BAY AREA AIR QUALITY MANAGEMENT DISTRICT

Fugitive Dust White Paper

Regulatory analysis and recommendations to further address fugitive dust and particulate matter emissions

Planning & Climate Protection	**Rules & Strategic Policy**
Mark Tang	Eric Lara
Principal Air Quality Specialist	Senior Air Quality Specialist

March 28, 2023

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I. Acknowledgements

The development of this white paper was guided by many contributors, including:

Gregory Nudd, Deputy Air Pollution Control Officer, Policy

Elizabeth Yura, Director, Rules & Strategic Policy

Jeff Gove, Director, Compliance and Enforcement

Ranyee Chiang, Director, Meteorology & Measurement

Victor Douglas, Manager, Rules & Strategic Policy

Song Bai, Manager, Assessment, Inventory & Modeling

Katherine Hoag, Assistant Manager, Meteorology, Measurements & Rules

David Joe, Assistant Manager, Rules & Strategic Policy

Sonam Shah-Paul, Assistant Manager, Executive Office

David Holstius, Senior Advanced Projects Advisor, Planning & Climate Protection

Virginia Lau, Advanced Projects Advisor, Planning & Climate Protection

Michael Flagg, Principal Air Quality Specialist, Meteorology & Measurement

Laura Cackette, Senior Air Quality Specialist, Rules & Strategic Policy

II. List of Abbreviations and Acronyms

AB 617 – Assembly Bill 617

Air District or BAAQMD – Bay Area Air Quality Management District

ATCM – Air Toxic Control Measure

BAAQMD – Bay Area Air Quality Management District

BACM – Best Available Control Measures

BMP – Best Management Practices

CAP – Community Action Plan

CAPP – Community Air Protection Program

CARB – California Air Resources Board

CERP – Community Emissions Reduction Plan

CEQA – California Environmental Quality Act

DCP – Dust Control Plan

DES – Clark County Department of Environment and Sustainability

EPA – Environmental Protection Agency

ICAPCMD – Imperial County Air Pollution Control District

MCAQD – Maricopa County Air Quality Department

MRR – Monitoring, recordkeeping, and reporting

NAAQS – National Ambient Air Quality Standards

NOA – Natural Occurring Asbestos

NOx – Nitrogen oxides

PM – Particulate Matter

Rule 2-1 – Regulation 2, Rule 1: General Requirements

Rule 6-1 – Regulation 6, Rule 1: General Requirements

Rule 6-6 – Regulation 6, Rule 6: Prohibition of Trackout

SCAQMD – South Coast Air Quality Management District

SMAQMD – Sacramento Metropolitan Air Quality Management District

SOx – Sulfur Oxides

TAC – Toxic air contaminant

TSP – Total Suspended Particulate

WOCAP – West Oakland Community Action Plan

III. Executive Summary

The Bay Area Air Quality Management District (Air District) administers many emissions reduction programs focused on particulate matter (PM) including fugitive dust. While PM exposures declined region-wide, many communities remain disproportionately impacted. Further reductions are needed to attain air quality standards, address environmental injustice, and achieve public health benefits. Historically underserved communities continue to bear the brunt of PM emissions and associated health impacts, especially in communities near significant PM sources such as oil refining, high-volume roadways, and marine operations. Fugitive dust emissions at PM-generating sources tend to be heavily influenced by both wind conditions and human activities, and emissions are episodic in nature. PM can pass through the nasal passage and enter the lungs, leading to serious health effects associated with the heart and lungs.[1] Recent research and scientific analysis has also increased the Air District's understanding of the relationship between PM exposure and health impacts, including increased pulmonary disease such as asthma and increased premature morbidity.

The Air District's Advisory Council published a *Particulate Matter Reduction Strategy Report* in late 2020 and concluded that PM was the "most important health risk driver in Bay Area air quality…"[2] Community feedback, especially among representatives from overburdened communities also identified PM as a major concern and priority for reduction. Additionally, the West Oakland Community Action Plan (WOCAP)[3] identified fugitive dust as a further study measure for the Air District to investigate potential rulemaking to limit fugitive dust from construction activities.

This white paper explores opportunities to innovate, update and adjust Air District programs to further reduce exposure to particulate matter in the form of fugitive dust and therefore reduce associated health impacts. While this white paper broadly characterizes the challenges associated with existing programs, the focus of this white paper centers on opportunities for potential rulemaking activities to control fugitive dust, especially from sources of fugitive dust emissions such as, construction projects, earth moving activities, paved and unpaved roads, and bulk storage facilities.

A complete overview is provided below, including a gap analysis of existing Air District regulations and a list of recommended options as follows:

- Increase the practical enforceability of requirements by amending Regulation 6, Rule 1: General Requirements and Regulation 6, Rule 6: Prohibition of Trackout.
- Increase the mitigation of fugitive dust emissions by introducing the regulatory language requiring compliance with Dust Control Plans for earth moving operations.

[1] Environmental Protection Agency, n.d. What is Particulate Matter? Accessed April 15, 2021: https://www.epa.gov/pm-pollution/particulate-matter-pm-basics#PM

[2] BAAQMD, 2020. *Particulate Matter: Spotlight on Health Protection. Advisory Council Particulate Matter Reduction Strategy Report*. San Francisco. https://www.baaqmd.gov/~/media/files/board-of-directors/advisory-council/2020/ac_particulate_matter_reduction_strategy_report.pdf?la=en&rev=570867c8b25e4ca0b2f93f80c4c1ef02

[3] BAAQMD and West Oakland Environmental Indicators Project, 2019. Owning Our Air. The West Oakland Community Action Plan – Volume 1: The Plan. https://www.baaqmd.gov/~/media/files/ab617-community-health/west-oakland/100219-files/final-plan-vol-1-100219-pdf.pdf?la=en

- Further reduce fugitive dust emissions by implementing regulatory language mandating compliance with best management practices and/or best available control measures.
- Increase accountability by introducing regulatory language for a “Notice of Requirements” document for sites with equipment with the potential to generate fugitive dust.
- Explore inclusion of a potential “dust fee” or “plan registration fee” so additional compliance and enforcement activities may be appropriately resourced.
- Explore opportunities to lower the permitted allowable PM-emission threshold, similar to New Source Review for Toxic Air Contaminants.

