REPORT TO THE LEGISLATURE ON THE REGULATORY ACTIVITIES OF THE SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

Pursuant to
Chapter 1702, Statutes of 1990 (SB 1928)

SEPTEMBER 2017

Cleaning the Air that We Breathe…

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
GOVERNING BOARD

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TABLE OF CONTENTS

EXECUTIVE SUMMARY

Introduction

The South Coast Air Quality Management District (SCAQMD) is subject to internal and external reviews of its air quality programs. These include annual reviews of the District's budget, forecast and proposed operating budget for the upcoming fiscal year, and compliance program audits. In addition, the SCAQMD is required to submit to the California Air Resources Board (CARB) and State Legislature an annual review of its regulatory activities for the preceding calendar year. The attached report satisfies this latter requirement which is mandated pursuant to Chapter 1702, Statutes of 1990 (SB 1928, Presley), Section 40452 of the California Health and Safety Code.

Rule Adoptions and Amendments in 2016 and CEQA Alternatives

This section contains a summary of each major rule adoption or amendment adopted by the SCAQMD Governing Board in the preceding calendar year (e.g., 2016). Each summary contains detailed information about the estimated emission reductions, cost effectiveness, alternatives considered pursuant to the requirements in the California Environmental Quality Act (CEQA), socioeconomic impacts, and sources of funding.

Projects undertaken by public agencies are subject to CEQA, so rules and regulations promulgated by SCAQMD must be reviewed to determine if they are considered to be a "project" as defined by CEQA. If they are not a "project" or they are determined to be exempt from CEQA, no further action is required. If the project has the potential to create significant or less than significant adverse effects on the environment, then an environmental analysis is necessary. New rules or existing rules being amended often require a comprehensive CEQA document that contains an environmental impact analysis which includes the following:

* identification of potentially significant adverse environmental impacts evaluated based on environmental checklist topics;
* identification of feasible measures, if any, to mitigate significant adverse environmental impacts to the greatest extent feasible;
* if necessary, a discussion and comparison of the relative merits of feasible project alternatives that generally achieve the goals of the project, but may generate fewer or less severe adverse environmental impacts; and,
* identification of environmental topics not significantly adversely affected by the project.

If it is concluded in the CEQA document that no significant adverse environmental impacts would be generated by the proposed project, neither the identification of feasible mitigation measures nor an analysis of CEQA alternatives to the project is required. If significant adverse environmental impacts are identified, feasible mitigation measures, if any, and alternatives must be identified and an analysis of the relative merits of each alternative is required.

SCAQMD operates under a regulatory program certified by the Secretary for Resources pursuant to Public Resources Code (PRC) Section 21080.5. Certification means that the SCAQMD can incorporate its environmental analyses into CEQA documents other than environmental impact reports (EIRs), negative declarations (NDs), or mitigated NDs (MNDs). In addition, certified CEQA programs are not subject to a limited number of specific CEQA requirements identified in PRC Section 21080.5. All documents prepared by SCAQMD under its certified regulatory program are called Environmental Assessments (EAs). SCAQMD rules and regulations are subject to SCAQMD's certified CEQA program, while plans (e.g., AQMP) are not. In addition, Supplemental EAs, Addenda, and EAs for projects determined not to have significant environmental impacts often contain a more focused analysis of potential environmental impacts.

Refer to Chapter 1 for rule adoptions, rule amendments and CEQA Alternatives details.

CEQA Lead Agency Projects

SCAQMD also acts as the Lead Agency under CEQA for non-SCAQMD projects where SCAQMD typically has primary approval, i.e., discretionary permitting authority. Under CEQA, the Lead Agency is responsible for determining whether an EIR, ND, or other type of CEQA document is necessary for any proposal considered to be a "project" as defined by CEQA. Further, the Lead Agency is responsible for preparing the environmental analysis, complying with all procedural requirements of CEQA, and approving the environmental documents. All documents prepared by SCAQMD for permit projects are subject to the standard CEQA requirements. SCAQMD staff is responsible for preparing or reviewing prepared CEQA documents for stationary source permit projects.

Refer to Chapter 1 for CEQA Lead Agency details.

Socioeconomic Impact Analyses

California Health and Safety Code Section 40440.8 requires that SCAQMD perform socioeconomic impact assessments for its rules and regulations that will significantly affect air quality or emissions. Prior to the requirements of Section 40440.8, SCAQMD staff had been evaluating the socioeconomic impacts of its actions pursuant to a 1989 resolution of its Governing Board. Additionally, SCAQMD staff assesses socioeconomic impacts of CEQA alternatives to those rules with significant cost and emission reduction impacts.

The elements of socioeconomic impact assessments include direct effects on various types of affected industries in terms of control costs and cost effectiveness as well as public health benefits associated with Air Quality Management Plans (AQMPs). Additionally, SCAQMD staff uses an economic model developed by Regional Economic Models, Inc. (REMI) to analyze the potential direct and indirect socioeconomic impacts of SCAQMD rules on Los Angeles, Riverside, Orange, and San Bernardino Counties. These impacts include, but are not limited to employment and competitiveness.

Refer to Chapter 1 for Socioeconomic Impact Analyses.

Engineering and Permitting

Background

Section 40452 of the California Health and Safety Code requires that the SCAQMD submit an annual report to both the state board and Legislature that summarizes its regulatory activities for the preceding calendar year. Paragraph (b) of Section 40452 requires that the annual report include data on "the number of permits to operate or to construct, by type of industry, that are issued and denied, and the number of permits to operate that are not renewed." Paragraph (c) of section 40452 requires that the annual report also includes data on emission offset transactions and applications during the previous fiscal year, including an accounting of the number of applications for permits for new or modified sources that were denied because of the unavailability of emission offsets. In addition, SCAQMD Rule 2015 - Backstop Provisions, requires submittal of the annual Regional Clean Air Incentives Market (RECLAIM) Audit Report for the 2015 Compliance Year to the Legislature.

The following paragraphs provide a brief summary for each report.

Permitting Data – Calendar Year 2016

During calendar year 2016, SCAQMD dispositioned a total of 9,872 applications. The majority of these applications were for Permits to Operate (3,725), Area Sources & Certified/Registrations (2,327), and Changes of Operators (1,511). Also, 1,200 permits were not renewed. The total number of dispositioned applications for 2016 is about 13% higher than the total for 2015, mainly attributed to the SCAQMD's Permit Application Backlog Reduction efforts. This data, broken down into nine different categories, is summarized in Table 1 (Chapter II – Engineering and Permitting Activities).

Table 2 contains a breakdown of permits dispositioned (in the nine categories) and permits not renewed, by type of industry. The type of industry was based on North American Industry Classification System (NAICS) codes, which were provided by the applicant at the time of application filing. The top four NAICS codes were 324110 – Petroleum Refineries, 447190 - Gasoline Service Stations, 811121 – Automotive Body, Paint, and Interior Repair and Maintenance, and 445110 – Supermarkets and Other Grocery (except for Convenience) Stores.

Emission Offset Transactions Data – Fiscal Year 2015/2016

During fiscal year 2015-16, a total of 115 emission offset transactions were completed, which include 70 transactions for reactive organic gases (ROG), 2 transactions for oxides of nitrogen (NOx), 2 transactions for oxides of sulfur (SOx), 1 transaction for carbon monoxide (CO), and 40 transactions for particulate matter with an aerodynamic diameter less than 10 microns (PM10). The amount of emissions offsets transferred, by pollutant, include 1,486 pounds per day of ROG, 106 pounds per day of NOx, 46 pounds per day of SOx, 32 pounds per day of CO, and 137 pounds per day of PM10 (see Table 3). No banking applications resulting in the issuance of new emission offsets for ROG, NOx, SOx, CO or PM10 were processed. Additionally, no applications were denied permits for new or modified sources

due to the unavailability of emission offsets. (See Chapter II – Engineering and Permitting Activities, Attachment A for details).

RECLAIM Audit Report

The REgional CLean Air Incentives Market (RECLAIM) program was adopted in 1993 to provide facilities with flexibility in achieving the same emissions reduction goals as would have achieved under the traditional command and control approach while lowering the cost of compliance. To ensure RECLAIM is achieving its goal, SCAQMD Rule 2015 - Backstop Provisions, requires preparation of an annual audit report on the program. This Annual RECLAIM Audit Report assesses emission reductions, availability of RECLAIM Trading Credits (RTCs) and their average annual prices, job impacts, compliance issues, and other measures of performance for the twenty-second year of this program. The results of the annual audit show that RECLAIM continues to meet its aggregate emission goals and all other specified objectives.

As discussed in more detail in the audit report (see Attachment B), a total of 268 facilities were in the RECLAIM program at the end of Compliance Year 2015. Total NOx emissions from RECLAIM facilities were 25% less than the aggregate NOx allocations, and SOx emissions were 26% less than the aggregate SOx allocations for the program. The vast majority of RECLAIM facilities complied with their allocations during the 2015 compliance year (94% of NOx facilities and 97% of SOx facilities).

A total of over $1.47 billion in RTCs has been traded since the adoption of RECLAIM, of which $118.6 million occurred in calendar year 2016 (compared to $197.1 million in calendar year 2015), excluding swaps. The annual average prices of discrete-year NOx and SOx RTCs and infinite-year block (IYB – trades that involve blocks of RTCs with a specified start year and continuing in perpetuity) NOx and SOx RTCs traded in calendar years 2015 and 2016 were all below the applicable review thresholds for initiating program review.

In Compliance Year 2015, RECLAIM facilities reported a net gain of 1,329 jobs, representing 1.21% of their total employment. The RECLAIM program also met other applicable requirements including meeting the applicable federal offset ratio under New Source Review and having no significant seasonal fluctuation in emissions. Additionally, there is no evidence that RECLAIM resulted in any increase in health impacts due to emissions of air toxics.

Refer to Chapter V for the 2015 Annual RECLAIM Audit Report.

Budget and Work Program

The Executive Officer's Budget, Goals and Priority Objectives for FY 2017-18 was adopted by the Governing Board on June 2, 2017 and included the following fee increases for FY 2017-18: 1) Pursuant to Rule 320, an increase of most fees by 2.5% consistent with the Consumer Price Index; 2) A fee increase of 10.67% for Title V sources; and a 4% increase in specified fees for non-Title V sources.

Refer to Chapter III for the Budget & Work Program Fiscal Year 2017-2018 Report.

Clean Fuels Program

2016 Annual Report

During CY 2016 the SCAQMD executed 60 new contracts, projects or studies and modified 6 continuing projects adding additional dollars toward research, development, demonstration and deployment (RDD&D) of alternative fuel and clean fuel technologies. The SCAQMD Clean Fuels Program contributed nearly $21.8 million in partnership with other governmental organizations, private industry, academia and research institutes, and interested parties, with total project costs of a bit more than $198 million. The significant project scopes of a few key contracts executed in 2016 resulted in leveraging $9 for every $1 of Clean Fuels funding, whereas typical leveraging is $3-$4 for every $1 in Clean Fuels funding. Leveraging dollars and aggressively applying for additional funds whenever funding opportunities arise is more important than ever given the magnitude of additional funding identified in the Draft 2016 AQMP to achieve federal ozone air quality standards.

The projects or studies executed in 2016 addressed a wide range of issues and opportunities with a diverse mix of advanced technologies. The following core areas of technology advancement for 2016 executed contracts (in order of funding percentage) include:

- Electric and Hybrid Vehicle Technologies and Related Infrastructure (emphasizing electric and hybrid electric trucks and container transport technologies with zero emission operations);
- Fueling Infrastructure and Deployment (predominantly natural gas and renewable fuels);
- Hydrogen and Mobile Fuel Cell Technologies and Infrastructure;
- Engine Systems (emphasizing alternative and renewable fuels for truck and rail applications);
- Technology Transfer/Assessment and Outreach; and
- Fuels and Emission Studies.

During CY 2016, the SCAQMD supported a variety of projects and technologies, ranging from near- term to long-term research, development, demonstration and deployment activities. This “technology portfolio” strategy provides the SCAQMD the ability and flexibility to leverage state and federal funding while also addressing the specific needs of the South Coast Air Basin (Basin). Projects executed in CY 2016 included but are not limited to continued development and demonstration of electric and hybrid technologies with an emphasis on zero emission goods movement technologies, large-scale production of renewable natural gas (RNG) as well as demonstration of next generation engines using RNG, development and demonstration of hydrogen technologies and infrastructure, and development and demonstration of heavy-duty natural gas and ultra-low emission diesel engines and vehicles.

As of January 1, 2017, there were 93 open contracts (Appendix B) in the Clean Fuels Program.

Thirty-two (32) RDD&D projects or studies and 11 technology assessment and transfer contracts were completed in 2016.

2017 Plan Update

The overall strategy is based in large part on technology priorities and opportunities identified in the SCAQMD's AQMP and the SCAQMD Governing Board's directives to protect the health of residents in the Basin. The NOx, VOC and PM emission sources of greatest concern are heavy-duty on-road vehicles, medium- and light-duty on-road vehicles, and off-road equipment. Ocean-going vessels and locomotives remain a concern for the region, but at this time only the federal government has the authority to regulate them. Notwithstanding, TAO works with maritime and railroad companies to push the envelope in these areas as well.

The Plan Update includes projects to develop, demonstrate and commercialize a variety of technologies, from near-term to long-term commercialization, that are intended to provide solutions to the emission control needs identified in the Draft 2016 AQMP. Given the need for significant reductions over the next 6-14 year timeframe, mid- and longer-term alternative fuels, hybrid, electric and fuel cell based technologies are emphasized. Areas of focus include:

- reducing emissions from port-related activities, such as cargo handling equipment and container movement technologies, including demonstration and deployment of cargo container movement systems with zero emission range;
- mitigating criteria pollutant increases from renewable fuels, such as renewable natural gas, diesel and hydrogen as well as other renewable fuels and waste streams;
- developing and demonstrating electric-drive (fuel cell, battery, plug-in hybrid and hybrid) technologies across light-, medium- and heavy-duty platforms;
- producing transportation fuels and energy from renewable and waste stream sources; and
- establishing large-scale hydrogen refueling and EV charging infrastructure to help accelerate the introduction zero emission vehicles into the market.

Potential projects for 2017 total $16.5 million, with anticipated leveraging of more than $4 for every $1 of Clean Fuels funding, for total project costs of nearly $70 million. The proposed projects may also be funded by revenue sources other than the Clean Fuels Program, especially VOC and incentive projects.

CHAPTER I
RULE DEVELOPMENT, CEQA, and SOCIOECONOMIC IMPACT ANALYSES

RULE ADOPTIONS AND AMENDMENTS IN 2016 AND CEQA ALTERNATIVES

The following section lists all new and amended rules adopted by the Governing Board in 2016 by month. The type of CEQA document (including projects exempt from CEQA) is described for each new rule or rule amendment project. Alternatives are summarized only for those projects requiring an alternatives analysis pursuant to CEQA.

JANUARY 8, 2016
No rules were adopted or amended in January.

FEBRUARY 5, 2016
Two rules were amended in February, as follows:

1. **Amended Rule 1113 – Architectural Coatings:** Rule 1113 was amended to restrict the small container exemption for some categories, eliminate the small container exemption for categories that do not use the exemption and for high VOC specialty categories, lower some VOC limits, carve out new categories and establish VOC limits, revise definitions, clarify rule language, and remove outdated rule language. A Final EA was prepared for the project and the analysis concluded that there would be no significant adverse environmental impacts. Since no significant adverse environmental impacts were identified, no alternatives analysis was required by CEQA. The SCAQMD Governing Board certified the Final EA and approved the project with the following modifications: the final compliance date was changed to January 1, 2020, and staff was directed to provide a report to the Board in January 2019 on the status of the development of water-based coatings.

   Estimated Emission Reductions: VOC (0.88 tons/day). *Cost Effectiveness*: $1,150 per ton of VOC reduced from lowering the VOC limits and restricting and/or eliminating the Small Container Exemption for certain categories. *CEQA Alternatives*: None, not required. *Socioeconomic Impact*: See Socioeconomic Impact Analysis section. *Source of Funding*: Rule 314 Fees.

2. **Affirmation of Amendment to Regulation XX to Allow Use of Certified Emission Levels for Certain Rule 219 Exempt Equipment and Amend Definition of "Standard Gas Conditions" to Conform to Existing Practice:** The purpose of this project was to affirm the December 4, 2015 adoption of a specific amendment to the Proposed Amended Regulation XX - Regional Clean Air Incentives Market (RECLAIM). The specific amendment pertained to Rule 2012 provisions to allow the use of certified emissions values for Rule 219 equipment emission reporting and these provisions were presented and adopted as part of the December 4, 2015 Board package, even though the staff report had stated in error that this amendment would not be included. Also, Rule 2011 and 2012 protocol provisions clarifying the calculation of missing data consistent with current practice and other minor clarifications were presented and adopted as part of the December 4, 2015 Board package. While these amendments were legally adopted at that time, staff believed the public should be given a clear opportunity to comment on these amendments. Therefore, staff proposed that the Board affirm these amendments. In addition, SCAQMD staff proposed to amend Rules 2011 and 2012 to clarify a

definition for "Standard Gas Conditions" to conform to existing practice. This amended definition was inadvertently not included in the December 4, 2015 Board package although it was included in the October, 2015 Set Hearing package. The project was determined to be exempt from CEQA and a Notice of Exemption was filed with the County Clerks of Los Angeles, Orange, Riverside and San Bernardino counties. Since the project was determined to be exempt from CEQA, no alternatives analysis was required. The SCAQMD Governing Board approved the project as proposed.

Estimated Emission Reductions: None. *Cost Effectiveness*: Not applicable. *CEQA Alternatives*: None, not required. *Socioeconomic Impact*: None. *Source of Funding*: Permit Fees, Emission Fees, and Annual Operating Fees.

MARCH 4, 2016
No rules were adopted or amended in March.

APRIL 1, 2016
No rules were adopted or amended in April.

MAY 6, 2016
One rule was amended in May, as follows:

1. **Amended Rule 306 – Plan Fees:** Rule 306 was amended to make administrative changes to extend the payment due date for the remittance of initial plan fees and plan annual renewal fees from 30 to 60 days to be consistent with other fees in Regulation III – Fees. In addition, the amendments to Rule 306 updated the list of plans in subdivision (h) of Rule 306 that would be subject to annual review/annual renewal fees. The project was determined to be exempt from CEQA and a Notice of Exemption was filed with the County Clerks of Los Angeles, Orange, Riverside and San Bernardino counties. Since the project was determined to be exempt from CEQA, no alternatives analysis was required. The SCAQMD Governing Board approved the project as proposed.

   Estimated Emission Reductions: None. *Cost Effectiveness*: Not applicable. *CEQA Alternatives*: None, not required. *Socioeconomic Impact*: None. *Source of Funding*: Permit Fees and Annual Operating Fees.

JUNE 3, 2016
One rule was amended in June, as follows:

1. **Amended Rule 1110.2 ─ Emissions from Gaseous- and Liquid-Fueled Engines:** The Board adopted amendments at the December 4, 2015 meeting to provide the regulated community with additional time to comply with the biogas engine limits. Staff was directed to return to the Board with an amendment that would provide relief for one affected facility as expeditiously as possible with the proper CEQA analysis. This single facility operates two landfill gas-fired engines at the Prima Deshecha Landfill, is subject to a power purchase agreement (PPA) that expires on October 1, 2022, and cannot economically meet the established compliance deadline of January 1, 2017. The amendments exempted the facility operator from the emission requirements of the rule, contingent upon the facility submitting a retirement plan for the permanent shutdown of

all equipment subject to this rule at the expiration date of the PPA. A Final Subsequent EA was prepared for the project and the analysis concluded that the project would create significant adverse air quality impacts. No feasible mitigation measures were identified that would reduce or eliminate the impacts to less than significant, so a mitigation monitoring plan was not adopted for the project. Since significant adverse environmental impacts were identified, an alternatives analysis was required by CEQA and prepared that included the following alternatives:

Alternative A - No Project: The proposed project (e.g., amending Rule 1110.2) would not be adopted and the current universe of equipment at biogas facilities will continue to be subject to the NOx, VOC and CO emission limits according to the current compliance schedule in Rule 1110.2. If the facility cannot comply with the existing rule, operators may shut down their biogas engines and release their gas through their existing flares. The facility would purchase more electricity.

Alternative B - Replace Flares: Through additional rulemaking, biogas facilities not meeting the current Rule 1110.2 biogas emission limits would be required to process the biogas through new cleaner and efficient flares under a separate rule. The new flares' emissions would be lower than the NOx, CO, and VOC emissions from the proposed project. GHG emissions would increase from power plants needed to generate electricity that would otherwise be generated from the biogas engines and backup diesel engines. All other requirements and conditions in the amendments to Rule 1110.2 would be applicable.

Alternative C - New Micro Turbines: Through additional rulemaking, biogas facilities not meeting the current Rule 1110.2 biogas emission limits would be required to process the biogas through new micro turbines to handle their facilities' biogas under a separate rule. The new microturbine emissions would be comparable to the NOx, CO, and VOC emissions from the proposed project. GHG emissions would increase from backup diesel engines. All other requirements and conditions in the amendments to Rule 1110.2 would be applicable.

The SCAQMD Governing Board approved the project as proposed.

Estimated Emission Reductions: 0.07 tons per day (tpd) NOx; 0.01 tpd VOC, and 0.08 tpd CO (This amendment delayed a compliance date, so these values represent emission reductions foregone for a previous compliance date). *Cost Effectiveness*: Not required but analyzed per public comment request: $4,200 to $58,000 per ton of NOx, VOC and CO/7. *CEQA Alternatives*: Three alternatives were analyzed, alternatives described above. *Socioeconomic Impact*: None. *Source of Funding*: Permit Fees, Emission Fees, and Annual Operating Fees.

JULY 8, 2016
No rules were adopted or amended in July.

AUGUST 2016
There was no Governing Board meeting in August, so no rules were adopted or amended.

SEPTEMBER 2, 2016
No rules were adopted or amended in September.

OCTOBER 7, 2016
Three projects amending five rules (e.g., one project amending three rules concurrently, and two other projects amending one rule each) were approved in October, as follows:

1. **Amended Rule 307.1 - Alternative Fees for Air Toxics Emissions Inventory; Amended Rule 1401 - New Source Review of Toxic Air Contaminants; Amended Rule 1402 - Control of Toxic Air Contaminants from Existing Sources; SCAQMD Public Notification Procedures for Facilities Under the Air Toxics "Hot Spots" Information and Assessment Act (AB 2588) and Rule 1402; and, SCAQMD Guidelines for Participating in the Rule 1402 Voluntary Risk Reduction Program:** Rule 307.1 was amended to: 1) include a new category of billing for facilities in the Voluntary Risk Reduction Program; 2) to reimburse the SCAQMD for costs associated with public meetings required by Rule 1402; 3) replace the Standard Industrial Classification (SIC) codes with references to the North American Industry Classification System (NAICS) codes instead; 4) replace references to the California Air Pollution Control Officers Association (CAPCOA) "Air Toxics 'Hot Spots' Program Facility Prioritization Guidelines, July 1990" with the most current version of SCAQMD's "Facility Prioritization Procedures For AB 2588 Program;" and, 5) improve clarity. The amendments to Rule 307.1 were determined to be exempt from CEQA and a Notice of Exemption was filed with the County Clerks of Los Angeles, Orange, Riverside and San Bernardino counties. Since the amendments to Rule 307.1 were determined to be exempt from CEQA, no alternatives analysis was required.

   Rules 1401 and 1402 were amended to remove provisions that require staff to report to the Governing Board regarding changes from OEHHA regarding new or revised toxic air contaminant health values but instead discuss these changes and the potential impacts to permitting and AB 2588 in the AB 2588 Annual Report. Rule 1402 was amended to include a voluntary program to allow facilities to implement early risk reduction measures that go beyond the Action Risk threshold in Rule 1402 with an alternative public notification approach. In addition, Rule 1402 was amended to streamline implementation, improve clarity, and include provisions for potentially high risk level facilities. The "Public Notification Procedures for Phase I and II Facilities Under the Air Toxics 'Hot Spots' Information and Assessment Act of 1987 (AB 2588)" was revised and "SCAQMD Guidelines for Participating in the Rule 1402 Voluntary Risk Reduction Program" has been developed. A Final EA was prepared and the analysis concluded that there would be no significant adverse environmental impacts. Since no significant adverse environmental impacts were identified, no alternatives analysis was required by CEQA. The SCAQMD Governing Board certified the Final EA and approved the project with the following modification: a provision was added to PAR 1402 for High Risk Level Facilities which would require them to implement their Risk Reduction Plans no later than two years from the date of their approved plans instead of 2.5 years.

   Estimated Emission Reductions: None. *Cost Effectiveness*: Not applicable. *CEQA Alternatives*: None, not required. *Socioeconomic Impact*: See Socioeconomic Impact

Analysis section. *Source of Funding*: Permit Fees, Emission Fees, and Annual Operating Fees.

2. **Amended Regulation IX – Standards of Performance for New Stationary Sources:** The purpose of the amendments was to incorporate by reference federal New Source Performance Standards (NSPS) into Regulation IX. The incorporation by reference of NSPS requirements into Regulation IX recognizes the SCAQMD's authority to implement and enforce these federal regulations at the local level. The project was determined to be exempt from CEQA and a Notice of Exemption was filed with the County Clerks of Los Angeles, Orange, Riverside and San Bernardino counties. Since the project was determined to be exempt from CEQA, no alternatives analysis was required. The SCAQMD Governing Board approved the project as proposed.

   Estimated Emission Reductions: None. *Cost Effectiveness*: Not applicable. *CEQA Alternatives*: None, not required. *Socioeconomic Impact*: None. *Source of Funding*: Annual Operating Fees.

3. **Amended Regulation XX – Regional Clean Air Incentives Market (RECLAIM):** Rule 2002 - Allocations for Oxides of Nitrogen (NOx) and Oxides of Sulfur (SOx), which is one rule within Regulation XX – RECLAIM, was amended to address the treatment of RECLAIM Trading Credits (RTCs) upon NOx RECLAIM facility shutdowns. The objective of these amendments was to prevent NOx RTCs associated with a shutdown facility from the largest RECLAIM facilities from entering the market and potentially delaying the installation of pollution controls at other RECLAIM facilities. Specifically, the amendments to Rule 2002 established the criteria for determining a facility shutdown and the methodology to calculate the amount of NOx RTCs by which that facility's future holdings will be reduced. The amendments also included exclusions from these provisions for facilities under the same ownership and for facilities with approved Planned Non-Operational status for up to five years. A facility may request Planned Non-Operational status if it experiences a temporary substantial drop in its NOx emissions and meets specific criteria. The shutdown provisions would apply to facilities listed in Table 7 and Table 8 of Rule 2002 that have an initial allocation and that shut down entirely. Table 7 and Table 8 facilities in the RECLAIM program are those among the top 90 percent of RTC holders that are subject to the RTC holding reductions adopted for the December 4, 2015 amendments to Regulation XX - NOx RECLAIM. As such, the amendments to Regulation XX, Rule 2002 were considered to be modifications to the previously approved project (the December 4, 2015 amendments to Regulation XX and the certified December 2015 Final Program EA). SCAQMD staff's review of the amendments showed that while the criteria have been revised from the original proposal in December 2015 relative to the handling of shutdown RTCs, the potential impacts from implementing the amendments were concluded to be the same as what was previously analyzed in the December 2015 Final Program EA. Thus, the amendments for handling shutdown RTCs were concluded to not be expected to trigger any conditions identified in CEQA Guidelines Section 15162. Therefore, an Addendum was determined to be the appropriate CEQA document and as such, an Addendum to the December 2015 Final Program EA for Proposed Amended Regulation XX – Regional Clean Air Incentives Market (RECLAIM) was prepared. The analysis in the Addendum

concluded that there would be no significant adverse environmental impacts. Since no significant adverse environmental impacts were identified, no alternatives analysis was required. The SCAQMD Governing Board approved the project as proposed.

Estimated Emission Reductions: None. *Cost Effectiveness*: Not applicable. *CEQA Alternatives*: None, not required. *Socioeconomic Impact*: None. *Source of Funding*: Permit Fees, Emission Fees, and Annual Operating Fees.

NOVEMBER 4, 2016

One project amending two rules was approved in November, as follows:

1. **Amended Rule 1302 – Definitions; and, Amended Rule 1325 – Federal PM2.5 New Source Review Program:** Rule 1302 was amended to: 1) revise the definition of the term Allocation to remove incorrect references to Emission Reduction Credits; and, 2) revise the definition of the term Major Polluting Facility to lower the SOx potential to emit thresholds for facilities located in the South Coast Air Basin and Riverside County portion of the Salton Sea Air Basin from 100 tons per year (tons/year) to 70 tons/year, for consistency with the serious non-attainment classification for PM because SOx is a precursor to PM formation. Rule 1325 was amended to: 1) revise the definition of the term Major Polluting Facility by clarifying that the Major Source threshold of 100 tons/year for PM2.5 and PM2.5 precursors will remain in effect until August 14, 2017 or until the effective date of U.S. EPA's approval of these amendments to Rule 1325, whichever is later; 2) add a new Major Source threshold of 70 tons/year for PM2.5 and PM2.5 precursors to go into effect after August 14, 2017 or upon the effective date of U.S. EPA's approval of these amendments to Rule 1325, whichever is later; 3) expand the definition of the term Precursors to include VOC and ammonia because these pollutants are precursors to PM2.5 formation, to go into effect after August 14, 2017 or upon the effective date of U.S. EPA's approval of these amendments to Rule 1325, whichever is later; 4) revise the definition of the term Significant to establish new thresholds for VOC and ammonia at 40 tons/year each; 5) revise subdivision (f) - Two Year Limit on Facility Exemption, to be consistent with the proposed revisions to the definition of Major Source threshold; and, 6) add new subdivision (j) – Offset Exemption for Regulatory Compliance, to allow an exemption from the requirement to provide offsets under limited circumstances. Other minor changes were also included to improve clarity and provide consistency throughout both rules. The project was determined to be exempt from CEQA and a Notice of Exemption was filed with the County Clerks of Los Angeles, Orange, Riverside and San Bernardino counties. Since the project was determined to be exempt from CEQA, no alternatives analysis was required. The SCAQMD Governing Board approved the project as proposed.

   Estimated Emission Reductions: None. *Cost Effectiveness*: Not applicable. *CEQA Alternatives*: None, not required. *Socioeconomic Impact*: None. *Source of Funding*: Permit Fees, Emission Fees, and Annual Operating Fees.

DECEMBER 2, 2016

One project amending the BACT Guidelines, was approved in December, as follows:

1. **Amended Best Available Control Technology (BACT) Guidelines:** SCAQMD's New Source Review (NSR) regulations require applicants to use Best Available Control Technology (BACT) for new sources, relocated sources, and for modifications to existing sources that may result in an emission increase of any nonattainment air contaminant, any ozone depleting compound (ODC), or ammonia. Regulation XIII – New Source Review also requires the Executive Officer to periodically publish BACT Guidelines that establish the procedures and the BACT requirements for commonly permitted equipment. The BACT Guidelines were amended to update the Overview, Parts A, B, C and D, and to add Parts E and F in order to maintain consistency with recent changes to SCAQMD rules, and state and federal requirements. The amendments were determined to: 1) not result in more stringent requirements than those already required by current regulations; and 2) have no potential to adversely impact air quality or any other environmental topic area. The project was determined to be exempt from CEQA and a Notice of Exemption was filed with the County Clerks of Los Angeles, Orange, Riverside and San Bernardino counties. Since the project was determined to be exempt from CEQA, no alternatives analysis was required. The SCAQMD Governing Board approved the project with the following modifications: 1) staff was directed to work with industry and other stakeholders on assessing ultraviolet/electron beam (UV/EB) technology as an alternative to meeting BACT and the analysis should include BACT determinations by other air districts; and 2) staff should present the findings to the Stationary Source Committee by June 2017.

   Estimated Emission Reductions: None. *Cost Effectiveness*: Not applicable. *CEQA Alternatives*: None, not required. *Socioeconomic Impact*: None. *Source of Funding*: Permit Fees, Emission Fees, and Annual Operating Fees.

CEQA LEAD AGENCY PROJECTS

In 2016, one lead agency project with a certified CEQA document was approved by the SCAQMD's Executive Officer on June 7, 2016, as summarized below.

1. **June 2016 Addendum to the April 2012 Final Subsequent Environmental Impact Report (SEIR) for the Sunshine Gas Producers Renewable Energy Project:** Sunshine Gas Producers proposed to revise their Renewable Energy Project to increase the heat input rating on all five of its landfill gas turbines without requiring any physical modifications. As a result of the increase in fuel consumption by the landfill gas-fired turbines, less gas will be sent to and combusted in the Sunshine Canyon Landfill flares. The Renewable Energy Project was originally evaluated in the April 2012 Final SEIR. The SCAQMD evaluated the proposed changes to the April 2012 Final SEIR and determined that the project, as revised, would not create any new significant adverse environmental impacts or make substantially worse any existing significant adverse environmental impacts, and only minor additions or changes would be necessary to make the April 2012 Final SEIR adequate for the revised project. Since no significant adverse environmental impacts were identified, no alternatives analysis was required. The project was approved by the SCAQMD's Executive Officer.

SOCIOECONOMIC IMPACT ANALYSES

In 2016, eight rules were amended with three of them combined into one project. Out of these eight amended rules, two rules had socioeconomic impacts. Additionally, one rule, Rule 320, did not undergo any amendments that were brought to the SCAQMD Governing Board, but because it contains a requirement for an automatic annual California Consumer Price Index (CPI) adjustment that has associated socioeconomic impacts, this rule has also been included in this summary.

Lastly, staff prepared a Socioeconomic Assessment in order to inform decision-makers and stakeholders about the potential costs and benefits of the 2016 AQMP and how the associated socioeconomic impacts would affect communities within the region. Although the 2016 AQMP was adopted at the March 3, 2017 Governing Board Meeting and not during calendar year 2016, information is provided here as it represents a substantial amount of staff time spent in 2016.

Rule Amendments with Socioeconomic Impacts

Amended Rule 1113—Architectural Coatings (February 2016)

Rule 1113 was amended to limit the small container exemption (SCE) for certain categories, proposed new categories with VOC limits, eliminate categories regulated under a different rule, and reduce the VOC limit of some architectural coating categories to reflect currently available products.

The amendments to Rule 1113 affected all architectural coating manufacturers and wholesalers (approximately 200) who sell architectural coatings into or within the SCAQMD. The annual cost of compliance was estimated to be $368,000. A cost

effectiveness of $1,150 per ton of VOC reduced was estimated from lowering the VOC limits and restricting and/or eliminating the SCE for certain categories. It has been a standard socioeconomic practice that, when the annual compliance cost is less than one million current U.S. dollars, REMI is not used to simulate jobs and macroeconomic impacts, because the resultant impacts would be diminutive relative to the baseline regional economy.

Amended Rule 1402—Control of Toxic Air Contaminants from Existing Sources; Amended Rule 1401—New Source Review of Toxic Air Contaminants; and Amended Rule 307.1—Alternative Fees for Air Toxics Emissions Inventory (October 2016)

At its June 2015 meeting, the SCAQMD Governing Board adopted Rule 1402—Control of Toxic Air Contaminants from Existing Sources, incorporating revised OEHHA Guidelines. The Governing Board directed staff to work with stakeholders to incentivize early risk reductions beyond those required under Rule 1402, to assess public notification procedures, and explore alternatives for such facilities. In addition, the Governing Board also directed staff to streamline implementation of Rule 1402, if necessary.

Under the amendments to Rule 1402, 32 facilities were estimated to likely participate in the Voluntary Risk Reduction Program and 24 of these would potentially need to install additional air pollution control equipment beyond the air pollution control equipment identified in the June 2015 rule amendments. The associated cost of the amendments to Rule 1402 was estimated based on the types of air pollution control equipment that could potentially reduce the total facility risk below the Voluntary Risk Threshold. The cost impacts presented herein should be viewed with the caveat that all additional costs are voluntary. Facilities that do not wish to participate may follow the traditional risk assessment and reduction pathway for which all costs were already analyzed in the June 2015 rule amendments.

The associated total annual compliance cost of implementing the amendments to Rule 1402 was estimated to range from $1.07 million to $1.17 million, depending on the real interest rate assumed (1%-4%). The total cost mainly consists of the cost of installing and operating control equipment. The compliance costs estimated in the analysis are associated with additional pollution control equipment costs only and do not take into account other potential costs, such as some permitting and administrative costs, as these cost would have occurred independent of the proposed amendments. There are no expected cost impacts associated with the guidance documents because these guidance documents are administrative in nature and do not impose any additional costs to the affected facilities.

SCAQMD does not conduct a dollar per ton cost effectiveness for risk-based regulations since many other factors besides the amount of pollution affects the risk such as the toxic potency and the location of receptors. Rule 1402 regulates toxics, as such the cost effectiveness analysis is not applicable here.

Amended Rule 1402 was expected to result in approximately 10 annual jobs foregone between 2017 and 2030 when it was assumed that facilities would finance capital costs of control equipment at a 4-percent real interest rate and that all equipment and services would

be purchased from businesses located within the region. The projected job impacts represent less than 0.001 percent of the total employment in the four-county region.

In combination with the amendments to Rule 1402, amended Rule 1401 removed the staff requirement to report OEHHA changes to risk values to the Governing Board and instead consolidated reporting changes and their potential impacts in the SCAQMD AB 2588 Annual Report. The amendments to Rule 1401 were intended to provide additional clarity and were administrative in nature, and therefore, were determined to not have any adverse socioeconomic impacts.

Rule 307.1 was amended with Rules 1401 and 1402 to include a fee for Voluntary Risk Reduction facilities and a provision to either directly pay or reimburse the SCAQMD for costs associated with public meetings. The fee for Voluntary Risk Reduction facilities is identical to the fee the facilities would have had to pay with traditional risk reduction, and in some cases is less if the facility is required to submit a Health Risk Assessment and/or Risk Reduction Plan. The fee for public meetings is identical to the cost of the facility conducting their own public meeting. The amended requirements in Rule 307.1 were intended to provide additional clarity and are administrative and informational in nature, and would not have any adverse socioeconomic impacts.

Existing Rule with Ongoing Socioeconomic Impacts

Rule 320—Automatic Adjustment Based on Consumer Price Index (CPI) for Regulation III Fees (March 2016)

Pursuant to Rule 320, an across-the-board 2.4-percent increase in fee rates (equivalent to the change in the California CPI from December 2014 to December 2015) occurred on July 1, 2016. The October 29, 2010 SCAQMD Governing Board Resolution annually requires, by March 15, an assessment of the increase in fee rates based on the previous year's CPI. Rule 320 does not affect air quality or emission limits and as such no socioeconomic and cost effectiveness analyses are required. A socioeconomic assessment was nonetheless conducted to assess the cost impacts of the fee increase. In addition, the analysis provides background information, such as historical trends of SCAQMD revenues from various fees and sectoral distributions of these fees.

Nearly all the facilities regulated by the SCAQMD would be affected by the proposed fee increases and these facilities belong to every sector of the economy. The fees examined included emissions fees, permit processing fees, annual permit renewal fees, toxic hot spot fees, source testing fees, and a portion of fees under Rule 2202 – On-Road Motor Vehicle Mitigation Options.

The across-the-board CPI-based fee rate increase would bring additional revenue totaling $1.94 million to the SCAQMD. Based on the fee categories examined in the analysis, the manufacturing sector as a whole would experience the largest increase in fees (approximately $0.84 million for about 4,000 facilities), followed by the services sector (approximately $0.35 million for about 11,000 facilities) and the retail trade sector (approximately $0.24

million for about 4,100 facilities). Within the manufacturing sector, the petroleum and coal products manufacturing industry, mostly comprised of refineries, will experience an increase of approximately $0.36 million.

Rule Amendments without Socioeconomic Impacts

Amended Rule 1110.2—Emissions from Gaseous and Liquid-Fueled Engines (June 2016)

Rule 1110.2 regulates oxides of nitrogen (NOx), carbon monoxide (CO), and volatile organic compound (VOC) emissions from liquid and gas fueled internal combustion engines operating in the SCAQMD producing more than 50 rated brake horsepower (bhp). Amended Rule 1110.2 delayed implementation of new concentration limits for biogas-fired engines at affected facilities from 2016 to between 2017 and 2019. In addition, amended Rule 1110.2 would affect fewer biogas-fired engines. The additional time for compliance and five fewer affected engines would result in potential savings for affected facilities. As such, no adverse socioeconomic impact was anticipated for amended Rule 1110.2.

Amended Rule 2002—Allocations for Oxides of Nitrogen (NOx) and Oxides of Sulfur (SOx) (October 2016)

Regulation XX was amended on December 4, 2015 to achieve programmatic NOx RECLAIM trading credit (RTC) reductions from compliance years 2016 through 2022. Among the proposed amendments considered at that time was a provision to address RTCs from the shutdown of facilities. The Governing Board motion that was approved did not include the shutdown provisions and directed staff to return to the Governing Board, after further analysis and discussion with the RECLAIM working group, with a proposal that would allow a closer alignment of shutdown credits in the RECLAIM program and command and control programs, short of full forfeiture.

Amendments to Rule 2002 were crafted to prevent NOx RTCs associated with a facility shutdown from entering the market and potentially delaying the installation of pollution controls at other RECLAIM facilities. Specifically, the amendments established the criteria for determining a facility shutdown and the methodology to calculate the amount of NOx RTCs by which that facility's future holdings would be reduced. Amended Rule 2002 included exclusions from these provisions for facilities under the same ownership and for facilities with approved planned non-operational status for up to five years.

Rule 2002, as amended, would not be expected to create new socioeconomic impacts resulting in new or more severe significant effects beyond those analyzed in the previous Final Socioeconomic Report for the December 4, 2015 amendments to Regulation XX. Specifically, staff acknowledged in the previous report that the provision of surrendering and retiring NOx RTCs from the market could potentially affect the credit market and prices, and that the magnitude of the potential impact would depend heavily on the usual market behavior of each facility before it decides to shut down. In the same report, a market analysis was included which analyzed the potential incremental compliance cost for the affected

facilities under various credit price scenarios, from no effects on the current market price to the worst-case scenario where the discrete NOx RTC price reaches the threshold of $22,500 per ton and thus would trigger the price stabilizing mechanism set forth in Rule 2002.

Amended Rule 1302—Definitions; and, Amended Rule 1325—Federal PM2.5 New Source Review Program (November 2016)

Amended Rule 1302 set the definitions used in Regulation XIII—New Source Review. Since the amendments were administrative in nature, no socioeconomic impacts were expected.

Rule 1325 incorporates U.S. EPA's requirements for PM2.5 into Regulation XIII – New Source Review. The rule mirrors federal requirements and is applicable to major polluting facilities, which are defined by rule as sources with actual emissions, or the potential to emit, 100 tons per year or more of PM2.5 or its precursors. Based on comments received from the U.S. EPA regarding SIP approvability of Rule 1325, amendments were adopted to incorporate administrative changes to definitions, provisions and exclusions.

No socioeconomic impact assessment was required for amended Rule 1325 because the amendments do not "significantly affect air quality or emissions limitations." (Health and Safety Code Section 40440.8(a)).

2016 AQMP Socioeconomic Assessment

In order to inform decision-makers and stakeholders about the potential costs and benefits of the 2016 AQMP and how the associated socioeconomic impacts would affect communities within the region, a Socioeconomic Assessment was prepared. Based on recommendations made by Abt Associates in 2014 to improve the socioeconomic assessment, a concerted effort among SCAQMD staff, scientific advisors, sister agencies, the public, and the business community was made to conduct an enhanced analysis that not only utilized state-of-the-art methods, but was more accessible and transparent to the general public. While many of Abt Associates' recommendations have been implemented, staff continues to update and refine its methodologies for subsequent AQMPs and socioeconomic assessments for clean air rules and programs.

The analyses in the 2016 AQMP Socioeconomic Assessment were conducted using two major modeling tools: the Regional Economic Model, Inc. (REMI)'s Policy Insight Plus, a policy simulation program for regional macroeconomic impacts, and the U.S. Environmental Protection Agency's environmental Benefits Mapping and Analysis program (BenMAP). Total incremental costs, inclusive of the cost of incentives, were compiled for proposed control measures with quantified emission reductions. Modeled air quality data for the Basin, together with mathematical functions and parameters based on the most updated epidemiological and economic studies, were used in BenMAP to quantify public health benefits due to reduced exposure to air pollution. Public health benefits were combined with incremental costs to estimate a range of regional jobs and other macroeconomic impacts from implementing the Final 2016 AQMP. Projected changes in health risk and monetized public

health benefits were also used to analyze how implementation of the Final 2016 AQMP may affect environmental justice (EJ) in the Basin, as evaluated by a number of alternative metrics.

Enhancements made to the 2016 AQMP Socioeconomic Assessment

First and foremost, this report was designed to be accessible and transparent to the general public. The main document presented the general picture of socioeconomic impacts while clearly defining methodologies employed and data sources utilized. Careful consideration was given to report not only overall impacts, but to also discuss uncertainty and provide a range of estimates through sensitivity analyses. When quantification of uncertainty was not feasible, a qualitative discussion about uncertainty sources, the expected magnitude, and impact of uncertainty (i.e. negative or positive effect on results) was added. In addition, the appendices provided technical readers with more details about the analyses, while an executive summary geared towards a more general audience condensed the analyses and results. As each component of the 2016 Socioeconomic Assessment was developed, it was presented at various meetings to the STMPR Advisory Group, the AQMP Advisory Group, and interested parties to enhance transparency and solicit feedback. Staff also presented the preliminary outline of this report and described analysis methodologies at six AQMP scoping meetings in July 2016.

To implement Abt's recommendation to clearly define the baseline for socioeconomic analysis and clarify whether the baseline should include SCAG's TCMs, staff worked closely with SCAG staff and consultants from REMI and the Center for Continuing Study of the California Economy. Following many rounds of communication and discussions, consensus was reached that TCMs, along with other components of the 2016 RTP/SCS, should be considered as baseline for the 2016 AQMP socioeconomic assessment, and that, for informational purposes, the benefits and costs associated with TCMs would be provided separately in the 2016 AQMP Appendix IV-C: Regional Transportation Plan/Sustainable Communities Strategy and Transportation Control Measures. This baseline definition is also consistent with the AQMP baseline inventory of air pollutant emissions, which considers any emission reductions associated with SCAG's 2016 RTP/SCS and all its sub-components (TCMs included) as accounted for in the baseline. Additionally, as in the past, the default baseline forecasts of population and jobs in the REMI model were adjusted in accordance with the population and job projections from SCAG's 2016 Growth Forecast, which was also largely used to project future baseline emissions of air pollutants.

In order to improve the public health benefits analysis conducted in the socioeconomic assessment, SCAQMD commissioned IEc to conduct an updated literature review of epidemiological studies to quantify concentration-response functions, which quantitatively describe the relationship between exposure to air pollution and various health endpoints, and economic valuation functions, which are used to monetize quantified public health benefits. Based on the review of literature, IEc provided staff with recommendations on which health endpoints to include in the public health benefits analysis of the Final 2016 AQMP and which mathematical functions should be used to evaluate and quantify benefits. IEc also provided recommendations on the use of the U.S. EPA's BenMAP tool, including choices of

data input, assumptions and procedures that were appropriate for the functions used in the analysis. IEc recommendations and the analysis results were presented during each step of the process to the STMPR Advisory Group for review and guidance. In addition to IEc recommendations, the BenMAP operations were further reviewed and confirmed as appropriate by Dr. Jin Huang, a former project manager for the 2014 Abt review and the STMPR expert on BenMAP analysis.

IEc also reviewed the most updated literature of environmental justice studies and analytical tools. Based on the review, IEc recommended alternative EJ screening definitions and the most appropriate screening tools that have been developed to help identify EJ communities for socioeconomic assessment purposes. Additionally, IEc recommended the state-of-science methodology to analyze the impacts of the 2016 AQMP on health risk distributions between and within EJ and non-EJ communities. To engage the community and develop the most applicable approach in the region, the 2016 AQMP Socioeconomic Assessment Environmental Justice Working Group was formed to review and provide comments and suggestions on IEc's recommendations and staff's analysis results. The Working Group's feedback helped inform and enhance the EJ analyses in this report.

Finally, SCAQMD commissioned a third-party evaluation by Dr. Michael Lahr on REMI's modeling of nonmarket benefits and Abt's further recommendation to evaluate how to improve the input of these benefits into REMI. REMI models non-market benefits as an improvement to regional amenities, or quality of life; however, the 2014 Abt Report indicated that there remained methodological uncertainties as to how these benefits could be best incorporated into macroeconomic modeling and asked staff to keep abreast of developments at the U.S. EPA's Science Advisory Board Panel on Economy-Wide Modeling. While it is generally recognized that location-specific amenities such as climate, clean air, public safety, and other public service provisions, make a region more attractive to economic migrants, the 2014 Abt Report also indicated that prospective economic migrants may consider air quality differently than other types of amenities when making their location choices; however, such differences, if any, were not taken into account under the prior modeling approach. As such, Abt recommended identifying methods to properly normalize the magnitude of adjustments made to the sub-region specific amenity coefficients in REMI's migration equation, which links air quality change with the relative attractiveness of one area compared to another. Based on the qualitative conclusion made in the third-party evaluation, staff conducted a sensitivity analysis of job impacts where the REMI input related to the non-market portion of public health benefits was discounted by half, therefore significantly lessening the magnitude of adjustments to the amenity coefficients in REMI. Staff preliminarily concluded that this adjustment is a major determinant to the non-market benefits related job impact; however, further research is needed to determine the proper scaling of the related REMI input.

Future Enhancements

Staff will continue working to update the technical aspects of its analyses which includes updating methodologies to quantify visibility, material, and agricultural benefits, developing methods to properly normalize the magnitude of adjustment to the amenity coefficient in

REMI, evaluating the use of other modeling tools such as partial equilibrium modeling to supplement REMI for small scale impacts, updating best practices for estimating small business impacts, and closely monitoring the U.S. EPA Science Advisory Board's Economy-Wide Modeling Panel discussions and recommendations, particularly on the macroeconomic modeling of non-market benefits. Retrospective studies, when feasible, will be considered as part of the implementation plan to enhance the uncertainty analysis.

CHAPTER II
ENGINEERING AND PERMITTING ACTIVITIES

ENGINEERING AND PERMITTING

As shown in Table 1 below, during calendar year 2016, SCAQMD dispositioned a total of 9,872 applications. The majority of these applications were for Permits to Operate (3,725), Area Sources & Certified/Registrations (2,327), and Changes of Operators (1,511). Also, 1,200 permits were not renewed. The total number of dispositioned applications for 2016 is about 13% higher than the total for 2015, mainly attributed to the SCAQMD's Permit Application Backlog Reduction efforts.

