted in the Supplement, in December 2024, staff conducted an informal case study of warehouses in the Portside community located in the vicinity of a specific sensitive receptor. In all, staff researched 70 buildings classified in the CoStar inventory as a "warehouse" to better determine how many facilities may be conducting goods-movement related activities that would likely be subject to a possible warehouse ISR.

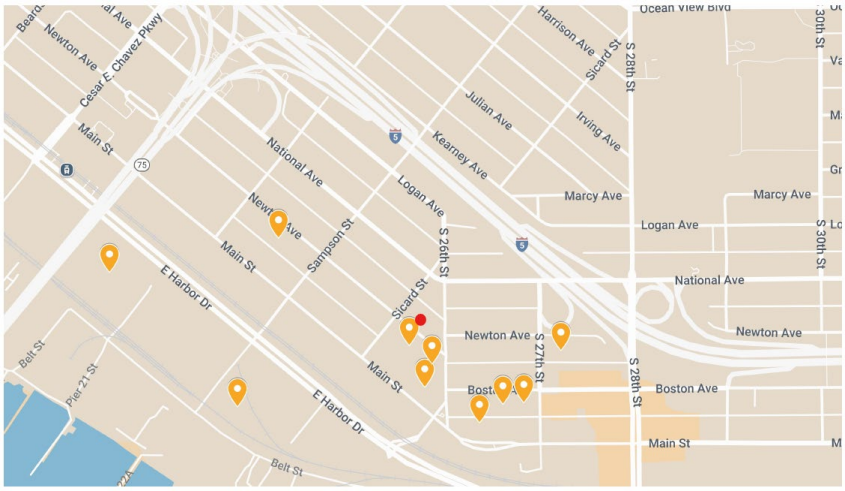
Figure 3 shows the 70 warehouse building locations (in blue) assessed around the sensitive receptor selected in the sample area in the Portside community. Figure 4 shows within the same sample area the warehouse building locations (in yellow) that staff identified as likely to be subject to a possible warehouse ISR due to their size and operational characteristics. The red dot on both maps indicates the location of the sensitive receptor assessed.

Figure 3 – Warehouse Building Locations Assessed[40]



[40] Ibid., Figure 11, p. 48

Figure 4 – Warehouse Building Locations Potentially Subject to a Possible ISR (if developed)[41]



The findings concluded that: (1) many facilities did not appear to be doing prototypical goods-movement activities, (2) it is uncertain whether smaller facilities would have adequate pathways to comply with a potential ISR similar in scope to SCAQMD Rule 2305, and (3) approximately 14% of the 70 facilities researched were likely be conducting goods-movement related activities.

The study's findings indicate that the potential emission reductions that may be realized from a potential ISR in San Diego County are likely to be less in practice than the estimates presented in the Supplement, regardless of whether smaller warehouses (less than 50,000 square feet) are included in a warehouse ISR or not. According to the preliminary findings in the study, of the 70 sample warehouse buildings researched, an estimated 64% (45 out of 70) of those facilities do not appear to be involved in goods-movement activities at all (e.g., educational facility, residential housing, and a church).[42]

Applying this value of 64% to the warehouse inventory in the Portside community to account for facilities that are not likely conducting warehousing activities, would reduce the estimated emission benefits in the Portside community from a potential ISR to 0.1 – 0.4 tons per year of NOx, and 0.001 – 0.004 tons per year of PM2.5 for the 2028 baseline year. Applying the same 64% value to the warehouse inventory countywide, would reduce the estimated emission benefits for the region to 5 – 10 tons per year of NOx, and 0.04 – 0.11 tons per year of PM2.5 for the 2028 baseline year. Both metrics reinforce that actual implementation of a warehouse ISR in San Diego County, would likely achieve less emission reductions than estimated to date.

[41] Ibid., Figure 12, p. 49
[42] Ibid., Section 2.7.4, pp. 46-49

It is possible that other regions of the county may have higher or lower percentages of warehouses conducting goods movement activities. Regardless of the exact percentage in each area, the results indicate that not all of the facilities identified in the warehouse building inventory are conducting prototypical warehousing activities, and thus may not be emitting indirect source emissions. Thus, the actual emission reductions are likely to be less than the estimates presented in the Supplement if a potential ISR is implemented.

3.6 District Costs for Rule Development and Administration

The estimated one-time and on-going District costs for rule development and administration are substantial in light of current fiscal uncertainty.

In the Supplement, staff re-evaluated the potential costs associated with rule development, implementation, and administration of a possible warehouse ISR in San Diego County, including ongoing rule development, administration, outreach, possible litigation defense, and enforcement activities. Such costs include the items listed below, which are subject to revision during a possible future formal rulemaking process. While "direct" costs associated with implementation of the program could potentially be recouped through District fees, other "one-time" costs would likely not be recoupable, unless the District received a one-time grant and/or other funding contributions for such work.

One-time cost estimates

- $250,000 to prepare required California Environmental Quality Act (CEQA) documentation.
- $250,000 to prepare required Socioeconomic Impact Assessment (SIA) documentation.
- $200,000 to develop a new District web portal for reporting requirements.
- $135,000 for District/County legal costs to defend a potential ISR if litigated.

Ongoing cost estimates

- Up to $900,000 per year (ongoing) for additional staff to administer the program (e.g. report evaluation, compliance, outreach activities).
- $25,000 per year (ongoing) to annually maintain the District web portal.
- $75,000 per year for enhanced enforcement-related actions (if necessary).
- Unknown outside legal counsel costs if a potential ISR is litigated (if necessary).

Staff believe ongoing costs associated with the direct implementation of the program (e.g., costs associated with reviewing, evaluating, and enforcing standard rule provisions) could potentially be recouped by District fees. However, costs associated with CEQA

document development, SIA development, web portal development, internal/external legal counsel, and enhanced enforcement activities may not be recouped through fees alone, though legal judgments, grants, and/or enforcement agreements could potentially recoup some costs incurred.[43]

In the District's fiscal year 2025-2026 adopted budget, approximately $184,000 is potentially available for a contracted consultant to prepare the required CEQA and SIA documents if a formal warehouse ISR rulemaking were to be initiated. However, staff estimate $500,000 total would be needed to prepare the CEQA and SIA documents and that preparation of both documents would take approximately 12 months to complete.

Additionally, the FY 25-26 budget does not include funds for the development of a new District web portal for report submissions ($200,000), as well as potential legal costs for defending litigation if necessary ($135,000 estimate).

If the District were to proceed with formal rulemaking for a potential warehouse ISR, the potential estimated costs would likely require the reallocation (or diversion) of funds from other District programs towards the development of a local warehouse ISR in future fiscal years, unless the District received one-time grant money and/or other contributions. Concurrently, there is also significant uncertainty regarding the availability of funding from federal and state sources, which could further decrease available funds that could be available for such work in the District's budget, or with other high priority programs. The projected funding needed to start implementing a potential warehouse ISR, coupled with long-term funding uncertainty, could put significant strain on the District's existing and future budgets, jeopardize District efforts for full cost-recovery of operations, and could reduce existing emission reduction and monitoring programs already being implemented.

3.7 Implementation and Compliance Efforts

A warehouse ISR in San Diego County modeled after the South Coast Air Quality Management District (SCAQMD) Rule 2305, which is the only warehouse ISR that has withstood litigation to date, is anticipated to require significant District staff effort for program implementation, outreach, and compliance/enforcement activities.

If a potential warehouse ISR were to be developed, the District has determined that an ISR would need to be modeled after SCAQMD Rule 2305 to minimize potential legal challenge. This is because Rule 2305 was upheld in federal court and later approved by the EPA. Any significant deviation from the model of Rule 2305 could potentially result in legal challenge of a local warehouse ISR on untested legal grounds. In addition, the

[43] Ibid., Section 2.6, pp. 40-42

District could be at risk of administering a unique program that may not be consistent with a potential statewide indirect source regulation if one is developed by CARB in the future. An inconsistent program could then necessitate the need to do a "clean-up" rulemaking, which could result in additional costs and resources not already accounted for. Staff efforts to implement and conduct outreach and compliance/enforcement activities for a program modeled after Rule 2305 are anticipated to be resource intensive, as described below.

Below are some key highlights presented by SCAQMD staff on their "2nd Annual Report for the Warehouse Actions and Investments to Reduce Emissions (WAIRE) Program." The report provides an overview of the WAIRE Program's implementation from Rule 2305 adoption on May 7, 2021, through August 31, 2024. Additional outreach totals are included as were reported at the SCAQMD Mobile Source Committee on October 17, 2025.

- Low levels of warehouses reporting: 28% - 43% submission rate of the expected annual reports from warehouses subject to Rule 2305.
- Significant SCAQMD outreach efforts: 21,875+ compliance advisories sent; 18,400+ calls and emails to the SCAQMD program hotline; 4,800+ in-person staff visits; over 150 presentations to stakeholders.[44]
- Notices of Violation (NOV): Over 725 Notices of Violation (NOV) issued to warehouses subject to Rule 2305 for failure to submit required reports.[45]

The results above indicate the District would in all likelihood need additional staffing to implement a similar warehouse ISR program for San Diego County. While ongoing staff costs may potentially be recouped by District fees, additional resources will likely be necessary to adequately handle the anticipated significant increase in workload. This work would include, but is not limited to, reviewing submitted reports, conducting stakeholder outreach and engagement activities, and enforcement actions for non-compliance.

For context, the District currently issues and maintains a total of approximately 8,300 Permits to Operate in San Diego County. The introduction of a potential ISR that applies to facilities greater than 50,000 sq. ft. may potentially add up to a maximum of 657 new facilities (i.e., warehouses) to the District's enforcement caseload, which equates to an almost 8% increase in a short period of time, although as noted above the number of facilities ultimately subject to a potential rule is likely to be lower. The District anticipates

[44] Ibid., Section 2.7.1, pp. 43-44

[45] SCAQMD, Rule 2305 Implementation Status Report: Warehouse Actions and Investments to Reduce Emissions (WAIRE) Program, October 17, 2025, p. 47, https://www.aqmd.gov/docs/default-source/agendas/mobile-source/msc-agenda-101725.pdf?sfvrsn=a2d36c7e_9

that staff costs to maintain these new permits could potentially be recouped through permit fees, and that an increase in staffing could occur incrementally to coincide with the phasing in of rule requirements. However, an increase of this magnitude in enforcement caseload (not including the additional activities conducted by SCAQMD staff) would nonetheless strain existing resources until such resources could be procured and costs recouped. Additionally, due to the uncertainty on the number of warehouse locations that could be subject to a potential ISR (Section 3.5), and present uncertainty with the level of funding overall that could be allocated to the District (Section 3.6), additional analysis of these factors would be needed before developing a warehouse ISR.

4.0 ADDITIONAL CONSIDERATIONS

The following are additional items considered by the District that informed the conclusion of this White Paper.

4.1 SCAQMD Rule 2305

SCAQMD Rule 2305 was developed with the goal of reducing regional emissions to attain the federal and state Ozone and PM2.5 ambient air quality standards while achieving localized emission reductions as a co-benefit.

Per the California Health and Safety Code (H&SC), the SCAQMD is required to adopt an Air Quality Management Plan (AQMP) to demonstrate compliance with both federal and state ambient air quality standards for SCAQMD's jurisdiction. The AQMP is a blueprint for meeting federal and state air quality standards, which include the National Ambient Air Quality Standards (NAAQS) for the SCAQMD jurisdiction. On March 3, 2017, SCAQMD's Governing Board adopted the 2016 AQMP. To attain the federal ozone and PM 2.5 NAAQS, the 2016 AQMP relies on reducing regional NOx emissions as a primary strategy (NOx is a precursor to the formation of both ozone and PM 2.5) but also includes measures to reduce directly emitted PM 2.5.

In the 2016 AQMP, the SCAQMD committed to assist CARB and U.S. EPA in developing the Further Deployment Measures, including through the development of local Facility Based Mobile Source Measures (FBMSMs). One of the FBMSMs includes MOB-03 – Emissions Reductions at Warehouse Distribution Centers. After considering the results of a year-long process for SCAQMD staff to evaluate potential emissions reduction strategies for the FBMSMs, in May 2018, the Governing Board directed staff to initiate rulemaking for a warehouse Indirect Source Rule (ISR), namely Proposed Rule (PR) 2305 - Warehouse Indirect Source Rule – Warehouse Actions and Investments to Reduce Emissions Program, and PR 316 – Fees for Rule 2305.[46]

Thus, Rule 2305 was developed with the intent to reduce regional emissions to attain the federal and state Ozone and PM2.5 ambient air quality standards. As a co-benefit, Rule 2305 would provide localized health benefits, particularly for those living in close proximity to a subject warehouse.[47] While a potential warehouse ISR for San Diego may similarly help to reduce regional and localized emissions, staff estimate that other measures implemented in San Diego County could achieve greater NOx emission reductions in support of attaining federal ozone and particulate matter standards.

[46] SCAQMD, Rule 2305, Staff Report, pp. 7-9
[47] Ibid., p.16

4.2 Stakeholder Comments

The District considered applicable comments received.



The following are summaries of comments received by the District on the Supplement and a potential warehouse ISR. The District is not required per state law (California Environmental Quality Act) to provide written responses to these comments received because the CEQA process does not apply simply to the District's consideration of a warehouse ISR, which is not yet a rulemaking project. Nonetheless, feedback is included here to acknowledge that the comments received were considered by the District.

4.2.1 Written Comments

The District received written comments from various stakeholders following the public release of the Supplement on April 15, 2025.[48] Some key comments received (*in italics*) are summarized below along with District feedback.

1. *Implementing an appointment system at the Otay Mesa Cargo Port of Entry presents a more practical, cost-effective solution for reducing emissions than a proposed ISR.*

   This comment was similarly discussed in the Supplement.[49] It is still uncertain whether an appointment system would provide emission reduction benefits. Short and long-term emissions models may be necessary to determine if such a project would result in induced demand at the Otay Mesa Port of Entry (POE) over time. This could potentially increase emissions due to a possible increase in truck traffic. A pilot project at the POE in Calexico currently in the conceptual stage may provide additional information on the effectiveness of such an appointment system. However, the District's role in the planning, development, and implementation of such a system would be limited because Caltrans is the main project lead in Calexico. Furthermore, it is uncertain whether the District would have the regulatory authority to require and/or set up the proposed system. The District will continue to monitor the progress of the Calexico appointment system project. If the

[48] https://www.sdapcd.org/content/dam/sdapcd/documents/rules/warehouse-work-group/april-2025/Comments.pdf; and https://www.sdapcd.org/content/dam/sdapcd/documents/rules/warehouse-work-group/comments/additional-comments.pdf

[49] Supplement, Section 2.1.5, pp. 13-14

project results in short and long-term emission reductions, the District could consider supporting a similar project in the future at the Otay Mesa Cargo POE.

2. *Goods movement is important to the economy of the San Diego region, as it supports jobs and ensures the availability of essential goods. Having warehouses in the region can improve access of distributors to their customers, which include both retail outlets and people ordering products for delivery to their own homes. The [Supplement] notes that it is necessary to consider "whether an ISR specifically in San Diego County would result in tenants moving their operations out of the county or state, or into Mexico to avoid becoming subject to a local ISR. If operations were moved into Mexico or a neighboring county, those emissions may potentially continue to impact San Diego air quality." We would like to emphasize this consideration.*

   As a result of Rule 2305 being implemented, SCAQMD staff did not expect warehouse relocation, and anticipated minimal goods movement diversion.[50] However, the impact for San Diego County from a local ISR is uncertain considering the region's proximity to a shared border with Mexico, and the daily movement of goods that currently occurs across the international border. Consequently, an SIA is needed to determine such potential impacts for San Diego County. Additionally, economic uncertainties involving tariffs at the federal level could represent an additional cost and/or factor that might result in operations moving from the San Diego County region to Mexico and vice versa. This aspect and others would need to be fully assessed in an SIA for San Diego County since these factors could not be accounted for in the Supplement.

3. *Under any scenario in which rules cause higher shipping costs, there will be some decline in marginal economic activity, loss of jobs/economic output locally and nationally, and an accompanying rise in prices throughout the chain from producer to consumer. These losses may or may not be modest in comparison to benefits.*

   According to the SCAQMD's SIA, based on the compliance cost of Rule 2305, it is projected that -240 to 11,100 jobs would be forgone on average annually from 2022 to 2031 in total across all SCAQMD industries for the low-cost (Scenario 10) and high-cost (Scenario 7) scenarios. Scenario 10 assumes all potentially affected warehouse operators comply with Rule 2305 through third party visits from Class 6 zero-emission vehicles, while Scenario 7 assumes all potentially affected

[50] SCAQMD, Rule 2305, Socioeconomic Impact Assessment, p. ES-7

warehouse operators comply with Rule 2305 by paying a mitigation fee and not receiving any funds from the mitigation fee for future compliance with Rule 2305.

Estimated forgone jobs are not currently existing jobs which are lost in the future. Rather, they are jobs which were expected to be created in the future which are no longer expected to be created, as the total number of jobs in the compliance period is higher than the total number of jobs before the compliance period. In effect, this results in a stifling of job creation. Additionally, the negative jobs forgone values presented for Scenario 10 are indicative of estimated additional jobs created if all facilities complied in the manner modeled in Scenario 10.[51]

Jobs may similarly be forgone in San Diego County if a local ISR is developed, though likely at a smaller scale than those projected for SCAQMD due to less industry and warehouse population in the region. An SIA would need to be prepared to determine such impacts for the region.

4. *Implementation of Assembly Bill (AB) 98 is anticipated to reduce truck traffic and other impacts from new warehouses. Adding an ISR [in San Diego County] could make it especially difficult to develop and operate new warehouses despite the building standards, truck routes, and other mitigations required by the law.*

While AB 98 imposes strict requirements to new/expanded warehouses greater than 250,000 sq. ft. in size, it also includes requirements for new/expanded warehouses smaller than that size threshold. For example, for new/expanded warehouse sites under 250,000 sq. ft. zoned in industrial areas, requirements include: (1) complying with the most current building energy efficiency standards; (2) providing conduits at every loading bay serving cold storage; (3) prohibiting the use of auxiliary truck engine power to power refrigeration; (4) using high-efficiency HVAC systems; (5) orienting loading bays on the opposite side of the building from sensitive receptors; (6) having a separate entrance for heavy-duty trucks; (7) locating truck entrances/exits and internal circulation away from sensitive receptors; and (8) using at least 50 feet of landscape buffering along sensitive receptors.

For new/expanded warehouse sites smaller than 250,000 sq. ft. in a location not zoned for industrial use, the requirements are similar, but in some cases more stringent. Such requirements would include the following, in addition to those listed above: (1) comply with 21st Century Warehouse design elements; (2) use at least 100 feet of landscape buffering along sensitive receptors instead of 50 feet; (3)

[51] Ibid., p. ES-7

ensure all truck loading bays be setback 500 feet from any property line abutting a sensitive receptor; or (4) rezone as applicable.[52]

Operators of new or expanded warehouses are subject to the requirements of AB 98 as of January 1, 2026. This would be in addition to the requirements of a potential local warehouse ISR if adopted, though some requirements would be complementary to one another. For example, a local ISR would include a menu of compliance options to choose from, such as the operation of zero-emission cargo handling equipment. If the proposed new facility has requirements to only use zero-emission cargo handling equipment to comply with AB 98, in practice, the proposed new facility could potentially comply with both AB 98 and a local ISR by opting to use zero-emission cargo handling equipment. Considering that operators at new or expanded warehouses would be subject to the requirements of both AB 98 and a potential local ISR, having to comply with the regulations could have the effect of stifling the development and/or expansion of such operations in San Diego County.

5. *We encourage APCD to assist businesses in the San Diego region with complying with existing federal, state, and local rules rather than adding additional rules specific to the region.*

District staff engage regularly with affected industry to assist with compliance with federal, state, and local rules and regulations. One example of this engagement is through the District's current Business Assistance Program, which provides sites with courtesy inspections, permitting assistance, and training opportunities to facilitate compliance and for sites to be informed about regulations at all levels of government.[53] The District acknowledges that with the potential adoption of a warehouse ISR such engagement efforts would need to be significantly enhanced.

[52] AB 98 defines "21st century warehouse" as meaning a logistics use that meets all of the following: (1) complying with or exceeding all requirements of the most current building energy efficiency standards including but not limited to photovoltaic system installation and battery storage, cool roofing, medium and heavy-duty vehicle charging readiness, and light duty electric vehicle charging readiness and installed charging stations, (2) skylights in at least 1% of the roof area or equivalent LED efficient lighting, (3) providing conduits at every loading bay serving cold storage and prohibiting the use of auxiliary truck engine power to power refrigeration, (4) using high-efficiency HVAC systems, (5) pursuant to CARB's Zero-Emission Forklifts regulation, ensuring all forklifts used on-site are zero-emission by 1/1/2030 to the extent operationally feasible, and (6) pursuant to CARB's SORE regulation, ensuring all small off-road engines used on-site are zero-emission to the extent operationally feasible, https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=202320240AB98#96CHP.

[53] https://www.sdapcd.org/content/sdapcd/compliance/business-assistance.html

Pursuant to federal and state law, the District adopts new and amended rules to support attainment of federal and state ambient air quality standards, and to meet federal, state, and local requirements. The District balances these obligations along with and in parallel to the goal of improving air quality in under-resourced communities pursuant to separate state law, and with resources to implement such obligations. In addition, the District administers several state, federal, and local funding programs to assist businesses with reducing emissions from mobile sources that go above and beyond the requirements of any regulation.

6. *An ISR would likely take many years to develop and may even jeopardize a warehouse owner/operator's ability to qualify for future state funding for cleaner vehicles and equipment, should certain voluntary emission reduction measures become required.*

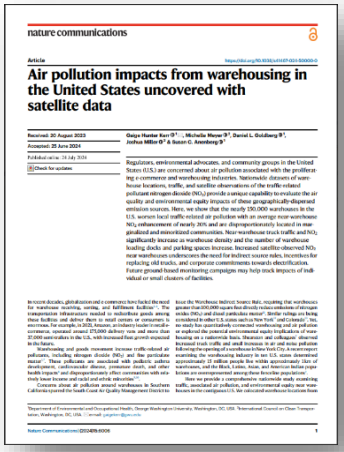
   If the District pursues formal warehouse ISR rulemaking, it is anticipated that a rule would not be effective until 2028 at the earliest. At that point, if adopted, an ISR would likely impede incentive funding opportunities for any warehouse owner/operator subject to the rule, including funding for zero-emission trucks and infrastructure. Many of the District's incentive programs utilize state or federal funding, which typically include requirements to ensure the funds are being used in "surplus" to existing rules or regulations and between 1-3 years in advance of regulatory deadlines. As such, potentially affected facilities planning to use incentive funding to comply with a potential warehouse ISR (if adopted) in the same year, would likely be ineligible for such funding. To avoid potential incentive funding complications, the District strongly encourages warehouse owners or operators who are planning to apply to the District for incentive funding, to apply as early as possible to such incentive programs, and in advance of any potential local or statewide warehouse ISR (if developed).[54] This would ensure that their equipment is as clean as possible prior to any potential future regulatory requirements, either at the local or state level, potentially limiting possible regulatory requirements.

7. *SCAQMD Warehouse Indirect Source Rule 2305 did not receive any creditable emission reductions from EPA. It is, therefore, reasonable to assume that a rule modeled after the South Coast's program would then not receive any SIP credit for emission reductions.*

[54] Information about available funding opportunities is available on the District's webpage, https://www.sdapcd.org/content/sdapcd/grants.html.

According to the EPA, if the SCAQMD corrected specific deficiencies relating to enforceability in Rule 2305, they could receive SIP credit (i.e., full approval) for the emission reductions achieved rather than a measure that simply "strengthens" the State Implementation Plan (SIP).[55] At this time, it is uncertain whether SCAQMD will amend their rule to correct those deficiencies. While SIP-creditable emission reductions are generally preferred for such measures, they are not always critically needed. If the District elected to pursue a warehouse ISR in the future, the District could potentially address these deficiencies to the extent feasible prior to submittal to the U.S. EPA. Regardless, under the current federal Administration it is uncertain whether a warehouse ISR for San Diego County would be approvable by the EPA.

8. *Staff's methodology is flawed in determining warehouse size and truck volumes, especially considering the District's refined analysis of CoStar "warehouses." As noted in the Kerr et al. study, if it was the case that the size of the facility correlated so strongly with increased truck volume/visits, then [the Kerr et al. study's] findings would have also indicated as such.[56]*


nature communications

Article

Air pollution impacts from warehousing in the United States uncovered with satellite data

Staff analyzed the data used in the Kerr et al study referenced in the comment. The results of the analysis indicate a strong correlation between warehouse floor area and on-road NOx emissions, 0.99, and between warehouse floor area and annual average daily traffic, 0.97 to 0.99 (Appendix B – Kerr Study Analysis). A correlation coefficient of 1 indicates a perfect positive correlation, which means that when one variable changes, the other variable changes in the same direction. This means that as warehouse square footage increases, on-road emissions and annual average daily traffic also proportionately increases.

9. *The Warehouse ISR concepts explored in the Framework Supplement are limited to compliance options available in the SCAQMD Warehouse Indirect Source Rule (Rules 2305 and 316), and do not properly consider the unique context of*

[55] 89 FR 73568, https://www.federalregister.gov/d/2024-20349/p-34. In the EPA's approval of Rule 2305, three specific types of deficiencies related to enforceability were identified: (1) two ambiguous definitions; (2) the sunset clause; and (3) two instances of unbounded director's discretion.

[56] Kerr et al, Air pollution impacts from warehousing in the United States uncovered with satellite data, July 24, 2024, https://www.nature.com/articles/s41467-024-50000-0#Sec4

warehousing operations in San Diego or its localized impacts on warehouse-adjacent communities. As a result, the Framework Supplement does not provide accurate estimates of potential emission reductions that may be achieved through an indirect source rule, the cost of regulation, or the effectiveness of an incentive-only framework.

Staff elicited input from stakeholders multiple times during the WWG meetings on any alternatives to a warehouse ISR that could specifically work for San Diego County. The District summarized the alternatives that were brought up for discussion within the Supplement, and while all were considered, staff determined that the only viable, and legally sound, non-regulatory option discussed during the WWG meetings was the incentive-based option. Furthermore, the Supplement did assess the truck-related emission impacts specific to San Diego County warehouse operations, and also assessed the estimated emission reductions that would be achieved on a localized basis within both AB 617 communities (Portside and International Border). Within this White Paper, the potential health benefits that could potentially be achieved in both referenced communities with a warehouse ISR, have also now been quantified.

Staff analyzed the potential impacts of a warehouse ISR for San Diego County using SCAQMD's Rule 2305 as the model considering it is the only rule adopted that currently regulates warehousing operations in California. Rule 2305 is also the only warehousing rule approved by the U.S. EPA and upheld in federal court after legal challenge. In addition, the analyses presented in the Supplement considers warehouses as small as 50,000 sq ft. This size category expands beyond the applicability threshold of Rule 2305, which only applies to warehouses 100,000 sq ft or larger. Consequently, even looking at warehouses at this size threshold, the District is on untested legal ground. Furthermore, warehouses smaller than 50,000 sq ft were not included in the analyses in the Supplement due to certain challenges for regulating within that size category (see Comment No. 10 below).

Regarding the comment on accuracy of potential emission reductions that could be achieved through a potential warehouse ISR, staff used the same methodology as the one used for the development of the SCAQMD Rule 2305 to estimate baseline emissions.[57] To date, the District has not been informed by stakeholders of any alternative methodologies that could be considered to estimate baseline emissions.

Staff then evaluated three best-case emissions reduction scenarios in the Supplement (Scenarios 1, 2 and 3). Scenario 3 (Low-NOx, ZEV, Other) was

[57] Supplement, Section 2.4.1, pp. 28-31

evaluated as a potential "achieved-in-practice," i.e., more realistic, scenario based on the reported implementation rates in the SCAQMD region of certain Low-NOx and ZE compliance options that would result in direct emission reductions at subject facilities.[58]

Regarding the comment on accuracy of the cost estimates presented in the Supplement, the total annual compliance costs for San Diego County were estimated using a weighted annual cost of $0.26/sq ft derived from SCAQMD's information on average costs and WAIRE Menu Items implemented. Cost-effectiveness values, expressed in dollars per pound of NOx emissions reduced ($/lb), were estimated using the total annual compliance costs and the emission reductions listed in the Supplement.[59]

All preliminary estimates presented in the Supplement (e.g., baseline emissions, emission reductions, compliance costs, and cost-effectiveness values) were calculated using the best available data and methodologies at the time. These estimates are subject to change pending further analysis and updated data as available if future rulemaking is pursued.

Regarding the comment on an incentive-only framework, discussions on incentive program concepts can be found in Section 4.7.

10. *Expanding the applicability of an ISR to a broader range of warehouses throughout the region would substantially increase emission reduction potential for the rule and help ensure cleaner air in San Diego's disadvantaged communities and neighborhoods that endure a disproportionate share of air pollutant emissions, exposure, and health impacts.*

This comment was similarly discussed in the Supplement.[60] Lowering the applicability threshold of an ISR to warehouses less than 50k sq ft is not likely to result in increased emission reductions as suggested, for the following reasons:

- Many smaller warehousing facilities identified as "warehouses" in the CoStar inventory may be conducting non-warehousing activities. As evaluated in the case study conducted with the Portside community, up to 64% of the warehouses identified by CoStar in that vicinity do not appear to be involved in goods movement activities. These facilities observed in the case study are used for non-warehousing activities, e.g., educational facilities, residential

[58] Ibid., Section 2.4.2, pp. 31-32
[59] Ibid., Section 2.5, pp. 38-40
[60] Ibid., Section 2.1.5, pp. 16-17

housing, and a church (Section 3.5). Similar trends of facilities being used for non-warehousing activities are likely to be seen throughout the County. While some of these facilities may have occasional truck activity (or none at all), they are not characterized as the prototypical goods movement operation seen at large warehouses that have been identified in other areas of California as being large contributors to indirect sources of emissions.

- SCAQMD Rule 2305 includes provisions that allow warehousing facilities with little/no trucking activity to be exempt from procuring WAIRE points in their respective ISR (i.e., below a de minimis value).[61] Effectively, this means that while a facility categorized as a "warehouse" might still need to report to SCAQMD under Rule 2305, they would not be required to modify any of their operations, purchase any new equipment or infrastructure, nor be required to reduce any emissions whatsoever. Coupled with the fact that many warehouses identified by CoStar are not conducting goods-movement operations, a similar de-minimis threshold for smaller facilities doing little/no trucking activity in San Diego County (and thus not producing significant emissions), would not likely achieve significant additional emission reductions.

- Finally, regulating smaller warehouses less than 100,000 sq ft of floor space poses significant logistical and legal challenges that may not be adequately addressed within already federally approved ISRs. SCAQMD Rule 2305 was developed to include a menu of compliance options specifically for warehouse facilities with floor area of 100,000 sq ft or more due to the type of activities occurring at facilities of this size. However, those compliance menu options that would be needed in a potential ISR may not be feasible for smaller warehouse operators to implement.

  Options such as installing solar panels or charging infrastructure may not be feasible for smaller facilities where adequate space is not available. Additionally, such options may not be available for warehouse tenants that lease the building they occupy, as approval by the warehouse owner would be required to make such improvements. For smaller warehouses, such constraints are further exacerbated as warehouse size decreases and facilities get used for multiple purposes (e.g., manufacturing, storage, office space, etc.). Consequently, purchasing zero-emission equipment may not always be

[61] SCAQMD, Rule 2305, Warehouse Indirect Source Rule – Warehouse Actions and Investments to Reduce Emissions (WAIRE) Program, May 7, 2021, p. 2305 – 17, https://www.aqmd.gov/docs/default-source/rule-book/reg-xxiii/r2305.pdf?sfvrsn=99b5af61_21

feasible, especially if charging infrastructure cannot be installed onsite, or is not readily available for public use.

The inability for a smaller facility to implement at least some of the compliance menu options could result in any potential warehouse ISR being considered as a de-facto purchase mandate and raise federal preemption concerns. There are also concerns that land-use changes (such as new sensitive receptors moving into a neighborhood) interacting with such requirements could present a dynamic regulatory environment, which consequently could result in previously exempt warehouses becoming subject to a potential ISR even if their operations have never changed. This scenario could create additional legal uncertainty.

11. *While the Framework Supplement acknowledges California's withdrawal of a waiver request to the Environmental Protection Agency for its Advanced Clean Fleets (ACF) regulation, it does not fully lay out the emissions or air quality impacts of this decision or the vacuum of regulatory uncertainty that the loss of this regulation creates.*

By letter dated January 13, 2025, CARB withdrew their request for a waiver from the EPA. Consequently, the anticipated emission benefits that would have been achieved through implementation of the ACF regulation, including those from the turnover of truck fleets servicing warehousing operations, were not included in estimates presented in the Supplement.[62] The emission scaling factors were subsequently adjusted to effectively remove from the District's initial estimates the emission reductions that the ACF regulation was anticipated to achieve.[63]

The District acknowledges that there continues to be uncertainty on the status of other regulations at the State and federal level. However, it is unclear what and how much impact these actions will ultimately have on emissions overall as many of the actions are now in litigation with uncertain outcomes. Additionally, there are recommendations happening at the State level that seek to mitigate some of these federal actions, one of which includes CARB potentially pursuing a statewide ISR (Sections 4.4.3 and 4.4.4). The District is also mindful of uncertainty with seeking federal approval for new local rules that could deviate from already approved rules in the SIP.

[62] Supplement, Section 2.7.2, p. 45
[63] Ibid., Section 2.4.1, p. 30

12. While the scale and pace of this transition demonstrates that the requisite technology is available, voluntary or incentive-based programs do not always work.

While voluntary incentive programs are not "required", their existence has consistently shown that they are an integral component in the transition to cleaner technologies. CARB has noted in a recent report that incentive programs "crosscut the need to address both the affordability of vehicles and infrastructure and to support market expansion."[64] While the commentor notes that zero-emission technology is now available, the price of such technology (without incentive funding) still far exceeds the cost of traditional combustion equipment. For example, the approximate cost of a ZEV Class 8 truck with day cab is $436k, while the cost of a similar diesel Class 8 truck is $156k, which is a 179% difference.[65] Without the existence of incentive programs, procuring zero-emission technology would likely continue to be too expensive for many small businesses or independent owner/operators for the foreseeable future. Additionally, with State incentive funding levels being reduced for FY25-26 for various programs like the Clean Truck and Bus Voucher Incentive Project (HVIP) and AB 617, it is uncertain whether available grant funding can sufficiently meet local demand for zero-emission equipment in the foreseeable future.