Each recommended action should be developed in coordination with relevant stakeholders including community advocates. It is important to note, this white paper provides a qualitative overview and future development activities will conduct qualitative and quantitative analysis to support proposed actions.

IV. Impetus

Problem Statement

The focus of this white paper centers on mitigating and reducing the impacts of episodic exposure from fugitive dust, particularly in overburdened communities. Exposure to fugitive dust emissions can lead to acute health effects and this white paper will discuss opportunities for potential rulemaking activities to control fugitive dust, with a focus on construction projects, earth moving activities, paved and unpaved roads, and bulk handling and storage facilities. This white paper will provide an overview of the Air District's existing particulate matter programming, focusing on fugitive dust, and will identify strategies and recommendations for potential rule development activities to reduce fugitive dust and particulate matter emissions.

V. Introduction

Particulate Matter Background

Particulate matter, also known as PM, is characterized as a "complex mixture of extremely small particles and liquid droplets."[4] PM is often categorized by size, with particles that are 10 micrometers in diameter or smaller referred to as 'PM_{10}' and fine particles 2.5 micrometers in diameter or smaller as '$PM_{2.5}$.' PM can also be categorized as Total Suspended Particulate (TSP), which encompasses all airborne particles and as Ultrafine PM, defined as particles smaller than 0.1 micrometers in diameter.[5]

Particulate matter can also be categorized by material and composition, such as diesel PM. Diesel PM is categorized by the State of California as a toxic air contaminant (TAC), which results in additional regulatory requirements to protect public health.[6] Diesel PM is primarily generated by diesel fuel combustion in backup generators, lawn equipment and on-road and off-road equipment and vehicles.

Sources of PM include industrial sources such as refineries, concrete batch plants, or landfills, or from construction sites, paved or unpaved roads, fires and brake and tire wear from mobile sources. PM can also form in the atmosphere as a result of chemical reactions from gases in the air such as sulfur oxides (SOx) and nitrogen oxides (NOx). PM from sources such as construction sites, paved or unpaved roads, and bulk storage facilities may result in fugitive dust. Fugitive dust is generally defined as particulate matter that is released into the air through mechanical disturbance or high wind speeds. The EPA defines fugitive (dust) emissions as those that could not reasonably pass through a stack, chimney, vent, or other functionally-equivalent opening.

PM can pass through the nasal passage and enter the lungs, leading to serious health effects associated with the heart and lungs.[7] In December 2020, the Air District Advisory Council published its *Particulate*

[4] Environmental Protection Agency (n 1).
[5] BAAQMD, 2018. Staff Report – Particulate Matter, Proposed New Regulation 6: Common Definitions and Test Methods. Accessed April 15, 2021: https://www.baaqmd.gov/~/media/dotgov/files/rules/archive-2018-regulation-6/bundled-documents/20180801_50_sr_0600-pdf.pdf?la=zh-tw
[6] California Air Resources Board, n.d. CARB Identified Toxic Air Contaminants. Accessed May 2, 2021: https://ww2.arb.ca.gov/resources/documents/carb-identified-toxic-air-contaminants
[7] Environmental Protection Agency (n 1).

Matter Reduction Strategy Report (Report),[8] concluding that "PM is the most important health risk driver in Bay Area air quality, both $PM_{2.5}$ as a criteria pollutant and diesel PM as a toxic air contaminant."[9] The report also stated that further particulate matter reductions are needed to reduce overall health risks in the Bay Area. As elevated $PM_{2.5}$ exposures occur in locations adjacent to local sources, it is of upmost importance to control and reduce these emissions in these communities.

By way of the Clean Air Act, the Environmental Protection Agency (EPA) sets National Ambient Air Quality Standards (NAAQS) for criteria air pollutants, including PM_{10} and $PM_{2.5}$.[10] Through rule development, permitting, enforcement, and monitoring, the Air District regulates PM emissions in the San Francisco Bay Area to comply with the NAAQS. It's important to note that exposure levels below the NAAQS still cause adverse health impacts; there is no "safe" level of PM exposure.

Despite decades of progress in reducing air pollution, some communities bear a disproportionate burden. These are usually, low-income communities of color which bear additional health burdens due to the health impacts of institutional racism (for example, chronic stress from housing and food insecurity). In the Bay Area, many fugitive dust sources are over-represented in these overburdened communities.

In response to Assembly Bill (AB) 617, the California Air Resources Board (CARB) established the Community Air Protection Program (CAPP).[11] The CAPP was created to reduce community exposure to air pollution in communities most impacted. The Air District partners with CARB and local communities to develop, implement strategic plans (also called Community Emissions Reduction Programs, or "CERPs") and identify funding to support programs that reduce air emissions in these communities. Many communities identified PM as a high priority air pollutant for further reductions.

Because of these health considerations and policy drivers, Air District staff are analyzing additional mechanisms to control and reduce fugitive dust and particulate matter emissions in the Bay Area.

Engagement

Air District staff received input on fugitive dust issues and impacts from various community stakeholders in Bayview Hunters Point (San Francisco), Richmond/San Pablo, and East and West Oakland. Some highlighted operations included large and small aggregate facilities, metal recycling operations, and construction sites. Staff took the opportunity to document community concerns surrounding PM and witness PM-related activity that may impact community health.