TABLE - 1
Permit Applications Completed During Calendar Year 2016

Type	Count
Permits to Construct	595
Permits to Operate	3725*
Changes of Operator	1511
Denials	77
Cancellations	784
ERCs	185
Plans	270
TV/RECLAIM	398
Area Sources & Certified/Registrations	2327
Total	**9872**
Permits Not Renewed	1200

*****This includes 1,454 applications for Permit to Construct that were issued as Permit to Construct/Operate.

TABLE - 2
Permit Applications Completed During Calendar Year 2016

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/ RECLAIM	Area Source/Cert. & Registration	Not Renewed	Grand Total
111219	Other Vegetable (except Potato) and Melon Farming	0	0	0	0	0	0	0	0	6	0	6
111310	Orange Groves	0	0	0	0	0	0	0	0	3	0	3
111320	Citrus (except Orange) Groves	0	1	0	0	0	0	0	0	0	0	1
111332	Grape Vineyards	0	0	0	0	0	0	0	0	4	0	4
111421	Nursery and Tree Production	0	0	0	0	0	0	0	0	0	1	1
111998	All Other Miscellaneous Crop Farming	0	1	0	0	0	0	0	0	1	1	3
112120	Dairy Cattle and Milk Production	0	1	0	0	0	0	1	0	0	4	6
112310	Chicken Egg Production	0	0	0	0	0	0	0	0	0	2	2
112990	All Other Animal Production	0	4	1	0	1	0	0	0	2	0	8
115112	Soil Preparation, Planting, and Cultivating	0	2	0	0	0	0	0	0	0	0	2
115114	Postharvest Crop Activities (except Cotton Ginning)	0	1	0	0	0	0	0	0	0	0	1
115210	Support Activities for Animal Production	0	2	0	0	1	0	0	0	0	0	3
211111	Crude Petroleum and Natural Gas Extraction	13	43	4	0	50	1	20	26	6	1	164
212299	All Other Metal Ore Mining	0	0	0	0	0	0	0	0	0	2	2

TABLE - 2
Permit Applications Completed During Calendar Year 2016

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/ RECLAIM	Area Source/Cert. & Registration	Not Renewed	Grand Total
212311	Dimension Stone Mining and Quarrying	0	4	0	0	0	0	0	0	0	0	4
212312	Crushed and Broken Limestone Mining and Quarrying	0	2	0	0	0	0	0	0	0	0	2
212321	Construction Sand and Gravel Mining	0	7	0	0	2	0	0	0	0	0	9
213112	Support Activities for Oil and Gas Operations	14	12	17	0	9	3	1	7	1	0	64
221118	Other Electric Power Generation	1	17	0	0	36	20	0	7	4	3	88
221122	Electric Power Distribution	0	0	0	0	0	0	0	0	1	0	1
221210	Natural Gas Distribution	0	15	0	0	0	0	0	1	0	0	16
221310	Water Supply and Irrigation Systems	0	55	0	0	1	0	8	9	11	20	104
221320	Sewage Treatment Facilities	0	16	0	0	0	0	0	0	0	0	16
236115	New Single-Family Housing Construction (except For-Sale Builders)	0	11	1	0	0	0	4	0	14	9	39
236116	New Multifamily Housing Construction (except For-Sale Builders)	0	0	0	0	0	0	0	0	3	1	4
236118	Residential Remodelers	1	0	0	0	0	0	0	0	32	9	42
236210	Industrial Building Construction	0	0	0	0	0	0	0	0	7	0	7

TABLE - 2
Permit Applications Completed During Calendar Year 2016

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/ RECLAIM	Area Source/Cert. & Registration	Not Renewed	Grand Total
236220	Commercial and Institutional Building Construction	0	13	0	0	0	0	8	0	8	6	35
237110	Water and Sewer Line and Related Structures Construction	0	5	0	2	1	0	2	0	0	1	11
237120	Oil and Gas Pipeline and Related Structures Construction	0	0	1	4	0	0	1	0	0	6	12
237210	Land Subdivision	2	4	0	0	1	0	0	0	13	4	24
237310	Highway, Street, and Bridge Construction	9	24	0	0	3	0	2	1	7	0	46
237990	Other Heavy and Civil Engineering Construction	0	8	0	0	0	0	3	1	0	9	21
238110	Poured Concrete Foundation and Structure Contractors	0	3	1	0	0	0	2	0	0	5	11
238130	Framing Contractors	0	1	0	0	0	0	0	1	0	1	3
238140	Masonry Contractors	2	1	0	0	0	0	0	0	0	0	3
238160	Roofing Contractors	0	6	4	0	2	0	0	4	2	7	25
238190	Other Foundation, Structure, and Building Exterior Contractors	0	0	0	0	1	0	0	0	0	0	1
238210	Electrical Contractors and Other Wiring Installation Contractors	13	1	0	0	0	0	1	2	3	20	40

TABLE - 2
Permit Applications Completed During Calendar Year 2016

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/ RECLAIM	Area Source/Cert. & Registration	Not Renewed	Grand Total
238220	Plumbing, Heating, and Air-Conditioning Contractors	0	6	0	0	0	0	1	2	2	1	12
238310	Drywall and Insulation Contractors	0	1	0	0	0	0	0	0	6	10	17
238320	Painting and Wall Covering Contractors	2	6	0	0	1	0	0	0	2	4	15
238340	Tile and Terrazzo Contractors	0	2	0	0	0	0	0	0	0	0	2
238350	Finish Carpentry Contractors	0	3	0	0	0	0	0	0	0	1	4
238390	Other Building Finishing Contractors	0	3	0	0	0	0	0	0	0	0	3
238910	Site Preparation Contractors	0	1	0	0	1	0	7	0	32	47	88
238990	All Other Specialty Trade Contractors	2	22	0	0	11	0	5	0	95	17	152
311111	Dog and Cat Food Manufacturing	1	0	0	0	1	0	0	2	0	0	4
311119	Other Animal Food Manufacturing	0	1	0	0	0	0	0	0	0	0	1
311211	Flour Milling	0	7	30	0	0	0	0	0	0	0	37
311225	Fats and Oils Refining and Blending	0	0	0	0	0	0	0	0	1	0	1
311340	Nonchocolate Confectionery Manufacturing	0	1	0	0	0	0	0	0	0	0	1

TABLE - 2
Permit Applications Completed During Calendar Year 2016

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/ RECLAIM	Area Source/Cert. & Registration	Not Renewed	Grand Total
311411	Frozen Fruit, Juice, and Vegetable Manufacturing	0	1	0	0	0	0	0	0	0	0	1
311412	Frozen Specialty Food Manufacturing	0	1	0	0	0	0	0	0	2	0	3
311422	Specialty Canning	0	0	0	0	0	0	0	0	1	0	1
311511	Fluid Milk Manufacturing	0	0	0	0	0	0	0	0	2	0	2
311514	Dry, Condensed, and Evaporated Dairy Product Manufacturing	0	2	0	0	0	0	0	0	0	0	2
311611	Animal (except Poultry) Slaughtering	0	0	0	0	3	0	0	0	5	0	8
311613	Rendering and Meat Byproduct Processing	0	0	0	0	0	0	0	0	1	0	1
311710	Seafood Product Preparation and Packaging	0	2	0	0	0	0	0	0	0	0	2
311811	Retail Bakeries	0	8	0	0	0	0	1	1	0	0	10
311812	Commercial Bakeries	9	7	0	0	11	0	0	3	31	0	61
311813	Frozen Cakes, Pies, and Other Pastries Manufacturing	0	0	0	0	5	0	0	0	0	0	5
311821	Cookie and Cracker Manufacturing	0	4	0	0	2	0	0	0	1	0	7
311824	Dry Pasta, Dough, and Flour Mixes Manufacturing from Purchased Flour	0	12	1	0	0	0	0	0	0	0	13

TABLE - 2
Permit Applications Completed During Calendar Year 2016

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/ RECLAIM	Area Source/Cert. & Registration	Not Renewed	Grand Total
311830	Tortilla Manufacturing	0	2	0	0	0	0	0	0	0	0	2
311911	Roasted Nuts and Peanut Butter Manufacturing	4	0	9	0	0	0	0	0	0	0	13
311920	Coffee and Tea Manufacturing	0	5	0	0	2	0	0	0	0	0	7
311930	Flavoring Syrup and Concentrate Manufacturing	0	3	0	0	8	0	0	0	1	0	12
311941	Mayonnaise, Dressing, and Other Prepared Sauce Manufacturing	0	1	0	0	0	0	0	0	0	0	1
311942	Spice and Extract Manufacturing	0	3	0	0	1	0	0	1	4	0	9
311999	All Other Miscellaneous Food Manufacturing	5	15	0	0	2	0	0	0	2	0	24
312111	Soft Drink Manufacturing	1	1	0	0	0	0	0	0	2	0	4
312112	Bottled Water Manufacturing	0	1	0	0	0	0	0	0	0	0	1
312120	Breweries	0	3	0	0	0	0	0	3	5	0	11
313210	Broadwoven Fabric Mills	1	3	0	0	6	0	0	3	0	2	15
313310	Textile and Fabric Finishing Mills	0	5	0	0	0	0	0	1	2	8	16
313320	Fabric Coating Mills	0	1	0	0	2	0	0	1	0	0	4
314110	Carpet and Rug Mills	0	0	0	0	2	0	0	0	0	0	2
314120	Curtain and Linen Mills	0	0	0	0	0	0	0	1	0	0	1

TABLE - 2
Permit Applications Completed During Calendar Year 2016

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/ RECLAIM	Area Source/Cert. & Registration	Not Renewed	Grand Total
314999	All Other Miscellaneous Textile Product Mills	0	4	0	0	0	0	0	0	0	0	4
315190	Other Apparel Knitting Mills	2	3	0	0	0	0	0	0	0	0	5
315240	Women's, Girls', and Infants' Cut and Sew Apparel Manufacturing	0	1	0	0	0	0	0	0	0	0	1
316210	Footwear Manufacturing	0	0	0	0	1	0	0	0	0	0	1
321113	Sawmills	0	0	0	0	0	0	0	0	0	1	1
321911	Wood Window and Door Manufacturing	0	2	0	0	0	0	0	0	0	3	5
321918	Other Millwork (including Flooring)	0	1	0	0	0	0	0	0	0	3	4
321991	Manufactured Home (Mobile Home) Manufacturing	0	9	0	0	0	0	1	3	0	0	13
321999	All Other Miscellaneous Wood Product Manufacturing	0	0	0	0	0	0	0	0	0	2	2
322121	Paper (except Newsprint) Mills	1	8	0	0	9	0	0	4	0	0	22
322130	Paperboard Mills	0	10	0	0	1	0	0	4	0	0	15
322211	Corrugated and Solid Fiber Box Manufacturing	0	9	6	0	0	0	0	5	1	0	21

TABLE - 2
Permit Applications Completed During Calendar Year 2016

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/ RECLAIM	Area Source/Cert. & Registration	Not Renewed	Grand Total
322212	Folding Paperboard Box Manufacturing	1	0	0	0	0	0	0	1	0	0	2
322219	Other Paperboard Container Manufacturing	0	1	2	0	0	0	0	0	0	0	3
322220	Paper Bag and Coated and Treated Paper Manufacturing	0	10	0	0	0	0	0	0	0	8	18
322299	All Other Converted Paper Product Manufacturing	2	0	0	0	5	0	0	1	1	3	12
323111	Commercial Printing (except Screen and Books)	5	50	8	0	7	1	1	8	3	15	98
323113	Commercial Screen Printing	0	1	0	0	0	0	0	3	0	0	4
324110	Petroleum Refineries	8	18	363	0	36	5	18	53	0	0	501
324120	Asphalt Paving, Roofing, and Saturated Materials Manufacturing	0	0	9	0	0	0	0	0	0	0	9
324121	Asphalt Paving Mixture and Block Manufacturing	9	17	0	0	0	0	0	5	0	0	31
324122	Asphalt Shingle and Coating Materials Manufacturing	7	7	0	0	9	2	0	6	0	0	31
324191	Petroleum Lubricating Oil and Grease Manufacturing	2	23	0	0	7	2	0	2	0	0	36

TABLE - 2
Permit Applications Completed During Calendar Year 2016

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/ RECLAIM	Area Source/Cert. & Registration	Not Renewed	Grand Total
325110	Petrochemical Manufacturing	1	2	0	0	0	0	0	0	2	0	5
325120	Industrial Gas Manufacturing	0	4	0	0	2	1	1	1	0	0	9
325130	Synthetic Dye and Pigment Manufacturing	8	23	0	0	0	0	0	0	0	0	31
325180	Other Basic Inorganic Chemical Manufacturing	6	13	0	0	4	0	0	2	1	0	26
325199	All Other Basic Organic Chemical Manufacturing	0	0	0	0	3	0	0	0	0	0	3
325211	Plastics Material and Resin Manufacturing	3	10	0	0	8	0	0	0	2	1	24
325212	Synthetic Rubber Manufacturing	0	0	0	0	2	0	0	0	0	0	2
325311	Nitrogenous Fertilizer Manufacturing	0	9	0	0	0	0	0	0	0	0	9
325312	Phosphatic Fertilizer Manufacturing	0	1	0	0	0	0	0	0	0	0	1
325320	Pesticide and Other Agricultural Chemical Manufacturing	0	2	0	0	0	0	0	0	0	0	2
325411	Medicinal and Botanical Manufacturing	0	6	0	0	0	0	0	0	0	0	6
325412	Pharmaceutical Preparation Manufacturing	2	8	4	0	0	1	0	0	10	0	25

TABLE - 2
Permit Applications Completed During Calendar Year 2016

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/ RECLAIM	Area Source/Cert. & Registration	Not Renewed	Grand Total
325414	Biological Product (except Diagnostic) Manufacturing	1	0	0	0	0	0	0	1	0	0	2
325510	Paint and Coating Manufacturing	1	20	0	0	1	0	0	0	1	0	23
325520	Adhesive Manufacturing	0	9	0	0	0	0	0	0	0	0	9
325611	Soap and Other Detergent Manufacturing	0	11	0	0	0	0	0	0	0	0	11
325613	Surface Active Agent Manufacturing	0	0	0	0	0	0	0	1	0	0	1
325620	Toilet Preparation Manufacturing	0	6	0	0	0	0	0	0	2	0	8
325910	Printing Ink Manufacturing	0	5	0	0	10	0	0	0	0	0	15
325998	All Other Miscellaneous Chemical Product and Preparation Manufacturing	0	9	0	0	0	0	0	0	2	0	11
326111	Plastics Bag and Pouch Manufacturing	2	7	0	0	1	0	0	0	0	0	10
326113	Unlaminated Plastics Film and Sheet (except Packaging) Manufacturing	1	3	0	0	6	0	1	2	0	0	13
326130	Laminated Plastics Plate, Sheet (except Packaging), and Shape Manufacturing	0	2	0	0	0	0	1	1	0	12	16
326150	Urethane and Other Foam Product (except Polystyrene) Manufacturing	0	4	0	0	1	0	0	0	0	0	5

TABLE - 2
Permit Applications Completed During Calendar Year 2016

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/ RECLAIM	Area Source/Cert. & Registration	Not Renewed	Grand Total
326160	Plastics Bottle Manufacturing	0	13	0	0	0	0	0	0	0	0	13
326199	All Other Plastics Product Manufacturing	14	48	0	0	1	0	0	5	0	2	70
326299	All Other Rubber Product Manufacturing	0	7	0	0	7	0	0	0	0	0	14
327120	Clay Building Material and Refractories Manufacturing	1	10	0	0	4	0	0	0	1	0	16
327211	Flat Glass Manufacturing	0	1	0	0	0	0	0	0	0	0	1
327212	Other Pressed and Blown Glass and Glassware Manufacturing	0	3	0	0	0	0	0	1	0	0	4
327213	Glass Container Manufacturing	6	1	0	0	0	0	0	1	0	0	8
327215	Glass Product Manufacturing Made of Purchased Glass	0	1	0	0	0	0	0	0	1	0	2
327310	Cement Manufacturing	0	0	0	0	10	0	2	0	1	0	13
327320	Ready-Mix Concrete Manufacturing	0	24	0	0	0	0	0	0	0	0	24
327331	Concrete Block and Brick Manufacturing	0	8	0	0	0	0	0	0	0	0	8
327390	Other Concrete Product Manufacturing	4	15	12	0	1	0	0	3	0	0	35

TABLE - 2
Permit Applications Completed During Calendar Year 2016

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/ RECLAIM	Area Source/Cert. & Registration	Not Renewed	Grand Total
327410	Lime Manufacturing	0	0	14	0	0	0	0	0	0	0	14
327420	Gypsum Product Manufacturing	3	0	0	0	0	0	0	1	0	0	4
327910	Abrasive Product Manufacturing	0	0	0	0	3	0	0	0	0	0	3
327991	Cut Stone and Stone Product Manufacturing	0	2	0	0	0	0	0	0	0	0	2
327992	Ground or Treated Mineral and Earth Manufacturing	2	1	0	0	1	0	0	2	0	0	6
327999	All Other Miscellaneous Nonmetallic Mineral Product Manufacturing	0	3	2	0	0	0	0	0	0	0	5
331110	Iron and Steel Mills and Ferroalloy Manufacturing	0	3	6	0	0	0	0	0	1	0	10
331210	Iron and Steel Pipe and Tube Manufacturing from Purchased Steel	1	0	0	0	0	0	0	0	0	6	7
331221	Rolled Steel Shape Manufacturing	0	0	0	0	0	0	0	0	0	1	1
331222	Steel Wire Drawing	0	0	0	0	0	0	0	0	0	1	1
331315	Aluminum Sheet, Plate, and Foil Manufacturing	0	2	0	0	0	0	0	0	0	0	2
331318	Other Aluminum Rolling, Drawing, and Extruding	0	5	0	0	1	0	0	0	0	0	6

TABLE - 2
Permit Applications Completed During Calendar Year 2016

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/ RECLAIM	Area Source/Cert. & Registration	Not Renewed	Grand Total
331491	Nonferrous Metal (except Copper and Aluminum) Rolling, Drawing, and Extruding	0	8	0	0	2	0	0	0	0	0	10
331492	Secondary Smelting, Refining, and Alloying of Nonferrous Metal (except Copper and Aluminum)	4	12	0	0	11	0	4	5	0	0	36
331511	Iron Foundries	0	1	0	0	0	0	0	0	0	0	1
331512	Steel Investment Foundries	0	0	0	0	0	0	1	0	0	0	1
331523	Nonferrous Metal Die-Casting Foundries	0	5	0	0	0	0	0	0	0	4	9
331524	Aluminum Foundries (except Die-Casting)	0	9	0	0	3	0	0	0	0	0	12
331529	Other Nonferrous Metal Foundries (except Die-Casting)	0	2	0	0	0	0	0	0	0	5	7
332111	Iron and Steel Forging	0	1	0	0	0	0	0	0	0	0	1
332112	Nonferrous Forging	2	11	0	0	3	0	0	2	0	0	18
332119	Metal Crown, Closure, and Other Metal Stamping (except Automotive)	0	1	0	0	0	0	0	0	0	0	1
332182	#N/A	0	0	9	0	0	0	0	0	0	0	9

TABLE - 2
Permit Applications Completed During Calendar Year 2016

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/ RECLAIM	Area Source/Cert. & Registration	Not Renewed	Grand Total
332216	Saw Blade and Handtool Manufacturing	0	0	0	0	0	0	0	1	0	0	1
332311	Prefabricated Metal Building and Component Manufacturing	0	2	0	0	0	0	0	1	0	0	3
332312	Fabricated Structural Metal Manufacturing	2	2	0	0	4	0	0	2	0	0	10
332313	Plate Work Manufacturing	0	4	0	0	0	0	0	0	0	2	6
332321	Metal Window and Door Manufacturing	0	2	0	0	0	0	0	0	0	0	2
332322	Sheet Metal Work Manufacturing	1	17	0	1	0	0	1	1	1	10	32
332323	Ornamental and Architectural Metal Work Manufacturing	0	1	0	1	0	0	0	0	0	2	4
332431	Metal Can Manufacturing	0	2	0	0	0	0	0	0	2	0	4
332439	Other Metal Container Manufacturing	0	7	0	0	0	0	1	0	0	0	8
332510	Hardware Manufacturing	2	4	3	0	0	0	0	0	1	1	11
332613	Spring Manufacturing	0	3	0	0	0	0	0	0	0	0	3
332618	Other Fabricated Wire Product Manufacturing	0	5	0	0	1	0	0	0	0	0	6

TABLE - 2
Permit Applications Completed During Calendar Year 2016

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/ RECLAIM	Area Source/Cert. & Registration	Not Renewed	Grand Total
332710	Machine Shops	29	0	1	0	1	0	0	0	1	2	34
332722	Bolt, Nut, Screw, Rivet, and Washer Manufacturing	8	21	15	0	6	0	0	0	0	0	50
332811	Metal Heat Treating	0	2	0	0	0	0	0	1	1	0	4
332812	Metal Coating, Engraving (except Jewelry and Silverware), and Allied Services to Manufacturers	9	50	0	0	7	0	0	6	3	15	90
332813	Electroplating, Plating, Polishing, Anodizing, and Coloring	31	66	13	0	23	0	0	0	7	17	157
332911	Industrial Valve Manufacturing	0	0	0	0	0	0	0	0	0	1	1
332912	Fluid Power Valve and Hose Fitting Manufacturing	0	4	0	0	0	0	0	0	0	0	4
332919	Other Metal Valve and Pipe Fitting Manufacturing	0	5	0	0	0	0	0	0	0	1	6
332994	Small Arms, Ordnance, and Ordnance Accessories Manufacturing	1	0	0	0	0	0	0	0	0	0	1
332996	Fabricated Pipe and Pipe Fitting Manufacturing	0	1	0	0	0	0	0	0	0	0	1

TABLE - 2
Permit Applications Completed During Calendar Year 2016

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/ RECLAIM	Area Source/Cert. & Registration	Not Renewed	Grand Total
332999	All Other Miscellaneous Fabricated Metal Product Manufacturing	2	6	0	0	0	0	0	2	0	0	10
333111	Farm Machinery and Equipment Manufacturing	0	1	0	0	0	0	0	0	0	0	1
333120	Construction Machinery Manufacturing	0	1	0	0	0	0	0	0	0	0	1
333132	Oil and Gas Field Machinery and Equipment Manufacturing	1	1	0	0	1	0	0	0	0	0	3
333241	Food Product Machinery Manufacturing	0	2	0	0	0	0	0	0	0	0	2
333314	Optical Instrument and Lens Manufacturing	1	0	0	0	0	0	0	0	0	0	1
333316	Photographic and Photocopying Equipment Manufacturing	0	0	0	0	1	0	0	0	0	1	2
333318	Other Commercial and Service Industry Machinery Manufacturing	0	2	0	0	0	0	0	0	1	0	3
333413	Industrial and Commercial Fan and Blower and Air Purification Equipment Manufacturing	0	1	0	0	0	0	0	0	0	0	1
333415	Air-Conditioning and Warm Air Heating Equipment and Commercial and Industrial Refrigeration Equipment	0	1	0	0	0	0	0	0	1	1	3

TABLE - 2
Permit Applications Completed During Calendar Year 2016

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/ RECLAIM	Area Source/Cert. & Registration	Not Renewed	Grand Total
	Manufacturing											
333511	Industrial Mold Manufacturing	0	0	0	0	0	0	0	0	0	6	6
333514	Special Die and Tool, Die Set, Jig, and Fixture Manufacturing	2	5	0	1	0	0	0	0	0	3	11
333517	Machine Tool Manufacturing	0	1	0	0	0	0	0	0	0	1	2
333519	Rolling Mill and Other Metalworking Machinery Manufacturing	0	0	0	0	0	0	0	1	0	0	1
333612	Speed Changer, Industrial High-Speed Drive, and Gear Manufacturing	0	1	0	0	0	0	0	0	0	0	1
333911	Pump and Pumping Equipment Manufacturing	0	1	0	0	2	0	0	0	0	0	3
333921	Elevator and Moving Stairway Manufacturing	0	3	0	0	0	0	0	0	0	0	3
333922	Conveyor and Conveying Equipment Manufacturing	2	0	0	1	0	0	0	0	0	0	3
333924	Industrial Truck, Tractor, Trailer, and Stacker Machinery Manufacturing	0	3	0	0	0	0	0	0	0	0	3

TABLE - 2
Permit Applications Completed During Calendar Year 2016

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/ RECLAIM	Area Source/Cert. & Registration	Not Renewed	Grand Total
333991	Power-Driven Handtool Manufacturing	0	2	0	0	0	0	0	0	0	0	2
333999	All Other Miscellaneous General Purpose Machinery Manufacturing	0	0	0	0	0	0	0	0	1	0	1
334111	Electronic Computer Manufacturing	0	0	0	0	0	0	0	0	5	0	5
334112	Computer Storage Device Manufacturing	0	0	0	0	0	0	0	0	1	0	1
334118	Computer Terminal and Other Computer Peripheral Equipment Manufacturing	0	1	0	0	0	0	0	0	4	0	5
334220	Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing	1	9	0	0	1	0	0	2	8	0	21
334310	Audio and Video Equipment Manufacturing	0	0	0	0	0	0	0	0	0	1	1
334412	Bare Printed Circuit Board Manufacturing	0	0	0	0	0	0	0	0	0	1	1
334413	Semiconductor and Related Device Manufacturing	0	26	1	0	5	0	0	0	0	0	32
334416	Capacitor, Resistor, Coil, Transformer, and Other Inductor Manufacturing	0	2	0	0	2	0	0	0	2	0	6

TABLE - 2
Permit Applications Completed During Calendar Year 2016

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/ RECLAIM	Area Source/Cert. & Registration	Not Renewed	Grand Total
334418	Printed Circuit Assembly (Electronic Assembly) Manufacturing	1	8	16	0	0	0	0	1	0	5	31
334419	Other Electronic Component Manufacturing	0	9	1	0	1	0	1	2	4	0	18
334510	Electromedical and Electrotherapeutic Apparatus Manufacturing	0	1	0	0	3	0	0	0	2	0	6
334511	Search, Detection, Navigation, Guidance, Aeronautical, and Nautical System and Instrument Manufacturing	1	8	0	0	4	0	0	3	2	0	18
334514	Totalizing Fluid Meter and Counting Device Manufacturing	0	1	0	0	0	0	0	0	0	0	1
334515	Instrument Manufacturing for Measuring and Testing Electricity and Electrical Signals	0	0	0	0	0	0	0	0	2	0	2
334516	Analytical Laboratory Instrument Manufacturing	0	2	0	0	0	0	0	0	4	0	6
334613	Blank Magnetic and Optical Recording Media Manufacturing	0	14	0	0	0	0	0	0	0	0	14

TABLE - 2
Permit Applications Completed During Calendar Year 2016

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/ RECLAIM	Area Source/Cert. & Registration	Not Renewed	Grand Total
334614	Software and Other Prerecorded Compact Disc, Tape, and Record Reproducing	0	14	0	0	7	0	0	0	0	1	22
335110	Electric Lamp Bulb and Part Manufacturing	1	1	0	0	0	0	0	1	0	0	3
335121	Residential Electric Lighting Fixture Manufacturing	0	2	0	0	1	0	0	0	0	0	3
335122	Commercial, Industrial, and Institutional Electric Lighting Fixture Manufacturing	3	4	0	0	1	0	0	0	0	0	8
335129	Other Lighting Equipment Manufacturing	0	5	0	0	1	0	0	0	0	0	6
335221	Household Cooking Appliance Manufacturing	0	7	0	0	0	0	0	0	0	0	7
335311	Power, Distribution, and Specialty Transformer Manufacturing	0	2	0	0	0	0	0	0	0	0	2
335312	Motor and Generator Manufacturing	0	0	0	0	0	1	0	1	0	0	2
335313	Switchgear and Switchboard Apparatus Manufacturing	0	1	0	0	0	0	0	0	0	0	1
335314	Relay and Industrial Control Manufacturing	0	0	0	0	15	0	0	5	0	0	20

TABLE - 2
Permit Applications Completed During Calendar Year 2016

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/ RECLAIM	Area Source/Cert. & Registration	Not Renewed	Grand Total
335911	Storage Battery Manufacturing	0	2	2	0	0	0	0	0	0	0	4
335931	Current-Carrying Wiring Device Manufacturing	0	5	0	0	1	0	0	0	0	0	6
335932	Noncurrent-Carrying Wiring Device Manufacturing	0	2	0	0	0	0	0	1	0	0	3
335999	All Other Miscellaneous Electrical Equipment and Component Manufacturing	0	7	0	0	0	0	0	0	1	2	10
336111	Automobile Manufacturing	0	1	0	0	0	0	0	0	0	1	2
336120	Heavy Duty Truck Manufacturing	0	1	0	1	0	0	0	0	0	0	2
336211	Motor Vehicle Body Manufacturing	0	1	0	0	0	0	0	0	0	0	1
336214	Travel Trailer and Camper Manufacturing	0	3	0	0	1	0	1	2	0	0	7
336320	Motor Vehicle Electrical and Electronic Equipment Manufacturing	0	0	0	0	0	0	0	0	0	1	1
336360	Motor Vehicle Seating and Interior Trim Manufacturing	0	1	0	0	0	0	0	0	0	0	1
336390	Other Motor Vehicle Parts Manufacturing	1	7	0	0	0	0	1	0	0	2	11
336411	Aircraft Manufacturing	5	30	0	0	12	0	0	5	2	0	54

TABLE - 2
Permit Applications Completed During Calendar Year 2016

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/ RECLAIM	Area Source/Cert. & Registration	Not Renewed	Grand Total
336412	Aircraft Engine and Engine Parts Manufacturing	4	2	0	0	1	0	0	0	1	0	8
336413	Other Aircraft Parts and Auxiliary Equipment Manufacturing	16	22	22	1	5	0	0	8	5	0	79
336414	Guided Missile and Space Vehicle Manufacturing	0	4	0	0	4	0	0	0	1	0	9
336419	Other Guided Missile and Space Vehicle Parts and Auxiliary Equipment Manufacturing	0	29	0	0	0	0	0	2	0	0	31
336611	Ship Building and Repairing	0	1	0	0	0	0	0	0	0	0	1
336612	Boat Building	0	0	0	0	0	0	0	0	0	2	2
336991	Motorcycle, Bicycle, and Parts Manufacturing	0	8	0	0	0	0	0	0	0	0	8
337110	Wood Kitchen Cabinet and Countertop Manufacturing	0	5	0	0	0	0	0	0	0	2	7
337121	Upholstered Household Furniture Manufacturing	0	2	0	0	0	0	0	0	0	6	8
337122	Nonupholstered Wood Household Furniture Manufacturing	0	4	0	0	1	0	0	2	0	0	7
337124	Metal Household Furniture Manufacturing	0	5	0	0	0	0	0	1	0	1	7

TABLE - 2
Permit Applications Completed During Calendar Year 2016

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/ RECLAIM	Area Source/Cert. & Registration	Not Renewed	Grand Total
337125	Household Furniture (except Wood and Metal) Manufacturing	0	2	0	0	0	0	0	0	0	0	2
337127	Institutional Furniture Manufacturing	0	4	0	0	0	0	0	0	0	0	4
337211	Wood Office Furniture Manufacturing	0	2	0	0	0	0	0	0	0	4	6
337212	Custom Architectural Woodwork and Millwork Manufacturing	0	1	0	0	0	0	0	0	0	1	2
337214	Office Furniture (except Wood) Manufacturing	0	4	0	0	0	0	0	3	0	0	7
337215	Showcase, Partition, Shelving, and Locker Manufacturing	1	2	0	0	0	0	0	0	0	1	4
337910	Mattress Manufacturing	0	0	1	0	1	0	0	0	2	7	11
339112	Surgical and Medical Instrument Manufacturing	0	0	2	0	0	0	0	1	9	0	12
339113	Surgical Appliance and Supplies Manufacturing	0	0	0	0	0	0	0	1	0	0	1
339114	Dental Equipment and Supplies Manufacturing	3	10	0	0	0	0	0	0	0	0	13
339115	Ophthalmic Goods Manufacturing	4	9	0	0	4	0	0	0	0	0	17
339116	Dental Laboratories	0	0	0	0	0	0	0	0	1	0	1
339910	Jewelry and Silverware Manufacturing	0	1	0	0	0	0	0	0	0	7	8

TABLE - 2
Permit Applications Completed During Calendar Year 2016

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/ RECLAIM	Area Source/Cert. & Registration	Not Renewed	Grand Total
339920	Sporting and Athletic Goods Manufacturing	0	0	0	0	0	0	0	0	0	1	1
339930	Doll, Toy, and Game Manufacturing	0	3	0	0	0	0	0	0	0	0	3
339940	Office Supplies (except Paper) Manufacturing	0	0	0	0	0	0	0	0	4	0	4
339950	Sign Manufacturing	0	10	0	0	0	0	0	0	0	2	12
339991	Gasket, Packing, and Sealing Device Manufacturing	0	2	0	0	0	0	0	0	0	2	4
339992	Musical Instrument Manufacturing	0	2	0	0	0	0	0	0	1	0	3
339999	All Other Miscellaneous Manufacturing	0	9	0	0	0	0	0	1	4	12	26
423110	Automobile and Other Motor Vehicle Merchant Wholesalers	0	5	0	0	0	0	2	0	0	2	9
423120	Motor Vehicle Supplies and New Parts Merchant Wholesalers	5	11	2	0	2	0	1	0	0	10	31
423130	Tire and Tube Merchant Wholesalers	0	1	0	0	0	0	0	0	0	1	2
423140	Motor Vehicle Parts (Used) Merchant Wholesalers	0	0	0	0	1	0	0	0	0	0	1
423210	Furniture Merchant Wholesalers	0	2	0	0	0	0	0	0	0	0	2

TABLE - 2
Permit Applications Completed During Calendar Year 2016

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/ RECLAIM	Area Source/Cert. & Registration	Not Renewed	Grand Total
423220	Home Furnishing Merchant Wholesalers	0	2	0	0	0	0	0	0	0	0	2
423310	Lumber, Plywood, Millwork, and Wood Panel Merchant Wholesalers	0	0	0	0	0	0	0	1	0	0	1
423320	Brick, Stone, and Related Construction Material Merchant Wholesalers	4	14	0	0	0	0	0	1	0	0	19
423410	Photographic Equipment and Supplies Merchant Wholesalers	0	2	0	0	0	0	0	0	0	0	2
423420	Office Equipment Merchant Wholesalers	0	1	0	0	0	0	0	0	0	0	1
423430	Computer and Computer Peripheral Equipment and Software Merchant Wholesalers	0	5	0	0	4	0	0	0	0	0	9
423440	Other Commercial Equipment Merchant Wholesalers	0	0	0	0	0	0	0	0	0	1	1
423450	Medical, Dental, and Hospital Equipment and Supplies Merchant Wholesalers	0	3	0	0	0	0	0	0	2	3	8
423510	Metal Service Centers and Other Metal Merchant Wholesalers	0	4	0	0	0	0	0	0	0	0	4

TABLE - 2
Permit Applications Completed During Calendar Year 2016

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/ RECLAIM	Area Source/Cert. & Registration	Not Renewed	Grand Total
423610	Electrical Apparatus and Equipment, Wiring Supplies, and Related Equipment Merchant Wholesalers	0	3	0	0	1	0	0	0	2	0	6
423690	Other Electronic Parts and Equipment Merchant Wholesalers	0	1	0	0	0	0	0	0	1	0	2
423720	Plumbing and Heating Equipment and Supplies (Hydronics) Merchant Wholesalers	0	2	0	1	1	0	0	0	0	0	4
423810	Construction and Mining (except Oil Well) Machinery and Equipment Merchant Wholesalers	0	3	0	0	3	0	0	0	0	0	6
423820	Farm and Garden Machinery and Equipment Merchant Wholesalers	0	3	0	1	2	0	0	0	0	0	6
423830	Industrial Machinery and Equipment Merchant Wholesalers	0	9	0	0	4	0	0	1	10	1	25
423840	Industrial Supplies Merchant Wholesalers	3	23	0	1	3	0	0	0	1	1	32
423850	Service Establishment Equipment and Supplies Merchant Wholesalers	0	1	0	0	0	0	0	0	0	2	3

TABLE - 2
Permit Applications Completed During Calendar Year 2016

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/ RECLAIM	Area Source/Cert. & Registration	Not Renewed	Grand Total
423860	Transportation Equipment and Supplies (except Motor Vehicle) Merchant Wholesalers	0	2	0	0	0	0	0	0	0	0	2
423910	Sporting and Recreational Goods and Supplies Merchant Wholesalers	0	3	0	0	0	0	0	0	0	0	3
423920	Toy and Hobby Goods and Supplies Merchant Wholesalers	7	4	0	0	0	0	0	1	1	0	13
423930	Recyclable Material Merchant Wholesalers	2	13	0	2	1	0	0	0	4	13	35
423940	Jewelry, Watch, Precious Stone, and Precious Metal Merchant Wholesalers	0	1	0	0	0	0	0	0	0	0	1
423990	Other Miscellaneous Durable Goods Merchant Wholesalers	0	6	0	0	2	0	0	0	1	0	9
424130	Industrial and Personal Service Paper Merchant Wholesalers	0	6	0	0	0	0	0	0	0	0	6
424210	Drugs and Druggists' Sundries Merchant Wholesalers	2	2	0	0	1	0	0	0	0	0	5
424320	Men's and Boys' Clothing and Furnishings Merchant Wholesalers	0	1	0	0	0	0	0	0	2	0	3
424340	Footwear Merchant Wholesalers	0	0	0	0	0	0	0	0	0	1	1

TABLE - 2
Permit Applications Completed During Calendar Year 2016

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/ RECLAIM	Area Source/Cert. & Registration	Not Renewed	Grand Total
424410	General Line Grocery Merchant Wholesalers	0	1	0	0	0	0	0	0	0	0	1
424420	Packaged Frozen Food Merchant Wholesalers	1	9	12	0	0	0	0	0	1	0	23
424450	Confectionery Merchant Wholesalers	0	0	0	0	0	0	0	0	1	0	1
424460	Fish and Seafood Merchant Wholesalers	0	0	0	0	0	0	0	0	3	0	3
424470	Meat and Meat Product Merchant Wholesalers	0	0	0	0	0	0	0	0	1	0	1
424490	Other Grocery and Related Products Merchant Wholesalers	0	3	0	0	2	0	0	0	1	0	6
424590	Other Farm Product Raw Material Merchant Wholesalers	0	0	0	0	0	0	0	0	0	2	2
424690	Other Chemical and Allied Products Merchant Wholesalers	0	13	0	0	2	0	0	0	0	0	15
424710	Petroleum Bulk Stations and Terminals	0	6	74	0	3	0	8	6	0	0	97
424720	Petroleum and Petroleum Products Merchant Wholesalers (except Bulk Stations and Terminals)	1	13	1	1	13	0	0	2	3	0	34

TABLE - 2
Permit Applications Completed During Calendar Year 2016

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/ RECLAIM	Area Source/Cert. & Registration	Not Renewed	Grand Total
424820	Wine and Distilled Alcoholic Beverage Merchant Wholesalers	0	0	0	0	0	0	0	0	3	0	3
424910	Farm Supplies Merchant Wholesalers	0	12	0	0	0	0	0	0	0	0	12
424950	Paint, Varnish, and Supplies Merchant Wholesalers	1	11	1	0	0	0	0	0	0	1	14
424990	Other Miscellaneous Nondurable Goods Merchant Wholesalers	0	3	0	0	0	0	1	0	0	2	6
441110	New Car Dealers	5	27	3	0	5	0	0	0	3	4	47
441120	Used Car Dealers	1	6	0	0	0	0	0	0	0	0	7
441222	Boat Dealers	0	1	0	0	0	0	0	0	0	0	1
441228	Motorcycle, ATV, and All Other Motor Vehicle Dealers	1	1	1	0	1	0	1	0	0	1	6
441310	Automotive Parts and Accessories Stores	0	8	0	1	0	0	0	0	0	2	11
442110	Furniture Stores	0	3	0	0	1	0	0	0	0	1	5
442210	Floor Covering Stores	3	0	0	0	0	0	0	2	0	0	5
442299	All Other Home Furnishings Stores	0	2	0	0	0	0	0	0	0	0	2
443141	Household Appliance Stores	0	0	0	0	0	0	0	0	1	0	1
443142	Electronics Stores	0	0	0	0	0	0	0	0	3	0	3

TABLE - 2
Permit Applications Completed During Calendar Year 2016

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/ RECLAIM	Area Source/Cert. & Registration	Not Renewed	Grand Total
444110	Home Centers	0	7	0	0	8	0	0	1	5	2	23
444120	Paint and Wallpaper Stores	0	3	0	0	0	0	0	0	0	1	4
444130	Hardware Stores	0	1	0	0	0	0	0	0	0	0	1
444190	Other Building Material Dealers	0	4	0	0	0	0	0	0	0	6	10
444220	Nursery, Garden Center, and Farm Supply Stores	0	0	0	0	0	0	0	0	0	2	2
445110	Supermarkets and Other Grocery (except Convenience) Stores	0	18	0	2	1	1	0	1	251	12	286
445120	Convenience Stores	4	52	0	0	2	0	1	0	0	3	62
445291	Baked Goods Stores	0	0	0	0	0	0	0	0	0	1	1
445299	All Other Specialty Food Stores	0	1	0	0	0	0	0	0	0	2	3
445310	Beer, Wine, and Liquor Stores	0	1	0	0	0	0	0	0	0	1	2
446110	Pharmacies and Drug Stores	0	2	0	0	1	0	0	0	13	0	16
446120	Cosmetics, Beauty Supplies, and Perfume Stores	0	5	0	0	0	0	0	0	0	0	5
446130	Optical Goods Stores	0	1	0	0	0	0	0	0	0	0	1
446199	All Other Health and Personal Care Stores	0	0	1	0	0	0	0	0	0	0	1
447100	Gasoline Stations	1	0	0	0	0	0	0	0	0	0	1

TABLE - 2
Permit Applications Completed During Calendar Year 2016

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/ RECLAIM	Area Source/Cert. & Registration	Not Renewed	Grand Total
447110	Gasoline Stations with Convenience Stores	0	1	0	0	0	0	0	0	0	0	1
447190	Other Gasoline Stations	42	209	126	0	8	0	2	10	4	14	415
448110	Men's Clothing Stores	0	0	0	0	0	0	0	0	2	0	2
448120	Women's Clothing Stores	0	0	0	0	2	0	0	1	1	0	4
448140	Family Clothing Stores	0	0	0	0	0	0	0	0	1	1	2
448310	Jewelry Stores	0	0	0	0	0	0	1	0	0	0	1
451110	Sporting Goods Stores	0	0	0	0	0	0	0	0	0	1	1
451130	Sewing, Needlework, and Piece Goods Stores	0	0	3	0	1	0	0	0	1	0	5
451211	Book Stores	0	2	0	0	0	0	1	0	17	0	20
452111	Department Stores (except Discount Department Stores)	0	3	0	0	0	0	0	0	2	2	7
452112	Discount Department Stores	0	2	0	0	0	0	0	0	0	0	2
452910	Warehouse Clubs and Supercenters	1	33	0	0	3	108	0	0	0	0	145
452990	All Other General Merchandise Stores	0	2	0	0	0	0	0	0	0	0	2
453110	Florists	0	0	0	0	0	0	0	0	3	0	3
453210	Office Supplies and Stationery Stores	0	1	0	0	0	0	0	0	0	0	1
453220	Gift, Novelty, and Souvenir Stores	0	7	2	0	0	0	0	2	3	0	14
453310	Used Merchandise Stores	2	2	0	0	0	0	0	0	1	0	5

TABLE - 2
Permit Applications Completed During Calendar Year 2016

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/ RECLAIM	Area Source/Cert. & Registration	Not Renewed	Grand Total
453910	Pet and Pet Supplies Stores	1	0	0	0	0	0	0	0	0	0	1
453920	Art Dealers	0	0	0	0	0	0	0	0	1	1	2
453930	Manufactured (Mobile) Home Dealers	0	7	0	0	0	0	1	2	0	0	10
453998	All Other Miscellaneous Store Retailers (except Tobacco Stores)	0	14	0	0	2	0	0	1	7	0	24
454113	Mail-Order Houses	0	1	0	0	0	0	1	0	3	0	5
454210	Vending Machine Operators	0	3	0	0	0	0	0	1	0	0	4
454310	Fuel Dealers	0	4	0	0	1	0	0	0	0	3	8
454390	Other Direct Selling Establishments	0	2	0	0	0	0	0	0	1	0	3
481111	Scheduled Passenger Air Transportation	0	14	1	0	1	1	1	3	1	0	22
481219	Other Nonscheduled Air Transportation	0	0	0	1	0	0	0	0	0	0	1
482111	Line-Haul Railroads	0	4	0	0	0	0	0	0	0	0	4
483112	Deep Sea Passenger Transportation	0	0	0	0	0	0	0	0	0	2	2
484110	General Freight Trucking, Local	0	1	0	0	0	0	1	2	2	3	9
484121	General Freight Trucking, Long-Distance, Truckload	0	2	0	0	0	0	0	0	1	0	3
484230	Specialized Freight (except Used Goods) Trucking, Long-Distance	0	4	0	0	0	0	0	0	0	0	4

TABLE - 2
Permit Applications Completed During Calendar Year 2016

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/ RECLAIM	Area Source/Cert. & Registration	Not Renewed	Grand Total
485111	Mixed Mode Transit Systems	0	3	0	0	0	0	0	0	0	0	3
485112	Commuter Rail Systems	0	1	0	0	0	0	0	0	0	0	1
485113	Bus and Other Motor Vehicle Transit Systems	0	6	0	0	1	0	0	1	1	0	9
485310	Taxi Service	0	0	0	0	0	0	0	0	1	0	1
485320	Limousine Service	0	0	0	0	0	0	0	0	1	0	1
485410	School and Employee Bus Transportation	0	0	0	0	0	0	0	0	1	0	1
485999	All Other Transit and Ground Passenger Transportation	0	0	0	0	0	0	0	0	0	1	1
486110	Pipeline Transportation of Crude Oil	0	1	5	0	0	0	1	3	0	0	10
486210	Pipeline Transportation of Natural Gas	0	45	0	0	0	1	0	4	0	0	50
488110	Airport Operations	0	14	0	0	1	0	0	5	0	0	20
488111	Air Traffic Control	0	0	0	0	0	0	0	0	0	1	1
488119	Other Airport Operations	0	4	0	1	0	0	0	1	5	0	11
488190	Other Support Activities for Air Transportation	0	1	0	0	0	0	0	0	0	0	1
488210	Support Activities for Rail Transportation	0	12	0	0	5	0	1	1	0	0	19
488320	Marine Cargo Handling	0	2	0	0	0	0	1	0	0	0	3

TABLE - 2
Permit Applications Completed During Calendar Year 2016

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/ RECLAIM	Area Source/Cert. & Registration	Not Renewed	Grand Total
488410	Motor Vehicle Towing	0	1	0	0	1	0	0	0	0	0	2
488490	Other Support Activities for Road Transportation	0	1	0	0	0	0	0	0	2	0	3
488510	Freight Transportation Arrangement	0	1	1	1	0	0	1	0	0	0	4
488991	Packing and Crating	0	1	0	0	0	0	0	0	0	1	2
488999	All Other Support Activities for Transportation	1	6	0	0	2	0	1	1	2	0	13
491110	Postal Service	0	0	0	0	0	0	0	0	4	1	5
492210	Local Messengers and Local Delivery	0	1	0	0	0	0	0	0	0	0	1
493110	General Warehousing and Storage	7	8	0	8	2	0	0	1	8	0	34
493120	Refrigerated Warehousing and Storage	0	1	0	0	0	0	0	0	0	0	1
493190	Other Warehousing and Storage	0	12	0	0	2	0	2	5	0	0	21
511110	Newspaper Publishers	0	0	0	0	0	0	0	0	1	0	1
511120	Periodical Publishers	0	0	0	0	0	0	0	0	1	0	1
511199	All Other Publishers	0	1	0	0	3	0	0	0	0	6	10
512110	Motion Picture and Video Production	0	9	0	0	0	0	1	1	12	1	24
512131	Motion Picture Theaters (except Drive-Ins)	0	2	0	0	0	0	0	0	0	0	2

TABLE - 2
Permit Applications Completed During Calendar Year 2016

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/ RECLAIM	Area Source/Cert. & Registration	Not Renewed	Grand Total
512132	Drive-In Motion Picture Theaters	0	0	0	0	0	0	0	0	1	0	1
512191	Teleproduction and Other Postproduction Services	0	9	0	0	0	0	0	0	0	0	9
512199	Other Motion Picture and Video Industries	0	1	0	0	0	0	0	0	0	1	2
512240	Sound Recording Studios	0	0	0	0	0	0	0	0	1	0	1
515120	Television Broadcasting	0	7	0	1	0	0	1	0	1	2	12
515210	Cable and Other Subscription Programming	0	1	0	0	0	0	1	0	4	2	8
517110	Wired Telecommunications Carriers	0	1	0	0	0	0	0	0	0	0	1
517210	Wireless Telecommunications Carriers (except Satellite)	0	19	188	0	2	0	0	0	16	1	226
517410	Satellite Telecommunications	0	0	0	0	0	0	0	0	0	2	2
517911	Telecommunications Resellers	0	5	0	0	7	0	1	0	54	0	67
517919	All Other Telecommunications	0	1	0	1	1	0	0	0	1	1	5
518210	Data Processing, Hosting, and Related Services	0	2	0	0	0	0	0	0	0	0	2
519120	Libraries and Archives	0	0	0	2	0	0	1	0	14	0	17
522110	Commercial Banking	0	5	1	0	1	0	0	0	6	0	13

TABLE - 2
Permit Applications Completed During Calendar Year 2016

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/ RECLAIM	Area Source/Cert. & Registration	Not Renewed	Grand Total
522120	Savings Institutions	0	0	0	0	0	0	0	0	0	2	2
522130	Credit Unions	0	2	0	0	0	0	1	0	5	0	8
522220	Sales Financing	0	0	0	0	0	0	0	0	2	0	2
522291	Consumer Lending	0	1	0	0	0	0	0	0	0	0	1
522292	Real Estate Credit	0	1	0	0	0	0	0	0	0	0	1
522320	Financial Transactions Processing, Reserve, and Clearinghouse Activities	0	3	0	0	0	0	0	1	1	0	5
523110	Investment Banking and Securities Dealing	0	0	0	1	0	0	0	0	1	0	2
523120	Securities Brokerage	0	0	0	0	0	0	0	0	0	1	1
523910	Miscellaneous Intermediation	2	4	0	0	0	0	0	0	3	1	10
523930	Investment Advice	0	2	1	0	0	0	0	0	1	0	4
523991	Trust, Fiduciary, and Custody Activities	0	0	0	0	1	0	0	0	2	1	4
523999	Miscellaneous Financial Investment Activities	0	1	0	0	0	0	0	0	0	0	1
524113	Direct Life Insurance Carriers	0	1	0	0	0	0	0	0	0	0	1
524114	Direct Health and Medical Insurance Carriers	0	2	0	0	0	0	0	0	1	2	5
524126	Direct Property and Casualty Insurance Carriers	0	0	0	0	0	0	0	0	2	0	2

TABLE - 2
Permit Applications Completed During Calendar Year 2016

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/ RECLAIM	Area Source/Cert. & Registration	Not Renewed	Grand Total
524210	Insurance Agencies and Brokerages	0	2	0	0	0	0	0	0	4	5	11
524298	All Other Insurance Related Activities	0	0	0	0	0	0	0	0	17	0	17
525110	Pension Funds	0	1	0	0	0	0	0	0	0	0	1
531110	Lessors of Residential Buildings and Dwellings	0	37	9	0	1	0	1	1	27	2	78
531120	Lessors of Nonresidential Buildings (except Miniwarehouses)	0	2	3	0	1	0	3	0	18	0	27
531190	Lessors of Other Real Estate Property	0	0	1	0	0	0	0	0	3	1	5
531210	Offices of Real Estate Agents and Brokers	0	24	4	0	0	0	1	0	31	7	67
531311	Residential Property Managers	0	1	0	0	0	0	0	0	0	0	1
531312	Nonresidential Property Managers	2	7	14	0	0	0	1	0	8	2	34
531390	Other Activities Related to Real Estate	0	2	0	0	0	0	0	0	0	0	2
532111	Passenger Car Rental	0	2	0	0	0	0	0	0	1	0	3
532112	Passenger Car Leasing	0	0	0	0	0	0	0	0	1	0	1
532120	Truck, Utility Trailer, and RV (Recreational Vehicle) Rental and Leasing	0	0	0	0	0	0	0	0	1	0	1
532220	Formal Wear and Costume Rental	0	2	0	0	0	0	0	0	0	1	3

TABLE - 2
Permit Applications Completed During Calendar Year 2016

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/ RECLAIM	Area Source/Cert. & Registration	Not Renewed	Grand Total
532299	All Other Consumer Goods Rental	0	0	0	0	0	0	0	0	0	1	1
532412	Construction, Mining, and Forestry Machinery and Equipment Rental and Leasing	0	6	0	0	0	0	0	0	0	1	7
532490	Other Commercial and Industrial Machinery and Equipment Rental and Leasing	0	13	0	0	2	0	0	0	44	4	63
533110	Lessors of Nonfinancial Intangible Assets (except Copyrighted Works)	0	2	0	1	0	0	0	0	0	0	3
541110	Offices of Lawyers	0	1	0	0	0	0	0	0	5	0	6
541213	Tax Preparation Services	0	0	0	0	0	0	0	0	1	0	1
541310	Architectural Services	0	4	0	0	5	0	0	0	0	1	10
541320	Landscape Architectural Services	8	14	0	0	3	0	0	0	5	0	30
541330	Engineering Services	0	8	0	0	4	0	9	0	43	15	79
541380	Testing Laboratories	0	7	0	1	1	0	0	0	3	0	12
541410	Interior Design Services	0	3	0	0	0	0	0	1	0	0	4
541420	Industrial Design Services	0	0	0	0	0	0	0	0	1	0	1
541430	Graphic Design Services	0	1	0	0	2	0	0	0	0	0	3

TABLE - 2
Permit Applications Completed During Calendar Year 2016

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/ RECLAIM	Area Source/Cert. & Registration	Not Renewed	Grand Total
541511	Custom Computer Programming Services	0	1	0	0	0	0	0	0	0	1	2
541512	Computer Systems Design Services	1	1	0	0	0	0	0	0	1	2	5
541519	Other Computer Related Services	0	0	0	0	0	0	1	0	0	0	1
541611	Administrative Management and General Management Consulting Services	0	11	1	1	2	0	1	0	19	3	38
541612	Human Resources Consulting Services	0	0	0	0	0	0	0	0	1	0	1
541613	Marketing Consulting Services	0	0	0	0	0	3	0	0	0	1	4
541614	Process, Physical Distribution, and Logistics Consulting Services	0	1	0	0	0	0	0	0	0	0	1
541618	Other Management Consulting Services	0	7	0	0	0	0	0	0	1	2	10
541620	Environmental Consulting Services	0	9	1	0	3	0	17	0	23	34	87
541690	Other Scientific and Technical Consulting Services	0	0	2	1	1	0	1	0	3	0	8
541711	Research and Development in Biotechnology	0	4	0	0	0	0	0	0	2	0	6

TABLE - 2
Permit Applications Completed During Calendar Year 2016

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/ RECLAIM	Area Source/Cert. & Registration	Not Renewed	Grand Total
541712	Research and Development in the Physical, Engineering, and Life Sciences (except Biotechnology)	1	25	0	0	0	0	2	0	5	1	34
541720	Research and Development in the Social Sciences and Humanities	0	0	0	0	0	0	0	0	2	0	2
541810	Advertising Agencies	0	1	0	0	0	0	0	0	2	0	3
541830	Media Buying Agencies	0	0	0	0	0	0	0	0	1	0	1
541850	Outdoor Advertising	1	1	0	0	0	0	0	0	0	0	2
541860	Direct Mail Advertising	0	1	0	0	0	0	0	0	0	0	1
541890	Other Services Related to Advertising	0	2	0	0	0	0	0	0	0	0	2
541910	Marketing Research and Public Opinion Polling	1	2	0	0	0	0	0	0	2	0	5
541921	Photography Studios, Portrait	0	0	0	0	0	0	0	0	1	0	1
541940	Veterinary Services	0	2	1	0	0	0	0	0	0	0	3
541990	All Other Professional, Scientific, and Technical Services	2	8	0	0	2	0	1	0	8	65	86
551112	Offices of Other Holding Companies	0	6	0	0	0	0	0	1	16	0	23

TABLE - 2
Permit Applications Completed During Calendar Year 2016

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/ RECLAIM	Area Source/Cert. & Registration	Not Renewed	Grand Total
561110	Office Administrative Services	8	10	1	0	1	0	1	1	13	1	36
561210	Facilities Support Services	0	0	1	0	0	0	3	0	0	0	4
561410	Document Preparation Services	0	0	0	0	0	0	0	0	0	1	1
561421	Telephone Answering Services	0	0	0	0	0	0	1	0	0	0	1
561431	Private Mail Centers	0	0	0	0	0	0	0	0	1	0	1
561440	Collection Agencies	0	1	0	2	0	0	0	0	0	0	3
561491	Repossession Services	0	0	0	0	0	0	0	0	0	3	3
561499	All Other Business Support Services	6	17	1	0	4	0	1	0	2	0	31
561510	Travel Agencies	0	1	1	0	0	0	0	0	0	0	2
561612	Security Guards and Patrol Services	0	1	0	0	0	0	0	0	0	0	1
561621	Security Systems Services (except Locksmiths)	0	0	0	0	0	0	0	0	1	0	1
561720	Janitorial Services	1	5	3	1	0	0	0	0	11	3	24
561730	Landscaping Services	0	3	0	0	1	0	0	0	0	3	7
561790	Other Services to Buildings and Dwellings	0	9	1	0	1	0	0	0	2	2	15
561910	Packaging and Labeling Services	2	8	0	0	0	0	0	0	0	0	10
561990	All Other Support Services	1	6	2	1	2	0	2	1	4	10	29

