

**2nd Working Group Meeting for
Proposed Amended Rule 1469 –
Hexavalent Chromium Emissions from
Chromium Electroplating and Chromic
Acid Anodizing Operations**

and

**Proposed Amended Rule 1426 –
Emissions from Metal Finishing
Operations**

South Coast AQMD

May 18, 2017₁

Summary of Working Group #1 on March 23, 2017

- Provided background and regulatory history of Rule 1469 and Rule 1426
 - Rule 1469 applies to chrome plating and chromic acid anodizing
 - Rule 1426 applies to other metal finishing operations (e.g., nickel, cadmium, copper, lead); no control requirements
- Provided overview of rulemaking process
- Discussed findings and need to re-open Rule 1469
 - Findings from air monitoring at Hixson and Anaplex and other efforts
 - Take into account the 2016 Revised OEHHA Guidelines for Estimating Health Risk
 - Address inconsistencies with Rule 1469 and 2012 EPA NESHAP for Hard and Decorative Chromium Electroplating and Chromium Anodizing Tanks (lower surface tension and prohibited use of PFOS fume suppressants)

Follow-up on Key Comments from Working Group Meeting #1

- Basis of the 1.0 ng/m³ hexavalent chromium ambient concentration threshold for facilities in Paramount
- Additional explanation for increase in hexavalent chromium ambient concentration levels near Hixson
- Provide additional information regarding the cost of pollution controls for Hixson
- Request for minutes of Working Group Meeting
- Request for socioeconomic process
- Monitoring data on two facilities is not sufficient
- Request for more focused Working Group Meetings

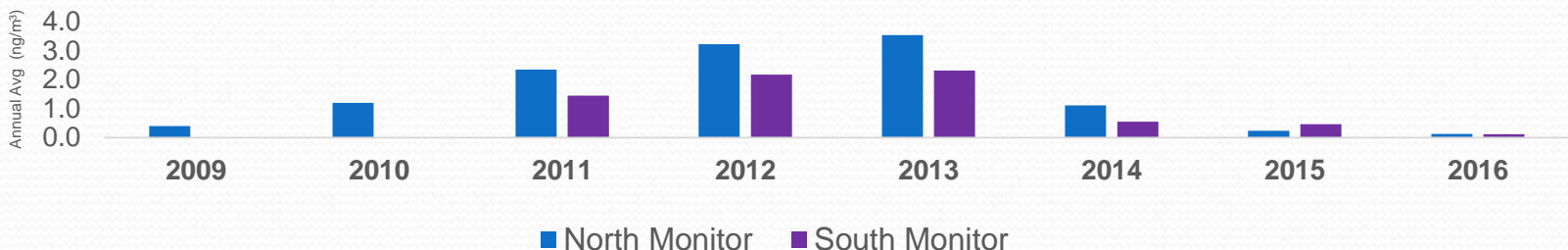
Basis of Hexavalent Chromium Ambient Concentration Threshold

- Hexavalent chromium ambient threshold used for Hixson and Anaplex based on 100 in a million cancer risk assuming residential exposure
- SCAQMD has utilized three-sample average of 1.0 ng/m³ as part of Anaplex Stipulated Order for Abatement; must curtail operations if exceeded
- 1.0 ng/m³ is an interim threshold representing a significant cancer risk; must also meet risk requirements of Rule 1402
- **Basis for 1.0 ng/m³ threshold (Anaplex):**
 - Monitor placed at closest sensitive receptor to the facility is located 500 feet downwind
 - Monitor measured a 5-fold drop off in concentration at the facility's property line to the monitor
 - Hexavalent chromium has ~0.2 ng/m³ chronic exposure for 100 in a million cancer risk
 - **(5) x (0.2 ng/m³) = 1.0 ng/m³**