In addition, the impacts of PM were a focus during the AB 617 Community Emission Reduction Planning (CERP) Process in West Oakland as well as in the formation of the Richmond-North Richmond-San Pablo CERP, currently in progress. The Bayview Hunters Point and East Oakland CERP processes are presently launching, but staff anticipate fugitive dust to be one of the issues at the forefront of their concerns.

[8] BAAQMD, 2020 (n 2).
[9] *Ibid*.
[10] Environmental Protection Agency, n.d. Criteria Air Pollutants. Accessed April 15, 2021: https://www.epa.gov/criteria-air-pollutants
[11] California Air Resources Board, n.d. Community Air Protection Program. Accessed April 15, 2021: https://ww2.arb.ca.gov/capp

Additionally, the West Oakland CERP, Owning Our Air: The West Oakland Community Action Plan (CAP), included a Further Study Measure that states that "The Air District will investigate potential rulemaking to limit fugitive dust from construction activity."[12]

VI. Existing Landscape

As previously discussed, the purpose of this paper is to identify potential strategies that can strengthen and improve existing Air District programs to further control and reduce fugitive dust PM emissions. The Air District's Advisory Council "recognized that particulate matter is a major driver of health risks from Bay Area air quality."[13] The Advisory Council also recognized "there is no known threshold for harmful $PM_{2.5}$ health effects" and recommended further actions to reduce PM exposure and achieve additional health benefits.[14] Additionally, ongoing engagement with local communities raised concerns surrounding fugitive dust emissions from dust generating sites, including but not limited to, construction operations, stockpiles, and earthmoving operations. The following sections discuss the current impetus and existing landscapes that may affect PM programming, including rules, monitoring, enforcement, and planning activities.

Framework for Regulating and Evaluating PM Impacts

Regional & Local PM Emissions

While a regionally-focused regulatory framework successfully reduced PM exposures across the Bay Area, additional strategies may be needed to control PM emissions, including fugitive dust, at a local level.

PM emissions reduction programs traditionally target achieving regional criteria pollutant reductions where an ambient air quality standard was established.[15] These ambient air quality standards are based on air basins and benefit entire regions. However, the regional approach may not adequately protect subregional and local marginalized communities which historically bear elevated negative environmental conditions and associated health effects. This approach also fails to consider the cumulative impacts of many sources of air pollution, a major concern of community advocates.

Conversely, because diesel PM is listed by the State of California as a TAC, sources of diesel PM emissions are evaluated based on modeled localized exposures and emissions from the most impacted locations which must not exceed specific cancer risk thresholds. The Air District evaluates sources of TAC's utilizing a health risk screening analysis, which models localized exposures and cancer risk. TAC emissions cannot exceed specific cancer risk thresholds for nearby receptors (residents and workers); failure to do so would result in a rejection of the application for a Permit to Operate.

In December 2021, the Air District's Board of Directors adopted amendments to Regulation 2, Rule 1: General Requirements (Rule 2-1) and Regulation 2, Rule 5: New Source Review for Toxic Air

[12] BAAQMD, 2019 (n 3).
[13] BAAQMD, 2020 (n 2).
[14] BAAQMD, 2020 (n 2).
[15] California Air Resources Board, n.d. Criteria Air Pollutants. Accessed May 2, 2021: https://ww2.arb.ca.gov/our-work/programs/criteria-air-pollutants

Contaminants (Rule 2-5), which increased community health protections by lowering the cancer risk threshold for TAC emissions, including diesel PM, in Overburdened Communities.

As noted, currently there is not an established framework and methodology to evaluate health risks from localized concentrations of PM. Air District staff is currently studying potential solutions, which may inform future rulemaking efforts to amend the Air District's regulations.

California Environmental Quality Act (CEQA)

Localized and short duration impacts from PM emissions are also considered when evaluating a project's environmental impacts in accordance with CEQA. The Air District publishes the CEQA Air Quality Guidelines (Guidelines) to assist lead agencies in evaluating air quality impacts of projects and plans proposed in the Bay Area. The Guidelines outline thresholds of significance for determining the significance of air quality impacts, screening criteria, assessment, and mitigation of project impacts. The Air District periodically updates the CEQA guidelines and thresholds to reflect changes in the legal and regulatory landscape, as well as advancements in scientific knowledge, analytical methods, and mitigation strategies and technologies.

Existing Air District PM Emissions Reductions Programming

The Air District's existing PM programs are administered through various activities described in more detail below.

Compliance & Enforcement

The Air District administers a comprehensive Compliance & Enforcement Program. Air Quality Inspectors are tasked with verifying pollution-generating sources comply with federal, state, and local regulations, including compliance with Air District-issued Permits to Operate. Inspectors frequently conduct site visits and investigations when fielding complaints and at regular intervals as part of their role in enforcing the regulations at alleged sites or complaint locations.

Due to high wind gusts generally being intermittent in nature, exceedances of current applicable rules and regulations pertaining to fugitive dust can be challenging for Air District inspectors to verify (see also Rules & Regulations section below). Therefore, frequent oversight and follow-up is often necessary to determine non-compliance. Often, collaboration with the public is necessary to appropriately and efficiently respond to ongoing emissions events which can be done through the robust complaint filing and response program.

Fugitive dust emissions at PM-generating sources tend to be heavily influenced by both wind conditions and human activities such as driving over unpaved roadways and/or earth moving activities such as the disturbance or transfer of stockpiles. Additionally, meteorological conditions such as high wind conditions significantly exacerbate fugitive dust. While high wind speeds are generally easily forecasted on a regional scale, they are more difficult to pinpoint at the local scale. A well-designed approach to controlling fugitive dust emissions during high wind speeds is achievable by integrating the proper management framework into the existing regulations, allowing for a more efficient use of Air District time and resources by providing a more streamlined method to determine compliance.