As has been demonstrated by the EPA's approval of SCAQMD Rule 2305, and the rule withstanding litigation, an ISR must offer a menu of compliance options, and is at this time the only legal pathway currently available for a potential warehouse ISR. Thus, a potential ISR, if adopted, would have the same level of uncertainty as to the level of implementation and adoption of cleaner technologies as an incentive program. For an ISR, facilities must select from a menu of options to comply; some of these available options would achieve little to no creditable emission reductions, nor would these options address the dynamic of diesel trucks operating within under-resourced communities. General economic principles suggest that it is highly likely that many of the subject facilities for a warehouse ISR, would select the least expensive option to comply with a potential ISR, which has been exhibited within reporting for SCAQMD Rule 2305. Additionally, adoption of a potential ISR would restrict these subject facilities from being eligible for incentive funding to comply with the rule, making ZEV or Low-NOx menu options potentially even less viable to the warehouse operator.

[64] https://ww2.arb.ca.gov/sites/default/files/2025-08/August%202025%20Report%20to%20the%20Governor%20in%20Response%20to%20Executive%20Order%20on%20ZEV%20Deployment%20FINAL_0.pdf

[65] CARB, Zero-Emission Class 8 Truck Pricing Comparisons – EU & US, October 2024, p.3, https://ww2.arb.ca.gov/sites/default/files/2024-12/Zero%20Emission%20Class%208%20Tractor%20Pricing%20Comparisons_ADA.pdf

13. *In Section 2.6 of the [Supplement], the District explains that up to six additional full-time staff positions would be necessary to regulate warehouses over 50,000 sq ft, under such a rule, and that staffing increases would result in up to $900,000 in additional ongoing costs for personnel salary and benefits. While we are sensitive to the financial realities of the District, a more in-depth analysis of warehouse activity and truck counts throughout the County is required to determine whether this figure overestimates administrative costs.*

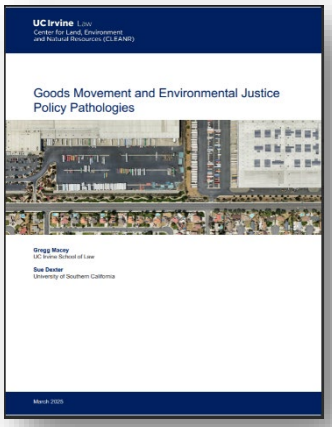
The estimated ongoing costs included in the Supplement of $300,000 to $900,000 that the District may accrue were based on the number of additional full-time staff positions that may be needed to implement an ISR (assuming regulation of facilities over 50,000 sq. ft.) and were not based on warehouse activity and truck counts.[66] These estimated salary costs also comprised of the "all-in" costs for hiring of such positions, which include salary and benefits. The District acknowledges that such ongoing costs could decrease as the number of subject facilities are likely to be less than the warehouse inventory estimated in the Supplement due to the number of facilities that are most likely not conducting warehousing activities. Nonetheless, the District would likely need to plan accordingly with appropriate staffing levels to cover the anticipated large increase in workload and additional outreach and enforcement activities associated with a potential warehouse ISR.

Staff believes the staffing needs in San Diego County presented in the Supplement are consistent with other air districts also evaluating existing and potential warehouse ISRs. In a recent presentation the Bay Area AQMD (which is also evaluating a potential warehouse ISR) estimated that three full-time equivalent staff would be needed solely for the rule development process alone.[67] SCAQMD also estimated five full-time equivalent positions for rule and program implementation for Rule 2305.

[66] Supplement, Section 2.6, p. 41

[67] BAAQMD, Presentation to Stationary Source Committee, March 12, 2025, slide 13, https://www.baaqmd.gov/~/media/files/board-of-directors/2025/ssc_presentations_031225_op-pdf.pdf?rev=ca3e15891cee4cf987e33ce7ec16f579&sc_lang=en

14. *The potential public health benefits of a Warehouse ISR are substantial. For example, the UC Irvine School of Law study estimated the dollar value of health benefits of a Rule 2305-style Warehouse ISR in the Bay Area. Its authors determine that such a program would achieve health benefits from PM and NOx/ozone reductions of up to $18.1 million per year for a Rule 2305-type program in the Bay Area alone.*[68]



The District acknowledges that public health benefits may be achieved in any region through the implementation of a warehouse ISR (see Section 3.2). However, the level of benefits will vary between regions due to differences in warehouse inventory and actions implemented for compliance. For example, regions that have little/no warehousing activity, would be expected to experience little/no health benefit from a potential ISR. Thus, an ISR's effectiveness will depend significantly on the inventory of goods movement-related warehouses in a particular region.

The UC Irvine School of Law study referenced in the comment, which analyzed ISR impacts in the Bay Area air basin, considered approximately 1,000 warehouses and distribution/transloading centers greater than or equal to 100,000 square feet. [69] This amount is four times greater than the 243 large warehouse buildings estimated for San Diego County of similar size, and thus it would be expected that regions with a greater warehouse inventory would experience more emission reduction benefits from a potential ISR. However, it is also likely that not all of the 1,000 facilities in the inventory identified for the Bay Area region are conducting warehousing activities, which could reduce the study's emissions reduction estimate and corresponding potential health benefits noted (Section 3.5). The District utilized the same tool (EPA COBRA) as the study referenced above to estimate potential health benefits for San Diego County regionwide, as well as in under-resourced communities (see Section 3.2), in the Supplement and within this White Paper. Due to fewer facilities that would be subject to a potential ISR, and using San Diego County-specific truck trip rate estimates for trucks visiting warehouses throughout the county, this expectedly produces a much smaller health benefit than those anticipated in the Bay Area and South Coast regions.

[68] Gregg Macey & Sue Dexter, Goods Movement and Environmental Justice Policy Pathologies, UC Irvine Law CLEANR, March 2025, Table 5, p.47, https://cleanr.law.uci.edu/files/2025/03/Goods-Movement-and-Environmental-Justice-Policy-Pathologies-March-18-2025.pdf
[69] Ibid., p. 43

Also, the projected air quality in the study is based in part on the retirement of existing internal combustion engine trucks and purchase of new vehicles from 2025 through 2045. A WAIRE-based ISR must include multiple compliance options, some of which do not result in direct emission reductions at the facility, e.g., installation of solar panels, charging infrastructure, and air filters in the surrounding communities. Thus, warehouse operators/owners may elect not to replace their trucks with lower emission vehicles as a compliance option. For this reason, and as discussed above, the emission reductions and associated public health benefits are likely to be less in practice than the estimates presented in the study.

15. *Barrio Logan has 220 warehouses across roughly 5 square miles. West National City has 201 warehouses within its borders. Roughly ¾ of these warehouses are smaller than 20,000 square feet; they should appear in any consideration of the utility and cost-effectiveness of an ISR.*

Based upon the results of a case study conducted by the District within the ISR Supplement,[70] staff believes there is a strong likelihood that a small percentage of the warehouse buildings noted by the commenter (and seemingly identified by CoStar) in these neighborhoods are conducting goods movement activity. The case study, which evaluated 70 warehouse locations (all sizes) around a sensitive receptor in the Barrio Logan neighborhood, determined 14% (10 out of 70) of the CoStar warehouse inventory in the area assessed were likely to be conducting prototypical warehouse operations that might be conducive to trucking activity. Other locations identified as a "warehouse", had other activities occurring that are not likely to generate significant truck activity and/or emissions, including a billiards hall, educational facility, church, youth and community center, art gallery, and event space rental. Staff believes that, particularly in areas where land use zoning is mixed between industrial and residential uses (like Barrio Logan and National City), that many of the locations identified as a warehouse by CoStar may not actually be a warehouse that would be subject to a potential ISR (if developed), or are small businesses operating a warehouse that could potentially be impacted financially if they were to be subject to an ISR.

As noted above, regulating warehouses smaller than 100,000 sq ft of floor space poses significant logistical and legal challenges that may not be adequately

[70] Supplement, Section 2.7.4, pp. 46-49

addressed within already federally approved ISRs.[71] See Comment No. 10, Section 4.2.1.

16. *Sensitive land uses face even greater impacts of warehousing and goods movement; Barrio Senior Villas, for example, is home to residents over the age of 75 and located within 1000 feet of over 35 warehouses.*

The number of warehouses located within 1,000 feet of the Barrio Senior Villas referenced in the comment may be an overestimation of facilities that are actively engaged in goods-movement activities, considering staff's case study of the warehouses located in that same area. According to the preliminary findings in the study, of the 70 sample warehouse buildings researched, an estimated 64% (45 out of 70) of those facilities do not appear to be involved in goods-movement activities at all (e.g., educational facility, residential housing, and a church). See Section 3.5.

17. *Prior to development of Rule 2305, SCAQMD attempted a voluntary incentive program for over a year but achieved little success.*

Potential options for reducing emissions from warehouses were discussed in the SCAQMD Warehouse ISR Working Group such as facility caps, local government measures, clean fleets crediting/banking program, voluntary fleet certification program, best management practices, and mitigation fees. Of these options, only the best management practices (now the WAIRE Menu and Custom WAIRE Plan option) and the mitigation fee options were included in Rule 2305.[72]

Like SDAPCD, SCAQMD has also exhibited significant success in implementing voluntary incentive programs. In 2020 alone, one year before Rule 2305 was adopted, SCAQMD awarded over $139 million for clean air projects, of which $40 million was awarded to goods-movement operators who purchased 399 cleaner heavy-duty vehicles, electric charging infrastructure, and hydrogen fueling units.[73]

18. *According to updated ISR emission reduction estimates presented to the public by SDAPCD in April 2025, an ISR for facilities over 50,000 square feet is expected to*

[71] Supplement, Section 2.1.5, pp. 16-17
[72] SCAQMD, Rule 2305, Staff Report, p. 11
[73] SCAQMD, 2020 Annual Report, https://www.aqmd.gov/docs/default-source/annual-reports/2020-annual-report.pdf

reduce regional NOx emissions by as much as 36.1 tons per year, and PM2.5 emissions by as much as 0.26 tons per year.

Estimated emission reductions from warehouses in San Diego County subject to a potential ISR are between 13 - 27 tons per year of nitrogen oxide (NOx), and 0.1 - 0.3 tons per year of particulate matter (PM2.5), depending on the applicability threshold used. See Section 3.1. These figures are best-case scenario, and for the reasons described in the Supplement and this White Paper, the District anticipates lower emission reductions than calculated to date.

19. *But the South Coast's Rule 2305 is not the first indirect source rule in California. In fact, local air districts in California have utilized indirect source regulations for decades. The table below [in comment letter] provides a brief description of indirect source rules adopted by various air districts in California.*

While there are six ISRs referenced in the table in the comment letter, five of those rules are for residential, commercial, and/or industrial development projects, which are different source types than warehouses.[74] In general, these rules require on-site mitigation or payment of off-site mitigation fees, and all involve emissions only from new and redevelopment sources (i.e. not existing). Additionally, all five of the referenced rules were adopted prior to the eventual passage of Proposition 26, which was passed by California voters in November 2010. The imposition of Proposition 26 significantly limited local government authority to adopt fees, such that a similar rule adopted today would not be likely to survive legal challenge.

The sixth rule referenced in the comment letter is SCAQMD Rule 2305, which currently is the only ISR adopted in California that specifically applies to warehouses sized 100,000 sq ft and larger located in the South Coast region. Accordingly, Rule 2305 has been referenced and discussed in the ISR Framework, the Supplement, and this White Paper, and thus is more appropriate to be the model for a potential warehouse ISR for San Diego County.

20. *APCD has a legal obligation under state law to adopt indirect source controls. Under state law, air districts that have moderate air pollution such as San Diego County must comply with additional requirements in developing plans to achieve and maintain state ambient air quality standards. More specifically, California law directs each district with moderate air pollution to include specific measures in its*

[74] The six ISRs referenced in the table of the comment letter are: Colusa County, Rule 510; Mendocino County, Regulation 1; San Joaquin Valley, Rule 9510; Imperial County, Rule 310; Tehama County, Rule 2:11D; and South Coast, Rule 2305.

attainment plan, including "provisions to develop areawide source and indirect source control programs."

The District is not legally obligated under state law to adopt ISRs but rather has the discretion to consider ISRs as options for inclusion in the region's State ozone attainment plan. The California H&SC requires that "each district with moderate air pollution shall, *to the extent necessary to meet the requirements of the plan developed pursuant to Section 40913 [emphasis added]*," include certain measures in its attainment plan, with one of the possible measures being "provisions to develop areawide source and indirect source control programs."[75]

Plans developed pursuant to Section 40913 "shall be based a determination by the district board that the plan is a cost-effective strategy to achieve attainment of the state standards by the earliest practicable date."[76] Section 40922 further states that such plans "shall include an assessment of the cost effectiveness of available and proposed control measures and shall contain a list which ranks the control measures from the least cost-effective to the most cost-effective…" and, in addition to considering the relative cost effectiveness, the district shall also consider factors "…including, but not limited to, technological feasibility, total emission reduction potential, the rate of reduction, public acceptability, and enforceability."[77]

Through modeling completed for San Diego County's 2020 federal ozone Attainment Plan, the District determined that attainment of the most stringent federal ozone standard (i.e., 2015 standard, or 70 ppb), was anticipated by the federal deadline of 2032, without the need to adopt an ISR or any additional local measures.[78] Consequently, the District is not required by either State or federal law to include provisions to develop areawide source and indirect source control programs, but rather has the option to do so if considered necessary to meet the requirements of the plan.

In addition, per H&SC 40716(a), "…with respect to the attainment of state ambient air quality standards, a district *may [emphasis added]* adopt and implement regulations…" to "…reduce or mitigate emissions from indirect and areawide

[75] California Health and Safety Code (H&SC), § 40918(a) and § 40918 (a)(4), https://codes.findlaw.com/ca/health-and-safety-code/hsc-sect-40918/. This requirement likewise applies to serious, severe, and extreme air pollution (see H&SC, § 40919, 40920, and 40920.5).
[76] H&SC § 40913(b), https://codes.findlaw.com/ca/health-and-safety-code/hsc-sect-40913/
[77] H&SC § 40922, https://codes.findlaw.com/ca/health-and-safety-code/hsc-sect-40922/
[78] SDAPCD, 2020 Plan for Attaining the National Ambient Air Quality Standards for Ozone in San Diego County, October 2020, p. 84, https://www.sdapcd.org/content/dam/sdapcd/documents/grants/planning/Att%20A%20(Attainment%20Plan)_ws.pdf

sources of air pollution."[79] Also, per H&SC 40100.6.5(a)(6), the District shall "*consider [emphasis added]* adopting an indirect source rule to address pollution from mobile sources that is associated with stationary sources, such as ports, warehouses, and distribution centers."[80] Accordingly per the H&SC, the District may adopt or shall consider adopting an ISR, which are not the same as requiring the District to adopt such rules. This is further supported by a statement made by the SCAQMD within a May 2018 Staff Report to their Governing Board on ISRs noting that "*SCAQMD is not required to adopt an ISR simply because another air district found it feasible*."[81]

21. While the 2009, 2016, and 2022 Regional Air Quality Strategy make note of potential indirect source measures, the District has yet to take action to develop any indirect source regulation.

As discussed in the 2022 Regional Air Quality Strategy (RAQS), a possible ISR measure was included in the District's list of scheduled measures for possible adoption.[82] This was not a commitment in the RAQS to adopt a warehouse ISR within a certain timeframe but to consider it for possible adoption. Staff's preparation of the ISR Framework, convening the WWG meetings, and preparation of the Supplement and this White Paper were done to fulfill the requirement set forth by AB 423 to consider an ISR for warehouses and distribution centers in San Diego County, and also fulfill the commitment for consideration made in the 2022 RAQS.

The District did not mention possible ISR regulations within the 2009 or 2016 RAQS. However, the District's existing indirect source program that was adopted by the Board in 1997 primarily consists of outreach to local governments, land developers, and neighborhood groups, to reduce vehicle trips and associated emissions through voluntary land use and street design improvements. No ISR rulemakings were under consideration in this program until the 2022 RAQS was developed and adopted.

[79] https://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?sectionNum=40716.&lawCode=HSC
[80] https://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?sectionNum=40100.6.5.&lawCode=HSC
[81] SCAQMD, Staff Update and Recommendations, Facility-Based Mobile Source Measures, March 2018, p. 3-2, https://www.aqmd.gov/docs/default-source/agendas/governing-board/2018/2018-may4-032.pdf?sfvrsn=70fcf961_2
[82] SDAPCD, 2022 Regional Air Quality Strategy (RAQS), p. 55, https://www.sdapcd.org/content/dam/sdapcd/documents/grants/planning/Att.%20A%20-%202022%20RAQS.pdf

4.2.2 Additional Comments

Since the public release of the Supplement in April 2025, staff continued to engage with various industry and environmental stakeholders, including the County of San Diego Environmental Justice Working Group, to elicit feedback on the District's consideration of a local warehouse ISR. Some key comments received (*in italics*) are summarized below along with District feedback.

1. *Waiting for CARB to adopt a statewide ISR is not a viable option as it will likely face legal challenges and take at least 5 years to develop and adopt.*

   If CARB were to develop statewide emission reduction strategies for indirect sources (Sections 4.4.3 and 4.4.4) there is the potential that a statewide warehouse ISR could be challenged in court on the argument, among other things, of federal preemption of mobile sources such as trucks. A potential warehouse ISR for San Diego County could also be legally challenged on the same grounds and would likely take multiple years to develop and adopt.

2. *Incorporate equity to protect smaller businesses from any costs.*

   A local warehouse ISR could potentially apply to small businesses depending on the applicability threshold of the rule. Any warehouse subject to a local ISR, including potential small businesses, would incur costs to comply with the requirements of the rule, such as District fees, reporting fees, as well as implementation costs such as installing charging infrastructure, purchasing ZEV or Low-NOx trucks, or mitigation fees.

3. *Prioritize protections for nearby EJ communities and ensure strategies don't shift pollution elsewhere.*

   A local warehouse ISR cannot prevent emissions attributed to warehousing activities from being displaced to other areas. It is currently unknown whether warehouse operations would be relocated outside of San Diego County, such as to other regions in California, out of state, or out of the United States, as a result of the estimated costs that would be incurred to comply with the requirements of a local ISR (Section 4.5.4). If developed and adopted by CARB, a statewide warehouse ISR may help to minimize the displacement of emissions at least within California through uniform requirements for all subject air districts throughout the state.

4.3 Supplement Clarifications

The following are additional discussions of certain sections of the Supplement provided for clarification.

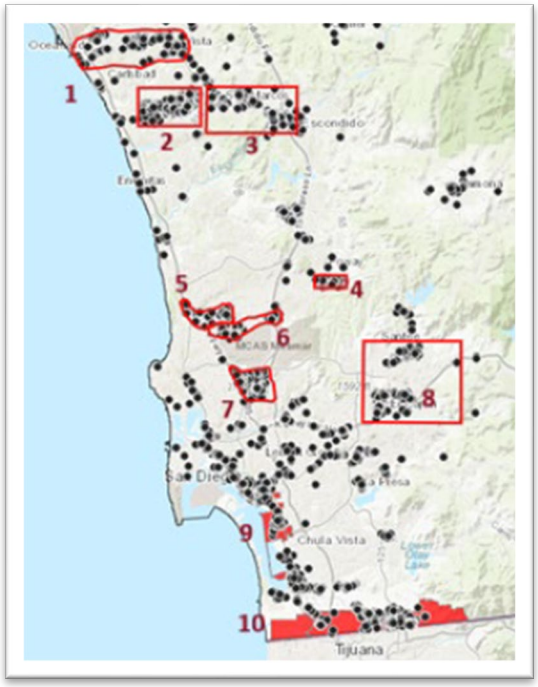
4.3.1 Warehouse Clusters

Correlation Coefficients

The Warehouse Clusters analysis was included in the Supplement to present the correlation between warehouse floor area and total truck trip volume. The warehouse clusters were grouped into ten areas of San Diego County where general warehouse clusters are located (Figure 5).[83] Except for the Portside and International Border communities, the other eight clusters were designated using approximate boundaries to group warehouses located within the same city or area and not with census tracts or any specific geographic parameters.

[83] 1) Oceanside and Vista, (2) Carlsbad and Vista, (3) San Marcos and Escondido, (4) Poway, (5) Sorrento Valley, (6) Miramar, (7) Kearny Mesa, (8) Santee and El Cajon, (9) Portside Community (AB 617), and (10) International Border Community (AB 617)

Figure 5 – Map of Warehouse Clusters in San Diego County



The following are the estimated number of warehouse buildings sized 100,000 sq ft and greater that are located in each of the ten warehouse clusters analyzed: Oceanside and Vista (8), Carlsbad and Vista (15), San Marcos and Escondido (0), Poway (6), Sorrento Valley (0), Miramar (0), Kearny Mesa (3), Santee and El Cajon (0), the Portside Community (6), and the International Border Community (36).[84]

The overall trend of the analysis showed that warehouse floor area (square footage) and total truck volume have a strong positive correlation. This means that as warehouse square footage increases, the truck volume also proportionately increases. Due to this strong correlation between warehouse size and truck volume, staff determined that the methodology presented in the Supplement to estimate truck trip rates specific to the San Diego region was appropriate.[85]

Emissions Impact

The Supplement does not conclude that the ten warehouse clusters assessed are located in communities that are disproportionately impacted by air pollution specifically from warehouse operations. Additional analysis was needed to determine if these specific communities are disproportionately impacted by warehousing activities. The District attempts to answer this question in the sections below by evaluating warehouse locations

[84] Supplement, Appendix A, Table A1, pp. A-1 and A-2
[85] Ibid., Sections 2.3.3 and 2.3.4, pp. 20-22

that exist in relation to impacted areas found in CalEnviroscreen and looking at communities that were identified by the District's Office of Environmental Justice as being disproportionately impacted through other metrics and tools.

At present time, only two emission inventories have been developed for state-designated disadvantaged communities within the county, which are the Portside and International Border Communities. With those existing inventories, staff was able to estimate the impact a potential warehouse ISR may have on those communities. However, staff could not determine the emissions impact in other under-resourced communities in the county, e.g., Vista, Escondido, and El Cajon. If formal rulemaking is pursued in the future, staff could potentially estimate the emission reduction impacts of a potential ISR in areas where the total emissions of a community can be determined. It is only then that the percentages of emissions from warehousing operations in relation to total emissions from all other sources can be estimated in those areas.

CalEnviroScreen

Though additional analysis will be needed to quantify the percentage of the emissions impact within the warehouse clusters analyzed, staff used CalEnviroScreen 4.0 to determine the degree of health burden in these clusters. CalEnviroScreen 4.0 is an online tool that evaluates communities throughout California using environmental, public health, and socioeconomic indicators to determine their health burdens.[86] Communities are given a percentile score (out of 100%) to show how they compare to the rest of the state. Communities receiving the highest scores statewide are indicated in the map as shaded in light orange (>70% - 80%), orange (>80% - 90%), or red (>90% - 100%), with higher scores indicating increasing health burdens. Figures 6 through 14 below show warehouses sized 50,000 sq ft and larger shown as dots located in each of the ten warehouse clusters analyzed overlayed with the CalEnviroScreen 4.0 maps.[87]

[86] https://oehha.ca.gov/calenviroscreen/report/calenviroscreen-40

[87] Warehouses legend: Industrial warehouses 100k sq ft and greater (yellow); industrial warehouses 50k to less than 100k sq ft (orange); flex warehouses 100k sq ft and greater (olive); and flex warehouses 50k to less than 100k sq ft (maroon).

Figure 6 – Warehouse Cluster 1 (Oceanside and Vista)



Figure 7 – Warehouse Cluster 2 (Carlsbad and Vista)

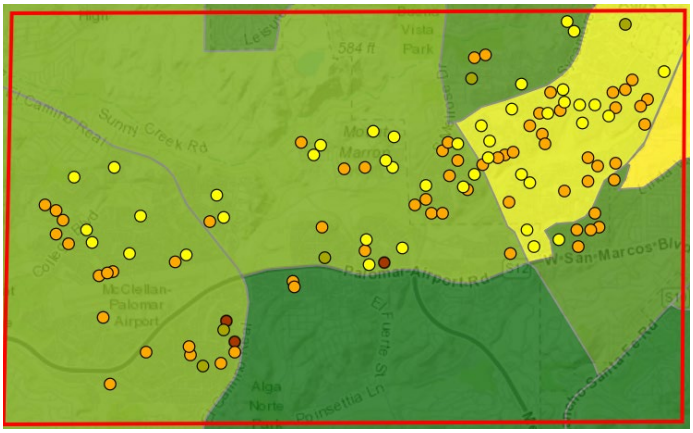


Figure 8 – Warehouse Cluster 3 (San Marcos and Escondido)

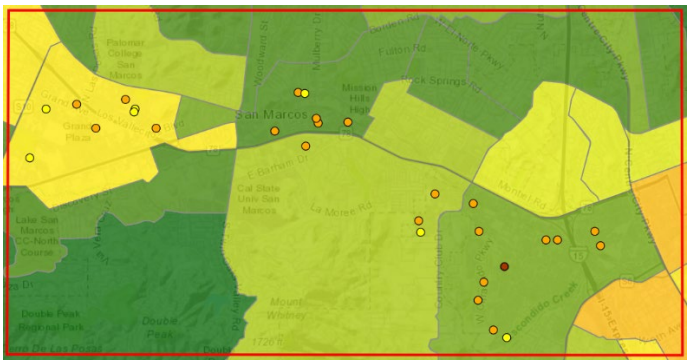


Figure 9 – Warehouse Cluster 4 - Poway



Figure 10 – Warehouse Clusters 5 and 6 (Sorrento Valley, Miramar)

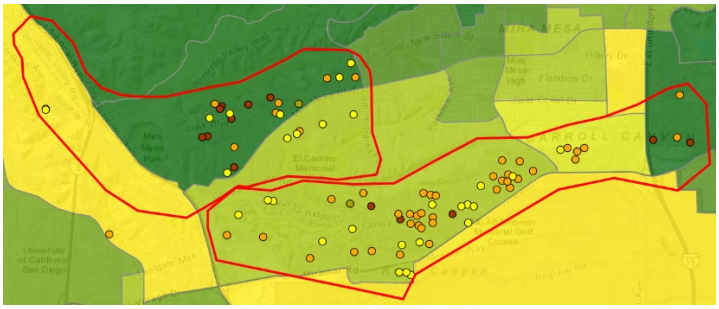


Figure 11 – Warehouse Cluster 7 (Kearny Mesa)

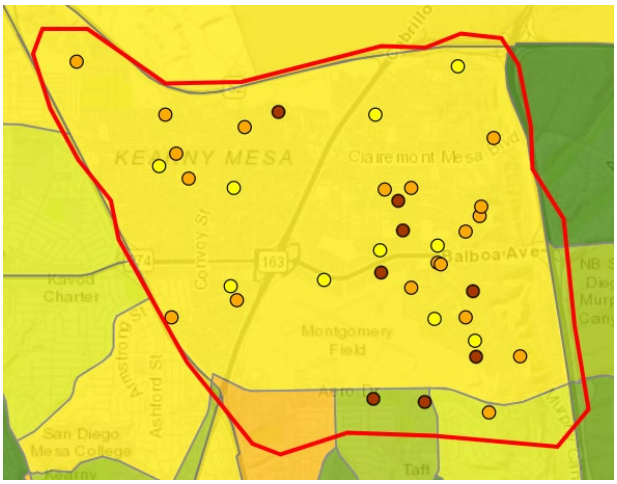


Figure 12 – Warehouse Cluster 8 (Santee and El Cajon)

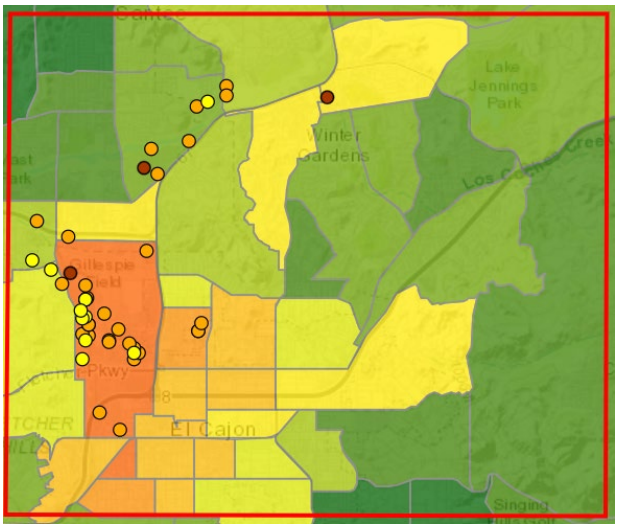


Figure 13 – Warehouse Cluster 9 (Portside Community)

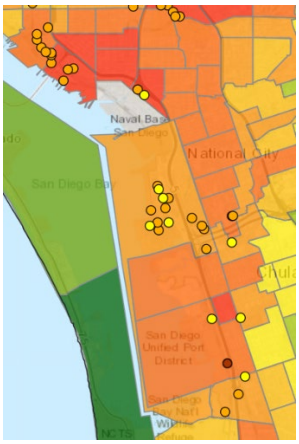


Figure 14 – Warehouse Cluster 10 (International Border Community)

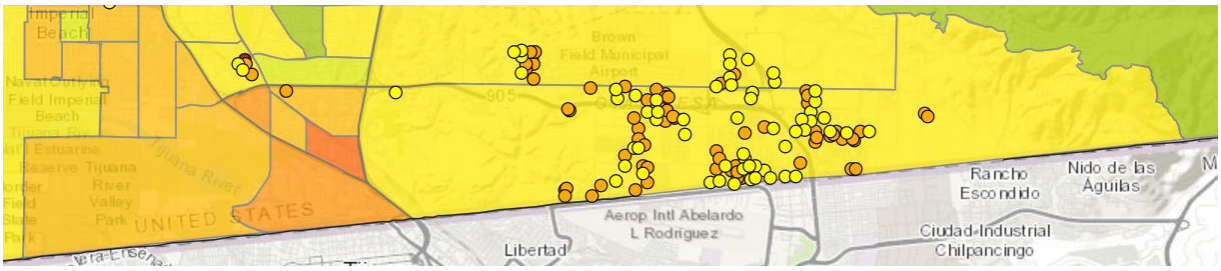
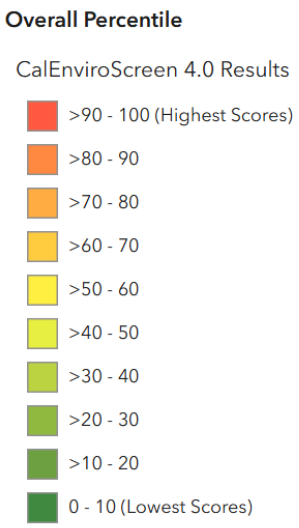


Figure 15 – CalEnviroScreen Legend



With the exception of warehouse building locations in Cluster 8 – Santee and El Cajon (Figure 12) and Cluster 9 – Portside Community (Figure 13), the graphics visually indicate that warehouse buildings located within the other eight clusters are located primarily in areas with CalEnviroScreen scores of 60% (yellow) or less (green). This indicates that most of the warehouse building locations sized 50,000 sq ft and greater located within these clusters may actually be located in areas within the county that have not been identified in CalEnviroscreen 4.0 as having as a high health burden compared to those in the other communities. Additional information on warehouses located in under-resourced communities can be found in the next section.

4.3.2 Under-Resourced Communities

An analysis of warehouse buildings located in under-resourced communities compared to the rest of the county demonstrated that a majority of potential warehousing locations (over 70%) are located outside of identified under-resourced communities.

Staff also assessed the locations of warehouses in specific designated environmental justice communities throughout the County to determine if the same dynamic found in Section 4.3.1 applied in other under-resourced communities that may not have been assessed in the clusters discussed above. With the use of a map developed by the District's Office of Environmental Justice, staff identified the warehouse buildings located in various under-resourced communities throughout San Diego County.

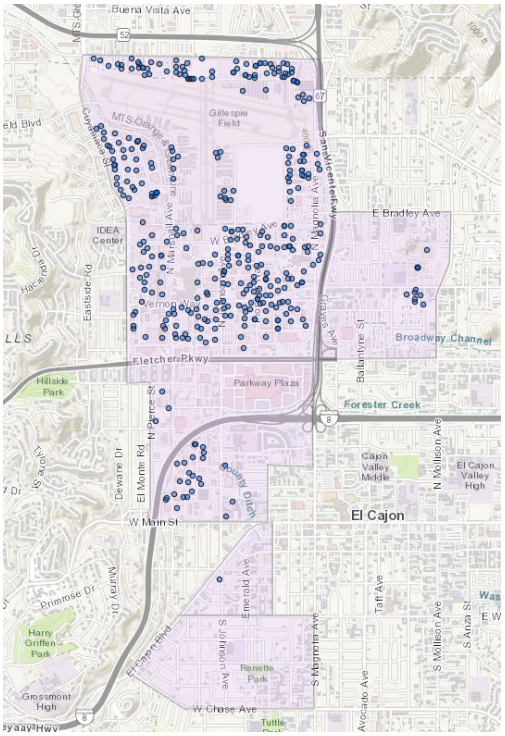
These under-resourced communities were evaluated independently of each other because they are designated with different criteria as determined by the state, the County of San Diego, or the collaborative effort between the District's Office of Environmental Justice and other partner organizations. Note that the warehouse buildings located in the

AB 617 Portside and International Border Communities were already accounted for in the Supplement. For more information on how these under-resourced communities were designated see Appendix C – Background on Under-Resourced Communities.

Senate Bill 535

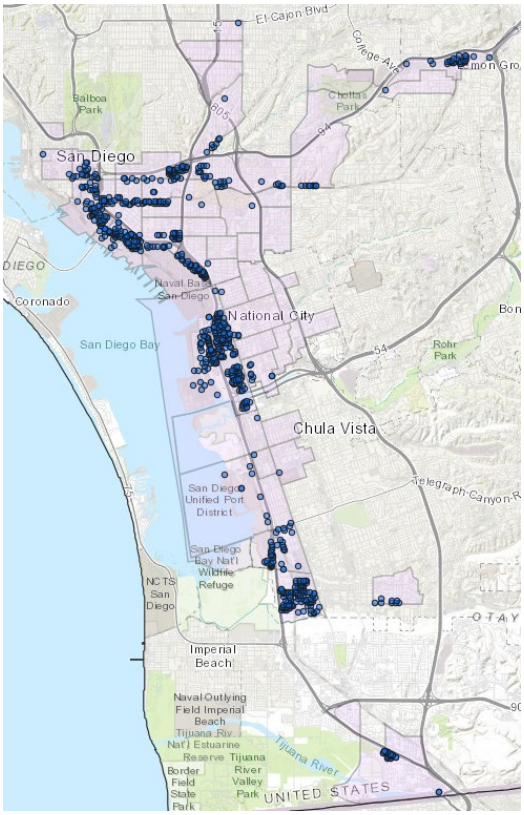
The District determined that a total of 1,163 warehouse buildings of any size were identified as being located in disadvantaged communities (DAC) as defined by Senate Bill (SB) 535 (Figures 16 and 17). This equates to 17.3% of all warehouse buildings in San Diego County identified using the CoStar data being located within DACs as defined by SB 535.[88] For warehouse buildings sized 50,000 sq ft and larger (which is the applicability threshold for a potential ISR considered in the Supplement), there are 81 such warehouse buildings located in these DACs, which is 12.3% of warehouse buildings in the county in this size category.[89] The warehouse buildings in DACs sized 50,000 sq ft and larger are located in areas that rank on average in between the 83rd and 84th percentile according to CalEnviroScreen 4.0.