Follow-up Comment

Additional Explanation of Increase of Hexavalent Chromium Levels at Hixson

- Working Group Meeting #1, presented monitored levels of hexavalent chromium near Hixson
- Questions were raised regarding why the hexavalent chromium levels increased over time
- Difficult to attribute a specific reason for lower levels in 2009 and 2010; no significant change/fluctuation to amp-hr usage or operations
- In 2014, SCAQMD discovered a breach creating cross-draft in the structure housing chromic acid anodizing line
 - Hixson implemented mitigation measures including repairing breach, enclosing the chromic acid anodizing tank, closing roof vents, and covering the dichromate seal tank



Follow-up Comment:

Additional Information Regarding Cost of Hixson Pollution Controls

- Hixson Metal Finishing submitted a Risk Reduction Plan indicating measures to reduce risk
- Risk Reduction Plan identified measures with an estimated cost of \$7 million
- \$900,000 was associated with the plating and anodizing control system and related expenditures
- A majority of costs were associated with production or non-Rule 1469 operations
 - ~\$4.4 million for a planned installation of a new chromic acid anodizing line and chem film line
 - ~\$1.4 million for movement and install of paint and oven operations

Follow-up Comment:

Request for SCAQMD Socioeconomic Process for Rule Development

- Socioeconomic impact report must be prepared if SCAQMD proposes to adopt, amend, or repeal a rule that will significantly affect air quality or emissions reductions (Health & Safety Code Section 40440.8(a)) discussing for the proposed rule:
 - Type of industries affected
 - Impact on employment and the economy of the Basin
 - Range of probable costs, including costs to industry
 - Availability and cost-effectiveness of alternatives
 - Emission reduction potential

Follow-up Comment:

Request for SCAQMD Socioeconomic Process for Rule Development *(continued)*

- Data related to this socioeconomic impact report is collected throughout the rule development process from:
 - Input from stakeholders (eg. Facilities, vendors, consultants)
 - Cost documents (EPA cost manual, Risk Reduction Measures)
- The Socioeconomic group uses Regional Economic Models, Inc. (REMI) to estimate regional impacts on employment and the economy
 - Web link to REMI was provided on the Proposed Rules webpage for PAR 1469/1426 at the request of the working group
- Socioeconomic impact report is made available as part of the set hearing package, which is typically 30 days before the public hearing

Follow-up to Other Comments

- Request for minutes of the 1st Working Group Meeting
 - Summary of the preceding working group meeting will be provided in the presentation for the following working group meeting
- Monitoring data on two facilities is not sufficient
 - Information gained from investigations at Hixson and Anaplex
 - Collecting additional data from site visits and other SCAQMD activities

Follow-up Comment:

Request for More Focused Working Group Meetings

- Recommendation that future working group meetings be more topic focused due to the complexity of the requirements and amount of data
- SCAQMD staff will be presenting information, findings, and concepts in topic-based segments (e.g., emission controls, housekeeping, monitoring, costs, etc.)
- Tentative schedule
 - Working Group #2: **Point Source Controls**
 - Working Group #3: **Housekeeping**
 - Working Group #4: **Enclosures and Fugitive Emissions and Other Sources**

SCAQMD Compton Special Air Monitoring Effort

- Air monitoring in the city of Paramount identified sources with high levels hexavalent chromium that were previously unknown
- Purpose of this effort is to assess levels of hexavalent chromium near metal-processing facilities in communities
- Compton was selected using a criteria that considered:
 - Clustering of multiple hexavalent chromium emitting facilities
 - Potential for fugitive emissions from hexavalent chromium operations
 - Proximity to residences, schools, and hospitals
- **Town hall meeting tentatively scheduled June 1, 2017**
- Effort will initially focus air monitoring near chromium plating and anodizing facilities
- Impetus is not PAR 1469, however, any information learned will be considered during development of PAR 1469



Rule 1469 Point Source Controls

Overview

- Focus of the presentation is on current Rule 1469 pollution control requirements
 - Provide an overview of pollution controls facilities are currently using to meet point source requirements
 - Identification of areas of concern with existing point source controls
 - Initial recommendations for proposed amendments
- Future Working Group Meetings will discuss needs for pollution controls on other tanks such as the heated sodium dichromate tanks and possibly other tanks