TABLE - 2
Permit Applications Completed During Calendar Year 2016

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/ RECLAIM	Area Source/Cert. & Registration	Not Renewed	Grand Total
562112	Hazardous Waste Collection	0	4	0	0	0	0	2	0	0	0	6
562211	Hazardous Waste Treatment and Disposal	0	6	0	0	0	0	1	0	7	0	14
562212	Solid Waste Landfill	1	22	0	0	8	0	2	3	3	1	40
562219	Other Nonhazardous Waste Treatment and Disposal	0	1	0	0	3	0	0	0	0	0	4
562910	Remediation Services	0	9	0	0	3	0	2	0	57	148	219
562920	Materials Recovery Facilities	0	8	2	0	8	0	1	4	2	7	32
562998	All Other Miscellaneous Waste Management Services	0	2	0	0	0	0	0	0	0	0	2
611110	Elementary and Secondary Schools	0	25	2	4	2	0	0	0	72	9	114
611210	Junior Colleges	0	2	0	0	0	0	1	2	14	0	19
611310	Colleges, Universities, and Professional Schools	0	34	1	0	1	1	2	6	31	1	77
611519	Other Technical and Trade Schools	0	11	0	0	0	0	0	0	0	0	11
611620	Sports and Recreation Instruction	0	1	0	0	0	0	0	0	0	0	1
611699	All Other Miscellaneous Schools and Instruction	0	0	0	0	0	0	0	0	1	0	1
611710	Educational Support Services	6	0	0	0	0	0	0	0	0	0	6

TABLE - 2
Permit Applications Completed During Calendar Year 2016

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/ RECLAIM	Area Source/Cert. & Registration	Not Renewed	Grand Total
621111	Offices of Physicians (except Mental Health Specialists)	0	8	0	0	8	0	1	0	16	1	34
621112	Offices of Physicians, Mental Health Specialists	0	5	0	0	0	0	1	1	6	0	13
621210	Offices of Dentists	0	0	0	0	0	0	0	0	1	1	2
621310	Offices of Chiropractors	0	0	0	0	0	0	0	0	1	0	1
621340	Offices of Physical, Occupational and Speech Therapists, and Audiologists	0	0	0	0	0	0	0	0	1	0	1
621399	Offices of All Other Miscellaneous Health Practitioners	0	0	0	0	0	0	0	0	1	0	1
621491	HMO Medical Centers	0	0	0	0	0	0	0	0	1	0	1
621492	Kidney Dialysis Centers	0	0	0	0	0	0	0	0	0	1	1
621493	Freestanding Ambulatory Surgical and Emergency Centers	0	1	0	0	0	0	0	0	0	0	1
621498	All Other Outpatient Care Centers	1	0	0	0	0	0	0	0	0	0	1
621610	Home Health Care Services	0	2	1	0	0	0	0	0	0	0	3
621991	Blood and Organ Banks	0	0	0	0	0	0	0	0	1	0	1
621999	All Other Miscellaneous Ambulatory Health Care Services	1	6	1	0	0	0	0	0	8	4	20
622110	General Medical and Surgical Hospitals	0	31	0	0	3	0	5	7	45	4	95

TABLE - 2
Permit Applications Completed During Calendar Year 2016

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/ RECLAIM	Area Source/Cert. & Registration	Not Renewed	Grand Total
622210	Psychiatric and Substance Abuse Hospitals	0	6	0	0	4	0	0	0	1	0	11
622310	Specialty (except Psychiatric and Substance Abuse) Hospitals	0	2	0	0	0	0	0	0	2	0	4
623110	Nursing Care Facilities (Skilled Nursing Facilities)	0	10	0	0	1	0	0	0	3	0	14
623311	Continuing Care Retirement Communities	0	1	0	0	0	0	0	0	1	0	2
623312	Assisted Living Facilities for the Elderly	0	3	0	0	0	0	0	0	1	0	4
623990	Other Residential Care Facilities	0	5	0	2	0	0	0	0	0	0	7
624120	Services for the Elderly and Persons with Disabilities	0	3	0	0	0	0	0	0	5	2	10
624190	Other Individual and Family Services	0	2	0	0	0	0	0	0	5	0	7
624410	Child Day Care Services	0	0	0	1	0	0	0	0	0	0	1
711130	Musical Groups and Artists	0	4	0	0	0	0	0	0	1	0	5
711190	Other Performing Arts Companies	0	2	0	0	2	0	0	0	2	1	7
711211	Sports Teams and Clubs	0	0	0	0	0	0	0	0	4	0	4
711310	Promoters of Performing Arts, Sports, and Similar Events with Facilities	0	2	1	0	0	0	0	0	7	0	10

TABLE - 2
Permit Applications Completed During Calendar Year 2016

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/ RECLAIM	Area Source/Cert. & Registration	Not Renewed	Grand Total
711410	Agents and Managers for Artists, Athletes, Entertainers, and Other Public Figures	0	0	0	0	0	0	0	0	5	0	5
711510	Independent Artists, Writers, and Performers	0	4	0	0	2	0	0	0	1	0	7
712110	Museums	0	1	0	0	1	0	0	0	3	1	6
712130	Zoos and Botanical Gardens	0	0	0	0	0	0	0	0	1	0	1
713110	Amusement and Theme Parks	5	17	0	0	0	0	0	5	3	0	30
713910	Golf Courses and Country Clubs	0	11	0	0	0	0	0	0	2	2	15
713940	Fitness and Recreational Sports Centers	1	8	0	0	2	0	1	2	12	0	26
713990	All Other Amusement and Recreation Industries	0	0	0	0	0	0	0	0	1	0	1
721110	Hotels (except Casino Hotels) and Motels	0	17	0	1	0	0	0	0	51	5	74
721120	Casino Hotels	0	0	0	0	0	0	0	0	2	0	2
721214	Recreational and Vacation Camps (except Campgrounds)	0	2	0	0	0	0	0	0	0	0	2
722310	Food Service Contractors	2	0	0	0	0	0	0	0	0	0	2
722320	Caterers	0	1	0	0	0	0	0	0	1	0	2
722410	Drinking Places (Alcoholic Beverages)	0	0	0	1	0	0	0	0	2	4	7

TABLE - 2
Permit Applications Completed During Calendar Year 2016

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/ RECLAIM	Area Source/Cert. & Registration	Not Renewed	Grand Total
722511	Full-Service Restaurants	3	1	0	0	1	0	0	0	144	67	216
722513	Limited-Service Restaurants	3	5	0	0	0	0	2	0	20	50	80
722514	Cafeterias, Grill Buffets, and Buffets	0	0	0	0	0	0	0	0	1	0	1
722515	Snack and Nonalcoholic Beverage Bars	0	0	0	0	0	0	0	0	0	1	1
811111	General Automotive Repair	4	25	3	2	3	0	2	1	1	8	49
811112	Automotive Exhaust System Repair	0	0	1	0	0	0	0	0	0	0	1
811113	Automotive Transmission Repair	0	0	0	0	0	0	0	0	0	2	2
811118	Other Automotive Mechanical and Electrical Repair and Maintenance	0	9	0	0	10	0	0	1	0	2	22
811121	Automotive Body, Paint, and Interior Repair and Maintenance	65	156	107	0	9	0	0	3	0	53	393
811192	Car Washes	0	7	0	0	0	0	0	0	1	2	10
811198	All Other Automotive Repair and Maintenance	0	3	1	0	0	0	0	0	0	0	4
811219	Other Electronic and Precision Equipment Repair and Maintenance	0	7	0	0	4	0	2	0	1	1	15
811310	Commercial and Industrial Machinery and Equipment (except Automotive and Electronic) Repair and	1	11	1	0	0	0	0	0	1	0	14

TABLE - 2
Permit Applications Completed During Calendar Year 2016

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/ RECLAIM	Area Source/Cert. & Registration	Not Renewed	Grand Total
	Maintenance											
811412	Appliance Repair and Maintenance	0	6	1	0	0	0	0	0	2	0	9
811420	Reupholstery and Furniture Repair	0	4	0	0	0	0	0	0	0	7	11
811490	Other Personal and Household Goods Repair and Maintenance	0	5	0	0	0	0	0	0	0	0	5
812112	Beauty Salons	0	5	0	0	0	0	0	1	1	0	7
812113	Nail Salons	0	0	0	0	0	0	0	0	1	0	1
812210	Funeral Homes and Funeral Services	2	5	1	0	0	0	0	0	0	1	9
812220	Cemeteries and Crematories	6	5	0	0	0	0	0	0	6	0	17
812310	Coin-Operated Laundries and Drycleaners	0	1	0	0	0	0	0	0	0	2	3
812320	Drycleaning and Laundry Services (except Coin-Operated)	0	49	4	2	1	0	0	0	6	46	108
812331	Linen Supply	6	2	1	0	0	0	0	1	2	0	12
812332	Industrial Launderers	0	1	0	0	2	0	0	0	0	0	3
812910	Pet Care (except Veterinary) Services	0	0	0	0	0	0	0	0	2	1	3
812930	Parking Lots and Garages	0	1	0	0	1	0	0	0	0	0	2

TABLE - 2
Permit Applications Completed During Calendar Year 2016

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/ RECLAIM	Area Source/Cert. & Registration	Not Renewed	Grand Total
812990	All Other Personal Services	0	1	0	0	0	0	0	0	0	0	1
813110	Religious Organizations	0	7	0	0	0	0	0	0	2	1	10
813212	Voluntary Health Organizations	0	1	0	0	0	0	0	0	1	0	2
813312	Environment, Conservation and Wildlife Organizations	0	0	0	0	0	0	0	0	1	0	1
813319	Other Social Advocacy Organizations	0	1	0	0	0	0	0	0	0	0	1
813410	Civic and Social Organizations	0	2	0	0	0	0	0	0	4	0	6
813910	Business Associations	0	18	0	0	21	0	0	2	2	0	43
813920	Professional Organizations	0	1	0	0	0	0	0	0	0	1	2
813930	Labor Unions and Similar Labor Organizations	0	4	0	0	1	0	0	2	0	0	7
813990	Other Similar Organizations (except Business, Professional, Labor, and Political Organizations)	0	4	0	3	2	0	0	0	16	0	25
921110	Executive Offices	0	30	0	2	2	0	0	1	14	1	50
921120	Legislative Bodies	2	11	0	0	0	0	0	0	3	1	17
921190	Other General Government Support	1	7	3	2	0	0	0	1	8	0	22
922110	Courts	0	7	0	0	3	0	2	0	9	1	22
922120	Police Protection	0	10	0	1	0	0	1	4	27	0	43

TABLE - 2
Permit Applications Completed During Calendar Year 2016

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/ RECLAIM	Area Source/Cert. & Registration	Not Renewed	Grand Total
922130	Legal Counsel and Prosecution	0	1	0	0	0	0	0	0	0	0	1
922140	Correctional Institutions	0	2	0	0	1	0	0	0	8	0	11
922150	Parole Offices and Probation Offices	0	3	0	0	0	0	0	0	0	0	3
922160	Fire Protection	0	12	0	0	0	0	0	0	0	0	12
922190	Other Justice, Public Order, and Safety Activities	0	0	0	0	0	0	1	0	1	0	2
923120	Administration of Public Health Programs	0	2	0	0	0	0	1	0	1	0	4
923130	Administration of Human Resource Programs (except Education, Public Health, and Veterans' Affairs Programs)	0	0	0	0	1	0	0	0	3	0	4
923140	Administration of Veterans' Affairs	0	4	0	0	0	0	0	2	3	0	9
924110	Administration of Air and Water Resource and Solid Waste Management Programs	8	38	0	4	14	0	0	4	11	0	79
924120	Administration of Conservation Programs	1	7	0	0	0	0	0	0	0	0	8
925120	Administration of Urban Planning and Community and Rural Development	0	0	0	0	1	0	0	0	1	0	2

TABLE - 2
Permit Applications Completed During Calendar Year 2016

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/ RECLAIM	Area Source/Cert. & Registration	Not Renewed	Grand Total
926120	Regulation and Administration of Transportation Programs	0	5	0	0	1	0	0	0	1	2	9
926130	Regulation and Administration of Communications, Electric, Gas, and Other Utilities	0	4	0	0	0	0	0	0	5	0	9
927110	Space Research and Technology	0	1	0	0	0	0	0	0	2	0	3
928110	National Security	0	1	0	0	0	0	0	0	0	0	1
999990	Unclassified	34	339	330	7	68	33	57	21	340	60	1289
0	**TOTALS**	**595**	**3725**	**1511**	**77**	**784**	**185**	**270**	**398**	**2327**	**1200**	**11072**

Emission Reduction Credit (ERC) and Short Term Emission Reduction Credit (STERC) Transactions for Fiscal Year 2015-16[1] (California Health and Safety Code Section 40452)

Pursuant to paragraph (c) of section 40452 of the California Health and Safety Code, this report summarizes data on emission offset transactions and applications, by pollutant, during the previous fiscal year. Note that during Fiscal Year 2015-16, no applications were denied for a permit for a new source for the reason of failure to provide the required emission offsets.

Table 1 summarizes Emission Reduction Credit (ERC) and Short Term Emission Reduction Credit (STERC) transactions for Fiscal Year 2015-16, including totals, by pollutant, of the number of emission offset transactions and the quantity of emission offsets transferred in units of pounds per day and tons per year. Table 2 summarizes ERC banking applications processed during Fiscal Year 2015-16, including the number of newly generated STERCs by pollutant in units of pounds per day and tons per year.

Tables 3 and 4 provide details on the amount of each emission offset transaction and processed ERC banking application respectively.

Table 1: Emission Offset Transactions – Fiscal Year 2015-16

Criteria Pollutant	Number of Emission Offset Transfer Transactions[2]				Quantity of Emission Offsets Transferred[3] (lb/day)				Annualized Quantity of Emission Offsets Transferred[3] (ton/year)			
	ERC	STERC[4]	STERC[5]	TOTAL	ERC	STERC[4]	STERC[5]	TOTAL	ERC	STERC[4]	STERC[5]	TOTAL
ROG	49	21	0	70	1,177	309	0	1,486	214.9	56.4	0	271.3
NOX	2	0	0	2	106	0	0	106	19.4	0	0	19.4
SOX	2	0	0	2	46	0	0	46	8.4	0	0	8.4
CO	0	1	0	1	0	32	0	32	0	5.8	0	5.8
PM10	24	16	0	40	74	63	0	137	13.5	11.5	0	25.0

Table 2: Emission Offset Applications – Fiscal Year 2015-16

Criteria Pollutant	Number of Banking Applications Resulting in the Issuance of New STERCs[6]	Quantity of Emission Reductions Achieved (STERCs)[7] (lb/day)	Annualized Quantity of Emission Reductions Achieved[7] (ton/year)
ROG	0	0	0
NOX	0	0	0
SOX	0	0	0
CO	0	0	0
PM10	0	0	0

[1] This report does not include RECLAIM Trading Credit (RTC) transactions.
[2] Includes all emission offset certificates that transferred ownership.
[3] Includes the total amount of emission offsets transferred.
[4] STERC transfer transactions including the long term emission offset, those that have an ending year of 9999.
[5] STERC transfer transactions not including the long term emission offset in which the emission offset with the greatest year is treated like a long term emission offset.
[6] Includes all emission offset applications resulting in the generation of new certificates.
[7] Includes the total amount of emission offsets generated.

Table 3: Emission Offset Transaction Summary – Fiscal Year 2015-16
Sorted by Pollutant and Amount

SCAQMD NO.	POLLUTANT	AMOUNT (LB/DAY)	AMOUNT (TON/YR)	TYPE	START YEAR	END YEAR
SC1516-001	ROG	1	0.2	ERC	N/A	N/A
SC1516-002	ROG	1	0.2	ERC	N/A	N/A
SC1516-003	ROG	1	0.2	ERC	N/A	N/A
SC1516-004	ROG	1	0.2	ERC	N/A	N/A
SC1516-005	ROG	1	0.2	ERC	N/A	N/A
SC1516-006	ROG	1	0.2	ERC	N/A	N/A
SC1516-007	ROG	1	0.2	ERC	N/A	N/A
SC1516-008	ROG	1	0.2	ERC	N/A	N/A
SC1516-009	ROG	1	0.2	ERC	N/A	N/A
SC1516-010	ROG	1	0.2	ERC	N/A	N/A
SC1516-011	ROG	1	0.2	ERC	N/A	N/A
SC1516-012	ROG	2	0.4	ERC	N/A	N/A
SC1516-013	ROG	0	0	STERC	2015	2015
SC1516-014	ROG	0	0	STERC	2016	2016
SC1516-015	ROG	0	0	STERC	2017	2017
SC1516-016	ROG	0	0	STERC	2018	2018
SC1516-017	ROG	2	0.4	STERC	2019	9999
SC1516-018	ROG	0	0	STERC	2015	2015
SC1516-019	ROG	0	0	STERC	2016	2016
SC1516-020	ROG	0	0	STERC	2017	2017
SC1516-021	ROG	0	0	STERC	2018	2018
SC1516-022	ROG	2	0.4	STERC	2019	9999
SC1516-023	ROG	2	0.4	ERC	N/A	N/A
SC1516-024	ROG	2	0.4	ERC	N/A	N/A
SC1516-025	ROG	2	0.4	ERC	N/A	N/A
SC1516-026	ROG	0	0	STERC	2015	2015
SC1516-027	ROG	0	0	STERC	2016	2016
SC1516-028	ROG	0	0	STERC	2017	2017
SC1516-029	ROG	0	0	STERC	2018	2018
SC1516-030	ROG	0	0	STERC	2019	2019
SC1516-031	ROG	0	0	STERC	2020	2020
SC1516-032	ROG	3	0.5	STERC	2021	9999
SC1516-033	ROG	0	0	STERC	2015	2015
SC1516-034	ROG	0	0	STERC	2016	2016
SC1516-035	ROG	0	0	STERC	2017	2017
SC1516-036	ROG	0	0	STERC	2018	2018
SC1516-037	ROG	0	0	STERC	2019	2019
SC1516-038	ROG	0	0	STERC	2020	2020
SC1516-039	ROG	3	0.5	STERC	2021	9999
SC1516-040	ROG	3	0.5	ERC	N/A	N/A
SC1516-041	ROG	3	0.5	ERC	N/A	N/A
SC1516-042	ROG	0	0	STERC	2015	2015
SC1516-043	ROG	0	0	STERC	2016	2016

SCAQMD NO.	POLLUTANT	AMOUNT (LB/DAY)	AMOUNT (TON/YR)	TYPE	START YEAR	END YEAR
SC1516-044	ROG	0	0	STERC	2017	2017
SC1516-045	ROG	0	0	STERC	2018	2018
SC1516-046	ROG	4	0.7	STERC	2019	9999
SC1516-047	ROG	4	0.7	ERC	N/A	N/A
SC1516-048	ROG	4	0.7	ERC	N/A	N/A
SC1516-049	ROG	0	0	STERC	2015	2015
SC1516-050	ROG	0	0	STERC	2016	2016
SC1516-051	ROG	0	0	STERC	2017	2017
SC1516-052	ROG	0	0	STERC	2018	2018
SC1516-053	ROG	0	0	STERC	2019	2019
SC1516-054	ROG	0	0	STERC	2020	2020
SC1516-055	ROG	5	0.9	STERC	2021	9999
SC1516-056	ROG	0	0	STERC	2015	2015
SC1516-057	ROG	0	0	STERC	2016	2016
SC1516-058	ROG	0	0	STERC	2017	2017
SC1516-059	ROG	0	0	STERC	2018	2018
SC1516-060	ROG	0	0	STERC	2019	2019
SC1516-061	ROG	0	0	STERC	2020	2020
SC1516-062	ROG	5	0.9	STERC	2021	9999
SC1516-063	ROG	5	0.9	ERC	N/A	N/A
SC1516-064	ROG	5	0.9	ERC	N/A	N/A
SC1516-065	ROG	6	1.1	ERC	N/A	N/A
SC1516-066	ROG	6	1.1	ERC	N/A	N/A
SC1516-067	ROG	6	1.1	STERC	2017	9999
SC1516-068	ROG	0	0	STERC	2016	2016
SC1516-069	ROG	0	0	STERC	2015	2015
SC1516-070	ROG	6	1.1	ERC	N/A	N/A
SC1516-071	ROG	6	1.1	ERC	N/A	N/A
SC1516-072	ROG	6	1.1	ERC	N/A	N/A
SC1516-073	ROG	7	1.3	ERC	N/A	N/A
SC1516-074	ROG	7	1.3	ERC	N/A	N/A
SC1516-075	ROG	7	1.3	ERC	N/A	N/A
SC1516-076	ROG	8	1.5	ERC	N/A	N/A
SC1516-077	ROG	0	0	STERC	2015	2015
SC1516-078	ROG	0	0	STERC	2016	2016
SC1516-079	ROG	0	0	STERC	2017	2017
SC1516-080	ROG	0	0	STERC	2018	2018
SC1516-081	ROG	0	0	STERC	2019	2019
SC1516-082	ROG	0	0	STERC	2020	2020
SC1516-083	ROG	8	1.5	STERC	2021	9999
SC1516-084	ROG	0	0	STERC	2015	2015
SC1516-085	ROG	0	0	STERC	2016	2016
SC1516-086	ROG	0	0	STERC	2017	2017
SC1516-087	ROG	0	0	STERC	2018	2018

SCAQMD NO.	POLLUTANT	AMOUNT (LB/DAY)	AMOUNT (TON/YR)	TYPE	START YEAR	END YEAR
SC1516-088	ROG	0	0	STERC	2019	2019
SC1516-089	ROG	0	0	STERC	2020	2020
SC1516-090	ROG	8	1.5	STERC	2021	9999
SC1516-091	ROG	9	1.6	ERC	N/A	N/A
SC1516-092	ROG	9	1.6	ERC	N/A	N/A
SC1516-093	ROG	10	1.8	ERC	N/A	N/A
SC1516-094	ROG	10	1.8	ERC	N/A	N/A
SC1516-095	ROG	0	0	STERC	2016	2016
SC1516-096	ROG	0	0	STERC	2017	2017
SC1516-097	ROG	0	0	STERC	2018	2018
SC1516-098	ROG	10	1.8	STERC	2019	9999
SC1516-099	ROG	10	1.8	ERC	N/A	N/A
SC1516-100	ROG	11	2	ERC	N/A	N/A
SC1516-101	ROG	11	2	ERC	N/A	N/A
SC1516-102	ROG	12	2.2	ERC	N/A	N/A
SC1516-103	ROG	0	0	STERC	2016	2016
SC1516-104	ROG	0	0	STERC	2017	2017
SC1516-105	ROG	0	0	STERC	2018	2018
SC1516-106	ROG	13	2.4	STERC	2019	9999
SC1516-107	ROG	14	2.6	ERC	N/A	N/A
SC1516-108	ROG	0	0	STERC	2016	2016
SC1516-109	ROG	0	0	STERC	2017	2017
SC1516-110	ROG	0	0	STERC	2018	2018
SC1516-111	ROG	15	2.7	STERC	2019	9999
SC1516-112	ROG	0	0	STERC	2016	2016
SC1516-113	ROG	0	0	STERC	2017	2017
SC1516-114	ROG	0	0	STERC	2018	2018
SC1516-115	ROG	15	2.7	STERC	2019	9999
SC1516-116	ROG	16	2.9	ERC	N/A	N/A
SC1516-117	ROG	0	0	STERC	2016	2016
SC1516-118	ROG	0	0	STERC	2017	2017
SC1516-119	ROG	0	0	STERC	2018	2018
SC1516-120	ROG	18	3.3	STERC	2019	9999
SC1516-121	ROG	0	0	STERC	2016	2016
SC1516-122	ROG	0	0	STERC	2017	2017
SC1516-123	ROG	0	0	STERC	2018	2018
SC1516-124	ROG	0	0	STERC	2019	2019
SC1516-125	ROG	0	0	STERC	2020	2020
SC1516-126	ROG	18	3.3	STERC	2021	9999
SC1516-127	ROG	0	0	STERC	2016	2016
SC1516-128	ROG	0	0	STERC	2017	2017
SC1516-129	ROG	0	0	STERC	2018	2018
SC1516-130	ROG	18	3.3	STERC	2019	9999
SC1516-131	ROG	0	0	STERC	2015	2015

SCAQMD NO.	POLLUTANT	AMOUNT (LB/DAY)	AMOUNT (TON/YR)	TYPE	START YEAR	END YEAR
SC1516-132	ROG	0	0	STERC	2016	2016
SC1516-133	ROG	0	0	STERC	2017	2017
SC1516-134	ROG	0	0	STERC	2018	2018
SC1516-135	ROG	19	3.5	STERC	2019	9999
SC1516-136	ROG	19	3.5	ERC	N/A	N/A
SC1516-137	ROG	23	4.2	ERC	N/A	N/A
SC1516-138	ROG	25	4.6	ERC	N/A	N/A
SC1516-139	ROG	0	0	STERC	2016	2016
SC1516-140	ROG	0	0	STERC	2017	2017
SC1516-141	ROG	0	0	STERC	2018	2018
SC1516-142	ROG	0	0	STERC	2019	2019
SC1516-143	ROG	0	0	STERC	2020	2020
SC1516-144	ROG	35	6.4	STERC	2021	9999
SC1516-145	ROG	38	6.9	ERC	N/A	N/A
SC1516-146	ROG	44	8	ERC	N/A	N/A
SC1516-147	ROG	0	0	STERC	2015	2015
SC1516-148	ROG	0	0	STERC	2016	2016
SC1516-149	ROG	0	0	STERC	2017	2017
SC1516-150	ROG	0	0	STERC	2018	2018
SC1516-151	ROG	45	8.2	STERC	2019	9999
SC1516-152	ROG	50	9.1	ERC	N/A	N/A
SC1516-153	ROG	50	9.1	ERC	N/A	N/A
SC1516-154	ROG	0	0	STERC	2015	2015
SC1516-155	ROG	0	0	STERC	2016	2016
SC1516-156	ROG	0	0	STERC	2017	2017
SC1516-157	ROG	0	0	STERC	2018	2018
SC1516-158	ROG	0	0	STERC	2019	2019
SC1516-159	ROG	0	0	STERC	2020	2020
SC1516-160	ROG	57	10.4	STERC	2021	9999
SC1516-161	ROG	213	38.9	ERC	N/A	N/A
SC1516-162	ROG	501	91.4	ERC	N/A	N/A
Total		**1,486**	**271.3**	**N/A**		

SCAQMD NO.	POLLUTANT	AMOUNT (LB/DAY)	AMOUNT (TON/YR)	TYPE	START YEAR	END YEAR
SC1516-163	NOX	1	0.2	ERC	N/A	N/A
SC1516-164	NOX	105	19.2	ERC	N/A	N/A
Total		**106**	**19.4**	**N/A**		

SCAQMD NO.	POLLUTANT	AMOUNT (LB/DAY)	AMOUNT (TON/YR)	TYPE	START YEAR	END YEAR
SC1516-165	SOX	20	3.7	ERC	N/A	N/A
SC1516-166	SOX	26	4.7	ERC	N/A	N/A
Total		**46**	**8.4**	**N/A**		

SCAQMD NO.	POLLUTANT	AMOUNT (LB/DAY)	AMOUNT (TON/YR)	TYPE	START YEAR	END YEAR
SC1516-167	CO	0	0	STERC	2016	2016
SC1516-168	CO	32	5.8	STERC	2017	9999
Total		**32**	**5.8**	**N/A**		

SCAQMD NO.	POLLUTANT	AMOUNT (LB/DAY)	AMOUNT (TON/YR)	TYPE	START YEAR	END YEAR
SC1516-169	PM10	1	0.2	ERC	N/A	N/A
SC1516-170	PM10	0	0	STERC	2016	2016
SC1516-171	PM10	0	0	STERC	2017	2017
SC1516-172	PM10	0	0	STERC	2017	2017
SC1516-173	PM10	1	0.2	STERC	2019	9999
SC1516-174	PM10	1	0.2	ERC	N/A	N/A
SC1516-175	PM10	1	0.2	ERC	N/A	N/A
SC1516-176	PM10	1	0.2	ERC	N/A	N/A
SC1516-177	PM10	1	0.2	ERC	N/A	N/A
SC1516-178	PM10	1	0.2	ERC	N/A	N/A
SC1516-179	PM10	1	0.2	ERC	N/A	N/A
SC1516-180	PM10	0	0	STERC	2016	2016
SC1516-181	PM10	0	0	STERC	2017	2017
SC1516-182	PM10	0	0	STERC	2018	2018
SC1516-183	PM10	1	0.2	STERC	2019	9999
SC1516-184	PM10	0	0	STERC	2016	2016
SC1516-185	PM10	0	0	STERC	2017	2017
SC1516-186	PM10	1	0.2	STERC	2018	9999
SC1516-187	PM10	0	0	STERC	2016	2016
SC1516-188	PM10	0	0	STERC	2017	2017
SC1516-189	PM10	1	0.2	STERC	2018	9999
SC1516-190	PM10	1	0.2	ERC	N/A	N/A
SC1516-191	PM10	0	0	STERC	2016	2016
SC1516-192	PM10	0	0	STERC	2017	2017
SC1516-193	PM10	0	0	STERC	2018	2018
SC1516-194	PM10	1	0.2	STERC	2019	9999
SC1516-195	PM10	1	0.2	ERC	N/A	N/A
SC1516-196	PM10	1	0.2	ERC	N/A	N/A
SC1516-197	PM10	2	0.4	STERC	2019	9999

SCAQMD NO.	POLLUTANT	AMOUNT (LB/DAY)	AMOUNT (TON/YR)	TYPE	START YEAR	END YEAR
SC1516-198	PM10	0	0	STERC	2018	2018
SC1516-199	PM10	0	0	STERC	2017	2017
SC1516-200	PM10	0	0	STERC	2016	2016
SC1516-201	PM10	0	0	STERC	2015	2015
SC1516-202	PM10	2	0.4	ERC	N/A	N/A
SC1516-203	PM10	2	0.4	ERC	N/A	N/A
SC1516-204	PM10	2	0.4	ERC	N/A	N/A
SC1516-205	PM10	3	0.5	ERC	N/A	N/A
SC1516-206	PM10	3	0.5	ERC	N/A	N/A
SC1516-207	PM10	3	0.5	ERC	N/A	N/A
SC1516-208	PM10	3	0.5	ERC	N/A	N/A
SC1516-209	PM10	3	0.5	ERC	N/A	N/A
SC1516-210	PM10	3	0.5	ERC	N/A	N/A
SC1516-211	PM10	4	0.7	STERC	2019	9999
SC1516-212	PM10	0	0	STERC	2018	2018
SC1516-213	PM10	0	0	STERC	2017	2017
SC1516-214	PM10	0	0	STERC	2016	2016
SC1516-215	PM10	0	0	STERC	2015	2015
SC1516-216	PM10	4	0.7	STERC	2019	9999
SC1516-217	PM10	0	0	STERC	2018	2018
SC1516-218	PM10	0	0	STERC	2017	2017
SC1516-219	PM10	0	0	STERC	2016	2016
SC1516-220	PM10	0	0	STERC	2015	2015
SC1516-221	PM10	4	0.7	ERC	N/A	N/A
SC1516-222	PM10	0	0	STERC	2016	2016
SC1516-223	PM10	0	0	STERC	2017	2017
SC1516-224	PM10	0	0	STERC	2018	2018
SC1516-225	PM10	5	0.9	STERC	2019	9999
SC1516-226	PM10	0	0	STERC	2016	2016
SC1516-227	PM10	0	0	STERC	2017	2017
SC1516-228	PM10	0	0	STERC	2018	2018
SC1516-229	PM10	5	0.9	STERC	2019	9999
SC1516-230	PM10	0	0	STERC	2016	2016
SC1516-231	PM10	0	0	STERC	2017	2017
SC1516-232	PM10	0	0	STERC	2018	2018
SC1516-233	PM10	5	0.9	STERC	2019	9999
SC1516-234	PM10	0	0	STERC	2016	2016
SC1516-235	PM10	0	0	STERC	2017	2017
SC1516-236	PM10	0	0	STERC	2018	2018
SC1516-237	PM10	5	0.9	STERC	2019	9999
SC1516-238	PM10	0	0	STERC	2016	2016
SC1516-239	PM10	0	0	STERC	2017	2017
SC1516-240	PM10	0	0	STERC	2018	2018
SC1516-241	PM10	5	0.9	STERC	2019	9999

SCAQMD NO.	POLLUTANT	AMOUNT (LB/DAY)	AMOUNT (TON/YR)	TYPE	START YEAR	END YEAR
SC1516-242	PM10	7	1.3	ERC	N/A	N/A
SC1516-243	PM10	0	0	STERC	2016	2016
SC1516-244	PM10	0	0	STERC	2017	2017
SC1516-245	PM10	7	1.3	STERC	2018	9999
SC1516-246	PM10	0	0	STERC	2016	2016
SC1516-247	PM10	0	0	STERC	2017	2017
SC1516-248	PM10	7	1.3	STERC	2018	9999
SC1516-249	PM10	8	1.5	ERC	N/A	N/A
SC1516-250	PM10	9	1.6	STERC	2015	9999
SC1516-251	PM10	9	1.6	ERC	N/A	N/A
SC1516-252	PM10	12	2.2	ERC	N/A	N/A
Total		**137**	**25**	**N/A**		

Table 4: Emission Offset Application Summary – Fiscal Year 2015-16
Sorted by Pollutant and Amount

SCAQMD NO.	POLLUTANT	AMOUNT (LB/DAY)	AMOUNT (TON/YR)	TYPE	START YEAR	END YEAR
No Banking Application Approved during Fiscal Year 2015-16						
Total		**N/A**	**N/A**	**N/A**		

CHAPTER III
BUDGET AND WORK PROGRAM FISCAL YEAR 2017-2018

[Attached herein as Chapter III]

CHAPTER IV
CLEAN FUELS PROGRAM 2016 ANNUAL REPORT AND 2017 PLAN UPDATE

[Attached herein as Chapter IV]

CHAPTER V
ANNUAL RECLAIM AUDIT REPORT
FOR 2015 COMPLIANCE YEAR

[Attached herein as Chapter V]

Budget & Work Program

Fiscal Year 2017-2018

South Coast Air Quality Management District

South Coast AQMD

BUDGET & WORK PROGRAM

FISCAL YEAR 2017-2018

Prepared by Finance
Michael B. O'Kelly, Chief Administrative Officer

SOUTH COAST
AIR QUALITY MANAGEMENT DISTRICT

TABLE OF CONTENTS

TABLE OF CONTENTS

TABLE OF CONTENTS

SOUTH COAST

AIR QUALITY MANAGEMENT DISTRICT

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

GOVERNING BOARD

WILLIAM A. BURKE, Ed.D
Chairman
Speaker of the Assembly Appointee

BEN BENOIT
Vice Chair
County of Riverside
Cities Representative

MARION ASHLEY
County of Riverside Representative

JOE BUSCAINO
City of Los Angeles Representative

MICHAEL A. CACCIOTTI
County of Los Angeles
Cities Representative
Eastern Region

SHEILA KUEHL
County of Los Angeles Representative

JOSEPH K. LYOU, Ph.D.
Governor's Appointee

LARRY McCALLON
County of San Bernardino
Cities Representative

JUDY MITCHELL
County of Los Angeles
Cities Representative
Western Region

SHAWN NELSON
County of Orange Representative

DR. CLARK E. PARKER, SR.
Senate Rules Committee Appointee

DWIGHT ROBINSON
County of Orange
Cities Representative

JANICE RUTHERFORD
County of San Bernardino Representative

WAYNE NASTRI
Executive Officer

SOUTH COAST

AIR QUALITY MANAGEMENT DISTRICT

South Coast
Air Quality Management District
21865 Copley Drive, Diamond Bar, CA 91765-4178
(909) 396-2000 • www.aqmd.gov

June 2, 2017

South Coast Air Quality Management District Board and Stakeholders

Transmittal of the Executive Officer's
Fiscal Year 2017-18 Budget and Work Program

This document represents South Coast Air Quality Management District's (SCAQMD) proposed General Fund Budget and Work Program for FY 2017-18. The budget was developed based on SCAQMD's commitment to clean the air and protect the health of all residents in the South Coast Air District through practical and innovative strategies. To achieve these goals, the proposed budget for FY 2017-18 balances expenditures of $149.9 million with revenues of $147.0 million and prior year revenues of $2.9 million.

The proposed FY 2017-18 level of expenditures, up 5.9% from the FY 2016-17 adopted budget, includes increased costs for retirement, salaries associated with new positions, contractual needs, and capital outlays including a net increase of 12.25 positions to bring the staffing level to 825.25. This increase in positions will augment enforcement, monitoring and analysis, rulemaking, and communications efforts. Four positions are funded by mobile source-related incentive programs such as Clean Fuels, Carl Moyer, and Prop 1B as well as by Air Toxics revenue. The 0.25 FTE is to provide three months of critical overlap and to provide service continuity before the Assistant Deputy Executive Officer of Information Management retires.

The FY 2017-18 proposed revenue budget of $147.0 million, up 7.7% from the FY 2016-17 adopted budget, and includes a CPI fee adjustment of 2.5%. In addition, in response to a 2016 EPA Title V Program Review, and to more fully recover costs of the Title V program, the FY 2017-18 proposed revenue budget includes an additional fee adjustment to Title V permit processing fees and annual operating permit renewal fees of 10.67% in FY 2017-18, an additional 10.67% in FY 2018-19, and an additional 10.66% in FY 2019-20. Finally, for non-Title V facilities, the FY 2017-18 budget includes an additional fee adjustment of 4.0% in FY 2017-18 plus an additional fee adjustment of 4.0% in FY 2018-19 for permit processing fees and annual operating permit renewal fees which will better

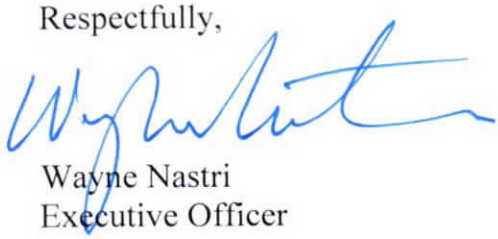
recover costs. At $92.2 million or 62.7% of the projected revenue budget, stationary source revenues account for the largest source of revenue. Over the past two decades, total permit fees (including permit processing, annual operating permit, and annual emissions based fees) collected from stationary sources has increased by about 29.2% from $66.8 million in FY 1991-92 to $86.3 million (estimated) in FY 2016-17. When adjusted for inflation however, stationary source revenues have decreased by 24% over this same period.

While significant efforts are put forth to develop a detailed budget for the next fiscal year, uncertain political and economic issues may create challenges. These challenges may include changes in grant revenue funding levels, increased retirement costs due to actuarial and investment adjustments, and onetime Penalties and Settlement revenue that varies annually. SCAQMD is well positioned to address these uncertainties by monitoring funding sources, our retirement plan, and actual financial results on a continuous basis. Additionally, the proposed budget includes an assigned/unassigned general fund balance of 24% of revenues to provide a reasonable financial safety net.

The public and the business community have multiple opportunities to participate in the budget development process. These include meetings of the Budget Advisory Committee which is made up of representatives from the business and environmental communities, two public consultation meetings to discuss the proposed budget and work program, and two meetings of the Governing Board. The public consultation meetings and Governing Board meetings are noticed to the public through direct mail to permitted facilities, print media, and through the SCAQMD website.

In summary, I am proposing a budget for FY 2017-18 that allows our programs to operate efficiently, transparently, and in a manner sensitive to public agencies, businesses and the public, while providing a continuum of emissions reductions and health benefit improvements. The proposed Fiscal Year 2017-18 Budget and Work Program serves to ensure the strength and stability of the District as we make progress toward attaining the federal and state clean air mandates.

Respectfully,

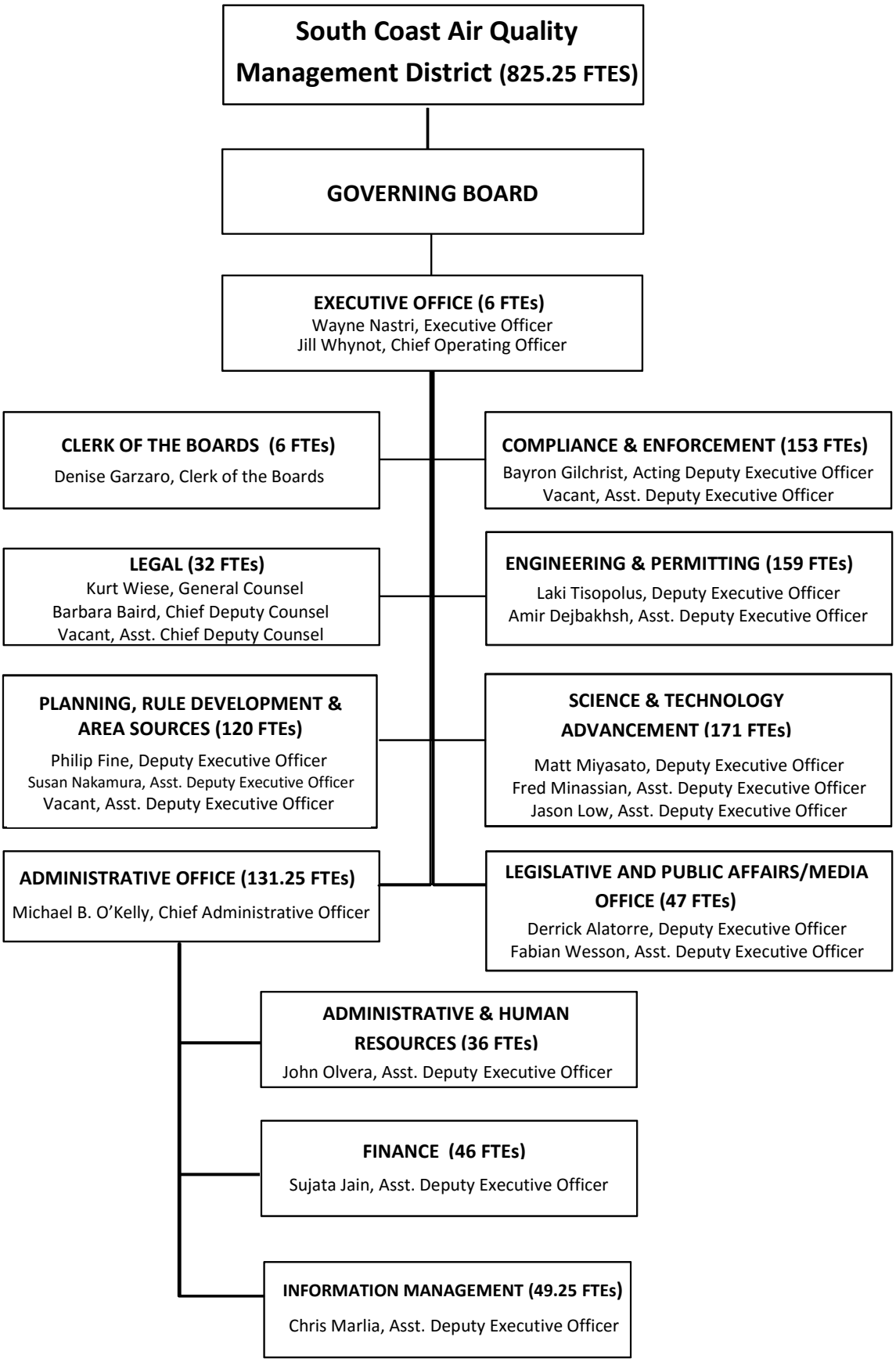


Wayne Nastri
Executive Officer

MBO:DRP

The Government Finance Officers Associationof the United States and Canada (GFOA) presented a Distinguished Budget Presentation Award to **South Coast Air Quality Management District, California** for its annual budget for the fiscal year beginning **July 1, 2016**. In order to receive this award, a governmental unit must publish a budget document that meets program criteria as a policy document, as an operations guide, as a financial plan, and as a communications device.

This award is valid for a period of one year only. We believe our current budget continues to conform to program requirements, and we are submitting it to GFOA to determine its eligibility for another award.


South Coast Air Quality Management District (825.25 FTES)
GOVERNING BOARD
EXECUTIVE OFFICE (6 FTEs)
Wayne Nastri, Executive Officer
Jill Whynot, Chief Operating Officer
CLERK OF THE BOARDS (6 FTEs)
Denise Garzaro, Clerk of the Boards
COMPLIANCE & ENFORCEMENT (153 FTEs)
Bayron Gilchrist, Acting Deputy Executive Officer
Vacant, Asst. Deputy Executive Officer
LEGAL (32 FTEs)
Kurt Wiese, General Counsel
Barbara Baird, Chief Deputy Counsel
Vacant, Asst. Chief Deputy Counsel
ENGINEERING & PERMITTING (159 FTEs)
Laki Tisopolus, Deputy Executive Officer
Amir Dejbakhsh, Asst. Deputy Executive Officer
PLANNING, RULE DEVELOPMENT & AREA SOURCES (120 FTEs)
Philip Fine, Deputy Executive Officer
Susan Nakamura, Asst. Deputy Executive Officer
Vacant, Asst. Deputy Executive Officer
SCIENCE & TECHNOLOGY ADVANCEMENT (171 FTEs)
Matt Miyasato, Deputy Executive Officer
Fred Minassian, Asst. Deputy Executive Officer
Jason Low, Asst. Deputy Executive Officer
ADMINISTRATIVE OFFICE (131.25 FTEs)
Michael B. O'Kelly, Chief Administrative Officer
LEGISLATIVE AND PUBLIC AFFAIRS/MEDIA OFFICE (47 FTEs)
Derrick Alatorre, Deputy Executive Officer
Fabian Wesson, Asst. Deputy Executive Officer
ADMINISTRATIVE & HUMAN RESOURCES (36 FTEs)
John Olvera, Asst. Deputy Executive Officer
FINANCE (46 FTEs)
Sujata Jain, Asst. Deputy Executive Officer
INFORMATION MANAGEMENT (49.25 FTEs)
Chris Marlia, Asst. Deputy Executive Officer

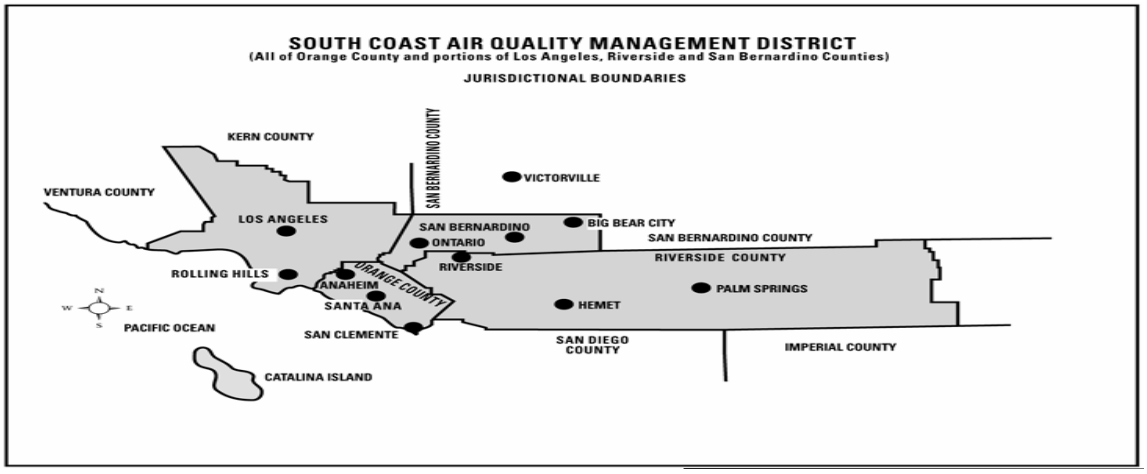
SUMMARY

Preface

This document represents the proposed FY 2017-18 Budget and Work Program of the South Coast Air Quality Management District (SCAQMD). The proposed budget is available for public review and comment during the month of April. Two public consultation meetings are scheduled to discuss the proposed budget and proposed fees changes, one on April 11, 2017 and a second on April 18, 2017. In addition, a workshop for the Governing Board is scheduled on April 21, 2017. A final Proposed Draft Budget and Work Program and Proposed Amended Regulation (PAR) III - Fees, which may include changes based on input from the public and Board, will be presented for adoption at a public hearing on June 2, 2017.

Introduction

The South Coast Air Quality Management District (SCAQMD) began operation on February 1, 1977 as a regional governmental agency established by the California Legislature pursuant to the Lewis Air Quality Management Act. The SCAQMD encompasses all of Orange County and parts of Los Angeles, San Bernardino and Riverside Counties. It succeeded the Southern California Air Pollution Control District (APCD) and its predecessor four county APCDs, of which the Los Angeles County APCD was the oldest in the nation, having been formed in 1947. The SCAQMD Governing Board is composed of 13 members, including four members appointed by the Boards of Supervisors of the four counties in SCAQMD's jurisdiction, six members appointed by cities in the SCAQMD's jurisdiction and three members appointed by the Governor, the Speaker of the State Assembly and the Rules Committee of the State Senate, respectively. The members appointed by the Boards of Supervisors and cities consist of one member of the Board of Supervisors of Los Angeles, Orange, Riverside, and San Bernardino Counties, respectively, and a mayor or member of the city council of a city within Orange, Riverside, and San Bernardino Counties. Los Angeles County cities have three representatives, one each from the western and eastern portions and one member representing the City of Los Angeles.

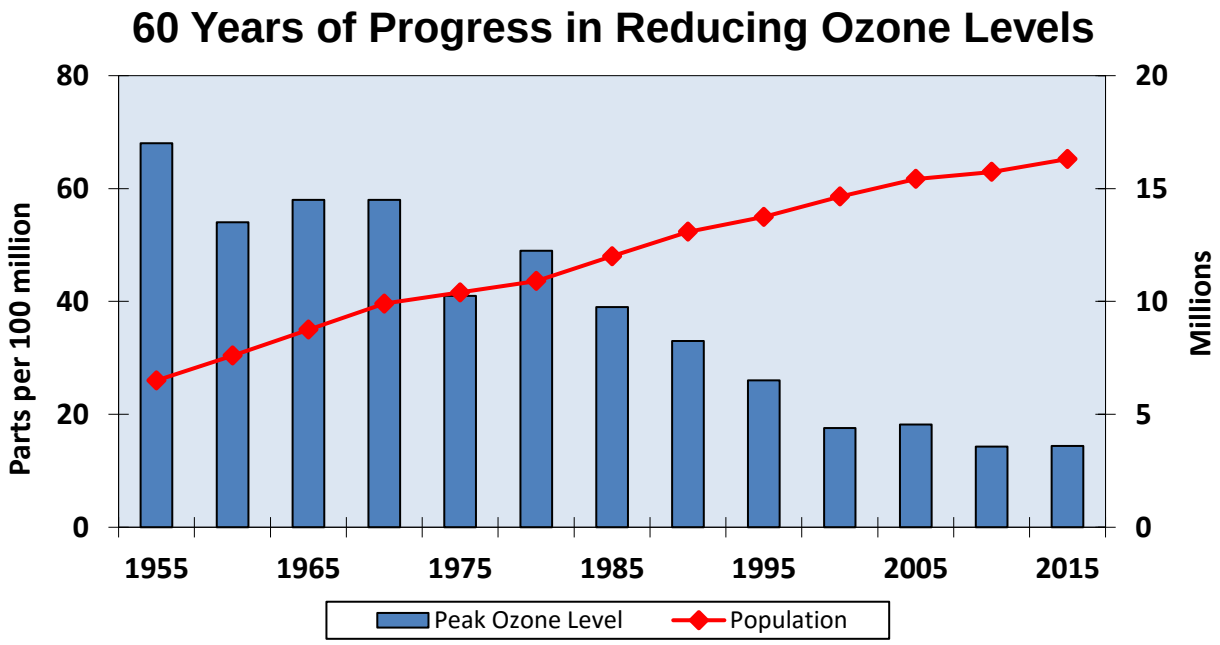


Air Quality History

The South Coast Air Basin has suffered unhealthful air since its rapid population growth and industrialization during World War II. While air quality has improved, the residents of the Basin still breathe some of the most polluted air in the nation.

The 68-year history of the region's air pollution control efforts is, in many ways, one of the world's key environmental success stories. Peak ozone levels have been cut by almost three-fourths since air monitoring began in the 1950s. Population exposure was cut in half during the 1980s alone.

Since the late 1940s when the war on smog began to 2015, the region's population has more than tripled from 4.8 million to 16.9 million; the number of motor vehicles has increased over five-fold from 2.3 million to 13 million; and the area has grown into one of the most prosperous regions of the world. This phenomenal economic growth illustrates that pollution control and strong economic growth can coincide.



Mission

SCAQMD's mission is to clean the air and protect the health of all residents in the South Coast Air District through practical and innovative strategies.

This mission is pursued through a comprehensive program of planning, regulation, education, enforcement, compliance incentives, technical innovation and promoting public understanding of air quality issues. The SCAQMD has implemented a policy of working with regulated businesses to ensure their participation in making the rules which will impact them. This cooperative approach has resulted in greater business support for air that is more healthful to breathe.

To carry out its mission, SCAQMD develops a set of Goals and Priority Objectives which are evaluated and revised annually and presented as part of the budget proposal. The following Draft Goals have been identified as being critical to meeting SCAQMD's Mission for FY 2017-18:

I. Achieve Clean Air Standards.
II. Enhance Public Education and Equitable Treatment for All Communities.
III. Operate Efficiently and Transparently.

These goals are the foundation for SCAQMD's Work Program. Each goal is supported by multiple activities, which target specific areas of program performance.

Air Quality

Overview

The four-county Southern California region, designated for air quality purposes as the South Coast Air Basin (Basin), has some of the highest air pollution levels in the United States. The federal government has designated seven pollutants that are pervasive enough across the nation to warrant federal health standards, called National Ambient Air Quality Standards (NAAQS). Known as "criteria pollutants," these are: ozone (O_3); nitrogen dioxide (NO_2); particulates (PM10); fine particulates (PM2.5); carbon monoxide (CO); lead (Pb); and sulfur dioxide (SO_2).