Violations & Settlements

Air District inspectors issue a Notice to Comply (NTC) or a Notice of Violation (NOV) whenever an observed violation is documented. An NTC resembles a 'fix-it ticket' and is typically issued when the violation is an administrative violation or when the violation is minor and not related to emissions. NTCs typically can be corrected immediately or within a specified timeframe, typically no more than 14 days. An NOV is issued for violations of a serious nature, which may result in a greater public health threat or for unresolved or reoccurring minor violations. NOVs are issued when a facility violates a federal, state, or local regulation or when a facility violates the requirements in their Permit to Operate. NOV's can result in monetary penalties that can vary depending on the severity of the violation.

Rules & Regulations

Regulation 6, Rule 1: General Requirements (Rule 6-1), and Regulation 6, Rule 6: Prohibition of Trackout (Rule 6-6) are the two Air District regulations that address PM emissions from aggregate, concrete, sand, and other earth moving operations (including construction sites).

Both rules were last amended in 2018, as a suite of PM-related rule amendments. The Air District's Advisory Council and substantial stakeholder engagement subsequently highlighted the need to strengthen and improve these rules to reduce localized PM exposure, especially in overburdened communities.

Regulation 6, Rule 1: General Requirements

Regulation 6, Rule 1: General Requirements set forth the general emissions limitations of PM in "the atmosphere through the establishment of limitations on emission rates, emission concentrations, visible emissions and opacity."[16] The majority of PM emissions controls for concrete batch plants, aggregate plants, and sand-related operations, collectively defined under Rule 6-1 as 'regulated bulk material sites' are controlled under this regulation.

As written, Rule 6-1 may not achieve the desired PM reductions due to several issues with the existing language / requirements and lack of standards that suppress fugitive emissions.

Challenges with existing regulation language:

- **Enforceability**
  The existing regulation contains requirements that are difficult to enforce. The burden of proof to issue violations from fugitive dust is tied to opacity and Ringlemann Chart observations which require a minimum of 3 minutes in any hour exceedances. PM emissions and fugitive dust are typically caused by intermittent meteorological conditions such as high winds which do not always exceed the visible emissions evaluation standards.
- **Monitoring/Data**
  Community stakeholders have requested additional PM air monitoring, both at the fenceline of facilities with the potential to emit PM or generate fugitive dust, and in the surrounding

[16] BAAQMD, August 2018. *Regulation 6, Rule 1: Particulate Matter General Requirements*. Accessed July 6, 2021: https://www.baaqmd.gov/~/media/dotgov/files/rules/archive-2018-regulation-6-rule-1/documents/rg0601-pdf.pdf?la=en&rev=57b56e4a39be4995b3d021c8dd7c941c

community. Currently, the Air District operates a robust network of 17 regulatory-grade $PM_{2.5}$ air monitoring stations around the region in compliance with EPA regulations. This number exceeds what is required by USEPA for characterizing regional $PM_{2.5}$ levels. Given the high cost of the regulatory-grade monitors, it's not feasible to deploy enough to completely characterize local impacts. Therefore, we must also consider other sources of information to inform policy and implementation programs to reduce localized PM emissions impacts.

Challenges with regulation standards:

- **Fugitive Dust**
  As written, our current tools for addressing fugitive dust emissions through enforcement is through the use of opacity or Ringlemann Chart observations (see Enforceability above). Due to the intermittent nature of wind events and the intricacies of documenting noncompliance, it is challenging for Air District inspection staff to certify fugitive dust violations. In many other jurisdictions (which will be further outlined below), any fugitive dust observed by an inspector is subject to enforcement action, without adhering to opacity or Ringlemann Chart observations as long as an observable plume crosses a property line.
- **Moisture Content & Stabilization**
  The existing rule does not mandate stockpile stabilization requirements, and instead relies on visible emissions evaluations to control fugitive dust. As previously noted, visible emissions evaluations present enforceability difficulties and challenges. Recommendations would include stockpile moisture content or adequately wetted requirements, in addition to mandating dust management plans and other operational modifications during high wind events, or when there is potential for windblown fugitive dust. See 'Recommendations' section for further discussion.
- **Record Keeping / Dust Management Plan**
  The current Rule 6-1 has limited record keeping requirements under Section 6-1-502 (as related to regulated bulk material sites), which states "persons monitoring emissions in accordance with the requirements of Regulation 1 shall keep records, report emission excesses and provide summaries of data collected as required by Regulation 1."[17] This monitoring, recordkeeping, and reporting (MRR) requirement does little to reduce emissions – an expansion of this record keeping requirement to a formal Dust Management Plan that requires additional mitigation measures during observed exceedances would likely increase the efficacy of the regulation in reducing PM emissions.

Regulation 6, Rule 6: Prohibition of Trackout

Regulation 6, Rule 6: Prohibition of Trackout was adopted by the Air District Board of Directors on August 1, 2018 and is focused on road dust generated by vehicles moving over unpaved roads (rendering them airborne). Additionally, Rule 6-6 addresses mud, dirt and earth that can be tracked out onto roadways by mobile equipment such as construction equipment.

Although the language and requirements for the prevention and mitigation of track out are clearly described in Rule 6-6, the regulation is extremely difficult to enforce.

[17] *Ibid*.