Current Rule 1469 Emission Rate Limits

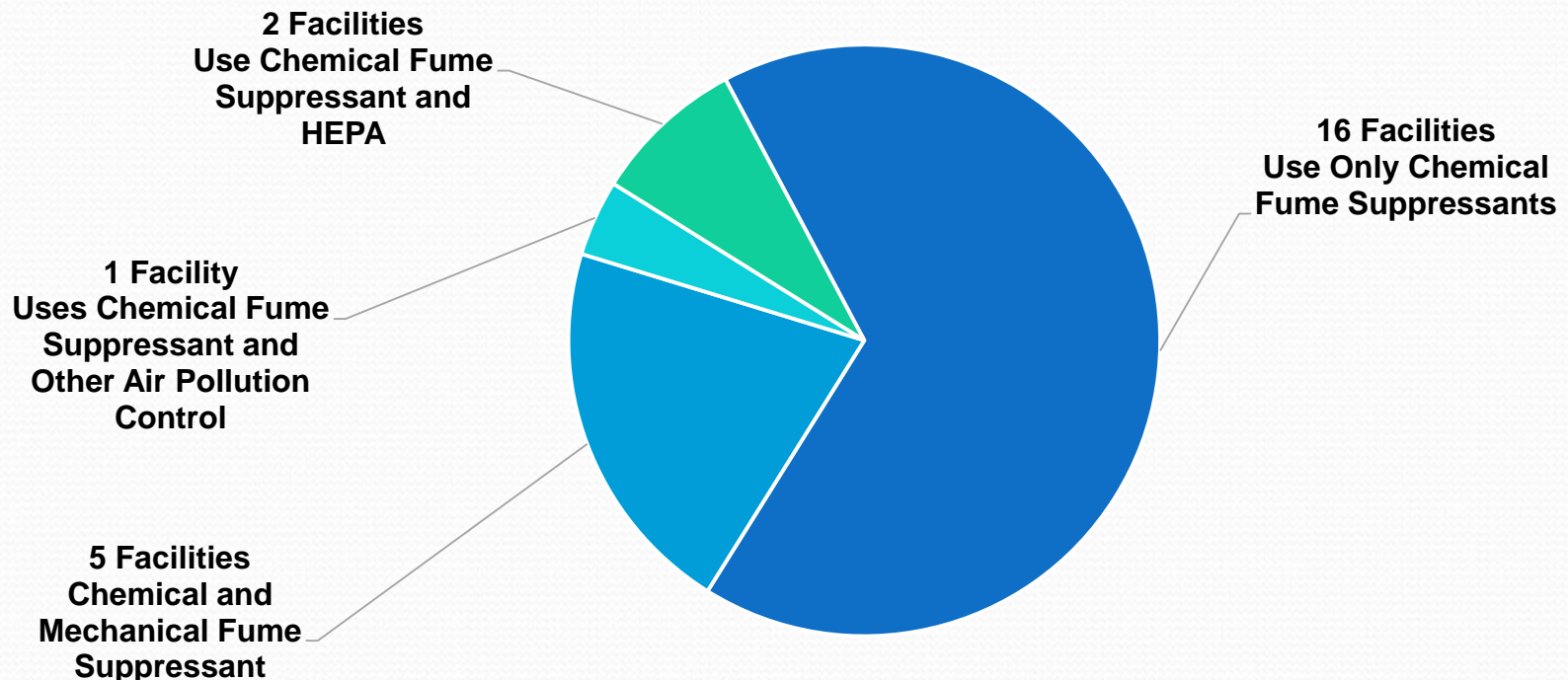
- Rule 1469 currently requires control of hexavalent chromium emissions by:
 - In-tank controls (e.g., chemical/mechanical fume suppressants); and/or
 - Add-on control equipment (e.g., scrubbers, composite mesh pad, HEPA)
- Emission limits are based on distance to sensitive receptors and annual permitted ampere hours
- New tanks must meet ≤ 0.0011 mg/amp-hr
- Of the 111 Rule 1469 facilities
 - 24 are required to meet the 0.01 mg/amp-hr requirement
 - 87 are required to meet the 0.0015 mg/amp-hr requirement