In addition, the State of California through the California Air Resources Board (CARB) sets ambient air quality standards for these same pollutants. California's standards are in some cases tighter than the U.S. Environmental Protection Agency's (U.S. EPA) standards, reflecting the conclusion on CARB's part that some of the federal standards are not adequate to protect public health in this region. Toxic compounds also are a potential problem. More toxic pollution is emitted into the air in the Basin than in any other region in California. The Basin's large number of motor

vehicles and small sources, including small businesses and households using ozone-forming consumer products and paints, compounds the problem.

Air Quality Trends

While our air quality continues to improve, the Basin remains one of the most unhealthful areas in the nation in terms of air quality. Ozone levels have fallen by more than three-quarters since peaks in the mid-1950s. U.S. EPA revised and strengthened the 8-hour ozone NAAQS, effective December 28, 2015, from concentrations exceeding 75 parts-per-billion (ppb) to concentrations exceeding 70 ppb. In 2016, the new 2015 8-hour ozone NAAQS was exceeded in the Basin on 132 days and the former 2008 ozone NAAQS was exceeded on 106 days based on preliminary data. The 2015 ozone NAAQS was exceeded in the Basin on 113 days in 2015, the lowest number ever recorded, and 123 days in 2014. The increase in ozone exceedance days in 2016 is attributed to enhanced photochemical ozone formation through the summer due to persistent weather patterns that limited vertical mixing and warmed the lower atmosphere. While the ozone control strategy continued to reduce precursor emissions from sources in the Basin in 2016, ozone-forming emissions transported from several long-term, large wildfires in southern and central California in the summer may have also played a role in the increase of exceedance days. The maximum observed ozone levels also show some year-to-year variability, but have generally been decreasing over the years. The highest 8-hour ozone level in the preliminary 2016 data was 122 ppb, compared to 127 ppb in 2015 and 110 ppb in 2014. The value from 2014 was the Basin's lowest recorded annual maximum 8-hour ozone concentration to date.

PM2.5 levels have decreased dramatically in the Basin since 1999; however, design value concentrations are still above the current annual 24-hour NAAQS. Effective March 18, 2013, U.S. EPA strengthened the annual average PM2.5 standard from 15 $\mu g/m^3$ to 12 $\mu g/m^3$, while retaining the 24-hour PM2.5 NAAQS of 35 $\mu g/m^3$. In 2016, the 24-hour PM2.5 NAAQS was exceeded on 10 days based on preliminary filter data with near-road measurements included. This was a dramatic improvement over the 25 days that exceeded the PM2.5 NAAQS in 2015 and the lowest ever recorded in the Basin. While the 2015 PM2.5 measurements were strongly influenced by the long-term effects of the drought in California, the 2016 data was influenced by an increase in wintertime storm systems that improved ventilation in the Basin on many days in the winter months when the highest PM2.5 concentrations typically occur. The Basin's peak annual average PM2.5 level in 2016, 14.0 $\mu g/m^3$ (preliminary data) was a little higher than the 2015 value, 13.3 $\mu g/m^3$, which was the lowest annual average since PM2.5 monitoring started in 1999. In 2016, quarterly PM2.5 averages for the second and third quarters were above normal for recent years, likely due to the impact of smoke transported from numerous fires burning in Southern and Central California during the summer months. However, no days exceeded the 24-hour PM2.5 NAAQS in the summer of 2016, except for July 5 due to emissions from Independence Day fireworks.

In 2006, U.S. EPA rescinded the annual federal standard for PM10 but retained the 24-hour standard. U.S. EPA re-designated the Basin as attainment of the health based standard for PM10, effective July 26, 2013. Ambient levels of PM10 in the Basin have continued to meet the federal 24-hour PM10 NAAQS through 2016.

In November 2008, U.S. EPA revised the lead NAAQS from a 1.5 $\mu g/m^3$ quarterly average to a rolling 3-month average of 0.15 $\mu g/m^3$ and added new near-source monitoring requirements. The Los Angeles County portion of the Basin has been designated non-attainment for lead due to monitored concentrations near one facility. However, starting with the 3-year 2012-2014 design value, the Basin has met the lead standard. A re-designation request to U.S. EPA is pending.

Nitrogen dioxide, sulfur dioxide, and carbon monoxide levels have improved in the Basin and are in full attainment of the NAAQS. In 2007, U.S. EPA formally re-designated the Basin to attainment of the carbon monoxide NAAQS. Maximum levels of carbon monoxide in the Basin have been consistently less than one-third of the federal standards since 2004. In 2010, U.S. EPA revised the NO_2 1-hour standard to a level of 100 ppb and the SO_2 1-hour standard to a level of 75 ppb. In 2016, all sites in the Basin remained in attainment of these NAAQS.

Mandates

The SCAQMD is governed and directed by several state laws and a comprehensive federal law that provide the regulatory framework for air quality management in the Basin. These laws require SCAQMD to take prescribed steps to improve air quality.

Generally speaking, SCAQMD is responsible for stationary sources such as factories and businesses. CARB and U.S. EPA are primarily responsible for motor vehicles. SCAQMD and CARB share responsibilities with respect to area sources. SCAQMD and the Southern California Association of Governments (SCAG) share some responsibilities with CARB regarding some aspects of mobile source emissions related to transportation and land use. Control of emissions from sources such as airports, harbors, and trains is shared by U.S. EPA, CARB and SCAQMD. Without adequate efforts by CARB and U.S. EPA to control emission sources under their sole authority, it is impossible for the region to reach federal clean air standards.

Under State law, SCAQMD must periodically develop and submit to the State an Air Quality Management Plan (AQMP or Plan) demonstrating how the region will achieve State and Federal ambient air quality standards, or at a minimum demonstrate that all feasible measures are being carried out to meet state air quality standards. Each iteration of the Plan is an update of the previous version. To date, the SCAQMD's Governing Board has adopted Plans demonstrating attainment in 1989, 1991, 1994, 1997, 1999 (amendments to the plan adopted in 1997), 2003, 2007 and 2012. The 2016 AQMP was approved in March 2017. Earlier plans in 1979 and 1982 did not show attainment and predicted continued unhealthful air well into this century. Revisions to the annual PM2.5 NAAQS, adopted by U.S. EPA in 2012 to further protect public health, lead to the projected attainment of the new annual PM2.5 NAAQS by 2025. The attainment deadline for the 2006 24-hour PM2.5 NAAQS is 2019. The 2008 federal 8-hour ozone NAAQS has an attainment deadline of 2032. Attainment designations for the 2015 ozone NAAQS are expected to be finalized in 2018, with State Implementation Plan (SIP) attainment demonstrations likely due in 2021 or 2022. Attainment deadlines for the new ozone NAAQS are still pending, but for an extreme non-attainment area such as the Basin, the attainment deadline is 20 years from the effective date of the designation or approximately 2038.

State Laws include:

- California Clean Air Act (AB 2595) requires air districts in California to adopt plans to expeditiously meet state ambient air quality standards. It mandates that SCAQMD's attainment plans meet several specific requirements including:
  - ♦ a 5% per year reduction in emissions (the plan can achieve less than 5% annual reduction if it includes every feasible measure and an expeditious adoption schedule);
  - ♦ Best Available Control Technology (BACT) for new and modified sources;
  - ♦ Best Available Retrofit Control Technology (BARCT) for existing sources.
- Lewis-Presley Air Quality Management Act (SB 151) specifies additional, more stringent requirements for air quality plans in the Basin. It specifies that SCAQMD has responsibility to prepare the plan in conjunction with SCAG, which must prepare the portions of the plan relating to demographic projections, land use, and transportation programs.
- Air Toxics "Hot Spots" Information & Assessment Act (AB 2588) requires facilities that emit significant quantities of pollutants to prepare health risk assessments describing the impact of toxic contaminants on neighboring areas. If SCAQMD determines that the toxic emissions create a significant risk, the public must be notified, and facilities must reduce emissions to below significant levels.
- Tanner Air Toxics Process (AB 1807) requires CARB to adopt air toxic control measures to limit emissions of toxic air contaminants from classes of industrial facilities. Local air districts are required to enforce these regulations or adopt equally or more stringent regulations of their own.

State law also includes the following measures:

- authorizes SCAQMD to adopt market incentives such as the emissions trading program known as RECLAIM as long as the emitters achieve reductions equivalent to command-and-control regulations;
- requires SCAQMD to establish a program to encourage voluntary participation in projects to increase the use of clean-burning fuels;
- requires SCAQMD to adopt and enforce rules to ensure no net emission increases from stationary sources.

Under the Federal Clean Air Act, SCAQMD must develop and submit to CARB for review, followed by submittal to U.S. EPA, an element of the SIP demonstrating how the Basin will achieve the NAAQS. In the case of ozone, the Plan was required to be submitted by November 15, 1994 and for PM10 particulate matter, the Plan was required to be submitted by February 8, 1997. Plans for other pollutants were submitted in earlier years. In 1997, U.S. EPA adopted new NAAQS for PM2.5 and replaced the 1997 1-hour ozone NAAQS with a new standard based on an 8 hour average. The SIPs to attain these federal standards were submitted to U.S. EPA in November, 2007. The SIP to attain the current 2006 24-hour PM2.5 NAAQS was submitted in early 2013. The SIP to attain the 2008 8-hour ozone standard is expected to be submitted in early 2017 following the March 3, 2017 adoption of the 2016 AQMP by the SCAQMD Governing Board.

The Federal Clean Air Act mandates that sanctions be imposed on an area if a suitable Plan is not adopted and approved by U.S. EPA. These sanctions can include loss of key federal funds and more stringent requirements on new or expanding industries. Specific requirements for SCAQMD's AQMP include stringent requirements plus Lowest Achievable Emission Rate (LAER) and offsets for major new sources. Federal law also requires an operating permit program for major stationary sources, known as Title V, which must be supported by permit fees. In addition, air toxics regulations adopted by U.S. EPA pursuant to Title III must be implemented by SCAQMD.

Air Quality Control

Developing solutions to the air quality problem involve highly technical processes and a variety of resources and efforts to meet the legal requirements of California and federal laws.

Monitoring: The first step in air quality control is to determine the smog problem by measuring air pollution levels. SCAQMD operates approximately 41 monitoring stations throughout the Basin. These range from fully equipped stations that measure levels of all criteria pollutants, as well as some air toxic pollutant levels, to those which measure a specific pollutant in critical areas. These measurements provide the basis of our knowledge about the nature of the air pollution problem and the data for planning and compliance efforts to address the problem.

Pollution Sources: The SCAQMD, in cooperation with CARB and SCAG, estimates the sources of emissions causing the air pollution problem. Nature itself causes a portion of the emissions and must be considered. In general, SCAQMD estimates stationary and natural sources of emissions, SCAG develops the information necessary to estimate population and traffic, and CARB develops the information necessary to estimate mobile and area source emissions using the SCAG traffic data. This data is then consolidated in the AQMP for use in developing the necessary control strategies.

Air Quality Modeling: Using air quality, meteorological and emissions models, SCAQMD planners simulate air pollution to demonstrate attainment of the air quality standards and the impacts of sources to local and regional air quality. Due to the nature of air pollution, air quality models can be very complex. Some pollutants are not emitted directly into the air but are products of photochemical reactions in the atmosphere. For example, VOCs mix with nitrogen dioxide (NO_2) and react in sunlight to form ozone; similarly, nitrogen oxide gases from tailpipes and smokestacks can be transformed into nitrates or particulates (PM2.5 and PM10). The planners thus must take into account transport, land use characteristics and chemical reactions of emissions in the atmosphere to evaluate air quality impacts. Using model output, planners can look at different control scenarios to determine the best strategies to reduce air pollution for the lowest cost.

The considerable data required for these analyses is collected on an ongoing basis by SCAQMD staff. Modeling data is prepared and delivered using a geographic information system (GIS). GIS capability is used to prepare and produce data and spatial analysis maps for various needs by SCAQMD including rulemaking and California Environmental Quality Act (CEQA) document development.

Planning: With emissions data and an air quality model in place, planners can develop possible control strategies and scenarios. SCAQMD focuses most of its effort on stationary source controls. As mentioned earlier, strategies to reduce vehicle miles traveled (VMT) are developed primarily by SCAG, while mobile source control standards are developed primarily by CARB.

Once a plan of emission controls to achieve the NAAQS is outlined, SCAQMD is required to hold multiple public meetings to present the proposed control strategies and receive public input. SCAQMD also conducts a socioeconomic analysis of the strategies. SCAQMD maintains an ongoing and independent advisory group of outside experts for both its air quality modeling and socioeconomic assessment methodologies.

To meet federal air quality standards, the AQMPs and SIP submittals, including the 2016 AQMP, called for significant emissions reductions from projected baseline emissions in order to meet the NAAQS by the federal attainment deadlines (2019 for the 2006 24-hour PM2.5 NAAQS, 2025 for the 2012 annual PM2.5 NAAQS, 2023 for the 1979 1-hour ozone NAAQS, 2024 for the 1997 8-hour ozone NAAQS, and 2032 for the 2008 8-hour ozone NAAQS). These combined reductions, while meeting most NAAQS, will still not result in attainment of all California State ambient air quality standards or the revised 2015 8-hour ozone NAAQS. The 2012 AQMP addressed the 24-hour PM2.5 NAAQS. The 2016 AQMP addresses the 2008 8-hour ozone NAAQS and the 2012 annual PM2.5 NAAQS, and demonstrates compliance with the requirements for being a "serious" non-attainment area for the 24-hour PM2.5 NAAQS requirements. SCAQMD will continue to improve the emissions inventories and modeling techniques in order to address the 2015 8-hour NAAQS for the next AQMP revision which has an anticipated adoption in the 2021 or 2022 timeframe.

Rulemaking: The regulatory process, known as rulemaking, takes the concepts of control measures outlined in the AQMP and turns them into proposed rule language. This process involves the following: extensive research on technology; site inspections of affected industries to determine feasibility; typically a year or more of public task force and workshop meetings; in-depth analyses of environmental, social and economic impacts; and thorough review with appropriate Governing Board Committees.

This extensive process of public and policymaker participation encourages consensus in development of rule requirements so that affected sources have an opportunity for input into the rules that will regulate their operations. Once the requirements are developed, the proposed rule, along with an Environmental Assessment and a socioeconomic report, is presented to SCAQMD's Governing Board at a public hearing. Public testimony is presented and considered by the Board before any rule is adopted. The adopted or amended rules are then submitted to CARB and U.S. EPA for their approval. It is not uncommon for rulemaking to include follow-up implementation studies. These studies may extend one or more years past rule adoption/amendment and prior to rule implementation. Such studies are typically submitted to the Governing Board or appropriate Governing Board Committees.

Enforcement and Education: SCAQMD issues permits to construct and operate equipment to companies to ensure equipment is operated in compliance with adopted rules. Follow-up inspections are made to ensure that equipment is being operated under permit conditions.

Technical Innovation: In the late 1980s, SCAQMD recognized that technological innovation, as well as rule enforcement, would be necessary to achieve clean air standards. Thus the Technology Advancement Office was created to look for and encourage technical innovation to reduce emissions. The California State Legislature supported this effort by providing a $1 surcharge on every DMV registration fee paid within the Basin. These funds have been matched at a ratio of approximately three-to-one with funds from the private sector to develop new technologies such as low-emission vehicles, low-NO_x burners for boilers and water heaters, zero-pollution paints and solvents, fuel cells and other innovations.

An additional $4 vehicle registration fee was authorized by the state legislature in 1990. These fees are administered through SCAQMD with $1.20 going to SCAQMD for mobile source emissions reductions, $1.60 subvened directly to cities and counties to support their air quality programs, and $1.20 to the Mobile Source Air Pollution Reduction Review Committee (MSRC). The MSRC is an outside panel established by state law whose function is to make the decisions on the actual projects to be funded from that portion of the revenue.

Public Education: In the end, SCAQMD's efforts to clean up the air will be successful only to the extent that the public understands air quality issues and supports and participates in our cleanup effort. Thus, SCAQMD strives to involve and inform the public through the Legislative and Public Affairs/Media Office, public meetings, publications, the press, and public service announcements.

Budget Synopsis

The SCAQMD's annual budget is adopted for the General Fund for a fiscal year that runs from July 1 through June 30 of the following year. The period covered by the FY 2017-18 budget is from July 1, 2017 to June 30, 2018. The General Fund budget is the agency's operating budget and is structured by Office and account. The accounts are categorized into three Major Objects: Salaries and Employee Benefits, Services and Supplies, and Capital Outlays. The budget is supplemented with a Work Program which estimates staff resources and expenditures along program and activity lines. A Work Program Output Justification is completed for each Work Program which identifies performance goals, measureable outputs, legal mandates, activity changes and revenue categories.

The annual expenditure and revenue budget for the General Fund is adopted on a modified accrual basis. All annual expenditure appropriations lapse at fiscal year-end if they have not been expended or encumbered. Throughout the year, budget amendments may be necessary to accommodate additional revenues and expenditure needs. Any amendments due to budget increases or transfers between expenditure accounts in different Major Objects must be

approved by SCAQMD's Governing Board. They are submitted to the Governing Board for approval at a monthly Board meeting in the format of a board letter which documents the need for the request and the source of funding for the expenditure. Budget amendments resulting from transfers between expenditure accounts within the same Major Object are approved at the Office level.

SCAQMD does not adopt annual budgets for its Special Revenue Funds. Special Revenue Funds are used to record transactions applicable to specific revenue sources that are legally restricted for specific purposes. All transactions in Special Revenue Funds are approved by the Governing Board on an as needed basis.

Budget Process

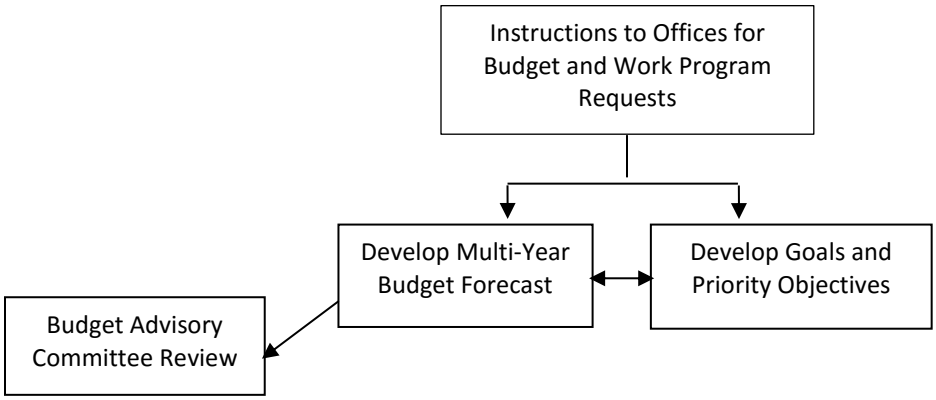
The SCAQMD budget process begins with the Chief Administrative Officer issuing instructions and guidelines to the Offices. Under the guidance of the Executive Officer, the Chief Operating Officer and the Chief Administrative Officer, the Offices also begin establishing Goals and Priority Objectives for the fiscal year. The proposed annual budget and multi-year forecast is then developed by the Offices, Finance, Executive Council, and the Executive Officer based on the Goals and Priority Objectives as well as guidelines issued by the Executive Officer. Each Office submits requests for staffing, select Salary accounts, Services and Supplies accounts, and the Capital Outlays account. The remaining salary and benefit costs are developed by Finance. Capital expenditure requests are reviewed by an in-house committee who prioritizes the requests. Revenue projections are developed by Finance based on input received from the appropriate Offices and incorporating any proposed changes to the fee schedules. This information is integrated into an initial budget request, including a top-level multi-year forecast, and then fine-tuned under the direction of the Executive Officer to arrive at a proposed budget. The public, business community, and other stakeholders have several opportunities to participate in the budget process, up to and at the budget adoption hearing by the Governing Board, including:

- two meetings of the Budget Advisory Committee whose members include various stakeholder representatives
- two public consultation meetings to discuss proposed amendments to Regulation III - Fees and the proposed budget
- a public hearing on the Proposed Draft Budget and Work Program and Proposed Amended Regulation (PAR) III - Fees

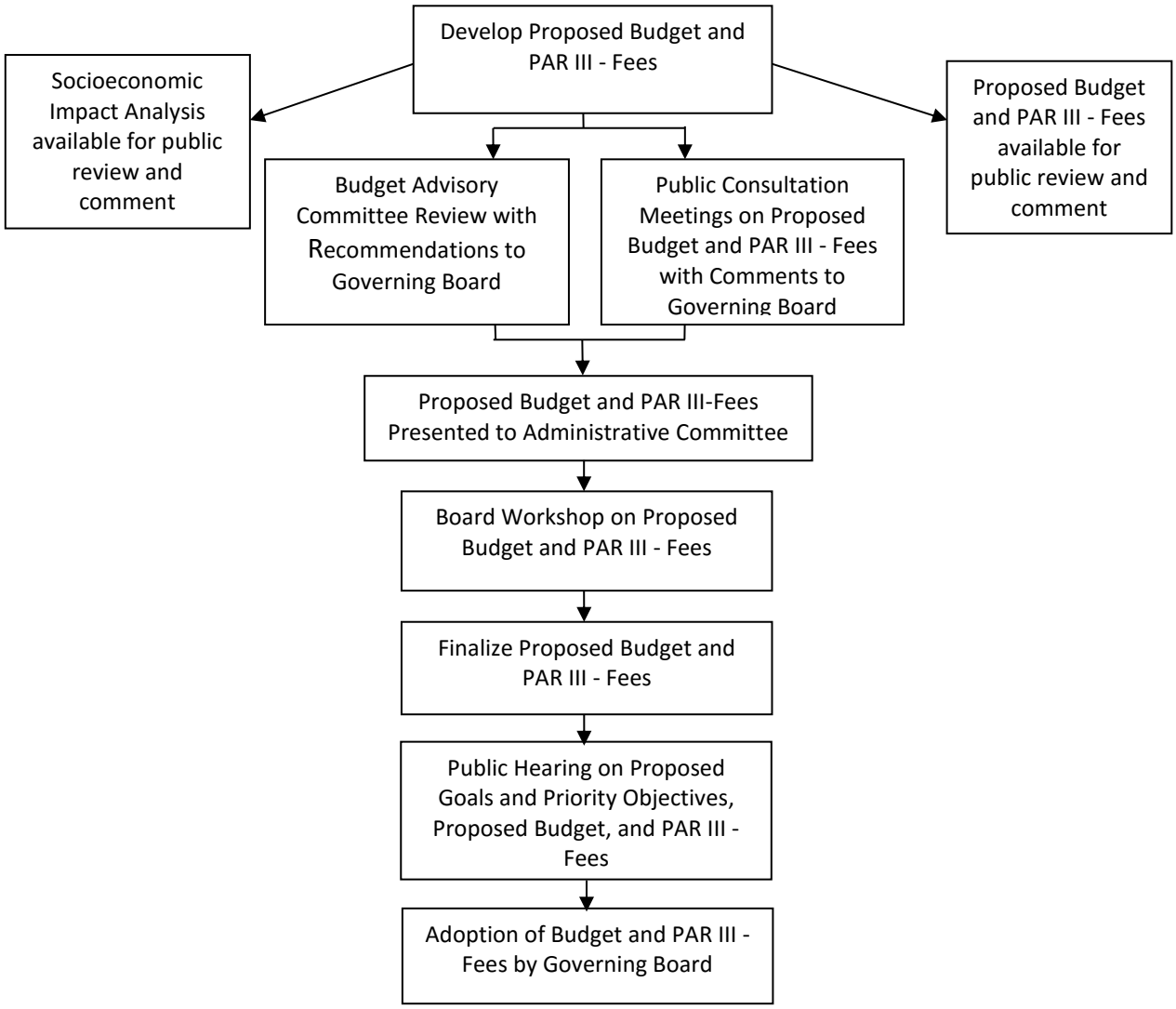
The proposed budget is presented to SCAQMD's Governing Board at a budget workshop and to SCAQMD's Administrative Committee. Any public comments and Budget Advisory Committee recommendations are also submitted to the Governing Board by April 15 of each year. The final proposed budget, including final fee schedules, is adopted by the Governing Board and is in place on July 1 for the start of the new fiscal year.

The following flow charts represent the major milestones and processes that take place in the development of the SCAQMD budget:

Preliminary Budget Process



Annual Budget Process



Budget Timeline	
Budget packages distributed to Offices	Dec 7, 2016
Budget submissions received from Offices	Jan 13, 2017
Budget Advisory Committee meeting	Jan 20, 2017
Proposed budget available for public review	April 5, 2017
Budget Advisory Committee meeting on proposed budget and PAR III - Fees	April 6, 2017
Public Consultation Meetings on proposed budget and PAR III - Fees	April 11, 2017; April 18, 2017
Public comments and Budget Advisory Committee recommendations submitted to Governing Board	April 14, 2017; April 25, 2017
Governing Board Budget Workshop	April 21, 2017
Budget presented to Administrative Committee	May 12, 2017
Public Hearing & Governing Board adoption of budget and PAR III - Fees	June 2, 2017

Proposed Budget & Work Program

Budget Overview

The budget for FY 2017-18 proposes expenditures of $149.9 million and revenues of $147.0 million, using prior year revenues to supplement FY 2017-18 projected revenues. To compare against prior years, the following table shows SCAQMD's amended budget and actual expenditures for FY 2015-16, adopted and amended budgets for FY 2016-17 and proposed budget for FY 2017-18.

Description	FY 2015-16 Amended	FY 2015-16 Actual	FY 2016-17 Adopted	FY 2016-17 Amended[1]	FY 2017-18 Proposed
Staffing	803	-	813	815	825.25
Revenue/Transfers In	$141.3	$134.4	$136.4	$143.5	$147.0
Program Costs/Transfers Out	$147.8	$138.7	$141.5	$150.2	$149.9

[1] Includes Board approved changes through March 2017

This budget reflects a decrease of approximately $0.3 million in expenditures from the FY 2016-17 amended budget and a $8.4 million increase in expenditures from the budget adopted for FY 2016-17. The increase in expenditures from the FY 2016-17 adopted budget can be attributed to increases in retirement costs, salaries associated with new positions, contractual costs, and capital outlays. The FY 2017-18 proposed budget includes 825.25 positions, an increase of 10.25 positions over the FY 2016-17 amended budget. This increase in positions will augment enforcement, monitoring and analysis, rulemaking, and communications efforts. Four positions are funded by mobile source-related incentive programs and by Air Toxics revenue. The 0.25 FTE

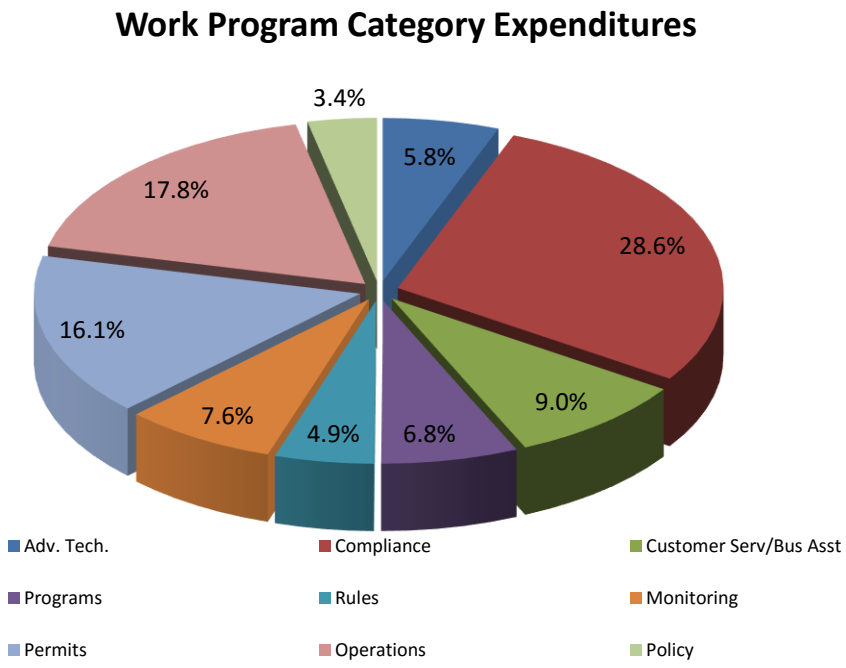
is to provide three months of critical overlap and to provide service continuity before the Assistant Deputy Executive Officer of Information Management retires.

Expenditures

Work Program

SCAQMD expenditures are organized into nine Work Program Categories: Advance Clean Air Technology; Ensure Compliance with Clean Air Rules; Customer Service and Business Assistance; Develop Programs to Achieve Clean Air; Develop Rules to Achieve Clean Air; Monitoring Air Quality; Operational Support; Timely Review of Permits; and Policy Support. Each category consists of a number of Work Programs, or activities, which are classified according to the nature of the activity being performed.

Each Work Program ties to the goals and objectives of the agency and identifies resources, performance measures/outputs and legal mandates. A complete description of each program category along with a detailed work program sort by program is included in the Goals and Priority Objectives and Work Program section. The pie chart that follows represents the budgeted expenditures by Program Category for FY 2017-18.



The following table compares SCAQMD Work Program expenditures by category for the FY 2016-17 adopted budget and FY 2017-18 proposed budget.

Work Program Categories	FY 2016-17 Adopted Budget	FY 2017-18 Proposed Budget
Advance Clean Air Technology	$ 7,093,418	$ 8,661,899
Ensure Compliance with Clean Air Rules	43,314,046	42,802,490
Customer Service and Business Assistance	12,217,648	13,437,515
Develop Programs to Achieve Clean Air	10,419,982	10,184,322
Develop Rules to Achieve Clean Air	6,387,801	7,354,657
Monitoring Air Quality	10,458,169	11,398,567
Operational Support	25,899,412	26,747,503
Timely Review of Permits	20,952,521	24,151,356
Policy Support	4,784,698	5,140,597
Total	$ 141,527,695	$ 149,878,906

Account Categories

The following table compares the FY 2016-17 adopted budget and the FY 2016-17 amended budget to the proposed budget for FY 2017-18 by account category. The FY 2016-17 amended budget includes the Board-approved mid-year adjustments through March 2017.

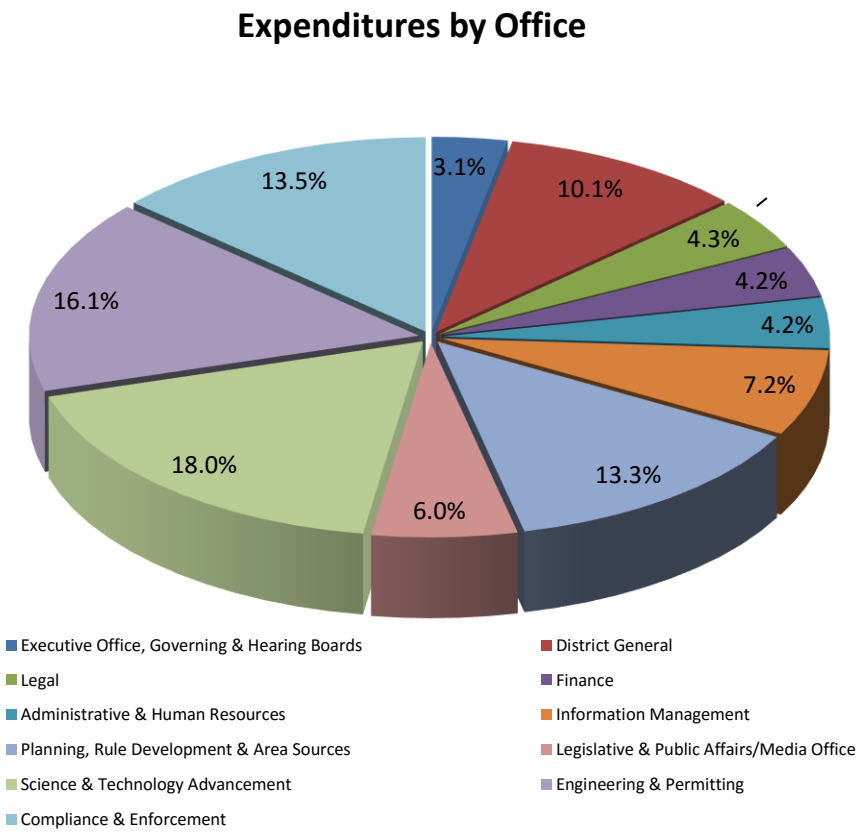
Account Description	FY 2016-17 Adopted Budget	FY 2016-17 Amended Budget	FY 2017-18 Proposed Budget
Salaries/Benefits	$ 114,841,998	$ 114,927,674	$ 119,860,494
Insurance	1,317,400	1,362,400	1,317,400
Rents	462,973	576,462	498,154
Supplies	2,630,504	3,391,594	2,777,621
Contracts and Services	8,989,091	12,762,460	10,515,792
Maintenance	1,420,861	1,727,108	1,687,193
Travel/Auto Expense	852,960	1,034,937	864,520
Utilities	2,213,288	2,140,448	2,213,288
Communications	701,000	759,260	702,000
Capital Outlays	850,000	4,046,251	1,950,717
Other	1,053,128	1,276,927	1,302,213
Debt Service	6,194,492	6,194,492	6,189,514
Total	$ 141,527,695	$ 150,200,013	$ 149,878,906

As mentioned previously, the proposed budget for FY 2017-18 represents an approximately $0.3 million decrease in expenditures from the FY 2016-17 amended budget. The FY 2016-17

amended budget includes mid-year increases associated with the purchase of air monitoring and laboratory analysis instruments, field platforms and software, development of online permitting modules, strategic consulting for the AQMP, development of a web-based application system for the Enhanced Fleet Modernization Program, the pursuit of environmental justice interests and policies, and grant related expenditures offset by revenue.

Office Categories

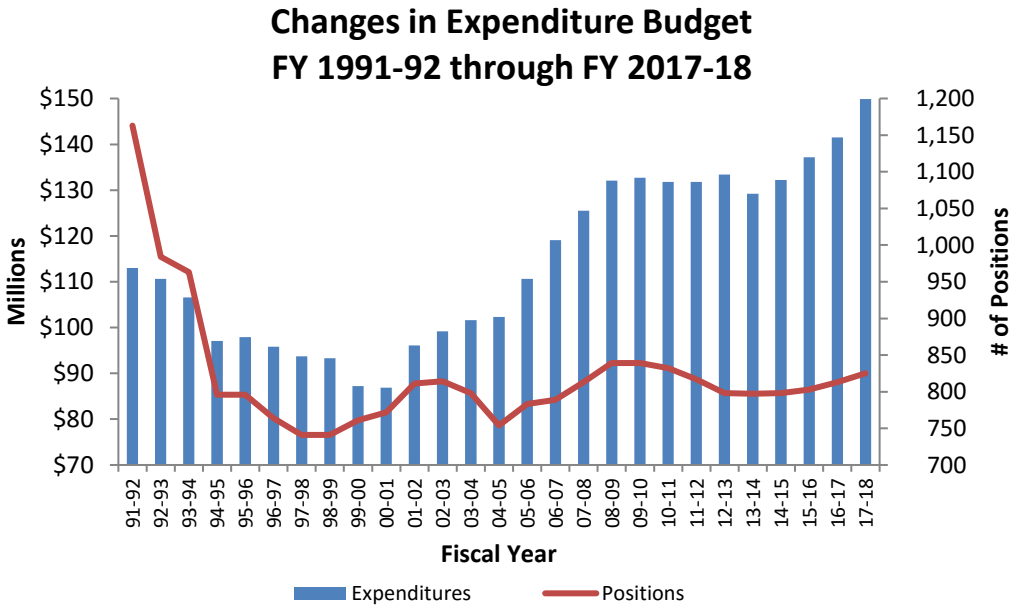
The following pie chart represents budgeted expenditures by Office for FY 2017-18.

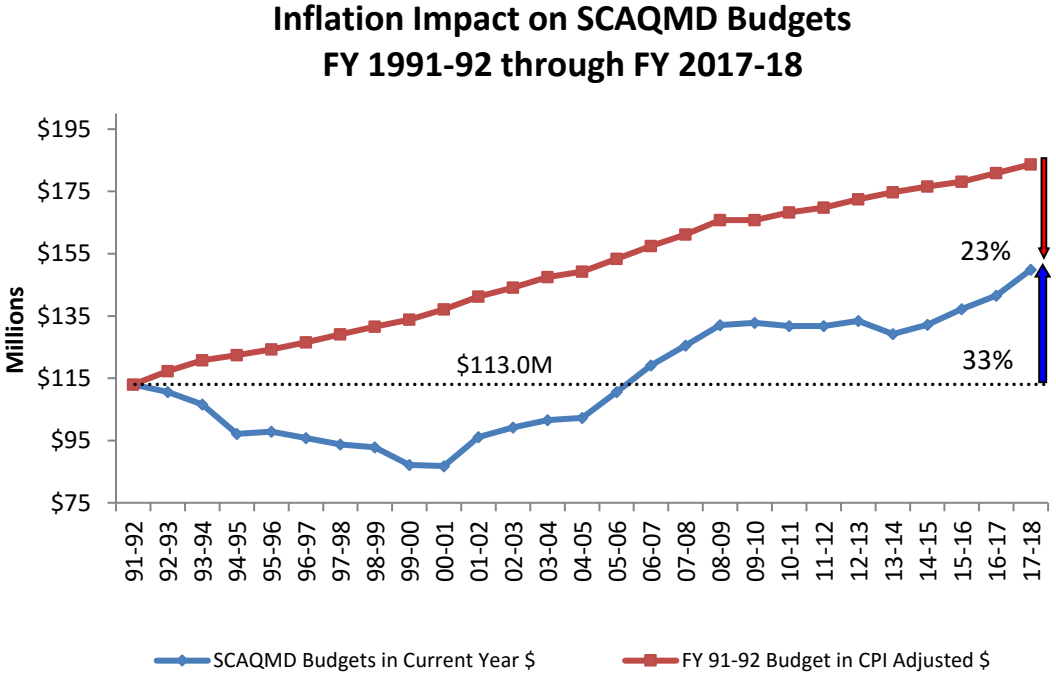


Budget Changes

Over the years, SCAQMD has focused on streamlining many of its operations while still meeting its program commitments, despite new federal and state mandates and increased workload complexity. The focus has been on reducing expenditures in the Major Object of Services and Supplies and maximizing the efficient use of staff resources to enable select vacant positions to remain vacant, be deleted or be unfunded. This effort has resulted in reduced program costs and is reflected in the following charts showing SCAQMD's staffing and budget levels starting in FY 1991-92 when staffing was at 1,163 FTEs. The proposed budget for FY 2017-18 reflects a staffing level of 825.25 FTEs. This staffing level is 29% (337.75 FTEs) below the FY 1991-92 level. The FY

2017-18 proposed budget is 33% higher when compared to the FY 1991-92 adopted budget of $113 million. However, after adjusting the FY 1991-92 adopted budget for CPI over the last 26 years, the FY 17-18 proposal is 23% lower.





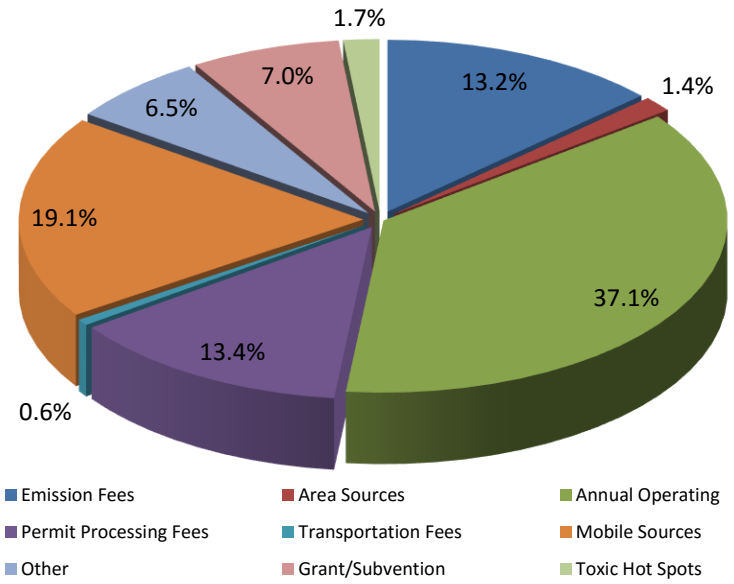
CPI adjustment based on California Consumer Price Index for the preceding Calendar Year

Revenues

Revenue Categories

Each year, in order to meet its financial needs, the SCAQMD Governing Board adopts a budget supported by a system of annual operating and emission fees, permit processing fees, toxic "hot spots" fees, area sources fees, source test/analysis fees, and transportation plan fees. In FY 2017-18, these fees are projected to generate approximately $99.6 million or about 68% of SCAQMD revenues; of this $99.6 million, $92.2 million or 63% of SCAQMD's revenues are from stationary sources. Other sources, which include penalties/settlements, Hearing Board fees, interest, and miscellaneous income, are projected to generate approximately 6% of total revenues in FY 2017-18. The remaining 26% of revenue is projected to be received in the form of federal grants, California Air Resource Board (CARB) subvention, and California Clean Air Act motor vehicle fees. Beginning with its Fiscal Year 1978-79 Budget, the SCAQMD became a fee supported agency no longer receiving financial support from property taxes. The FY 2017-18 proposed revenue budget includes a proposed CPI fee adjustment of 2.5%, an additional 10.67% increase to Title V annual operating permit renewal and permit processing fees to more fully recover Title V program costs, and a 4% increase to non-Title V annual operating permit renewal and permit processing fees to better align program costs with revenue.

Revenues by Major Category



The following table compares the FY 2016-17 adopted revenue budget and the FY 2016-17 amended revenue budget to the proposed revenue budget for FY 2017-18. The FY 2016-17 amended revenue budget includes Board-approved mid-year changes through March 2017.

Revenue Description	FY 2016-17 Adopted Budget	FY 2016-17 Amended Budget	FY 2017-18 Proposed Budget
Annual Operating Emission Fees	$ 19,859,100	$ 19,859,100	$ 19,480,550
Annual Operating Permit Renewal Fees	48,565,400	48,565,400	53,078,320
Permit Processing Fees	16,771,480	16,771,480	19,595,150
Portable Equipment Registration Program	1,277,420	1,277,420	1,200,000
Area Sources	2,549,180	2,549,180	2,152,500
Grant/Subvention	10,362,130	13,295,493	10,397,650
Mobile Sources	25,724,780	28,245,999	28,199,250
Transportation Programs	860,520	860,520	861,360
Toxic Hot Spots	2,619,510	2,769,510	2,488,380
Other[1]	7,350,970	7,357,610	7,471,470
Transfers In	505,790	1,980,422	2,072,190
Total	$ 136,446,280	$ 143,532,134	$ 146,996,820

[1]Includes revenues from Interest, Lease Income, Source Testing, Hearing Board, Penalties/Settlements, Subscriptions, and Other.

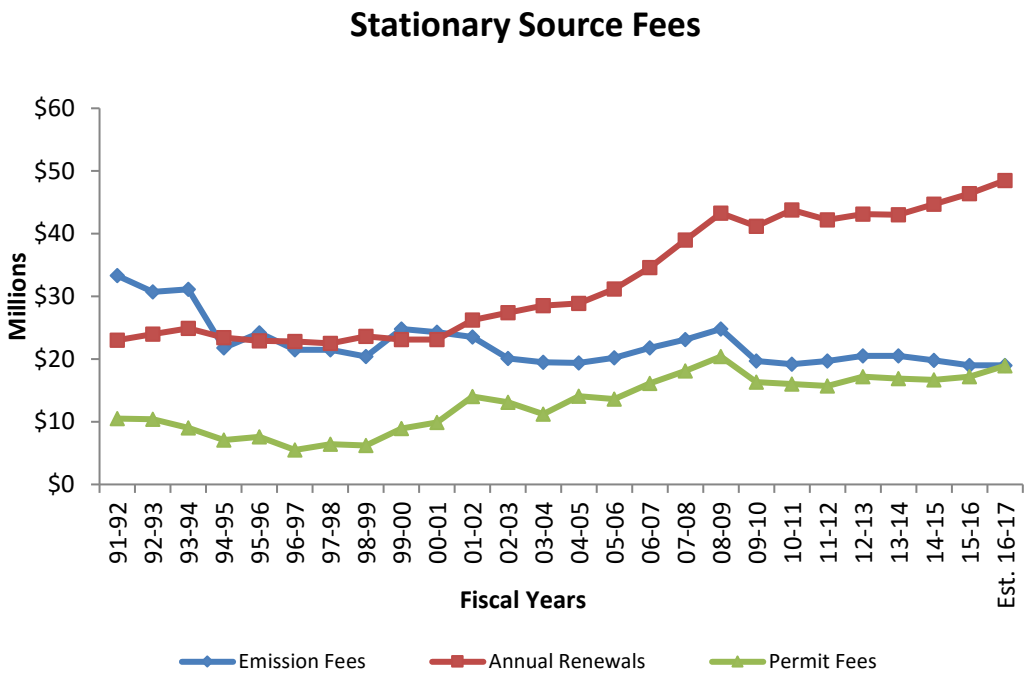
Over the past two decades, total permit fees (including permit processing, annual operating permit, and annual emissions-based fees) collected from stationary sources has increased by about 29% from $66.8 million in FY 1991-92 to $86.3 million (estimated) in FY 2016-17. When adjusted for inflation however, stationary source revenues have decreased by 24% over this same period.

Mobile source revenues that are subvened to the SCAQMD by the Department of Motor Vehicles (DMV) are projected to increase slightly from the FY 2016-17 budgeted amounts based on vehicle registration information from the DMV and recent revenue received. In addition, this category reflects reimbursements of incentive programs (Clean Fuels, Carl Moyer, and Prop 1B) whose contract activities and revenues are recorded in special revenue funds outside the General Fund. These incentive program costs incurred by the General Fund are reimbursed to the General Fund from the various special revenue funds (subject to any administrative caps) and are reflected under the Mobile Source revenue category.

Revenues from the federal government, (Environmental Protection Agency, Department of Homeland Security, and Department of Energy) are projected to stay flat in FY 2017-18 from FY 2016-17 budgeted levels reflecting little change in the amount of federal dollars from one-time and on-going grants in support of air quality efforts. However, it is recognized that actual revenues may be impacted by potential changes in federal funding priorities in the form of lower

grant revenue received through U.S. EPA grants. State Subvention funding is expected to remain at the current level (reduced approximately 35% from FY 2001-02) for FY 2017-18.

The following graph tracks actual stationary source revenues by type of fee from FY 1991-92 (when CPI limits were placed on SCAQMD fee authority) to estimated revenues for FY 2016-17.



Debt Structure

Pension Obligation Bonds

These bonds were issued jointly by the County of San Bernardino and the SCAQMD in December 1995. In June 2004 the SCAQMD went out separately and issued pension obligation bonds to refinance its respective obligation to the San Bernardino County Employee's Retirement Association (SBCERA) for certain amounts arising as a result of retirement benefits accruing to members of the Association.

The annual payment requirements under these bonds are as follows:

Year Ending June 30	Principal	Interest	Total
2018	$ 3,432,798	$ 3,756,716	$ 7,189,514
2019	3,553,110	3,637,290	7,190,400
2020	3,686,640	3,503,982	7,190,622
2021	3,840,443	3,353,106	7,193,549
2022-2024	11,796,881	3,653,994	15,450,875
Total	$ 26,309,872	$ 17,905,088	$ 44,214,960

Fund Balance

The SCAQMD is projecting an Unreserved (Unassigned) Fund Balance for June 30, 2018 of $27,389,438 in addition to the following Reserved and Unreserved Designated Fund Balances for FY 2017-18.

Classification	Reserves/Unreserved Designations	Amount
Committed	Reserve for Encumbrances	$ 7,723,000
Nonspendable	Reserve for Inventory of Supplies	80,000
	Unreserved Designations:	
Assigned	For Enhanced Compliance Activities	883,018
Assigned	For Other Post Employment Benefit (OPEB) Obligations	2,952,496
Assigned	For Permit Streamlining	2, 288,385
Assigned	For Self-Insurance	2,000,000
Assigned	For Unemployment Claims	80,000
	Total Reserved & Unreserved Designations	$ 16,006,899

Reserves represent portions of the fund balance set aside for future use and are therefore not available for appropriation. These funds are made-up of encumbrances which represent the estimated amount of current and prior years' unperformed purchase orders and contract commitments at year-end; and inventory which represents the value at cost of office, computer, cleaning and laboratory supplies on hand at year-end.

Unreserved Designations in the fund balance indicate plans for use of financial resources in future years. The Designation for Enhanced Compliance Activities provides funding for inspection/compliance efforts. The Designation for Other Post Employment Benefit Obligations (OPEB) provides funding to cover the current actuarial valuation of the inherited OPEB obligation for long-term healthcare costs from the County of Los Angeles resulting from the consolidation of the four county Air Pollution Control Districts (APCDs). The Designation for Permit Streamlining was established to fund program enhancements to increase permitting efficiency and customer service. The SCAQMD is self-insured for general liability, workers' compensation, automobile liability, premises liability, and unemployment.

Long-Term Projection

The SCAQMD continues to face a number of challenges in the upcoming years, including continued higher operating costs due to increased retirement costs and the need for major infrastructure improvement projects for an aging headquarters building while meeting air quality goals, permit processing targets, and growing program commitments. In April 2017, SBCERA took action to lower their investment return assumptions from 7.5% to 7.25% and modify their mortality assumptions, which will significantly impact the level of expenditures beginning in FY

2018-19. A primary uncertainty continues to be the degree of fluctuations the financial markets will take over the next few years which will determine the performance of our retirement investments and other investments. Another uncertainty is any legislative action that may impact the level of federal and state funding from grant awards and subvention funds. Cost recovery within the constraints of Prop 26 is a third uncertainty as SCAQMD strives to balance program operating expenses with revenues collected from fees. In order to face these challenges, SCAQMD has a five year plan in place that provides for critical infrastructure improvement projects, maintains a stable vacancy rate in order to maximize cost efficiency, better aligns program revenues with costs, and strives to keep the percentage of unreserved fund balance to revenue within the Governing Board mandate of 20%. The following chart, outlining SCAQMD's financial projection over this time period, shows the agency's commitment to meet these challenges and uncertainties while protecting the health of the residents within the SCAQMD boundaries and remaining sensitive to business. While not included in the Five Year Projection, starting in FY 2022-23, SCAQMD will realize a $3.1M savings in Pension Obligation Bond payments.

Fiscal 2016-17 Estimate and Five Year Projection ($ in Millions)						
	FY 16-17 Estimate	**FY 17-18 Proposed**	**FY 18-19 Projected**	**FY 19-20 Projected**	**FY 20-21 Projected**	**FY 21-22 Projected**
STAFFING		825.25	825	825	825	825
REVENUES/TRANSFERS IN*	$146.5	$147.0	$150.4	$151.2	$151.8	$153.0
EXPENDITURES/TRANSFERS OUT	$145.2	$149.9	$155.5	$155.1	$156.1	$156.8
Change in Fund Balance	$1.3	-$2.9	-$5.1	-$3.9	-$4.3	-$3.8
UNRESERVED FUND BALANCE (at year-end)	$38.5	$35.6	$30.5	$26.6	$22.3	$18.5
% of REVENUE	26%	24%	20%	18%	15%	12%

*Includes projected CPI fee increase of 2.5% for FY 2017-18 with an additional 10.67% for Title V annual operating permit renewal and permit processing fees and an additional 4% for non-Title V annual operating permit renewal and permit processing fees; a CPI of 2.6% for FY 2018-19 with an additional 10.67% for Title V annual operating permit renewal and permit processing fees and an additional 4% for non-Title V annual operating permit renewal and permit processing fees; a CPI of 2.4% for FY 2019-20 with an additional 10.66% for Title V annual operating permit renewal and permit processing fees; and a CPI of 2.3% for FY 2020-21 and FY 2021-22.

As part of the Five Year Projection, SCAQMD details out projected building maintenance and capital outlay improvement projects for its headquarters building. These projects are outlined in the following chart. In addition, the Infrastructure Improvement Fund has been created with unanticipated one-time revenues from the General Fund for many of the capital outlay building improvement projects. The projects proposed from the Infrastructure Improvement Fund

include upgrading the Energy Management System, finish replacing the centrifugal chillers and cooling towers, and replacing the Liebert air conditioning units in the Computer Room.

GENERAL FUND **POTENTIAL BUILDING MAINTENANCE and CAPITAL OUTLAY PROJECTS** **FY 2017-18 through 2021-22**
Refurbish Restroom and Copy/Coffee Room Sinks and Counter Tops
Renovate Irrigation and Upgrade Controllers
Repaint Building Interior
Refurbish/Replace Restroom Side Panels
Replace Cooling Towers (2) and Chillers (2)
Replace Liebert AC Units - Computer Room (6)
Replace Gaylord Air Scrubbers (2) - Cafeteria
Covert Pneumatic Controls to Direct Digital Controls
Replace Aging Kitchen Equipment
Recoat Roofing Surface - District Headquarters
Repair Parking Lot and Repaint Parking Stalls and Curbs
Repair and Re-coat Parking Structure Deck
Replace VCT Tiles (Various Areas)
Repaint and Wallpaper Conference Center
Replace Air Handler Fan Walls
Upgrade Energy Management System
Replace Ceiling Tiles - Various Floors
Convert Fluorescent Office Lighting to LED
Upgrade Electric Vehicle Charger and Support System
Replace Carpet – Floors 3 & 4
Replace Roof – Child Care Center
Renovate Third Floor North
Modernize Elevator Equipment

SUMMARY OF FISCAL YEAR 2017-18 PROPOSED BUDGET				
	FY 2016-17 Adopted Budget	FY 2016-17 Amended Budget [1]	FY 2016-17 Estimate [2]	FY 2017-18 Proposed
Funding Sources				
Revenue	$ 135,940,490	$ 142,050,862	$ 145,260,004	$ 144,924,630
Transfers-In	505,790	1,481,272	1,282,557	2,072,190
Total Financing Sources	$ 136,446,280	$ 143,532,134	$ 146,542,560	$ 146,996,820
Funding Uses				
Salaries & Employee Benefits	$ 114,841,998	$ 114,927,674	$ 111,665,805	$ 119,860,494
Services & Supplies	25,835,697	31,226,088	29,716,593	28,067,695
Capital Outlays	850,000	4,046,251	3,850,652	1,950,717
Transfers-Out	-	-	-	-
Total Funding Uses	$ 141,527,695	$ 150,200,013	$ 145,233,050	$ 149,878,906

Fund Balances -Reserves & Unreserved Designations	Classification	Projected June 30, 2017	Projected June 30, 2018
Reserve for Encumbrances	Committed	$ 7,583,000	$ 7,723,000
Reserve for Inventory of Supplies	Nonspendable	80,000	80,000
Designated for Enhanced Compliance Activities	Assigned	883,018	883,018
Designated for Litigation/Enforcement	Assigned	-	-
Designated for Other Post Employment Benefit (OPEB) Obligations	Assigned	2,952,496	2,952,496
Designated for Permit Streamlining	Assigned	288,385	2,288,385
Designated for Self-Insurance	Assigned	2,000,000	2,000,000
Designated for Unemployment Claims	Assigned	80,000	80,000
Total Reserves & Unreserved Designations		$ 13,866,899	$ 16,006,899
Unassigned Fund Balance	Unassigned	$ 32,301,524	$ 27,389,438
Total Fund Balances		$ 46,168,423	$ 43,396,337

[1] The FY 16-17 Amended Budget includes mid-year changes through March 2017.