Section 6-6-301 of Rule 6-6 states the following:

"**Prohibition of Trackout onto Paved Roadways:** The owner/operator of any Large Bulk Material Site, Large Construction Site, or Large Disturbed Surface Site shall not cause or allow trackout at any active exit from such site onto an adjacent paved public roadway or shoulder of a paved public roadway that exceeds cumulative 25 linear feet and creates fugitive dust visible emissions without cleaning up such trackout within 4 hours of when the owner/operator identifies such excessive trackout; and shall not cause or allow more than 1 quart of trackout to remain on the adjacent paved public roadway or the paved shoulder of the paved public roadway at the end of any workday."[18]

There is an extremely large burden of proof for this requirement, making it not practically enforceable. It is a challenge for Air District inspectors to clearly identify 25 linear feet and collect more than 1 quart of trackout over a 4-hour period. This is especially difficult in communities where dust-generating sources are located next to each other making it challenging to determine the offending operator.

Regulation 2, Rule 1: Permits - General Requirements

The Air District conducts a comprehensive engineering evaluation and generate permitting determinations upon review. During the review, staff ensure facilities are meeting applicable regulations. Regulation 2, Rule 1, outlines the applicable requirements, limits, and standards pertaining to each specific source type or operation.[19] If an evaluation determines that the new or modified source at a facility is subject to a permit to operate it is considered non-exempt.

Non-exempt sources are those that do not meet exemption thresholds for that particular operation or source type and must therefore obtain a Permit to Operate and an Authority to Construct from the Air District, pursuant to Rule 2-1. Examples of such sources include equipment at refineries, concrete batch plants, industrial facilities, backup diesel generators, autobody shops, and gas stations.

If an evaluation determines the new or modified source does not exceed permitting thresholds outlined in Rule 2-1, it is considered *exempt* from permitting requirements. A complete list of applicable exemptions are listed under the Air District's Rule 2-1-100 section. Examples of potential exemptions include temporary portable equipment and sources which do not exceed the throughput (processing) threshold in any of the Air District's rules. Another example are construction sites which are currently exempt from permitting per Rule 2-1 Section 113 Subsection 2.18. Although exempt, these sources must still comply with general emissions standards and limits in Rule 2-1. In addition, they remain subject to public nuisance requirements per Rule 1-301 and visible emission standards per Rule 6-1.

CARB NOA ATCM:

[18] BAAQMD. August 1, 2018. *Regulation 6, Rule 6: Prohibition of Trackout*. Accessed July 6, 2021: https://www.baaqmd.gov/~/media/dotgov/files/rules/archive-2018-regulation-6-rule-6/documents/rg0606-pdf.pdf?la=en

[19] BAAQMD. December 15, 2021. *Regulation 2, Rule 1: Permits – General Requirements.* Accessed January 20, 2022: https://www.baaqmd.gov/~/media/dotgov/files/rules/reg-2-permits/2021-amendments/documents/20211215_rg0201-pdf.pdf?la=en&rev=103cc60e706947d3ad1e4f5a090483c1

The Air District was delegated the authority to administer and enforce CARBs Asbestos Airborne Toxic Control Measure (ATCM) for Construction, Grading, Quarrying, and Surface Mining Operations. The ATCM is specific to Naturally Occurring Asbestos (NOA) but may provide a framework to augment the existing Air District Regulation 6 suite of PM rules such as the approval of an operator-developed dust control plan. Approved dust control plans must contain specific monitoring procedures, the use of on-site dust suppression technologies and operational parameters to reduce fugitive dust containing NOA. Dust control plans are currently not required under any other Air District rule or regulation, but may be considered for future recommendations. Additionally, this ATCM introduces the adequately wetted requirement and testing method. This requirement is outlined under section 93105 (h)(5)(B):

> "If no moisture threshold is specified in a district-approved asbestos dust mitigation plan, a sample of at least one (1) quart in volume shall be taken from the top three (3) inches of a road, or bare area or from the surface of a stockpile. The sample shall be poured out from a height of four (4) feet onto a clean hard surface. The material shall be considered to be adequately wetted if there is no observable dust emitted when the material is dropped."

VII. Knowledge Assessment of PM Regulatory Landscape

Air District staff conducted an analysis of existing PM emissions related control regulations at other air districts in California, Nevada and Arizona. As noted previously, the Air District's Regulation 6, Rule 1 and Regulation 6, Rule 6 may be improved with the inclusion of additional emission suppression standards, clarification of rule language to provide greater enforceability, and the inclusion of monitoring plans.

Discussion of Opportunities

Potential opportunities and measures to enhance the Air District's PM programming are categorized into the following broad categories: process weight limits, fugitive dust, dust control plans, and a gap analysis.

Process weight limits

The Air District's Rules and Regulations prescribe *Standards*, which specify limitations or requirements that operators must comply with. These standards may specify operating parameters, emissions standards, or other administrative requirements. All operators are required to meet the standards regardless of whether the operator must obtain an Air District Permit to Operate, unless the operator qualifies for an exemption.

Operators or facilities that emit PM emissions are subject to process weight limits as prescribed by Rule 6-1. Process weights are the total weight of all materials introduced into an operation, including solid fuels and process air."[20] The Air District's process weight limits may be amended to reduce these process weights limits, similar to those in Sacramento Metropolitan Air Quality Management District (SMAQMD) Rule 404 Particulate Matter and Rule 405 Dust and Condensed Fumes and Clark County Department of Environment and Sustainability (DES)'s Section 27 – Particulate Matter from Process Weight Rate.

[20] BAAQMD, 2018 (n 16).

Fugitive Dust

Fugitive dust is generally defined as particulate matter that is released into the air through mechanical disturbance or high wind speeds. This material can be suspended in the air by direct or indirect human activities. For example, fugitive dust may be generated when paved, unpaved, stabilized or unstabilized surfaces are disturbed and the dust is carried by wind off the property. Air District Rule 6-1 limits fugitive dust from Regulated Bulk Material Sites. Rule 6-6 limits fugitive dust from Trackout.