Figure 16 – Warehouses in SB535 DACs (El Cajon)



[88] (1,163/ 6,737) = 17.3%
[89] ISR Framework, Table 1, p. 5; (81/ 657) = 12.3%

Figure 17 – Warehouses in SB535 DACs (South San Diego)

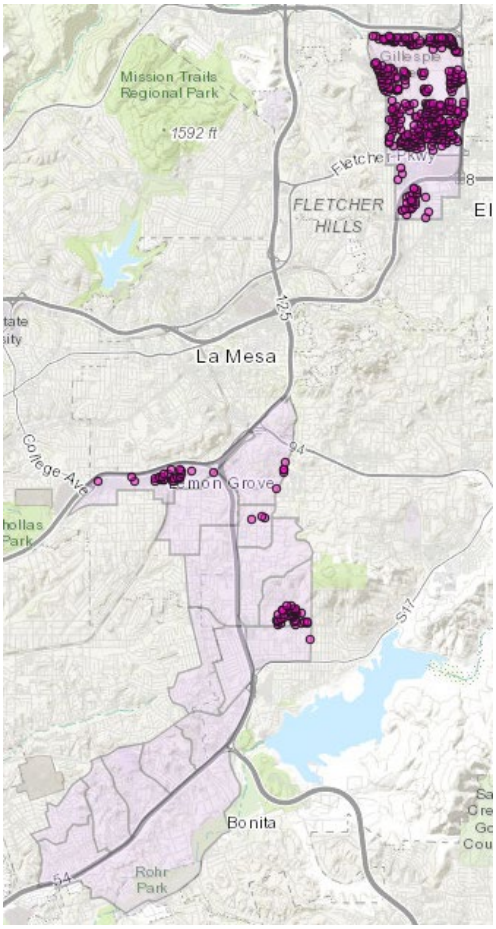


Environmental Justice Communities

A total of 446 warehouse buildings of any size were identified as being located in County of San Diego-defined Environmental Justice (EJ) Communities (Figure 18). This equates to 6.6% of all warehouse buildings in San Diego County located in these communities.[90] For warehouse buildings sized 50,000 sq ft and larger, there are 27 such warehouses located in these communities, which is 4.1% of warehouse buildings in the county in this size category.[91] The warehouse buildings in EJ Communities sized 50,000 sq ft and larger are located in areas that rank on average in the 86th percentile according to CalEnviroScreen 4.0.

[90] (446/ 6,737) = 6.6%
[91] (27/ 657) = 4.1%

Figure 18 – Warehouses in County EJ Communities



Environmental Justice Partnership Communities

A total of 1,083 warehouse buildings of any size were identified as being located in Environmental Justice Partnership (EJP) Communities (Figures 19 and 20). This equates to 16.1% of all warehouse buildings in San Diego County located in these communities.[92] For warehouse buildings sized 50,000 sq ft and larger, there are 62 such warehouse buildings located in these communities, which is 9.4% of warehouse buildings in the county in this size category.[93] The warehouse buildings in EJP Communities sized 50,000 sq ft and larger are located in areas that rank on average in between the 81st and 83rd percentile according to CalEnviroScreen 4.0.

[92] (1,083/ 6,737) = 16.1%
[93] (62/ 657) = 9.4%

Figure 19 – Warehouses in Local EJP Communities (North County)

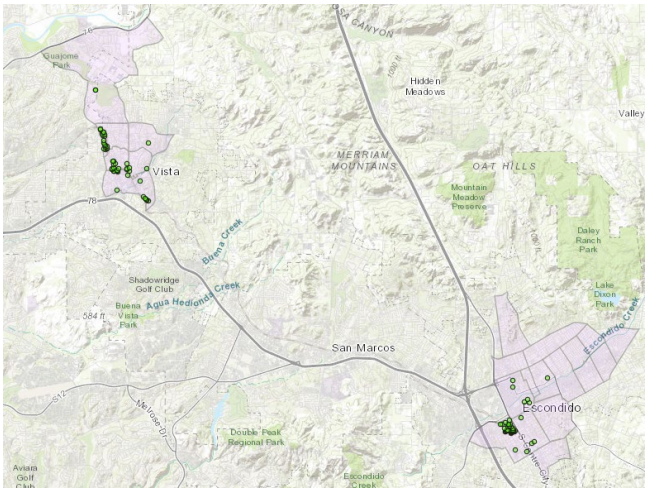
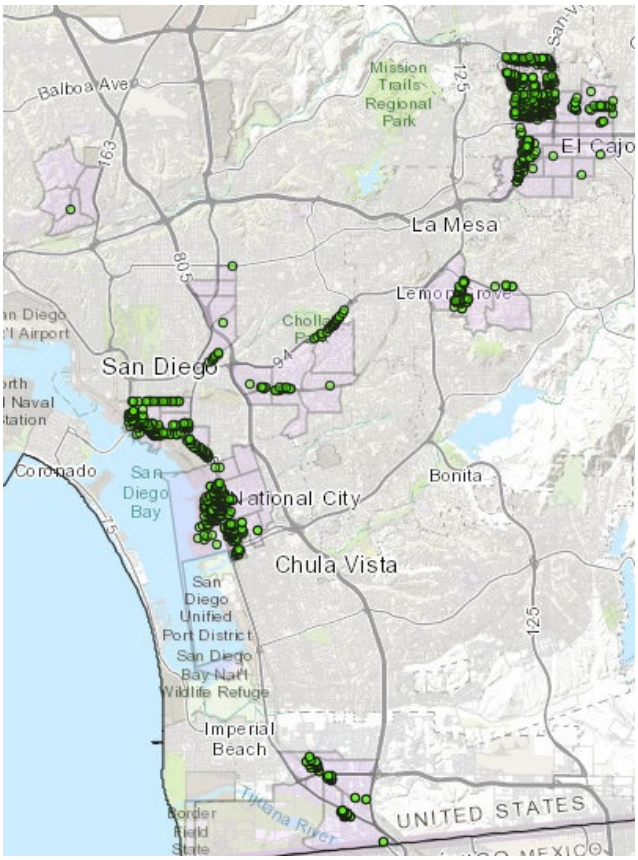


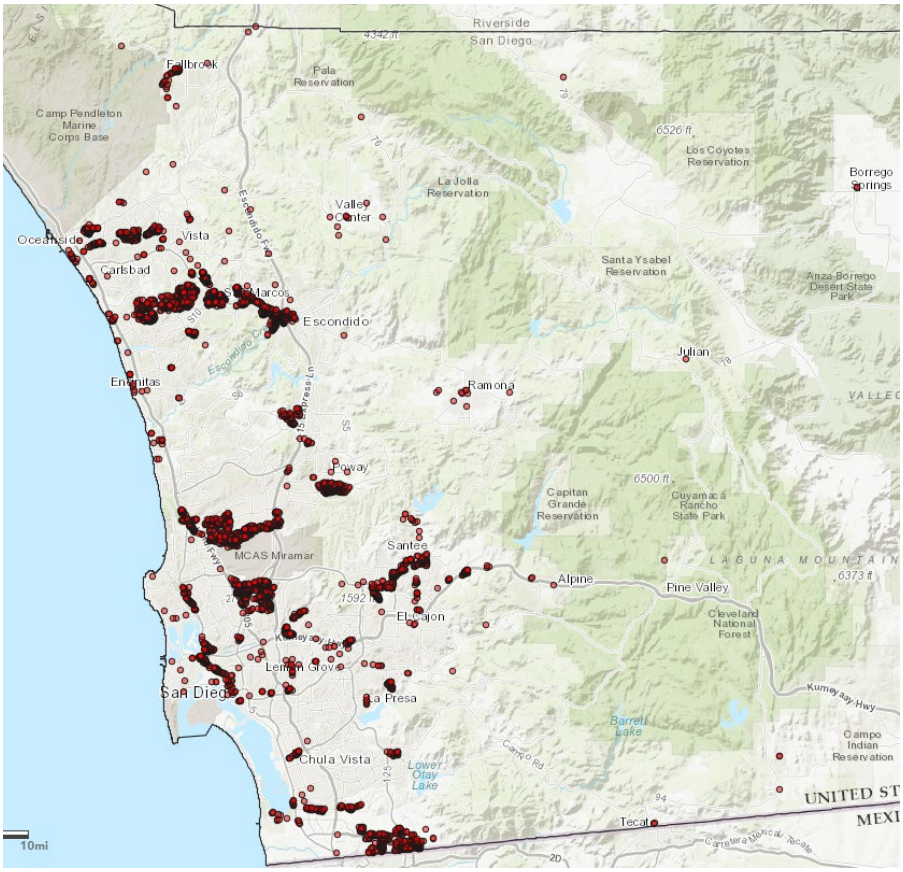
Figure 20 – Warehouses in Local EJP Communities (South and East County)



Outside of Under-Resourced Communities

Staff also identified warehouse building locations that are located outside of the communities discussed above: DACs designated under SB 535, County of San Diego EJ Communities and EJP Communities, the AB 617 Portside and International Border Communities, and tribal land. A total of 4,988 warehouse buildings of any size were identified as being located outside of these designated under-resourced communities (Figure 21). This equates to 74.0% of all warehouse buildings in San Diego County located in other areas of the county.[94] For warehouse buildings sized 50,000 sq ft and larger, there are 467 such warehouses located in other areas, which is 71.1% of warehouse buildings in the county in this size category.[95] These warehouse buildings are located in areas with lower average health burdens (34th percentile) according to CalEnviroScreen 4.0.

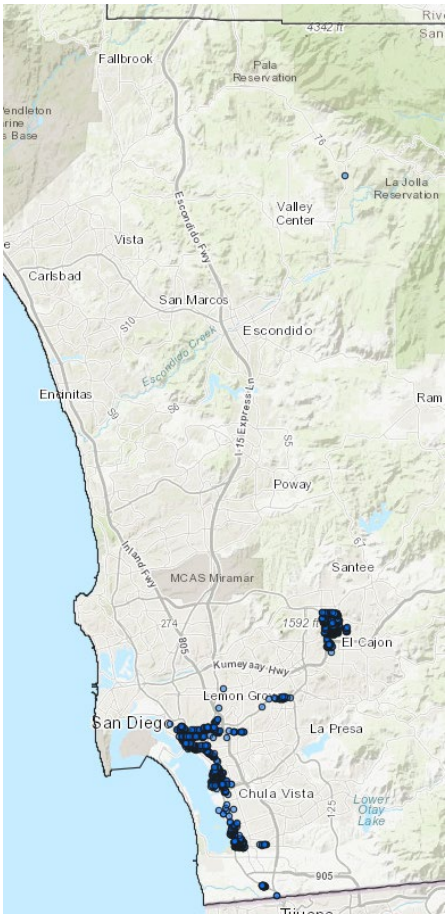
Figure 21 – Warehouses Outside of Under-Resourced Communities



[94] (4,988/ 6,737) = 74.0%
[95] (467/ 657) = 71.1%

In comparison, there are a total of 1,749 warehouse buildings of any size in the under-resourced communities of SB 535, County of San Diego EJ Communities and EJP Communities, the AB 617 Portside and International Border Communities, and tribal land (Figure 22).[96] This equates to 26.0% of all warehouse buildings in San Diego County.[97] For warehouse buildings sized 50,000 sq ft and larger, there are 190 such warehouse buildings located in under-resourced communities, which is 28.9% of warehouse buildings in the county in this size category.[98]

Figure 22 – Warehouses Within Under-Resourced Communities



[96] (6,737 – 4,988) = 1,749. The sum of the number of warehouses in each under-resourced community is greater than the total of 1,749 because the various communities have areas of overlap between them. For example, a warehouse located in an area designated as a DAC (SB 535) may also be in an area designated as an EJ Community (County of San Diego) and/or EJP Community (local).
[97] (1,749/ 6,737) = 26.0%
[98] (657 - 467) = 190; (190/ 657) = 28.9%

In addition, an analysis of communities in the SCAQMD region showed that those living within 0.5 miles of a warehouse subject to that district's Rule 2305 (100,000 sq ft and larger) rank in the 85th percentile according to CalEnviroScreen.[99] This analysis suggests that most warehouses in the SCAQMD region subject to Rule 2305 are located in close proximity to communities with high health burdens. In comparison, 28.9% of warehouse buildings sized 50,000 sq ft and larger in San Diego County are located in under-resourced communities with health burdens ranging between the 81st and 86th percentile.

Conclusion

The findings show that the majority (71.1%) of warehouse buildings sized 50,000 sq ft and larger in the county are located outside of identified under-resourced communities, and are located in areas with lower average health burdens (34th percentile) in CalEnviroScreen. These findings suggest that the majority of emissions attributed to warehousing activities may be generated outside of under-resourced communities in the county. Due to the difference in the location of warehouses relative to under-resourced communities in the county compared to subject warehouses in the SCAQMD region, a potential warehouse ISR for San Diego County may not be the most efficient strategy to achieve similar localized health benefit impacts as those anticipated from SCAQMD Rule 2305.

4.3.3 CARB Scaling Factors

Due to the recent revocation of State waivers of preemption for several state mobile source regulations, the future legal status of CARB regulations is uncertain (Section 4.4.1). Nonetheless, staff used the best data available at the time when the Supplement was being prepared.[100] If the District receives official confirmation from CARB that certain regulations have been withdrawn and/or repealed in their entirety (as was the case with the ACF regulation), and if the District begins the formal rulemaking process for a warehouse ISR, staff would coordinate with CARB to use the appropriate scaling factors and update the estimated baseline emissions and potential emission reductions.

It should be noted that while the revocation of state waivers could impact CARB mobile source regulations, the adoption of Assembly Bill 98 requirements for new and expanded warehouses (Section 4.4.2), as well as the potential for CARB to develop a statewide ISR (Sections 4.4.3 and 4.4.4), could also result in potential changes to the estimates presented in the Supplement. For example, in September 2025, CARB proposed to amend the ACF regulation to remove some fleets from the regulation, but still require

[99] SCAQMD, Rule 2305, Staff Report, p. 16
[100] Supplement, Section 2.4.1, p. 30

emission reduction targets for others within their regulatory authority that may not require EPA waivers.[101] This uncertainty on the status of state mobile source regulations, which all need to be accounted for in the consideration of any potential warehouse ISR, is another component that contributes to the complexity of estimating the emission benefits of a warehouse ISR for San Diego County.

4.3.4 Public Health Benefits

The Supplement included estimates that implementation of a potential warehouse ISR could result in avoiding between 25 and 68 health-related incidences per year as a best-case scenario. This includes reductions in certain health incidences, which are the number of events that would be avoided per year because of the emission reductions. Health related incidences include the following: total mortality; nonfatal heart attacks; infant mortality; total hospital admits, all respiratory; total emergency room visits, respiratory; total asthma onset; total asthma symptoms; emergency room visits, asthma; lung cancer; hospital admits (cardio-cerebro/peripheral vascular disease, Alzheimer's disease, Parkinson's disease); stroke; total hay fever/rhinitis; cardiac arrest, out of hospital; and emergency room visits, all cardiac (Appendix A – EPA COBRA Output Tables).[102]

This White Paper includes additional public health estimates specifically for the Portside and International Border communities (Section 3.2.2). For the Portside community, the estimated health benefits result in reductions in negative health-related incidences that total less than five overall incidents per year for the community. For the International Border community, the estimated health benefits result in reductions in negative health-related incidences that total less than 19 overall incidents per year for the community.

4.3.5 Costs and Necessity for Conducting CEQA and SIA Analyses

The Supplement concluded that an Environmental Impact Report (EIR) would be necessary to comply with CEQA if the District were to pursue formal development of a warehouse ISR. This aligns with the SCAQMD, which also determined their warehouse Rule 2305 required an Environmental Assessment (equivalent to an EIR) because the rule had the potential to generate significant adverse environmental impacts for the topics of: 1) aesthetics; 2) agriculture and forestry resources; 3) air quality and greenhouse gas emissions; 4) biological resources; 5) cultural resources; 6) energy; 7) geology and soils; 8) hazardous materials and solid and hazardous waste; 9) hydrology and water quality; 10) mineral resources; 11) noise; 12) transportation; and 13) utilities and service

[101] CARB, Board Item Summary, September 2025, https://ww2.arb.ca.gov/sites/default/files/barcu/board/books/2025/092525/25-6-8bis.pdf
[102] Supplement, Section 2.4.4, pp. 37-38

systems.[103] In comparison, an incentive-based program or potentially other non-regulatory alternative approaches would likely not require a CEQA analysis at this level or would be categorically exempt.

The Supplement also concluded that a Socioeconomic Impact Analysis (SIA) would be required to comply with State law if the District were to pursue formal development of a warehouse ISR. The California H&SC requires air districts to conduct such an analysis whenever rules are being modified or adopted, and emissions are consequently reduced or increased. The District does not currently have the appropriate resources to prepare an SIA of this complexity in-house. This is a primary reason why staff contracted with a third-party consultant to potentially prepare an SIA for the District as needed. A streamlined or inadequate SIA could be grounds for litigation from stakeholders who may oppose a potential ISR. In comparison, an incentive-based or other non-regulatory alternative program does not require an SIA.

For stationary source rule adoptions or amendments over the past few years, the required level of CEQA/SIA analysis has varied. Past District rulemakings were not as controversial and did not have the same risk of federal preemption or potential litigation as an ISR. Similarly, robust SIA analyses were not previously determined to be required. However, given the controversial nature of a potential warehouse ISR, comprehensive CEQA/SIA analyses would be needed in support of such rulemaking. While no recent rulemaking has required an EIR, staff anticipates that future zero-emission water heater and furnace rules may likely require an EIR-level CEQA document and comprehensive SIA analyses.

4.4 Other Federal and State Activities

Other state activities, such as Assembly Bill 98 and a possible statewide ISR if adopted in the future, would likely achieve and support mobile source emission reductions from warehousing operations.

Other federal and state actions related to the goods movement industry or mobile sources have been or are being taken since the release of the Supplement. These actions are important considerations when contemplating potential strategies to reduce emissions from warehousing activities. A few key actions are discussed below.

[103] SCAQMD, Rule 2305, Board Letter, May 27, 2021, p. 6, http://www.aqmd.gov/docs/default-source/Agendas/Governing-Board/2021/2021-May7-027.pdf?sfvrsn=10

4.4.1 U.S. EPA Approvability

On September 11, 2024, the U.S. Environmental Protection Agency (EPA) approved SCAQMD Rule 2305 as a SIP strengthening measure rather than granting a full approval. Though the EPA made it clear that the rule was nonetheless still federally enforceable, full approval of the rule was not granted due to specific deficiencies identified by the EPA. These deficiencies included: two ambiguous definitions that cite California Code of Regulations that have not been approved in the State Implementation Plan (SIP); the rule's inclusion of a sunset clause, meaning if the rule were to sunset in the future, it had the potential to interfere with reasonable further progress or attainment of the National Ambient Air Quality Standards, and represented a potential inconsistency with the Clean Air Act; and, two instances in the rule of a concept known as "unbounded director's discretion," which potentially allows an air district to undermine enforceability of a SIP regulation.

Due to these deficiencies, the EPA could not assign credit in the SIP for the emission reductions anticipated from Rule 2305 up and until the deficiencies are resolved. Staff are not aware if and when the SCAQMD plans to rectify these deficiencies in an upcoming rule amendment. Re-opening the rule for amendments could bring additional scrutiny to the already-approved rule. While Rule 2305 withstood a legal challenge in federal court, the court's decision does not preclude other lawsuits from potentially being filed to challenge the EPA's approval of Rule 2305 into the SIP. As of January 2026, no further appeals or litigation have been filed.[104]

After the Supplement's release, the U.S. Senate voted on May 22, 2025, to revoke three waivers of preemption issued by the U.S. EPA for CARB: the Advanced Clean Cars II (ACC II) regulation, the Advanced Clean Trucks (ACT) rule, and the Heavy-Duty Low NOx Omnibus Regulation. However, CARB rejected the Senate vote as illegal. In a statement by then CARB Chair Liane Randolph, "California will pursue every available remedy to challenge these actions and defend our right to protect the public from dangerous air pollution."[105] Considering that the U.S. Congress revoked waivers for state regulations that were adopted to reduce emissions from mobile sources, it is uncertain whether the EPA will approve a warehouse ISR into the SIP for any region for the foreseeable future. However, the District acknowledges that EPA approval may not be critically necessary to proceed with developing a warehouse ISR for San Diego County.

4.4.2 Assembly Bill 98

Assembly Bill 98 (AB 98) was passed by the California state legislature in late August 2024 and signed by Governor Newsom on September 29, 2024. AB 98 will apply to new

[104] Supplement, Section 2.7.1, p. 43
[105] https://dieselnet.com/news/2025/05us2.php

and expanded warehouses that are proposed for any floor size, though more requirements apply to proposed facilities over 250,000 sq ft in size.

In summary, AB 98 will: (1) prescribe statewide warehouse standards for new or expanded logistics use developments to minimize impacts on certain "sensitive receptors," as specified; (2) prohibit cities and counties from approving new or expanded logistics use developments unless they meet specified standards; (3) require cities and counties to update their circulation elements by January 1, 2028 to include specified truck routes, except that certain local agencies in the Inland Empire must comply with this requirement by January 1, 2026; and (4) provide for enforcement of circulation update requirements by the Attorney General.

AB 98 will primarily affect new and expanded warehouse operations throughout the state. Existing warehouse operations may not be as impacted unless they are proposing to expand operations.[106] However, AB 98 coupled with other regulations that may apply to new buildings and sources of emissions (e.g., CEQA and New Source Review), could significantly slow the rate of development of new or expanded large warehouses throughout California and San Diego County. It is uncertain how AB 98 will impact emissions from warehousing operations overall.

4.4.3 Possible Statewide ISR

In March 2025, Assemblymember Robert Garcia introduced Assembly Bill 914 (AB 914). The legislation proposed to affirm CARB's authority to regulate indirect sources that attract activity from vehicles and other mobile equipment. Currently, local air districts have explicit authority under state law to adopt indirect source rules to reduce emissions in their respective regions.[107] In June 2025, the bill was ordered to the inactive file. As of January 15, 2026, the bill's status had not changed.

If a similar bill is introduced in the future and ultimately passes, CARB may proceed to adopt and enforce rules and regulations applicable to indirect sources, such as warehouses and distribution centers if necessary to achieve National Ambient Air Quality Standards (NAAQS). In this scenario, CARB would become the lead agency in developing an ISR for the state.

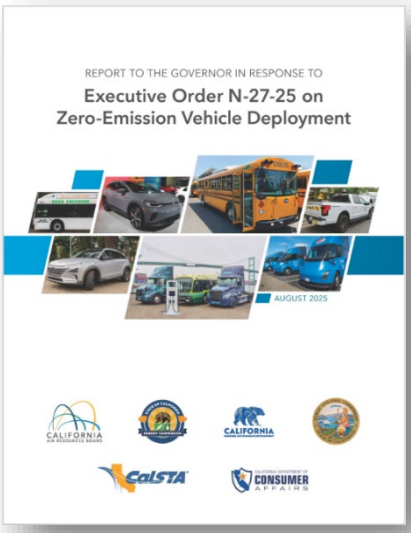
Due to the revocation of three waivers of preemption issued by the U.S. EPA for CARB, and CARB's withdrawal of their request for a waiver from the EPA for the Advanced Clean Fleets (ACF) Regulation, it is necessary for CARB to develop alternative strategies that can achieve emission reduction benefits now forgone from the revocation and withdrawal

[106] Supplement, Section 2.7.3, p. 46

[107] https://earthjustice.org/press/2025/new-legislation-from-assemblymember-robert-garcia-tackles-californias-growing-pollution-hotspots

of those waivers.[108] If statewide ISR legislation is passed in the future, it would be a pathway for CARB to develop such emission reduction strategies for indirect sources statewide and potentially provide consistent requirements for warehouses across the various air districts in California.

4.4.4 California Report on ZEV Deployment



Signed on June 12, 2025, Executive Order N-27-25 directed CARB, the California Energy Commission, Governor's Office of Business and Economic Development, California State Transportation Agency, and Department of Consumer Affairs to recommend strategies that make clean transportation more affordable, reliable, and accessible.[109] On August 19, 2025, California state agencies published a report in response to Governor Gavin Newsom's executive order on zero-emission vehicle (ZEV) deployment.[110] The report, developed with input from the public, charts a path to expand clean and ZEV adoption across all vehicle types, protect public health, and maintain the state's momentum in the face of federal rollbacks.

The report detailed actions being needed in six areas: private investment, incentives, infrastructure, fuel pricing, regulations, and procurement. Under the section on regulations, the report recommended only two actions, one of which was for CARB to collaborate with local air districts to develop and implement a statewide ISR. As proposed, the report recommends CARB pursue a statewide ISR that would reduce emissions from mobile sources that frequent indirect sources such as large warehouses, ports, airports, and railyards.[111] The report's recommendation for CARB to develop a statewide ISR also aligns with the objectives of AB 914 discussed in the previous section (Section 4.4.3).

[108] Supplement, Section 2.7.2, p. 45
[109] Executive Order N-27-25, June 12, 2025, https://www.gov.ca.gov/wp-content/uploads/2025/06/CRA-Response-EO-N-27-25_-bl-formatted-GGN-Signed-6-11-954pmFinal.pdf
[110] Report to the Governor in Response to Executive Order N-27-25 on Zero-Emission Vehicle Deployment, August 2025, https://ww2.arb.ca.gov/sites/default/files/2025-08/August%202025%20Report%20to%20the%20Governor%20in%20Response%20to%20Executive%20Order%20on%20ZEV%20Deployment%20FINAL_0.pdf
[111] Report to the Governor, p. 6

4.5 Ramboll Study

A third-party study that analyzed SCAQMD's WAIRE Program (Rule 2305) to date, which noted inconsistencies in reported data and the benefits that can be directly attributed to Rule 2305, and other findings.



Consulting firm Ramboll released a study in June 2025 that analyzed the implementation of SCAQMD's WAIRE program, which enforces that air district's warehouse Rule 2305.[112] The Ramboll Study is a third-party review of the SCAQMD WAIRE Program to date that was prepared independently of the SCAQMD and SDAPCD, and sponsored by the Supply Chain Federation. Note that the SDAPCD does not affirm or deny the study's findings. SCAQMD may address the findings of the Ramboll Study in the future. Some key findings of the study (*in italics*) are summarized below along with SDAPCD feedback.

4.5.1 Near Zero Emission Truck Visits

Rule 2305 specifies that qualifying Near-Zero Emission (NZE) trucks must be equipped with engines certified to meet the lowest optional NOx standard applicable at the time of manufacture as defined in the California Code of Regulations Title 13, Section 1956.8.[113] Beginning in 2022 when the WAIRE Program went into effect, the lowest optional NOx standard dropped to 0.01 grams per horsepower hour (g/hp-hr). However, to date, no engines have been certified to meet this 0.01 g/hp-hr standard. As a result, warehouse operators are unable to purchase new NZE trucks (with Model Year 2022 or newer engines) even if they are incentivized to do so under the WAIRE Program. All NZE trucks currently in operation are equipped with Model Year 2021 or older engines certified to the 0.02 g/hp-hr optional Low-NOx standard that predates the WAIRE Program's initial implementation date. Hence, according to the study, any NOx emission reductions from NZE truck trips that SCAQMD staff included in their 2nd Annual Report for the WAIRE Program cannot be attributed to the WAIRE Program.[114]

[112] Ramboll, Review of the South Coast Air Quality Management District Indirect Source Rule (ISR) on Warehouses, June 23, 2025, https://supplychainfederation.com/wp-content/uploads/2025/08/ISR-Ramboll-Study_6-23-25_Updated.pdf. A summary of the Ramboll Study can also be found here, https://supplychainfederation.com/wp-content/uploads/2025/08/WarehouseISR_Summary_6-23-25_Updated.pdf.

[113] https://www.law.cornell.edu/regulations/california/13-CCR-1956.8

[114] Ramboll Study, pp. 1-2

It is inherently difficult to attribute emission reductions to a specific program. Facilities can procure cleaner equipment for a variety of reasons that could go beyond the scope (or be complementary) of an ISR and Rule 2305 (i.e., incentive funding availability, corporate strategy, etc.). If emission reductions from Low-NOx truck trips are not solely attributable to the WAIRE Program as suggested in the study, which were reported to account for 40% of the total earned WAIRE Points in SCAQMD for Phase 2 facilities (150k to <250k sq ft), compliance year 2023, the District notes that it is possible that the emission reduction estimates included in the Supplement are likely to have been overestimated.[115]

4.5.2 Zero Emission Yard Hostlers

In SCAQMD's Final Staff Report for the Warehouse ISR, the baseline NOx emissions from all yard hostlers associated with warehouses that would be subject to the WAIRE Program was estimated to be 0.09 tons per day (tpd) for 2023, and 0.08 tpd for 2031.[116] The 2nd Annual Report for the WAIRE Program reported that the WAIRE Program had reduced emissions from yard hostlers by approximately 0.4 to 0.5 tpd in 2023, which is four to five times higher than the baseline emissions reported for these equipment.[117]



This emission benefit estimate for yard hostlers is a result of SCAQMD's assumption that all zero-emission (ZE) hostler usage reported under the WAIRE Program represent replacements of equivalent diesel yard hostler usage. However, there is no requirement in the WAIRE Program to retire or replace diesel yard hostlers with ZE yard hostlers. Instead, the WAIRE Program allows users of ZE yard hostlers to earn WAIRE points that can be used to meet their compliance requirements without assuring that existing diesel yard hostlers are retired or replaced.[118]

To its credit, Rule 2305 allowed for a greater understanding of the existing yard hostler inventory within the SCAQMD region, which is a category that was previously not well documented. That being said, if existing diesel yard hostlers are not being retired or replaced in the SCAQMD region as suggested in the study, it is possible that Rule 2305 may not be achieving emission reductions at a subject facility from the use of ZE yard

[115] Supplement, Section 2.4.3, p. 33
[116] SCAQMD, Rule 2305, Staff Report, Table 13, p. 52
[117] SCAQMD, 2nd Annual Report for the Warehouse Actions and Investments to Reduce Emissions (WAIRE) Program, October 2024, Figure 18, p. 24, https://www.aqmd.gov/docs/default-source/planning/fbmsm-docs/annual_report_waire_program_102024.pdf?sfvrsn=c6288561_9
[118] Ramboll Study, pp. 3-4

hostlers. The emission reductions noted from ZE yard hostlers also being exceedingly higher than the estimated baseline emissions from yard hostlers subject to Rule 2305, does also call into question the validity of the numbers, and whether those reductions were truly the result of Rule 2305 being in place or not.

4.5.3 Cost of Class 8 ZE Trucks

The study's findings indicate that the compliance cost for Scenario 1 (compliance using mitigation fee-only) is approximately $0.81/sq ft/yr, which is similar to SCAQMD's assessment. However, the costs associated with the acquisition and use of Class 8 ZE trucks to meet the compliance obligation (Scenarios 2 and 3) range from $0.46 to $1.32/sq. ft./yr, depending on the type of warehouse and methods of ZE truck acquisition. These costs are 3.3 to 9.4 times the $0.14/sq ft/yr value that SCAQMD staff estimated for the only Class 8 ZE truck visit scenario that was analyzed in the Socioeconomic Impact Assessment for Rule 2305.[119] The primary reasons for this discrepancy are SCAQMD staff's assumption that the Class 8 ZE truck fleet visiting the warehouse would be a third party truck that is not owned by the warehouse operator and staff's projected decrease in the purchase cost of Class 8 ZE trucks from $292,544 in 2022 to $201,351 in 2024 and $170,748 in 2031.[120] However, as noted in a more recent 2024 report from CARB, the purchase price of a Class 8 ZE trucks have actually increased from $332,757 in 2021 to $436,839 in 2024.[121] Overall, the study's findings indicate that the lease and use of Class 8 ZE trucks ($1.06 to $1.32/sq ft per year) for rule compliance is more costly than paying mitigation fees ($0.79 to $0.83/sq ft per year). While purchase and use of ZE Class 8 truck ($0.46 to $0.57/sq ft per year) could be more cost effective than the mitigation fee payment ($0.79 to $0.83/sq ft per year), this requires a sizeable upfront capital investment, posing additional financial risks on business operations.[122]

Due to inflation and other factors, it is likely that the costs for ZEV equipment have increased since the time of SCAQMD's analysis. While this is expected within the rule development process, if this is the case, then the compliance costs and cost-effectiveness estimates included in the Supplement are likely to have been underestimated.[123]

4.5.4 Net Emissions Increases

Emissions leakage can occur when an area implements stricter emission reduction measures, causing a relocation to areas with more relaxed regulations. Proposed

[119] SCAQMD, Rule 2305, SIA, p. ES-6
[120] Ibid., Table 10, p. 14
[121] CARB, Zero-Emission Class 8 Truck Pricing Comparisons – EU & US, October 2024, p. 3, , https://ww2.arb.ca.gov/sites/default/files/2024-12/Zero%20Emission%20Class%208%20Tractor%20Pricing%20Comparisons_ADA.pdf
[122] Ramboll Study, pp. 6-7
[123] Supplement, Section 2.5, pp. 38-40

Warehouse ISRs that model SCAQMD's WAIRE Program could provide warehouse operators an option to pay a mitigation fee, effectively making the ISR a tax obligation for warehouse operators who are unable to be serviced by ZE trucks at their facilities. These increased costs to warehouse operators would eventually be passed down to consumers through increased cost of goods and could cause small warehouse operators who are unable to absorb these additional costs to go out of business. Alternatively, warehouses may choose to relocate outside of ISR's jurisdiction to avoid paying these fees. This relocation could result in increased trip lengths and result in a net increase in regional NOx emissions.[124]

Notably, in relation to Rule 2305, SCAQMD completed a study during their rule development process in relation to this comment and found that it did not hold merit. SCAQMD has continued to see growth in the warehousing industry in their region since Rule 2305 adoption with no indication that relation is occurring. However, at the same time, increased compliance costs can result in increased consumer prices and/or warehousing operations potentially closing or relocating outside the jurisdiction of Rule 2305. This dynamic was similarly elevated in a comment the District received to the Supplement. In addition, if warehousing operations are relocating outside of the SCAQMD region, air quality could potentially be negatively impacted in other regions of San Diego County, or in the International Border community (if such relocations occur to the industrial areas of Tijuana). A statewide ISR that provides equivalent requirements for each region, if developed by CARB in the future, could potentially address this concern and limit the potential for relocation of businesses.