[2] Includes estimated encumbrances of $6,130,000 which will be applicable to the fiscal year ending June 30, 2017.

ANALYSIS OF PROJECTED JUNE 30, 2017 FUND BALANCE			
Fund Balances as of June 30, 2016			
Reserves	$ 6,982,806		
Designated	6,203,899		
Unassigned	31,006,208		
Total Fund Balances, June 30, 2016:		$	44,192,913
Add Excess Fiscal Year 2016-17 Revenues over Expenditures:			
Revenues	$ 146,542,560		
Expenditures[1]	139,103,050		
Sub-Total:		$	7,439,510
Deduct Decrease in Encumbrances Open on June 30, 2016:			(5,464,000)
Deduct Projected FY 2016-17 Transfers Out to Other Funds			-
Total Projected Fund Balances, June 30, 2017:		$	46,168,423
Fund Balances (Projected) at June 30, 2017			
Reserve for Encumbrances		$	7,583,000
Reserve for Inventory of Supplies			80,000
Designated for Enhanced Compliance Activities			883,018
Designated for Litigation/Enforcement			-
Designated for Other Post Employment Benefit (OPEB) Obligations			2,952,496
Designated for Permit Streamlining			288,385
Designated for Self-Insurance			2,000,000
Designated for Unemployment Claims			80,000
Unassigned			32,301,524
Total Projected Fund Balances, June 30, 2017		$	46,168,423
Note: This analysis summarizes the estimated amount of funds that will be carried into FY 2016-17.			
[1] Expenditures do not include estimated $6,130,000 encumbrances for the Fiscal Year ended June 30, 2017.			

SCHEDULE OF AVAILABLE FINANCING AND PROPOSED FISCAL YEAR 2017-18 RESERVES AND DESIGNATIONS		
Fund Balances	$ 46,168,423	
Emission Fees	19,480,550	
Annual Renewal Fees	53,078,320	
Permit Processing Fees	19,595,150	
Portable Equipment Registration Program	1,200,000	
State Subvention	3,945,090	
Federal Grant	6,452,560	
Interest Revenue	332,060	
Lease Revenue	136,540	
Source Test/Analysis Fees	774,900	
Hearing Board Fees	307,500	
Penalties and Settlements	5,000,000	
Area Sources	2,152,500	
Transportation Programs	861,360	
Mobile Sources/Clean Fuels	28,199,250	
Air Toxics "Hot Spots"	2,488,380	
Other Revenues/Transfers In	2,992,660	
Total Funds		$ 193,165,243
Less Proposed Fiscal Year 2017-18. Reserves and Designations:		
Reserve for Encumbrances	$ 7,723,000	
Reserve for Inventory of Supplies	80,000	
Designated for Enhanced Compliance Activities	883,018	
Designated for Litigation/Enforcement	-	
Designated for Other Post Employment Benefit (OPEB) Obligations	2,952,496	
Designated for Permit Streamlining	2,288,385	
Designated for Self-Insurance	2,000,000	
Designated for Unemployment Claims	80,000	
Total Proposed Reserves and Designations:		$ 16,006,899
Available Financing:		$ 177,158,344

ANALYSIS OF PROJECTED JUNE 30, 2018 FUND BALANCE		
Fund Balances as of June 30, 2017		
Reserves	$ 7,663,000	
Designated	6,203,899	
Unassigned	32,301,524	
Total Fund Balances, June 30, 2017:		$ 46,168,423
Add Excess Fiscal Year 2017-18 Revenues over Expenditures:		
Revenues	$ 146,996,820	
Expenditures[1]	143,778,906	
Sub-Total:		$ 3,217,914
Deduct Decrease in Encumbrances Open on July 1, 2017:		(5,990,000)
Total Projected Fund Balances, June 30, 2018:		$ 43,396,337
Fund Balances (Projected) Fiscal Year 2017-18:		
Reserve for Encumbrances		$ 7,723,000
Reserve for Inventory of Supplies		80,000
Designated for Enhanced Compliance Activities		883,018
Designated for Litigation/Enforcement		-
Designated for Other Post Employment Benefit (OPEB) Obligations		2,952,496
Designated for Permit Streamlining		2,288,385
Designated for Self-Insurance		2,000,000
Designated for Unemployment Claims		80,000
Unassigned		27,389,438
Total Projected Fund Balances, June 30, 2018		$ 43,396,337

[1] Expenditures do not include estimated $6,100,000 encumbrances for the Fiscal Year ended June 30, 2018.

Revenue Comparison				
Revenue Account	FY 2015-16 Actual	FY 2016-17 Budget	FY 16-17 Estimate	FY 17-18 Proposed
Emission Fees	$ 18,984,919	$ 19,859,100	$ 19,022,757	$ 19,480,550
Annual renewal Fees	46,380,074	48,565,400	48,452,801	53,078,320
Permit Processing Fees	17,239,759	16,771,480	18,837,116	19,595,150
Portable Equipment Registration Program	1,212,719	1,277,420	1,353,070	1,200,000
State Subvention	3,944,602	3,947,390	3,947,390	3,945,090
State Grant	2,884,368	-	-	-
Federal Grant	7,105,975	6,414,740	6,878,026	6,452,560
Interest Revenue	435,773	332,060	332,060	332,060
Lease Revenue	141,195	136,540	160,556	136,540
Source Test/Analysis Fees	683,328	774,140	714,812	774,900
Hearing Board Fees	163,960	307,200	487,925	307,500
Penalties and Settlements	5,704,685	5,000,000	11,463,815	5,000,000
Area Sources	2,226,172	2,549,180	2,549,180	2,152,500
Transportation Programs	891,991	860,520	823,900	861,360
Mobile Sources/Clean Fuels	21,967,629	25,724,780	26,878,718	28,199,250
Air Toxics "Hot Spots"	2,373,579	2,619,510	2,500,239	2,488,380
Other Revenues/Transfers In	2,064,188	1,306,820	2,140,194	2,992,660
Total Revenue	$ 134,404,917	$ 136,446,280	$ 146,542,560	$ 146,996,820

Annual Operating Emissions Fees

The Lewis-Presley Air Quality Management Act (Health & Safety Code Section 40400-40540) authorizes the SCAQMD to collect fees for permitted sources to recover the costs of District programs related to these sources. (Health & Safety Code 40410(b)). The SCAQMD initiated an annual operating emissions fees program in January 1978. As the program currently exists, all permitted facilities pay a flat fee for up to four tons of emissions. In addition to the flat fee, facilities that emit four tons or greater (from both permitted and unpermitted equipment) of any organic gases, specific organics, nitrogen oxides, sulfur oxides, or particulate matter, or 100 tons per year or greater of carbon monoxide, also pay fees based on the facility's total emissions. These facilities pay for emissions from permitted equipment as well as emissions from unpermitted equipment and processes which are regulated, but for which permits are not required, such as solvent use. In addition, a fee-per-pound is assessed on the following toxic air contaminants and ozone depleters: ammonia; asbestos; benzene; cadmium; carbon tetrachloride; chlorinated dioxins and dibenzofurans; ethylene dibromide; ethylene dichloride; ethylene oxide; formaldehyde; hexavalent chromium; methylene chloride; nickel; perchloroethylene; 1,3-butadiene; inorganic arsenic; beryllium; polynuclear aromatic hydrocarbons (PAHs); vinyl chloride; lead; 1,4-dioxane; trichloroethylene; chlorofluorocarbons (CFCs); and 1,1,1-trichloroethane. The rates are set forth in SCAQMD Rule 301.

FY 2017-18 Proposed Budget: The non-RECLAIM emissions are based on Annual Emission Report (AER) data for Calendar Year 2015. The RECLAIM NO_X and SO_X emission projection is based on holdings according to the RECLAIM Trading Credit (RTC) listing. The flat emission fees are projected based on the number of active facilities with at least one permit. A 2.5% CPI increase is included.

Annual Operating Permit Renewal

State law authorizes the SCAQMD to have an annual permit renewal program and authorizes fees to recover the costs of the program (Health & Safety Code Section 42300; 40510(b). The annual operating permit renewal program, initiated by the SCAQMD in February 1977, requires that all active permits be renewed on an annual basis upon payment of annual renewal fees. The annual renewal rates are established in SCAQMD Rule 301 and are based on the type of equipment, which is related to the complexity of related compliance activity For basic equipment (not control equipment) the operating fee schedule also corresponds to some extent to the emission potential of the equipment. Along with annual operating emissions fees, annual operating permit renewal fees are intended to recover the costs of programs such as SCAQMD's compliance program, planning, rule making, monitoring, testing, source education, public outreach, civil enforcement, including the SCAQMD's Hearing Board, and stationary and area source research projects.

FY 2017-18 Proposed Budget: The projection is based on an estimated number of permits at the various equipment fee schedules. A 2.5% CPI increase is included. Also included is a 10.67% increase for Title V annual operating permit renewal fees and a 4% increase in non-Title V annual operating permit renewal fees.

Permit Processing Fees

Under the Health & Safety Code 42300, SCAQMD may adopt and implement a program requiring that before the construction or operation of any equipment which emits or controls air pollution in SCAQMD's jurisdictional boundaries, a permit to construct and to operate must be obtained from SCAQMD. SCAQMD has adopted rules requiring such permits, to ensure that equipment in SCAQMD's jurisdictional boundaries is in compliance with SCAQMD Rules and Regulations but exempts certain equipment which is deemed to have de minimis emissions (Rule 219). Permit fees are authorized by state law to recover the reasonable costs of the permit program involving permitting, planning, enforcement, and monitoring related activities. Permit processing fees support the permit processing program and the fee rate schedules for the different equipment categories are based on the average time it takes to process and issue a permit. Each applicant, at the time of filing, pays a permit processing fee which partially recovers the costs for normal evaluation of the application and issuance of the permit to construct and permit modifications. This category also includes fees charged to partially recover the costs of evaluation of plans, including but not limited to Rule 403 dust control plans, and Rule 1118 flare monitoring plans. The permit processing fees also cover the administrative cost to process Change of Operator applications, applications for Emission Reduction Credits, and Administrative Changes to permits. This category also includes a number of specific fees such as Title V permit processing fees, CEQA and air quality modeling fees, and public noticing fees. Finally this category includes some fees that are related to specific activity such as asbestos notification and Rule 222 'registration in lieu of permit.'

FY 2017-18 Proposed Budget: The projection is based on the anticipated number and type of applications that will be processed. A 2.5% CPI increase is included. Also included is a 10.67% increase for Title V permit processing fees and a 4% increase for non-Title V permit processing fees.

Portable Equipment Registration Program (PERP)

The California Air Resources Board (CARB) provides revenues to local air districts to offset the costs of inspecting equipment registered under CARB's Portable Equipment Registration Program (PERP). Fees for inspection of PERP-registered engines by SCAQMD field staff are collected by CARB at the time of registration and passed through to SCAQMD on an annual basis. Fees for inspection of all other PERP-registered equipment are billed at an hourly rate set forth in SCAQMD Rule 301, as determined by CARB and collected by SCAQMD at the time the inspection is conducted.

FY 2017-18 Proposed Budget: The revenue projection is based on the anticipated number of inspections.

Area Sources

Emissions fees from architectural coatings revenue covers architectural coatings fair share of emissions supported programs. Quantity-based fees on architectural coatings are also assessed. SCAQMD Rule 314 covers emission-based fees and quantity-based fees. Fees on area sources are authorized by Health & Safety Code §40522.5. Beginning in FY 2008-09, annual assessments of architectural coatings, based on quantity (gallons) distributed or sold for use in SCAQMD's jurisdiction, are included in revenue projections. This revenue allows SCAQMD to recover the costs of staff working on compliance, laboratory support, architectural coatings emissions data, rule development, and architectural coatings revenue collection.

FY 2017-18 Proposed Budget: Fees are based on the annual quantity and emissions of architectural coatings distributed or sold into or within the District for use in the District for the previous calendar year. Emissions are decreasing while sales volume is increasing. A 2.5% CPI increase is included.

California Air Resources Board Subvention

Under Health and Safety Code Section 39800-39811, the State appropriates monies each year to CARB to subvene to the air quality districts engaged in the reduction of air contaminants pursuant to the basin wide air pollution control plan and related implementation programs. The SCAQMD received subvention funds, at its inception, beginning in 1977.

FY 2017-18 Proposed Budget: In FY 2002-03, the state reduced SCAQMD's subvention to $4 million, a reduction of approximately $2 million from the FY 2001-02 level. The current amount of $3.9 million is included in the FY 2017-18 proposed budget.

Federal Grants/Other Federal Revenue

SCAQMD receives funding from EPA Section 103 and 105 grants to help support the SCAQMD in its administration of active air quality control and monitoring programs where the SCAQMD is required to perform specific agreed-upon activities. Other EPA and Department of Energy (DOE) grants provide funding for various air pollution reduction projects. A Department of Homeland Security (DHS) grant funds a special particulate monitoring program. When stipulated in the grant agreement, the General Fund is reimbursed for administrative costs associated with grant-funded projects. Most federal grants are limited to specific purposes but EPA Section 105 grants are available for the general support of air quality-related programs. However, it is recognized that actual revenues may be impacted by potential changes in federal funding priorities in the form of lower grant revenue received through U.S. EPA grants.

FY 2017-18 Proposed Budget: The revenue projection is based on funding levels from current federal grants. It should be noted that potential changes in federal funding priorities are not yet reflected.

Interest

Revenue from this source is the result of investing the SCAQMD's General Fund cash balances.

FY 2017-18 Proposed Budget: The revenue projection is based on current budget levels.

Leases

Revenue in this category is a result of leasing available space at SCAQMD’s Headquarters facility.

FY 2017-18 Proposed Budget: The projection is based on the terms of any negotiated lease payments SCAQMD expects to receive.

Source Test/Sample Analysis Fees

Revenue in this category includes fees for source tests, test protocol and report reviews, continuous emissions monitoring systems (CEMS) evaluations and certifications, laboratory approval program (LAP) evaluations, and laboratory sample analyses. The revenue recovers a portion of the costs of performing tests, technical evaluations, and laboratory analyses.

FY 2017-18 Proposed Budget: A 2.5% CPI increase is included.

Hearing Board

Hearing Board revenue is from the filing of petitions for variances and appeals, excess emissions fees, and daily appearance fees. The revenue recovers a portion of the costs associated with these activities. Petitions for Orders for Abatement, which go before the Hearing Board, are filed by the District; therefore, there are no Hearing Board fees/revenue related to these proceedings.

FY 2017-18 Proposed Budget: This estimate is based on the number of hearings held/cases heard. A 2.5% CPI increase is included.

Penalties/Settlements

The revenue from this source is derived from cash settlements for violations of permit conditions, SCAQMD Rules, or state law. This revenue source is available for the general support of the SCAQMD's programs.

FY 2017-18 Proposed Budget: It is anticipated that revenue in this category will be approximately $5.0 million.

Mobile Sources

Mobile Sources revenue is composed of four components: AB2766 revenue and administrative/program cost reimbursements from three programs: Carl Moyer, Proposition 1B, and MSRC.

AB2766:
Section 9250.17 of the Vehicle Code gives the Department of Motor Vehicles (DMV) the authority and responsibility to collect and forward to the SCAQMD four dollars for every vehicle registered in SCAQMD's jurisdictional boundaries. Thirty percent of the money ($1.20 per vehicle) collected is recognized in SCAQMD's General Fund as mobile sources revenue and is used for programs to reduce air pollution from motor vehicles and to carry out related planning, monitoring, enforcement, and technical studies authorized by, or necessary to implement, the California Clean Air Act of 1988 or the SCAQMD Air Quality Management Plan. A proportionate share of programs that are not associated with any individual type of source (e.g., air quality monitoring) is supported by these revenues. The remaining monies are used to pay for projects to reduce air pollution from mobile vehicles: 40% ($1.60 per vehicle) to the Air Quality Improvement Special Revenue Fund to be passed through to local governments and 30% ($1.20 per vehicle) to the Mobile Source Air Pollution Reduction Fund (MSRC) to pay for projects recommended by the MSRC and approved by the SCAQMD Governing Board (see MSRC below).

Carl Moyer:
The Carl Moyer Memorial Air Quality Standards Attainment Program (Carl Moyer Program) provides funding from the state of California for the incremental cost of cleaner heavy-duty vehicles, off-road vehicles and equipment, marine, and locomotive engines. The General Fund receives reimbursements from the Carl Moyer Fund for staff time and other program implementation/administration costs up to specified limits.

Proposition 1B:
The Proposition 1B Program is a $1 billion bond program approved by California voters in November 2006. This incentive program is designed to reduce diesel emissions and public health risks from goods movement activities along California's trade corridors. The General Fund receives reimbursements from the Proposition 1B Funds for staff time and other program implementation/administration costs up to specified limits.

MSRC:
MSRC revenue reflects the reimbursement from the Mobile Source Air Pollution Reduction Special Revenue Fund for the cost of staff support provided to the MSRC in administering a mobile source program. These administrative costs are limited by State law and the MSRC adopts a budget for staff support each year.

FY 2017-18 Proposed Budget: Revenue projections are based on vehicle registration data from the DMV, recent revenue received, and anticipated reimbursable staff costs to implement the Carl Moyer Prop 1B, and MSRC programs.

Clean Fuels

The General Fund receives reimbursements from the Clean Fuels Program Special Revenue Fund for staff time and other program implementation/administration costs necessary to implement the Clean Fuels Program.

Section 9250.11 of the Vehicle Code gives the DMV authority to collect and forward to SCAQMD money for clean fuels technology advancement programs and transportation control measures related to motor vehicles, according to the plan approved pursuant to Health & Safety Code §40448.5. One dollar is collected by the DMV for every vehicle registered in SCAQMD's jurisdictional boundaries, forwarded to SCAQMD, and deposited in the Clean Fuels Program Special Revenue Fund.

Clean fuels fees from stationary sources are recorded in a separate revenue account within the Clean Fuels Program Special Revenue Fund. Fees authorized by Health & Safety Code §40512 are collected from sources that emit 250 tons or more per year of Nitrogen Oxides (NOx), Sulfur Oxides (SOx), Reactive Organic Compounds (ROC), or Particulate Matter (PM). The fees collected are used to develop and implement activities that promote the use of clean-burning fuels. These activities include assessing the cost effectiveness of emission reductions associated with clean fuels development and use of new clean fuels technologies, and other clean fuels related projects. The General Fund receives reimbursements from the Clean Fuels Program Fund for staff time and other program implementation/administration costs necessary to implement a Clean Fuels Program.

FY 2017-18 Proposed Budget: Revenue projections are based on anticipated reimbursable staff and other program costs to implement the Clean Fuels Program.

Transportation Programs

In accordance with federal and state Clean Air Act requirements, SCAQMD's Rule 2202 – On-Road Vehicle Mitigation Options provides employers with various options to either reduce mobile source emissions generated from employee commutes or implement mobile source emission reduction programs. Employers with 250 or more employees at a worksite are subject to Rule 2202 and are required to submit an annual registration to implement an emission reduction program that will obtain emission reductions equivalent to a worksite specific emission reduction target. The revenue from this category is used to recover a portion of the costs associated with filing, processing, reviewing, and auditing the registrations and the ridesharing programs. Fees for indirect sources, which are sources that attract mobile sources, such as the large employers covered by Rule 2202, are authorized by Health & Safety Code §40522.5.

FY 2017-18 Proposed Budget: The projection is based on the anticipated number of registrations. A 2.5% CPI increase is included.

Toxic "Hot Spots"

Health and Safety Code Section 44380 requires the SCAQMD to assess and collect fees from facilities that emit toxic compounds. Fees collected are used to recover state and SCAQMD costs to collect and analyze data regarding air toxics and their effect on the public. Costs recovered include a portion of the administrative, outreach, plan processing, and enforcement costs to implement this program.

FY 2017-18 Proposed Budget: The revenue projection is based on estimated General Fund reimbursements from the Air Toxics Fund for staff time and other program and administrative expenditures.

Other

Miscellaneous revenue includes revenue attributable to professional services the SCAQMD renders to other agencies, reimbursements from special revenue funds (non-mobile source), vanpool revenue, fees from fitness center memberships, and Public Records Act requests.

FY 2017-18 Proposed Budget: The revenue projections are based on historical trend information.

SOUTH COAST

AIR QUALITY MANAGEMENT DISTRICT

SCAQMD Line Item Expenditures						
Major Object / Account # **/** Account Description		**FY 2015-16 Actuals**	**FY 2016-17 Adopted Budget**	**FY 2016-17 Amended Budget**	**FY 2016-17 Estimate ***	**FY 2017-18 Proposed Budget**
Salary & Employee Benefits						
51000-52000	Salaries	$ 69,718,259	$ 75,122,297	$ 75,207,973	$ 74,178,802	$ 78,307,837
53000-55000	Employee Benefits	35,190,430	39,719,701	39,719,701	37,487,003	41,552,657
Sub-total Salary & Employee Benefits		$ 104,908,689	$ 114,841,998	$ 114,927,674	$ 111,665,805	$ 119,860,494
Services & Supplies						
67250	Insurance	$ 1,155,189	$ 1,317,400	$ 1,362,400	$ 1,296,540	$ 1,317,400
67300	Rents & Leases Equipment	227,502	176,182	229,401	218,312	201,363
67350	Rents & Leases Structure	281,866	286,791	347,061	330,284	296,791
67400	Household	528,845	722,021	683,021	600,000	761,366
67450	Professional & Special Services	10,504,094	6,888,870	10,288,810	9,791,440	8,313,336
67460	Temporary Agency Services	1,184,229	911,420	1,309,717	1,246,404	910,060
67500	Public Notice & Advertising	266,214	403,850	395,700	376,572	469,100
67550	Demurrage	78,749	62,930	85,212	81,093	61,930
67600	Maintenance of Equipment	911,862	538,382	846,629	824,913	684,714
67650	Building Maintenance	1,016,022	882,479	880,479	818,705	1,002,479
67700	Auto Mileage	130,083	66,647	188,629	179,511	82,147
67750	Auto Service	309,576	471,000	471,000	448,231	471,000
67800	Travel	263,732	315,313	375,308	357,165	311,373
67850	Utilities	1,791,287	2,213,288	2,140,448	2,036,977	2,213,288
67900	Communications	679,741	701,000	759,260	722,557	702,000
67950	Interest Expense	3,954,555	3,863,482	3,863,482	3,863,482	3,756,716
68000	Clothing	41,040	35,698	56,878	49,945	39,578
68050	Laboratory Supplies	441,851	302,160	561,008	501,550	304,000
68060	Postage	292,410	450,087	432,258	112,136	445,087
68100	Office Expense	1,178,920	1,075,565	1,370,994	1,510,434	1,113,975
68200	Office Furniture	47,255	61,500	75,500	66,297	105,425
68250	Subscriptions & Books	147,280	173,545	176,771	155,225	175,517
68300	Small Tools, Instruments, Equipment	235,320	159,949	346,185	255,954	222,039
68400	Gas and Oil	212,728	372,000	372,000	326,658	372,000
69500	Training/Conference/Tuition/ Board Exp.	696,661	681,665	705,033	670,951	926,337
69550	Memberships	122,874	70,440	159,210	151,514	68,128
69600	Taxes	27,234	74,000	89,660	76,538	74,000
69650	Awards	51,740	77,023	77,023	77,336	77,023
69700	Miscellaneous Expenses	125,447	150,000	246,001	238,861	156,725
69750	Prior Year Expense	(46,500)	-	-	-	-
69800	Uncollectable Accounts Receivable	435,327	-	-	-	-
89100	Principal Repayment	2,235,598	2,331,010	2,331,010	2,331,010	2,432,798
Sub-total Services & Supplies		$ 29,528,731	$ 25,835,697	$ 31,226,088	$ 29,716,593	$ 28,067,695
77000	**Capital Outlays**	$ 3,074,374	$ 850,000	$ 4,046,251	$ 3,850,652	$ 1,950,717
79050	**Building Remodeling**	$ -	$ -	$ -	$ -	$ -
Total Expenditures		$ 137,511,794	$ 141,527,695	$ 150,200,013	$ 145,233,050	$ 149,878,906
* Estimates based on July 2016 through March 2017 actual expenditures and budget amendments.						

Acct. #	Account Description	FY 2016-17 Adopted Budget	FY 2016-17 Amended Budget	FY 2016-17 Estimate	FY 2017-18 Proposed Budget	Increase/ (Decrease)[a]
51000-52000	**SALARIES**	**$ 75,122,297**	**$ 75,207,973**	**$ 74,178,802**	**$ 78,307,837**	**$ 3,185,540**
These accounts include salaries and special pays such as: Call-Back, Hazard, Night Shift, Rideshare, Skill-Based, Stand-By and Overtime. The FY 2017-18 Proposed Budget includes the costs associated with the three year labor agreement that went into effect on January 1, 2015, the addition a net of 10.25 positions and proposes to maintain vacant positions at 8%. The FY 2017-18 Proposed Budget does not include overtime amounts for federal grant work that is not expected to be awarded until mid-year and will not be appropriated until the grants are awarded.						
53000	**EMPLOYEE BENEFITS**	**$ 3,222,026**	**$ 3,222,026**	**$ 2,876,680**	**$ 3,365,307**	**$ 143,281**
This account includes the costs associated with State Disability Insurance, employer share of unemployment insurance, Social Security and Medicare. In addition, this account includes individual memberships and/or management physicals.						
54000	**RETIREMENT**	**$ 26,060,373**	**$ 26,060,373**	**$ 24,358,274**	**$ 28,166,843**	**$ 2,106,470**
This account includes the employer's share of the employee retirement system contributions. The increase from the FY 2016-17 Adopted Budget is based on the contribution rates provided from the San Bernardino County Retirement Association (SBCERA).						
55000	**INSURANCE**	**$ 10,437,302**	**$ 10,437,302**	**$ 10,252,048**	**$ 10,020,506**	**($ 406,796)**
This account includes employer's share of health, life, dental, vision care and accident insurance.						

[a] FY 2017-18 Proposed Budget vs. FY 2016-17 Adopted Budget.

SCAQMD Personnel Summary – Authorized/Funded Positions						
Positions as of	**Mid-Year Adjustments**		**Positions as of**	**FY 2016-17 Request**		**Positions as of**
June 30, 2016	Add	Delete	June 30, 2017	Add	Delete	July 1, 2017
813	7	(5)	815	24.25	(14)	825.25

Fiscal Year 2016-17 Mid-Year Changes in Authorized/Funded Positions				
Office	**Position**	**Add**	**Delete**	**Total**
Compliance & Enforcement	Deputy Executive Officer	1	-	1
Engineering & Permitting	Program Supervisor	1	-	1
Engineering & Permitting	Air Quality Analysis & Compliance Supervisor	-	(1)	(1)
Administrative Office	Assistant Deputy Executive Officer	1	-	1
Legislative & Public Affairs/Media Office	Legislative Assistant	1	-	1
Legislative & Public Affairs/Media Office	Staff Assistant	-	(1)	(1)
Science & Technology Advancement	Air Quality Instrument I	-	(2)	(2)
Science & Technology Advancement	Office Assistant	-	(1)	(1)
Science & Technology Advancement	Air Quality Chemist	1	-	1
Science & Technology Advancement	Air Quality Instrument II	1	-	1
Science & Technology Advancement	Air Quality Specialist	1	-	1
Total Mid-Year Changes		**7**	**(5)**	**2**

Fiscal Year 2017-18 Requested Personnel Actions				
Office	**Position**	**Add**	**Delete**	**Total**
Compliance & Enforcement	Senior Enforcement Manager	2	-	2
Engineering & Permitting	Supervising Air Quality Engineer	8	-	8
Engineering & Permitting	Air Quality Analysis & Compliance Supervisor	-	(8)	(8)
Engineering & Permitting	Sr. Air Quality Engineering Manager	1	-	1
Engineering & Permitting	Sr. Enforcement Manager		(1)	(1)
Executive Office	Chief Operating Officer	1	-	1
Executive Office	Senior Administrative Secretary	-	(1)	(1)
Executive Office	Senior Policy Advisor	-	(1)	(1)
Administrative Office	Chief Administrative Officer	1	-	1
Administrative Office	Chief Financial Officer	-	(1)	(1)
Administrative Office	Senior Administrative Secretary	1	-	1
Administrative Office [(b)]	Assistant Deputy Executive Officer - IM	0.25	-	0.25
Administrative Office	Deputy Executive Officer	-	(1)	(1)
Legislative & Public Affairs/Media Office	Director of Communications	1	-	1
Legislative & Public Affairs/Media Office	Graphic Arts Illustrator II	-	(1)	(1)
Legislative & Public Affairs/Media Office	Sr. Office Assistant	1	-	1
Planning, Rules Development, & Area Sources	Air Quality Engineer II	1	-	1
Planning, Rules Development, & Area Sources	Air Quality Specialist	3	-	3
Science & Technology Advancement	Air Quality Instrument II	1	-	1
Science & Technology Advancement	Lab Technician	1	-	1
Science & Technology Advancement	Air Quality Specialist	1	-	1
Science & Technology Advancement	Secretary	1	-	1
Total Fiscal Year 2017-18 Requested Personnel Actions		24.25	(14)	10.25

[(b)] Only budgeted for three months.

Acct. #	Account Description	FY 2016-17 Adopted Budget	FY 2016-17 Amended Budget	FY 2016-17 Estimate	FY 2017-18 Proposed Budget	Increase/ (Decrease)[a]
67250	**INSURANCE**	**$1,317,400**	**$1,362,400**	**$1,296,540**	**$1,317,400**	**$ -**
This account is for insurance coverage for the following: commercial property (real and personal) with earthquake and flood coverage, boiler and machinery, public official liability, excess workers' compensation, and excess general liability. The SCAQMD is self-insured for workers' compensation, general liability, and automobile liability. The amount requested reflects anticipated workers' compensation claims, insurance policy premiums, property losses above SCAQMD's insurance deductibles, and liability claim payments.						
67300	**RENTS & LEASES EQUIPMENT**	**$176,182**	**$229,401**	**$218,312**	**$201,363**	**$25,181**
This account is for lease agreements and/or rental of office equipment such as communication devices for emergency response inspectors, laboratory and atmospheric measurement equipment for special projects, audio visual equipment for outside meetings, printing equipment, and photocopiers. The increase from the FY 2016-17 Adopted Budget reflects an increase in the walk-up copiers lease and in equipment rentals for public meetings.						
67350	**RENTS & LEASES STRUCTURE**	**$286,791**	**$347,061**	**$330,284**	**$296,791**	**$10,000**
This account is for expenditures associated with structures and lot leases, and off-site storage rentals: Long Beach field office - $106,791; Wind Station Leases in the Coachella Valley - $2,000; Conference and meeting rooms - $9,000; Air monitoring sites/Wind Stations - $169,000; and Public Meetings - $10,000 Free and low-cost public facilities are used whenever possible for public workshops and informational meetings. The change from the FY 2016-17 Adopted Budget is due to additional budget for public meeting building rentals. The FY 2017-18 Proposed Budget does not include amounts for federally funded grant programs. An expenditure appropriation will occur mid-year when the grants are awarded.						
67400	**HOUSEHOLD**	**$722,021**	**$683,021**	**$600,000**	**$761,366**	**$ 39,345**
This account is used for trash disposal, landscape maintenance, parking lot maintenance, janitorial supplies, and janitorial contracts. This account is also used for expenses associated with the Diamond Bar facility, such as specialized cleaning supplies and services required in the computer room. The change from the FY 2016-17 Adopted Budget is due to an increase in the janitorial contract.						
67450	**PROFESSIONAL & SPECIAL SERVICES**	**$6,888,870**	**$10,288,810**	**$9,791,440**	**$8,313,336**	**$1,424,466**
This account is for services rendered to the SCAQMD by outside contractors. The FY 2017-18 Professional & Special Services supporting detail is located at the end of this section. The increase from the FY 2016-17 Adopted Budget is attributed to including budget for Clean Fuels, Prop 1B and Carl Moyer expenditures during the budget process instead of through a budget amendment as in past fiscal years. The FY 2017-18 Proposed Budget does not include amounts for federally funded grant programs. An expenditure appropriation will occur mid-year when the grants are awarded.						

[a]FY 2017-18 Proposed Budget vs. FY 2016-17 Adopted Budget.

Acct. #	Account Description	FY 2016-17 Adopted Budget	FY 2016-17 Amended Budget	FY 2016-17 Estimate	FY 2017-18 Proposed Budget	Increase/ (Decrease)[(a)]
67460	**TEMPORARY AGENCY SERVICES**	**$911,420**	**$1,309,717**	**$1,246,404**	**$910,060**	**($1,360)**
Funds budgeted in this account are used for specialized temporary services that supplement staff in support of SCAQMD programs. Amounts are budgeted as a contingency for long-term absences and retirements/resignations. Also budgeted in this account is the student internship program that provides college students with the opportunity to gain experience in the workplace. The FY 2017-18 Proposed Budget does not include amounts for federally funded grant programs. An expenditure appropriation will occur mid-year when the grants are awarded.						
67500	**PUBLIC NOTICE & ADVERTISING**	**$403,850**	**$395,700**	**$376,572**	**$469,100**	**$65,250**
This account is used for legally required publications such as Requests for Proposals, Requests for Quotations, personnel recruitment, public outreach, advertisement of SCAQMD Governing Board and Hearing Board meetings, and public notification of SCAQMD rulemaking activities. The increase from the FY 2016-17 Adopted Budget is due to an anticipated increase in legally required publications.						
67550	**DEMURRAGE**	**$62,930**	**$85,212**	**$ 81,093**	**$61,930**	**($1,000)**
This account is for various freight and cylinder charges as well as workspace reconfigurations and personnel moves. The FY 2017-18 Proposed Budget does not include amounts for federally funded grant programs. An expenditure appropriation will occur mid-year when the grants are awarded.						
67600	**MAINTENANCE OF EQUIPMENT**	**$538,382**	**$846,629**	**$824,913**	**$684,714**	**$146,332**
This account is for maintenance costs of SCAQMD equipment such as the following: mainframe computer hardware, phone switch, air monitoring equipment, print shop equipment, copiers, and audio visual equipment. The FY 2017-18 Proposed Budget reflects the increased cost of maintenance for the IP network as well for printers, server hardware and network hardware but does not include amounts for federally funded grant programs. An expenditure appropriation will occur mid-year when the grants are awarded.						
67650	**BUILDING MAINTENANCE**	**$882,479**	**$880,479**	**$818,705**	**$1,002,479**	**$120,000**
This account reflects expenditures for maintaining SCAQMD offices and air monitoring stations. Also included are: a contingency amount for unplanned repairs; Gateway Association dues; elevator maintenance; energy management; and compressor services. The increase from the FY 2016-17 Adopted Budget is to re-establish the Burbank and Long Beach air monitoring stations. The FY 2017-18 Proposed Budget does not include amounts for federally funded grant programs. An expenditure appropriation will occur mid-year when the grants are awarded.						

[(a)]FY 2017-18 Proposed Budget vs. FY 2016-17 Adopted Budget.

Acct. #	Account Description	FY 2016-17 Adopted Budget	FY 2016-17 Amended Budget	FY 2016-17 Estimate	FY 2017-18 Proposed Budget	Increase/ (Decrease)[(a)]
67700	**AUTO MILEAGE**	**$66,647**	**$188,629**	**$179,511**	**$82,147**	**$15,500**
This account is used to reimburse employees for the cost of using personal vehicles while on SCAQMD business. The requests include the mileage incurred for staff that are required to work on their scheduled days off and for employees who use their personal vehicles on SCAQMD-related business, conferences, and seminars and to attend various community, business and intergovernmental events. The increase from the FY 2016-17 Adopted Budget reflects an increase in the mileage for Engineering & Permitting staff required to work on their scheduled days off. The FY 2017-18 Proposed Budget does not include amounts for federally funded grant programs. An expenditure appropriation will occur mid-year when the grants are awarded.						
67750	**AUTO SERVICE**	**$471,000**	**$471,000**	**$448,231**	**$471,000**	**$ -**
This account is used for the maintenance, towing, repair, and expired CNG tank replacement of SCAQMD fleet vehicles. The FY 2017-18 Proposed Budget reflects the growing age of the fleet and the costs to maintain vehicles.						
67800	**TRAVEL**	**$315,313**	**$375,308**	**$357,165**	**$311,373**	**($ 3,940)**
This account is for business travel, including lodging and meals paid pursuant to the Administrative Code, for participation in legislative hearings and meetings involving state, federal, and inter-agency issues that affect air quality in the South Coast Air Basin. The FY 2017-18 Proposed Budget reflects anticipated needs but does not include amounts for federally funded grant programs. An expenditure appropriation will occur mid-year when the grants are awarded.						
67850	**UTILITIES**	**$2,213,288**	**$2,140,448**	**$2,036,977**	**$2,213,288**	**$-**
This account is used to pay gas, water, and electricity costs at the SCAQMD's headquarters building, the Long Beach field office, and air monitoring stations.						
67900	**COMMUNICATIONS**	**$701,000**	**$759,260**	**$722,557**	**$702,000**	**$1,000**
This account includes telephone and fax service, leased computer lines, video conferencing, wireless internet access for inspectors in the field, radio, and microwave services. The FY 2017-18 Proposed Budget does not include amounts for federally funded grant programs. An expenditure appropriation will occur mid-year when the grants are awarded.						
67950	**INTEREST EXPENSE**	**$3,863,482**	**$3,863,482**	**$3,863,482**	**$3,756,716**	**($106,766)**
This account is for the interest due on the 1995 and 2004 Pension Obligation Bonds. The decrease from the FY 2016-17 Adopted Budget reflects scheduled payments for FY 2017-18						

[(a)]FY 2017-18 Proposed Budget vs. FY 2016-17 Adopted Budget.

Acct. #	Account Description	FY 2016-17 Adopted Budget	FY 2016-17 Amended Budget	FY 2016-17 Estimate	FY 2017-18 Proposed Budget	Increase/ (Decrease)[(a)]
68000	**CLOTHING**	**$35,698**	**$56,878**	**$49,945**	**$39,578**	**$3,880**
This account is for the purchase of safety equipment and protective clothing used by source testing, laboratory, compliance, and stockroom personnel. The increase from the FY 2016-17 Adopted Budget reflects the anticipated level of expenditures for FY 2017-18.						
68050	**LABORATORY SUPPLIES**	**$302,160**	**$561,008**	**$501,550**	**$304,000**	**$1,840**
This account is used to purchase various supplies such as chemicals, calibration gases and glassware for laboratory services. The FY 2017-18 Proposed Budget reflects anticipated needs but does not include amounts for federally funded grant programs. An expenditure appropriation will occur mid-year when the grants are awarded.						
68060	**POSTAGE**	**$450,087**	**$432,258**	**$112,136**	**$445,087**	**($ 5,000)**
This account covers the cost of mailing out annual billings, permits, notifications to the Governing Board and Advisory groups, monthly newsletters, warrants, outreach materials to local governments, and Rule 2202 notifications. The FY 2017-18 Proposed Budget reflects mailings based on current activity.						
68100	**OFFICE EXPENSE**	**$1,075,565**	**$1,370,994**	**$1,510,434**	**$1,113,975**	**$38,410**
This account is used for the purchase of office supplies, computer hardware and software under $5,000, photocopier supplies, print shop and artist supplies, and stationery and forms. The FY 2017-18 Proposed Budget reflects anticipated needs but does not include amounts for federally funded grant programs. An expenditure appropriation will occur mid-year when the grants are awarded.						
68200	**OFFICE FURNITURE**	**$61,500**	**$75,500**	**$66,297**	**$105,425**	**$ 43,925**
This account is for office furniture under $5,000. The increase in the FY 2017-18 Proposed Budget reflects staffing level needs as well as an anticipated increase in the need for ergonomic furniture.						
68250	**SUBSCRIPTIONS & BOOKS**	**$173,545**	**$176,771**	**$155,225**	**$175,517**	**$1,972**
This account is used to purchase reference materials, magazine subscriptions, books, and on-line database legal research services. The FY 2017-18 Proposed Budget reflects anticipated cost increases.						
68300	**SMALL TOOLS, INSTRUMENTS, EQUIPMENT**	**$159,949**	**$346,185**	**$255,954**	**$222,039**	**$62,090**
This account covers the purchase of small tools and equipment for air monitoring stations, laboratory, and headquarters building maintenance. The increase from the FY 2016-17 Adopted Budget is due to stricter quality control, an expanded monitoring network, and increased use of equipment; however, it does not include amounts for federally funded grant programs. An expenditure appropriation will occur mid-year when the grants are awarded.						

[(a)]FY 2017-18 Proposed Budget vs. FY 2016-17 Adopted Budget.

Acct. #	Account Description	FY 2016-17 Adopted Budget	FY 2016-17 Amended Budget	FY 2016-17 Estimate	FY 2017-18 Proposed Budget	Increase/ (Decrease)[(a)]
68400	**GAS & OIL**	**$372,000**	**$372,000**	**$326,658**	**$372,000**	**$ -**
This account is for the purchase of gasoline, oil, and alternative fuels for the SCAQMD fleet. The cost is anticipated to stay flat from the FY 2016-17 Adopted Budget.						
69500	**TRAINING/CONF/ TUITION/BOARD EXP**	**$681,665**	**$705,033**	**$670,951**	**$926,337**	**$244,672**
This account is used for tuition reimbursement, conference and training registrations, certain costs associated with the SCAQMD's Governing and Hearing Boards and advisory groups, and training-related travel expenditures. The FY 2017-18 Proposed Budget reflects anticipated needs and includes increases in field and lab certification training and Hearing Board costs.						
69550	**MEMBERSHIPS**	**$70,440**	**$159,210**	**$151,514**	**$68,128**	**($2,312)**
This account provides for SCAQMD membership in in scientific, clean fuels, advanced technology, and related environmental business/policy organizations. The FY 2017-18 Proposed Budget reflects anticipated needs.						
69600	**TAXES**	**$74,000**	**$89,660**	**$76,538**	**$74,000**	**$ -**
This account is for unsecured property and use taxes, fuel taxes, and sales taxes. The cost is anticipated to stay flat from the FY 2016-17 Adopted Budget.						
69650	**AWARDS**	**$77,023**	**$77,023**	**$77,336**	**$77,023**	**$ -**
This account covers employee service awards for continuous service, employee recognition programs, plaques/awards the SCAQMD may present to individuals/businesses/community groups for outstanding contributions towards air quality goals, and promotional awards for community events. The cost is anticipated to stay flat from the FY 2016-17 Adopted Budget.						
69700	**MISCELLANEOUS EXPENSES**	**$150,000**	**$246,014**	**$238,861**	**$156,725**	**$6,725**
This account is to record expenditures that do not fall in any other account such as SCAQMD advisory group per diems, meeting and event expenses, and sponsorships. The increase from the FY 2016-17 Adopted Budget reflects the anticipated level of expenditures for FY 2017-18.						
69750	**PRIOR YEAR EXPENSE**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
This account is used to record actual expenditures attributable to prior year budgets. No amount is budgeted for this account due to the nature of the account.						

[(a)]FY 2017-18 Proposed Budget vs. FY 2016-17 Adopted Budget.

	Account Description	FY 2016-17 Adopted Budget	FY 2016-17 Amended Budget	FY 2016-17 Estimate	FY 2017-18 Proposed Budget	Increase/ (Decrease)[a]
69800	**UNCOLLECTIBLE ACCOUNTS RECEIVABLE**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
No amount is budgeted for this account due to the nature of the account.						
89100	**PRINCIPAL REPAYMENT**	**$2,331,010**	**$2,331,010**	**$2,331,010**	**$2,432,798**	**($101,788)**
This account reflects the principal due on pension obligation bonds. The increase from the FY 2016-17 Adopted Budget reflects scheduled payments for FY 2017-18						

[a]FY 2017-18 Proposed Budget vs. FY 2016-17 Adopted Budget.

Proposed Fiscal Year 2017-18 Professional & Special Services Detail by Office			
Office	**Program**	**Contract Description**	**Amount**
District General	Dist. General Overhead	Administrative Fees for 1995 & 2004 Pension Obligation Bonds (POBs)	$1,500
	Dist. General Overhead	Arbitration/Hearing Officer	9,400
	Dist. General Overhead	Benefits Administrator	13,000
	Dist. General Overhead	COBRA Administration Services	6,000
	Dist. General Overhead	Custodial Fees for 1995 & 2004 POBs	800
	Dist. General Overhead	Employee Assistance Program	13,995
	Dist. General Overhead	Employee Relations Litigation	250,000
	Dist. General Overhead	Health Reimbursement Arrangement Plan Administration	5,000
	Dist. General Overhead	Modular Furniture Maintenance, Setup, and Moving Services	15,000
	Dist. General Overhead	Oracle Software Support	30,400
	Dist. General Overhead	PeopleSoft Maintenance	208,400
	Dist. General Overhead	Plans and Design Consulting Services	95,000
	Dist. General Overhead	Security Alarm Monitoring	1,980
	Dist. General Overhead	Security Guard Services	498,000
	Dist. General Overhead	Wellness Program	37,500
	Sub-total District General		**$1,185,975**
Governing Board	Operational Support	Board Member Assistant/Consultants	$713,628
	Sub-total Governing Board		**$713,628**
Executive Office	Develop Programs	Professional & Special Services	$150,000
	Sub-total Executive Office		**$150,000**
Finance	Operational Support	Bank Service Charges/Los Angeles County Treasurer Office	$60,000
	Ensure Compliance	Bank Services Fund 15, Hot Spots Lockbox	15,000
	Operational Support	Financial Audit	45,000
	Operational Support	Financial Consultant for Treasury Management	23,000
	Operational Support	LA County Treasurer Office - PGP Maintenance	1,650
	Sub-total Finance		**$144,650**
Legal	Ensure Compliance	Experts/Court Reporters/Attorney Services	$30,000
	Ensure Compliance	Litigation Counsel	169,500
	Ensure Compliance	Software Maintenance & Licensing - Courtview Justice Solutions	30,000
	Operational Support	Specialized Legal Services	50,000
	Sub-total Legal		**$279,500**

Proposed Fiscal Year 2017-18 Professional & Special Services Detail by Office (cont.)			
Office	**Program**	**Contract Description**	**Amount**
Administrative & Human Resources	Operational Support	Architectural, Engineering and Surveyor Consultants	$3,250
	Operational Support	In-house Training Classes	500
	Operational Support	Insurance Broker of Record	49,000
	Operational Support	Locksmith	2,000
	Operational Support	Medical Services Provider	20,000
	Operational Support	NEOGOV Subscription License	8,000
	Operational Support	Occupational Health Services	25,000
	Customer Service & Business Assistance	Outside Binding Services	6,000
	Customer Service & Business Assistance	Outside Printing Services	5,000
	Operational Support	Test Development	15,000
	Operational Support	Third-Party Claims Administrator for Workers Compensation	18,000
	Sub-total Administrative & Human Resources		**$151,750**
Clerk of the Boards	Ensure Compliance	Court Reporting, Audio-visual, and/or Security Services	$64,100
	Ensure Compliance	Outside Legal Contract	15,000
	Ensure Compliance	Professional Interpreter Services	6,400
	Sub-total Clerk of the Boards		**$85,500**
Information Management	Operational Support	Action Works Metro System Software Support	$20,000
	Operational Support	Adobe Creative Cloud Software Support	600
	Operational Support	AER & R1113/314 Upgrade & Maintenance	15,000
	Operational Support	AIS (Address Information System) Five Digit subscription	1,100
	Operational Support	Anti-Spam Maintenance/Support	11,500
	Operational Support	ArcGIS Online Annual Subscription	1,000
	Operational Support	Backup Software	33,600
	Operational Support	Backup Utility Maintenance	11,500
	Operational Support	CLASS System Maintenance	88,000
	Operational Support	Component One Software Support	1,100
	Operational Support	Computer-Based Training Software Support	1,800
	Operational Support	CourtView System Maintenance	10,000

Proposed Fiscal Year 2017-18 Professional & Special Services Detail by Office (cont.)			
Office	**Program**	**Contract Description**	**Amount**
Information Management (cont.)	Operational Support	Crystal Reports Software Support	$20,000
	Operational Support	Disaster Recovery Software	60,000
	Operational Support	Dundas Chart Software Support	700
	Operational Support	Dynamic Web Twain License Renewal	4,500
	Operational Support	Email Recovery Software (PowerControls) Maint/Support	1,750
	Operational Support	Email Reporting	3,800
	Operational Support	ERwin ERX & BPwin SW Support	24,000
	Operational Support	Faxcom FaxServer Support	12,500
	Operational Support	Imaging Software Support	131,000
	Operational Support	Infragistics Pro Software Support	1,000
	Operational Support	Ingres/OpenIngres Additional Licensing	72,000
	Operational Support	Ingres/OpenIngres Advanced Success Pack	140,000
	Operational Support	Installshield Software Support	3,800
	Operational Support	Internet Filtering Maintenance/Support	35,000
	Operational Support	Kronos Time Keeper	2,000
	Operational Support	Microsoft Developer Network CD - Application Development	15,196
	Operational Support	Microsoft Developer Network Premium Renewal	4,000
	Operational Support	Microsoft Technical Software Support (Server Applications)	15,000
	Operational Support	Microsoft Virtual Earth Maintenance/Support	12,500
	Operational Support	Network Analyzer (Sniffer) Maintenance/Support	4,500
	Operational Support	Network Backbone Support	15,000
	Operational Support	NT Software Support - Proactive	62,000
	Operational Support	Off-site Document Destruction Services	24,000
	Operational Support	Off-site Storage Nightly Computer Backup	22,000
	Operational Support	Online Filing Infrastructure	25,000
	Operational Support	PowerBuilder Software Support	24,000
	Operational Support	PreEmptive Analytics Software Support	7,000
	Operational Support	Proxy Reporting Support	3,250
	Operational Support	PVCS Software Support	4,900
	Operational Support	ScaleOut StateServer Maintenance	8,266

Proposed Fiscal Year 2017-18 Professional & Special Services Detail by Office (cont.)			
Office	**Program**	**Contract Description**	**Amount**
Information Management (cont.)	Operational Support	SCAQMD Web Application Modifications	$20,000
	Operational Support	Secure Service Digital ID Services	1,000
	Operational Support	Secure Service Digital ID DEC Internet Server	850
	Operational Support	Sitefinity CMS Software Support	9,500
	Operational Support	Software Support for EOS.Web Enterprise	6,300
	Operational Support	Software Support for On-Line Catalog	2,050
	Operational Support	Swiftview Software Support	950
	Operational Support	Telephone Switchview Software Support	9,500
	Operational Support	Terminal Emulation (Reflection) Maintenance/Support	1,175
	Operational Support	Videoteleconferencing Maintenance & Support	13,000
	Operational Support	Virus Scan Support	15,000
	Operational Support	Visual Expert Software Support	6,000
	Operational Support	Web Consulting Support	64,300
	Operational Support	Web Core Technology Upgrade (.NET upgrade)	10,000
	Operational Support	Website Evaluation & Improvement	200,000
	Sub-total Information Management		**$1,313,487**
Planning, Rule Development, & Area Sources	Ensure Compliance	AER Printing	$5,000
	Monitoring Air Quality	Air Quality Forecast and Alert Notification Support	50,000
	Develop Programs	California Emissions Estimator Model (CalEEMod) Upgrades/Support	10,000
	Develop Programs	CEQA for AQMD Projects	140,000
	Develop Programs	CEQA Special Studies	50,000
	Timely Review of Permits	Dispersion Modeling Support	50,000
	Develop Programs	Implementation of Abts Recommendations	330,000
	Monitoring Air Quality	Maintain Wind Stations and Analyze Data	60,000
	Monitoring Air Quality	MATES V	50,000
	Monitoring Air Quality	Meteorological Data Services	7,500
	Develop Rules	PM and Ozone Model Consulting	90,000
	Develop Programs	Rule 2202 Computer System Maintenance	15,000
	Customer Service & Business Assistance	Rule 2202 ETC On-Line Training	25,000

Proposed Fiscal Year 2017-18 Professional & Special Services Detail by Office (cont.)			
Office	**Program**	**Contract Description**	**Amount**
Planning, Rule Development, & Area Sources (cont.)	Develop Programs	SIP, AQMP and Rule Printing	$8,000
	Develop Rules	Software renewal, upgrades and purchase in support of economic modeling	150,000
	Develop Rules	Technical Assessment in of Regional Modeling	50,000
	Ensure Compliance	Technology Assessment Studies	75,000
	Monitoring Air Quality	Weather Data Services Communications	7,500
	Sub-total Planning, Rule Development & Area Sources		**$1,173,000**
Legislative & Public Affairs/Media Office	Policy Support	After-hours Call Center Service	$3,500
	Customer Service & Business Assistance	Clean Air Awards	12,600
	Customer Service & Business Assistance	Community Outreach	410,000
	Policy Support	Graphics & Printing	33,616
	Policy Support	Graphics, Printing & Outreach Materials	4,000
	Policy Support	Legislative Advocacy - Sacramento	365,000
	Policy Support	Legislative Advocacy - Washington DC	665,130
	Policy Support	Legislative Computer Services	10,000
	Customer Service & Business Assistance	Multi-Lingual Translation - Public Participation	20,000
	Policy Support	News Release Services	9,000
	Policy Support	Photographic and Video Services - MO	5,000
	Policy Support	Photographic and Video Services	50,000
	Customer Service & Business Assistance	Promotion Marketing of Smart Phone Tools	50,000
	Policy Support	Radio/Television Monitoring	11,000
	Sub-total Legislative & Public Affairs/Media Office		**$1,648,846**
Science & Technology Advancement	Ensure Compliance	Laboratory Analytical Services	$15,000
	Advanced Clean Air Technology	Technical Assistance, Expert Consultation, Outreach/Education – Clean Fuels	1,000,000
	Advanced Clean Air Technology	Technical Assistance, Expert Consultation, Outreach/Education – CMP, AB923	75,000
	Develop Programs	Technical Assistance, Expert Consultation, Outreach/Education – Prop 1B	300,000
	Ensure Compliance	Source Testing Services	30,000
	Ensure Compliance	Technical Support for Air Monitoring and Community Complaint Resolution	35,000
	Sub-total Science & Technology Advancement		**$1,455,000**

Proposed Fiscal Year 2017-18 Professional & Special Services Detail by Office (cont.)			
Office	**Program**	**Contract Description**	**Amount**
Engineering & Permitting	Operational Support	Workspace Reconfiguration	$2,500
	Sub-total Engineering & Permitting		**$2,500**
Compliance & Enforcement	Ensure Compliance	Lab Analysis Services for R1176 and other air samples	$5,000
	Operational Support	Workspace Reconfiguration	4,500
	Sub-total Compliance & Enforcement		**$9,500**
		Total Professional & Special Services	**$8,313,336**

Acct. #	Account Description	FY 2016-17 Adopted Budget	FY 2016-17 Amended Budget	FY 2016-17 Estimate	FY 2017-18 Proposed Budget	Increase/ (Decrease)[a]
77000	**CAPITAL OUTLAYS**	**$ 850,000**	**4,046,251**	**$ 3,850,652**	**$ 1,950,717**	**$1,100,717**

This account is for tangible asset expenditures with a value of at least $5,000 and a useful life of at least three years and intangible asset expenditures with a value of at least $5,000 and a useful life of at least one year. The increase from the FY 2016-17 Adopted Budget reflects anticipated needs. The FY 2017-18 Proposed Budget does not include amounts for federally funded grant programs. An expenditure appropriation will occur mid-year when the grants are awarded.