Rule 1469 Emission Limit Requirements

Distance to Sensitive Receptor (meters)	Annual Permitted Amp-Hrs	Emission Limit (mg/amp-hr)
≤ 100	$\leq 20,000$	0.01
> 100	$\leq 50,000$	0.01
≤ 100	$> 20,000$	0.0015
> 100	$> 50,000$	0.0015

Compliance Approach for Facilities Required to Meet 0.01 mg/amp-hr

- 24 facilities required to meet an emission limit of 0.01 mg/amp-hr
- Majority of facilities use only certified chemical fume suppressants to meet requirement



24 Facilities Required to Meet 0.01 mg/amp-hr

Certified Chemical Fume Suppressants

- 2012 NESHAP
 - Prohibited PFOS in chemical fume suppressants; and
 - Lowered the surface tension
- SCAQMD and the California Air Resources Board certify chemical fume suppressants to meet the required surface tension and emission limit
- 4 PFOS-free chemical fume suppressants have been certified to achieve the 0.01 mg/amp-hour emission limit at very low surface tensions

Potential Concerns with Certified Chemical Fume Suppressants

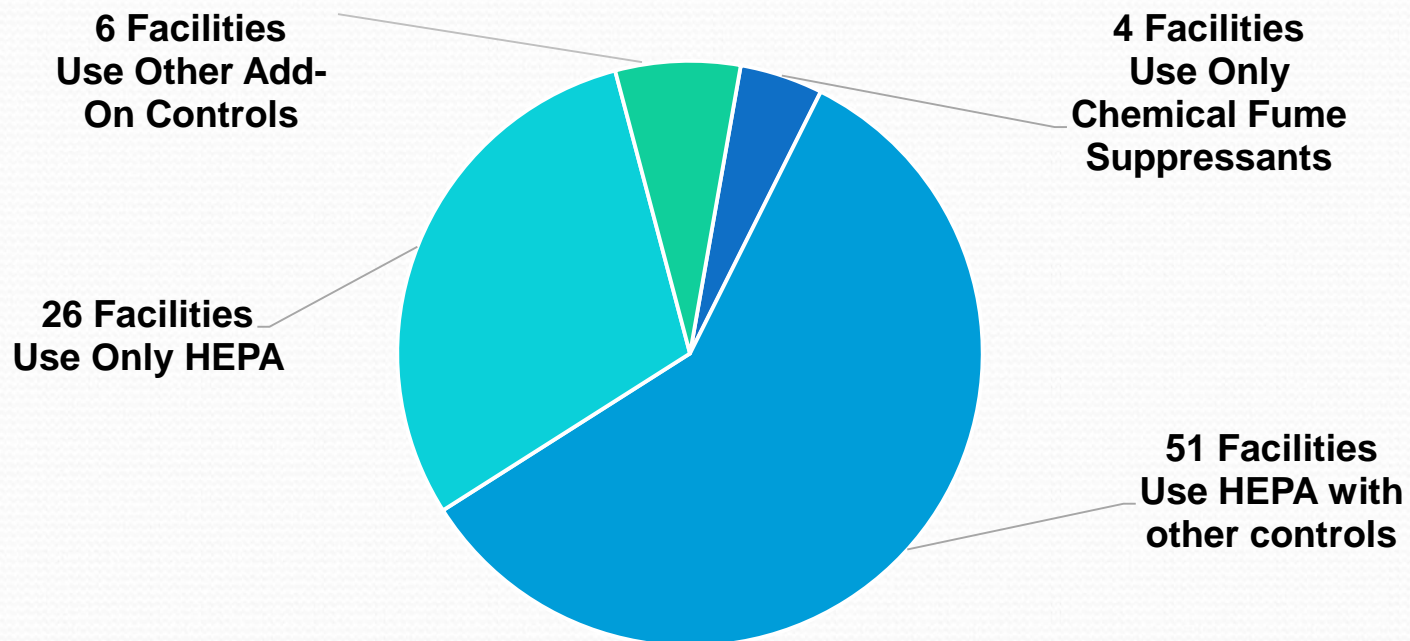
- Two potential concerns with Certified Chemical Fume Suppressants
- Uncertain if operators are able to sustain low surface tensions required when using non-PFOS chemical fume suppressants
 - SCAQMD collecting data to confirm operators can achieve surface tension
- Operating conditions such as higher tank temperatures and/or mixing techniques that affect the surface tension such as air sparging may differ from conditions present during certification test resulting in higher emissions