4.5.5 Implementation Costs

SCAQMD has allocated approximately half a million dollars to AgreeYa Solutions, Inc. for the development and maintenance of their WAIRE POP web portal.[125,126] *Although SCAQMD staff have proactively addressed some of the bugs with the tool's functionality, WAIRE POP still suffers from foundational data integrity issues. Warehouse operators frequently need to contact staff during the report amendment process, requiring backend approval, which significantly slows the process. Overall, the WAIRE Program imposes substantial administrative costs that are not adequately covered by current reporting fees.*[127]

[124] Ramboll Study, p. 8
[125] SCAQMD, Governing Board Package, August 6, 2021, Agenda No. 7, https://www.aqmd.gov/docs/default-source/agendas/governing-board/2021/brdpkg-2021-aug6.pdf?sfvrsn=5681d661_15
[126] SCAQMD, Governing Board Package, March 1, 2024, Agenda No. 6, https://www.aqmd.gov/docs/default-source/Agendas/Governing-Board/2024/2024-mar1-006.pdf?sfvrsn=2
[127] Ramboll Study, p. 9

Given the funds that the SCAQMD allocated to develop and maintain their web portal discussed in the study (updated to a total of approximately $900,000 per SCAQMD), and recent costs for developing other SDAPCD programs from the ground up (e.g., CC4A and AIRE), estimates included in the Supplement of $200k for a new District web portal and $25k estimate to maintain the web portal on an annual basis, may have been underestimated.[128]

[128] Supplement, Section 2.6, p. 41

5.0 POTENTIAL ISR ALTERNATIVES

Other potential non-regulatory alternatives for consideration, such as a focused Transport Refrigeration Unit (TRU) incentive program, may provide comparable emission reductions at lower costs and/or resources than anticipated with an ISR.

This section includes additional information on potential alternatives to a local warehouse ISR. Since the public release of the Supplement, the District has further evaluated alternative ISR concepts proposed within the WWG and Supplement, in addition to other new concepts. Notably, the District envisions being able to proceed with at least one potential alternative program given current staff resources and availability.

5.1 GMERP TRU Incentive Program

5.1.1 Background

An incentive funding concept that may likely reduce diesel emissions in disadvantaged communities from warehouses, grocery stores, and other indirect sources of emissions that move refrigerated cargo by truck is the replacement of diesel Transport Refrigeration Units (TRUs) with zero-emission TRUs. TRUs are refrigeration systems powered by diesel internal combustion engines designed to refrigerate or heat perishable products that are transported in various containers, including truck vans, semi-truck trailers (pictured below), shipping containers, and railcars.[129]



The Proposition 1B Goods Movement Emission Reduction Program (GMERP) is a partnership between CARB and local agencies to reduce diesel emissions and health risk from freight movement along California trade corridors. Projects funded under this program must achieve early or extra emission reductions not otherwise required by law or regulation. The District administers the program for the San Diego region. The District currently has approximately $2.8 million remaining in the program and can request an additional $665k if needed for additional projects, totaling $3.4 million.[130] Any remaining unused funds must be returned to CARB to be reallocated to other air districts in California. The District has administered this program since 2008 on

[129] https://ww2.arb.ca.gov/our-work/programs/transport-refrigeration-unit/about

[130] Estimates reflect funding available as of October 2025. Additional funding could become available for TRUs if existing GMERP projects already under contract get cancelled or do not proceed.

behalf of CARB, but in recent years has been unable to allocate funds for additional projects due to limited applicant eligibility and more stringent program requirements.

CARB recently revised programmatic requirements associated with TRUs as well as other emission source categories. These changes have seemingly renewed interest in facilities applying for TRU funding to replace aging diesel TRUs with zero-emission TRUs. This interest was exhibited in a recent GMERP grant solicitation in the Bay Area Air Quality Management District, which received over $37 million in application requests for zero-emission TRUs from major transportation and grocery fleets.[131] Similarly, the SCAQMD also requested approval from their respective Board to open a solicitation for zero-emission TRU projects funded through GMERP.[132] The San Joaquin Valley Air Pollution Control District also opened a solicitation for zero-emission TRU projects on December 15, 2025.[133]

5.1.2 Tentative Timeline and Budget

To implement a GMERP TRU program, the District would first need to coordinate with CARB staff to modify GMERP Grant Agreements accordingly to transfer remaining GMERP funds for TRUs. Staff has preliminarily discussed this with CARB, and CARB has informed the District that a project solicitation could be opened immediately upon making requested administrative changes within the GMERP tracking database ("GMOD") for the purposes of project and solicitation tracking. These changes are expected to take less than one month to complete. Concurrently, District staff and CARB could then coordinate (in parallel to opening a project solicitation) to complete a required Grant Agreement amendment to formally transfer the remaining GMERP funds to TRU projects. The amendment would need to be completed prior to making any payments with executed contracts.

Tentatively, the District envisions being able to open a GMERP TRU solicitation and start evaluating potential projects by the end of 2026, and executing contracts by the end of 2027. The Grant Agreement amendment would stipulate the actual timeframe for having new equipment operational, but the District anticipates that all new zero-emission TRU equipment would need to be fully operational within the 2028-2029 timeframe. Staff would (ideally) time the opening of a GMERP TRU solicitation concurrently to the District's existing Clean Air for All annual grant solicitation. Doing so would leverage marketing and outreach efforts/funding that is available through other APCD incentive programs, and

[131] https://www.baaqmd.gov/~/media/files/strategic-incentives/goods-movement-docs/other-equipment/ranklist-g16gmbr1-pdf.pdf?rev=ef92e1f38d704744b1c6863768e9e1d9&sc_lang=en
[132] https://www.aqmd.gov/docs/default-source/agendas/governing-board/2025/2025-oct3-003.pdf?sfvrsn=df4c6d7e_2
[133] https://www.valleyair.org/grants/proposition-1b-goods-movement/

allow the District to conduct targeted outreach to potential applicants in and around disadvantaged communities.

The District estimates implementing the entire TRU program with one full-time equivalent (FTE) position at the District for a period of approximately two years. This position already exists at the District working within the APCD Incentives division on other incentive programs and would be redirected to implement a TRU program, saving valuable time and money and forgoing a protracted hiring effort to staff a new program.[134] Staff costs to implement such a program are estimated to comprise of both CARB administrative funding (approximately $33k) and approximately $389k in other District funds over a two-year implementation period ($211k per year), and is not anticipated to require ongoing staff to administer beyond the two-year implementation period. With approximately $184k included in the FY 25-26 for possible warehouse ISR CEQA and SIA work that could potentially be redirected to GMERP implementation in future budgets, the District believes it would have sufficient available funds to fully cover the approximate cost to implement a successful program. In comparison to the estimated one-time costs to implement a warehouse ISR (i.e., $835k) and the ongoing costs associated with a warehouse ISR (i.e. up to $1 million), the GMERP TRU program's implementation costs are significantly lower, and could result in faster emission reductions if successful.

5.1.3 Estimated Emission Reductions

Staff estimates that if all remaining GMERP funds within San Diego County (approximately $3.4 million) were used to replace 34 diesel TRUs with new zero-emission units, it would likely achieve comparable PM2.5 emission reductions as a potential ISR in San Diego County, and would achieve approximately half of the anticipated low-end NOx reductions as a warehouse ISR (Table 7).[135]

[134] Past GMERP solicitations have been implemented with only 1 or 2 staff members and 300-400 applications. In comparison, a TRU program would be expected to receive fewer applications.

[135] The NOx emission reductions may be similar in practice to those anticipated from a warehouse ISR given that the estimated warehouse ISR emission reductions calculated are a best-case scenario and are likely to be less in practice.

Table 7 - Emission Reductions from TRU Replacements

PM	NOx	Description
51.08459	1729.545	Average lifetime reductions per TRU in BAAQMD GMERP over 5-year project life (lbs)
10.21692	345.9089	Average per year reductions per TRU in BAAQMD GMERP (lbs)
0.005108	0.172954	Average per year reductions per TRU (tons)
34		Potential number of TRUs that the program may replace with $3.4 million in Prop 1B funding (assuming $100k per TRU project)
0.173672	**5.880436**	Potential emission reductions that the program may achieve (tons/year) with $3.4 million in funding (assuming $100k per TRU)[136]
0.1 to 0.3	**13 to 27**	Potential emission reductions anticipated from a local warehouse ISR[137]

5.1.4 Conclusion

Based on recent information provided by CARB, there are almost 1,600 TRU units based in San Diego County, most of which are diesel-powered. CARB estimates that these TRU units emit approximately 227 tons of NOx per year.[138] Diesel TRU replacements with zero-emission technology are especially advantageous because they would likely produce real, enforceable, permanent, and quantifiable emission reductions in under-resourced communities and areas where the public congregates, in much closer proximity than most warehousing clusters. For example, refrigerated cargo is typically delivered to and from grocery stores, restaurants, and other establishments located near the general public (e.g., residences, schools, child-care centers, and health clinics). Reducing TRU emissions through this incentive funding program would likely achieve both regionwide and localized emission benefits, and provide comparable emission reductions to a potential warehouse ISR. The District could also explore prioritizing incentive funding to companies that operate within disadvantaged communities, and/or near sensitive receptors. The District could also explore building on momentum that could result from a successful GMERP TRU program to seek even more emission reductions by opening up additional funding and prioritization pathways that could then utilize Carl Moyer and AB

[136] GMERP tabulates total PM emissions, whereas the ISR Framework Supplement included estimates for PM2.5 emissions, which is a subset of PM. This may be the reason there are more PM reductions estimated with GMERP.
[137] Supplement, Section 2.4.3, p. 33
[138] CEPAM v1.04, https://ww2.arb.ca.gov/cepam

617 incentive funding for additional zero-emission TRU projects, if GMERP funds are exhausted.

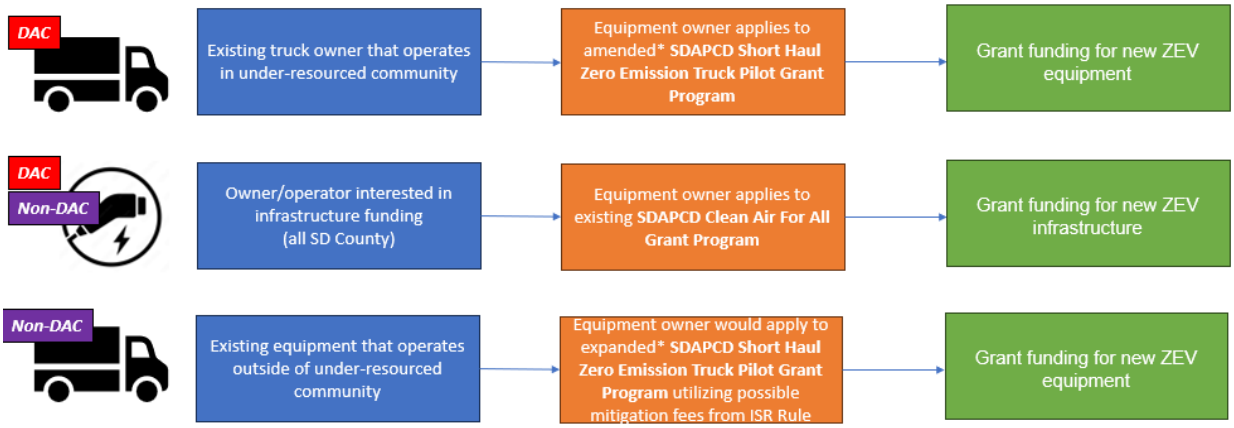
The District considers this as a viable alternative strategy that could achieve similar health benefits in lieu of a potential warehouse ISR for the following reasons: the high level of interest in TRU funding exhibited in the Bay Area region; comparable emission reductions to a potential warehouse ISR; no CEQA and/or SIA analyses would be needed; real, enforceable, permanent, and quantifiable emission reductions; minimal risk for legal challenges because it would be a voluntary program; and implementation with current staff resources.

5.2 Heavy-Duty Truck Incentive Program

5.2.1 Background

On March 4, 2024, staff presented to the WWG a preliminary three-tiered incentive concept as the primary non-regulatory strategy to incentivize emission reductions from warehouses and distribution centers in a timely manner (Figure 23).

Figure 23 – Preliminary Incentive Strategy[139]



The first tier would incentivize new zero-emission vehicle (ZEV) truck purchases in under-resourced communities by expanding and modifying the existing Portside Short Haul Zero-Emission Truck Pilot program to areas outside of the Portside Community and to encourage more applications. The second tier, which already exists today through the Clean Air for All Grant program, would continue to incentivize infrastructure purchases for new ZEV charging opportunities for warehouse and trucking companies. Lastly, the third tier would be considered by the District if a warehouse ISR were to be developed, and mitigation fees were collected as a method of compliance. The third tier would expand

[139] Supplement, Figure 2, p. 9

the District's existing Zero Emission Truck Pilot Program to ensure warehouse entities and trucking companies operating outside of under-resourced communities would be eligible to apply for new ZEV trucks.[140]

5.2.2 Tentative Timeline

To implement the aforementioned Heavy-Duty Truck incentive program, the District envisions it would be able to complete each tier in subsequent phases.

Tier 1

The first tier, which would expand and modify the existing Portside Short Haul Zero-Emission Truck Pilot program, would first need AB 617 Portside Community Steering Committee (CSC) approval (as well as potentially the AB 617 International Border CSC), and CARB approval to proceed with any modified program requirements. Potential programmatic revisions would be expected to include opening up funding eligibility beyond the Portside neighborhoods to other disadvantaged and low-income communities, and potentially prioritize applications submitted from warehousing entities located within 1,000 feet of a sensitive receptor, which was an idea requested by the WWG. Additional adjustments submitted could also seek to enhance participation in the program, such as building stronger relationships with ZEV truck dealerships, which have historically proven to be a successful model for reaching potential applicants.

Based on past submissions to CARB for community-identified projects, it is expected that CSC discussions, the preparation of a submittal to CARB, and subsequent approval by CARB, could take approximately one year to complete before being able to proceed, with the potential that CSC members may not ultimately want to support such a proposal. Consequently, a tentative timeline of opening a modified program in 2027 would be anticipated if pursued and supported by the CSC. Like GMERP, formal Grant Agreements with CARB may stipulate the actual contracting and operational deadlines for new zero-emission trucks, but a tentative timeline for being operational between 2028-2029 is anticipated if successful. The program would remain open until funds are exhausted or State deadlines for liquidation expire. Existing staff that currently implement the District's Clean Air for All grant program would likely be utilized to administer the program; therefore most (if not all) funding would be covered by CARB from existing Grant Agreements. Funding would likely emanate from the District's AB 617 fund, which due to recent legislation being passed is now expected to receive annual allocations to the District for the foreseeable future.

[140] Ibid., Section 2.1.2, pp. 8-9

Tier 2

The second tier of the Heavy-Duty Truck Incentive program, which would incentivize electrification infrastructure for trucks serving or located at warehouses, currently exists today and could be further modified to enhance participation from warehousing entities before a future Clean Air for All Grant solicitation. Infrastructure projects to serve trucks, no matter where they are located or serve, is already an allowable funding category, but may not be as well-known as other incentive programs. To enhance participation from warehousing and/or trucking companies that serve them, the District could explore including provisions within a future solicitation to prioritize such projects that could demonstrate potential emission reduction benefits around sensitive receptors, or potentially offering a higher funding cap for applicable projects.

As mentioned, formal Grant Agreements with CARB may stipulate the actual contracting and operational deadlines for new zero-emission infrastructure, but a tentative timeline for equipment being operational between 2028-2029 is anticipated if successful. The immediate availability of such a program would also work well in relation to ZEV truck purchases, as most companies require infrastructure prior to making investments in the ZEV trucks. The program would be anticipated to open annually as part of the District's existing Clean Air for All grant program; therefore, most (if not all) funding would be covered by CARB from existing Grant Agreements. Funding would likely emanate from the District's AB 617 fund which, due to recent legislation being passed, is now expected to receive annual allocations to the District for the foreseeable future. Pursuant to AB 617 funding requirements, the District would still be required to demonstrate how the funding relates (and benefits) disadvantaged and low-income communities. Existing funding from the Carl Moyer program could also be utilized if available.

Tier 3

The third tier of the Heavy-Duty Truck Incentive program, which would incentivize the purchase of ZEV trucks not located in disadvantaged communities through an additional modification to the District's Zero-Emission Truck Pilot program, would require more time and evaluation to prepare relevant timelines and budgets. If a warehouse ISR is not pursued, the District would not collect mitigation fees associated with its implementation. Consequently, the District would need to seek an additional funding source (beyond AB 617) to fund such truck projects. Existing Carl Moyer program funding could be utilized to a limited extent, but such funding is in high demand from other source categories and would also require scrappage of existing equipment which some companies have recently been reluctant to do.

Should a funding source be identified and received for such a program, the District would commit to working with community members and stakeholders in the development of such a program to further encourage projects in and around warehouses, including making any

necessary revisions to the Zero-Emission Truck Pilot project at the appropriate time and coordinating with any CSC and/or CARB as applicable. While some aspects are unknown, the District anticipates that existing staff that already implement the District's Clean Air for All grant program could be utilized to administer this potential future program.

Summary

The District anticipates Tiers 1 and 2 of the aforementioned program could potentially be available by 2027. Staff would (ideally) time the opening of such elements with the District's existing Clean Air For All annual grant solicitation. Doing so would leverage marketing and outreach efforts/funding that is available through other APCD incentive programs, and allow the District to conduct targeted outreach to potential applicants in and around disadvantaged communities.

5.2.3 Tentative Budget and Estimated Emission Reductions

The District estimates being able to implement Tiers 1 and 2 of the program with existing positions currently implementing other grant programs at APCD and would be redirected to implement a Heavy-Duty truck program, saving valuable time and money and forgoing a protracted hiring effort to staff a new program. Staff costs to implement are estimated to be approximately $211,000 per year, most (if not all) of which would be covered by CARB administrative funding associated with the incentive grants received from the state. The District would attempt to seek a funding source for Tier 3 of the aforementioned program that would similarly allow for full reimbursement of staff time spent on implementing a potential future program. In comparison to the estimated one-time costs to implement a warehouse ISR (i.e., $835k) and the ongoing costs associated with a warehouse ISR (i.e., up to $1 million), the Heavy-Duty Truck Incentive Program's implementation costs are expected to be lower and could result in faster emission reductions if successful.

Staff analyzed the amount of incentive funding, potential administration funding to implement, and number of heavy-duty truck replacements that would be needed from such a program to achieve emission reductions equivalent to the reductions expected through a potential warehouse ISR. The following assumptions were used in the analysis:

- Using EMFAC2025, a NOx emission factor for an "average" heavy-duty truck in San Diego County was developed.[141] The average heavy-duty truck operational

[141] https://arb.ca.gov/emfac/emissions-inventory

on San Diego County roadways emits approximately 0.066 tons per year of NOx, and 0.002 tons per year of PM2.5.[142]

- The Supplement noted that an ISR could achieve emission reductions between 13 to 27 tons per year of NOx and between 0.1 and 0.3 tons per year of PM2.5 in San Diego County, in a best-case scenario.[143]

- Using the above emission estimates, an incentive program replacing diesel heavy-duty trucks with zero-emission equipment would need to replace between 194 and 405 trucks to achieve equivalent NOx reductions to a potential warehouse ISR. For PM2.5, a similar incentive program would need to replace between 65 and 130 trucks with zero-emission equipment to achieve similar results as a potential warehouse ISR.

- Using the District's ZEV Pilot Project grant amounts as a proxy for a possible grant amount ($250k per truck replacement), an estimated $16 to $101 million would be needed for zero-emission truck replacements for such an incentive program to achieve equivalent ISR emission reductions. For context, the District has received over $20 million annually since 2022 from AB 617 and Carl Moyer grant awards.[144]

- Typical for most grant programs the District administers for CARB, the administration of such a program would likely require that approximately 10% of the incentive funding cover District costs to administer the program. This equates to between $2 million to $10 million.

5.3 Coordination with Warehousing Industry

Another potential concept for further consideration would be for staff to coordinate with warehouse owners/operators and/or industry organizations with the goal of procuring voluntary commitments from industry to: (1) support installation of charging infrastructure for zero-emission vehicles and equipment; (2) further the transition to zero-emission cargo handling equipment where applicable; (3) continue and enhance the District's zero-

[142] The White Paper as released on January 16, 2026, included incorrect truck emission factors showing higher baseline emissions from heavy-duty diesel trucks, which have now been corrected. The corrected truck emission factors now reflect EMFAC2025 v2.0.0, San Diego County, 2025 calendar year, summer season, Class 6-8 Diesel Trucks categories. As a result, the estimates for truck replacements and funding required have also been updated.

[143] Supplement, Table 8, p. 34

[144] Given the disparity between anticipated annual funding levels the District receives and the scale of implementing such a program, the District acknowledges that sole implementation of this truck replacement incentive funding approach would be unlikely to generate comparable emission reductions equivalent to a warehouse ISR in San Diego County. However, if combined with a successful TRU incentive program, the District believes these alternative strategies can result in comparable emission reductions to a potential warehouse ISR.

emission truck pilot program; and (4) prioritize access to incentives and grants. This coordination with industry could also be paired with the potential GMERP TRU or the Heavy-Duty Truck incentive programs discussed in the preceding two sections to achieve additional NOx and PM2.5 emission reductions.

6.0 SUMMARY OF FINDINGS AND CONSIDERATIONS

The following is a summary of the findings and considerations that informed the conclusions of this White Paper. See the referenced sections for more detailed discussions on each item.

- The estimated emission reductions from a potential warehouse ISR in San Diego County are projected to be significantly less than the reductions anticipated from other rulemakings (Section 3.1).
- The estimated public health benefits, both regionwide and in under-resourced communities, of a potential warehouse ISR are less than the benefits anticipated from recent and potential future rulemakings (Section 3.2).
- The estimated compliance costs of a potential warehouse ISR are greater than the costs anticipated from other rulemakings (Section 3.3).
- The estimated cost-effectiveness values of a potential warehouse ISR significantly exceed those for other District rulemakings, as well as cost-effectiveness thresholds used in other air districts (Section 3.4).
- A substantial percentage of the facilities identified as “warehouses” in the District’s inventory may not be conducting warehousing activities. This will likely reduce the number of facilities that would potentially be subject to a potential warehouse ISR (Section 3.5).
- The estimated one-time and on-going District costs for rule development and administration are substantial in light of current fiscal uncertainty (Section 3.6).
- A warehouse ISR in San Diego County modeled after the South Coast Air Quality Management District (SCAQMD) Rule 2305, which is the only warehouse ISR that has withstood litigation to date, is anticipated to require significant District staff effort for program implementation, outreach, and compliance/enforcement activities (Section 3.7).
- SCAQMD Rule 2305 was developed with the goal of reducing regional emissions to attain the federal and state Ozone and PM2.5 ambient air quality standards while achieving localized emission reductions as a co-benefit (Section 4.1).
- The District considered applicable comments received (Section 4.2).
- An analysis of warehouse buildings located in under-resourced communities compared to the rest of the county demonstrated that a majority of potential warehousing locations (over 70%) are located outside of identified under-resourced communities (Section 4.3.2).
- Other state activities, such as Assembly Bill 98 and a possible statewide ISR if adopted in the future, would likely achieve and support mobile source emission reductions from warehousing operations (Section 4.4).

- A third-party study that analyzed SCAQMD's WAIRE Program (Rule 2305) to date, which noted inconsistencies in reported data and the benefits that can be directly attributed to Rule 2305, and other findings (Section 4.5).
- Other potential non-regulatory alternatives for consideration, such as a focused Transport Refrigeration Unit (TRU) incentive program, may provide comparable emission reductions at lower costs and/or resources than anticipated with an ISR (Section 5.0).

7.0 CONCLUSION

The District believes the analysis outlined in this White Paper supports prioritizing the alternative strategies detailed in Section 5.0. These strategies are expected to reduce emissions, help meet state and federal air quality goals, and improve air quality in communities most impacted by pollution. Given the relatively high estimated cost of implementing a local rule, and the potential for a future statewide Indirect Source Rule (ISR), the District believes focusing on these alternatives represents the most efficient use of resources at this time.

As part of future planning, the District will designate a potential warehouse ISR as a "Further Study Measure" in the upcoming Regional Air Quality Strategy (RAQS). This ensures the measure remains under active review, with status updates provided to stakeholders as part of the regular RAQS development process. If future analysis demonstrates that the measure is both feasible and cost-effective, it may be considered for adoption.

Should the selected alternative strategies experience delays or fail to achieve intended outcomes, the District can reassess the appropriateness of a local warehouse ISR, taking into account any statewide ISR developments and implementation progress.

APPENDIX A – EPA COBRA Output Tables

Table A1 – Further Study Measure FS-7, Zero-Emission Water Heaters

Total Health Benefits		
	$4,466,535	$5,323,737
	Low Value	High Value

	Change in Incidence	Monetary Value
Total Mortality	**0.260 / 0.319**	**$3,796,502 / $4,653,704**
Mortality, All Cause (PM)	0.051 / 0.110	$747,520 / $1,604,722
Mortality, O3 Short-term Exposure (O3)	0.009	$130,955
Mortality, O3 Long-term Exposure (O3)	0.200	$2,918,028
Nonfatal Heart Attacks (PM)	**0.034**	**$2,861**
Infant Mortality (PM)	**0.000**	**$5,936**
Total Hospital Admits, All Respiratory	**0.033**	**$645**
Hospital Admits, All Respiratory (PM)	0.005	$151
Hospital Admits, All Respiratory (O3)	0.028	$495
Total Emergency Room Visits, Respiratory	**0.528**	**$858**
Emergency Room Visits, Respiratory (PM)	0.030	$48
Emergency Room Visits, Respiratory (O3)	0.499	$810
Total Asthma Onset	**2.290**	**$174,706**
Asthma Onset (PM)	0.169	$12,866
Asthma Onset (O3)	2.122	$161,840
Total Asthma Symptoms	**348.483**	**$122,622**
Asthma Symptoms, Albuterol Use (PM)	30.688	$20
Asthma Symptoms, Chest Tightness (O3)	87.554	$33,777
Asthma Symptoms, Cough (O3)	103.280	$39,845
Asthma Symptoms, Shortness of Breath (O3)	44.186	$17,047
Asthma Symptoms, Wheeze (O3)	82.775	$31,934
Emergency Room Visits, Asthma (O3)	**0.003**	**$2**
Lung Cancer (PM)	**0.004**	**$189**
Hospital Admits, Cardio-Cerebro/Peripheral Vascular Disease (PM)	**0.008**	**$244**
Hospital Admits, Alzheimers Disease (PM)	**0.028**	**$618**
Hospital Admits, Parkinsons Disease (PM)	**0.003**	**$72**
Stroke (PM)	**0.004**	**$225**
Total Hay Fever/Rhinitis	**14.518**	**$16,176**
Hay Fever/Rhinitis (PM)	1.062	$1,183
Hay Fever/Rhinitis (O3)	13.456	$14,993
Cardiac Arrest, Out of Hospital (PM)	**0.001**	**$55**
Emergency Room Visits, All Cardiac (PM)	**0.015**	**$33**
Minor Restricted Activity Days (PM)	**52.447**	**$6,594**
School Loss Days (O3)	**197.469**	**$335,364**
Work Loss Days (PM)	**8.953**	**$2,832**
Total PM Health Effects	**93.503 / 93.561**	**$781,446 / $1,638,648**
Total O3 Health Effects	**531.580**	**$3,685,089**

Table A2 – Further Study Measure FS-10, Zero-Emission Central Furnaces

Total Health Benefits		
	$3,357,429	$4,001,769
	Low Value	High Value

	Change in Incidence	Monetary Value
Total Mortality	**0.196 / 0.240**	**$2,853,773 / $3,498,112**
Mortality, All Cause (PM)	0.038 / 0.083	$561,895 / $1,206,234
Mortality, O3 Short-term Exposure (O3)	0.007	$98,436
Mortality, O3 Long-term Exposure (O3)	0.150	$2,193,442
Nonfatal Heart Attacks (PM)	**0.026**	**$2,151**
Infant Mortality (PM)	**0.000**	**$4,462**
Total Hospital Admits, All Respiratory	**0.025**	**$485**
Hospital Admits, All Respiratory (PM)	0.004	$113
Hospital Admits, All Respiratory (O3)	0.021	$372
Total Emergency Room Visits, Respiratory	**0.397**	**$645**
Emergency Room Visits, Respiratory (PM)	0.022	$36
Emergency Room Visits, Respiratory (O3)	0.375	$609
Total Asthma Onset	**1.722**	**$131,326**
Asthma Onset (PM)	0.127	$9,671
Asthma Onset (O3)	1.595	$121,655
Total Asthma Symptoms	**261.949**	**$92,173**
Asthma Symptoms, Albuterol Use (PM)	23.068	$15
Asthma Symptoms, Chest Tightness (O3)	65.813	$25,390
Asthma Symptoms, Cough (O3)	77.634	$29,950
Asthma Symptoms, Shortness of Breath (O3)	33.214	$12,814
Asthma Symptoms, Wheeze (O3)	62.221	$24,004
Emergency Room Visits, Asthma (O3)	**0.002**	**$2**
Lung Cancer (PM)	**0.003**	**$142**
Hospital Admits, Cardio-Cerebro/Peripheral Vascular Disease (PM)	**0.006**	**$184**
Hospital Admits, Alzheimers Disease (PM)	**0.021**	**$464**
Hospital Admits, Parkinsons Disease (PM)	**0.002**	**$54**
Stroke (PM)	**0.003**	**$169**
Total Hay Fever/Rhinitis	**10.913**	**$12,160**
Hay Fever/Rhinitis (PM)	0.798	$889
Hay Fever/Rhinitis (O3)	10.115	$11,270
Cardiac Arrest, Out of Hospital (PM)	**0.001**	**$41**
Emergency Room Visits, All Cardiac (PM)	**0.011**	**$25**
Minor Restricted Activity Days (PM)	**39.424**	**$4,956**
School Loss Days (O3)	**148.435**	**$252,089**
Work Loss Days (PM)	**6.730**	**$2,129**
Total PM Health Effects	**70.284 / 70.328**	**$587,396 / $1,231,736**
Total O3 Health Effects	**399.580**	**$2,770,033**

Table A3 – 2028, Scenario 3, 50k sq ft Threshold, Portside Community

Total Health Benefits		
	$32,075	$40,129
	Low Value	High Value

	Change in Incidence	Monetary Value
Total Mortality	**0.002 / 0.002**	**$27,487 / $35,541**
Mortality, All Cause (PM)	0.000 / 0.001	$7,023 / $15,077
Mortality, O3 Short-term Exposure (O3)	0.000	$879
Mortality, O3 Long-term Exposure (O3)	0.001	$19,585
Nonfatal Heart Attacks (PM)	**0.000**	**$27**
Infant Mortality (PM)	**0.000**	**$56**
Total Hospital Admits, All Respiratory	**0.000**	**$5**
Hospital Admits, All Respiratory (PM)	0.000	$1
Hospital Admits, All Respiratory (O3)	0.000	$3
Total Emergency Room Visits, Respiratory	**0.004**	**$6**
Emergency Room Visits, Respiratory (PM)	0.000	$0
Emergency Room Visits, Respiratory (O3)	0.003	$5
Total Asthma Onset	**0.016**	**$1,207**
Asthma Onset (PM)	0.002	$121
Asthma Onset (O3)	0.014	$1,086
Total Asthma Symptoms	**2.421**	**$823**
Asthma Symptoms, Albuterol Use (PM)	0.288	$0
Asthma Symptoms, Chest Tightness (O3)	0.588	$227
Asthma Symptoms, Cough (O3)	0.693	$267
Asthma Symptoms, Shortness of Breath (O3)	0.297	$114
Asthma Symptoms, Wheeze (O3)	0.556	$214
Emergency Room Visits, Asthma (O3)	**0.000**	**$0**
Lung Cancer (PM)	**0.000**	**$2**
Hospital Admits, Cardio-Cerebro/Peripheral Vascular Disease (	**0.000**	**$2**
Hospital Admits, Alzheimers Disease (PM)	**0.000**	**$6**
Hospital Admits, Parkinsons Disease (PM)	**0.000**	**$1**
Stroke (PM)	**0.000**	**$2**
Total Hay Fever/Rhinitis	**0.100**	**$112**
Hay Fever/Rhinitis (PM)	0.010	$11
Hay Fever/Rhinitis (O3)	0.090	$101
Cardiac Arrest, Out of Hospital (PM)	**0.000**	**$1**
Emergency Room Visits, All Cardiac (PM)	**0.000**	**$0**
Minor Restricted Activity Days (PM)	**0.493**	**$62**
School Loss Days (O3)	**1.325**	**$2,251**
Work Loss Days (PM)	**0.084**	**$27**
Total PM Health Effects	**0.879 / 0.879**	**$7,342 / $15,396**
Total O3 Health Effects	**3.568**	**$24,733**

Table A4 – 2028, Scenario 3, 50k sq ft Threshold, International Border Community

Total Health Benefits		
	$134,297	$167,663
	Low Value	High Value
	Change in Incidence	Monetary Value
Total Mortality	**0.008 / 0.010**	**$115,045 / $148,411**
Mortality, All Cause (PM)	0.002 / 0.004	$29,097 / $62,463
Mortality, O3 Short-term Exposure (O3)	0.000	$3,691
Mortality, O3 Long-term Exposure (O3)	0.006	$82,257
Nonfatal Heart Attacks (PM)	**0.001**	**$111**
Infant Mortality (PM)	**0.000**	**$231**
Total Hospital Admits, All Respiratory	**0.001**	**$20**
Hospital Admits, All Respiratory (PM)	0.000	$6
Hospital Admits, All Respiratory (O3)	0.001	$14
Total Emergency Room Visits, Respiratory	**0.015**	**$25**
Emergency Room Visits, Respiratory (PM)	0.001	$2
Emergency Room Visits, Respiratory (O3)	0.014	$23
Total Asthma Onset	**0.066**	**$5,063**
Asthma Onset (PM)	0.007	$501
Asthma Onset (O3)	0.060	$4,562
Total Asthma Symptoms	**10.153**	**$3,457**
Asthma Symptoms, Albuterol Use (PM)	1.195	$1
Asthma Symptoms, Chest Tightness (O3)	2.468	$952
Asthma Symptoms, Cough (O3)	2.911	$1,123
Asthma Symptoms, Shortness of Breath (O3)	1.246	$481
Asthma Symptoms, Wheeze (O3)	2.333	$900
Emergency Room Visits, Asthma (O3)	**0.000**	**$0**
Lung Cancer (PM)	**0.000**	**$7**
Hospital Admits, Cardio-Cerebro/Peripheral Vascular Disease (	**0.000**	**$10**
Hospital Admits, Alzheimers Disease (PM)	**0.001**	**$24**
Hospital Admits, Parkinsons Disease (PM)	**0.000**	**$3**
Stroke (PM)	**0.000**	**$9**
Total Hay Fever/Rhinitis	**0.421**	**$469**
Hay Fever/Rhinitis (PM)	0.041	$46
Hay Fever/Rhinitis (O3)	0.379	$423
Cardiac Arrest, Out of Hospital (PM)	**0.000**	**$2**
Emergency Room Visits, All Cardiac (PM)	**0.001**	**$1**
Minor Restricted Activity Days (PM)	**2.041**	**$257**
School Loss Days (O3)	**5.566**	**$9,454**
Work Loss Days (PM)	**0.348**	**$110**
Total PM Health Effects	**3.640 / 3.642**	**$30,417 / $63,783**
Total O3 Health Effects	**14.985**	**$103,880**

APPENDIX B – Kerr Study Analysis

Staff analyzed the data used in the Kerr et al study by calculating two correlations:[145]

- Correlation between warehouse floor area (RBA) and on-road emissions (EONRD).
- Correlation between warehouse floor area (RBA) and annual average daily traffic (AADT).