A listing by office of the proposed Capital Outlays for FY 2017-18 is provided at the end of this section.

[a]FY 2017-18 Proposed Budget vs. FY 2016-17 Adopted Budget.

Acct. #	Account Description	FY 2015-16 Adopted Budget	FY 2015-16 Amended Budget	FY 2015-16 Estimate	FY 2016-17 Proposed Budget	Increase/ (Decrease)[a]
79050	**BUILDING REMODELING**	**$-**	**$-**	**$-**	**$-**	**$-**

This account is used for minor remodeling projects which become necessary as a result of reorganizations or for safety reasons. No projects are anticipated in Fiscal Year 2017-18.

[a]FY 2017-18 Proposed Budget vs. FY 2016-17 Adopted Budget.

Fiscal Year 2017-18 Capital Outlays Detail				
Office	**Program**	**Category**	**Description**	**Amount**
District General	Operational Support	N/A	Unbudgeted Capital Outlay - This amount is set aside for unanticipated needs or emergency situations to avoid interruption of operations.	$75,000
	Operational Support	Replacement	System Support and Programming (PeopleSoft/CLASS) - Funding for functional and technical support and special reporting needs for the CLean Air Support System (CLASS)-Finance automated billing and the PeopleSoft Human Capital Management and Financial Accounting systems.	75,000
	Operational Support	Replacement	Fiber Cable Network Infrastructure Upgrade – Funding for a fiber network cable system that will provide sufficient bandwidth to support the increasing bandwidth demands from multiple desktop 1 Gb/s connections (data, audio, video)	250,000
	Operational Support	Replacement	Utility Cart - Funding to replace a non-operational 27 year old cart that is needed to move equipment, tools and supplies for various maintenance projects at the SCAQMD Headquarters.	18,717
	Sub-total District General			**$418,717**
Legal	Ensure Compliance	New	Expand/Enhance Reporting Capabilities within JWorks Case Management Software – Software enhancements to provide customized reporting functions that are necessary to broaden capabilities and improve efficiency and effectiveness.	$25,000
	Sub-total Legal			**$25,000**
Planning, Rule Development & Area sources	Develop Rules	New	Architectural Coating Reporting & Fee Billing - Funding for modifications and enhancements to the web-based R314/R1113 Architectural Coatings Reporting system to enhance functionality for invoicing, auditing, data management, reporting and QA/QC validations.	$50,000
	Ensure Compliance	New	Rule 1415 Online Reporting Program – Funding for systems development to modify the Rule 1415 web application, the completion of the software development lifecycle (SDLC), and the deployment of the enhanced systems into the production environment.	30,000
	Ensure Compliance	New	Support Web-Based Annual Emissions Reporting Software - Enhancements to the software system to ensure the system retains its functionality.	100,000
	Sub-total Planning, Rules & Area Sources			**$180,000**
Information Management	Operational Support	New	Miscellaneous Telecommunication Upgrade/Enhancement – Funding to enable Telecommunications to meet unforeseen network needs/changes required to support SCAQMD staff.	$35,000

Fiscal Year 2017-18 Capital Outlays Detail (cont.)				
Office	**Program**	**Category**	**Description**	**Amount**
Information Management (cont.)	Operational Support	Replacement	Network Server Upgrade – Funding to upgrade network servers to support new operating systems and new server applications	$75,000
	Operational Support	New	PeopleSoft Migration/Upgrade – Funding to upgrade PeopleSoft Financials 9.1 to 9.2 and thus continue to receive software updates/support to be in compliance with federal and state regulations	250,000
	Operational Support	New	GIS Infrastructure Update - Funding to upgrade SCAQMD's GIS infrastructure to support critical real-time applications (i.e. air quality maps, FIND facility maps, Check Before you Burn Maps, etc.)	25,000
	Timely Review of Permits	New	Title V Fee Increase Implementation – Funding to implement the proposed Title V fee increase in the SCAQMD billing system.	115,000
	Operational Support	New	Fujitsu Color Duplex Scanner - Funding to acquire a scanner capable of handling larger drawings.	6,600
	Sub-total Information Management			**$506,600**
Legislative & Public Affairs/Media Office	Operational Support	Replacement	Large Format Printer – Funding to replace a large format printer that is over seven years old.	$6,000
	Operational Support	Replacement	Laminator - Wide Format – Funding to replace a wide format laminator that is over six years old.	5,400
	Operational Support	Replacement	Apple Computer – Funding for a computer to store and archive old events and projects.	8,000
	Sub-total Legislative & Public Affairs/Media Office			**$19,400**
Science & Technology Advancement	Ensure Compliance	Replacement	GC-TCA-FID with gas sampling valve and autosampler – Funding for an instrument used for oil and gas industry rules analysis; measures source-level and fugitive-level emissions.	$75,000
	Monitoring Air Quality	New	Software application for refinery emission project – Funding to purchase software to automate the validation and analysis of collected data from sensors monitoring VOC emissions.	60,000
	Advance Clean Air Technology	New	Annual July Board letter Clean Fuels: Advanced Tech Vehicles/Infrastructure – Funding for advanced technology vehicles.	285,000
	Sub-total Science & Technology Advancement			**$420,000**
Engineering & Permitting	Timely Review of Permits	New	Title V Online Permit Publishing – Funding to acquire an online system which will allow for indexing of each section of the Title V permit.	$20,000
	Sub-total Engineering & Permitting			**$20,000**
Compliance & Enforcement	Ensure Compliance	New	Title V Web Application Development – Funding to develop a web-based Title V application process.	$200,000
	Ensure Compliance	Replacement	Portable Toxic Vapor Analyzer (TVA), Flame Ionization Detectors (FIDs) with Photo Ionization Detector (PID) - Funding for instruments used to monitor gases above the surface of landfills and VOC contaminated soils.	161,000
	Sub-total Compliance & Enforcement			**$361,000**
			Total Capital Outlays	**$1,950,717**

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
GOALS AND PRIORITY OBJECTIVES FOR FY 2017-2018

MISSION STATEMENT

"To clean the air and protect the health of all residents in the South Coast Air District through practical and innovative strategies."

GOALS AND PRIORITY OBJECTIVES

The following Goals and Priority Objectives have been identified as being critical to meeting SCAQMD's Mission in Fiscal Year 2017-18.

GOAL I. Achieve Clean Air Standards.

Priority Objective		Performance Indicator	Performance Measurement
1	Implementation of the 2016 AQMP	Adherence to adoption and implementation schedules for rules, working groups, assessments and programs as adopted in the 2016 AQMP.	Complete 6 rule adoptions and/or actions that result in achievements towards AQMP emissions reductions.
2	Implement the Action Plan for Toxics Facilities	Conduct monitoring and achieve emissions reductions at previously unknown high risk facilities.	Conduct monitoring of at least 10 facilities and reduce emissions from those found to have high toxics risk to the community.
3	Secure Incentive Funding for Emissions Reduction	Dollar amount of new funding sources for pollution reduction projects.	Secure $400 Million of new funding sources.
4	Ensure Efficient Air Monitoring and Laboratory Operations	Achieve acceptable completion of valid data points out of the scheduled measurements in the SCAQMD air monitoring network for NAAQS pollutant before U.S. EPA deadline.	Achieve acceptable valid data completion submitted to U.S. EPA before deadline.
5	Ensure Timely Inspections of Facilities	Total number of Title V Inspections completed annually.	Complete 386 Title V Inspections.
6	Reduce Backlog of Permit Applications	Reduce number of permit applications in the backlog.	Reduce the number of pending permit applications to 3,800 or less.
7	Support Development of Cleaner Advanced Technology	Amount of Clean Fuels Program projects funded.	Fund $10 Million of Clean Fuels program projects with a 1:4 leveraging ratio.

GOAL II. Enhance Public Education and Equitable Treatment for All Communities.

Priority Objective		Performance Indicator	Performance Measurement
1	Evaluation of Low Cost Air Quality Sensors	Evaluation and posting of results of low cost air quality sensors that have reached the market.	Evaluate and post results of 75% of sensors that have reached the market.
2	Outreach Events and Media Relations	Number of large community outreach events conducted in each County.	Conduct 4 large community outreach events, including 1 in each County.
3	Investigation of Community Complaints	Development of standardized acknowledgment time for community complaints.	Develop a process to measure and establish an appropriate acknowledgement time for community complaints.
4	Social Media Efforts	Percentage increase in number of social media followers.	10% increase in social media followers.
5	Engage Young Persons	Creation and number of meetings of a young persons advisory group.	Create a young persons advisory group and conduct 4 meetings.

GOAL III. Operate Efficiently and Transparently.

Priority Objective		Performance Indicator	Performance Measurement
1	Ensure Transparent Governance	Percentage of Committee and Board meeting agendas with materials made available to the public one week prior to the meeting.	100% of Committee and Board meeting agendas with materials made available to the public one week prior to the meeting.
2	Ensure Transparent Governance	Percentage of Stakeholder and Working Group meeting agendas with materials made available to the public 48 hours prior to the meeting.	100% of Stakeholder and Working Group meeting agendas with materials made available to the public 48 hours prior to the meeting.
3	Maintain a Well Informed Staff	Number of all staff information sessions offered and conducted.	Offer and conduct 10 information sessions/training for all staff.
4	Partner with Public Agencies, Stakeholder Groups, & Business Community	Number of meetings with Permit Streamlining Task Force subcommittee and stakeholders.	Conduct 4 meetings of the Permit Streamlining Task Force subcommittee and stakeholders.
5	IT Systems Improvements	Number of completed Enterprise GIS improvement projects.	Complete 9 of the 15 Enterprise GIS projects indentified in the Enterprise GIS Implementation Plan.
6	Timely Financial Monitoring	Timely budgetary financial reporting.	Submit quarterly budgetary financial reports to the Governing Board within 6 working days of the end of the quarter.

PROGRAM CATEGORIES

ADVANCE CLEAN AIR TECHNOLOGY

Identify technologies from anywhere in the world that may have application in reducing emissions from mobile and stationary sources in the SCAQMD's jurisdiction. Suggest strategies to overcome any barriers and, when appropriate, implement those strategies.

(A) Identify short-term and long-term technical barriers to the use of low-emission clean fuels and transportation technologies.

(B) Promote development and assess the use of clean fuels and low-emitting technologies.

(C) Work with industry to promote research and development in promising low-emission technologies and clean fuels.

(D) Provide technical and program support to the Mobile Source Air Pollution Reduction Review Committee (MSRC).

(E) Conduct source tests and analysis of samples to assess effectiveness of low-emissions technology.

(F) Implement and administer state-funded programs such as the Carl Moyer program for retrofitting, re-powering, or replacing diesel engines with newer and cleaner engines and the Proposition 1B program that provides funding for projects to reduce air pollution associated with freight movement along California's trade corridors.

ENSURE COMPLIANCE WITH CLEAN AIR RULES

Ensure compliance with SCAQMD rules for existing major and small stationary sources.

(A) Verify compliance with SCAQMD rules through inspections, sample collections, Visible Emissions Evaluations, certification of Continuous Emission Monitoring Systems (CEMS), and emissions audits.

(B) Issue Notices of Violation for major violations when discovered or a Notice to Comply for minor violations or to request records.

(C) Respond to and resolve public complaints concerning air pollution.

(D) Participate in Hearing Board cases, investigate breakdowns and notifications of demolitions or renovations of structures which may contain asbestos, conduct periodic monitoring, and observe source tests.

(E) Respond to industrial and chemical emergencies when requested by other agencies.

(F) Provide training classes for compliance with various SCAQMD rules such as Gasoline Transfer and Dispensing (Rule 461), Asbestos Demolition and Renovation (Rule 1403), Chrome Plating Operations (Rule 1469), Fugitive Dust Plans (Rule 403 & 403.1), Sump and Wastewater Separators (Rule 1176) and Combustion Gas Portable Analyzer Training & Certification (Rules 1146, 1146.1 & 1110.2).

PROGRAM CATEGORIES

CUSTOMER SERVICE AND BUSINESS ASSISTANCE

Support local government, businesses, and the general public.

(A) Provide local government, business and the public with accesses and input into the regulatory and policy processes of the SCAQMD.

(B) Assist cities and others with AB 2766 projects.

(C) Interact with local, state and federal agencies as well as others to share air quality information, resolve jurisdictional questions, and implement joint programs.

(D) Support air pollution reduction through implementation of comprehensive public information, legislative and customer service programs.

(E) Provide small business assistance services and support economic development and business retention activities.

(F) Make presentations to and meet with regulated organizations, individuals, public agencies and the media.

(G) Notify all interested parties of upcoming changes to air quality rules and regulations through public meetings, workshops, and printed and electronic information.

(H) Resolve permit- and fee-related problems and provide technical assistance to industry.

(I) Respond to Public Records Act requests.

(J) Produce brochures, newsletters, television, radio and print media information and materials, and digital information.

(K) Respond to letters and Internet inquiries from the public and to media inquiries and requests.

DEVELOP PROGRAMS TO ACHIEVE CLEAN AIR

Develop a regional Air Quality Management Plan (AQMP) to achieve federal and state ambient air quality standards and to meet all other requirements of the federal and California Clean Air Acts.

(A) Analyze air quality data and provide an estimation of pollutant emissions by source category.

(B) Develop pollutant control strategies and project future air quality using computer models and statistical analysis of alternative control scenarios.

(C) Analyze issues pertaining to air toxics, acid deposition, and potential socioeconomic and environmental impacts (CEQA) of SCAQMD plans and regulations.

(D) Conduct outreach activities to solicit public input on proposed control measures.

(E) Implement Rule 2201 On-Road Motor Vehicle Mitigation Options and process employee commute reduction program submittals and registrations. Provide one-on-one assistance to employers to ensure compliance with the rule.

DEVELOP PROGRAMS TO ACHIEVE CLEAN AIR (Cont.)

(F) Develop and update emissions inventories; conduct in-house auditing of annual emission reports; conduct field audits.

DEVELOP RULES TO ACHIEVE CLEAN AIR

Develop emission reduction regulations for sulfur dioxide, nitrogen dioxide, organic gases, particulate matter, toxics, and other pollutants to implement the regional AQMP, Tanner Air Toxics Process (AB 1807), National Emission Standards for Hazardous Air Pollutants (NESHAPS), and Prevention of Significant Deterioration (PSD) requirements.

(A) Provide an assessment of control technologies, evaluation of control cost, source testing and analysis of samples to determine emissions.

(B) Test and analyze products and processes to demonstrate pollution reduction potential.

(C) Solicit public input through meetings and workshops.

(D) Prepare rules to provide flexibility to industry, ensure an effective permit program and increase rule effectiveness.

(E) Evaluate effectiveness of area source rules, evaluate area source emission inventories, and propose new rules or amendments to improve implementation of area source programs, including the certification/registration of equipment, and as necessary pursuant to statewide regulatory requirements.

(F) Implement the AQMP. Develop feasibility studies and control measures.

(G) Conduct research and analyze health effects of air pollutants and assess the health implications of pollutant reduction strategies.

MONITORING AIR QUALITY

Operate and maintain within SCAQMD's jurisdiction a network of air quality monitoring sites for ozone, nitrogen oxides, sulfur oxides, particulate matter, carbon monoxide and other pollutants to obtain data regarding public exposure to air contaminants.

(A) Analyze, summarize, and report air quality information generated from the monitoring sites.

(B) Provide continuous records for assessment of progress toward meeting federal and state air quality standards.

(C) Develop and prepare meteorological forecasts and models.

(D) Respond to emergency requests by providing technical assistance to first-response public safety agencies.

MONITORING AIR QUALITY (Cont.)

(E) Notify the public, media, schools, regulated industries and others whenever predicted or observed levels exceed the episode levels established under state law.

(F) Conduct special studies such as MATES V, National Air Toxics Trends (NATTS), Port Air Quality Monitoring, Near Road NO_2 Monitoring, and TraPac Air Filtration Program.

(G) Conduct measurement activities to identify and monitor potential sources of all toxics including high-risk facilities.

(H) Deploy low-cost sensors to monitor air pollution within communities of the South Coast Air Basin and from specific sources.

(I) Assess the ability of optical remote sensing technology to characterize and quantify emissions from refineries and other sources, and to serve as a useful tool for enhancing existing leak detection and repair programs.

OPERATIONAL SUPPORT

Provide operational support to facilitate overall air quality improvement programs.

(A) Provide services that enable SCAQMD offices to function properly. Services include facility administration, human resources and financial services.

(B) Provide information management services in support of all SCAQMD operations, including automation of permitting and compliance records, systems analysis and design, computer programming and operations, records management, and the library.

(C) Provide legal support and representation on all policy and regulatory issues and all associated legal actions.

TIMELY REVIEW OF PERMITS

Ensure timely processing of permits for new sources based on compliance with New Source Review and other applicable local, state and federal air quality rules and regulations.

(A) Process applications for Permits to Construct and/or to Operate for new construction, modification and change of conditions for major and non-major sources.

(B) Process Title V permits (Initial, Renewal, and Revisions) and facility permits for RECLAIM sources.

(C) Process applications for Administrative Changes, Change of Operator, Plans, Emission Reductions Credits (ERCs) and RECLAIM Trading Credits (RTCs).

TIMELY REVIEW OF PERMITS (Cont.)

(D) Continue efforts to streamline and expedite permit issuance through:

(1) Equipment certification/registration programs
(2) Streamlined standard permits
(3) Enhancement of permitting systems (including electronic permitting)
(4) Expedited Permit Processing Program
(5) Maintaining adequate staff resources
(6) Improved training
(7) Revisiting policies and rules

POLICY SUPPORT

Monitor, analyze and attempt to influence the outcome of state/federal legislation.

(A) Track changes to the state/federal budgets that may affect SCAQMD.

(B) Respond to Congressional and Senatorial inquiries regarding SCAQMD programs, policies or initiatives.

(C) Assist SCAQMD consultants in identifying potential funding sources and securing funding for SCAQMD programs.

(D) Provide support staff to the Governing Board, Board committees, and various advisory and other groups including but not limited to: the Air Quality Management Plan Advisory Group, the Environmental Justice Advisory Group, the Home Rule Advisory Group, the Local Government and Small Business Assistance Advisory Group, the Mobile Source Air Pollution Reduction Review Committee (MSRC) and MSRC Technical Advisory Committee, the Scientific, Technical and Modeling Peer Review Advisory Group, the Technology Advancement Advisory Group, as well as ad hoc committees established from time to time and various Rule working groups.

REVENUE CATEGORIES

I. **Allocatable**

A portion of SCAQMD revenue offsets operational support costs of the SCAQMD.

1a Allocatable SCAQMD: District-wide administrative and support services (e.g., Human Resources, Payroll, Information Management).
1b Allocatable Office: Administrative activities specific to a division/office.

II. **Annual Operating Emissions Fees**

III. **Permit Processing Fees**

IV. **Annual Operating Permit Renewal Fees**

V. **Federal Grants/Other Federal Revenue**

VI. **Source Test/Sample Analysis Fees**

VII. **Hearing Board Fees**

VIII. **Clean Fuels Fees**

IX. **Mobile Sources**

X. **Air Toxics AB 2588**

XI. **Transportation Programs**

XII - XIV. These revenue categories are no longer used.

XV. **California Air Resources Board Subvention**

XVI. This revenue category is no longer used.

XVII. **Other Revenue**

XVIII. **Area Sources**

XIX. **Portable Equipment Registration Program (PERP)**

For a description of the revenue categories listed above, please refer to the corresponding revenue account in the FUND BALANCE & REVENUES section, "Explanation of Revenue Sources" within this document.

WORK PROGRAM OVERVIEW

The Work Program is a management tool that allocates resources by Office, Program Category, and project. It is developed from Program Output Justifications prepared during the budget process by each Office. Work Programs for each Office can be found in the "OFFICE BUDGETS" section of this document. Work Programs by Program Category are within the following pages. A glossary of terms and acronyms used in the Work Program are at the end of this section.

Professional & Special Services, Temporary Agency Services, and Capital Outlays expenditures are assigned to specific Work Program Codes associated with the project the expenditures support. All other expenditures (Salaries and Benefits and most Services and Supplies line items) are distributed within an Office by Full-Time Equivalent (FTE). A District General overhead cost has been apportioned to each Work Program line based on the number of FTE staff positions for that line.

The following is a brief description of each column in the Work Program:

The **#** column identifies each line in the Work Program in numerical order.

The **Program Code** is a five-digit code assigned to each program. The first two digits represent the Office number. The last three digits are the Program number.

The **Goal** column identifies which of the three Program Goals (defined in the Draft Goals and Priority Objectives) applies to that output. The Goals are:

GOAL I **Achieve Clean Air Standards.**

GOAL II **Enhance Public Education and Equitable Treatment for All Communities.**

GOAL III **Operate Efficiently and Transparently.**

The **Office** column, which appears on the Work Program by Category document, identifies the Office responsible for performing the work.

The **Program Category** column, which appears on the Work Program by Office document, identifies one of the nine Program Categories associated with an activity.

The **Program** column identifies the Program associated with the work.

The **Activities** column provides a brief description of the work.

The **FTEs** column identifies the number of Full Time Equivalent (FTE) staff positions in the current-year adopted budget, mid-year and proposed changes (+/-), and the proposed budget for the next fiscal year. An FTE position represents one person-year.

The **Proposed Expenditures** column, found in the Work Program by Category document, identifies the expenditures in the current-year adopted budget, proposed changes (+/-) and the proposed budget for the next fiscal year.

The **Revenue Category** column identifies the revenue that supports the work. Revenue Category titles can be found within this section and revenue descriptions are in the FUND BALANCE & REVENUES section, "Explanation of Revenue Sources" within this document.

Advance Clean Air Technology
Work Program by Category

#	Program Code		Goal	Office	Program	Activities	FTEs			Expenditures			Revenue Categories
							FY 2016-17	+/-	FY 2017-18	FY 2016-17	+/-	FY 2017-18	
1	08	001	I	LEG	AB2766/Mob Src/Legal Advice	AB2766 Leg Adv: Trans/Mob Source	0.05	-	0.05	$ 10,420	$ 183	$ 10,603	IX
2	04	003	III	FIN	AB2766/MSRC	MSRC Program Administration	0.35	-	0.35	49,680	2,814	52,494	IX
3	08	003	I	LEG	AB2766/MSRC	Legal Advice: MSRC Prog Admin	0.15	-	0.15	31,260	549	31,809	IX
4	44	003	I	STA	AB2766/MSRC	Mob Src Review Comm Prog Admin	0.50	-	0.50	81,155	980	82,134	IX
5	44	004	I	STA	AB2766/MSRC/Contract Admin	AB2766 Admin Discretionary Prog	3.00	-	3.00	486,929	5,877	492,806	IX
6	44	012	I	STA	AQMP/Control Tech Assessment	Tech Supp: Quantify Cost Effec	0.10	-	0.10	16,231	196	16,427	VIII
7	44	039	I	STA	Admin/Office Mgt/Tech Adv	Admin Support/Coordination	0.77	-	0.77	124,978	1,509	126,487	VIII
8	44	048	I	STA	Admin/Prog Mgmt/Tech Advance	Overall TA Program Mgmt/Coord	1.55	-	1.55	251,580	3,037	254,617	VIII
9	44	066	I	STA	AQIP Marine SCR DPF	AQIP Marine SCR DPF/Admin/Impl	0.15	-	0.15	24,346	294	24,640	IX
10	44	095	I	STA	CA Natural Gas Veh Partnership	CA Natural Gas Veh Partnership	0.05	-	0.05	8,115	98	8,213	VIII
11	04	130	III	FIN	Clean Fuels/Contract Admin	Clean Fuels Contract Admin/Monitor	0.15	-	0.15	21,291	1,206	22,497	VIII
12	44	130	I	STA	Clean Fuels/Contract Admin	Admin/Project Supp for TA Cont	6.57	(3.17)	3.40	1,066,374	(507,861)	558,514	VIII
13	08	131	I	LEG	Clean Fuels/Legal Advice	Legal Advice: Clean Fuels	0.05	-	0.05	10,420	183	10,603	VIII
14	44	132	I	STA	Clean Fuels/Mobile Sources	Dev/Impl Mobile Src Proj/Demo	4.35	1.65	6.00	706,047	1,564,566	2,270,613	VIII
15	44	134	I	STA	Clean Fuels/Stationary Combust	Dev/Demo Clean Combustion Tech	0.70	(0.20)	0.50	113,617	(31,482)	82,134	VIII
16	44	135	I	STA	Clean Fuels/Stationary Energy	Dev/Demo Alt Clean Energy	0.70	(0.15)	0.55	113,617	(23,269)	90,348	VIII
17	44	136	I	STA	Clean Fuels/Tech Transfer	Disseminate Low Emiss CF Tech	1.20	0.05	1.25	194,772	10,564	205,336	VIII
18	44	187	I	STA	DERA Sch Bus Repl	DERA Sch Bus Repl Admin/Impl	0.03	-	0.03	4,869	59	4,928	V
19	44	188	I	STA	DERA FY 13 Veh Repl	DERA Vehicle Repl Admin/Impl	0.20	-	0.20	32,462	392	32,854	XVII
20	44	190	I	STA	Diesel Projects EPA	Diesel Projects EPA/Admin/Impl	0.11	-	0.11	17,854	216	18,070	V
21	44	203	I	STA	EFMP Program Support	EFMP Program Support	-	1.19	1.19	-	195,480	195,480	XVII
22	44	356	I	STA	GGRF ZEDT Demo	GGRF ZEDT Demo Admin	1.10	-	1.10	178,541	2,155	180,696	XVII
23	44	361	I	STA	HD Trucks DOE ARRA	DOE HD Trucks Admin (ARRA)	2.00	-	2.00	324,619	3,918	328,538	V,XVII
24	44	453	I	STA	Mob Src: Emiss Inven Method	Rvw CARB/US EPA emissions inven methodology	1.50	-	1.50	243,464	2,939	246,403	VIII,IX
25	03	455	I	EO	Mobile Sources	Dev/Impl Mobile Source Strategies	0.10	(0.10)	-	24,903	(24,903)	-	IX
26	04	457	III	FIN	Mobile Source/Moyer Adm	Carl Moyer: Contract/Fin Admin	1.02	-	1.02	144,782	8,200	152,982	IX
27	08	457	I	LEG	Mob Src/C Moyer/Leg Advice	Moyer/Implem/Program Dev	0.10	-	0.10	20,840	366	21,206	IX
28	16	457	I	AHR	MS/Carl Moyer Admin	C Moyer/Contractor Compliance	0.50	(0.40)	0.10	90,896	(72,232)	18,663	IX
29	44	457	I	STA	Mob Src/C Moyer Adm/Outreach	Carl Moyer: Impl/Admin Grant	8.81	2.34	11.15	1,429,948	476,648	1,906,597	IX
30	44	459	I	STA	Mob Src/C Moyer/Impl/Prg Dev	Moyer/Implem/Program Dev	2.80	-	2.80	454,467	5,485	459,952	IX
31	44	460	I	STA	VIP Admin	VIP Admin/Outreach/Impl	0.80	-	0.80	129,848	1,567	131,415	IX
32	44	497	I	STA	Plug-in Hybrid EV DOE ARRA	DOE Plug-in Hybrid EV Admin (ARRA)	0.75	-	0.75	121,732	1,469	123,202	V
33	44	533	I	STA	POLB AMECS Demo	POLB AMECS Demo-Admin/Impl	0.47	-	0.47	76,286	921	77,206	XVII
34	04	542	I	FIN	Prop 1B:Goods Movement	Contracts/Finance Admin	0.50	-	0.50	70,971	4,020	74,991	IX
35	16	542	I	AHR	Prop 1B:Goods Movement	Prop 1B: Goods Movement	0.50	(0.40)	0.10	90,896	(72,232)	18,663	IX
36	04	544	I	FIN	Prop 1B:Low Emiss Sch Bus	Grants/Finance Admin	0.05	-	0.05	7,097	402	7,499	IX
37	44	677	I	STA	School Bus/Lower Emission Prog	School Bus Program Oversight	0.70	-	0.70	113,617	1,371	114,988	IX
38	26	738	I	PRA	Target Air Shed EPA	Targeted Air Shed Admin/Impl	0.25	-	0.25	42,185	838	43,023	V,XVII
39	44	738	I	STA	Target Air Shed EPA	Targeted Air Shed Admin/Impl	0.15	-	0.15	24,346	294	24,640	V,XVII
40	44	740	I	STA	Tech Adv/Commercialization	Assess CFs/Adv Tech Potential	0.25	-	0.25	40,577	490	41,067	VIII
41	44	741	I	STA	Tech Adv/Non-Combustion	Dev/Demo Non-Combustion Tech	0.10	-	0.10	16,231	196	16,427	VIII
42	44	816	I	STA	Transportation Research	Transport Research/Adv Systems	0.50	-	0.50	81,155	980	82,134	VIII
						Total Advance Clean Air Technology	43.68	0.81	44.49	$ 7,093,418	$ 1,568,481	$ 8,661,899	

A prorated share of the District General Budget has been allocated to each line in the work program based on the number of FTEs reflected on the line.

Ensure Compliance
Work Program by Category

#	Program Code		Goal	Office	Program	Activities	FTEs			Expenditures			Revenue Categories
							FY 2016-17	+/-	FY 2017-18	FY 2016-17	+/-	FY 2017-18	
1	44	015	I	STA	Acid Rain Program	Acid Rain CEMS Eval/Cert	0.50	-	0.50	$ 81,155	$ 980	$ 82,134	II,IV
2	26	042	I	PRA	Admin/Office Mgmt/Compliance	Admin: Compl w SCAQMD Rules	0.50	(0.50)	-	84,370	(84,370)	-	Ib
3	44	042	I	STA	Admin/Office Mgmt/Compliance	Compliance: Assign/Manage/Supp	0.37	-	0.37	60,055	725	60,779	Ib
4	26	046	I	PRA	Admin/Office Mgmt/Compliance	Admin: Compl of Existing Source	0.75	(0.75)	-	126,554	(126,554)	-	Ib
5	50	070	I	EP	CARB PERP Program	CARB Audits/Statewide Equip Reg	7.00	(7.00)	-	1,080,878	(1,080,878)	-	XIX
6	60	070	I	CE	CARB PERP Program	CARB Audits/Statewide Equip Reg	-	5.00	5.00	-	740,253	740,253	XIX
7	50	071	I	EP	Arch Ctgs - Admin	Report Review	0.10	(0.10)	-	15,441	(15,441)	-	XVIII
8	08	072	I	LEG	Arch Ctgs - End User	Case Dispo/Rvw, Track, Prep NOVs	0.05	-	0.05	10,420	183	10,603	XVIII
9	26	072	I	PRA	Arch Ctgs - End User	Compliance/Rpts/Rule Implementation	1.00	(0.20)	0.80	168,739	(31,066)	137,673	XVIII
10	44	072	I	STA	Arch Ctgs - End User	Sample Analysis/Rpts	5.00	(3.00)	2.00	811,548	(483,011)	328,538	XVIII
11	50	072	I	EP	Arch Ctgs - End User	Compliance/Rpts/RuleImpmenta	0.10	(0.10)	-	15,441	(15,441)	-	XVIII
12	08	073	I	LEG	Arch Ctgs - Other	Case Dispo/Rvw, Track, Prep NOVs	0.05	-	0.05	10,420	183	10,603	XVIII
13	26	073	I	PRA	Arch Ctgs - Other	Compliance/Rpts/Rule Implementation	1.00	(0.20)	0.80	168,739	(31,066)	137,673	XVIII
14	50	073	I	EP	Arch Ctgs - Other	Compliance/Rpts/Rule Implementation	4.50	(4.50)	-	694,850	(694,850)	-	XVIII
15	26	076	I	PRA	Area Sources/Compliance	Area Source Compliance	5.00	(0.30)	4.70	893,695	20,134	913,829	III,IV,V,IX,XV
16	16	080	III	AHR	Auto Services	Vehicle/Radio Repair & Maint	3.00	-	3.00	545,374	14,521	559,895	Ia
17	44	105	I	STA	CEMS Certification	CEMS Review/Approval	6.15	-	6.15	998,204	12,048	1,010,253	II,III,VI
18	35	111	II	LPA	Call Center/CUT SMOG	Smoking Vehicle Complaints	8.00	-	8.00	1,311,868	69,123	1,380,992	IX,XV
19	08	115	I	LEG	Case Disposition	Trial/Dispo-Civil Case/Injunct	5.00	-	5.00	1,041,993	18,302	1,060,295	II,IV,V,VII,XV
20	50	152	III	EP	Compliance/IM Related Activiti	Assist IM: Design/Review/Test	0.50	(0.50)	-	77,206	(77,206)	-	II
21	60	152	III	CE	Compliance/IM Related Activiti	Assist IM: Design/Review/Test	-	0.50	0.50	-	274,025	274,025	IV
22	08	154	I	LEG	Compliance/NOV Administration	Review/Track/Prep NOVs/MSAs	1.20	(0.20)	1.00	250,078	(38,019)	212,059	IV
23	50	155	I	EP	Compliance Guidelines	Procedures/Memos/Manuals	0.50	(0.50)	-	77,206	(77,206)	-	II
24	60	155	I	CE	Compliance Guidelines	Procedures/Memos/Manuals	-	2.50	2.50	-	370,127	370,127	IV
25	50	156	I	EP	Perm Proc/Info to Compliance	Prov Permit Info to Compliance	3.00	-	3.00	463,233	47,247	510,480	III,IV,XV
26	50	157	I	EP	Compliance/Special Projects	Prog Audits/Data Req/Board Supp	5.00	(5.00)	-	772,055	(772,055)	-	IV
27	60	157	I	CE	Compliance/Special Projects	Prog Audits/Data Req/Brd Supp	-	5.00	5.00	-	740,253	740,253	II
28	50	158	I	EP	Compliance Testing	R461/Combustion Equip Testing	1.00	(1.00)	-	159,411	(159,411)	-	II
29	60	158	I	CE	Compliance Testing	R461/Combustion Equip Testing	-	0.50	0.50	-	240,025	240,025	IV
30	44	175	I	STA	DB/Computerization	Develop Systems/Database	0.44	-	0.44	71,416	862	72,278	II,IV,VI
31	08	185	I	LEG	Database Management	Support IM/Dev Tracking System	0.25	0.50	0.75	87,100	126,945	214,044	IV
32	26	215	I	PRA	Annual Emission Reporting	Annl Des/Impl/Emiss Monitor Sys	7.50	0.50	8.00	1,270,543	211,188	1,481,731	II,V
33	08	235	I	LEG	Enforcement Litigation	Maj Prosecutions/Civil Actions	2.00	-	2.00	416,797	7,321	424,118	IV
34	50	240	I	EP	Environmental Justice	R461/Combustion Equip Testing	-	0.50	0.50	-	85,080	85,080	II,IV,XV
35	26	358	I	PRA	GHG Rules-Compl	Green House Gas Rules-Compliance	-	1.05	1.05	-	180,696	180,696	IV
36	17	364	I	CB	Hearing Board/Abatement Orders	Attnd/Recrd/Monitr Mtgs	0.10	-	0.10	20,094	2,290	22,384	IV
37	17	365	I	CB	Hearing Board/Variances/Appeal	Attend/Record/Monitor HB Mtgs	3.20	-	3.20	668,399	133,379	801,778	IV,V,VII
38	50	365	I	EP	Hearing Bd/Variances	Variances/Orders of Abatement	1.50	(0.75)	0.75	231,617	(103,997)	127,620	VII
39	60	365	I	CE	Hearing Bd/Variances	Variances/Orders of Abatement	-	2.00	2.00	-	296,101	296,101	VII
40	08	366	I	LEG	Hearing Board/Legal	Hear/Disp-Varian/Appeal/Rev	3.00	-	3.00	625,196	10,981	636,177	IV,V,XV

A prorated share of the District General Budget has been allocated to each line in the work program based on the number of FTEs reflected on the line.

Ensure Compliance (Cont.)
Work Program by Category

#	Program Code		Goal	Office	Program	Activities	FTEs			Expenditures			Revenue Categories
							FY 2016-17	+/-	FY 2017-18	FY 2016-17	+/-	FY 2017-18	
41	50	375	I	EP	Inspections	Compliance/Inspection/Follow-up	79.20	(79.20)	-	$ 12,245,807	$ (12,245,807)	$ -	II,V,XV
42	60	375	I	CE	Inspections	Compliance/Inspection/Follow-up	-	83.10	83.10	-	12,303,011	12,303,011	II,V,XV
43	50	377	I	EP	Inspections/RECLAIM Audits	Audit/Compliance Assurance	23.80	(17.80)	6.00	3,674,984	(2,654,024)	1,020,960	II,IV
44	60	377	I	CE	Inspections/RECLAIM Audits	Audit/Compliance Assurance	-	15.00	15.00	-	2,220,760	2,220,760	II,IV
45	08	380	I	LEG	Interagency Coordination	Coordinate with Other Agencies	0.20	-	0.20	41,680	732	42,412	II,V
46	08	403	III	LEG	Legal Rep/Litigation	Prep/Hearing/Disposition	3.50	-	3.50	913,895	27,811	941,706	Ia,II
47	44	450	I	STA	Microscopic Analysis	Asbestos/PM/Metals Analysis	2.00	-	2.00	324,619	3,918	328,538	VI
48	08	465	I	LEG	Mutual Settlement	Mutual Settlement Program	3.00	-	3.00	625,196	10,981	636,177	IV
49	50	492	I	EP	Customer Service	Compliance/Inspection/Follow-up	-	0.50	0.50	-	85,080	85,080	II,V,IX,XV
50	44	500	I	STA	PM2.5 Program	Est/Operate/Maint PM2.5 Network	11.30	-	11.30	1,834,099	22,138	1,856,237	II,V,IX
51	50	538	I	EP	Port Comm AQ Enforcement	Port Comm AQ Enforcement	0.50	(0.50)	-	77,206	(77,206)	-	IX
52	60	538	I	CE	Port Comm AQ Enforcement	Port Comm AQ Enforcement	-	-	-	-	-	-	IX
53	60	539	I	CE	Procedure 5 Review	Evaluate Proc 5 Asbestos Plans	-	0.40	0.40	-	59,220	59,220	XVII
54	50	542	I	EP	Prop 1B:Goods Movement	Prop 1B: Gds Mvmnt/Inspect	0.30	(0.30)	-	46,323	(46,323)	-	IX
55	50	550	II	EP	Public Complaints/Breakdowns	Compltresp/Invflwup/Resolutn	10.00	(10.00)	-	1,544,111	(1,544,111)	-	II,IV,V,XV
56	60	550	II	CE	Public Complaints/Breakdowns	Compltresp/Invflwup/Resolutn	-	10.00	10.00	-	1,480,507	1,480,507	II,IV,V,XV
57	50	605	I	EP	RECLAIM/Admin Support	Admin/Policy/Guidelines	10.00	(3.50)	6.50	1,544,111	(438,071)	1,106,040	II,III,IV,XV
58	60	605	I	CE	RECLAIM/Admin Support	Admin/Policy/Guidelines	-	5.00	5.00	-	740,253	740,253	II,III,IV,XV
59	26	620	I	PRA	Refinery Pilot Project	Refinery Pilot Project	0.25	-	0.25	42,185	838	43,023	II
60	26	645	I	PRA	Rule 1610 Plan Verification	Rule 1610 Plan Verification	0.50	0.25	0.75	84,370	44,699	129,069	V,IX
61	50	678	I	EP	School Siting	Identify Haz. Emission Sources near Schools	1.00	(0.75)	0.25	154,411	(111,871)	42,540	II
62	60	678	I	CE	School Siting	Identify Haz. Emission Sources near Schools	-	0.05	0.05	-	7,403	7,403	IV
63	50	680	I	EP	Small Business Assistance	Asst sm bus w/ Permit Process	0.50	-	0.50	77,206	7,874	85,080	III,IV
64	44	700	I	STA	Source Testing/Compliance	Conduct ST/Prov Data/Compl	2.25	-	2.25	395,197	4,408	399,605	VI
65	44	704	I	STA	ST/Sample Analysis/Compliance	Analyze ST Samples/Compliance	4.00	-	4.00	649,239	82,836	732,075	VI
66	44	707	I	STA	VOC Sample Analysis/Compliance	VOC Analysis & Rptg/Compliance	7.00	-	7.00	1,173,168	13,714	1,186,881	IV,XV
67	26	716	I	PRA	Spec Monitoring/R403	Rule 403 Compliance Monitoring	1.05	(1.05)	-	177,176	(177,176)	-	III,IV,IX,XV
68	44	716	I	STA	Special Monitoring	Rule 403 Compliance Monitoring	2.20	-	2.20	392,081	4,310	396,391	III,IV,IX,XV
69	50	751	I	EP	Title III Inspections	Title III Comp/Insp/Follow Up	0.50	(0.50)	-	77,206	(77,206)	-	IV
70	60	751	I	CE	Title III Inspections	Title III Comp/Insp/Follow Up	-	0.10	0.10	-	14,805	14,805	IV
71	50	771	I	EP	Title V Inspections	Title V Compl/Inspect/Follow Up	11.00	(11.00)	-	1,698,522	(1,698,522)	-	II,IV
72	60	771	I	CE	Title V	Title V Compl/Inspect/Follow Up	-	3.50	3.50	-	518,177	518,177	II,IV
73	04	791	III	FIN	Toxics/AB2588	AB2588 Toxics HS Fee Collection	0.15	-	0.15	36,291	1,206	37,497	X
74	08	791	I	LEG	Toxics/AB2588	AB2588 Legal Advice: Plan & Impl	0.05	-	0.05	10,420	183	10,603	X
75	27	791	III	IM	Toxics/AB2588	AB2588 Database Software Supp	0.50	-	0.50	147,295	1,732	149,026	X
76	50	791	I	EP	Toxics/AB2588	AB2588 Rev Rprts/Risk Redplans	0.25	-	0.25	38,603	3,937	42,540	X
77	60	791	I	CE	Toxics/AB2588	Risk Reduct Plan Rvw/Comm Mtgs	-	0.10	0.10	-	14,805	14,805	X
78	26	794	I	PRA	Toxics/AB2588	AB2588 Core, Tracking, IWS	9.40	3.60	13.00	1,586,147	651,040	2,237,188	X
79	44	794	I	STA	Toxics/AB2588	Eval Protocols/Methods/ST	1.25	3.00	4.25	202,887	495,255	698,142	X
80	44	795	I	STA	Toxics/Engineering	R1401 Toxics/HRA Prot/Rpt Eval	0.05	-	0.05	8,115	98	8,213	VI,X
81	08	805	III	LEG	Training	Continuing Education/Training	0.50	-	0.50	104,199	1,830	106,029	Ib
82	50	850	I	EP	VEE Trains	Smoking Trains-Compl/Inspec/FU	0.50	(0.50)	-	77,206	(77,206)	-	IX,XV
						Total Ensure Compliance	263.96	(7.05)	256.91	$ 43,314,046	$ (511,556)	$ 42,802,490	

A prorated share of the District General Budget has been allocated to each line in the work program based on the number of FTEs reflected on the line.

Customer Service and Business Assistance
Work Program by Category

#	Program Code		Goal	Office	Program	Activities	FTEs			Expenditures			Revenue Categories
							FY 2016-17	+/-	FY 2017-18	FY 2016-17	+/-	FY 2017-18	
1	04	002	III	FIN	AB2766/Mobile Source	Prog Admin: Monitor/Dist/Audit	0.10	-	0.10	$ 24,194	$ (9,196)	$ 14,998	IX
2	26	007	I	PRA	AB2766/MSRC	AB2766 Prov Tech Asst to Cities	1.10	0.12	1.22	185,613	24,338	209,951	IX
3	50	038	I	EP	Admin/Office Management	Dev/Coord Goals/Policies/Overs	5.00	(4.00)	1.00	772,055	(595,895)	176,160	Ib
4	60	038	III	CE	Admin/Office Budget	Dev/Coord Goals/Policies/Overs	-	6.00	6.00	-	890,304	890,304	Ib
5	35	046	III	LPA	Admin/Prog Mgmt	Admin Office/Units/SuppCoord Staff	3.02	1.00	4.02	495,230	198,718	693,948	Ib
6	50	047	I	EP	Admin/Operations Support	Budget/Contracts/Reports/Projects	5.00	(3.00)	2.00	777,055	(434,235)	342,820	Ib
7	60	047	I	CE	Admin/Operations Support	Budget/Contracts/Reports/Projects	-	6.00	6.00	-	892,804	892,804	Ib
8	35	126	II	LPA	Clean Air Connections	Coord of region-wide community group	1.00	-	1.00	163,984	8,640	172,624	II,IX
9	04	170	I	FIN	Billing Services	Answer/Resp/Resolv Prob & Inq	8.00	-	8.00	1,151,042	64,318	1,215,360	II,III,IV
10	50	200	I	EP	Economic Dev/Bus Retention	Perm Proc/Public Participation	0.10	-	0.10	15,441	1,575	17,016	III
11	35	205	II	LPA	Environmental Education	Curriculum Dev/Project Coord	0.25	-	0.25	40,996	2,160	43,156	II,IX,XV
12	26	216	I	PRA	AER Public Assistance	AER Design/Impl/Monitor Emiss	2.00	-	2.00	337,478	6,705	344,183	II
13	35	240	I	LPA	Environmental Justice	Impl Board's EJ Pgrms/Policies	2.00	-	2.00	327,967	17,281	345,248	II,IV
14	04	260	III	FIN	Fee Review	Cmte Mtg/Fee-Related Complaint	0.10	-	0.10	14,194	804	14,998	II,III,IV,XV
15	35	260	III	LPA	Fee Review	Cmte Mtg/Fee-Related Complaint	0.50	-	0.50	81,992	4,320	86,312	II,III,IV,XV
16	50	260	III	EP	Fee Review	Fee Review Committee	0.45	-	0.45	69,485	7,087	76,572	II,III,IV
17	04	355	III	FIN	Grants Management	Grant Anlyz/Eval/Negot/Acc/Rpt	1.00	-	1.00	141,943	8,040	149,982	IV,V,XV
18	35	381	III	LPA	Interagency Liaison	Interact Gov Agns/Promote SCAQMD	0.15	-	0.15	24,598	1,296	25,894	Ia,XV
19	03	390	I	EO	Local Govt Policy Development	Policy Development	0.05	(0.05)	-	12,451	(12,451)	-	Ia,IX
20	35	390	I	LPA	Intergov/Geographic Deployment	Dev/Impl Local Govt Outreach	9.50	-	9.50	1,595,843	82,084	1,677,928	II,IX
21	08	404	I	LEG	Legal Rep/Legislation	Draft Legis/SCAQMD Position/Mtgs	0.05	0.20	0.25	10,420	42,595	53,015	II,IX
22	50	425	I	EP	Lobby Permit Services	Supp Perm Proc/Customer Svc	1.00	-	1.00	154,411	15,749	170,160	III
23	27	481	III	IM	New System Development	Dev sys in supp of Dist-wide	1.75	-	1.75	593,731	(235,939)	357,792	Ia,III
24	03	490	II	EO	Outreach	Publ Awareness Clean Air Prog	1.00	(0.03)	0.97	249,026	64,013	313,039	Ia
25	35	491	II	LPA	Outreach/Business	Chambers/Business Meetings	1.00	-	1.00	176,584	(3,960)	172,624	II,IV
26	35	492	II	LPA	Public Education/Public Events	Pub Events/Conf/Rideshare Fair	1.00	-	1.00	573,984	8,640	582,624	II,V,IX,XV
27	60	492	II	CE	Outreach/Business	Pub Events/Conf/Rideshare Fair	-	0.20	0.20	-	29,610	29,610	IX
28	35	496	II	LPA	Outreach/Visiting Dignitary	Tours/Briefings-Dignitary	0.25	-	0.25	40,996	2,160	43,156	Ia
29	35	514	I	LPA	Permit: Expired Permit Program	Assist w Permit Reinstatement	0.30	-	0.30	49,195	2,592	51,787	IV
30	50	520	I	EP	Perm Proc/Pre-Appl Mtg Outreac	Pre-App Mtgs/Genl Prescreening	4.00	(3.00)	1.00	617,644	(447,484)	170,160	III
31	16	540	III	AHR	Print Shop	Printing/Collating/Binding	4.00	-	4.00	738,165	19,361	757,526	Ia
32	35	555	II	LPA	Public Information Center	Inform public of unhealthy air	1.00	-	1.00	253,984	8,640	262,624	II,V,IX
33	03	565	III	EO	Public Records Act	Comply w/ Public Req for Info	0.05	(0.04)	0.01	12,451	(9,224)	3,227	Ia
34	04	565	I	FIN	Public Records Act	Comply w/ Public Rec Requests	0.02	-	0.02	2,839	161	3,000	Ia
35	08	565	III	LEG	Public Records Act	Comply w/ Public Rec Requests	1.00	0.50	1.50	208,399	109,690	318,088	Ia
36	16	565	III	AHR	Public Records Act	Comply w/ Public Rec Requests	0.05	-	0.05	9,090	242	9,332	Ia
37	17	565	III	CB	Public Records Act	Comply w/ Public Rec Requests	0.02	-	0.02	4,019	458	4,477	Ia
38	26	565	III	PRA	Public Records Act	Comply w/ Public Rec Requests	0.53	0.04	0.57	89,432	8,660	98,092	Ia
39	27	565	III	IM	Public Records Act	Comply w/ Public Req for Info	4.75	-	4.75	770,469	117,081	887,550	Ia
40	35	565	III	LPA	Public Records Act	Comply w/ Public Req for Info	0.10	-	0.10	16,398	864	17,262	Ia

A prorated share of the District General Budget has been allocated to each line in the work program based on the number of FTEs reflected on the line.

Customer Service and Business Assistance (Cont.)
Work Program by Category

#	Program Code		Goal	Office	Program	Activities	FTEs			Expenditures			Revenue Categories
							FY 2016-17	+/-	FY 2017-18	FY 2016-17	+/-	FY 2017-18	
41	44	565	III	STA	Public Records Act	Comply w/ Public Req for Info	0.17	-	0.17	$ 27,593	$ 333	$ 27,926	Ia
42	50	565	III	EP	Public Records Act	Comply w/ Public Req for Info	0.50	(0.25)	0.25	77,206	(34,666)	42,540	Ia
43	60	565	III	CE	Public Records Act	Comply w/ Public Req for Info	-	2.00	2.00	-	296,101	296,101	Ia
44	04	631	III	FIN	Cash Mgmt/Refunds	Research/Doc/Prep/Proc Refunds	0.30	-	0.30	42,583	2,412	44,995	III,IV,XI
45	35	679	III	LPA	Small Business Assistance	Small Business/Financial Assistance	1.00	-	1.00	163,984	8,640	172,624	III
46	08	681	III	LEG	Small Business/Legal Advice	Legal Advice: SB/Fee Review	0.05	-	0.05	10,420	183	10,603	II,III
47	50	690	I	EP	Source Education	Prov Tech Asst To Industries	2.80	-	2.80	432,351	44,097	476,448	III,IV,V,XV
48	60	690	I	CE	Source Education	Prov Tech Asst To Industries	-	0.40	0.40	-	59,220	59,220	III,IV,V,XV
49	44	701	I	STA	Source Testing/Customer Svc	Conduct ST/Prov Data/Cust Svc	0.05	-	0.05	8,115	98	8,213	VI
50	44	709	I	STA	VOC Sample Analysis/SBA/Other	VOC Analysis & Reptg/Cust Svc	0.50	-	0.50	81,155	980	82,134	VI
51	35	710	I	LPA	Speakers Bureau	Coordinate/conduct speeches	0.10	-	0.10	16,398	864	17,262	Ia
52	16	720	I	AHR	Subscription Services	Rule & Gov Board Materials	1.70	-	1.70	309,045	8,228	317,274	IV,XVII
53	35	791	I	LPA	Toxics/AB2588	Outreach/AB 2588 Air Toxics	0.01	-	0.01	1,640	86	1,726	X
54	26	833	II	PRA	Rule 2202 ETC Training	Rule 2202 ETC Training	1.30	(0.37)	0.93	244,361	(59,316)	185,045	XI
						Total Customer Service & Business Assistance	69.67	5.72	75.39	$ 12,217,648	$ 1,219,867	$ 13,437,515	

A prorated share of the District General Budget has been allocated to each line in the work program based on the number of FTEs reflected on the line.