Initial Recommendations for Use of Chemical Fume Suppressants

- Source testing needed to confirm tanks meet the 0.01 mg/amp-hr emission limit if operating conditions (temperature and mixing technique) vary from testing conditions during certification
- Encourage use of other mixing techniques that do not disturb the surface tension via mechanical agitation methods such as eductors or paddles
 - Source test of chemical fume suppressant may be needed to confirm emission limit is achieved

Compliance Approach for Facilities Required to Meet 0.0015 mg/amp-hr

- 87 facilities required to meet an emission limit of 0.0015 mg/amp-hr or less
- Majority of facilities use a HEPA system exclusively or in conjunction with other control methods to meet emission limit



87 Facilities Required to Meet 0.0015 mg/amp-hr

Issues with Cross-Draft

- Cross-draft is airflow that can impede the collection efficiency of an air pollution control device or create process fugitive emissions
- Sources include: openings in buildings (doors, windows, and roof vents), worker comfort fans, and rectifier fans
- 11 facilities were visited in 2017
 - 10 facilities had sources of cross-draft near tanks that interfered with collection efficiency of pollution controls
- Smoke tests showed that cross-draft negatively impacted collection efficiency
- Emissions can be dispersed into the air if point source controls aren't operating optimally

Parameter Monitoring of Add-On Pollution Control Devices

- Rule 1469 has two parametric provisions to ensure pollution controls are working properly
 - Continuously monitor the pressure drop across the add-on pollution control device
 - Continuously monitor the inlet velocity pressure of a packed-bed scrubber with a mechanical gauge
- Rule 1469 requires semi-annual smoke tests to demonstrate capture efficiency of the ventilation system
 - Non-compliance with a smoke test requires immediate shutdown associated with ventilation system
- Parametric monitoring and smoke tests are good indicators of the health of the pollution controls, but does not provide a quantitative assessment of the emissions

Observations of Add-On Controls

- Since 2015, the rules staff has visited 34 Rule 1469 facilities
- Staff found issues with pollution controls that may lead to higher than measured emission rates or insufficient capture of hexavalent chromium
 - Variation of maintenance frequency and housekeeping practices of air pollution control devices
 - Congested air-slots build-up of material
 - Collection slots that are not controlling the entirety of the tank
 - Tank covers with perforations or holes