Both correlations indicate a strong relationship between warehouse floor area and on-road emissions (0.99), and between warehouse floor area and annual average daily traffic (0.97 to 0.99). A correlation coefficient of 1 indicates a perfect positive correlation, which means that when one variable changes, the other variable changes in the same direction.[146] Therefore, as warehouse square footage increases, on-road emissions and annual average daily traffic also proportionately increases.

Table B1 – Warehouse Floor Area and Emissions

City	Count of Sub	Sum of RBA	Avg floor area	Sum of EAIRP	Sum of ENONPT	Sum of ENONRD	Sum of EONRD	Sum of ERAIL	Sum of ERWC	Sum of EALL
Campo	3	69880	23,293	0	1.434075147	5.671195149	19.0697608	156.8923721	0.200954221	183.2683678
Carlsbad	60	3112212	51,870	459.4379778	3382.968754	13936.8463	30882.8096	2007.341385	341.4656384	51010.86975
Chula Vista	53	2445984	46,151	455.5446502	3573.167782	12769.69048	35307.39723	4528.211904	127.7784657	56761.79059
El Cajon	70	2438109	34,830	365.5147762	4793.17165	15847.43439	47364.28467	1773.953855	330.8410687	70475.20129
Encinitas	1	26579	26,579	0	34.98558044	172.7808685	347.7989502	23.29445648	3.840089321	582.6998901
Escondido	54	1806468	33,453	0.390419025	1965.557726	7473.814743	28391.75934	1313.461157	235.2947221	39380.27844
Fallbrook	3	75838	25,279	1.594059169	31.32354927	205.4012299	234.5946884	127.1659813	4.534640789	604.614151
Imperial Beach	1	26011	26,011	1.98231E-05	49.45735168	202.590683	454.7655029	84.3604126	1.521110296	792.6950684
Jamul	1	38000	38,000	0	20.52851486	56.16518784	171.2213135	0	1.969271183	249.8843231
La Mesa	2	63850	31,925	10.5946312	179.5735931	557.8886108	1712.943237	86.84208679	7.526556969	2555.368774
Lakeside	11	477475	43,407	58.23070765	474.2116318	1655.262909	4027.964569	71.51924515	33.18663764	6320.375763
Lemon Grove	5	177598	35,520	0.054224865	574.8330917	1639.011597	6432.876953	299.1056137	16.76549864	8962.646729
National City	29	1884245	64,974	0.488023804	2470.050537	8334.67041	31119.54059	4833.457001	47.16618919	46805.37256
Oceanside	55	2310908	42,017	16.63449819	3183.396732	12736.52051	25725.68826	2618.264492	300.84254	44581.34607
Poway	56	3874108	69,181	0.202439494	1817.813383	5465.458931	19529.51302	183.3571808	172.5703943	27168.91678
Ramona	3	103072	34,357	10.33788747	17.80431366	40.98323631	158.1085854	0	2.41852653	229.6525421
San Diego	471	24553079	52,130	33707.29292	27576.1766	94651.25222	403950.7633	23588.84257	1034.139985	584508.4702
San Marcos	46	1779551	38,686	7.945930107	1777.756416	7171.32666	19585.80017	1668.36215	206.4132309	30417.60492
Santee	17	501994	29,529	90.05436516	980.9120522	3304.66803	9227.952362	318.280756	60.97982597	13982.8479
Spring Valley	5	137239	27,448	0.020125088	327.600708	1033.891678	3045.62677	140.174118	21.76326752	4569.076538
Valley Center	1	25394	25,394	0.104213186	3.185622931	68.0994873	32.68902588	0	0.119341269	104.1976776
Vista	58	2783158	47,985	420.827379	3002.399654	12043.24803	25318.07169	2044.223803	300.998003	43129.76892
Total	**1,005**	**48,710,752**	**48,468**	**35,605**	**56,238**	**199,373**	**693,041**	**45,867**	**3,252**	**1,033,377**
Correlation RBA vs				**0.97**	**0.99**	**0.99**	**0.99**	**0.97**	**0.93**	**0.99**

[145] Kerr et al, "Data availability" section, https://www.nature.com/articles/s41467-024-50000-0#Sec4

[146] A correlation coefficient of 1 indicates a perfect positive correlation, which means that when one variable changes, the other variable changes in the same direction, https://www.scribbr.co.uk/stats/correlation-coefficient-meaning/.

Table B2 – Warehouse Floor Area and Annual Average Daily Traffic

Row Labels	Count of City	Sum of RBA	Sum of AADT	Sum of AADT_single	Sum of AADT_combination	Sum of AADT5km	Sum of AADT5km_single	Sum of AADT5km_combination	Sum of AADT3km	Sum of AADT3km_single	Sum of AADT3km_combination	Sum of AADT1km	Sum of AADT1km_single	Sum of AADT1km_combination
Campo	3	69880	208921.0726	11039.36015	10782.50086	172387.8567	8459.761097	9118.846397	99844.12338	4362.617657	2813.572257	25098.14766	1141.580708	736.2368335
Carlsbad	60	3112212	537853870	16238236.27	12612721.7	254684997	7129754.541	5915890.283	69363511.05	1533038.83	1447336.414	8202164.98	165446.8147	166298.1066
Chula Vista	53	2445984	600594234.4	18272631.98	17315242.06	391349473.4	11961439.49	11399034.44	162164148.2	5255091.32	4487090.099	33816114.28	1264153.518	839593.9146
El Cajon	70	2438109	699348396.4	22323963.52	24788229.58	478157645.9	14883545.39	18020497.3	250133101.7	7496035.804	9606512.363	62882001.05	1630904.568	1333148.302
Encinitas	1	26579	6149678.131	226456.0628	179284.6555	4619303.733	180766.8431	134930.4808	2763628.129	110057.546	76178.77459	692728.6261	26620.30003	19005.86067
Escondido	54	1806468	486649710.9	14429403.12	16459248.37	366573257.2	10989133.5	12817607.12	215207241.6	6775533.97	7250714.119	51593255.73	1877532.492	1486060.265
Fallbrook	3	75838	4702847.793	252599.0738	78752.60117	2396286.595	17556.30485	11162.33997	1528656.767	7443.574087	5527.839077	301821.3382	135.8111541	81.52051841
Imperial Beach	1	26011	9980368.506	310646.1521	289052.0047	3541564.816	124027.2598	103089.6916	1736276.07	73509.38168	52907.37809	109420.3177	1684.123012	2557.840965
Jamul	1	38000	2442840.649	85346.8691	59409.27392	743191.4134	34599.29108	26768.93429	174583.7283	12310.72681	7357.937118	42743.53219	2835.5846	1702.057008
La Mesa	2	63850	26089280.37	742515.5844	726551.7522	17508984.92	475406.364	382701.82	8670045.492	272664.2493	235159.7657	1698789.42	35122.5623	21753.88361
Lakeside	11	477475	64155875.47	2101666.837	2673399.549	36581163.03	1385382.687	1758173.876	10585481.66	452274.0265	795681.1055	2932357.815	150936.5347	261169.6378
Lemon Grove	5	177598	98201712.26	2661509.211	2007504.15	54997134.85	1458902.54	987984.4354	13867082.49	396745.6425	237434.6038	3979843.967	107178.2963	62183.68619
National City	29	1884245	509355401.3	14687848.95	11066174.99	285124770.9	7913702.139	6482448.407	125013152.6	3434200.436	2845777.433	25907649.11	597754.4109	470784.2791
Oceanside	55	2310908	410686801	13010130.52	10261334.03	261919094.1	8262097.293	6224740.035	136424545.1	4275337.248	3094320.579	13335238.5	428975.9572	234525.2583
Poway	56	3874108	428795402.6	12692730.84	20292571.07	133678877	3202501.11	5892189.96	18306511.82	150125.6816	233499.6816	2650935.57	2722.576772	5938.536882
Ramona	3	103072	2165160.15	86087.32398	55894.98764	1635727.163	64840.53521	44626.83865	1043541.045	38955.28489	30581.46397	367192.3651	16528.38499	11846.23788
San Diego	471	24553079	6838757769	217212715.1	195713634.9	3759659918	122571850.9	108947590.9	1536639874	49905545.21	44542631.48	323022127.7	10383343.79	9328492.91
San Marcos	46	1779551	339749886.3	10639399.68	8662905.148	203132142.2	6289960.145	4610063.288	94405542.82	2774975.406	1835199.87	33194154.75	945768.5792	686209.6684
Santee	17	501994	140820815.9	4268162.681	4940759.918	84215840.34	2792089.606	3648956.9	33990548.46	1212444.686	1957214.436	7658742.203	336122.6567	740896.2274
Spring Valley	5	137239	47600295.98	1338260.867	1146741.123	26957460.82	884283.1913	801424.6299	8636067.022	315934.4177	327294.372	1117362.683	42310.62706	42705.79107
Valley Center	1	25394	96430.5321	7528.354352	8018.870358	51713.4543	3574.610427	3807.517056	6608.256031	0	0	0	0	0
Vista	58	2783158	340713896.4	8904617.928	5799038.498	203047460.7	5153143.87	3186010.956	91235789.44	2442604.184	1312539.569	12407112.19	209091.6431	126337.3452
Correlation RBA vs			**0.993**	**0.992**	**0.992**	**0.988**	**0.986**	**0.984**	**0.979**	**0.978**	**0.967**	**0.969**	**0.967**	**0.967**
minimum correlation		**0.967**												
maximum correlation		**0.993**												

APPENDIX C – Background on Under-Resourced Communities

Senate Bill 535

In 2012, Senate Bill (SB) 535 (De León, Chapter 830, Statutes of 2012) established initial requirements for minimum funding levels to "Disadvantaged Communities." The legislation also gave CalEPA the responsibility for identifying those communities, stating that CalEPA's designation of disadvantaged communities must be based on "geographic, socioeconomic, public health, and environmental hazard criteria."

In May 2022, CalEPA released its updated designation of disadvantaged communities for the purpose of SB 535.[147] In this designation, CalEPA formally designated four categories of geographic areas as disadvantaged:

- Census tracts receiving the highest 25 percent of overall scores in CalEnviroScreen 4.0.
- Census tracts lacking overall scores in CalEnviroScreen 4.0 due to data gaps, but receiving the highest 5 percent of CalEnviroScreen 4.0 cumulative pollution burden scores.
- Census tracts identified in the 2017 DAC designation as disadvantaged, regardless of their scores in CalEnviroScreen 4.0.
- Lands under the control of federally recognized Tribes.

The designation takes into account the latest and best available data and considers factors related to data unavailability. This designation went into effect on July 1, 2022, at which point programs funded through California Climate Investments will use the designation in making funding decisions.[148]

Environmental Justice Communities

As discussed in the Environmental Justice Element (EJ Element) of the County of San Diego's General Plan, the County of San Diego identified "disadvantaged communities" for the EJ Element using the state-recommended screening tool CalEnviroScreen combined with localized data available through the County's Live Well San Diego data Indicators as measurements of pollution, health, and social equity. To broaden the reach of the EJ Element and to align with current County programs directed at high-need areas, the County's methodology refers to "disadvantaged communities" as Environmental Justice Communities (EJ Communities) to differentiate them from the State's designated "disadvantaged communities."

To better target engagement efforts and tailored goals, policies, and implementation measures in the EJ Element, the County grouped the 17 identified census tracts into four (4) distinct EJ Communities:

[147] https://oehha.ca.gov/media/downloads/calenviroscreen/document/sb535dacresultsdatadictionaryf2022.zip
[148] https://oehha.ca.gov/calenviroscreen/sb535

North El Cajon, North Lemon Grove, Spring Valley, and Sweetwater. These communities span the unincorporated and incorporated (city) areas within the jurisdiction covered by the County's General Plan and share land use jurisdiction with the cities of Chula Vista, El Cajon, La Mesa, Lemon Grove, and San Diego.[149]

Environmental Justice Partnership Communities

The Environmental Justice Partnership (EJP) is a collaborative effort between SDAPCD's Office of Environmental Justice, County of San Diego's Office of Sustainability and Environmental Justice (OSEJ), California Air Resources Board (CARB), community-based organizations (CBOs), and individual community members to reduce air pollution and improve air quality in some of the San Diego communities most impacted by air pollution. EJP focus communities include the following: Barrio Logan and National City, City Heights, El Cajon, Escondido and Vista, Linda Vista, San Ysidro, Southeast San Diego, and Spring Valley.[150]

[149] San Diego County General Plan, Environmental Justice Element, pp. 9-5 and 9-6, https://www.sandiegocounty.gov/content/dam/sdc/pds/gpupdate/09-Environmental-Justice-Aug2021.pdf
[150] https://www.sdapcd.org/content/sdapcd/community/office-of-environmental-justice/ejp.html

Warehouse ISR Background

Assembly Bill 423

In November 2021, the San Diego County Air Pollution Control District (SDAPCD or District) staff began work pursuant to California Assembly Bill (AB) 423 (Gloria, 2019) to evaluate the feasibility of various actions to address indirect sources of pollution, particularly warehouses and distribution centers. More specifically, AB 423 required the District to "consider adopting an indirect source rule to address pollution from mobile sources that is associated with stationary sources, such as ports, warehouses, and distribution centers."

Assembly Bill 617

In addition to the requirements of AB 423, AB 617 (Garcia, 2017) requires the California Air Resources Board (CARB) and the air districts to develop and implement Community Emission Reduction Plans (CERPs) to reduce exposures and emissions in communities that are the most impacted by poor air quality. Accordingly, one of the strategies in the CERP for the Portside Community (July 2021) is for the District to evaluate and, if feasible, propose a new rule to control emissions from indirect sources.[1] Similarly, one of the strategies in the CERP for the International Border Community (March 2024) is for the District to develop and advocate for rules or other strategies that reduce emissions from indirect sources, including heavy-duty trucks in Otay Mesa and San Ysidro.[2]

August 2022 Governing Board Meeting

In August 2022, staff provided an informational update to the Governing Board on their research and evaluation to date including the District's legal authority to regulate indirect sources, other California air districts' indirect source rules, warehouse building inventory in San Diego County, stakeholder feedback, an overview of the rule development process, and ongoing rule development activities associated with the evaluation of a potential indirect source rule.

[1] Portside Community Emissions Reduction Plan, July 2021, Action C3, p. 156, https://www.sdapcd.org/content/dam/sdapcd/documents/capp/cerp/Portside-Environmental-Justice-CERP-July-2021.pdf

[2] International Border Community Emissions Reduction Plan, March 2024, Heavy-Duty Vehicles/Strategy 5, p. 50, https://www.sdapcd.org/content/dam/sdapcd/documents/capp/meetings/int--border/reports/IBCSC%20CERP%2003.29.24.pdf

May 2023 – ISR Framework

In May 2023, District staff prepared a report titled "Options and Considerations for Reducing Indirect Source Emissions at Warehouses, Distribution Centers, and Ports", also referred to as the "ISR Framework", and presented the preliminary findings at the June 2023 Governing Board meeting.[3] The ISR Framework provided an update on staff's research and evaluation of the District's legal authority to regulate indirect sources, other California air districts' indirect source rules, warehouse building inventory in San Diego County, an overview of the possible rule development process, and ongoing activities associated with a potential Memorandum of Understanding (MOU) with the San Diego Unified Port District (Port District).

The conclusion of the ISR Framework suggested that a warehouse ISR and associated administrative fees for facilities above 100,000 square feet in size are potentially feasible and could be successfully implemented in San Diego County. It was also determined that while a local ISR could provide some emission reductions from the freight sector, such a rule was estimated to be the costliest measure the District has ever enacted in terms of the compliance costs per pound of reduced emissions. The ISR Framework further informed the public and the Governing Board that if staff were to proceed with rule development, further technical analyses (including required socioeconomic and environmental impact studies) and public review would be necessary in accordance with State law to further assess and verify feasibility prior to rule adoption.

June 2023 Governing Board Meeting

In June 2023, the Governing Board approved staff's recommendation to convene a working group, otherwise known as the Warehouse Working Group (WWG), to further engage with stakeholders and to evaluate additional concepts to reduce emissions from warehouses and distribution centers. As part of its direction, the Governing Board also instructed staff to (1) prioritize under-resourced communities, (2) consider smaller warehouses and warehouses near sensitive receptors (e.g., residences, hospitals, schools, etc.), and (3) return to the October 2023 Governing Board meeting with a timeline for action and proposed composition of the working group. The Governing Board also directed staff to pursue an MOU with the San Diego Unified Port District (Port District) that includes emissions reduction, facilitative, and health protective mitigation measures.

[3] SDAPCD, Options and Considerations for Reducing Indirect Source Emissions at Warehouses, Distribution Centers, and Ports [ISR Framework], May 2023, https://www.sdapcd.org/content/dam/sdapcd/documents/rules/warehouse-work-group/references/isr-framework-english.pdf

August 2023 Planning and Policy Committee Meeting

On August 2, 2023, District staff presented the draft timeline and potential composition of WWG participants, as well as a WWG Purpose Statement, to the SDAPCD Planning and Policy Committee. Feedback received by the Committee and stakeholders included requests to (1) expedite the projected timeline for possible regulatory action where feasible, (2) de-linking the timelines for possible regulatory and non-regulatory actions to accelerate implementation, (3) add representation to the list of possible working group participants, specifically from Tijuana-based organizations (such as the Mexican Consulate) and North/East San Diego County, and (4) begin developing proactive public messaging strategies on indirect sources and their corresponding emissions. Staff incorporated this feedback into attachments for the Board's consideration at the October Board meeting.

October 2023 Governing Board Meeting

In October 2023, staff presented an informational update to the Governing Board on the establishment of the WWG, potential working group participants, and a proposed tentative timeline for action as detailed in the Board letter attachment "Warehouse Working Group (WWG) Tentative Timeline and Possible Working Group Participants". The proposed scope and goal of the working group were provided in the attachment "Warehouse Working Group Purpose Statement". Feedback received from the Governing Board included adding representation from public health and/or physician groups to the working group participant list, a status update on the South Coast Air Quality Management District (SCAQMD) Rule 2305 litigation, and expanded outreach to communities impacted by warehousing activities.

Warehouse Working Group Meetings

As directed by the Governing Board, between September 2023 and October 2024, staff conducted 10 virtual public meetings with WWG participants, comprising almost 20 hours of in-depth, technical conversations about indirect source emissions. Over 90 organizations participated at least once during the WWG process, comprising of key local community, environmental, industrial, and government stakeholders, to collect varying perspectives from a wide variety of stakeholders. The group was not typically able to reach a consensus on most topics. While such agreements were not anticipated, the WWG nonetheless continually provided thoughtful and meaningful information for the District's consideration.

April 2025 – ISR Framework Supplement

In April 2025, District staff prepared a report titled "Warehouse Indirect Source Rule (ISR) Framework Supplement".[4] The report, also referred to as the Supplement, presented an update to pertinent sections found in the initial ISR Framework for warehouses and distribution centers. The Supplement also provided new or updated information through analysis that was either directed by the Governing Board, Planning and Policy Committee, and/or discussed through the WWG.

June 2025 Governing Board Meeting

In June 2025, District staff presented a proposed MOU with the Port District for the Governing Board's consideration. The MOU incorporated voluntary commitments that will: (1) support installation of charging infrastructure for zero-emission vehicles and equipment; (2) further the transition to zero-emission cargo handling equipment; (3) continue and enhance the SDAPCD zero-emission truck pilot program and Port District zero-emission truck activities; (4) prioritize access to incentives and grants to help achieve shared Portside emission reduction goals; (5) reduce emissions from ocean going vessels and commercial harbor craft; (6) enhance public participation and transparency on Port District and SDAPCD projects in the Portside area; and (7) create additional opportunities to maximize air quality benefits from the Port's Maritime Industrial Impact Funding. The Governing Board authorized the District to enter into the MOU during the meeting. In July 2025, the Board of Port Commissioners also approved the MOU. On August 4, 2025, the MOU between the SDAPCD and the Port District became effective.

January 2026

On January 16, 2026, the District released a final report titled "Strategies to Reduce Indirect Source Emissions at Warehouses and Distribution Centers White Paper", also referred to as the "White Paper" (Attachment C).[5] The Supplement presented additional context to information and findings made within the ISR Framework Supplement. The White Paper also: (1) included responses to applicable comments within the ISR Framework Supplement comment period, (2) included a more robust analysis of a potential warehouse ISR's anticipated impact in under-resourced communities within San Diego County, and (3) included more information on potential alternative strategies including estimated funding levels, staffing, timelines, and budgets. This information helped inform conclusions made within the White Paper Section 5.0.

[4] SDAPCD, Warehouse Indirect Source Rule (ISR) Framework Supplement, April 2025, https://www.sdapcd.org/content/dam/sdapcd/documents/rules/warehouse-work-group/april-2025/isr-framework-supplement.pdf

[5] The White Paper, as released on January 16, 2026, included incorrect truck emission factors within Section 5.2.3 showing higher baseline emissions from heavy-duty diesel trucks, which have now been corrected and incorporated into the Revised White Paper released on February 25, 2026 (Attachment C).

From: noreply@sdapcd.org
To: APCD, Public Comment
Cc: Forbis, Paula; Vigil, Domingo; Luther, Mahiany; Gronenthal, Jude J; Mike.Watt@sdapcd.org
Subject: APCDGB Written Public Comment
Date: Thursday, February 12, 2026 2:34:54 PM

You've received a new form based mail from https://www.sdapcd.org/content/sdapcd/about/district-boards/governing-board/board-agendas-minutes/meeting-information.html

Submitted Data:

Name*
Anthony Dang

Agenda Item
NON-AGENDA PUBLIC COMMENT (GENERAL)

Enter comments here:
Good afternoon board. My name is Anthony Dang, I'm a policy advocate with Climate Action Campaign where we're fighting for an affordable, pollution-free future. We cannot reach this collective future when our neighbors, especially our portside and borderside communities as identified by AB 617 are facing unjust amounts of air pollution.

We appreciate the thoroughness of the recently released ISR White Paper and the staff's analysis of how the South Coast AQMD model might be replicated. However, we believe further analysis is required. We shouldn't just look at whether a model from other regions can be copied; we must look at how an ISR can be tailored to San Diego's unique needs and constraints.

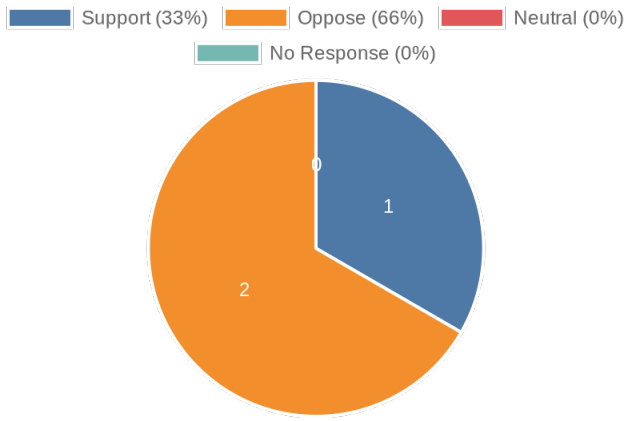
While San Diego may have a different warehouse footprint than our neighbors at South Coast, our Port of Entry clusters are 'bright red' on CalEnviroScreen. We urge the Board to look beyond replication and instead design a rule that works within our specific budget and geographic constraints to protect our most impacted residents - these constraints are opportunities to innovate for the benefit of our environmental justice communities.

The white paper assesses incentive programs which could be a starting place, but we know there is historically low participation in incentive programs, eventually an ISR or another policy would need to be developed so we have a more holistic carrot and stick type of policy. And waiting for the statewide ISR is not an option either as it will inevitably be tied down in legal challenges for several years.

Thank you again to the staff for all their hard work and research and we look forward to future discussions.

Agenda Item: eComments for E.5) UPDATE ON STRATEGIES TO REDUCE INDIRECT SOURCE EMISSIONS FROM WAREHOUSES AND DISTRIBUTION CENTERS IN SAN DIEGO COUNTY

Overall Sentiment



Charles Rilli
Location:
Submitted At: 5:01pm 04-07-26

On behalf of Sierra Club San Diego's 28,000 members and supporters'-we oppose the staff recommendation. SDAPCD should begin rulemaking for an Indirect Source Rule to address a major, unregulated pollution source from large trip generators. An ISR would cut emissions, improve public health, advance environmental justice,and support climate goals.Rulemaking allows feasibility analysis while ensuring accountability, flexibility, and innovation, and fills gaps left by weakened fed clean fleet rules.

Pamela Heatherington
Location:
Submitted At: 4:32pm 04-07-26

I encourage you to pass and regulate an Indirect Source Rule There is a gap in regional and air quality strategies. Trucks are a prime source of emissions that affect not only our health but the health of our environment. Disproportionally these impacts target low-income communities, communities of color and those that live close to freeways.
We must do better.
Pamela Heatherington

Craig Benedetto
Location:
Submitted At: 12:25pm 04-06-26

On Behalf of NAIOP San Diego, and our over 400 members, we are writing in support of the staff recommendation to pursue incentive based strategies that further reduce greenhouse gas emissions, rather than pursue a costly indirect source rule making exercise. NAIOP has appreciated staff's time and consideration of the numerous data points presented demonstrating that an ISR is not cost effective, nor an effective strategy. Based on numerous local examples, incentives work. Thank you!

From: Ron Askeland
To: APCD, Public Comment
Subject: [External] Opposition to Agenda E. #5
Date: Tuesday, April 7, 2026 5:33:34 PM

To: SDAPCD
Subject: Opposition to Agenda E. #5

SDAPCD must start rulemaking now. San Diego's air pollution comes mainly from vehicle trips to major sites. ISR reduces NOx, PM2.5, and ozone precursors, improving air quality for low-income and minority communities. It supports clean air standards and climate targets by cutting transportation emissions. San Diego can learn from ISR policies in Los Angeles and other regions; six ISRs are already in place in California.

Thank you,
Dr. Ronald Askeland

From: joan bockman
To: APCD, Public Comment
Subject: [External] Vote no on E5
Date: Wednesday, April 8, 2026 1:32:29 PM

After a huge public outcry, Oceanside approved a warehouse. We need protection from the pollution caused by these uses. Please work on rules and vote against staff recommendation.
Joan Bockman
Oceanside

From:	Craig Benedetto
To:	APCD, Public Comment
Cc:	Jack Monger; Sharon Cloward; Alejandra Mier y Teran; Chris Duggan; Myriam Mendoza
Subject:	[External] Comments - Item E5 - SD APCD Governing Board - Coalition Letter regarding ISR
Date:	Wednesday, April 8, 2026 11:12:28 AM
Attachments:	Final Coalition Letter - SD APCD - Item E5 - ISR Recommendations - Ap 9, 2026.pdf Coalition Final - ISR Framework Letter May 30.pdf

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Good afternoon. Attached is a coalition letter for distribution to the SD APCD Governing Board for tomorrow's hearing. The comment letter is in regard to the staff recommendation for Item E5 on the Board's agenda and includes an attachment (two documents) that should accompany the letter. Thank you for distributing this to the Board members. Please let us know if you have any questions.

Sent by:

Craig Benedetto
California Strategies
530 B Street, Suite 920
San Diego, CA 92101

O: (619) 546-7451
C: (619) 980-8032
E: craigb@calstrat.com

www.calstrat.com

April 7, 2026

Members of the Governing Board
San Diego County Air Pollution Control District
10124 Old Grove Rd.
San Diego, CA 92131

RE: Item E5 - Support Staff Recommendation Regarding Strategies to Reduce Indirect Source Emissions

Dear Members of the Governing Board:

The undersigned Coalition represents a broad spectrum of business organizations in San Diego County that support responsible air quality management while recognizing the economic realities of our region. We are writing today in support of the staff recommendation on strategies to reduce indirect source emissions, as reflected in the staff report on Item E5. Our Coalition members have been participating in stakeholder meetings convened by the District and appreciate staff's engagement throughout this process and their willingness to discuss numerous data points relative to emissions and our region's unique situation.

ISR's Do NOT Work

It's important to look at a recent analysis by Ramboll of the South Coast AQMD proposed Indirect Source Rule (ISR). The conclusion by Ramboll indicated that the SCAQMD ISR has had a negligible effect on emissions, a much higher cost of compliance than anticipated by AQMD staff, and demonstrates that the SCAQMD ISR is effectively a supply chain tax that impacts affordability on virtually every good and service California consumers receive. Given these results in our neighboring region, we can learn important lessons and take a different approach here in San Diego.

The SDAPCD analysis of an ISR for the San Diego Region shows the air quality benefit to be even less, given the number, size and distribution of warehouse uses.

ISR's SIGNIFICANTLY Increase Costs to Employers and Consumers Alike

California is already among the most expensive states in which to operate a business, and additional regulatory burdens risk further increasing costs for employers, consumers, and working families. As we have stated in previous correspondence to the District, an ISR would impose onerous new requirements that would significantly increase operating costs, disrupt supply chains, and ultimately reduce the competitiveness of our region. Businesses are already facing significant inflationary pressures and regulatory complexities at the local, state, and federal level, which would be further exacerbated by an ISR.

The staff recommendation captures many of our concerns, which are centered on the cost of these new regulations compared to the emission reductions offered by an ISR.

The staff report is clear, emission reductions from an ISR would be "*significantly less than the reductions anticipated from other rule makings*." Likewise, the potential health benefits, including in under resourced communities, would be "*less than the benefits anticipated from recent and potential rulemakings*."

Please see attached a letter, previously submitted to the District, detailing our concerns. Data points demonstrate that an ISR would be the least effective and most costly rule to date to reduce criteria air pollutants, namely nitrogen oxides (NOx) and particulate matter (PM).

As a border region, much of San Diego's truck and commercial traffic is a pass through from other areas, including across our international border. Additionally, the traffic patterns of many of these truck trips and the location of facilities would not be meaningfully impacted by an ISR and, more notably, would not benefit overburdened areas in our community. We strongly support the proposed staff recommendation and its focus on incentives that are currently making progress, including in our Port communities where Port of San Diego and SDAPCD recently signed an MOU that strengthens our collaborative, partnership to continue incentivizing voluntary emissions reductions. We also welcome continued collaboration opportunities with the business community to expand incentives and other programs to cost-effectively reduce emissions. As the staff report shows, this would be a far more effective strategy.

For these reasons, we respectfully urge the APCD Board to support the staff recommendation and refrain from pursuing an ISR.

Sincerely,

Jack Monger
Industrial Environmental Association

Sharon Cloward
San Diego Working Waterfront

Chris Cate
San Diego Regional Chamber of Commerce

Alejandra Mier y Teran
Otay Mesa Chamber of Commerce

Craig Benedetto
NAIOP San Diego

Chris Duggan
California Restaurant Association - San Diego County Chapter

May 31, 2025

Mike Watt
Deputy Director
San Diego County Air Pollution Control District
10124 Old Grove Rd.
San Diego, CA 92131

RE: Comments regarding Warehouse ISR Framework Supplement

Dear Mr. Watt,

The undersigned Coalition represents a broad spectrum of business organizations and advocates in San Diego County, who support ensuring responsible air quality management while balancing the economic realities of our region. We appreciate the opportunity to prepare and submit comments regarding the staff's proposed Indirect Source Rule Framework Supplement (ISR), published in April 2025, as informed by the Warehouse Work Group (WWG) meetings that were held throughout 2024.

California is already among the most expensive states in which to operate a business, affecting both San Diego's business community and working families. The proposed ISR imposes new requirements and rulemaking that increase operating costs for businesses. The costs of new rulemaking and regulations greatly undermine the competitiveness of our region and our

region's economy, further straining affordability for businesses and residents alike. Businesses are already facing significant inflationary pressures and regulatory complexities at both the local and state level, which would be further exacerbated by this proposed rulemaking. We remain concerned that the proposed rulemaking laid forth in this ISR does not accurately or effectively address emissions, and places undue burdens that will undoubtedly drive up the costs of goods and services, which will be borne by consumers in the San Diego region.

The Coalition hopes that District Staff and its Governing Board will take into consideration the following comments and agree with the Coalition's recommendation against creating an ISR for San Diego County. As conceptualized by other Air Districts such as the South Coast Air Quality Management District, and even through the WWG's own findings, an ISR would be the least effective and most costly rule to date to reduce criteria air pollutants, namely nitrogen oxides (NOx) and particulate matter (PM).

1) Executive Summary, Page ES-2

Regarding the comment from the "environmental perspective", where: "developing an ISR (as opposed to a voluntary incentive program) could potentially provide more certainty for achieving emission reductions if framed in a way that could target such facilities in disadvantaged communities".

The Coalition asserts that staff's emissions reduction analysis; CARB's emissions modelling data; IEA's warehouse identification, truck traffic, and emissions reduction analyses from publicly available data; and the Kerr et al study's finding as cited by the Environmental Health Coalition do not support this conclusion.

2) Executive Summary, Page ES-4

Regarding: "The results of the analysis showed a strong positive correlation between warehouse size and truck volume".

The Coalition disagrees with staff's methodology in determining warehouse size and truck volumes, especially considering the District's refined analysis of CoStar "warehouses". As noted in the Kerr et al. study, if it was the case that the size of the facility correlated so strongly with increased truck volume/visits, then their findings would have also indicated as such. Rather, the study concluded that across all population densities, the r-value for warehouse loading dock and parking space numbers (a useful proxy for

facility size) was low (less than r=0.2), especially for high-population density areas, where r=0.02 and r=0.03 for loading docks and parking spaces, respectively.

3) Executive Summary, Page ES-6

Regarding "The estimated cost-effectiveness for a possible ISR now far exceeds the cost-effectiveness values estimated for recent District rulemakings, as well as for incentive-based projects within the Carl Moyer program, which are generally recognized as some of the highest cost-effectiveness values for achieving emission reductions".