Develop Programs
Work Program by Category

#	Program Code		Goal	Office	Program	Activities	FTEs			Expenditures			Revenue Categories
							FY 2016-17	+/-	FY 2017-18	FY 2016-17	+/-	FY 2017-18	
1	26	002	I	PRA	AB2766/Mobile Source	AB2766 Mobile Source Outreach	0.90	0.14	1.04	$ 151,865	$ 27,110	$ 178,975	IX
2	04	009	I	FIN	AB 1318 Mitigation	AB 1318 Projects Admn/Impl	0.13	-	0.13	18,453	1,045	19,498	XVII
3	08	009	I	LEG	AB 1318 Mitigation	AB 1318 Projects Admn/Impl	0.05	-	0.05	10,420	183	10,603	XVII
4	26	009	I	PRA	AB 1318 Mitigation	AB 1318 Projects Admn/Impl	0.25	0.05	0.30	42,185	9,443	51,627	XVII
5	44	009	I	STA	AB 1318 Mitigation	AB 1318 Projects Admn/Impl	0.75	-	0.75	121,732	1,469	123,202	XVII
6	03	010	I	EO	AQMP	Develop/Implement AQMP	0.05	-	0.05	12,451	3,685	16,136	II,IX
7	08	010	I	LEG	AQMP	AQMP Revision/CEQA Review	0.20	-	0.20	41,680	732	42,412	II,IV,IX
8	26	010	I	PRA	AQMP	AQMP Special Studies	2.00	-	2.00	345,478	6,705	352,183	IV,V,IX,XV
9	03	028	I	EO	Admin/SCAQMD Policy	Dev/Coord Goals/Policies/Overs	2.00	(1.56)	0.44	648,052	(356,055)	291,997	Ia
10	26	038	I	PRA	Admin/Office Management	Coordinate Off/Admin Activities	0.75	3.80	4.55	126,554	656,461	783,016	Ib
11	26	049	I	PRA	Admin/Prog Mgmt/AQMP	Admin: AQMP Development	1.00	(1.00)	-	168,739	(168,739)	-	Ib
12	26	057	I	PRA	Admin/Transportation Prog Mgmt	Admin: Transportation Programs	0.75	(0.75)	-	126,554	(126,554)	-	Ib
13	26	068	II	PRA	SCAQMD Projects	Prepare Environmental Assessments	4.10	(0.75)	3.35	881,830	(115,324)	766,506	II,IV,IX
14	44	069	I	STA	AQIP Evaluation	AQIP Contract Admin/Evaluation	0.65	-	0.65	105,501	1,273	106,775	IX
15	26	102	II	PRA	CEQA Document Projects	Review/Prepare CEQA Comments	4.00	(0.50)	3.50	674,956	(72,637)	602,320	II,IX
16	26	104	I	PRA	CEQA Policy Development	ID/Develop/Impl CEQA Policy	0.90	0.30	1.20	161,865	54,644	216,510	IV,IX
17	26	128	I	PRA	Cln Communities Pln	Cln Communities Plan Admn/Impl	0.20	0.05	0.25	33,748	9,275	43,023	II,IX
18	26	217	I	PRA	Emissions Inventory Studies	Dev Emiss DB/Dev/Update Emiss	2.00	(1.30)	0.70	337,478	(217,014)	120,464	II,V,IX,XV
19	26	218	I	PRA	AQMP/Emissions Inventory	Dev Emiss Inv: Forecasts/RFPs	1.30	-	1.30	219,361	4,358	223,719	II,IX
20	26	219	I	PRA	Emissions Field Audit	Emissions Field Audit	0.50	-	0.50	84,370	1,676	86,046	II
21	44	396	I	STA	Lawnmower Exchange	Lawn Mower Admin/Impl/Outreach	0.30	-	0.30	48,693	588	49,281	XVII
22	26	397	II	PRA	Lead Agency Projects	Prep Envrnmt Assmts/Perm Proj	1.10	0.65	1.75	185,613	115,547	301,160	III
23	26	448	I	PRA	Mobile Src Strategies-Off Road	CARB Off-Road Mob Src ctrl strategy for SIP	-	1.00	1.00	-	172,091	172,091	XVII
24	44	448	I	STA	Mobile Src Strategies-Off Road	CARB Off-Road Mob Src ctrl strategy for SIP	0.15	(0.15)	-	24,346	(24,346)	-	XVII
25	26	451	I	PRA	Mob Src/CARB/EPA Monitoring	CARB/US EPA Mob Src Fuel Policies	-	1.50	1.50	-	258,137	258,137	IX
26	44	451	I	STA	Mob Src/CARB/EPA Monitoring	CARB/US EPA Mob Src Fuel Policies	1.50	(1.50)	-	243,464	(243,464)	-	IX
27	26	452	I	PRA	Mob Src/CEC/US DOE Monitoring	CEC/US DOE Mob Src rulemaking proposals	-	1.00	1.00	-	172,091	172,091	IX,XVII
28	44	452	I	STA	Mob Src/CEC/US DOE Monitoring	CEC/US DOE Mob Src rulemaking proposals	1.00	(1.00)	-	162,310	(162,310)	-	IX,XVII
29	44	458	I	STA	Mobile Source Strategies	Implement Fleet Rules	0.85	0.15	1.00	137,963	26,306	164,269	VIII
30	26	503	I	PRA	PM Strategies	PM10 Plan/Analyze/Strategy Dev	4.95	(1.55)	3.40	835,258	(250,148)	585,111	II,V,XV
31	44	542	I	STA	Prop 1B:Goods Movement	Prop 1B:Goods Movement	9.87	(0.17)	9.70	1,601,996	291,411	1,893,407	IX
32	35	560	I	LPA	Public Notification	Public notif of rules/hearings	0.50	-	0.50	101,992	4,320	106,312	II,IV,IX
33	26	600	I	PRA	Credit Generation Programs	Dev RFP/AQMP Ctrl Strats/Inter	-	-	-	-	-	-	II,V,IX
34	26	685	I	PRA	Socio-Economic	Apply econ models/Socio-econ	4.00	0.10	4.10	1,129,456	56,118	1,185,575	II,IV
35	44	702	I	STA	ST Methods Development	Eval ST Methods/Validate	0.95	-	0.95	154,194	1,861	156,055	II
36	44	705	I	STA	ST Sample Analysis/Air Program	Analyze ST Samples/Air Prgms	0.25	-	0.25	40,577	490	41,067	II
37	26	745	I	PRA	Rideshare	Dist Rideshare/Telecommute Prog	1.05	(0.44)	0.61	177,176	(72,200)	104,976	IX
38	26	816	I	PRA	Transportation Regional Progs	Dev AQMP Meas/Coord w/Reg Agn	1.00	(0.65)	0.35	168,739	(108,507)	60,232	V,IX
39	26	834	I	PRA	Rule 2202 Implement	Rule 2202 Proc/Sub Plans/Tech Eval	3.40	(0.85)	2.55	573,713	(134,880)	438,833	XI
40	26	836	I	PRA	Rule 2202 Support	R2202 Supt/CmptrMaint/WebSubmt	3.00	(0.41)	2.59	521,217	(60,501)	460,717	V,XI
						Total Develop Programs	56.35	(3.84)	52.51	$ 10,419,982	$ (235,660)	$ 10,184,322	

A prorated share of the District General Budget has been allocated to each line in the work program based on the number of FTEs reflected on the line.

Develop Rules
Work Program by Category

#	Program Code		Goal	Office	Program	Activities	FTEs			Expenditures			Revenue Categories
							FY 2016-17	+/-	FY 2017-18	FY 2016-17	+/-	FY 2017-18	
1	44	043	I	STA	Admin/Office Mgmt/Rules	Rules: Assign/Manage/Supp	0.15	-	0.15	$ 24,346	$ 294	$ 24,640	Ib
2	26	050	I	PRA	Admin/Rule Dev/PRA	Admin: Rule Development	1.25	(0.65)	0.60	210,924	(107,669)	103,255	Ib
3	26	071	I	PRA	Arch Ctgs - Admin	Rdev/Aud/DB/TA/SCAQMD/Rpts/AER	1.00	0.10	1.10	168,739	20,561	189,301	XVIII
4	26	077	I	PRA	Area Sources/Rulemaking	Dev/Eval/Impl Area Source Prog	2.00	0.05	2.05	337,478	15,309	352,787	II,IX
5	26	084	I	PRA	Blk Carbon Stdy EPA	EPA Blck Carbon Climate Study	0.20	(0.20)	-	33,748	(33,748)	-	V,XVII
6	26	165	I	PRA	Conformity	Monitor Transp. Conformity	0.40	(0.15)	0.25	67,496	(24,473)	43,023	V,IX
7	26	362	II	PRA	Health Effects	Study Health Effect/Toxicology	1.90	0.35	2.25	320,604	66,601	387,206	II,III,IX
8	03	385	I	EO	Credit Generation Programs	Dev/Impl Marketable Permit	0.02	(0.02)	-	4,981	(4,981)	-	II
9	26	385	I	PRA	Criteria Pollutants/Mob Srcs	Dev/Impl Intercredit Trading	0.75	-	0.75	126,554	2,514	129,069	IV,IX
10	26	449	I	PRA	Mob Src/SCAQMD Rulemaking	Prepare SCAQMD Mob Src rulemaking proposals	-	0.81	0.81	-	139,394	139,394	IX
11	44	449	I	STA	Mob Src/SCAQMD Rulemaking	Prepare SCAQMD Mob Src rulemaking proposals	2.00	(2.00)	-	324,619	(324,619)	-	VIII,IX
12	44	456	I	STA	MS & AQMP Control Strategies	AQMP Control Strategies	0.30	-	0.30	48,693	588	49,281	VIII
13	26	460	I	PRA	Regional Modeling	Rule Impact/Analyses/Model Dev	5.30	-	5.30	1,034,317	17,767	1,052,084	II,V,IX
14	03	650	I	EO	Rules	Develop & Implement Rules	0.04	(0.04)	-	9,961	(9,961)	-	II,IV,IX
15	50	650	I	EP	Rulemaking	Dev/Amend/Impl Rules	0.50	(0.25)	0.25	77,206	(34,666)	42,540	II,XV
16	60	650	I	CE	Rulemaking	Dev/Amend/Impl Rules	-	-	-	-	-	-	IV,XV
17	08	651	I	LEG	Rules/Legal Advice	Legal Advice: Rules/Draft Regs	1.00	-	1.00	208,399	3,660	212,059	II
18	44	653	I	STA	Rulemaking/BACT	Dev/Amend BACT Guidelines	2.00	-	2.00	324,619	3,918	328,538	II
19	26	654	I	PRA	Rulemaking/NOX	Rulemaking/NOx	2.70	(0.20)	2.50	455,596	(25,367)	430,228	II,IV,XV
20	26	655	I	PRA	NSR/Adm Rulemaking	Amend/Develop NSR & Admin Rules	2.00	0.50	2.50	337,478	92,750	430,228	II,IV,V,XV
21	26	656	I	PRA	Rulemaking/VOC	Dev/Amend VOC Rules	3.00	2.70	5.70	656,217	374,703	1,030,921	II,IV,XV
22	44	657	I	STA	Rulemaking/Support PRA	Assist PRA w/ Rulemaking	0.05	-	0.05	8,115	98	8,213	II
23	50	657	I	EP	Rulemaking/Support PRA	Provide Rule Development Supp	0.50	(0.25)	0.25	77,206	(34,666)	42,540	II,XV
24	60	657	I	CE	Rulemaking/Support PRA	Provide Rule Development Supp	-	0.50	0.50	-	74,025	74,025	IV,XV
25	26	659	I	PRA	Rulemaking/Toxics	Develop/Amend Air Toxic Rules	7.50	2.00	9.50	1,265,543	369,325	1,634,868	II,XV
26	08	661	I	LEG	Rulemaking/RECLAIM	RECLAIM Legal Adv/Related Iss	0.05	0.20	0.25	10,420	42,595	53,015	II
27	26	661	I	PRA	Rulemaking/RECLAIM	RECLAIM Amend Rules/Related Is	0.57	1.93	2.50	96,181	334,047	430,228	II
28	44	706	I	STA	ST Sample Analysis/Air Program	Analyze ST Samples/Rules	0.25	-	0.25	40,577	490	41,067	II
29	44	708	I	STA	VOC Sample Analysis/Rules	VOC Analysis & Rptg/Rules	0.25	-	0.25	40,577	490	41,067	II,XV
30	50	752	I	EP	Title III Rulemaking	Title III Dev/Implement Rules	0.25	-	0.25	38,603	3,937	42,540	II,V,XV
31	50	773	I	EP	Title V & NSR Rulemaking-Supp	Title V Rules Dev/Amend/Impl	0.25	-	0.25	38,603	3,937	42,540	II
						Total Develop Rules	36.18	5.38	41.56	$ 6,387,801	$ 966,856	$ 7,354,657	

A prorated share of the District General Budget has been allocated to each line in the work program based on the number of FTEs reflected on the line.

Monitoring Air Quality
Work Program by Category

#	Program Code		Goal	Office	Program	Activities	FTEs			Expenditures			Revenue Categories
							FY 2016-17	+/-	FY 2017-18	FY 2016-17	+/-	FY 2017-18	
1	44	038	I	STA	Admin/Office Mgmt/Monitoring	Overall Program Mgmt/Coord	1.40	-	1.40	$ 227,234	$ 2,743	$ 229,976	Ib
2	44	046	I	STA	Admin/Program Management	STA Program Administration	2.00	-	2.00	336,619	3,918	340,538	Ib
3	26	061	I	PRA	Air Quality Evaluation	Air Quality Evaluation	1.05	1.20	2.25	177,176	210,030	387,206	IX
4	44	063	I	STA	Ambient Air Analysis	Analyze Criteria/Tox/Pollutants	7.91	1.00	8.91	1,283,869	179,765	1,463,635	II,V,IX
5	44	064	I	STA	Ambient Network	Air Monitoring/Toxics Network	19.05	0.80	19.85	3,199,599	168,736	3,368,335	II,IV,V,IX
6	44	065	I	STA	Air Quality Data Management	AM Audit/Validation/Reporting	1.00	-	1.00	162,310	1,959	164,269	II,V,IX
7	44	067	II	STA	Ambient Lead Monitoring	Lead Monitoring/Analysis/Reporting	0.50	-	0.50	81,155	980	82,134	IV
8	44	073	I	STA	Arch Ctgs - Other	Sample Analysis/Rpts	2.00	-	2.00	324,619	3,918	328,538	XVIII
9	44	079	II	STA	AQ SPEC	AQ SPEC	3.00	-	3.00	486,929	5,877	492,806	XVII
10	44	081	I	STA	Air Filtration EPA	Air Filtration EPA/Admn/Impl	0.25	(0.10)	0.15	40,577	(15,937)	24,640	V
11	44	082	I	STA	Air Fltration Other	Air Filtration Other/Admn/Impl	0.25	(0.10)	0.15	40,577	(15,937)	24,640	XVII
12	44	084	I	STA	Blk Carbon Stdy EPA	EPA Blck Carbon Climate Study	-	0.20	0.20	-	32,854	32,854	XVII
13	50	210	II	EP	Emergency Response	Emerg Tech Asst to Public Saf	0.25	(0.25)	-	38,603	(38,603)	-	II,XV
14	60	210	II	CE	Emergency Response	Emerg Tech Asst to Public Saf	-	0.10	0.10	-	14,805	14,805	IV,XV
15	44	240	I	STA	Environmental Justice	Implement Environmental Justice	0.45	-	0.45	73,039	882	73,921	II,IX
16	44	248	I	STA	EPA Community Scale AQ-SPEC	EPA Community Scale AQ-SPEC	1.00	-	1.00	162,310	1,959	164,269	V,XVII
17	26	443	I	PRA	MATES V	MATES V	-	0.30	0.30	-	101,627	101,627	II,IX
18	26	445	I	PRA	Meteorology	ModelDev/Data Analysis/Forecast	2.15	(0.10)	2.05	437,789	39,998	477,787	II,V,IX
19	44	468	I	STA	NATTS(Natl Air Tox Trends Sta)	NATTS (Natl Air Tox Trends)	1.50	-	1.50	243,464	2,939	246,403	II,V,IX
20	44	469	I	STA	Near Roadway Mon	Near Roadway Monitoring	1.50	-	1.50	243,464	2,939	246,403	IV,V,IX
21	44	505	I	STA	PM Sampling Program (EPA)	PM Sampling Program - Addition	10.60	-	10.60	1,720,482	20,766	1,741,249	V
22	44	507	I	STA	PM Sampling Spec	PM Sampling Special Events	0.10	-	0.10	16,231	196	16,427	V
23	26	530	I	PRA	Photochemical Assessment	Photochemical Assessment	0.25	-	0.25	42,185	838	43,023	II,V
24	44	530	I	STA	Photochemical Assessment	Photochemical Assess & Monitor	3.00	-	3.00	486,929	5,877	492,806	V,IX
25	44	585	I	STA	Quality Assurance	Quality Assurance Branch	3.00	-	3.00	486,929	65,877	552,806	II,V,IX
26	44	663	I	STA	Salton Sea Monit	Mon/Analyze Hydrogen Sulfide	0.25	-	0.25	40,577	490	41,067	XVII
27	44	715	II	STA	Spec Monitoring/Emerg Response	Emergency Response	0.50	-	0.50	81,155	980	82,134	II
28	44	821	II	STA	TraPac Air Filt Prg	Admin/Tech Suppt/Reptg/Monitor	0.15	0.85	1.00	24,346	139,922	164,269	XVII
						Total Monitoring Air Quality	63.11	3.90	67.01	$ 10,458,169	$ 940,398	$ 11,398,567	

A prorated share of the District General Budget has been allocated to each line in the work program based on the number of FTEs reflected on the line.

Operational Support
Work Program by Category

#	Program Code		Goal	Office	Program	Activities	FTEs			Expenditures			Revenue Categories
							FY 2016-17	+/-	FY 2017-18	FY 2016-17	+/-	FY 2017-18	
1	04	020	III	FIN	Admin/SCAQMD Budget	Analyze/Prepare/Impl/Track WP	2.50	0.15	2.65	$ 354,857	$ 42,597	$ 397,454	Ia
2	04	021	III	FIN	Admin/SCAQMD Contracts	Contract Admin/Monitor/Process	3.20	-	3.20	454,217	25,727	479,944	Ia
3	04	023	III	FIN	Admin/SCAQMD Capital Assets	FA Rep/Reconcile/Inv/Acct	0.70	-	0.70	99,360	5,628	104,988	Ia
4	17	024	III	CB	Admin/SCAQMD/GB/HB Mgmt	Admin Governing/Hearing Brds	1.25	-	1.25	251,171	28,625	279,796	Ia,VII,XV
5	08	025	III	LEG	Admin/SCAQMD-Legal Research	Legal Research/Staff/Exec Mgmt	1.20	(0.10)	1.10	250,078	(16,813)	233,265	Ia
6	16	026	III	AHR	SCAQMD Mail	Posting/Mailing/Delivery	2.30	-	2.30	418,120	11,133	429,252	Ia
7	03	038	III	EO	Admin/Office Management	Budget/Program Management	1.00	1.00	2.00	249,026	73,695	322,721	Ib
8	04	038	III	FIN	Admin/Office Management	Fin Mgmt/Oversee Activities	3.00	1.75	4.75	425,828	286,588	712,417	Ib
9	08	038	III	LEG	Admin/Office Management	Attorney Timekeeping/Perf Eval	3.50	-	3.50	736,895	12,811	749,706	Ib
10	16	038	III	AHR	Admin/Office Management	Reports/Proj/Budget/Contracts	4.45	(0.60)	3.85	813,971	(90,440)	723,531	Ib
11	27	038	III	IM	Admin/Office Management	Overall Direction/Coord of IM	3.00	(0.75)	2.25	550,168	57,103	607,271	Ib
12	04	045	III	FIN	Admin/Office Budget	Office Budget/Prep/Impl/Track	0.05	-	0.05	7,097	402	7,499	Ib
13	44	052	I	STA	Admin/Prog Mgmt/Mob Src	Admin: Mobile Source	1.80	(1.80)	-	292,157	(292,157)	-	Ib
14	16	060	III	AHR	Equal Employment Opportunity	Program Dev/Monitor/Reporting	0.10	-	0.10	18,179	484	18,663	Ia
15	04	071	I	FIN	Arch Ctgs - Admin	Cost Analysis/Payments	0.04	-	0.04	5,678	322	5,999	XVIII
16	08	071	I	LEG	Arch Ctgs - Admin	Rule Dev/TA/Reinterpretations	0.05	-	0.05	10,420	183	10,603	XVIII
17	27	071	I	IM	Arch Ctgs - Admin	Database Dev/Maintenance	0.25	-	0.25	45,847	866	46,713	XVIII
18	04	085	III	FIN	Building Corporation	Building Corp Acct/Fin Reports	0.02	-	0.02	2,839	161	3,000	Ia
19	16	090	III	AHR	Building Maintenance	Repairs & Preventative Maint	7.00	-	7.00	1,275,789	33,882	1,309,671	Ia
20	16	092	III	AHR	Business Services	Building Services Admin/Contracts	2.40	0.15	2.55	436,299	39,611	475,910	Ia
21	08	102	II	LEG	CEQA Document Projects	CEQA Review	1.00	(0.50)	0.50	208,399	(102,369)	106,029	II,III,IX
22	27	160	III	IM	Computer Operations	Oper/Manage Host Computer Sys	5.25	-	5.25	1,370,144	19,782	1,389,926	Ia
23	27	184	III	IM	Database Information Support	Ad Hoc Reports/Bulk Data Update	1.00	-	1.00	203,389	3,463	206,853	Ia
24	27	185	III	IM	Database Management	Dev/Maintain Central Database	2.25	-	2.25	412,626	7,792	420,418	Ia
25	27	215	I	IM	Annual Emission Reporting	System Enhancements for GHG	0.50	-	0.50	91,695	1,732	93,426	II,XVII
26	16	225	III	AHR	Employee Benefits	Benefits Analysis/Orient/Records	1.50	-	1.50	272,687	7,260	279,947	Ia
27	16	226	III	AHR	Classification & Pay	Class & Salary Studies	0.30	-	0.30	119,537	(63,548)	55,989	Ia
28	08	227	III	LEG	Employee/Employment Law	Legal Advice: Employment Law	1.00	(0.50)	0.50	208,399	(102,369)	106,029	Ia
29	16	228	III	AHR	Recruitment & Selection	Recruit Candidates for SCAQMD	3.25	-	3.25	614,322	15,731	630,052	Ia
30	16	232	III	AHR	Position Control	Track Positions/Workforce Analys	0.55	-	0.55	99,985	2,662	102,647	Ia
31	04	233	III	FIN	Employee Relations	Assist HR/Interpret Salary Res	0.10	-	0.10	14,194	804	14,998	Ia
32	16	233	III	AHR	Employee Relations	Meet/Confer/Labor-Mgmt/Grievance	2.20	-	2.20	399,941	10,648	410,589	Ia
33	16	255	III	AHR	Facilities Services	Phones/Space/Keys/Audio-Visual	1.00	-	1.00	183,791	4,840	188,632	Ia
34	04	265	III	FIN	Financial Mgmt/Accounting	Record Accts Rec & Pay/Rpts	6.20	-	6.20	923,045	51,846	974,891	Ia
35	04	266	III	FIN	Financial Mgmt/Fin Analysis	Fin/SCAQMD Stat Analysis & Audit	0.80	-	0.80	113,554	6,432	119,986	Ia
36	04	267	III	FIN	Financial Mgmt/Treasury Mgmt	Treas Mgt Anlyz/Trk/Proj/Invst	0.90	0.10	1.00	211,398	23,234	234,632	Ia
37	04	268	III	FIN	Financial Systems	CLASS/Rev/Acct/PR/Sys Analyze	0.10	-	0.10	14,194	804	14,998	Ia
38	02	275	II	GB	Governing Board	Rep of Dist Meet/Conf/Testimony	-	-	-	1,557,882	154,015	1,711,896	Ia
39	08	275	III	LEG	Governing Board	Legal Advice:Attend Board/Cmte Mtgs	1.00	-	1.00	208,399	3,660	212,059	Ia
40	17	275	III	CB	Governing Board	Attend/Record/Monitor Meetings	1.40	-	1.40	281,312	32,060	313,372	Ia
41	35	350	III	LPA	Graphic Arts	Graphic Arts	2.00	-	2.00	327,967	36,681	364,648	Ia
42	27	370	III	IM	Information Technology Svcs	Enhance Oper Effic/Productivity	2.75	-	2.75	527,071	9,524	536,595	Ia
43	08	401	III	LEG	Legal Advice/SCAQMD Programs	General Advice: Contracts	2.00	-	2.00	476,797	(2,679)	474,118	Ia

A prorated share of the District General Budget has been allocated to each line in the work program based on the number of FTEs reflected on the line.

Operational Support (Cont.)
Work Program by Category

#	Program Code		Goal	Office	Program	Activities	FTEs			Expenditures			Revenue Categories
							FY 2016-17	+/-	FY 2017-18	FY 2016-17	+/-	FY 2017-18	
44	27	420	III	IM	Library	General Library Svcs/Archives	0.25	-	0.25	$ 54,197	$ 866	$ 55,063	Ia
45	04	447	I	FIN	Mobile Sources/Accounting	Record Acct Rec & Pay/Special Funds	0.65	-	0.65	92,263	5,226	97,489	IX
46	27	470	III	IM	Network Operations/Telecomm	Operate/Maintain/Implem SCAQMD	9.25	-	9.25	2,164,216	(110,169)	2,054,047	Ia
47	27	480	III	IM	New System Development	Dev sys for special oper needs	3.00	(0.50)	2.50	617,364	(58,037)	559,327	II,IV
48	04	493	II	FIN	Outreach/SB/MB/DVBE	Outreach/Incr SB/DVBE Partic	0.05	-	0.05	7,097	402	7,499	Ia
49	04	510	III	FIN	Payroll	Ded/Ret Rpts/PR/St & Fed Rpts	3.60	-	3.60	558,494	28,943	587,437	Ia
50	04	570	III	FIN	Purchasing	Purch/Track Svcs & Supplies	2.50	-	2.50	354,857	20,099	374,956	Ia
51	04	571	III	FIN	Purchasing/Receiving	Receive/Record SCAQMD Purchases	1.20	-	1.20	170,331	9,648	179,979	Ia
52	04	572	III	FIN	Purchasing-Receiving/Stockroom	Track/Monitor SCAQMD Supplies	1.00	-	1.00	141,943	8,040	149,982	Ia
53	27	615	III	IM	Records Information Mgmt Plan	Plan/Impl/Dir/Records Mgmt plan	1.25	-	1.25	281,237	4,329	285,566	Ia
54	27	616	III	IM	Records Services	Records/Documents processing	3.75	-	3.75	924,710	(86,413)	838,297	Ia,III,IV
55	04	630	III	FIN	Cash Mgmt/Revenue Receiving	Receive/Post Pymts/Reconcile	5.25	-	5.25	745,200	42,208	787,408	II,III,IV,XI
56	16	640	III	AHR	Risk Management	Liabl/Property/Wk Comp/Selflns	1.00	1.25	2.25	303,791	228,130	531,921	Ia
57	27	735	III	IM	Systems Maintenance	Maintain Existing Software Prog	4.50	-	4.50	1,335,452	15,725	1,351,177	II,III,IV
58	27	736	III	IM	Systems Implementation/PeopleS	Fin/HR PeopleSoft Systems Impl	1.50	-	1.50	275,084	255,195	530,279	Ia
59	04	805	III	FIN	Training	Continuing Education/Training	0.20	-	0.20	28,389	1,608	29,996	Ib
60	26	805	III	PRA	Training	Training	0.05	0.20	0.25	8,437	34,586	43,023	Ib
61	50	805	III	EP	Training	Dist/Org Unit Training	6.00	(2.90)	3.10	926,467	(398,971)	527,496	Ib
62	60	805	III	CE	Training	Dist/Org Unit Training	-	4.00	4.00	-	592,203	592,203	Ib
63	04	825	III	FIN	Union Negotiations	Official Labor/Mgmt Negotiate	0.02	-	0.02	2,839	161	3,000	Ia
64	08	825	III	LEG	Union Negotiations	Legal Adv: Union Negotiations	0.05	-	0.05	10,420	183	10,603	Ia
65	26	825	III	PRA	Union Negotiations	Official Labor/Mgmt Negotiate	0.01	0.01	0.02	1,687	1,754	3,442	Ia
66	35	825	III	LPA	Union Negotiations	Official Labor/Mgmt Negotiate	0.01	-	0.01	1,640	86	1,726	Ia
67	44	825	III	STA	Union Negotiations	Labor/Mgmt Negotiations	0.05	-	0.05	8,115	98	8,213	Ia
68	50	825	III	EP	Union Negotiations	Official Labor/Mgmt Negotiate	0.10	(0.05)	0.05	15,441	(6,933)	8,508	Ia
69	60	825	III	CE	Union Negotiations	Official Labor/Mgmt Negotiate	-	0.10	0.10	-	14,805	14,805	Ia
70	04	826	III	FIN	Union Steward Activities	Rep Employees in Grievance Act	0.01	-	0.01	1,419	80	1,500	Ia
71	08	826	III	LEG	Union Steward Activities	Rep Employees in Grievance Act	0.05	-	0.05	10,420	183	10,603	Ia
72	26	826	III	PRA	Union Steward Activities	Rep Employees in Grievance Act	0.01	0.01	0.02	1,687	1,754	3,442	Ia
73	35	826	III	LPA	Union Steward Activities	Union Steward Activities	0.01	-	0.01	1,640	86	1,726	Ia
74	44	826	III	STA	Union Steward Activities	Rep Employees in Grievance Act	0.05	-	0.05	8,115	98	8,213	Ia
75	50	826	III	EP	Union Steward Activities	Rep Employees in Grievance Act	0.10	(0.05)	0.05	15,441	(6,933)	8,508	Ia
76	60	826	III	CE	Union Steward Activities	Rep Employees in Grievance Act	-	0.10	0.10	-	14,805	14,805	Ia
77	03	855	II	EO	Web Tasks	Create/edit/review web content	0.03	-	0.03	7,471	2,211	9,682	Ia
78	04	855	II	FIN	Web Tasks	Create/edit/review web content	0.02	-	0.02	2,839	161	3,000	Ia
79	17	855	II	CB	Web Tasks	Create/edit/review web content	0.03	-	0.03	6,028	687	6,715	Ia
80	20	855	II	MO	Web Tasks	Create/edit/review web content	-	-	-	234,467	(234,467)		Ia
81	26	855	II	PRA	Web Tasks	Create/edit/review web content	0.10	0.40	0.50	16,874	69,172	86,046	Ia
82	27	855	II	IM	Web Tasks	Create/edit/review web content	3.25	-	3.25	881,815	11,256	893,071	Ia
83	35	855	II	LPA	Web Tasks	Create/edit/review web content	1.44	(1.04)	0.40	65,593	3,456	69,050	Ia
84	50	855	II	EP	Web Tasks	Creation/Update of Web Content	0.50	(0.25)	0.25	77,206	(34,666)	42,540	Ia
85	60	855	II	CE	Web Tasks	Creation/Update of Web Conten	-	0.50	0.50	-	74,025	74,025	Ia
						Total Operational Support	125.70	0.68	126.38	$ 25,899,412	$ 848,092	$ 26,747,503	

A prorated share of the District General Budget has been allocated to each line in the work program based on the number of FTEs reflected on the line.

Timely Review of Permits
Work Program by Category

#	Program Code		Goal	Office	Program	Activities	FTEs			Expenditures			Revenue Categories
							FY 2016-17	+/-	FY 2017-18	FY 2016-17	+/-	FY 2017-18	
1	26	040	I	PRA	Admin/Office Mgmt/AQ Impl	Admin/Modeling/New Legis/Sm Sr	0.47	(0.47)	-	$ 79,307	$ (79,307)	$ -	Ib
2	26	044	I	PRA	Admin/Office Mgmt/Permit & Fee	Admin: Resolve Perm/Fee Issues	0.10	(0.10)	-	16,874	(16,874)	-	Ib
3	50	120	I	EP	Certification/Registration Pro	Certification/Registration Prog	-	2.00	2.00	-	340,320	340,320	III
4	50	253	I	EP	ERC Appl Processing	Process ERC Applications	3.50	-	3.50	540,439	55,121	595,560	III
5	50	367	I	EP	Hearing Board/Appeals	Appeals: Permits & Denials	0.50	(0.25)	0.25	77,206	(34,666)	42,540	III
6	26	461	I	PRA	Permit & CEQA Modeling Review	Review Model Permit/Risk Assmt	1.50	(0.20)	1.30	303,109	(29,390)	273,719	III
7	50	475	I	EP	NSR Implementation	Implement NSR/Allocate ERCs	2.50	-	2.50	386,028	39,372	425,400	II,III,V,XV
8	50	476	I	EP	NSR Data Clean Up	Edit/Update NSR Data	0.50	-	0.50	77,206	7,874	85,080	II
9	50	515	I	EP	Perm Proc/Non TV/Non RECLAIM	PP: Non TitlV/TitlIII/RECLAIM	57.30	(5.55)	51.75	8,867,335	(35,556)	8,831,779	III,XV
10	08	516	I	LEG	Permit Processing/Legal	Legal Advice: Permit Processing	0.20	-	0.20	41,680	732	42,412	III
11	50	517	I	EP	Permit Services	Facility Data-Create/Edit	12.50	-	12.50	1,930,139	196,861	2,127,000	III,XV
12	50	518	I	EP	RECLAIM Non-Title V	Process RECLAIM Only Permits	4.50	-	4.50	694,850	70,870	765,720	III,IV,XV
13	50	519	I	EP	Perm Proc/Title III (Non TV)	Process Title III Permits	1.00	-	1.00	154,411	15,749	170,160	III
14	50	521	I	EP	Perm Proc/Expedited Permit	Proc Expedited Permits (301OT)	0.50	3.50	4.00	77,206	603,434	680,640	III
15	27	523	III	IM	Permit Streamlining	Permit Streamlining	0.25	-	0.25	45,847	866	46,713	III
16	50	523	I	EP	Permit Streamlining	Permit Streamlining	3.75	-	3.75	579,042	59,058	638,100	III
17	44	545	I	STA	Protocols/Reports/Plans	Eval Test Protocols/Cust Svc	0.10	-	0.10	16,231	196	16,427	III,IV
18	44	546	I	STA	Protocols/Reports/Plans	Eval Test Protocols/Compliance	6.15	-	6.15	998,204	12,048	1,010,253	IV,VI
19	50	607	I	EP	RECLAIM & Title V	Process RECLAIM & TV Permits	12.40	6.00	18.40	1,914,697	1,236,246	3,150,944	III
20	26	643	I	PRA	Rule 222 Filing Program	Rule 222 Filing Program	-	-	-	50,000	-	50,000	IV
21	50	643	I	EP	Rule 222 Filing Program	Rule 222 Filing Program	-	0.50	0.50	-	85,080	85,080	IV
22	35	680	I	LPA	Small Business/Permit Streamln	Asst sm bus to comply/SCAQMD req	3.95	-	3.95	647,735	34,130	681,865	II,III,IV,V,XV
23	44	725	I	STA	Permit Processing/Support E&C	Assist EAC w/ Permit Process	0.05	-	0.05	8,115	98	8,213	III
24	50	728	I	EP	Perm Proc/IM Programming	Assist IM: Design/Review/Test	2.00	0.55	2.55	308,822	125,086	433,908	II,III,IV
25	08	770	I	LEG	Title V	Leg Advice: Title V Prog/Perm Dev	0.05	-	0.05	10,420	183	10,603	II,IV
26	27	770	I	IM	Title V	Dev/Maintain Title V Program	1.00	0.50	1.50	183,389	211,890	395,279	III
27	08	772	I	LEG	Title V Permits	Leg Advice: New Source Title V Permit	0.05	-	0.05	10,420	183	10,603	III
28	50	774	I	EP	TV/Non-RECLAIM	Process Title V Only Permits	18.00	-	18.00	2,779,400	283,480	3,062,880	III
29	50	775	I	EP	Title V – Admin	Title V Administration	1.00	-	1.00	154,411	15,749	170,160	III
						Total Timely Review of Permits	133.82	6.48	140.30	$ 20,952,521	$ 3,198,834	$ 24,151,356	

A prorated share of the District General Budget has been allocated to each line in the work program based on the number of FTEs reflected on the line.

Policy Support
Work Program by Category

#	Program Code		Goal	Office	Program	Activities	FTEs			Expenditures			Revenue Categories
							FY 2016-17	+/-	FY 2017-18	FY 2016-17	+/-	FY 2017-18	
1	44	041	I	STA	Admin/Office Mgmt/Policy Supp	Overall Policy Supp/Mgmt/Coord	0.49	-	0.49	$ 79,532	$ 960	$ 80,492	Ib
2	26	048	I	PRA	Admin/Prog Mgmt/Policy	Admin: GB/Committee Support	1.25	(1.25)	-	210,924	(210,924)	-	Ib
3	03	078	II	EO	Asthma & Outdoor AQ Consortium	Asthma & Outdoor AQ Consortium	0.01	(0.01)	-	2,490	(2,490)	-	Ia
4	03	083	II	EO	Brain Tumor & Air Poll Foundat	Brain Tumor & Air Poll Foundation Support	0.03	(0.02)	0.01	7,471	(4,244)	3,227	Ia
5	04	083	II	FIN	Brain Tumor & Air Poll Foundat	Brain Tumor & Air Poll Foundation Support	0.02	-	0.02	2,839	161	3,000	Ia
6	26	083	II	PRA	Brain Tumor & Air Poll Fdn	Brain Tumor & Air Poll Foundation Support	0.10	-	0.10	16,874	335	17,209	Ia,II,IV
7	26	148	I	PRA	Climate Change	GHG/Climate Change Policy Development	2.10	1.00	3.10	379,352	154,131	533,483	IV,XVII
8	50	148	I	EP	Climate Change	GHG/Climate Change Support	0.50	-	0.50	77,206	7,874	85,080	II,IX
9	60	148	I	CE	Climate Change	GHG/Climate Chg Support	-	0.10	0.10	-	14,805	14,805	IV,IX
10	26	240	I	PRA	EJ-AQ Guidance Document	AQ Guidance Document	0.40	(0.35)	0.05	67,496	(58,891)	8,605	II,IX
11	03	275	I	EO	Governing Board	Board/Committee Support	1.60	0.12	1.72	398,441	156,638	555,079	Ia
12	03	276	III	EO	Advisory Group/Governing Board	Governing Board Advisory Group	0.05	(0.05)	-	12,451	(12,451)	-	Ia
13	26	276	I	PRA	Advisory Group/Home Rule	Governing Board Advisory Group	0.30	-	0.30	50,622	1,006	51,627	Ia
14	44	276	I	STA	Advisory Group/Technology Adva	Tech Adv Advisory Group Supp	0.10	-	0.10	16,231	196	16,427	VIII
15	50	276	I	EP	Board Committees	Admin/Stationary Source Committees	0.25	-	0.25	38,603	3,937	42,540	Ia
16	60	276	I	CE	Board Committees	Admin/Stationary Source Committee	-	0.15	0.15	-	22,208	22,208	Ia
17	26	277	I	PRA	Advisory Group/AQMP	Governing Board AQMP Advisory Group	0.05	-	0.05	8,437	168	8,605	II,IX
18	26	278	I	PRA	Advisory Group/Sci,Tech,Model	Scientific/Tech/Model Peer Rev	1.15	(1.00)	0.15	194,050	(168,236)	25,814	II,IX
19	35	280	I	LPA	Advisory Group/Ethnic Comm	GB Ethnic Comm Advisory Group	0.40	-	0.40	65,593	3,456	69,050	II,IX
20	35	281	I	LPA	Advisory Group/Small Business	SBA Advisory Group Staff Support	0.50	-	0.50	81,992	4,320	86,312	IV,IX
21	35	283	I	LPA	Governing Board Policy	Brd sup/Respond to GB req	0.55	-	0.55	90,191	4,752	94,943	Ia
22	35	345	II	LPA	Goods Mvmt&Financial Incentive	Goods Movement & Financial Incentives Progr	1.00	-	1.00	163,984	8,640	172,624	IX
23	03	381	I	EO	Interagency Liaison	Local/State/Fed Coord/Interact	0.40	0.31	0.71	99,610	129,521	229,132	Ia,IX
24	03	410	I	EO	Legislation	Testimony/Mtgs:New/Current Leg	0.50	(0.47)	0.03	124,513	(114,831)	9,682	Ia,IX
25	44	410	I	STA	Legislation	Support Pollution Reduction thru Legislatio	0.50	-	0.50	81,155	980	82,134	IX
26	35	412	I	LPA	Legislation/Federal	Lobbying/Analyses/Tracking/Out	0.25	-	0.25	706,126	2,160	708,286	Ia
27	35	413	I	LPA	Legislation/Exec Office Suppor	Coord Legis w/ EO, EC, Mgmt	0.25	-	0.25	40,996	2,160	43,156	Ia
28	35	414	I	LPA	Legislation-Effects	Lobbying/Analyses/Tracking/Out	0.80	-	0.80	141,187	6,912	148,099	Ia,IX
29	03	416	I	EO	Legislative Activities	Supp/Promote/Influence Legis/Adm	0.05	(0.02)	0.03	12,451	(2,770)	9,682	Ia
30	08	416	I	LEG	Legislative Activities	Lobbying: Supp/Promote/Influence legis/Adm	0.10	-	0.10	20,840	366	21,206	Ia
31	26	416	I	PRA	Legislative Activities	Supp/Promote/Influence Legis/Adm	0.10	0.40	0.50	16,874	69,172	86,046	Ia
32	35	416	I	LPA	Legislative Activities	Supp/Promote/Influence Legis/Adm	0.50	-	0.50	446,992	4,320	451,312	Ia
33	50	416	I	EP	Legislative Activities	Legislative Activities	0.25	-	0.25	38,603	3,937	42,540	Ia
34	60	416	I	CE	Legislative Activities	Legislative Activities	-	0.05	0.05	-	7,403	7,403	Ia
35	26	454	I	PRA	Mob Src:Greenhs Gas Reduc Meas	Provide comments on mob src portion of AB32	-	0.89	0.89	-	153,161	153,161	XVII
36	44	454	I	STA	Mob Src:Greenhs Gas Reduc Meas	Provide comments on mob src portion of AB32	0.89	(0.89)	-	144,456	(144,456)	-	XVII
37	20	494	II	MO	Outreach/Media	Edits,Brds,Talk shows,Commercl	-	-	-	659,509	(659,509)	-	Ia,IX
38	35	494	I	LPA	Outreach/Collateral Developmen	Edits,Brds,Talk shows,Commercl	4.56	1.04	5.60	185,506	945,904	1,131,410	Ia
39	03	717	III	EO	Student Interns	Gov Board/Student Intern Program	0.02	(0.02)	-	4,981	(4,981)	-	Ia
40	08	717	II	LEG	Student Interns	Gov Board/Student Intern Program	0.20	(0.10)	0.10	41,680	(20,474)	21,206	Ia
41	16	717	II	AHR	Student Interns	Gov Board/Student Intern Program	0.20	-	0.20	36,358	968	37,326	Ia
42	26	717	II	PRA	Student Interns	Gov Bd/Student Intern Program	0.01	0.24	0.25	1,687	41,335	43,023	Ia
43	35	717	II	LPA	Student Interns	Student Interns	0.10	-	0.10	16,398	864	17,262	Ia
44	60	717	II	CE	Student Interns	Gov Board/Student Intern Program	-	0.05	0.05	-	7,403	7,403	Ia
						Total Policy Support	20.53	0.17	20.70	$ 4,784,698	$ 355,898	$ 5,140,597	
						Total SCAQMD	813.00	12.25	825.25	$ 141,527,695	$ 8,351,211	$ 149,878,906	

A prorated share of the District General Budget has been allocated to each line in the work program based on the number of FTEs reflected on the line.

WORK PROGRAM GLOSSARY

Below are descriptions of the activities related to the Work Program.

AB 1318 Mitigation - an eligible electrical generating facility shall pay mitigation fees for the transfer of emission credits from SCAQMD's internal emission credit accounts. Mitigation fees shall be used to finance emission reduction projects, pursuant to the requirements of AB 1318.

AB 2766 (Mobile Sources, MSRC) - programs funded from motor vehicle registration revenues. The activities include: evaluation, monitoring, technical assistance, and tracking of AB2766 Subvention Fund Program progress reports including cost-effectiveness and emissions reductions achieved; supporting programs implemented by the Mobile Source Review Committee (MSRC); disbursing and accounting for revenues subvened to local governments; and performing SCAQMD activities related to reduction of emissions from mobile sources.

Acid Rain Program - developing and implementing the Continuous Emissions Monitoring (CEMS) Program in compliance with 40 CFR Part 75 of the Clean Air Act.

Administration/SCAQMD - supporting the administration of the SCAQMD. Examples are tracking fixed assets, operating the mailroom, preparing and reviewing contracts, conducting oversight of SCAQMD activities, developing District-wide policies and procedures, preparing the SCAQMD budget, providing legal advice on SCAQMD programs and other activities, and performing activities in support of the SCAQMD as a whole.

Admin/SCAQMD Capital Assets (Asset Management) – tracking of acquisitions, disposals/retirements and reconciliation of capital assets to the Capital Outlay account, and conducting annual lab and biennial asset inventories.

Administration/Office Management - supporting the administration of an organizational unit or a unit within an Office. This includes such items as preparing Office budgets, tracking programs, providing overall direction and coordination of the office, providing program management and integration, preparing policies and procedures manuals, and preparing special studies and projects.

Advisory Group – providing support to various groups such as: AQMP (Air Quality Management Plan), Environmental Justice, Home Rule, Local Government and Small Business Assistance, Technology Advancement, and Permit Streamlining Task Force.

AER (Air Emission Reporting) Program Public Assistance – providing public assistance in implementing SCAQMD's AER program by conducting workshops, resolving fee-related issues, and responding to questions.

Air Filtration - installation of high-efficiency air filtration devices in schools with the goal of reducing children's exposure to particulate matter in the classroom.

WORK PROGRAM GLOSSARY

Air Monitoring (Ambient Air Analysis, Ambient Network, Audit, Data Reporting, Special Monitoring) - monitoring the ambient air in the SCAQMD's jurisdiction. This includes operating the SCAQMD's air monitoring network and localized monitoring at landfill sites as well as conducting specialized monitoring in response to public nuisance situations. Also see Special Monitoring.

Air Quality Evaluation - analyzing air quality trends and preparing the Reasonable Further Progress (RFP) report.

Ambient Air Analysis/Ambient Network (Audit, Data Reporting, Special Monitoring) – complying with Federal regulations to monitor air quality for criteria pollutants at air monitoring stations to determine progress toward meeting the federal ambient air quality standards. This includes operating the SCAQMD's air monitoring network and localized monitoring at landfill sites as well as conducting specialized monitoring in response to public nuisance situations. SCAQMD monitoring stations also collect samples which are analyzed by SCAQMD's laboratory. Also see Special Monitoring.

Ambient Lead Monitoring – maintain the current ambient lead monitoring network to meet federal monitoring requirements.

Annual Emission Reporting (AER) – implementing the AER Program and tracking actual emissions reported by facilities, conducting audits of data, handling refunds, and preparing inventories and various reports.

AQIP Evaluation – provides incentive funding for projects to meet VOC, NOx, and CO emission targets with funds generated from companies who pay fees in lieu of carpool programs. Projects are funded through a semi-annual solicitation process.

AQMP (Air Quality Management Plan) – Management Plan for the South Coast Air Basin and the Interagency AQMP Implementation Committee.

Air Quality Sensor Performance Evaluation Center (AQ-SPEC) - program to test commercially available, low-cost air quality sensors.

Architectural Coatings (Admin, End User, Other) – Rule 314 requires architectural coatings manufacturers which distribute or sell their manufactured architectural coatings into or within the SCAQMD for use in the SCAQMD to submit an Annual Quantity and Emissions Report. To recover the cost of the program, a fee is assessed to these manufacturers. The fee is based on the quantity of coatings as well as the cumulative emissions from the quantity of coatings distributed or sold for use in the SCAQMD.

Area Sources/Compliance – developing rules and compliance programs, as well as alternatives to traditional permitting for smaller sources of emissions of VOC and NOx.

WORK PROGRAM GLOSSARY

Asthma and Outdoor Air Quality Consortium – a group composed of researchers from local universities with air pollution and respiratory disease expertise that conducts research projects relating to asthma and air quality.

Auto Services - maintaining the SCAQMD's fleet of automobiles, trucks, and vans as well as providing messenger services as needed.

Billing Services - administering the SCAQMD's permit billing system, responding to inquiries, and resolving issues related to fees billed.

Black Carbon Study – analyzing black carbon emissions in the Basin to determine climate implications that may be used within the AB 32 climate programs and in other air districts.

Board Committees - participation in Governing Board committees by preparing materials, presenting information on significant or new programs and providing technical expertise.

Brain & Lung Tumor & Air Pollution Foundation – foundation established to support research on the relationship between air pollution and brain tumors. The demographic, behavioral, and genetic factors in patients with brain tumors in the Los Angeles area are being studied to determine any potential impact that air pollution may have on brain tumor incidence.

Building Corporation - managing the South Coast Air Quality Management District Building Corporation. The Building Corporation issued Installment Sale Revenue Bonds in conjunction with the construction of the SCAQMD's Diamond Bar headquarters facility.

Building Maintenance - maintaining and repairing the Diamond Bar Headquarters facility and SCAQMD air monitoring sites.

Business Services – overseeing operation of Facilities Services, Automotive Services, Print Shop and Mail/Subscriptions Services; negotiating and administering Diamond Bar facility, Long Beach Office, and air monitoring station lease agreements.

California Natural Gas Vehicle Partnership – strategic, non-binding partnership formed to work together in developing and deploying natural gas vehicles and implementing a statewide natural gas infrastructure.

Call Center (Central Operator, CUT-SMOG, Field Support) - operating the 24-hour radio communication system via telephone between SCAQMD headquarters and the public.

CARB PERP (Portable Equipment Registration Program) – a program established by CARB allowing the operation of portable equipment in any air district throughout the state without individual local district permits. Amended to enhance enforceability and expand CARB's requirements for portable engines and equipment units, creating a more comprehensive and inclusive statewide registration program that now provides for triennial inspection and renewal of PERP registration.

Carl Moyer Program – provides incentive funding for the repower, replacement, or purchase of new heavy-duty vehicles and equipment beyond the emission limits mandated by regulations. Awards are granted through an annual solicitation process. Separate program announcements are also issued for pre-1990 diesel Class 7 or 8 truck fleet and ports truck fleet modernization programs. Also see Mobile Sources.

Case Disposition - resolving Notices of Violation (NOV) issued by SCAQMD inspectors. This includes preparing both civil and criminal cases and administering SCAQMD's Mutual Settlement Letter Program.

Cash Management (Revenue Receiving, Refunds) – receiving revenue, posting of payments, processing of refunds associated with SCAQMD programs, and bank and cash reconciliations.

CEMS Certification (Continuous Emissions Monitoring System) - evaluating, approving, and certifying the continuous emissions monitoring systems installed on emissions sources to ensure compliance with SCAQMD rules and permit conditions.

CEQA Document Projects/Special Projects (California Environmental Quality Act) - reviewing, preparing, assessing, and commenting on projects which have potential air quality impacts.

Certification/Registration Program – manufacturers can voluntarily apply to have standard, off-the-shelf equipment certified by SCAQMD to ensure that it meets all applicable requirements.

Classification and Pay – maintaining the classification plan and conducting job analyses to ensure SCAQMD positions are allocated to the proper class, and conducting compensation studies to ensure classes are appropriately compensated and salaries remain competitive in the workforce.

Clean Air Connections – increase awareness of air quality issues and SCAQMD's programs and goals by developing and nurturing a region-wide group of community members with an interest in air quality issues.

Clean Communities Plan (CCP) – an update to the 2000 Air Toxics Control Plan (ATCP) and the 2004 Addendum. The objective of the 2010 CCP is to reduce the exposure to air toxics and air-related nuisances throughout the district, with emphasis on cumulative impacts.

Clean Fuels Program (Contract Admin, Legal Advice, Mobile Sources, Stationary Combust/Energy, Tech Transfer) **–** accelerate the development and deployment of advanced, low emission technologies, including, but not limited to electric, hydrogen, and plug-in hybrid electric vehicles, low emission heavy-duty engines, after treatment for off-road construction equipment and identification of tailpipe emissions from biofuels.

Climate Change – developing and evaluating policy and strategy related to local, state, federal and international efforts on climate change. Seek to maximize synergies for criteria and toxic reduction and minimize and negative impacts.

Compliance (Guidelines, Testing, IM Related Activities, NOV Admin, Special Projects) **–** ensuring compliance of clean air rules and regulations through regular inspection of equipment and facilities, as well as responding to air quality complaints made by the general public.

Compliance/Notice of Violation (NOV) Administration – NOV processing and review for preparation for assignment to Mutual Settlement Agreement (MSA), civil, or criminal handling.

Computer Operations - operating and managing the SCAQMD's computer resources. These resources support the SCAQMD's business processes, air quality data, and modeling activities and the air monitoring telemetry system. Also see Systems Maintenance.

Conformity - reviewing of federal guidance and providing input on conformity analysis for the Regional Transportation Improvement Program (RTIP). Staff also participates in various Southern California Association of Governments (SCAG) meetings, the Statewide Conformity Working group, and other meetings to address conformity implementation issues. Staff participates in the federal Conformity Rule revision process, and monitors and updates Rule 1902, Transportation Conformity, as needed.

Credit Generation Programs (Intercredit Trading) – rulemaking and developing and implementing a program that expands emission credit trading by linking the SCAQMD's stationary and mobile source credit markets.

Criteria Pollutants/Mobile Sources – coordinating the implementation of the AQMP and conducting feasibility studies for mobile source categories; developing control measures and amended rules as warranted.

1-800-CUT-SMOG - See Call Center.

Database Information Support – day-to-day supporting of ad hoc reports and bulk data updates required from SCAQMD's enterprise databases.

Database Management - developing and supporting the data architecture framework, data modeling, database services, and the ongoing administration of SCAQMD's central information repository.