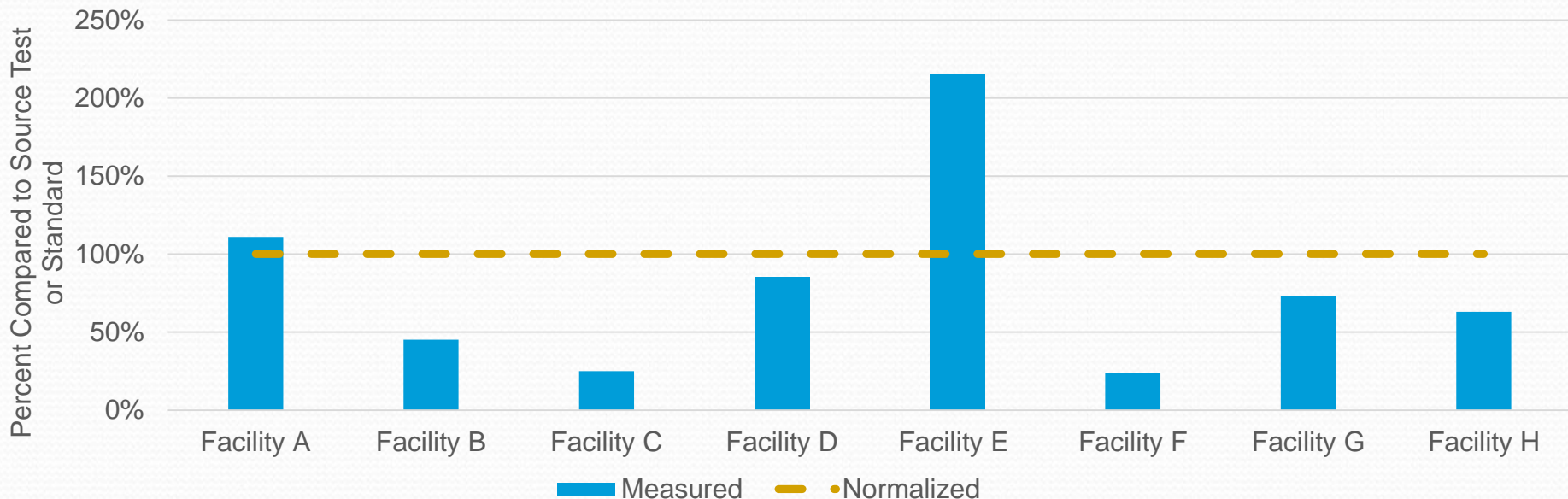
HEPA System – Slot Velocity

- SCAQMD staff took measurements for slot velocity using hot wire anemometers and performed smoke tests during site visits to assess the capture efficiency of add-on controls
- Sufficient velocity is needed to overcome air currents for capturing of emissions
 - Some source tests listed the slot velocity during the test
 - Generally a minimum slot velocity of 2000 feet per minute is recommended per Industrial Ventilation Manual
- No current rule requirement to continuously maintain or monitor slot velocities



Slot Velocity - Measurements

- Measured slot velocities were compared to either source test values (if available) or the minimum recommended slot velocity



- A system with reduced slot velocities may not be providing 100% capture of emissions as originally source tested

Facility E

- Slot velocities shown to be performing well above minimum recommended values
- This facility was found to be conducting monthly inspections of control equipment
 - Periodic cleaning of slots of collection systems
 - Replacement of equipment parts for air pollution systems to optimize operation (e.g., change out fan belts)
 - Utilizing third-party contractors to conduct periodic smoke tests