Although both Rule 6-1 and Rule 6-6 limit fugitive dust, the standards are very narrowly prescribed. In both instances, fugitive dust is prohibited only if the dust exceeds specific opacity or Ringlemann Chart standards, over a specific period of time. For Rule 6-6, the prohibition of fugitive dust is specifically associated with Trackout.

The large burden of proof has limited Air District inspectors' ability to issue violations, and consideration should be given to amending these regulations to streamline and simplify enforcement. Sacramento Metropolitan Air Quality Management District (SMAQMD) Rule 403 Fugitive Dust limits fugitive dust from "being airborne beyond the property line from what the emission originates, from any construction, handling or storage activity, or any wrecking, excavation, grading, clearing of land or solid waste disposal operation."[21] The SMAQMD Rule 403 Fugitive Dust also omits any opacity or Ringlemann Chart standard.

Other jurisdictions also require dust generating operations to submit a Dust Control Plan for approval (see following section).

Dust Control Plans

Many jurisdictions, including air districts and cities, require an approved Dust Control Plan (DCP) prior to commencement of any dust generating operations. DCPs are flexible and can be tailored to specific operations as requirements at construction sites may vary from the needs at a concrete batch plant.

Currently, the Air District does not require the submittal and approval of a DCP prior to issuance of a Permit to Operate. However, the Air District administers the Naturally Occurring Asbestos (NOA) Program, which does require Air District approval of an Asbestos Dust Mitigation Plan. The Asbestos Dust Mitigation Plan must address and describe how the operator will mitigate potential emissions from trackout, active storage piles, inactive disturbed surface areas and storage piles, traffic on unpaved on-site roads, earth moving activities, off-site transport of materials, and post-project stabilization of disturbed soil surfaces. In addition, the Air District may also require Asbestos Air Monitoring Plans for certain projects.

Many regulations do not prescribe specific operating parameters or control technologies to implement; the applicant/operator must identify and maintain these components in their DCPs. Dust control plans ensure that the operator is aware of applicable requirements and that they take the appropriate measures to control their emissions through the implementation of identified best management

[21] SMAQMD. August, 1977. *Rule 403 Fugitive Dust*. Accessed May 15, 2022: http://www.airquality.org/ProgramCoordination/Documents/rule403.pdf

practices (BMPs) or best available control measures (BACM). Some of the best management practices that exist for fugitive dust are described below.

Table 1: Best Management Practices for Fugitive Dust Suppression

Emission Suppression Option	Description
Wetting during active and inactive dust-generating activities including unpaved on-site roads	Apply water in sufficient quantities to suppress the generation of dust from onsite activities and unpaved on-site roads
Stabilization of on-site roads	Pave active roadways. Stabilization may also include semi-permanent techniques such as crusting or vegetative stabilization (applying temporary vegetative or seeding)
Moisture content of stockpiles	Maintaining specific moisture content of stockpiles to prevent wind erosion
Property Exit Controls	Install trackout mats, trackout plates, gravel pad and/or tire washers at property exits
Wet Vacuum Trucks	Clean up trackout with wet vacuum trucks on a specific frequency
Fenceline Air Monitoring	Implement a robust air monitoring plan to measure PM emissions exceedances
Covers and Enclosures	Use of covers and/or enclosures over conveyers, stockpiles and on trucks
Clean truck routes	Implement a trucking route that bypasses sensitive communities, or limit the use of local corridors
Signage and Speed Limits	Implement an onsite speed limit and install applicable signage to aid in minimizing fugitive dust emissions
On-site Dust Manager	Identify on-site trained manager responsible for implementation and maintenance of the DCP
Dust Control Training Classes	Operator representatives must successfully complete a Dust Control Training Class
Cease Operations	Cease operations when meteorological conditions warrant and fugitive dust cannot be prevented.

The Air District could consider implementing a future DCP Program. This would tier dust suppression requirements based on the potential to emit (such as size or throughput of operation) and based on past violation history – operators with a history of violating Rules 6-1 and 6-6 would be subject to increasing more restrictive emissions suppression controls.

To enforce a DCP, the Air District would need to develop a program to administer them. Given the increase in required resources, a DCP program would likely need to be supported with fees that would come in the form of registration and/or filing fees. As an alternative, the Air District may also consider incorporating DCPs and/or BACMs into Regulation 6.

The Air District's existing permitting program extends to most facilities; however, construction sites are currently exempt. Adding requirements for Dust Control Plans or incorporating best management practices directly into the rule could be beneficial.

Gap Analysis

Air District staff completed a gap analysis to review existing regulatory and programming to control PM emissions, which are also discussed above. Specifically, staff reviewed regulations and programming at the following jurisdictions due to their experience with dust suppression:

- California Air Resources Board (CARB)
- Clark County (NV) Department of Environment and Sustainability (DES)
- Imperial County Air Pollution Control District (ICAPCD)
- Maricopa County Air Quality Department (MCAQD)
- Sacramento Metropolitan Air Quality Management District (SMAQMD)
- South Coast Air Quality Management District (SCAQMD)

The tables below summarizes the findings from the gap analysis.

Burden of Proof for Sources of Fugitive Dust Emissions

This category evaluates methods currently used by other jurisdictions in order to reduce the burden of proof among Air District Rules and Regulations by introducing Dust Control Plans and clear requirements for any general sources with the potential to generate fugitive dust emissions.