While this phrasing is confusing, the Coalition agrees with the staff's assessment given all of the facts noted above that an ISR is the least cost-effective means of achieving emissions reductions, and we would encourage the APCD Board to come to the same conclusion based upon the preponderance of facts presented throughout the WWG process. The coalition encourages proponents for the rule to consider the opportunity costs for applying so much capital, time, and energy to provide such marginal material benefit to emissions reductions. There are demonstrably more effective alternatives to improving quality of life to affected community members within San Diego County than an ISR as conceptualized by South Coast AQMD.

4) Executive Summary, Page ES-8

Regarding "14% of the 70 facilities researched may likely be conducting goods-movement related activities. If these results are extrapolated for the warehouse inventory countywide, then the possible ISR emission reduction estimates presented above may very likely be a best-case scenario.

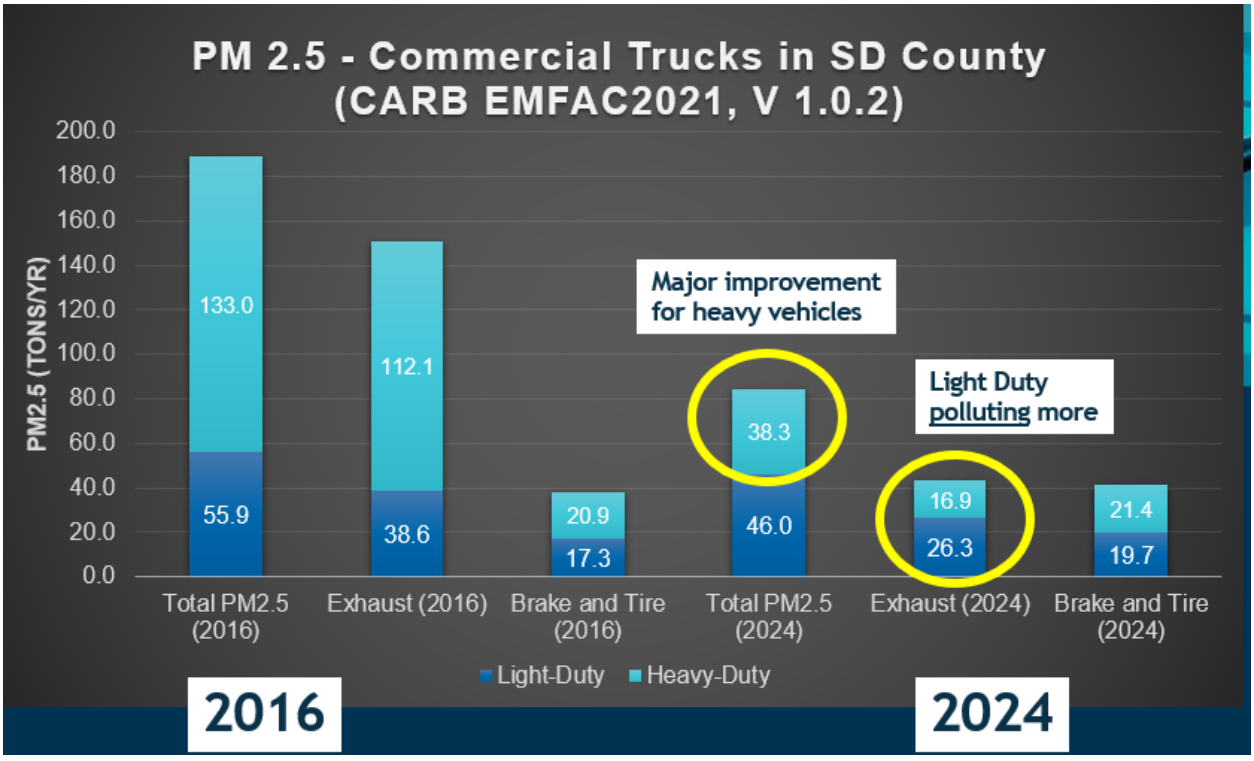
The Coalition agrees with staff's assessment that the emissions reductions estimates presented may be a best-case scenario, which strongly suggests against promulgating an ISR.

5) Section 2.1.5, Stakeholder Comments for District Consideration, Page 15:

The Coalition acknowledges and agrees that to implement an incentive-based electrification program of all diesel light-duty commercial vehicles throughout San Diego County would be infeasible due to the resources needed to administrate applicants and cover the total cost of the vehicles themselves. However, the Coalition maintains that the scope of an incentive-based program for light-commercial vehicle electrification can be scaled to

focus on small businesses across other industry groups, largely meeting the goals of this program. These businesses, categorized in the 2022 SANDAG Commercial Vehicle Survey, utilize fleets of diesel light-duty vehicles and present the best opportunity to reduce emissions from mobile sources, as demonstrated below.

Data shows that exhaust emissions of PM2.5 from the County's light-duty commercial vehicle population are considerably greater than heavy-duty commercial vehicles. According to CARB EMFAC emissions modeling, the amount and nature of NOx and diesel particulate emissions (classified as PM2.5) have changed considerably since 2016, the data year referenced in policy-making tools such as CalEnviroscreen. For example, the 2016 total heavy duty commercial vehicle contribution for PM2.5 was approximately 133 tons per year, compared to 55.9 tons per year for light-duty; of which, approximately 80% was from tailpipe exhaust. By 2024, the model estimates total heavy duty commercial vehicles emissions at approximately 38.3 tons per year (71% reduction), compared to 46 tons per year for light-duty commercial vehicles. Further analysis yields additional key insights (See the figure below).



First, overall contributions of NOx and diesel particulate matter, have decreased by more than 50% from 2016 to 2024. Second, exhaust emissions of PM2.5 from light-duty commercial vehicles are considerably greater than heavy-duty commercial vehicles, by a factor of 1.5; likely due to the numerous CARB emissions standards for medium/heavy-duty vehicles and fuel requirements.

The EMFAC-modelled emissions are also in alignment with the trends identified in SANDAG's 2022 Commercial Vehicle Survey, where up to 60% of all commercial vehicles in San Diego County are light-duty and they contribute a significant portion of commercial traffic within the County, including AB617-recognized disadvantaged communities. The owners of these vehicles include small and local businesses that are the most affected by changes in economic conditions, less likely to have the capital to electrify their work vehicle fleets and are the most at risk for slow adoption of EV technologies, despite their localized impacts to air quality within the communities that they serve.

Furthermore, the scope of a possible incentive-based program for light-commercial vehicle electrification can be scaled to accommodate resource and practicality needs by the District. For example, public data sets from entities like Go-Biz (CA Governor's Office of Business and Economic Development) allow for relatively simple identification and outreach to businesses within cities, census tracts, neighborhoods, etc. to assess their vehicle habits, and applicability for incentives. Successful initiation of an ISR incentives program for small businesses, whether scoped for the County, a City, or AB617 communities, appears to have multiple positives: investment in small businesses (and potentially disadvantaged communities), accelerating EV adoption for slow-adopters, reduction of street-level emissions from a mobile source with growing contributions to air pollution, and allowing for the commercial engine of San Diego's economy to maintain its operational flexibility.

6) Section 2.1.5, Stakeholder Comments for District Consideration, Page 17:

The Coalition commends the additional rigor applied by District Staff to the ISR emissions reduction analysis to append what was first presented to the Warehouse Working Group in October 2024. One of the Coalition's primary concerns regarding previous analyses was the use of real estate data from CoStar, of which a majority of their commercial/industrial properties are flagged with a "warehouse" descriptor but are, in fact, not used as such. The

use of the data at face value presented a high risk of overestimating the number of warehouses (and therefore commercial heavy-duty truck traffic) in San Diego County.

Staff's follow-up observational assessment of facilities classified as "warehouses" in the CoStar Data around the Barrio Senior Villas complex (in the AB617 Portside Community) determined that 10 out of 70 (14%) *may* be conducting goods movement and distribution (emphasis added). This low number aligns with IEA's independent analysis, as presented during one of the WWG sessions, of the quantity and location of warehousing facilities in San Diego County and warrants strong caution against overstating potential localized impacts in areas that CoStar data erroneously categorizes as warehouses.

7) Response to Environmental Health Coalition Letter to APCD Rulemaking Group on September 2024 in support of an ISR:

The Coalition understands that the Environmental Health Coalition has advocated for an ISR based in part on findings from the Kerr et al, (2024) Nature study titled "Air Pollution Impacts from Warehousing in the United States" in their letter to the APCD dated September 2024. On its face, the study purports to have identified a strong correlation of elevated NO2 concentrations (up to 21% relative to ambient conditions) around warehouse clusters at the national level with a population of approximately 150,000 facilities. However, in a separate presentation to the WWG, the IEA identified several key issues with the study's methodology and narrative that strongly suggest against an ISR for San Diego County, specifically, and the conceptualization of an ISR based on warehouse sizing as used in other Air Districts, more broadly.

First, the study presents in Figure 2B the correlation between NO2 measurements (collected via satellite composite measurements) and warehouse loading docks, parking spaces, and clustering (co-location) in three distinct cohorts: low-population density (<267 people per square kilometer[Sq.Km]), medium population density (267 to 1501 people per Sq.Km), and "high" population density (greater than 1501 people per Sq.Km) areas. The study's strongest correlation factor (r-value) among these cohorts is for low-population density clusters at 0.63. The r-value drops significantly, down to 0.24 (little to no correlation), for high-population

density areas. The study's authors concede the point that "the relationship between NOx, loading docks, parking spaces, and [warehouse] clustering is weaker in high population density environments, likely owing to the complex mixture of NOx sources in built up areas that may obscure the warehouse-associated enhancement". This suggests that warehouse operations, relative to all other commercial/industrial impacts, are indistinguishable to ambient air quality concerning NOx. For reference, essentially all developed census tracts with commercial warehousing areas in San Diego County, with the exception of Otay Mesa, have "high" population densities.

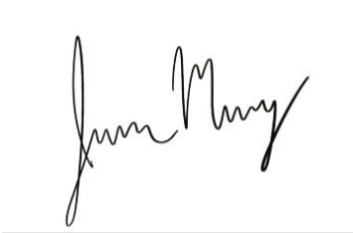
Second, the study's population of warehouse facilities for use in their methodology is based on CoStar data as well, which has since been demonstrated by the APCD's targeted review of 70 warehouse facilities around the Barrio Senior Villas complex, as potentially misrepresenting as much as 86% of the population as a warehouse facility. Therefore, the study's statistical associations (r- and p-scores) in their findings are likely significantly overstated or distorted. In other words, the study cannot conclude that warehousing clusters, especially in high population densities, contribute any more to ambient NOx concentrations than any other activity done in modern society, casting severe doubts on the effectiveness of an ISR.

Lastly, the Coalition strongly advises APCD to consider the following observation in the study's narrative: "Other warehouse characteristics were either uncorrelated or weakly correlated with NOx; for example, the correlation between warehouse building area and NOx is weak for all population densities (r=<0.1)". The Coalition believes that an observation like this in a study attempting to associate a link between warehouses and emissions, if true, suggests that the entire paradigm for a rule based on warehouse size (square footage) is technically unsound and an ineffective basis for an ISR. At this time, the publicly available data for emissions, commercial traffic, and properties would appear to support a stance against an ISR.

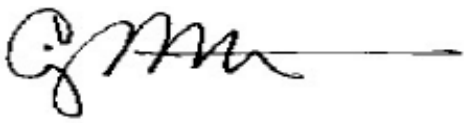
Thank you for your consideration of these comments and for the opportunities to participate and provide feedback through the WWG process. The Coalition understands this is a complicated situation, but remains steadfast in our conclusion that the facts do not warrant the initiation of a rule making process to establish an ISR. We would further hope that the District, in coming to the same conclusion, would continue to work with us,

as impacted stakeholders, on ways to address vehicle emissions that are feasible, sustainable and responsible to all communities.

Sincerely,



Justine Murray
Executive Director, Public Affairs
San Diego Regional
Chamber of Commerce



Craig Benedetto
Legislative Advocate
NAIOP San Diego



Jack Monger
CEO
Industrial Environmental Association

April 8, 2026

San Diego County Air Pollution Control District
10124 Old Grove Road
San Diego, CA 92131

Re: Oppose: Staff Recommendation for Item E.5
Coastal Environmental Rights Foundation Comments

Dear Air Pollution Control District Governing Board:

On behalf of Coastal Environmental Rights Foundation (CERF), please accept this letter in opposition to the staff recommendation for agenda item E.5 of the April 9, 2026 meeting, which would decline to begin the rulemaking process for a warehouse indirect source rule (ISR). CERF is a nonprofit environmental organization founded by surfers in 2008 for the protection and enhancement of California's coastal resources. The purposes of CERF are to aid the enforcement of environmental laws, raise public awareness about coastal environmental issues, encourage environmental activism, and generally act to defend natural resources in coastal areas. To further these goals, CERF actively seeks federal and state agency implementation of applicable statutes, and, where necessary, directly initiates enforcement actions on behalf of itself and its members.

CERF recommends that the San Diego Air Pollution Control District (SDAPCD) Governing Board direct staff to develop a countywide Indirect Source Rule (ISR) for warehouses and distribution centers. The San Diego ISR should use a phased approach to provide emission reductions to areas most impacted and in recognition of potential agency capacity limitations. The phases should be prioritized as follows: 1) facilities in the communities most impacted by diesel pollution from warehouse and distribution center operations; 2) warehouses over 100,000 square feet in these communities; 3) warehouses over 50,000 square feet in priority communities; and 4) warehouses in second-tier impact communities.

APCD asserts that a majority of warehouses and distribution centers are not located in under-resourced communities and that these communities would not benefit from an ISR. This conclusion comes from the utilization of CalEnviroscreen (CES) 4.0 rather than the new CES 5.0 made available this year, which clearly designates the border region as having a higher health burden than previous data suggest. CES has been working to improve the representation of impacts on the border region and has integrated pollution data for the border region, which also has the highest number of warehouses according to staff analysis: 36 warehouses of over 100,000 square feet and 102 warehouses of 50,000 square feet.

The current federal administration is attacking California's ability to clean our air through its rollback of California's vehicle emission rules. The California Air Resources Board was compelled to withdraw its request for a U.S. EPA waiver to implement the Advance Clean Fleet rule (ACF) when it became clear that a rejection was imminent. This rule would have made the goal of transitioning 100 percent of heavy-duty drayage fleets to zero-emission by 2035 a reality.

Without ACF, and a supportive federal government, impacted communities need leadership from regional air districts like SDAPCD to step up and tackle the indirect sources of pollution in the region. The warehouse and distribution center ISR is the regulatory vehicle needed at this time to ensure that freight movement and warehouse operations are part of the overall emission reduction strategies in San Diego. A warehouse ISR would provide the most benefits for the most impacted communities in the region, leading to greater emission reductions where they are needed the most. These air quality improvements would likely also be compounded by a reduction in greenhouse gas emissions – resulting in additional regional benefits.

CERF encourages you to act and not let this opportunity pass. San Diego needs your leadership; the federal government is failing our communities and pulling back on its commitment to clean air and a healthy environment. The ISR presents an invaluable local opportunity to lead with environmental justice.

Thank you for your consideration.

Sincerely,



Aram Zadeh
CERF Member-at-Large

EARTHJUSTICE

April 8, 2026

Chair Birkbeck-Garcia and Members of the Governing Board
San Diego Air Pollution Control District
1600 Pacific Highway
Room 302
San Diego, CA 92101

Re: Agenda Item No. E5 – OPPOSITION TO UPDATE ON STRATEGIES TO REDUCE INDIRECT SOURCE EMISSIONS FROM WAREHOUSES AND DISTRIBUTION CENTERS IN SAN DIEGO COUNTY

Dear Chair Birkbeck-Garcia and Members of the San Diego APCD Governing Board:

Earthjustice submits this letter in response to the February 20, 2026 Revised Strategies to Reduce Indirect Source Emissions at Warehouses and Distribution Centers White Paper ("2026 ISR White Paper"), developed by the staff of the San Diego Air Pollution Control District ("San Diego APCD"). Upon request by the Environmental Health Coalition, we reviewed the White Paper's cost-effectiveness analysis, proposed alternatives, and whether an ISR could be developed to provide relief to the most overburdened communities first. We have determined the following based on our review:

- The cost-effectiveness arguments in the 2026 ISR White Paper provide an incomplete picture, and it is premature to defeat a yet-to-be identified rule concept based on a back-of-the-envelope cost calculation.
- Simply pursing programs using taxpayer dollars (e.g. Proposition 1B and AB 617 funds) already allocated to clean the air in San Diego and voluntary approaches provide a poor substitute to an ISR that could be developed to provide long-term, consistent and permanent relief to the people of San Diego.
- An ISR could be designed to provide relief to overburdened communities first.

The San Diego APCD is charged with protecting public health and a retreat from its duties to clean the air and address the rampant environmental injustice caused by the warehousing industry through an ISR would be problematic. It is unsurprising that the warehousing industry and its freight industry allies oppose ISR concepts and would prefer placing the onus of cleaning up warehouse pollution on taxpayers to provide incentives. However, incentives alone are an inadequate solution to this problem and, more importantly, would absolve the corporations causing this pollution of their responsibility to right these wrongs. ISRs are a critical regulatory tool that the San Diego APCD can employ to ensure that corporations reaping the monetary benefits from goods movement do their part to clean up the dangerous air pollution they are creating. Action by the San Diego APCD is all the more

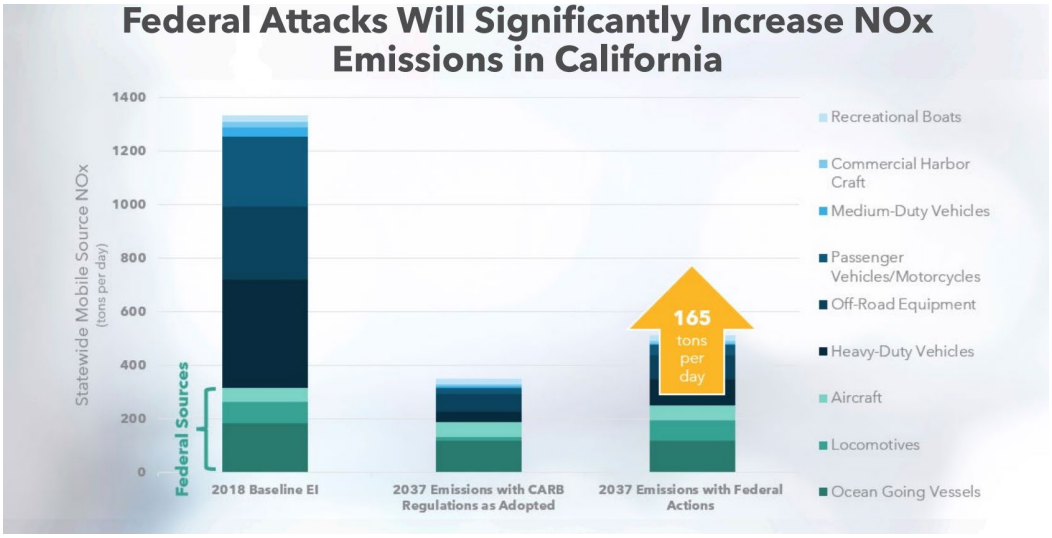
necessary in current circumstances, with the federal government attacking clean air protections and the traditional tools that California has employed to address transportation pollution.

I. ISRs are Needed to Fill Gaps Resulting from Federal Attacks on Clean Air Protections.

Last month, staff at the California Air Resources Board (CARB) presented to their Board regarding the significant and serious attacks the federal government has mounted against the state's clean air efforts. The following slide[1] demonstrates these attacks:

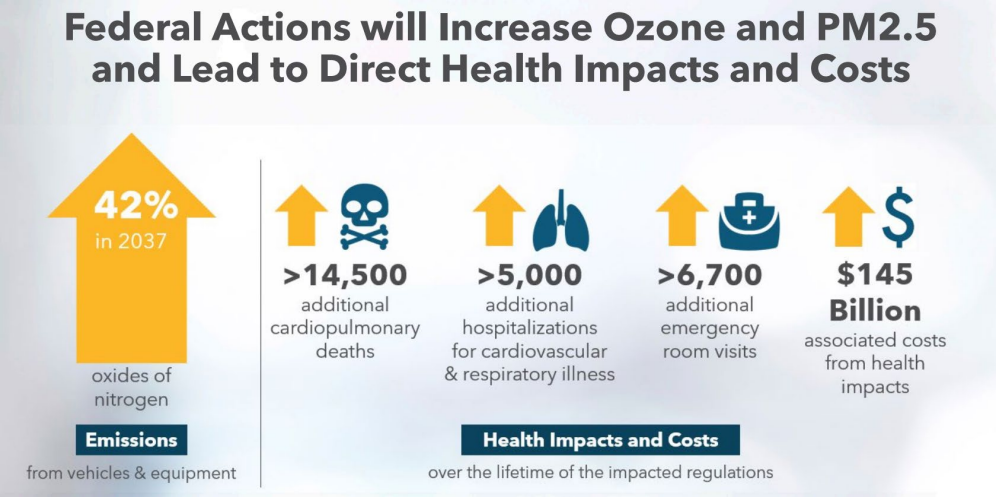


These federal actions will result in an additional 165 tons per day of nitrogen oxide (NOx) emissions in California, as detailed in the following chart.[2]



[1] California Air Resources Board, Consideration of Criteria Pollutant Planning Efforts, Presentation at March 26, 2026 Board Meeting, at Slide 3, *available at* https://ww2.arb.ca.gov/sites/default/files/barcu/board/books/2026/032626/26-2-2pres.pdf.
[2] *Id.* at Slide 4.

These increased emissions will lead to devastating health consequences for California, including San Diego. According to CARB staff, the projected increase in NOx emissions will lead to direct health impacts to Californians, including greater rates of heart and lung illnesses and 14,500 additional deaths related to such conditions. The cost of these direct health impacts are estimated to exceed $145 billion.[3]



Against this backdrop, this is not the time for the APCD to retreat from local regulatory tools that could help fill the massive gap in health protections resulting from these federal actions. The 2026 ISR White Paper does not effectively reflect this new reality, instead focusing on air plans that predated these actions to claim more reductions are not necessary to meet air quality standards. The Governing Board should take this new challenge seriously and make sure the APCD is pursuing ***all*** tools available to bring safe air to San Diegans.

II. The Cost-Effectiveness Conclusion in the 2026 ISR White Paper is Misleading.

The 2026 ISR White Paper states that "[t]he average annual compliance cost that would be incurred by each local warehouse subject to a potential ISR are estimated to be between $29,000 and $49,000 per year."[4] The agency calculates the 2028 costs as $0.26 cents per square foot of warehousing.[5] The 2026 ISR White Paper further notes "[t]he cost-effectiveness values are estimated to increase to a range between $485 and $622/lb in 2032 as NOx emission reductions are anticipated to decrease each year due to increasing emission benefits from various CARB mobile source regulations."[6]

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[3] *Id.* at Slide 5.
[4] San Diego Air County Air Pollution Control District, Strategies to Reduce Indirect Source Emissions at Warehouses and Distribution Centers White Paper, at 14 (Feb. 2026), https://www.sdapcd.org/content/dam/sdapcd/documents/rules/warehouse-work-group/feb-2026/isr-white-paper-rev022026.pdf.
[5] *Id.* at 17.
[6] *Id.* at 15.

As mentioned above, this analysis is incomplete because it fails to consider the fact that certain state regulations are no longer in place or not currently being enforced. In addition, the White Paper concedes the difficulty in relying on cost-effectiveness:

> "Due to multiple compliance options that would be available in a potential warehouse ISR that operators may select from, and other characteristics unique to the San Diego region (e.g., warehouse size distribution), staff cannot forecast the implementation rates that may occur for future years in the San Diego region."[7]

This is an important concession, and one that highlights the defectiveness of this analysis. While cost-effectiveness can be an important consideration, it cannot drive the decision to pursue a menu-based regulation that would offer a range of compliance options. By providing a menu, an ISR would have certain compliance options that will result in cost-savings for warehouses, some that are more expensive, and likely many that would fall somewhere in between.

Importantly, the 2026 ISR White Paper relies heavily on the cost-effectiveness analysis conducted by staff of the South Coast Air Quality Management District (South Coast AQMD) during the development of its Warehouse Indirect Source Rule adopted in 2021 (South Coast Warehouse Rule). But the San Diego APCD's 2026 ISR White Paper ignores a key disclaimer in the South Coast AQMD staff report. Of note, South Coast AQMD staff noted the following about cost analysis: "These estimates are expected to be conservative because they don't account for all incentive programs that could help offset costs (e.g., Low Carbon Fuel Standard) and they only show a 10-year period (less than the useful life of a truck) of costs and emissions reductions."[8]

In addition, the South Coast AQMD cautioned against comparing cost effectiveness for other regional air pollutant strategies by noting "[t]raditional cost effectiveness approaches are therefore not comparable to other programs focused solely on regional pollutant emission reductions." Thus, it is misleading to assume warehouse operators would be economically irrational and not pursue generous subsidies through state programs like the Low Carbon Fuel Standard or other programs that are allowed to be used.

Finally, it is absurd to conclude that a rule is cost-ineffective before even defining the actual rule. Cost-effectiveness is heavily dependent on what the rule actually does. For example, if an air district pursued the exact same rule as the South Coast Warehouse Rule but cut in half the point obligations for covered warehouses, the cost-effectiveness would differ dramatically from that of the South Coast rule. The 2026 ISR White Paper simultaneously concedes that cost-effectiveness is an imperfect tool to assess costs imposed on industry, while arguing that this analysis should guide the agency's decision to stop developing an ISR. The Governing Board

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[7] *Id.* at 17.
[8] South Coast Air Quality Management District, Rule 2305 Staff Report at 76-77 (May 2021) *available at* https://www.aqmd.gov/docs/default-source/agendas/governing-board/2021/2021-may7-027.pdf.

should reject this proposal, and instead direct staff to develop an ISR that meets the County's needs through a working group process.

III. The Alternatives Presented in the 2026 ISR White Paper Are Inadequate.

The proposed alternatives to an ISR in the 2026 ISR White Paper are woefully inadequate. The cornerstone of this proposal is to advance electrification of 34 of the 1,600 – a little more than 2% – of the Transportation Refrigeration Units (TRUs) in the region. While Earthjustice supports using incentive dollars to clean up TRUs, the report provides scant evidence why a program to address a mere 2% of the TRU population would be more effective than a program covering warehouses of a certain size in San Diego. And more importantly, the 2026 ISR White Paper fails to explain why the APCD could not pursue emissions reductions using these Goods Movement Emissions Reduction Program ("GMERP") funds allocated to San Diego, while moving forward with an ISR. This proposal is simply a repackaging of existing incentive funds. That there is a plan to use those dollars in a different way (i.e. pursuing TRU replacement) does not address the inadequacy of this alternative. The agency should pursue this approach ***and*** pursue an ISR at the same time.

The second proposal is to pursue a Heavy-Duty Truck Incentive Program. While using incentives to promote zero-emission trucks is a laudable goal, we point to the fact that the funds will come from AB 617, which would already be spent to provide relief to AB 617 communities if the California Legislature continues to appropriate money for this effort. And, more importantly, the irony of this proposal is that Tier 3 of the program is reliant upon passage of an ISR to ensure industry pays for cleanup, as opposed to just taxpayer dollars via the California legislative process. Again, we do not see why this program could not proceed while the agency pursues an ISR.

The third proposal is "coordination" with the warehousing industry. This approach is nonsensical, considering that the industry has had decades to address the pollution it is causing in the community and has thus far chosen not to resolve these concerns. There is no guarantee that this cooperation is a good use of time. Is the goal of this "coordination" to set up a voluntary program where warehouse operators will continue to propose ideas of spending taxpayer dollars to clean up the industry's pollution? This has been industry's approach, and these programs already exist.

We recognize that it takes courage for regulators to put the onus of cleaning up freight pollution onto the industries actually causing this pollution, as an ISR would do. Large logistics companies are powerful entities and have pushed back vociferously. This opposition often presents as hyperbolic claims lacking factual basis and not borne in the reality, including erroneous claims of exceeding legal authority—as seen in the South Coast Warehouse Rule. The 2026 ISR White Paper notes that only one Warehouse ISR has been successful in overcoming litigation, but this misses the point. Put another way, industries have ***never*** successfully

challenged an ISR in court despite the many legal claims opponents raised throughout the rulemaking process.

While the San Diego APCD should continue to implement incentive programs funded by taxpayers (e.g. GMERP, AB 617 funds, etc), it is also completely appropriate to not place ***all*** the onus on taxpayers to battle harmful freight pollution. This policy debate is about making large logistics companies – some of the most powerful and wealthy corporations in the world – finally do their part in providing relief to address the current public health crisis by freight operations.

IV. ISRs can be Designed to Provide Relief to Overburdened Communities First.

Indirect source rules are inherently flexible tools. Environmental Health Coalition has put forth a proposal that would prioritize providing relief to overburdened communities.[9] Earthjustice conducted a legal analysis to determine if there are any impediments to this approach, and found no legal basis preventing the San Diego APCD from pursuing such a rule. Considering ample evidence of inequitable impacts of warehouse pollution in the County, the air district has sound reasoning for crafting a rule that would provide relief more quickly to overburdened communities. In fact, the California Legislature has made clear that addressing toxic hotspots from the freight industry is an important state goal.

We would also like to point out that the South Coast Warehouse Rule similarly imposed a phased approach. While this phased approach was based on square footage, certain areas of the South Coast Air Basin, particularly San Bernardino, have witnessed the greatest development of mega-warehouses.[10]

V. Conclusion

Earthjustice encourages the San Diego APCD to continue efforts developing an ISR and request that the Governing Board direct staff to commence a rulemaking process. Millions of breathers in the region would see tangible health benefits from this effort. And, most importantly, an indirect source rule could be designed to address the cost concerns raised. As the federal government is retreating from protecting the health of San Diego residents, it is incumbent upon local agencies to do everything they can to protect public health.

Sincerely,

Adrian Martinez

Regina Hsu

[9] See Attachment 1.
[10] San Bernardino County: The Impact of Warehouse Expansion, https://storymaps.arcgis.com/stories/04fce23c4b5d40f4a78110648cac1b1b (2022).

ATTACHMENT 1

ENVIRONMENTAL HEALTH COALITION
P.O. BOX 390, NATIONAL CITY, CA 91951 • (619) 474-0220 • ENVIRONMENTALHEALTH.ORG

SD APCD Warehouse & Distribution Center

Indirect Source Rule (ISR)

Analysis & Recommended Actions

EHC Recommended Action: San Diego Air Pollution Control District should develop a Countywide Indirect Source Rule. The San Diego ISR should use a phased approach to provide emission reductions to areas most impacted and to recognize agency capacity. The phases should be: 1) prioritize facilities in the communities most impacted by diesel pollution from warehouse and distribution center operations; 2) prioritize warehouses over 100,000 sf in these communities; 3) expand to warehouses over 50,000 sf in priority communities; and 4) expand to warehouses in second-tier impact communities.

Low Income/Communities of Color are Disproportionately Impacted by Warehouse and Distribution Center Operations

- Diesel particulate matter (DPM) emissions are the primary cancer risk driver in Portside and Border Communities
    - DPM Emissions in the Border account for 79% of the cancer risk of over 1000 cancers per million, per CARB's California Air Toxics Assessment
    - DPM Emissions in Portside account for 84% of the cancer risk of nearly 1000 cancers per million, per CARB's California Air Toxics Assessment
- The International Border Community has the most warehouses and distribution centers in the county (36 over 100k sf and 102 over 50K sf). These facilities are not regulated for indirect sources and should be.
- The Portside Community is clearly impacted by diesel sources including trucks, ships, and cargo handling equipment. APCD's 'count' of warehouses over 100,000 sf is 6 and over 50,000 sf is 29, however, per APCD staff response, warehouses on Port Tidelands are not included. These may include the Pasha vehicle warehouse and distribution center on the NCMT and San Diego Refrigerated Service on TAMT and NCMT.
- At the June 2023 APCD Governing Board meeting, the GB directed staff to focus on an ISR prioritizing impacted communities and consideration of smaller warehouses

San Diego Needs a Countywide ISR to Improve Public Health and Fight Climate Pollution

- An ISR is a proven method for improving air quality, public health and reducing climate pollution
- An ISR is complementary to stationary source and transportation rules
- The Warehouse ISR is an approved and expected strategy in both the Portside and International Border Community Emission Reduction Plans (CERP)
- Local ISR rules are critically needed since the CARB Advanced Clean Fleets rule waiver request to EPA was rescinded, as the Trump EPA would have rejected it. As a result, state regulation to reduce emissions from trucks is no longer available to require rapid transition to zero emission for heavy-duty trucks. Although the Warehouse ISR cannot require Warehouse-serving trucks to transition to zero emission, it can require reduction of air pollutants via multiple options including zero emission trucks and operational equipment and installation of charging infrastructure.

San Diego APCD's Analysis of a Countywide ISR Is Incomplete and Inaccurate

- **Warehouses ARE located in in Under-Resourced Communities --** APCD asserts that the majority of warehouses and distribution centers are not located in under-resourced communities.
    - APCD's conclusion utilizes CalEnviroscreen (CES) 4.0 rather than the new CES 5.0, which clearly designates the border region as having a high health burden. CES has been working to improve the representation of the impacts on the border region and has integrated pollution data for the border region which also has the highest number of warehouses over 100K (36) and over 50K (102)
    - Warehouses in the Portside Community are undercounted as warehouses on Port Tidelands are not included, per APCD staff. This means facilities that attract thousands of heavy-duty trucks and contribute greatly to Portside pollution are not considered, such as SD Refrigerated Services, Pasha, Dixieline, and all of the warehouses on TAMT.
    - Warehouses in Portside and Border are densely populated compared to warehouses in other areas of the county – see chart below

- **The estimated emission reductions and public health benefits from an ISR in San Diego County are inappropriately compared to other rules as PM is not used as the primary comparison pollutant** – APCD asserts that other rules result in more benefits than the projections from the ISR.
    - PM emission reductions are not used as a point of comparison in White Paper Figure 1, only NOx is used.
    - PM is the primary driver of health impacts in 617 communities, as evidenced by CARB CATA Data cited above.

- NOx is the primary pollutant used in comparisons and while NOx is an important pollutant to reduce, it is not a carcinogen as PM is and does not have the devastating health impacts that PM does
- ISR **will** provide significant benefits to the most impacted communities, such as Portside and Border, and should not be compared to countywide reductions achieved by other rules whose benefits are spread over the county

- **The estimated emission reductions and public health benefits from an ISR in the most impacted/under-resourced communities is much greater than represented in the ISR White Paper, when compared on area size.**

  - NOx and PM reductions in Portside and Border are 6 to 8.6 times that for NOx, and PM reductions in the rest of the county. See Table 1 below
  - Warehouses in Portside and Border are far more densely located than anywhere else in the county, as represented by the chart below, therefore reductions are much more significant.