Need for Monitoring and Maintenance Requirements of Pollution Controls

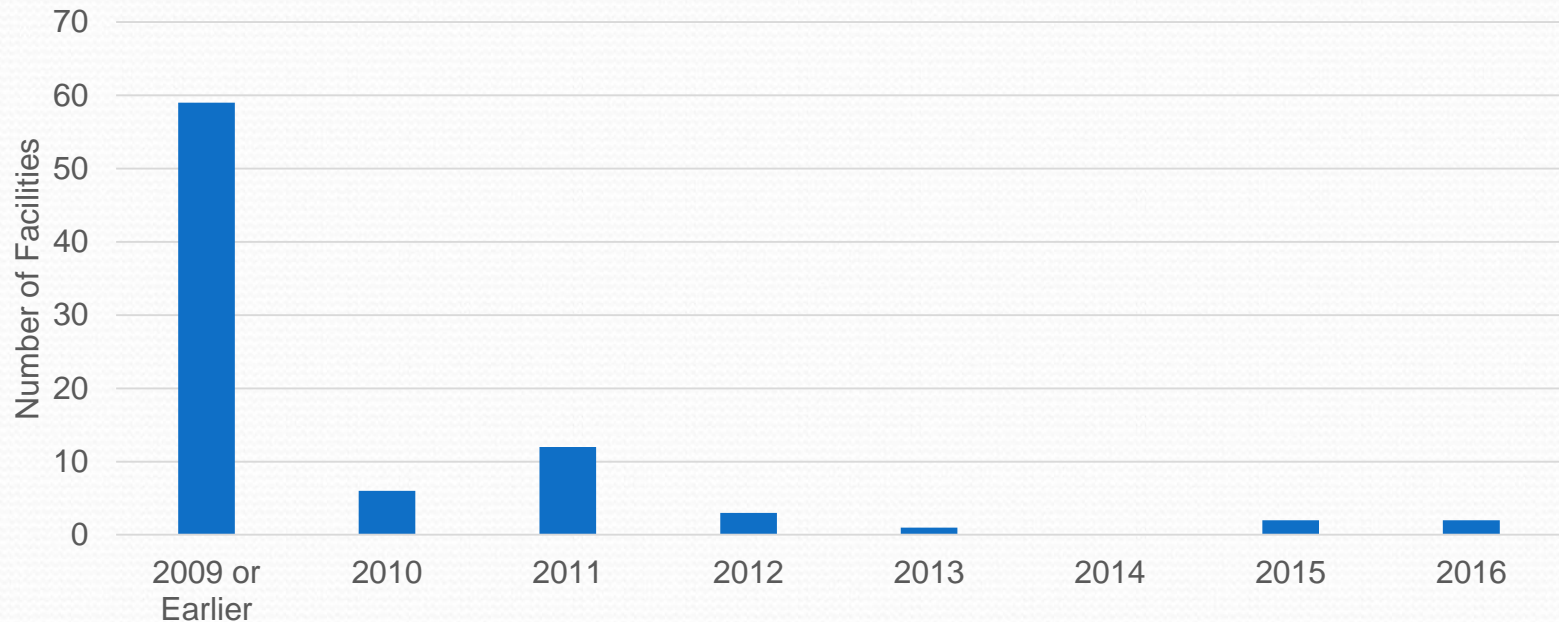
- Inadequate collection systems may result in additional process fugitive emissions
- Based on site visits, the efficacy of air pollution controls relating to collection and control of emissions have been observed to vary based on the frequency and type of maintenance conducted by the facility
- Adding a monitoring requirement for slot velocity will provide greater assurance air pollution controls have sufficient collection efficiency

Rule 1469 Source Test Requirements

- Rule 1469 allowed facilities to use a performance test conducted after January 1, 2000 to demonstrate compliance with the emission limits
- Based on permit applications, most pollution controls were installed before 2009
- Many of the source tests were conducted before 2009 (more than 8 years old)
- Rule 1469 currently has no provisions for periodic source testing