Table 2: Knowledge Assessment and Opportunities for Burden of Proof for Sources of fugitive dust emissions

Jurisdiction Reference	Rule	Section	BAAQMD Rule Opportunity	BAAQMD Opportunity
SCAQMD	Rule 403 Fugitive Dust	(d)(1)(A)	Rule 6-1, Rule 6-6	BAAQMD fugitive dust violation can be defined as observable dust crossing the property lines
SMAQMD	Rule 403 Fugitive Dust	301		
DES	Section 41 – Fugitive Dust	1.1.1 a)		
ICAPCD	Regulation VIII – Rule 800 Series Fugitive Dust Rules	800: D.3, 801: E.1.c, F.2, F.5, F.6, F.7	Rule 6-1, Rule 6-6	Dust Control Plans, including stabilization, moisture content, operator monitoring, recordkeeping and best available control measures for fugitive dust
SCAQMD	Rule 403 Fugitive Dust, Rule 403.1 Coachella Valley, Rule 403.2 Large Roadway Projects	Implementation handbook Table 1, (e)(2)		
MCAQD	Rule 310 – Fugitive Dust from Dust-Generating Operations, Rule 310.01 – Non-Traditional Sources of Fugitive Dust	305, 401, 402, 403, 503		
SCAQMD	Rule 403.2 Fugitive Dust from Large Projects	(d)(1), (d)(2), (e)(1)-(e)(3)	Rule 6-1, Rule 6-6	Requirements for large roadway or construction projects including notification, signage, speed limits, recordkeeping, dust control supervisor, and best available control measures
MCAQD	Rule 310 – Fugitive Dust from Dust-Generating Operations, Rule 310.01 – Non-Traditional Sources of Fugitive Dust	302		
CARB	Asbestos ATCM for Construction, Grading, Quarrying, and	(d)(1)(A)		

	Surface Mining Operations			
ICAPCD	Regulation VIII – Rule 800 Series Fugitive Dust Rules	800: F.1, Appendix B, 801: F.1, 802: F.1, 803: F.1, 805: F.1, F.3, 806: E.3, E.4, 806: E.3	Rule 6-1, Rule 6-6	Open roadways on property must be stabilized (i.e. gravel, vegetation) or paved at all earth moving operations
MCAQD	Rule 310 – Fugitive Dust from Dust-Generating Operations, Rule 310.01 – Non-Traditional Sources of Fugitive Dust	310: 304, 310.01: 301, 302		
SCAQMD	Rule 403 Fugitive Dust, Rule 403.1 Coachella Valley	Implementation handbook, (d)(2), (d)(3)		
ICAPCD	Regulation VIII – Rule 800 Series Fugitive Dust Rules	800: F.3	Rule 6-1, Rule 6-6	Adequately wetted determinations and test methods
CARB	Asbestos ATCM for Construction, Grading, Quarrying, and Surface Mining Operations	(d)(1)(B), (2)(B)		
MCAQD	Rule 310.01 – Fugitive Dust from Non-Traditional Sources of Fugitive Dust	305, 306	Rule 6-6	Minimize allowable trackout threshold and compliance determination procedures
CARB	Asbestos ATCM for Construction, Grading, Quarrying, and Surface Mining Operations	(4)(A)		
ICAPCD	Regulation VIII – Rule 800 Series Fugitive Dust Rules	803, 806		
SCAQMD	Control of Particulate Emissions from Metal Recycling	(d)(1)	Rule 6-1, Rule 6-6	Registration requirements for sites not subject to permitting

	and Shredding Operations			

Permitted Facility Restrictions

This category evaluates methods currently used by other jurisdictions in order to strengthen PM emissions standards and introduce dust control measures.

Table 3: Knowledge Assessment and Opportunities for Permitted Facility Restrictions

Jurisdiction Reference	Rule	Section	BAAQMD Rule Opportunity	BAAQMD Opportunity
SMAQMD	Rule 404 Particulate Matter, Rule 405 Dust and Condense Fumes	301	Rule 6-1	Reduce PM emissions limit of 0.23 grams per dry standard cubic meter (0.01 grains per dry standard cubic foot)
DES	Section 27 – Particulate Matter from Process Weight Rate	27	Rule 6-1	Reduce PM process weight limits
MCAQD	Rule 310 – Fugitive Dust from Non-Traditional Sources of Fugitive Dust	302	Rule 6-1	Permitting requirements for large dust-generating operations

Monitoring and Data

This category evaluates methods currently used by other jurisdictions in order to perform fenceline monitoring at dust generating facilities, monitor meteorological conditions, and perform adequate recordkeeping.

Table 4: Knowledge Assessment and Opportunities for Monitoring and Data

Jurisdiction Reference	Rule	Section	BAAQMD Rule Opportunity	BAAQMD Opportunity
SCAQMD	Rule 403 Fugitive Dust	(d)(3)	Rule 6-1, Rule 6-6	Dust Control Plans with fenceline monitoring
CARB	Asbestos ATCM for Construction, Grading, Quarrying, and Surface Mining Operations	(4)(H), (5)(A), (g)		
SCAQMD	Control of Particulate Emissions from	(5), (j)	Rule 6-1, Rule 6-6	Wind speed monitoring, BACM, and recordkeeping

	Metal Recycling and Shredding Operations			
SCAQMD	Rule 403.1 Coachella Valley	(d)(5), (g)		
SCAQMD	Control of Particulate Emissions from Metal Recycling and Shredding Operations	(l)		
CARB	Asbestos ATCM for Construction, Grading, Quarrying, and Surface Mining Operations	(G)4		
SCAQMD	Rule 403.2 Large Roadway Projects	(e)(2)	Rule 6-1, Rule 6-6	Vehicle speed monitoring, BACM, and recordkeeping
SCAQMD	Control of Particulate Emissions from Metal Recycling and Shredding Operations	(f)(4)		
ICAPCD	Regulation VIII – Rule 800 Series Fugitive Dust Rules	805: F.4.f.1		
MCAQD	Rule 310 – Fugitive Dust from Dust-Generating Operations	302.8, 304.2, 305.2, 305.6, 305.7, 305.12		
CARB	Asbestos ATCM for Construction, Grading, Quarrying, and Surface Mining Operations	(d)(1)(B)2, (e)(1)(A), (4)(D)1, (B)1		
ICAPCD	Regulation VIII – Rule 800 Series Fugitive Dust Rules	F.5	Rule 6-1, Rule 6-6	Daily self-inspection reports for those subject to dust control plans
MCAQD	Rule 310 – Fugitive Dust from Dust-Generating Operations	502		