- **The estimated cost-effectiveness of a potential warehouse ISR is 5-10 times better for impacted communities when compared based on area size.**
  - Cost effectiveness should be evaluated based on evaluating the relative ISR cost effectiveness by region in dollars per pound of reductions. Compared by area, ISR costs are lower than rules and incentives such as Voluntary Carl Moyer, SCAQMD 202 AQMP and Central furnaces from Figure 2 of the White Paper. See Table 2 below.

- **The estimated rule development and implementation costs are not excessive**
  - APCD budget is somewhat restricted, however the estimated one-time development costs are about $700K, which should be doable for an agency with an annual budget of $155 million
  - The ongoing district costs can be absorbed by permit fees
  - Costs can be reduced and managed by utilizing a phased implementation approach, focusing on the most impacted communities first

- **Non-regulatory alternatives, such as a focused Transport Refrigeration Unit (TRU) incentive program and the APCD/Port MOU, could be effective as complementary measures to the Warehouse ISR.**
  - EHC supported the 2022 CARB amendments to the TRU rules and CARB is looking at additional rules to reduce emissions from diesel-powered TRUs. Required transition to ZE TRUs will likely be blocked by the Trump Administration

- APCD should initiate a ZE TRU incentive program focused on operators in the most impacted communities.
- The Port MOU has ambitious goals that could accomplish the emission reductions of the ISR but current data show they are far behind their own MCAS and CERP goals, per the March 2026 Port Truck Report
- New Port Truck Report released March 2026 reports 99% of trucks are still diesel:
  - 3, 206 unique trucks visit the Port Terminals (TAMT:1862, NCMT: 1409)
  - Battery Electric Trucks (TAMT: 2)
  - Truck visit totals for 2025 = 72,542

- **State level actions such as AB 98 and potentially AB 1777 are not substitutes for a countywide ISR**.
  - AB 98 only applies to new or expanded warehouses and AB 1777 only restates CARB's authority to enact an ISR

Recommended Action: San Diego Air Pollution Control District should develop a Countywide Indirect Source Rule. The San Diego ISR should use a phased approach to provide emission reductions to areas most impacted and to recognize agency capacity. The phases should be: 1) prioritize facilities in the communities most impacted by diesel pollution from warehouse and distribution center operations; 2) prioritize warehouses over 100,000 sf in these communities; 3) expand to warehouses over 50,000 sf in priority communities; and 4) expand to warehouses in second-tier impact communities.

Recommended Action: The SDAPCD Governing Board should direct SDAPCD staff to research the following core elements of an ISR and report back:

- SDAPCD should establish a clear and transparent definition of warehouses and distribution centers and apply it to the dataset used to determine the warehouse population in San Diego County.
- A complete list of all warehouses and distribution centers should be published as public information to be used for ground-truthing to ensure that all warehouses and distribution centers are included
- Warehouses in impacted communities should be re-evaluated using CalEnviro Screen 5.0
- Warehouses in the most impacted communities should be researched to determine if they would be subject to an ISR including warehouses of 50,000 sq.ft or more.
- Based on a more complete and comprehensive analysis of warehouse activity, benefits and costs for a phased in countywide ISR should be calculated, including the market-shaping advantages of a region-wide ISR
- 2026-2027 Budget planning should include rule making resources (one time and ongoing) as well as revenue analysis to identify permitting enforcement and fee schedules to cover implementation cost

Table 1 – Emission Reductions Relative to Region Size

Region	ISR Applicability Threshold (sq ft)	Warehouse Count	Region Surface Area (*)	% of Total County (**)	Reduction relative to Region Size **NOx**	Reduction relative to Region Size **PM**	Reduction relative to Region Size **NOx**	Reduction relative to Region Size **PM**
			sq. miles	%	times	times	lbs/sq mile	lbs/sq mile
Portside	100k and greater	5	8	0.6%	3.8	3.7	75	0.75
International Border	100k and greater	46	23.5	1.8%	10.3	8.4	204	1.7
County w/o AB617	100k and greater	192	1258	97.6%	0.8	0.8	16	0.2
Total	100k and greater	243	1290	100.0%				
Portside	50k and greater	29	8	0.6%	6.0	6.2	250	2.5
International Border	50k and greater	102	23.5	1.8%	8.6	8.4	357	3.4
County w/o AB617	50k and greater	526	1258	97.6%	0.8	0.8	34	0.3
Total	50k and greater	657	1290	100.0%				

Table 2 – Cost Effectiveness Relative to Region Size

	ISR Applicability Threshold (sq ft)	ISR Total Cost (***)	Region Surface Area (*)	Scenario 3 (Low-NOx, ZEV, Other)	Scenario 3 (Low-NOx, ZEV, Other)	Scenario 3 (Low-NOx, ZEV, Other)	Scenario 3 Combined NOx & PM2.5	Cost Effectiveness/Region
		Dollars	sq. miles	tons per year	tons per year	tons/yr	lbs/yr	$/lb
				NOx	PM2.5	NOx+PM2.5	NOx+PM2.5	NOx+PM2.5
Portside	100k and greater		8	0.3	0.003	0.303	606	$ 122
International Border	100k and greater		23.5	2.4	0.02	2.42	4,840	$ 45
County w/o AB617	100k and greater		1258	10.2	0.1	10.3	20,600	$ 565
Total County	100k and greater	$11,932,039	1290	12.8	0.13	12.93	25,860	$ 461
ISR Cost/sq mile	100k and greater	$ 9,253.23						
Portside	50k and greater		8	1	0.01	1.0	2,020	$ 59
International Border	50k and greater		23.5	4.2	0.04	4.2	8,480	$ 42
County w/o AB617	50k and greater		1258	21.4	0.21	21.6	43,220	$ 437
Total County	50k and greater	$19,344,457	1290	26.7	0.26	27.0	53,920	$ 359
ISR Cost/sq mile	50k and greater	$ 15,001.52						

(*) Portside and IB Region size according to CARB and SDAPCD

(**) County area only includes urbanized, developed residential, commercial, industrial and agricultural land (30% of SD County, SANDAG)

(***) From Table 6, SDAPCD Supplement

From: noreply@sdapcd.org
To: APCD, Public Comment
Cc: Forbis, Paula; Vigil, Domingo; Luther, Mahiany; Gronenthal, Jude J; Mike.Watt@sdapcd.org
Subject: APCDGB Written Public Comment
Date: Thursday, April 9, 2026 3:39:27 PM

You've received a new form based mail from https://www.sdapcd.org/content/sdapcd/about/district-boards/governing-board/board-agendas-minutes/meeting-information.html

Submitted Data:

Name*
Narayan Gopinathan

Agenda Item
ITEM E5: UPDATE ON STRATEGIES TO REDUCE INDIRECT SOURCE EMISSIONS FROM WAREHOUSES AND DISTRIBUTION CENTERS IN SD COUNTY

Enter comments here:
I support the development and implementation of the ISR for San Diego County. The South Coast Air Quality Management District has successfully developed and implemented a similar ISR, and it is working. It is driving the deployment of electric trucks and renewable energy across the Air District. San Diego County can do the same thing, and achieve the same success.

From: Christopher Roberts
To: APCD, Public Comment
Subject: [External] Approve the Indirect Source Rule for San Diego County!
Date: Wednesday, April 8, 2026 5:44:56 AM

To the San Diego County APCD:
I am a volunteer with SanDiego350, a climate action organization that fights for environmental justice in San Diego County's underserved communities. I join the Environmental Health Coalition and Sierra Club San Diego chapter in calling for the APCD to move forward with implementing a comprehensive Indirect Source Rule in our county. Massive amounts of air pollution and greenhouse gas emissions emanate from huge trucks that travel to large warehouses in our County. Many of these warehouses are in low income communities in South County. The full list of talking points from the Sierra Club are listed below. Please do the right thing and approve a strong Indirect Source Rule, for the health and benefit of all residents of San Diego County.
Best regards,
Chris
--
Chris Roberts (he/him)
Transportation Team lead
SanDiego350
chris@sandiego350.org

Why an Indirect Source Rule Matters for San Diego

1. Targets a Major, Currently Unregulated Source of Pollution

- A large share of San Diego's air pollution and greenhouse gas emissions comes from **vehicle trips to and from major destinations**, not just tailpipes alone.
- Traditional regulations focus on vehicles or fuels—but **ISR addresses the demand side** (why trips happen in the first place).
- Fills a key policy gap in regional climate and air quality strategies.
- Withdrawel of the Advanced Clean Fleets regulation left a huge regulatory gap and is slowing down the transition to zero emission heavy duty trucks.

2. Improves Air Quality and Public Health

- Reduces emissions of **NOx, PM2.5, and ozone precursors**, which are linked to

asthma, heart disease, and premature death.

- Particularly beneficial for communities near **freeways, warehouses, and high-traffic corridors**.
- Our AB 617 communities, the portside community and the international border community are both communities that would greatly benefit from an indirect source rule.
- Supports San Diego's efforts to meet state and federal clean air standards.

3. Advances Environmental Justice

- Low-income communities and communities of color in San Diego (e.g., along freight corridors and near major employment hubs) bear disproportionate pollution burdens.
- ISR can:
  - Prioritize mitigation in **overburdened neighborhoods**
  - Require institutions to invest in **clean transportation options for workers**
- Aligns with California's **equity mandates, climate priorities, and EJ priorities**.

4. Supports Regional Climate Goals

- Helps San Diego meet targets under:
  - **Climate Action Plans (CAPs)**
  - **SANDAG Regional Plan**
  - California's statewide climate mandates (e.g., SB 32, Scoping Plan)

- Transportation is the **largest emissions sector** locally—ISR directly addresses it.

5. Creates Accountability for Major Trip Generators

- Large institutions benefit from attracting workers, customers, and deliveries—but currently **aren't responsible for the resulting emissions**.
- ISR establishes a **fair framework**:
    - If you generate pollution, you help mitigate it.
- Levels the playing field across large warehouse sectors.

6. Encourages Innovation and Flexibility

- ISR policies are typically **compliance-based**, allowing entities to choose how to comply.
- Encourages creative solutions like:
    - Mobility hubs
    - Electrified delivery fleets
    - Incentives for off-peak travel
    - Mitigation fees
    - Solar installation
- Can be tailored to different site types (universities vs. warehouses vs. hospitals).

7. Builds on Proven Models

- South Coast AQMD (Los Angeles region) has already advanced ISR policies.
- San Diego can:
    - Learn from existing frameworks
    - Avoid pitfalls
    - Adapt best practices to local conditions
- Indirect Source Rules are being considered in New York, New Jersey, Illinois, Colorado and the SF Bay Air District.
- 6 different Indirect Source Rules already adopted in California:

SIERRA CLUB
SAN DIEGO CHAPTER

Dear San Diego Air Pollution Control District Governing Board,

On behalf of the 28,000 members and supporters of the San Diego chapter of the Sierra Club, we write in opposition to the staff recommendation on the Indirect Source Rule (ISR). San Diego must initiate the rulemaking process to address a major and currently unregulated source of pollution, improve public health, and meet its climate and environmental justice commitments.

A significant share of San Diego's air pollution and greenhouse gas emissions comes not only from vehicle tailpipes, but from the volume of trips generated by large destinations such as warehouses, ports, and major employment centers. Existing regulations primarily focus on vehicle technology and fuels, leaving a critical gap in addressing the demand side—why and how these trips occur. An ISR directly fills this gap by holding major trip generators accountable for the pollution associated with their operations. This need is even more urgent following the withdrawal of the Advanced Clean Fleets regulation, which has created a substantial regulatory void and slowed the transition to zero-emission heavy-duty trucks.

An ISR would deliver meaningful improvements in air quality and public health by reducing emissions of nitrogen oxides (NOx), fine particulate matter (PM2.5), and ozone precursors. These pollutants are directly linked to asthma, cardiovascular disease, and premature death. The benefits would be especially significant for communities located near freeways,

warehouses, and high-traffic corridors. In San Diego, AB 617 communities—including portside and international border communities—face disproportionate exposure to diesel pollution and would greatly benefit from targeted emission reductions.

Advancing an ISR is also essential for environmental justice. Low-income communities and communities of color in San Diego bear a disproportionate burden of pollution due to their proximity to freight corridors and major trip-generating facilities. An ISR can prioritize mitigation in these overburdened neighborhoods, require investments in cleaner transportation options for workers, and align with California's environmental justice mandates and broader climate priorities.

Importantly, ISR policies are flexible and designed to encourage innovation. Rather than prescribing a single solution, they allow entities to choose how to comply. This can include strategies such as electrified delivery fleets, mobility hubs, off-peak delivery incentives, mitigation fees, and on-site renewable energy installations. These approaches can be tailored to different facility types, from warehouses to hospitals and universities.

A phased implementation approach provides a practical path forward. Starting with the most impacted communities, such as AB 617 areas, ensures early health benefits while allowing the district to build capacity, phase in requirements, and establish cost recovery through permitting fees.

In sum, initiating ISR rulemaking is a necessary and timely step. It addresses a clear regulatory gap, protects public health, advances environmental justice, supports climate goals, and creates a fair and flexible system of accountability. San Diego has both the need and the opportunity to lead—now is the time to act.

Sincerely,

Charles Rilli
Deputy Chapter Director
Sierra Club San Diego

From:	Jasmin Vargas
To:	APCD, Public Comment
Cc:	Forbis, Paula; Watt, Michael; Cormier, Nick; Consolacion, Randy
Subject:	[External] Written Public Comment for SD APCD Governing Board Meeting, April 9th, Agenda item #5
Date:	Tuesday, April 7, 2026 1:42:26 PM
Attachments:	4.7.26_EHC Comments- Wareshouse ISR_SD APCD_Final.odt

Dear Chair Birbeck-Garcia, Governing Board Members and APCD staff,

Environmental Health Coalition (EHC) recommends the San Diego Air Pollution Control District (SDAPCD) Governing Board direct SDAPCD staff to develop a Countywide Indirect Source Rule (ISR) for Warehouses and Distribution Centers and oppose staff recommendations for an alternative approach. The San Diego ISR should go forward so staff can begin to implement a rule that works best for San Diego. We have proposed a phased approach that would provide emission reductions to areas most impacted, while addressing the concerns outlined in the staff report.

The time has come to support the community vision for cleaner air in the San Diego Region and show your support for a Warehouse and Distribution Center Indirect Source Rule by proposing a motion to move forward with the rulemaking process and reject staff recommendations for more of the same. Environmental Health Coalition (EHC) has worked with the diligent and capable staff at SDAPCD for over four years to analyze the impacts and benefits of a Warehouse ISR in San Diego, but it is time to act. We applaud the efforts by staff put forward in the Strategies to Reduce Indirect Source Emissions at Warehouse and Distribution Centers White Paper, and we recognize the staffing and cost challenges which is why we believe a phased approach should be considered while developing a rule. We see an opportunity here to further the fight for the health of communities and families. EHC's approach provides a reasonable path forward that uses resources conservatively while protecting the health of San Diego's most vulnerable residents and impacted communities. See the attached document for further details and analysis. Please add this document to the record.

Sincerely,

Jasmin (Jas) Vargas · Air Quality/ Clean Ports Campaign Director
(She/Her/They/Them)
Environmental Health Coalition | *Environmental Health & Justice Campaign*
NEW ADDRESS: P.O. Box 390, National City, CA 91951
Office (619) 728-6088 | Cell (323) 807-3234
EHC Web | EHC Twitter | EHC Facebook

EMPOWERING PEOPLE · ORGANIZING COMMUNITIES · ACHIEVING JUSTICE

ENVIRONMENTAL HEALTH COALITION
P.O. BOX 390, NATIONAL CITY, CA 91951 • (619) 474-0220 • ENVIRONMENTALHEALTH.ORG

April 7,2026

Anne Marie Birbeck-Garcia, Chair
San Diego Air Pollution Control District
10124 Old Grove Road
San Diego, CA 92131

RE: SUPPORT FOR DEVELOPMENT OF INDIRECT SOURCE RULE – Agenda Item 5, April 9, 2026, Governing Board Meeting

Do not let this opportunity pass, San Diego needs a Warehouse ISR now!

Dear Chair Birbeck-Garcia and Governing Board Members,

Environmental Health Coalition (EHC) recommends the San Diego Air Pollution Control District (SDAPCD) Governing Board direct SDAPCD staff to develop a Countywide Indirect Source Rule (ISR) for Warehouses and Distribution Centers. The San Diego ISR should use a phased approach to provide emission reductions to areas most impacted and to recognize limited agency capacity. The phases should be: 1) facilities in the communities most impacted by diesel pollution from warehouse and distribution center operations; 2) warehouses over 100,000 sq.ft. in these communities; then 3) warehouses over 50,000 sq.ft. in priority communities; and 4) expand to warehouses in second-tier impact communities.

The time has come to support the community vision for cleaner air in the San Diego Region and show your support for a Warehouse and Distribution Center Indirect Source Rule by voting to move forward with the rulemaking process at the Governing Board meeting on April 9, 2026. Environmental Health Coalition (EHC) has worked with the diligent and capable staff at SDAPCD for over four years to analyze the impacts and benefits of a Warehouse ISR in San Diego. We applaud the efforts by staff put forward in the Strategies to Reduce Indirect Source Emissions at Warehouse and Distribution Centers White Paper, and we recognize the staffing and cost challenges. We see an opportunity here to further the fight for the health of communities and families. EHC's approach provides a reasonable path forward that uses resources conservatively while protecting the health of San Diego's most vulnerable residents and impacted communities.

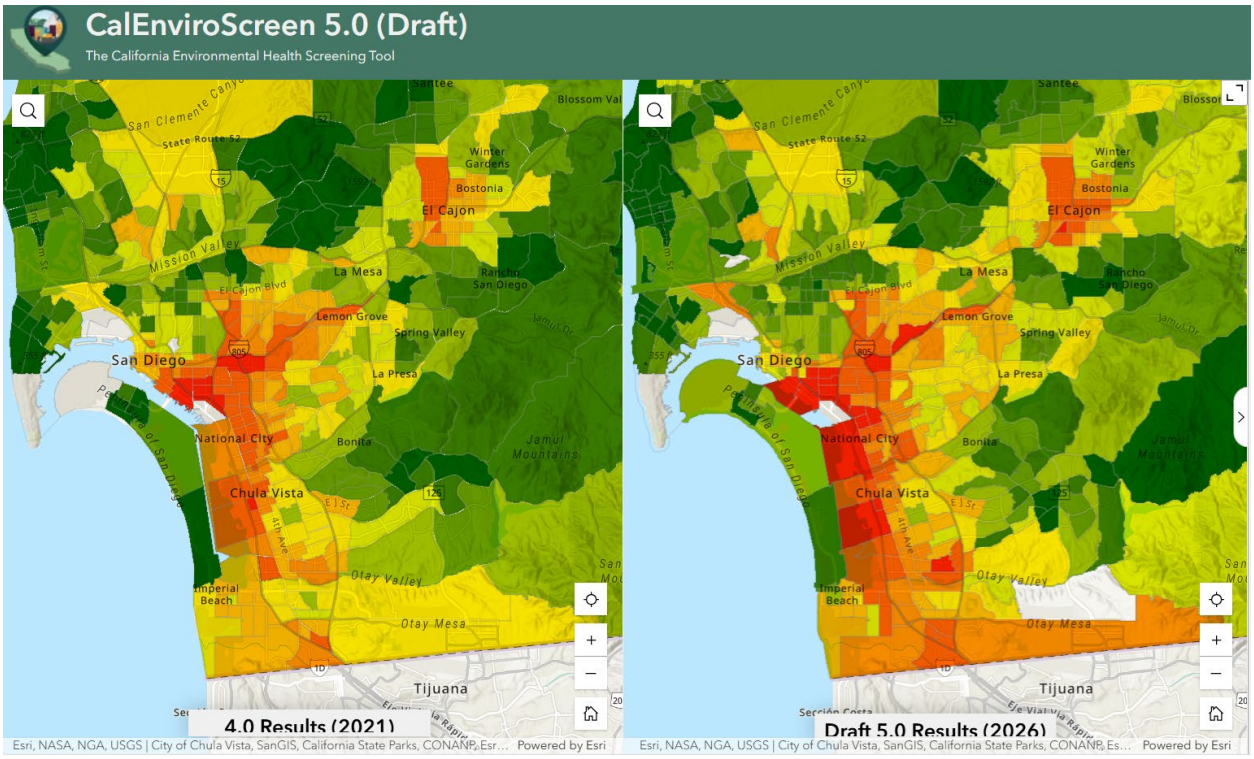
Portside and International Border Communities Need Relief

San Diego County air is classified as severe non-attainment for federal ozone standards and non-attainment for state PM10 and PM 2.5 at times. Specifically, the Portside and International Border communities are disadvantaged and highly impacted communities under the Community Air Protection Program (AB617) which focuses on reducing exposure to harmful air pollutants through local monitoring, emissions reduction strategies, and active community participation in decision-making processes. Both the Portside and International Border Community Emissions Reduction plans (CERP) include a Warehouse ISR as a strategy to meet the goals of the CERP. These environmental justice communities are hubs for freight movement, yet there has been little accountability for the decades of pollution and contamination created by this industry. Hence the need for AB 617, the CERP, and the Maritime Clean Air Strategy (MCAS) at the Port of San Diego that EHC fought to pass in 2021. As a result of the concentration of warehouses, distribution centers and other industrial uses that utilize heavy-duty trucks, cargo-handling equipment and other equipment, diesel particulate matter (DPM) emissions are the primary cancer risk drivers in Portside and Border communities. DPM emissions in the Border account for 79% of the cancer risk of over 1000 cancers per million, and in the Portside DPM accounts for 84% of the cancer risk of nearly 1000 cancers per million per CARB's California Air Toxics Assessment.[1]

White Paper Analysis Underestimates Benefits for Disadvantaged Communities

APCD asserts that a majority of warehouses and distribution centers are not located in under-resourced communities and that these communities would not benefit from an ISR. This conclusion come from the utilization of CalEnviroscreen (CES) 4.0 rather than the new CES 5.0 made available this year, which clearly designates the border region as having a higher health burden than previous data suggest. CES has been working to improve the representation of impacts on the border region and has integrated pollution data for the border region, which also has the highest number of warehouses according to staff analysis, over 100K (36) and over 50K (102).

[1] https://www.arcgis.com/apps/dashboards/8e81372402f64665a4569f690e4b6e15



EHC also discovered that warehouses in the Portside community were undercounted. Warehouses located on Port Tidelands were not included as part of the Co-Star data analyzed, according to APCD staff. This means facilities that attract thousands of heavy-duty trucks and contribute to Portside pollution are not included in the total Warehouses initially counted, such as SD Refrigerated Services, Pasha, Dixieline, and all the warehouses on Tenth Avenue Marine Terminal (TAMT).

Federal Actions Threaten Air Quality

The current federal administration is attacking California's ability to clean up our air through their rollback of our vehicle emission rules. The California Air Resources Board (CARB) was compelled to withdraw their request for a US EPA waiver to implement the Advance Clean Fleet rule (ACF), when it became clear that a rejection would be eminent. This rule would have made our goals to transition 100% of heavy-duty drayage fleets to zero-emission by 2035 a reality.

Without ACF, and a supportive federal government, impacted communities need leadership from regional air districts like SDAPCD to step up and tackle the indirect sources of pollution in the region. The Warehouse and Distribution Center ISR is the regulatory vehicle needed at this time to ensure that freight movement and warehouse operations are part of the overall emission reduction strategies in San Diego.

Cost Effectiveness Is Excellent with a Targeted and Phased Approach

A Warehouse ISR would provide the most benefits for the most impacted communities in the region, leading to greater emission reductions where they are needed the most. Based on our analysis, the benefits to the most impacted communities are higher than represented in the White Paper, especially in the reduction of diesel pollution.

The key questions for evaluating an ISR are how much it will reduce emissions and how much it will cost per pound of emission reductions. EHC's analysis (Appendix A) shows that using a phased approach and targeting the most impacted communities of Portside and International Border is highly cost effective and should be employed. Tables 1 and 2 shows that because of the density of warehouses and distribution centers in these communities in relatively small geographic areas, the cost of implementing the rule for 100,000 sq.ft. or larger warehouses is $122/lb. at Portside, and $45/lb. at the International Border, both much lower than the county-wide cost effectiveness of $461/lb., and on par with other rules and incentive programs. Emission reductions are almost four times greater in these targeted areas than in the rest of the county as well. The cost of not going forward with a Warehouse and Distribution Center ISR is much higher for the health of the residents of the most impacted communities. Even though staff have not analyzed a phased approach, EHC's analysis shows that it would be an effective strategy and urges the Board to direct staff to move forward by evaluating that approach while developing a rule.

The choice before the Governing Board is to go forward with the Warehouse ISR rulemaking process or put it aside and then wait and see if voluntary action and incentive programs make a difference. We think our communities have waited long enough, and history shows that incentives only work when there is a regulation on the horizon that will require change. EHC has supported and worked on the Heavy-Duty Truck Incentive Program, and we continue to support incentives for trucks, Transport Refrigeration Units (TRU), cargo handling equipment, and other incentive programs. These programs can be implemented while the Warehouse and Distribution Center ISR is undergoing more research and the rule-making process to finalize all the potential benefits, immediate costs, further research of the warehouses, warehouse emission inventory, and permitting fees. All of which is in the purview of the Board, and necessary to develop a Warehouse ISR that works for San Diego.

The proposed phased approach would need further study which will need to occur as the rule is being developed because the additional information necessary includes a warehouse inventory, including square footage and emissions, geographic location relative

to disadvantaged community and emission reduction measures that address the pollution being emitted, in this case, NOx, and Diesel Particulate Matter. The White Paper has an analysis of the impact with the information available, but a more robust analysis of the warehouses and distribution centers is needed. Their uses, operations, truck trips, and size are all needed to make adequate accounting to understand the overall positive impact.

EHC will continue to collaborate with staff to address the concerns raised in the White Paper and with your support, go forward with a Warehouse and Distribution Center ISR. We urge you to act and not let this opportunity pass by. San Diego needs your leadership; the federal government is failing our communities and pulling back on their commitment to clean air and a healthy environment. San Diego needs to lead with environmental justice. This is how we reach our CERP goals, this is how we ensure we meet the MCAS goals, and this is how we cut diesel and ozone pollution in the Portside and International Border communities.

Sincerely,



Franco Garcia, Executive Director



Jasmin Vargas, Air Quality & Clean Ports Campaign Director

Cc: APCD Governing Board Members Paula Forbis, Air Pollution Control Officer

Appendix A

Table 1 – Emission Reductions Relative to Region Size

Region	ISR Applicability Threshold (sq ft)	Warehouse Count	Region Surface Area (*)	% of Total County (**)	Reduction relative to Region Size **NOx**	Reduction relative to Region Size **PM**	Reduction relative to Region Size **NOx**	Reduction relative to Region Size **PM**
			sq. miles	%	times	times	lbs/sq mile	lbs/sq mile
Portside	100k and greater	5	8	0.6%	3.8	3.7	75	0.75
International Border	100k and greater	46	23.5	1.8%	10.3	8.4	204	1.7
County w/o AB617	100k and greater	192	1258	97.6%	0.8	0.8	16	0.2
Total	100k and greater	243	1290	100.0%				
Portside	50k and greater	29	8	0.6%	6.0	6.2	250	2.5
International Border	50k and greater	102	23.5	1.8%	8.6	8.4	357	3.4
County w/o AB617	50k and greater	526	1258	97.6%	0.8	0.8	34	0.3
Total	50k and greater	657	1290	100.0%				

Table 2 – Cost Effectiveness Relative to Region Size

	ISR Applicability Threshold (sq ft)	ISR Total Cost (***)	Region Surface Area (*)	Scenario 3 (Low-NOx, ZEV, Other)	Scenario 3 (Low-NOx, ZEV, Other)	Scenario 3 (Low-NOx, ZEV, Other)	Scenario 3 Combined NOx & PM2.5	Cost Effectiveness/Region
		Dollars	sq. miles	tons per year	tons per year	tons/yr	lbs/yr	$/lb
				NOx	PM2.5	NOx+PM2.5	NOx+PM2.5	NOx+PM2.5
Portside	100k and greater		8	0.3	0.003	0.303	606	$ 122
International Border	100k and greater		23.5	2.4	0.02	2.42	4,840	$ 45
County w/o AB617	100k and greater		1258	10.2	0.1	10.3	20,600	$ 565
Total County	100k and greater	$11,932,039	1290	12.8	0.13	12.93	25,860	$ 461
ISR Cost/sq mile	100k and greater	$ 9,253.23						
Portside	50k and greater		8	1	0.01	1.0	2,020	$ 59
International Border	50k and greater		23.5	4.2	0.04	4.2	8,480	$ 42
County w/o AB617	50k and greater		1258	21.4	0.21	21.6	43,220	$ 437
Total County	50k and greater	$19,344,457	1290	26.7	0.26	27.0	53,920	$ 359
ISR Cost/sq mile	50k and greater	$ 15,001.52						

(*) Portside and IB Region size according to CARB and SDAPCD

(**) County area only includes urbanized, developed residential, commercial, industrial and agricultural land (30% of SD County, SANDAG)

(***) From Table 6, SDAPCD Supplement

From: Ron Askeland
To: APCD, Public Comment
Subject: [External] Opposition to Agenda E. #5
Date: Tuesday, April 7, 2026 5:33:34 PM

To: SDAPCD
Subject: Opposition to Agenda E. #5

SDAPCD must start rulemaking now. San Diego's air pollution comes mainly from vehicle trips to major sites. ISR reduces NOx, PM2.5, and ozone precursors, improving air quality for low-income and minority communities. It supports clean air standards and climate targets by cutting transportation emissions. San Diego can learn from ISR policies in Los Angeles and other regions; six ISRs are already in place in California.

Thank you,
Dr. Ronald Askeland

From: Christopher Roberts
To: APCD, Public Comment
Subject: [External] Approve the Indirect Source Rule for San Diego County!
Date: Wednesday, April 8, 2026 5:44:56 AM

To the San Diego County APCD:
I am a volunteer with SanDiego350, a climate action organization that fights for environmental justice in San Diego County's underserved communities. I join the Environmental Health Coalition and Sierra Club San Diego chapter in calling for the APCD to move forward with implementing a comprehensive Indirect Source Rule in our county. Massive amounts of air pollution and greenhouse gas emissions emanate from huge trucks that travel to large warehouses in our County. Many of these warehouses are in low income communities in South County. The full list of talking points from the Sierra Club are listed below. Please do the right thing and approve a strong Indirect Source Rule, for the health and benefit of all residents of San Diego County.
Best regards,
Chris
--
Chris Roberts (he/him)
Transportation Team lead
SanDiego350
chris@sandiego350.org

Why an Indirect Source Rule Matters for San Diego

1. Targets a Major, Currently Unregulated Source of Pollution

- A large share of San Diego's air pollution and greenhouse gas emissions comes from **vehicle trips to and from major destinations**, not just tailpipes alone.
- Traditional regulations focus on vehicles or fuels—but **ISR addresses the demand side** (why trips happen in the first place).
- Fills a key policy gap in regional climate and air quality strategies.
- Withdrawel of the Advanced Clean Fleets regulation left a huge regulatory gap and is slowing down the transition to zero emission heavy duty trucks.

2. Improves Air Quality and Public Health

- Reduces emissions of **NOx, PM2.5, and ozone precursors**, which are linked to

asthma, heart disease, and premature death.

- Particularly beneficial for communities near **freeways, warehouses, and high-traffic corridors**.
- Our AB 617 communities, the portside community and the international border community are both communities that would greatly benefit from an indirect source rule.
- Supports San Diego's efforts to meet state and federal clean air standards.

3. Advances Environmental Justice

- Low-income communities and communities of color in San Diego (e.g., along freight corridors and near major employment hubs) bear disproportionate pollution burdens.
- ISR can:
  - Prioritize mitigation in **overburdened neighborhoods**
  - Require institutions to invest in **clean transportation options for workers**
- Aligns with California's **equity mandates, climate priorities, and EJ priorities**.

4. Supports Regional Climate Goals

- Helps San Diego meet targets under:
  - **Climate Action Plans (CAPs)**
  - **SANDAG Regional Plan**
  - California's statewide climate mandates (e.g., SB 32, Scoping Plan)

- Transportation is the **largest emissions sector** locally—ISR directly addresses it.

5. Creates Accountability for Major Trip Generators

- Large institutions benefit from attracting workers, customers, and deliveries—but currently **aren't responsible for the resulting emissions**.
- ISR establishes a **fair framework**:
    - If you generate pollution, you help mitigate it.
- Levels the playing field across large warehouse sectors.

6. Encourages Innovation and Flexibility

- ISR policies are typically **compliance-based**, allowing entities to choose how to comply.
- Encourages creative solutions like:
    - Mobility hubs
    - Electrified delivery fleets
    - Incentives for off-peak travel
    - Mitigation fees
    - Solar installation
- Can be tailored to different site types (universities vs. warehouses vs. hospitals).

7. Builds on Proven Models

- South Coast AQMD (Los Angeles region) has already advanced ISR policies.
- San Diego can:
  - Learn from existing frameworks
  - Avoid pitfalls
  - Adapt best practices to local conditions
- Indirect Source Rules are being considered in New York, New Jersey, Illinois, Colorado and the SF Bay Air District.
- 6 different Indirect Source Rules already adopted in California:

From: noreply@sdapcd.org
To: APCD, Public Comment
Cc: Forbis, Paula; Vigil, Domingo; Luther, Mahiany; Gronenthal, Jude J; Mike.Watt@sdapcd.org
Subject: APCDGB Written Public Comment
Date: Thursday, April 9, 2026 12:42:04 PM

You've received a new form based mail from https://www.sdapcd.org/content/sdapcd/about/district-boards/governing-board/board-agendas-minutes/meeting-information.html

Submitted Data:

Name*
Sarah Wiltfong

Agenda Item
ITEM E5: UPDATE ON STRATEGIES TO REDUCE INDIRECT SOURCE EMISSIONS FROM WAREHOUSES AND DISTRIBUTION CENTERS IN SD COUNTY

Enter comments here:
Dear Chair and Members of the Board:

On behalf of the Supply Chain Federation (SCF), I write in support of staff's recommendation on Item E5 to not move forward with an Indirect Source Rule (ISR) at this time and consider alternative options.

We appreciate the District's thoughtful and data-driven approach in evaluating whether an ISR would deliver meaningful emissions reductions in the San Diego region. Notably, staff's white paper reflects and incorporates key findings from SCF's independent technical analysis of the South Coast AQMD's WAIRE program, which provides important real-world insight into how these policies perform in practice.

Key considerations for the Board:

1. Lack of creditable emissions reductions under federal standards (SIP credit)
A critical consideration is whether an ISR would generate emissions reductions that can be credited toward State Implementation Plan (SIP) obligations. The U.S. EPA has already determined that the South Coast's warehouse ISR, implemented through the WAIRE program, does not qualify for creditable emission reductions in attainment planning.

This raises serious concerns that a similar approach, regardless of design, may not advance federally recognized air quality goals, even if it imposes significant costs.