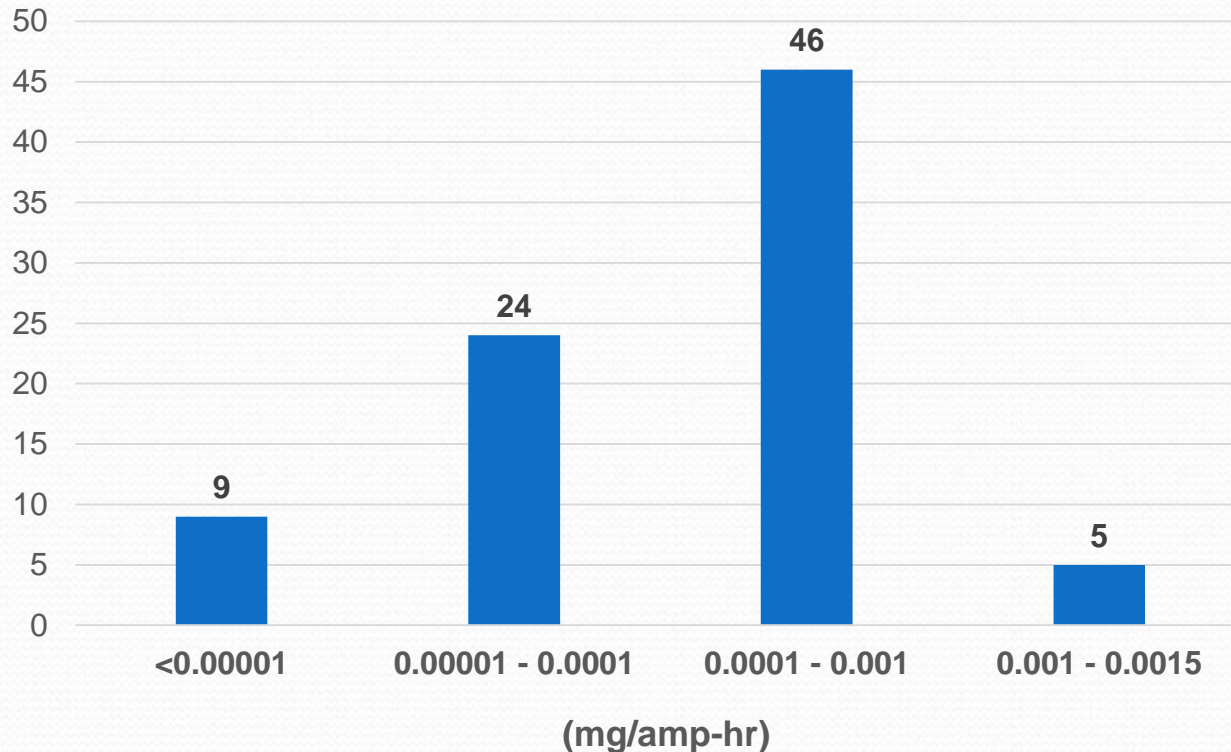
Facility Source Test Date

- 87 facilities were required to conduct a source
 - Majority of facilities conducted a source test more than 8 years ago (2009 or earlier)



Source Test Results Demonstrating Compliance with 0.0015 mg/amp-hr*

Source Test Results for Add-on Controls



* Includes 3 new facilities that are required to meet 0.0011 mg/amp-hr

Need for Periodic Source Testing

- Rule 1469 does not require facilities to conduct periodic source test for add-on air pollution control devices
- Periodic source tests are necessary to confirm equipment is providing adequate capture efficiency, and control of emissions are achieving a specific emission rate
- Many of SCAQMD rules have periodic source testing requirements such as Rules 1420.1, Rule 1420.2, and Rule 1430

Initial Recommendations

- Recommendations to reduce cross-draft:
 - Close openings: prevent exterior air currents from impacting tank operations
 - Enclose tank areas: walls in the structure prevent air currents from impacting tank areas
 - Erect barriers around rectifiers: rectifiers are equipped with fans to reduce the temperature; fans have been observed to be a source of air currents that impacts collection at hoods/slots
 - Direct comfort fans away from tanks: prevent air currents from fans from impacting the tank area

Initial Recommendations *(continued)*

- Recommendations for additional maintenance and monitoring measures to ensure proper collection and control:
 - Cleaning of slots/hoods of emission collection systems
 - Quarterly or more frequent cleaning and inspection
 - Installation of gauges to monitor air velocity
 - Data logger for monitored pressure drop across filters
 - Installation of temperature gauges and operating temperature labels for all rule tanks
- Source testing recommendations:
 - Require periodic source tests to ensure facilities are meeting emission limit

Evaluation of Other Non-Rule 1469 Tanks

- First Working Group Meeting discussed source test screening values for heated sodium dichromate seal tanks
- SCAQMD staff is evaluating other tanks that may be potential sources of emissions based on their metal content, heated, or agitated (e.g., heated or air sparged rinse tanks, stripping, etc.)
- Investigations will determine if controls are needed for these tanks

Schedule

- 3rd Working Group Meeting: June 2017 (tentative)
 - Housekeeping
- Governing Board Meeting: December 2017

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