CARB	Asbestos ATCM for Construction, Grading, Quarrying, and Surface Mining Operations	(2)(A), (B), (4)(H)	Rule 6-1, Rule 6-6	Asbestos Dust Control Plans that may include fenceline monitoring and adequately wetted determinations

CARB: California Air Resources Board
DES: Clark County (NV) Department of Environment and Sustainability
ICAPCD: Imperial County Air Pollution Control District
MCAQD: Maricopa County Air Quality Department
SMAQMD: Sacramento Metropolitan Air Quality Management District
SCAQMD: South Coast Air Quality Management District

VIII. Recommendations

Considering community concerns and the Air District Advisory Council's recommendations, this report provides several potential options to reduce fugitive dust PM emissions. It is important to note that staff have not yet extensively evaluated impacts nor the required resources to support the recommended efforts. Any future development and implementation of PM emissions reduction programming should continue with robust community and stakeholder engagement strategies, especially among those most impacted by PM emissions.

Regulation 6, Rule 1: General Requirements

Air District staff should explore opportunities to amend Rule 6-1 with the following:

1. Amend the process weight limit to be more health protective;
2. Expand fugitive dust property line requirements to all operations with the potential to emit fugitive dust, where a violation is determined once fugitive dust crosses the property line. This would lower the burden of proof for enforcement by eliminating the need to obtain opacity readings in these situations. Such amendments may emulate the SMAQMD, SCAQMD, and DES fugitive dust regulations;
3. Add a new standard to require minimum moisture content and stabilization testing of stockpiles and associated administrative requirements. This would require developing a testing methodology and determining feasibility. Alternatively, staff could explore adopting the adequately wetted standard in CARBs ATCM for Construction and Grading Operations;
4. Add a new requirement for appropriate control techniques under high wind speed meteorological conditions exceeding 25 miles per hour, similar to SCAQMD Rule 403.1 and Rule 1460; and
5. Add requirements for large roadway and construction projects including notification, recordkeeping, applicable standards, and best available control measures.

Regulation 6, Rule 6: Trackout

Air District staff should explore opportunities to amend Rule 6-6 with the following:

1. Investigate reducing burden of proof for enforcement for documenting trackout. Currently the burden of proof is 25 linear feet of trackout and more than 1 quart of trackout over 4 hours at the end of the workday. Such amendments may emulate MCAQD, ICAPCD, and CARB rule; and
2. Add a new standard to require immediate clean-up of trackout so less road dust is generated over the course of the workday. Such amendments would emulate ICAPCDs rule.

Best Management Practices and Best Available Control Measures

Air District staff should explore the opportunity to incorporate the implementation of best management practices (BMPs) or best available control measures (BACM) directly within both Rules 6-1 and 6-6 as standards. BMPs outlined directly in the rules may further deter potential fugitive dust emissions and make it easier for inspectors and operators to determine compliance and noncompliance. Examples include, but are not limited to: adequate dust suppression measures used before, during, and after any earth moving activities, appropriate water usage to prevent windblown dust, proper trackout control measures at all exits, dust control supervisor onsite at all times, proper record keeping and monitoring, limiting vehicular speeds and traffic, proper post-stabilization measures, etc.

Notice of Requirements

Air District staff should explore generating a "Notice of Requirements" fact sheet to distribute to potential violators. Given the high quantity of businesses, construction projects, and general operations that may not be subject to Air District permitting thresholds or requirements but may still have the potential to generate fugitive dust, it could be advantageous to develop a formal document that would serve as a fact sheet. This fact sheet would include all the general applicable rules and regulations pertaining to fugitive dust and ways to minimize and control fugitive dust emissions to remain in compliance. This document could be distributed by inspectors to any businesses, construction projects, or general operations that receive a complaint or violation. This document would help put potential violators on notice and would also alleviate community concerns regarding potential sources of fugitive dust emissions that may fall below permitting thresholds or requirements.

Dust Control Plans

Air District staff should also explore the opportunity to incorporate regulatory requirements for DCPs as deemed appropriate, such as for large road or construction projects or for a facility that frequently receives violations or complaints. DCPs would include site-specific BMPs or BACMs to follow and would require robust recordkeeping requirements. If deemed necessary, DCPs could also potentially mandate the requirement for fenceline monitoring at upwind and downwind locations with enforceable standards. As DCPs may affect both permitted facilities and those currently falling below permitting thresholds or requirements, this concept would be appropriate as an amendment to Rule 6-1, or as a new rule under the Regulation 6 suite of rules. See the DCP subsection above for details on specific controls (page 13).

Fees

The inclusion of a potential "dust fee" or "plan registration fee" should also be explored so additional compliance and enforcement activities associated with Regulation 6 and/or DCPs may be appropriately resourced.

Permitting

Air District staff should continue researching methodologies to evaluate PM emissions similar to TACs with health risk modeling. Air District staff should continue coordination to ensure this effort may be integrated into other updates to the Air District's PM Programming. In addition, Air District staff should investigate amending regulations to require an exposure threshold similar to the TAC Cancer Risk thresholds in Regulation 2, Rule 5: New Source Review of Toxic Air Contaminants, if an approved methodology is developed.