2. Structural limitations of ISRs create uncertainty in benefits and significant costs
Experience from the WAIRE program highlights several inherent challenges with ISR frameworks. Emissions reductions are largely driven by existing statewide regulations, not facility-based programs, and isolating or verifying additional benefits attributable to an ISR is difficult. At the same time, these policies can impose substantial and often underestimated costs through fees, infrastructure investments, and operational changes.

Compounding this issue, warehouses and similar facilities do not control the trucks that visit their sites, creating a fundamental misalignment between regulated entities and emissions sources. This limits the effectiveness of ISR requirements and can result in compliance mechanisms that function more as cost burdens than direct emissions reduction strategies.

These dynamics also introduce the risk of unintended consequences, including shifts in logistics patterns, longer truck trips, or relocation of facilities outside the jurisdiction, outcomes that can undermine both economic efficiency and environmental goals.

3. Existing progress should be recognized and built upon
Over the past two decades, existing regulations and industry investments have driven significant emissions reductions across the goods movement sector, including:

- More than 99% reduction in diesel particulate matter
- Approximately 94% reduction in NOx emissions since 2005

Building on these proven approaches, rather than layering new, untested frameworks, offers a more reliable path forward.

We commend SDAPCD staff for taking a careful, evidence-based approach and for recognizing the complexity of this issue. Based on the available data and real-world experience, we agree that moving forward with an ISR at this time would introduce significant uncertainty, costs, and implementation challenges without clear evidence of commensurate benefits, particularly given the lack of creditable emissions reductions under federal standards.

For these reasons, we respectfully urge the Board to support staff's recommendation on Item E5.
We look forward to continuing to work with the District on practical, effective strategies that improve air quality while maintaining a strong and efficient supply chain.

Sincerely,
Sarah Wiltfong
Chief Advocacy and Public Policy Officer
Supply Chain Federation

From: noreply@granicusideas.com
To: APCD, Public Comment
Subject: [External] New eComment for Air Pollution Control District Governing Board
Date: Wednesday, April 8, 2026 4:05:08 PM

San Diego County Air Pollution Control District

New eComment for Air Pollution Control District Governing Board

Brooke Armour submitted a new eComment.

Meeting: Air Pollution Control District Governing Board

Item: E.5) UPDATE ON STRATEGIES TO REDUCE INDIRECT SOURCE EMISSIONS FROM WAREHOUSES AND DISTRIBUTION CENTERS IN SAN DIEGO COUNTY

eComment: Dear Members of the San Diego County Air Pollution Control District, On behalf of the California Business Roundtable Board of Directors, I write regarding Item E5 on the April 9, 2026 ACPD's agenda, regarding the imposition of an Indirect Source Rule (ISR) for warehouses and distribution centers located in San Diego County. We previously expressed our opposition to an ISR in May 2025 and appreciate the thoughtful approach APCD staff has taken to ensure all voices on this issue are heard. We strongly believe the staff recommendation is a balanced and responsible step forward and will reduce unintended consequences an ISR would have on our economy and the resiliency of our supply chains. Now, more than ever, regions in California must commit to supporting and strengthening the supply chain, especially as trade between the U.S. and Mexico continues to be under the microscope. Weakening the supply chain via a warehouse ISR is the last thing the region, state, and national economy needs, and it will lead to job loss and cost increases for consumers not just in the San Diego region, but will have ripple effects throughout the supply chain. A healthy, efficient supply chain is the backbone of our economy. From manufacturing inputs to consumer goods, the movement of freight through land and sea ports, warehouses, and distribution hubs enables businesses of every size to operate effectively. Warehousing plays a vital role in this ecosystem by serving as the critical link between production and the customer, ensuring that goods are stored, sorted, and shipped with speed and reliability. In California, which processes over 40% of all U.S. containerized imports through its ports, the warehousing and logistics sector is not just a support function—it is a strategic economic driver. San Diego's land ports of entry, notably the San Ysidro and Otay Mesa crossings, are vital conduits for U.S.-Mexico trade, underpinning the regional economy. The Otay Mesa Port of Entry, in particular, stands as the largest commercial crossing on the California–Baja California border, handling the third-highest volume of trucks and trade value among all U.S.-Mexico land crossings. In 2019 alone, the Otay Mesa Port processed nearly 15 million individuals, over 6.5 million personal vehicles, and more than 3.5 million pedestrians. This robust activity underscores the port's critical role in facilitating the flow of goods and people

between the two nations. The integrated CaliBaja region, encompassing San Diego and Tijuana, boasts a combined GDP of approximately $250 billion, reflecting the deep economic interdependence fostered by these border crossings. The efficiency of these ports directly impacts industries ranging from manufacturing to agriculture, with delays or disruptions potentially costing billions in economic output. For instance, border delays in 2016 were estimated to result in a combined economic output loss of $3.4 billion for the U.S. and Mexico, with San Diego County and Baja California bearing a significant portion of this impact. As such, maintaining and enhancing the functionality of San Diego's land ports is not only essential for regional prosperity but also for the broader economic health of the U.S.-Mexico trade relationship. Warehouses serve as critical nodes in our supply chain infrastructure, facilitating the efficient movement of goods essential to both businesses and consumers. Disruptions or added regulatory burdens on these facilities can lead to increased operational costs, delays, and reduced competitiveness. According to a study published in ScienceDirect, supply chain performance is crucial to the smooth functioning of economies, and disruptions can create bottlenecks with adverse implications for economic growth. What's more, trade and warehousing jobs are among the fastest-growing and most diverse employment categories in the state, offering middle-income wages and pathways to upward mobility without requiring advanced degrees. According to the California Employment Development Department, transportation and warehousing employs over 900,000 workers statewide and has grown more than 30% over the past decade. These jobs are increasingly vital as businesses work to nearshore supply chains and reduce reliance on foreign manufacturing amid global disruptions and trade tensions. Policy decisions that hinder warehouse operations—through added costs, delays, or restrictions—can ripple across the economy, impacting everything from delivery timelines to inflation. In an era of economic uncertainty and geopolitical volatility, supporting the health and efficiency of our supply chain infrastructure is essential to California's long-term economic competitiveness. Potential Negative Impacts of the ISR The proposed ISR aims to reduce emissions associated with warehouse operations by imposing additional requirements on facilities and their associated transportation activities. While the goal of reducing emissions is commendable, the rule could lead to: • Increased Operational Costs: Compliance may necessitate significant investments in new technologies or infrastructure, which could be particularly burdensome for small and medium-sized enterprises. • Supply Chain Disruptions: Additional regulatory requirements could lead to delays in goods movement, affecting inventory management and delivery timelines. • Economic Competitiveness: Higher operational costs and potential delays could make San Diego County less attractive for business investments compared to other regions with more streamlined regulations. Economic and Operational Impacts Observed in SCAQMD's Implementation The South Coast AQMD's Rule 2305, known as the Warehouse Actions and Investments to Reduce Emissions (WAIRE) Program, has led to significant compliance costs for warehouse operators. Estimates suggest that the rule could impose up to $979 million in annual compliance costs across approximately 4,000 affected warehouses in the South Coast Air Basin. These costs stem from requirements such as acquiring zero-emission vehicles, installing charging infrastructure, and implementing other emission-reducing measures. While Indirect Source Rules like SCAQMD's Rule 2305 are designed with the intent of reducing greenhouse gas (GHG) and particulate emissions from warehouse operations and associated truck traffic,

there remains a lack of publicly available, independent data demonstrating measurable reductions as a direct result of these regulations. The U.S. Environmental Protection Agency has approved the rule as a SIP-strengthening measure, acknowledging its potential to contribute incrementally to regional air quality goals. However, the EPA has also stated that it did not credit the rule with specific emission reduction quantities due to questions about enforceability and quantification. Moreover, the WAIRE Program is still in its early stages of implementation, with limited verified reporting or third-party evaluation of actual emissions impacts. While there is a lack of data supporting any measurable reduction in emissions as a direct result of warehouse ISRs, there is clear data demonstrating the devastating economic impacts of supply chain disruptions. There has never been more uncertainty in the supply chain network, and added costs, regulatory barriers, and overall uncertainty is the wrong approach. California's trucking industry is widely regarded as the most environmentally regulated and among the cleanest in the United States. California already mandates that nearly all trucks and buses operating in California have 2010 or newer model year engines to minimize particulate matter (PM) and nitrogen oxides (NO_x) emissions, and periodic vehicle testing with emissions monitoring to identify and repair high-emitting vehicles, aiming to achieve significant reductions in smog-forming and toxic air pollutants. Combined with the industry's ongoing investments in cleaner and zero-emissions fleets, significant progress has already been made—and will continue to make—on reducing climate pollutants in the San Diego Region and across the state. For all of these reasons, we strongly oppose a warehouse ISR in the San Diego region. We stand committed to continuing to implement programs and make investments to reduce pollutants and improve air quality while still making strong investments in the regional, statewide, and national economy. Sincerely, Robert C. Lapsley President

View and Analyze eComments

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Anne Marie Birbeck-Garcia, Chair
San Diego Air Pollution Control District
10124 Old Grove Road
San Diego, CA 92131

April 8, 2026

RE: SUPPORT FOR DEVELOPMENT OF INDIRECT SOURCE RULE – Agenda Item 5, April 9, 2026, Governing Board Meeting

Good afternoon APCD governing board members and staff,

My name is Nicholas Paúl. I'm an attorney, former Portside CSC member, and member of the County of San Diego's Environmental Justice (EJ) Working Group.

I strongly urge this body to oppose the APCD staff recommendation and prioritize an Indirect Source Rule regulation to reduce emissions from indirect sources at warehouses and distribution centers.

There is no debate that heavy duty trucks contribute to the deadly cocktail of air contaminants that have been making our community members sick with asthma, lung cancer and other respiratory illnesses. There is no debate that there are communities in San Diego county that bear the brunt of industrial pollution and for decades have been urging policy makers to take decisive regulatory action to promote cleaner air and healthier environments.[1] For too long, warehouse facilities that attract heavy-duty trucks and other polluting sources have gone unregulated and have gone without accountability for the air pollutants and hazards that they expose San Diego County residents to.

For years, APCD has attempted to promote clean air technologies via incentive programs like the Portside Zero Emission Truck Pilot Project. While these programs are important and should continue, we have learned over time that incentives programs alone do not accomplish the clean air improvements we need. Very few trucks have been adopted and the primary beneficiaries have been large corporations.

Regulation in the form of an ISR can be a catalyst for progress, compelling industries to innovate and adopt more efficient technologies that will ultimately reduce air contaminants and save lives. Incentives without regulation, would mean cleaner air at industries convenience. An incentive only approach will not advance environmental justice.

[1] Most recently, The Portside Environmental Justice Community and the International Border Region were designated as AB 617 Environmental Justice Communities. These communities are amongst the most pollution burdened communities in the state of CA and have notably referenced addressing heavy-duty truck pollution in their Community Emission Reduction Plans (CERPs).

I strongly urge this body to oppose the APCD staff recommendation and prioritize an Indirect Source Rule regulation to reduce emissions from indirect sources at warehouses and distribution centers.

Thank you,



Nicholas Paúl
Former Portside CSC Member & EJ Working Group Advisor

From: Sam Shultz
To: APCD, Public Comment
Subject: [External] Indirect Source Rule
Date: Monday, April 13, 2026 5:31:28 PM

To the San Diego County APCD,

I am a volunteer with SanDiego350, a climate action organization that fights for environmental justice in San Diego County's underserved communities. I join the Environmental Health Coalition and Sierra Club San Diego chapter in calling for the APCD to move forward with implementing a comprehensive Indirect Source Rule in our county. Massive amounts of air pollution and greenhouse gas emissions emanate from huge trucks that travel to large warehouses in our County. Many of these warehouses are in low-income communities in South County. Please do the right thing and approve a strong Indirect Source Rule, for the health and benefit of all residents of San Diego County.

Kindly,
Sam

SIERRA CLUB
SAN DIEGO CHAPTER

ENVIRONMENTAL HEALTH COALITION

CLIMATE ACTION CAMPAIGN
SAN DIEGO | ORANGE COUNTY | LOS ANGELES

Warehouse ISR Phased Approach

April 9, 2026

Indirect Source Rule:

- Ending deadly warehouse operating pollution and addressing the climate crisis
- Zero emission solutions
- Flexible designs to reduce air pollution and public health impacts from indirect sources of pollutants from warehouse operations, like medium- and heavy-duty trucks.
    - San Diego will set a national standard if it adopts a warehouse Indirect Source Rule
    - Warehousing growth continues as online shopping and dependence on foreign goods rise.

The ISR policy can be enforced:

- Federal Clean Air Act- 1970 provided the authority
- State Legislatures (New York, Illinois, New Jersey, and Colorado are all considering an ISR)
- Regional Air Quality Agency (CA- SCAQMD)
- Cities (NYC)
- Adopted into the state implementation plan
- CA **Assembly Bill 423 (Gloria) -** Required air districts to consider indirect source rules.

Indirect Sources of Pollution



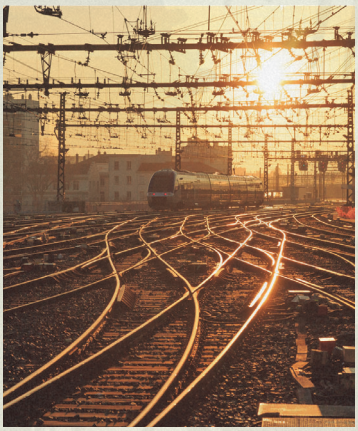
Ports



Airports



Warehouses



Railyards

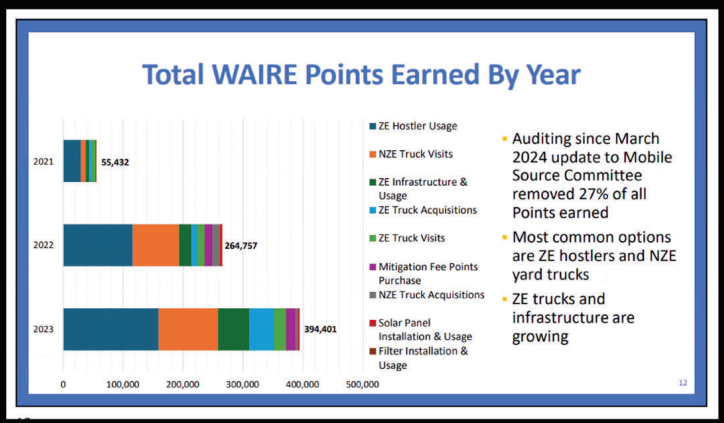
Indirect Source Rule

In 2021, the South Coast AQMD adopted rule 2305, which required large warehouses to offset pollution from the pollution their operations emit.

- Applied to warehouses over 100,000 sq/ft
- Based on truck traffic, facilities will be assigned a WAIRE point obligation.
- WAIRE Menu of options
  - ZEV truck adoption
  - Mitigation fee
  - Charging infrastructure
  - Solar installation
  - Filter purchase for impacted schools

Zero-Emission Energy Transition is here!

Technology will not be there - WRONG



Second Annual Report for the WAIRE Program

5

Air District	Indirect Source Regulation	Adoption Date
Colusa County	Rule 510: Imposes building permit fees for residential, commercial, and industrial development. Excess fees used to mitigate air quality impacts.	1991
Mendocino County	Regulation 1: Requires large development projects that indirectly results in or is projected to result in excess unmitigated emissions to document and implement mitigation measures. Authority to Construct permit is required if applicant is unwilling to implement mitigation measures or mitigated emissions still exceed thresholds.	2003
San Joaquin Valley	Rule 9510: Sets emission reduction targets for large new development, redevelopment, dan or transportation/transit projects, which can be achieved through on-site mitigation or payment of off-site mitigation fees	2005
Imperial County	Rule 310: Requires payment of operational development fee, emission reduction project, or emissions review for new commercial and residential development projects	2007
Tehama County	Rule 2:11D: Requires developers of new commercial and residential development projects to pay an Indirect Source Fee, provide on-site or off-site mitigation through an Alternative Emission Reduction Plan, or a combination of both.	2010
South Coast	Rule 2305: Requires operators of warehouses over 100,000 square feet to earn a certain number of points every year (calculated based on number of annual truck trips to/from the facility). Points can be earned through (1) completing any combination of actions in a menu of compliance options specified in the rule; (2) completing actions in a custom site-specific compliance plan approved by the district; or (3) paying a mitigation fee.	2021

Responses to Legal Concerns

- Air districts have expansive authority to devise regulations, including indirect source regulations.
- Indirect source rules have been repeatedly upheld by federal courts.
- Indirect source rules in California have varied in terms of applicability and phase-in implementation.
  - Five ISRs are focused on new development. San Joaquin Valley rule also requires new development to continue reducing emissions in operational phases.
  - The South Coast Warehouse Rule phased in implementation, based on square footage, and only covers warehouses larger than 100,000 square feet. The timeline for phasing in stringency also varied depending on size of facilities.
- The South Coast Warehouse Rule was adopted in part to address these pollution harms that disproportionately impact warehouse-adjacent communities, in recognition of the fact that massive warehouse development occurs in specific areas within the air basin.

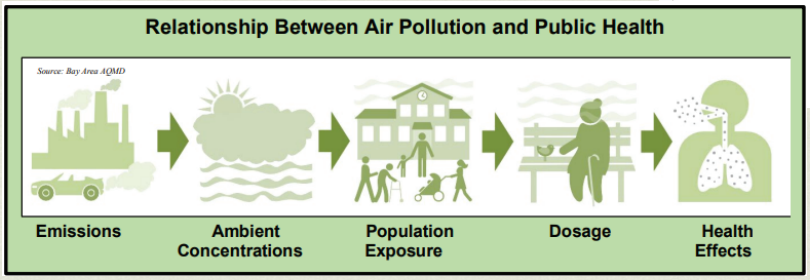
San Diego needs Leadership

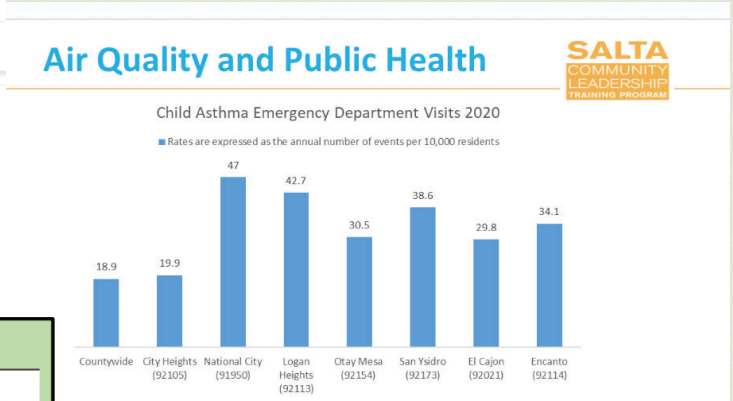
POLITICO

California | California Playbook | California Climate | California Decoded

Trump revokes California's nation-leading electric vehicle mandate

The battle over California's authority to set vehicle emissions standards will now head to the courts.



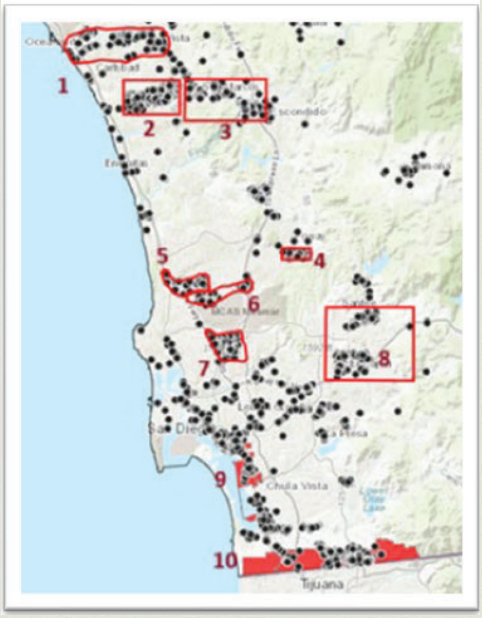


Cancer and asthma don't wait, and neither can we. We need a Warehouse rule now!

Why We Need An ISR In San Diego

San Diego County air is classified as severe non-attainment for federal ozone standards and non-attainment for state PM10 and PM 2.5 at times.

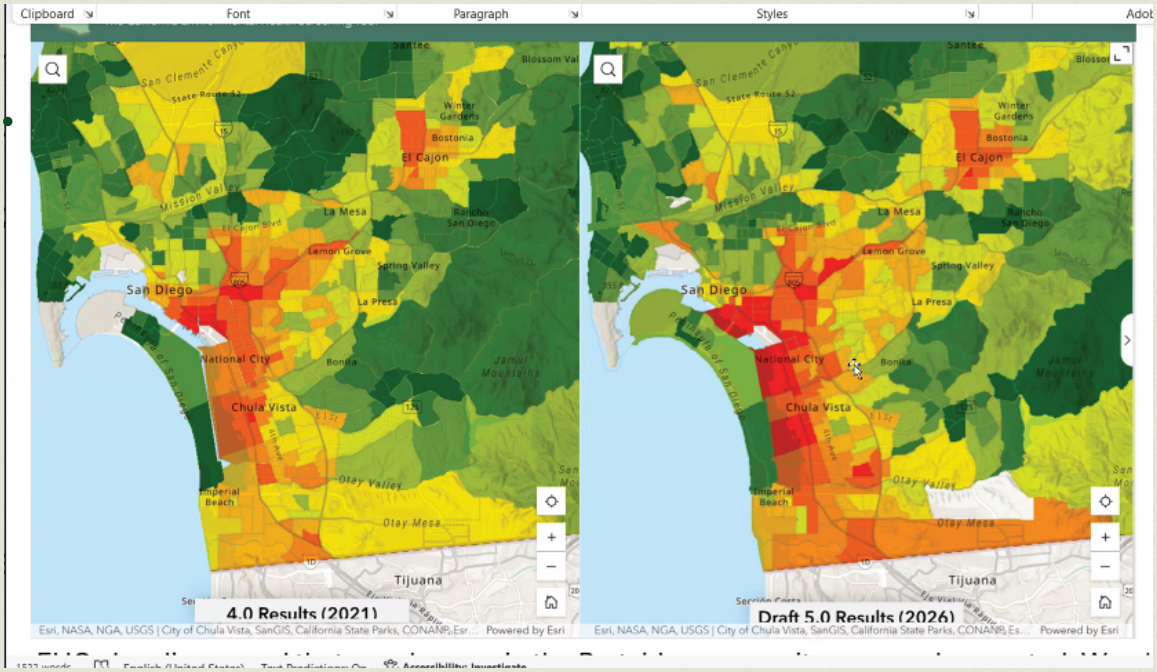
Diesel emissions cause 84% of the cancer risk from air pollution in Portside neighborhoods, and 79% of the cancer risk from air pollution in Border neighborhoods. -CATA, 2017

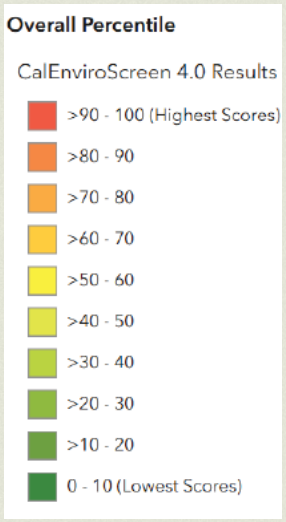


"...the analysis showed that warehouse floor area (square footage) and total truck volume have a strong positive correlation." -White Paper, Pg 45

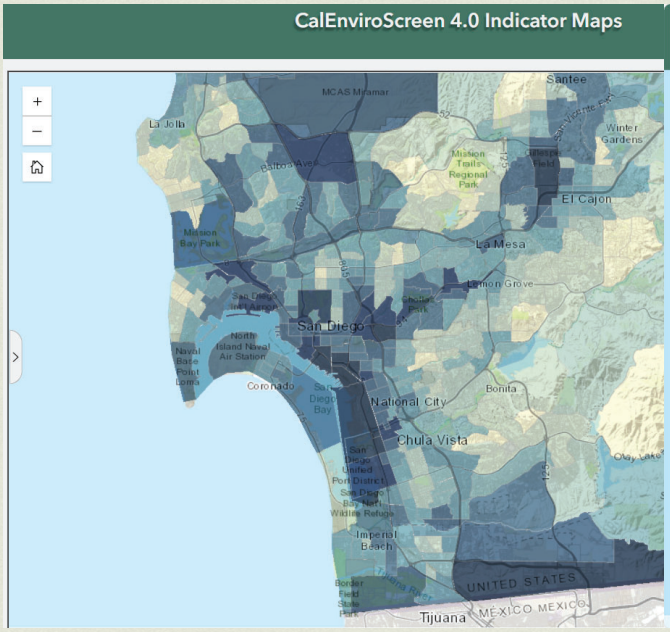
Portside and International Border communities are disadvantaged and highly impacted communities under the Community Air Protection Program (AB617)

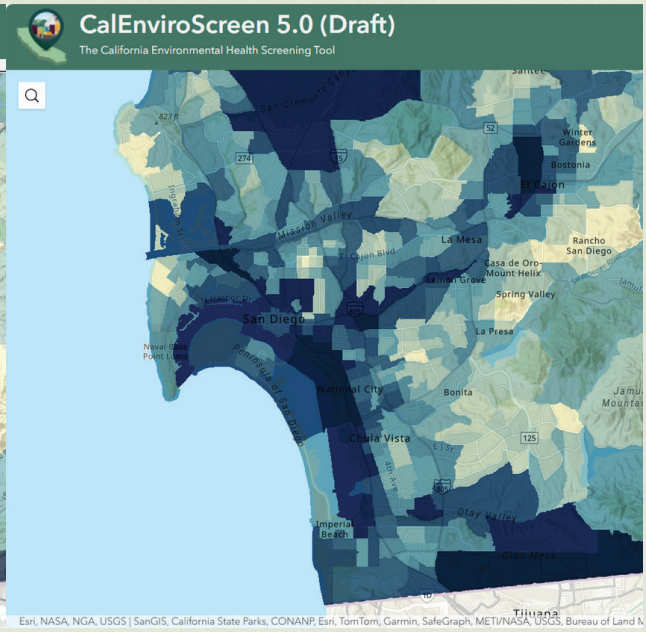
Cal Environscreen 5.0 (Latest)





Pollution Burden is Getting Worse





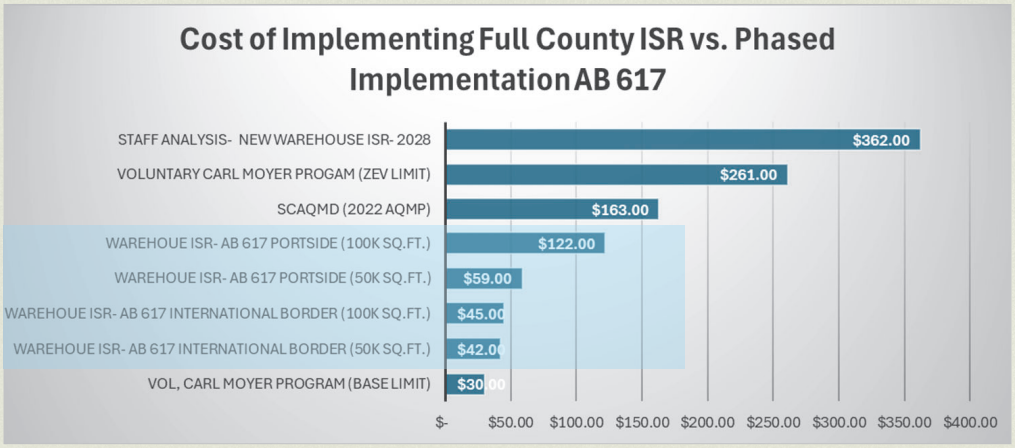
Phased Implementation Approach

Prioritize Impacted Communities

- AB 617 Communities
  - Portside
  - International Border

Staggered Warehouse compliance

1) Warehouses over 100,000 sq.ft.
2) Warehouses over 50,000 sq.ft.



Communities are Already Paying for Warehouse Pollution

- True cost-effectiveness cannot be determined until a rulemaking process begins.
- We need a full study of warehouse operations and truck trips.
- Identifying the most impacted communities through an equitable process, BAAQMD has used Cal Enviroscreen (AB 617 used for EHC Cost-Effectiveness Analysis)
- Voluntary incentive programs do not work without a regulatory rule to put pressure



Rulemaking Process Should Determine:

What would a cost effective phased approach that addresses the immediate public health damages to Border and Portside communities look like?

What will be the most effective compliance options?

- Clean Vehicles and Equipment
- Clean Enegy Infrastructure
- Funding and Offsets

What exactly is our warehouse footprint we need to mitigate for?

Thank You!



San Diego Air Pollution Control District
10124 10124 Old Grove Road
San Diego, CA 92131

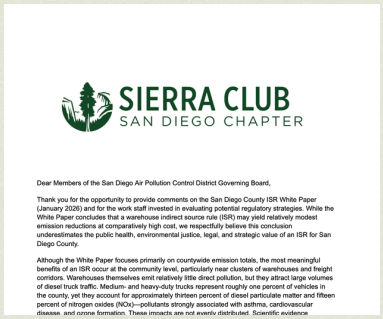
Via Electronic Mail

May 31, 2025



October 22, 2025

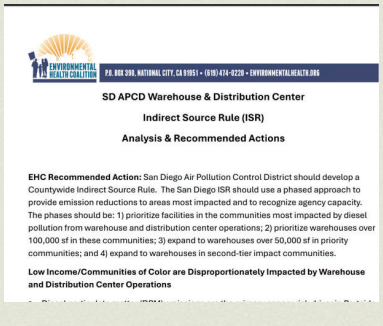
Members of the Governing Board
San Diego County Air Pollution Control District
c/o Clerk of the Board
1600 Pacific Highway, Room 402
San Diego, CA 92101



Dear Members of the San Diego Air Pollution Control District Governing Board,

Thank you for the opportunity to provide comments on the San Diego County ISR White Paper (January 2026) and for the work staff invested in evaluating potential regulatory strategies. While the White Paper concludes that a warehouse indirect source rule (ISR) may yield relatively modest emission reductions at comparatively high cost, we respectfully believe this conclusion underestimates the public health, environmental justice, legal, and strategic value of an ISR for San Diego County.

Although the White Paper focuses primarily on countywide emission totals, the most meaningful benefits of an ISR occur at the community level, particularly near clusters of warehouses and freight corridors. Warehouses themselves emit relatively little direct pollution, but they attract large volumes of diesel truck traffic. Medium- and heavy-duty trucks represent roughly one percent of vehicles in the county, yet they account for approximately thirteen percent of diesel particulate matter and fifteen percent of nitrogen oxides (NOx)—pollutants strongly associated with asthma, cardiovascular disease, and ozone formation. These impacts are not evenly distributed. Scientific evidence



ENVIRONMENTAL HEALTH COALITION | P.O. BOX 398, NATIONAL CITY, CA 91951 • (619) 474-0220 • ENVIRONMENTALHEALTH.ORG

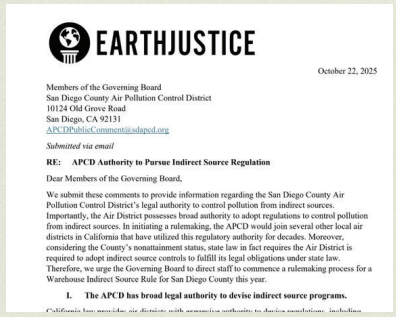
SD APCD Warehouse & Distribution Center

Indirect Source Rule (ISR)

Analysis & Recommended Actions

EHC Recommended Action: San Diego Air Pollution Control District should develop a Countywide Indirect Source Rule. The San Diego ISR should use a phased approach to provide emission reductions to areas most impacted and to recognize agency capacity. The phases should be: 1) prioritize facilities in the communities most impacted by diesel pollution from warehouse and distribution center operations; 2) prioritize warehouses over 100,000 sf in these communities; 3) expand to warehouses over 50,000 sf in priority communities; and 4) expand to warehouses in second-tier impact communities.

Low Income/Communities of Color are Disproportionately Impacted by Warehouse and Distribution Center Operations



October 22, 2025

Members of the Governing Board
San Diego County Air Pollution Control District
10124 Old Grove Road
San Diego, CA 92131
APCDPublicComment@sdapcd.org

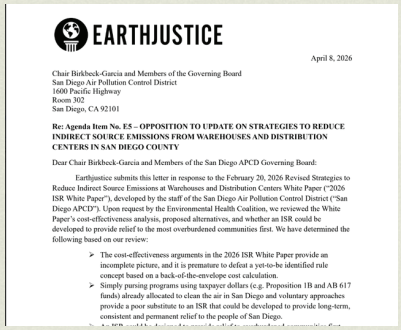
Submitted via email

RE: APCD Authority to Pursue Indirect Source Regulation

Dear Members of the Governing Board,

We submit these comments to provide information regarding the San Diego County Air Pollution Control District's legal authority to control pollution from indirect sources. Importantly, the Air District possesses broad authority to adopt regulations to control pollution from indirect sources. In initiating a rulemaking, the APCD would join several other local air districts in California that have utilized this regulatory authority for decades. Moreover, considering the County's nonattainment status, state law in fact requires the Air District is required to adopt indirect source controls to fulfill its legal obligations under state law. Therefore, we urge the Governing Board to direct staff to commence a rulemaking process for a Warehouse Indirect Source Rule for San Diego County this year.

I. The APCD has broad legal authority to devise indirect source programs.



April 8, 2026

Chair Birkbeck-Garcia and Members of the Governing Board
San Diego Air Pollution Control District
1600 Pacific Highway
Room 302
San Diego, CA 92101

Re: Agenda Item No. E5 – OPPOSITION TO UPDATE ON STRATEGIES TO REDUCE INDIRECT SOURCE EMISSIONS FROM WAREHOUSES AND DISTRIBUTION CENTERS IN SAN DIEGO COUNTY

Dear Chair Birkbeck-Garcia and Members of the San Diego APCD Governing Board:

Earthjustice submits this letter in response to the February 20, 2026 Revised Strategies to Reduce Indirect Source Emissions at Warehouses and Distribution Centers White Paper ("2026 ISR White Paper"), developed by the staff of the San Diego Air Pollution Control District ("San Diego APCD"). Upon request by the Environmental Health Coalition, we reviewed the White Paper's cost-effectiveness analysis, proposed alternatives, and whether an ISR could be developed to provide relief to the most overburdened communities first. We have determined the following based on our review:

- The cost-effectiveness arguments in the 2026 ISR White Paper provide an incomplete picture, and it is premature to defeat a yet-to-be identified rule concept based on a back-of-the-envelope cost calculation.
- Simply pursing programs using taxpayer dollars (e.g. Proposition 1B and AB 617 funds) already allocated to clean the air in San Diego and voluntary approaches provide a poor substitute to an ISR that could be developed to provide long-term, consistent and permanent relief to the people of San Diego.