DB/Computerization – developing laboratory instrument computer systems for data handling and control, evaluating the quality of the stored information, and further development and maintenance of the Source Test Information Management System (STIMS).

DERA (Diesel Emission Reduction Act) School Bus Replacement – an EPA funded project to replace diesel school buses with Compressed Natural Gas (CNG) and electric buses.

DERA (Diesel Emission Reduction Act) FY 13 Vehicle Replacement – an EPA funded project to replace on-road medium-duty diesel trucks with battery electric trucks.

Economic Development/Business Retention – meeting with various governmental agencies to assist company expansion or retention in the Basin.

EJ-AQ Guidance Document – providing outreach to local governments as they update their general plans and make land use decisions. Providing updates to the reference document titled "Guidance Document for Addressing Air Quality Issues in General Plans and Local Planning."

Emergency Response - responding to emergency air pollution (toxic) incidents, providing air quality monitoring support to local authorities.

Emission Reduction Credit Application Processing – processing applications for Emission Reduction Credits (ERC).

Emissions Field Audit – conducting field audits at facilities that have reported through Annual Emissions Reporting (AER) to ensure accurate emission reporting and to improve the program.

Emissions Inventory Studies – developing major point source emissions data and area source emissions inventory, updating emissions factors, developing and updating control factors, performing special studies to improve emission data, and responding to public inquiries regarding emission data.

Employee Benefits – administering SCAQMD's benefit plans, including medical, dental, vision, and life insurance, as well as State Disability Insurance, Section 125 cafeteria plan, Long Term Care and Long Term Disability plans, Section 457 deferred compensation plan, and COBRA program.

Employee Relations – managing the collective bargaining process, administering MOU's, preparing disciplinary documents, and administering SCAQMD's performance appraisal program, Family and Medical Leave Act (FMLA) requests, tuition reimbursement, and outside training requests.

Employee/Employment Law – handling legal issues dealing with employment law in coordination with outside counsel.

Enforcement Litigation – staff attorneys pursue enforcement litigation including actions for civil penalties or injunctions when violations have not been settled or circumstances otherwise dictate.

Environmental Education - informing and educating the public about air pollution and their role in bringing clean air to the basin.

Environmental Justice (EJ) **-** a strategy for equitable environmental policymaking and enforcement to protect the health of all persons who live or work in the South Coast District from the health effects of air pollution regardless of age, culture, ethnicity, gender, race, socioeconomic status, or geographic location. The Environmental Justice Initiatives help to identify and address potential areas where citizens may be disproportionately impacted by air pollutants and ensure clean air benefits are afforded to all citizens and communities of the region.

Equal Employment Opportunity – ensuring non-discrimination and equal employment for employees and applicants through broad-based, targeted advertising; training interviewers to ensure fairness in evaluating candidates; ensuring that selection processes and testing instruments are appropriate and job-related; coaching supervisors and managers regarding hiring processes; and gathering data and preparing related staffing reports.

Facilities Services – monitoring service contracts, supporting tenants, overseeing conference center use, administering identification badges, building access control, and key/lock systems, and workspace planning.

Fee Review – activities relating to conducting Fee Review Committee hearings for businesses that contest SCAQMD fees (Rule 313).

Financial Management (Accounting, Financial Analyses, Treasury Management, Systems) - managing the financial aspects of the SCAQMD. This includes SCAQMD's cash management, investment, and accounting programs, and program and financial audits. It also includes maintaining SCAQMD's permit-related financial and accounting records as well as maintaining and enhancing SCAQMD's payroll and accounting systems.

Goods Movement and Financial Incentives – programs to evaluate the air quality issues associated with goods movement and traffic congestion, and for the identification of financial incentives for expedited facility modernization and diesel engine conversion.

Governing Board – supporting the operation of the Governing Board and advisory groups of the SCAQMD. These activities range from preparing the agenda and minutes to providing support services, legal advice, speeches, letters, and conference coordination.

Grants Management - coordinating, negotiating, monitoring, accounting, and reporting of the SCAQMD's air pollution program and financial activities relating to grants, including EPA, DOE, CEC, DHS grants, and CARB Subvention.

Graphics Arts - designing and producing presentation materials and SCAQMD publications.

Green House Gas Reporting - many of the businesses and facilities within SCAQMD's jurisdiction are required to report their GHG emissions to CARB under the regulation for Mandatory Reporting of Greenhouse Gases (state) and, beginning in 2011, to the U.S. EPA under their Mandatory Reporting Rule (federal).

Green House Gas Reduction Fund – CARB's Low Carbon Transportation Greenhouse Gas Reduction Fund (GGRF) Investment Program funds a project to demonstrate zero emission drayage trucks.

Health Effects – conducting research and analyzing the health effects of air pollutants and assessing the health implications of pollutant reduction strategies; working with industry, trade associations, environmental groups, CARB and EPA and providing information to concerned citizens.

Hearing Board (Variances, Abatement Orders, Appeals, Legal) – supporting operation of the SCAQMD's Hearing Board. These activities include accepting petitions filed; preparing and distributing notices; preparing minute orders, findings, and decisions of the Board; collecting fees; and general clerical support for the Board.

Information Technology Services - implementing new information technologies to enhance operational efficiency and productivity. Examples include developing workflow applications, training and supporting computer end users, and migrating network operating systems.

Inspections - inspecting facilities and equipment that emit or have the potential to emit air pollutants.

Inspections/RECLAIM Audits – conducting RECLAIM inspections and audits at facilities subject to Regulation XX (RECLAIM).

Interagency Coordination/Liaison - interacting with state, local, and federal control agencies and governmental entities.

Intergovernmental/Geographic Deployment - influencing local policy development and implementing a local government clean air program.

Lawnmower Exchange – residents of the South Coast Air Basin may trade in their gas-powered lawnmower and purchase a new zero-emission, battery electric lawnmower at a significant discount.

Lead Agency Projects – SCAQMD permitting and rule development projects where a CEQA document is prepared and the SCAQMD is the lead agency.

Legal (Advice, District Prosecutor Support, Representation, Legislation, Liability Defense) - providing legal support to SCAQMD in the areas of liability defense, writs of mandate, injunctions, and public hearings. This activity also includes reviewing contracts, and advising staff on rules, fees and other governmental issues.

Legislation (Annual Reports, State, Federal, Legislative Activity) - drafting new legislation, analyzing and tracking proposed legislation, and developing position recommendations on legislation which impacts air quality.

Library - acquiring and maintaining reference materials and documentation that support the SCAQMD's programs.

Lobby Permit Services – providing information and support to applicants to expedite permit processing. Includes consolidating forms, prescreening review for completeness of applications, providing internet access of certain forms, and providing "over-the-counter" permits in the lobby of the SCAQMD's Diamond Bar headquarters.

Meteorology - modeling, characterizing, and analyzing both meteorological and air quality data to produce the SCAQMD's daily air quality forecast.

Microscopical Analysis - analyzing, identifying, and quantifying asbestos for compliance with SCAQMD, state, and federal regulations.

Mobile Sources (SCAQMD Rulemaking, Carl Moyer, CARB/EPA and CEC/US DOE monitoring, Emission Incentive Method, Greenhouse Gas Reduction Measures, Strategies (Off Road, Control, Accounting,) - transportation monitoring, strategies, control measures, demonstration projects, the Mobile Source Air Pollution Reduction Review Committee (MSRC), implementation of Fleet Rules, High Emitter Repair & Scrappage Program, and locomotive remote sensing.

Mobile Source and AQMP (Air Quality Management Plan) Control Strategies – provide technical assistance on the mobile source element of the AQMP.

Moyer Program – see Carl Moyer Program

Mutual Settlement Program - resolving civil penalties without court intervention; this program is a mechanism to resolve violations and avoid criminal proceedings.

National Air Toxics Trends Stations (NATTS) – through EPA funding, two sites in the monitoring network are utilized to collect ambient VOC and particulate samples. Samples are analyzed by the SCAQMD lab and reported to EPA where the data is used to determine toxic trends.

Near Roadway (NO_2) Monitoring – federal monitoring requirement that calls for state and local air monitoring agencies to install near-road NO_2 monitoring stations at locations where peak hourly NO_2 concentrations are expected to occur within the near-road environment in larger urban areas.

Network Operations/Telecommunications – installing, maintaining, and providing operational support of the SCAQMD's PC, voice, data, image, and radio networks; planning, designing, and implementing new network systems or services in response to the SCAQMD's communications and business needs; and providing training, support, and application development services for end-users of voice and PC systems.

New Systems Development – providing support for major computer systems development efforts.

New Source Review (NSR) (Data Clean-up, Implementation, Modeling Permit Review, Rulemaking) - developing and implementing New Source Review rules; designing, implementing, and maintaining the Emission Reduction Credits and the New Source Review programs. These programs streamline the evaluation of permit renewal and emissions reporting.

Outreach (Business, Media, Visiting Dignitary) - increasing public awareness of the SCAQMD's programs, goals, permit requirements, and employment opportunities; interacting, providing technical assistance, and acting as liaison between SCAQMD staff and various sectors of the private industry, local governments, and small businesses.

Outreach Media/Communications - monitoring local and national press accounts, both print and broadcast media, to assess SCAQMD's outreach and public opinion on SCAQMD rules and activities. This also includes responding to media calls for informational background material on SCAQMD news stories.

Payroll - paying salaries and benefits to SCAQMD employees, withholding and remitting applicable taxes, and issuing W2s.

Permit Processing NSR, (RECLAIM, Non RECLAIM, Title V, Title III, Pre-Application, Services, Expedited, IM Processing, CEQA Modeling Review, Legal, Support EAC, Expired) - inspecting, evaluating, auditing, analyzing, reviewing and preparing final approval or denial to operate equipment which may emit or control air contaminants.

Permit Streamlining – activities relating to reducing organizational costs and streamlining regulatory and permit requirements on businesses.

Photochemical Assessment Monitoring Systems (PAMS) - promulgating PAMS (a federal regulation), which requires continuous ambient monitoring of speciated hydrocarbons during smog season. Through EPA funding, ozone precursors are measured at seven stations and samples are collected.

PM Sampling Program (EPA) – daily collection of particulate samples

PM Monitoring/Strategies Programs ($PM_{2.5}$, PM_{10}, $PM_{10\text{-}2.5}$) – planning and developing rules related to $PM_{2.5}$, PM_{10}, and $PM_{10\text{-}2.5}$. Obtaining measurements of particulates at air monitoring stations throughout the South Coast Air Basin (Basin). Measurements are made for Total Suspended Particulate lead, PM_{10}, and $PM_{2.5}$ using federal reference methods (FRM) to determine compliance with state and federal air quality standards.

Port Community Air Quality Enforcement/I-710 Monitoring - inspecting and auditing marine vessels in the Rule 1631 pilot credit generation program. These oversight activities will help ensure the credit generation program produces real, quantified, and enforceable emissions reductions. Measurements including air toxics and criteria pollutants collected to determine impact of port activities on air quality near the ports and surrounding communities.

Port of Long Beach (POLB) Advanced Maritime Emission Control System (AMECS) Demo – funded by the Port of Long Beach, the proposed project will assess the performance and effectiveness of a barge-mounted emission control system to capture and treat hotelling emissions form ocean going vessels (OGV) at berth at the Port of Long Beach.

Portable Equipment Registration Program (PERP) – see CARB PERP Program.

Position Control – tracking Board-authorized positions and SCAQMD workforce utilization, processing personnel transactions for use by Payroll, and preparing reports regarding employee status, personnel transactions, and vacant positions.

PR 2301 Indirect Source Rule (ISR) Implementation– developing and implementing rules to mitigate emissions growth from new and redevelopment projects; the scope of the rule will include the reduction of emissions related to residential, commercial and industrial projects.

Print Shop – performing in-house printing jobs and contracting outside printing/binding services when necessary.

Proposition 1B - providing incentive funding for goods movement and lower emission school bus projects with funds approved by voters in November 2006.

Protocols/Reports/Plans/LAP - evaluating and approving protocols, source testing plans and reports submitted by regulated facilities as required by SCAQMD rules and permit conditions, New Source Review, state and federal regulations; and evaluating the capabilities of source test laboratories under the Laboratory Approval Program (LAP).

Public Complaints/Breakdowns - responding to air pollution complaints about odors, smoke, dust, paint overspray, or companies operating out of compliance; responding to industry notifications of equipment breakdowns, possibly resulting in emission exceedances.

Public Education/Public Events – implementing community events and programs to increase the public's understanding of air pollution and their role in improving air quality.

Public Information Center - notifying schools and large employers of predicted and current air quality conditions on a daily basis and providing the public with printed SCAQMD information materials.

Public Notification – providing timely and adequate notification to the public of SCAQMD rulemaking workshops and public hearing, proposed rules, upcoming compliance dates, and projects of interest to the public.

Public Records Act - providing information to the public as requested and as required by Government Code, Section 6254.

Purchasing (Receiving, Stockroom) - procuring services and supplies necessary to carry out SCAQMD programs.

Quality Assurance – assuring the data quality from the Monitoring and Analysis Division meets or exceeds state and federal standards and also assuring the appropriateness of the data for supporting SCAQMD regulatory, scientific and administrative decisions.

RECLAIM/Admin Support – developing and implementing rules, and monitoring of emissions of the REgional CLean Air Incentives Market (RECLAIM) program, a market incentives trading program designed to help achieve federal and state ambient air quality standards in a cost-effective manner with minimal impacts to jobs or public health.

RECLAIM and Title V – permit processing of applications from facilities that are both RECLAIM and Title V.

RECLAIM Non-Title V – permit processing of applications from RECLAIM facilities only.

Records Information Management Plan – providing the process to comply with internal and external requirements for the retention and retrieval of information pertinent to the mission and operation of the SCAQMD.

Records Services – maintaining SCAQMD's central records and files, converting paper files to images, and operating the network image management system; providing for all off-site long-term storage of records and for developing and monitoring the SCAQMD's Records Retention Policy.

Recruitment and Selection – assisting SCAQMD management in meeting staffing needs by conducting fair and non-discriminatory recruitment and selection processes that result in qualified, diverse applicants for SCAQMD jobs; overseeing promotional and transfer processes, and reviewing proposed staff reassignments.

Refinery Pilot Project – pursuant to the AQMP, a working group was formed to examine the efficacy of an alternative regulatory approach to reducing refinery emissions beyond the current requirements by establishing a targeted emission reduction commitment for each refinery for a set period of time and allow the use of on-site or off-site reduction strategies with acceptable environmental justice attributes.

Regional Modeling – designing, performing, and reviewing modeling and risk assessment analysis to assess the air quality impacts of new or modified sources of air pollution. Also see Meteorology.

Ridesharing - implementing the SCAQMD's Rule 2202 Trip Reduction Plan.

Risk Management - developing and administering SCAQMD's liability, property, and workers' compensation and safety programs.

Rule 1610 – ensuring compliance with Rule 1610, Old-Vehicle Scrapping.

Rule 2202 ETC Training – administering and conducting monthly Rule 2202 implementation training classes, workshops and/or forums for the regulated public and other interested individuals.

Rule 222 Implement/Support/Filing Program – ensuring compliance with Rule 222 for equipment subject to a filing requirement with the SCAQMD.

Rulemaking/Rules (NOx, BACT, SOx, VOC, Toxics, RECLAIM, Support PRA, Legal Advice) – developing new rules and evaluating existing SCAQMD and CARB rules and compliance information to assure timely implementation of the AQMP and its control measures.

Salton Sea Monitoring – maintaining the monitoring network for expected nuisance pollutants, primarily hydrogen sulfide, which are released from the Salton Sea area.

School Bus Lower Emission Program – funding to replace pre-1987 diesel school buses with new alternative fuel buses owned and operated by public school districts.

SCAQMD Mail – processing and delivering all incoming and outgoing mail.

SCAQMD Projects – SCAQMD permitting and rule development projects where a California Environmental Quality Act (CEQA) document is prepared and the SCAQMD is the lead agency.

School Siting – identifying any hazardous emission sources within one-quarter mile of a new school site as required by AB3205. District activities include reporting of criteria and toxic pollutant information and conducting inspections of permitted facilities within a quarter-mile radius of proposed schools.

Small Business Assistance (Financial, Legal, Permit Streamlining) **-** providing technical and financial assistance to facilitate the permit process for small businesses.

Socio-Economic - developing an economic database to forecast economic activity, analyzing economic benefits of air pollution control, and analyzing the social impact of economic activity resulting from air quality regulations and plans.

Source Education - providing classes to facility owners and operators to ensure compliance with applicable SCAQMD's rules and regulations.

Source Testing (ST) – conducting source tests as needed in support of permitting functions and to determine compliance with permit conditions and SCAQMD Rules. Additionally, data submitted by facilities is reviewed for protocol approval, CEMS certification, or test data acceptance.

Speaker's Bureau - training SCAQMD staff for advising local government and private industry on air quality issues.

Special Monitoring (Emergency, Rule 403) – performing special ambient air sampling at locations where public health, nuisance concern, or Rule 403 violations may exist; determining the impacts from sources emitting toxics on receptor areas; and performing special monitoring in support of the emergency response program and public complaints response. Also see Emergency Response.

Sample Analyses – analyzing samples submitted by inspectors to determine compliance with SCAQMD Rules. Samples are also analyzed in support of rule development activities.

Student Interns – providing mutually beneficial educational hands-on experience for high school and college students by providing them with the opportunity to engage in day-to-day work with mentoring professionals within SCAQMD.

Subscription Services - maintaining SCAQMD's rule subscription mailing list and coordinating the mailing of SCAQMD publications.

Systems Implementation PeopleSoft – implementing activities required to maintain an integrated Financial and Human Resources system, including additional features and functions introduced with scheduled software upgrades.

Systems Maintenance - routinely maintaining installed production data systems that support SCAQMD's business fluctuations, including minor modifications, special requests, fixes, and general maintenance.

Targeted Air Shed – funding from EPA to reduce air pollution in the nation's areas with the highest levels of ozone or particulate matter 2.5 ($PM_{2.5}$) exposure.

Technology Advancement (Commercialization, non-Combustion) - supporting the development of innovative controls for mobile and stationary sources, reviewing promising control technologies, and identifying those most deserving of SCAQMD developmental support.

Title III (Inspections, Rulemaking) - permitting equipment that emits hazardous air pollutants in compliance with the federal Clean Air Act.

Title V (Compliance,Legal Advice, Inspections, NSR Permits, Rulemaking) - developing and implementing a permit program in compliance with the federal Clean Air Act.

Toxic Inventory Development – non-facility specific tasks performed by the AB 2588 team to include toxic inventory development, support for rule development, and responding to public records and other data requests.

Toxics/AB 2588 – evaluation of toxic inventories, risk assessments and risk reduction plans, with public notification as required. Analyzing, evaluating, reviewing, and making recommendations regarding toxic substances and processes and contributing input to District toxic rules and programs.

Training (Education, Organizational and Human Resources Development, Staff) - providing increased training in the areas of personnel education, computers, safety procedures, new programs, hazardous materials, and new technologies.

Transportation Regional Programs/Research – actively participating in Advisory Groups and Policy Committees involving the development and monitoring of the District's AQMP, Congestion Mitigation Air Quality Improvement Program (CMAQ), Safe Accountable Flexible Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), Transportation Control Measures (TCMs) and regional alternative commute mode programs.

TraPac Air Filtration Program – implementing/administering the installation and maintenance of air filtration systems at Wilmington area schools.

Union Negotiations/Union Steward Activities – Union-related activities of union stewards including labor management negotiations and assisting in the filing of employee grievances.

VEE Trains – conducting periodic visible emission evaluations (VEE) of trains to verify compliance with visible emission requirements.

VOC Sample Analysis (Compliance/Rules/SBA/Other) - providing data and technical input for VOC rule development, performing analytical testing for compliance with SCAQMD rules regulating VOC content in coatings, inks, plastic foam, paint, adhesives, and solvents, and providing assistance and technical input to small businesses and other regulatory agencies, industry and the public.

Voucher Incentive Program (VIP) - incentive program designed to reduce emissions by replacing old, high-polluting vehicles with newer, lower-emission vehicles, or by installing a Verified Diesel Emission Control Strategy (VDECS).

Web Tasks – preparing and reviewing materials for posting to SCAQMD's internet and/or intranet website.

WORK PROGRAM ACRONYMS

ORGANIZATIONAL UNITS

AHR	Administrative & Human Resources
CB	Clerk of the Boards
CE	Compliance & Enforcement
DG	District General
EP	Engineering & Permitting
EO	Executive Office
FIN	Finance
GB	Governing Board
IM	Information Management
LEG	Legal
LPAM	Legislative & Public Affairs/Media Office
PRA	Planning, Rule Development & Area Sources
STA	Science & Technology Advancement

PROGRAMS

AB 1318	Offsets-Electrical Generating Facilities
AB 2588	Air Toxics ("Hot Spots")
AB 2766	Motor Vehicle Subvention Program
APEP	Annual Permit Emissions Program
AQIP	Air Quality Investment Program
AQMP	Air Quality Management Plan
BACT	Best Available Control Technology
CEMS	Continuous Emissions Monitoring Systems
CEQA	California Environmental Quality Act
CF	Clean Fuels Program
CMP	Carol Moyer Program
DERA	Diesel Emission Reduction Act
ERC	Emission Reduction Credit
GGRF	Greenhouse Gas Reduction Fund
MS	Mobile Sources Program
NSR	New Source Review
PERP	Portable Equipment Registration Program
PR	Public Records Act
QA	Quality Assurance
RFP	Reasonable Further Progress
RECLAIM	REgional CLean Air Incentives Market
ST	Source Test
Title III	Federally Mandated Toxics Program
Title V	Federally Mandated Permit Program
VIP	Voucher Incentive Program

POLLUTANTS

CO	Carbon Monoxide
NO_x	Oxides of Nitrogen
O_3	Ozone
$PM_{2.5}$	Particulate Matter <2.5 microns
PM_{10}	Particulate Matter $\leq$ 10 microns
ROG	Reactive Organic Gases
SO_x	Oxides of Sulfur
VOC	Volatile Organic Compound

GOVERNMENT AGENCIES

APCD	Air Pollution Control District (Generic)
CARB	California Air Resources Board
CEC	California Energy Commission
DHS	Department of Homeland Security
DOE	Department of Energy
EPA	Environmental Protection Agency
NACAA	National Association of Clean Air Agencies
SCAG	Southern California Association of Governments

GENERAL

AA	Affirmative Action
AER	Annual Emissions Reporting
AM	Air Monitoring
AQSCR	Air Quality Standards Compliance Report
AQ-SPEC	Air Quality Sensor Performance Evaluation Center
ATIP	Air Toxics Inventory Plan
AVR	Average Vehicle Ridership
CE-CERT	College of Engineering-Center for Environmental Research and Technology
CLASS	Clean Air Support System
CNG	Compressed Natural Gas
CTC	County Transportation Commission
CTG	Control Techniques Guideline
DB	Database
DPF	Diesel Particulate Filter
EIR	Environmental Impact Report
EJ	Environmental Justice
ETC	Employee Transportation Coordinator
EV	Electric Vehicle
FIP	Federal Implementation Plan
FY	Fiscal Year
GHG	Greenhouse Gas
HR	Human Resources
HRA	Health Risk Assessment
IAIC	Interagency AQMP Implementation Committee
IGA	Intergovernmental Affairs
ISR	Indirect Source Rules
LAER	Lowest Achievable Emissions Rate
LEV	Low Emission Vehicle
LNG	Liquefied Natural Gas
LS	Laboratory Services
MOU	Memorandum of Understanding
MPO	Metropolitan Planning Organization
MSERCs	Mobile Source Emission Reduction Credits
MSRC	Mobile Source (Air Pollution Reduction) Review Committee
NATTS	National Air Toxics Trends Stations
NESHAPS	National Emission Standards for Hazardous Air Pollutants
NGV	Natural Gas Vehicle
NOV	Notice of Violation
ODC	Ozone Depleter Compounds
PAMS	Photochemical Assessment Monitoring System
PAR	Proposed Amended Rule
PE	Program Evaluations
PR	Proposed Rule
RFP	Request for Proposal
RFQ	Request for Quotations
RTC	RECLAIM Trading Credit
SBA	Small Business Assistance
SIP	State Implementation Plan
SCR	Selective Catalytic Reduction
STE	Source Testing Evaluations
SULEV	Super Ultra Low-Emission Vehicle
TCM	Transportation Control Measure
ULEV	Ultra- Low-Emissions Vehicle
VEE	Visible Emissions Evaluations
VMT	Vehicle Miles Traveled
ZECT	Zero Emission Cargo Transport
ZEV	Zero-Emission Vehicle

GOVERNING BOARD

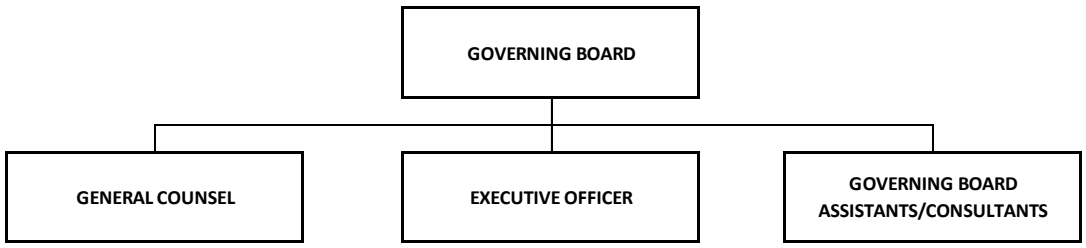
At a Glance:	
FY 2016-2017 Budget	**$1.6M**
FY 2017-2018 Request	**$1.7M**
Percent of SCAQMD Budget	**1.1%**
Total Requested FTEs	**-**

DESCRIPTION OF MAJOR SERVICES:

The Governing Board is made up of 13 officials who meet monthly to establish policy and review new or amended rules for approval. The Governing Board appoints the SCAQMD Executive Officer and General Counsel, and members of the Hearing Board. Each Governing Board member is allocated funds to retain the services of Board Consultants and/or Assistants to provide support in their duties as Governing Board members.

Governing Board members include:

- One county Board of Supervisor's representative each from the counties of Los Angeles, Orange, Riverside, and San Bernardino;
- One representative each from cities within Orange, Riverside, and San Bernardino counties, two representatives from cities within Los Angeles County, and one city representative from the City of Los Angeles;
- One representative appointed by the Governor, one by the Assembly Speaker, and one by the Senate Rules Committee.



Governing Board Line Item Expenditure						
Major Object / Account # **/** Account Description		**FY 2015-16 Actuals**	**FY 2016-17 Adopted Budget**	**FY 2016-17 Amended Budget**	**FY 2016-17 Estimate ***	**FY 2017-18 Proposed Budget**
Salary & Employee Benefits						
51000-52000	Salaries	$ 266,526	$ 311,670	$ 311,670	$ 189,875	$ 449,322
53000-55000	Employee Benefits	22,788	244,285	244,285	16,234	260,646
Sub-total Salary & Employee Benefits		$ 289,314	$ 555,955	$ 555,955	$ 206,109	$ 709,968
Services & Supplies						
67250	Insurance	$ -	$ -	$ -	$ -	$ -
67300	Rents & Leases Equipment	-	-	-	-	-
67350	Rents & Leases Structure	-	-	-	-	-
67400	Household	-	-	-	-	-
67450	Professional & Special Services	564,154	713,628	713,628	679,131	713,628
67460	Temporary Agency Services	-	-	-	-	-
67500	Public Notice & Advertising	60,569	52,000	52,000	49,486	52,000
67550	Demurrage	-	-	-	-	-
67600	Maintenance of Equipment	-	-	-	-	-
67650	Building Maintenance	-	-	-	-	-
67700	Auto Mileage	12,585	10,000	10,000	9,517	10,000
67750	Auto Service	-	-	-	-	-
67800	Travel	49,635	64,800	64,800	61,668	64,800
67850	Utilities	-	-	-	-	-
67900	Communications	27,836	20,000	20,000	19,033	20,000
67950	Interest Expense	-	-	-	-	-
68000	Clothing	-	-	-	-	-
68050	Laboratory Supplies	-	-	-	-	-
68060	Postage	783	10,000	10,000	8,781	10,000
68100	Office Expense	10,887	4,000	4,000	3,512	4,000
68200	Office Furniture	-	-	-	-	-
68250	Subscriptions & Books	-	-	-	-	-
68300	Small Tools, Instruments, Equipment	-	-	-	-	-
68400	Gas and Oil	-	-	-	-	-
69500	Training/Conference/Tuition/ Board Exp.	134,870	112,500	112,500	107,062	112,500
69550	Memberships	-	-	-	-	-
69600	Taxes	-	-	-	-	-
69650	Awards	-	-	-	-	-
69700	Miscellaneous Expenses	15,408	15,000	15,000	14,275	15,000
69750	Prior Year Expense	-	-	-	-	-
69800	Uncollectable Accounts Receivable	-	-	-	-	-
89100	Principal Repayment	-	-	-	-	-
Sub-total Services & Supplies		$ 876,727	$ 1,001,928	$ 1,001,928	$ 952,464	$ 1,001,928
77000	**Capital Outlays**	$ -	$ -	$ -	$ -	$ -
79050	**Building Remodeling**	$ -	$ -	$ -	$ -	$ -
Total Expenditures		$ 1,166,041	$ 1,557,883	$ 1,557,883	$ 1,158,573	$ 1,711,896
* Estimates based on July 2016 through February 2017 actual expenditures and budget amendments.						

EXECUTIVE OFFICE

WAYNE NASTRI
EXECUTIVE OFFICER

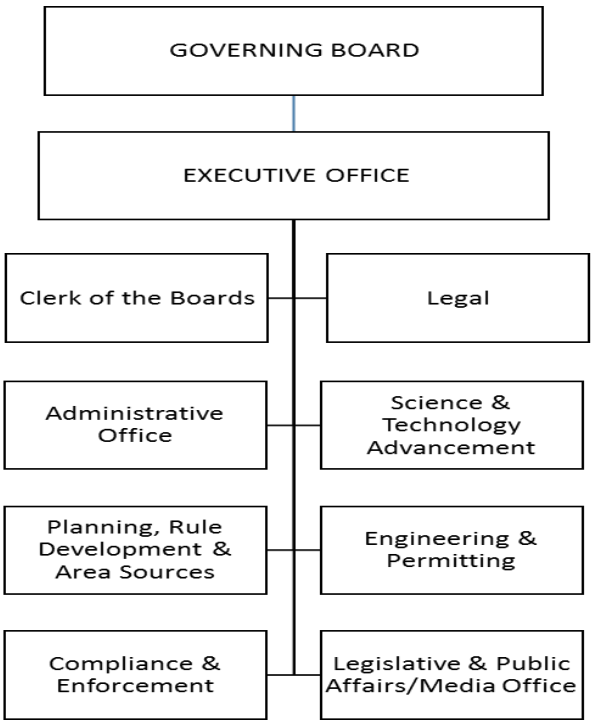
At a Glance:	
FY 2016-2017 Budget	$1.8M
FY 2017-2018 Request	$1.7M
Percent of SCAQMD Request	1.1%
Total Requested FTEs	6

DESCRIPTION OF MAJOR SERVICES:

The Executive Office is responsible for the comprehensive management of the SCAQMD and the development and implementation of near-term and long-term strategies to attain ambient air quality standards. The Executive Office also translates set goals and objectives into effective programs and enforceable regulations that meet federal and state statutory requirements, while being sensitive to potential socioeconomic and environmental justice impacts in the South Coast Air Basin.

The Executive Office currently consists of the Executive Officer, Chief Operating Officer, and four support staff. The Executive Officer serves as Chief of Operations in implementing policy directed by the agency's 13-member Governing Board and in working proactively with state and federal regulatory officials. The Executive Officer also oversees all of the day-to-day administrative functions of staff and the annual operating budget.

ORGANIZATIONAL CHART:



POSITION SUMMARY: 6 FTEs

Executive Office Unit	Amended FY 2016-17	Change	Proposed FY 2017-18
Administration	7	-1	6

STAFFING DETAIL:

2017-18 Requested Staffing

Position	Title
1	Chief Operating Officer
1	Executive Officer
3	Executive Secretary
1	Staff Specialist
6	Total Requested Positions

Executive Office Work Program by Office										
#	Program Code		Goal	Program Category	Program	Activities	FTEs FY 2016-17	+/-	FY 2017-18	Revenue Categories
1	03	010	I	Develop Programs	AQMP	Develop/Implement AQMP	0.05	-	0.05	II,IX
2	03	028	I	Develop Programs	Admin/SCAQMD Policy	Dev/Coord Goals/Policies/Overs	2.00	(1.56)	0.44	Ia
3	03	038	III	Operational Support	Admin/Office Management	Budget/Program Management	1.00	1.00	2.00	Ib
4	03	078	II	Policy Support	Asthma & Outdoor AQ Consortium	Asthma & Outdoor AQ Consortium	0.01	(0.01)	-	Ia
5	03	083	II	Policy Support	Brain Tumor & Air Poll Foundat	Brain Tumor & Air Poll Foundation Support	0.03	(0.02)	0.01	Ia
6	03	275	I	Policy Support	Governing Board	Board/Committee Support	1.60	0.12	1.72	Ia
7	03	276	III	Policy Support	Advisory Group/Governing Board	Governing Board Advisory Group	0.05	(0.05)	-	Ia
8	03	381	I	Policy Support	Interagency Liaison	Local/State/Fed Coord/Interact	0.40	0.31	0.71	Ia,IX
9	03	385	I	Develop Rules	Credit Generation Programs	Dev/Impl Marketable Permit	0.02	(0.02)	-	II
10	03	390	I	Customer Service and Business Assistance	Local Govt Policy Development	Policy Development	0.05	(0.05)	-	Ia,IX
11	03	410	I	Policy Support	Legislation	Testimony/Mtgs:New/Current Leg	0.50	(0.47)	0.03	Ia,IX
12	03	416	I	Policy Support	Legislative Activities	Supp/Promote/Influence Legis/Adm	0.05	(0.02)	0.03	Ia
13	03	455	I	Advance Clean Air Technology	Mobile Sources	Dev/Impl Mobile Source Strategies	0.10	(0.10)	-	IX
14	03	490	II	Customer Service and Business Assistance	Outreach	Publ Awareness Clean Air Prog	1.00	(0.03)	0.97	Ia
15	03	565	III	Customer Service and Business Assistance	Public Records Act	Comply w/ Public Req for Info	0.05	(0.04)	0.01	Ia
16	03	650	I	Develop Rules	Rules	Develop & Implement Rules	0.04	(0.04)	-	II,IV,IX
17	03	717	III	Policy Support	Student Interns	Gov Board/Student Intern Program	0.02	(0.02)	-	Ia
18	03	855	II	Operational Support	Web Tasks	Create/edit/review web content	0.03	-	0.03	Ia
						Total Executive Office	7.00	(1.00)	6.00	

Executive Office Line Item Expenditure						
Major Object / Account # **/** Account Description		**FY 2015-16 Actuals**	**FY 2016-17 Adopted Budget**	**FY 2016-17 Amended Budget**	**FY 2016-17 Estimate ***	**FY 2017-18 Proposed Budget**
Salary & Employee Benefits						
51000-52000	Salaries	$ 1,241,829	$ 954,942	$ 952,642	$ 907,198	$ 928,153
53000-55000	Employee Benefits	431,936	523,495	523,495	504,360	455,978
Sub-total Salary & Employee Benefits		$ 1,673,765	$ 1,478,436	$ 1,476,137	$ 1,411,557	$ 1,384,131
Services & Supplies						
67250	Insurance	$ -	$ -	$ -	$ -	$ -
67300	Rents & Leases Equipment	-	-	-	-	-
67350	Rents & Leases Structure	-	-	-	-	-
67400	Household	-	-	-	-	-
67450	Professional & Special Services	258,900	150,000	150,000	142,749	150,000
67460	Temporary Agency Services	-	-	-	-	-
67500	Public Notice & Advertising	-	7,500	7,500	7,137	7,500
67550	Demurrage	-	-	-	-	-
67600	Maintenance of Equipment	-	400	400	381	400
67650	Building Maintenance	-	-	-	-	-
67700	Auto Mileage	394	800	800	761	800
67750	Auto Service	-	-	-	-	-
67800	Travel	22,028	52,000	52,000	49,486	52,000
67850	Utilities	-	-	-	-	-
67900	Communications	6,703	6,500	6,500	6,186	6,500
67950	Interest Expense	-	-	-	-	-
68000	Clothing	-	-	500	439	-
68050	Laboratory Supplies	-	-	-	-	-
68060	Postage	578	7,000	7,000	6,147	7,000
68100	Office Expense	1,408	6,300	8,300	7,288	6,300
68200	Office Furniture	-	-	-	-	-
68250	Subscriptions & Bools	-	5,000	5,000	4,391	5,000
68300	Small Tools, Instruments, Equipment	-	-	-	-	-
68400	Gas and Oil	-	-	-	-	-
69500	Training/Conference/Tuition/ Board Exp.	1,725	1,000	3,600	3,426	1,000
69550	Memberships	25,595	26,000	26,000	24,743	26,000
69600	Taxes	-	-	-	-	-
69650	Awards	-	-	-	-	-
69700	Miscellaneous Expenses	752	25,000	19,900	18,938	25,000
69750	Prior Year Expense	-	-	-	-	-
69800	Uncollectable Accounts Receivable	-	-	-	-	-
89100	Principal Repayment	-	-	-	-	-
Sub-total Services & Supplies		$ 318,081	$ 287,500	$ 287,500	$ 272,072	$ 287,500
77000	**Capital Outlays**	$ -	$ -	$ -	$ -	$ -
79050	**Building Remodeling**	$ -	$ -	$ -	$ -	$ -
Total Expenditures		$ 1,991,846	$ 1,765,936	$ 1,763,637	$ 1,683,630	$ 1,671,631
* Estimates based on July 2016 through February 2017 actual expenditures and budget amendments.						

ADMINISTRATIVE OFFICE

MICHAEL B. O'KELLY
CHIEF ADMINISTRATIVE OFFICER

At a Glance:	
FY 2016-2017 Budget	$37.1M
FY 2017-2018 Request	$38.4M
Percent of SCAQMD Request	25.6%
Total Requested FTEs	131.25

DESCRIPTION OF MAJOR SERVICES:

The Administrative Office provides a broad range of administrative services to internal and external customers and stakeholders, including other divisions, employees, fee payers, community groups, the Mobile Source Air Pollution Reduction Review Committee, the Building Corporation, and the Brain and Lung Tumor and Air Pollution Foundation. These services are provided through three distinct departments: Administration and Human Resources (AHR), Finance, and Information Management (IM). AHR administers personnel, benefits, and labor and employee relations programs, risk management, employee safety, building/leased space operations, maintenance, and repair, vehicle services, and the Print Shop. Finance administers accounting, budgeting, grants management, financial reporting, accounts payable, billing, payroll, procurement, supply management, asset inventory, state and federal tax reporting, revenue posting, and asset management. IM administers technology hardware, software, system development and maintenance, communication systems, desktop and mobile support, workflow automation, imaging, public records request processing, and website development and maintenance.

ACCOMPLISHMENTS:

RECENT:

- Conducted over 100 successful recruitment efforts for promotional opportunities and new hires.
- Initiated Succession Planning program, through the Executive Office.
- Conducted Employee Benefits Fairs and wellness programs.
- Implemented a Teleworking Pilot Program for employees.
- Conducted an Evacuation Preparedness drill.
- Held mandatory training for sexual harassment prevention and anti-bullying policies.
- Software development and implementation for the following IT infrastructure improvements:

Upgraded Ingres Database for all CLASS applications; migrated the Telemetry Network Migration for increased bandwidth; updated all agency desktop computers to Windows 10 with Office 2013, and replaced approximately 30% of hardware.

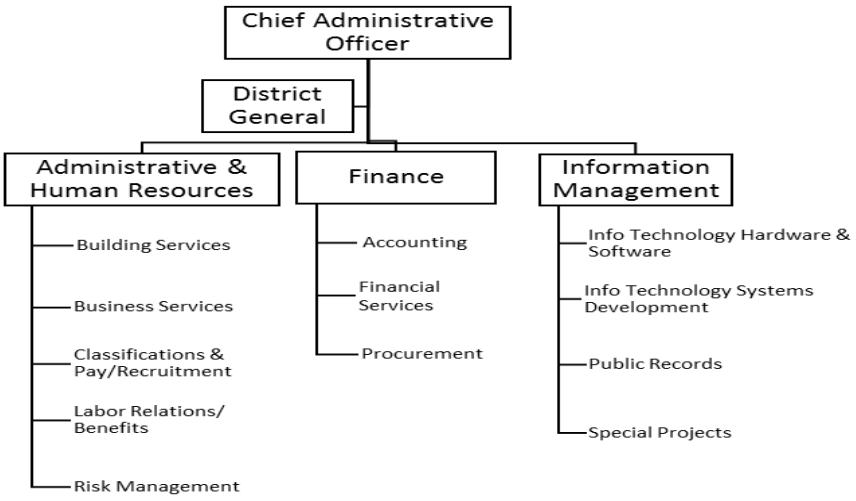
- Software development and implementation for the following internal systems: the Legal Department's management and archival applications in OnBase; Public Records' web-based Request Form, Internal Routing Form, and automated Records Collection; the agency's PeopleSoft Benefits Administration and Self Service Module.
- Software development and implementation for the following public-facing systems**:** Public Document Search Web Portal; CourtView Tracking System for DPO/Enforcement; R1403 Demolition and Asbestos Removal Notification system.
- Webcast and Conference Call-In Enhancements – Implemented webcasting of all Board Committee meetings and Hearing Board hearings, along with conference call-in capabilities to enhance transparency and public participation.
- ArcGIS online maps for Current Air Quality, Today's Forecast, Tomorrow's Forecast and Burn no Burn
- Completed office construction and remodels on various floors.
- Continued to expand electronic payment options to include Permit Processing Fee payments and Asbestos Notification payments.
- Processed 618 contracts and modifications, issued 53 Request for Proposals/Quotes, and processed 548 proposals/quotations. Processed 1,435 purchase orders and 418 CalCard orders.
- Implemented new financial reporting requirements, as required by Governmental Accounting Standards Board (GASB) Statement Number 75 "Accounting and Financial Reporting for Postemployment Benefit Plans Other than Pension Plans," through coordination with Los Angeles County Employees' Retirement Association (LACERA), and external auditors.
- Received the Government Finance Officer's Association's (GFOA) awards for the Annual Budget, Comprehensive Annual Financial Report (CAFR), and Popular Annual Financial Report (PAFR) for the most recent fiscal year.

ANTICIPATED:

- Negotiate new MOUs with three labor bargaining units, and amend Salary Resolution and Administrative Code for unrepresented employees.
- Provide training in the areas of safety, supervisor skills, and sexual harassment prevention and anti-bullying policies.
- Continue recruitment and selection efforts, and conduct classification studies
- Evaluate and plan for significant turnover of vehicle fleet due to CNG tank expiration.
- Develop a comprehensive emergency preparedness and management program.

- Software development and implementation for the following IT infrastructure improvements: Upgrade the agency's core network switching equipment; Upgrade the Storage Area Network; Upgrade or replace approximately 30% of desktop computer hardware.
- Software development and implementation for the following internal systems**:** CLASS Compliance Enforcement Portal Phase 1; Finance Customer Service Portal Phase 1**;** PeopleSoft Financials 9.2 Upgrades.
- Software development and implementation for the following public-facing systems**:** Electric Lawnmower Online Rebate System; R1415 Stationary Air Conditioning Systems Online Registration; Online Filing Infrastructure development and expansion for Permit Applications, Form filing and electronic submission for Transportation Plans, Dry Cleaners, Gas Stations and Automotive Spray Booths; Replace Your Ride Application Filing; FIND (Facility INformation Detail) and Emissions Report Systems Replacements; On Line Training and Registration System.
- Website evaluation & improvement: implement improvements based on evaluation feedback, performance tests, a user survey, and a full site audit.
- Continue to identify and implement additional opportunities for electronic payments.
- Implement the new financial reporting requirements, as required by Governmental Accounting Standards Board (GASB) Statement Number 75 "Accounting and Financial Reporting for Postemployment Benefit Plans Other than Pension Plans," through coordination with Los Angeles County Employees' Retirement Association (LACERA), and external auditors.
- Continue to receive GFOA Awards for the Annual Budget, CAFR, and PAFR to ensure SCAQMD's financial reports meet the highest professional standards.

ORGANIZATIONAL CHART:



POSITION SUMMARY: 131.25 FTEs

Chief Administrative Office Units	Amended FY 2016-17	Change	Proposed FY 2017-18
Administrative & Human Resources	36	-	36
Finance	45	1	46
Information Management	50	-0.75	49.25
Total	131	0.25	131.25

STAFFING DETAIL:

2017-18 Requested Staffing

Position	Title
2	Accounting Technician
1	Assistant Database Administrator
3.25	Assistant Deputy Executive Officer
1	Assistant Telecommunications Technician
1	Audio Visual Specialist
1	Building Maintenance Manager
1	Building Supervisor
1	Business Services Manager
2	Career Development Intern
1	Chief Administrative Officer
1	Computer Operations Supervisor
3	Computer Operator
2	Contracts Assistant
1	Controller
1	Database Administrator
1	District Storekeeper
1	Facilities Services Technician
3	Financial Analyst
1	Financial Services Manager
6	Fiscal Assistant
1	Fleet Services Supervisor
2	Fleet Services Worker II
4	General Maintenance Worker
4	Human Resources Analyst
2	Human Resources Manager
1	Human Resources Technician
3	Mail Subscription Services Clerk
1	Mail Subscription Services Supervisor

2017-18 Requested Staffing (cont.)

Position	Title
6	Office Assistant
1	Offset Press Operator
2	Payroll Technician
1	Principal Office Assistant
2	Print Shop Duplicator
1	Print Shop Supervisor
1	Procurement Manager
1	Public Affairs Specialist
1	Purchasing Assistant
1	Purchasing Supervisor
1	Risk Manager
6	Secretary
3	Senior Accountant
4	Senior Administrative Secretary
13	Senior Office Assistant
1	Staff Assistant
2	Staff Specialist
1	Stock Clerk
2	Supervising Office Assistant
1	Supervising Payroll Technician
9	Systems Analyst
8	Systems and Programming Supervisor
2	Technology Implementation Manager
2	Telecommunications Supervisor
5	Telecommunications Technician II
131.25	Total Requested Positions

Administrative Office Work Program by Office										
#	Program Code		Goal	Program Category	Program	Activities	FTEs FY 2016-17	+/-	FY 2017-18	Revenue Categories
1	04	002	III	Customer Service and Business Assistance	AB2766/Mobile Source	Prog Admin: Monitor/Dist/Audit	0.10	-	0.10	IX
2	04	003	III	Advance Clean Air Technology	AB2766/MSRC	MSRC Program Administration	0.35	-	0.35	IX
3	04	009	I	Develop Programs	AB 1318 Mitigation	AB 1318 Projects Admn/Impl	0.13	-	0.13	XVII
4	04	020	III	Operational Support	Admin/SCAQMD Budget	Analyze/Prepare/Impl/Track WP	2.50	0.15	2.65	Ia
5	04	021	III	Operational Support	Admin/SCAQMD Contracts	Contract Admin/Monitor/Process	3.20	-	3.20	Ia
6	04	023	III	Operational Support	Admin/SCAQMD Capital Assets	FA Rep/Reconcile/Inv/Acct	0.70	-	0.70	Ia
7	16	026	III	Operational Support	SCAQMD Mail	Posting/Mailing/Delivery	2.30	-	2.30	Ia
8	04	038	III	Operational Support	Admin/Office Management	Fin Mgmt/Oversee Activities	4.00	0.75	4.75	Ib
9	16	038	III	Operational Support	Admin/Office Management	Reports/Proj/Budget/Contracts	4.45	(0.60)	3.85	Ib
10	27	038	III	Operational Support	Admin/Office Management	Overall Direction/Coord of IM	3.00	(0.75)	2.25	Ib
11	04	045	III	Operational Support	Admin/Office Budget	Office Budget/Prep/Impl/Track	0.05	-	0.05	Ib
12	16	060	III	Operational Support	Equal Employment Opportunity	Program Dev/Monitor/Reporting	0.10	-	0.10	Ia
13	04	071	I	Operational Support	Arch Ctgs - Admin	Cost Analysis/Payments	0.04	-	0.04	XVIII
14	27	071	I	Operational Support	Arch Ctgs - Admin	Database Dev/Maintenance	0.25	-	0.25	XVIII
15	16	080	III	Ensure Compliance	Auto Services	Vehicle/Radio Repair & Maint	3.00	-	3.00	Ia
16	04	083	II	Policy Support	Brain Tumor & Air Poll Foundat	Brain Tumor & Air Poll Foundation Support	0.02	-	0.02	Ia
17	04	085	III	Operational Support	Building Corporation	Building Corp Acct/Fin Reports	0.02	-	0.02	Ia
18	16	090	III	Operational Support	Building Maintenance	Repairs & Preventative Maint	7.00	-	7.00	Ia
19	16	092	III	Operational Support	Business Services	Building Services Admin/Contracts	2.40	0.15	2.55	Ia
20	04	130	III	Advance Clean Air Technology	Clean Fuels/Contract Admin	Clean Fuels Contract Admin/Monitor	0.15	-	0.15	VIII
21	27	160	III	Operational Support	Computer Operations	Oper/Manage Host Computer Sys	5.25	-	5.25	Ia
22	04	170	I	Customer Service and Business Assistance	Billing Services	Answer/Resp/Resolv Prob & Inq	8.00	-	8.00	II,III,IV
23	27	184	III	Operational Support	Database Information Support	Ad Hoc Reports/Bulk Data Update	1.00	-	1.00	Ia
24	27	185	III	Operational Support	Database Management	Dev/Maintain Central Database	2.25	-	2.25	Ia
25	27	215	I	Operational Support	Annual Emission Reporting	System Enhancements for GHG	0.50	-	0.50	II,XVII
26	16	225	III	Operational Support	Employee Benefits	Benefits Analysis/Orient/Records	1.50	-	1.50	Ia
27	16	226	III	Operational Support	Classification & Pay	Class & Salary Studies	0.30	-	0.30	Ia
28	16	228	III	Operational Support	Recruitment & Selection	Recruit Candidates for SCAQMD	3.25	-	3.25	Ia
29	16	232	III	Operational Support	Position Control	Track Positions/Workforce Analys	0.55	-	0.55	Ia
30	04	233	III	Operational Support	Employee Relations	Assist HR/Interpret Salary Res	0.10	-	0.10	Ia
31	16	233	III	Operational Support	Employee Relations	Meet/Confer/Labor-Mgmt/Grievance	2.20	-	2.20	Ia
32	16	255	III	Operational Support	Facilities Services	Phones/Space/Keys/Audio-Visual	1.00	-	1.00	Ia
33	04	260	III	Customer Service and Business Assistance	Fee Review	Cmte Mtg/Fee-Related Complaint	0.10	-	0.10	II,III,IV,XV
34	04	265	III	Operational Support	Financial Mgmt/Accounting	Record Accts Rec & Pay/Rpts	6.20	-	6.20	Ia
35	04	266	III	Operational Support	Financial Mgmt/Fin Analysis	Fin/SCAQMD Stat Analysis & Audit	0.80	-	0.80	Ia
36	04	267	III	Operational Support	Financial Mgmt/Treasury Mgmt	Treas Mgt Anlyz/Trk/Proj/Invst	0.90	0.10	1.00	Ia
37	04	268	III	Operational Support	Financial Systems	CLASS/Rev/Acct/PR/Sys Analyze	0.10	-	0.10	Ia
38	04	355	III	Customer Service and Business Assistance	Grants Management	Grant Anlyz/Eval/Negot/Acc/Rpt	1.00	-	1.00	IV,V,XV
39	27	370	III	Operational Support	Information Technology Svcs	Enhance Oper Effic/Productivity	2.75	-	2.75	Ia
40	27	420	III	Operational Support	Library	General Library Svcs/Archives	0.25	-	0.25	Ia

Administrative Office (Cont.)
Work Program by Office

#	Program Code		Goal	Program Category	Program	Activities	FTEs FY 2016-17	FTEs +/-	FTEs FY 2017-18	Revenue Categories
41	04	447	I	Operational Support	Mobile Sources/Accounting	Record Acct Rec & Pay/Special Funds	0.65	-	0.65	IX
42	04	457	III	Advance Clean Air Technology	Mobile Source/Moyer Adm	Carl Moyer: Contract/Fin Admin	1.02	-	1.02	IX
43	16	457	I	Advance Clean Air Technology	MS/Carl Moyer Admin	C Moyer/Contractor Compliance	0.50	(0.40)	0.10	IX
44	27	470	III	Operational Support	Network Operations/Telecomm	Operate/Maintain/Implem SCAQMD	9.25	-	9.25	Ia
45	27	480	III	Operational Support	New System Development	Dev sys for special oper needs	3.00	(0.50)	2.50	II,IV
46	27	481	III	Customer Service and Business Assistance	New System Development	Dev sys in supp of Dist-wide	1.75	-	1.75	Ia,III
47	04	493	II	Operational Support	Outreach/SB/MB/DVBE	Outreach/Incr SB/DVBE Partic	0.05	-	0.05	Ia
48	04	510	III	Operational Support	Payroll	Ded/Ret Rpts/PR/St & Fed Rpts	3.60	-	3.60	Ia
49	27	523	III	Timely Review of Permits	Permit Streamlining	Permit Streamlining	0.25	-	0.25	III
50	16	540	III	Customer Service and Business Assistance	Print Shop	Printing/Collating/Binding	4.00	-	4.00	Ia
51	04	542	I	Advance Clean Air Technology	Prop 1B:Goods Movement	Contracts/Finance Admin	0.50	-	0.50	IX
52	16	542	I	Advance Clean Air Technology	Prop 1B:Goods Movement	Prop 1B: Goods Movement	0.50	(0.40)	0.10	IX
53	04	544	I	Advance Clean Air Technology	Prop 1B:Low Emiss Sch Bus	Grants/Finance Admin	0.05	-	0.05	IX
54	04	565	I	Customer Service and Business Assistance	Public Records Act	Comply w/ Public Rec Requests	0.02	-	0.02	Ia
55	16	565	III	Customer Service and Business Assistance	Public Records Act	Comply w/ Public Rec Requests	0.05	-	0.05	Ia
56	27	565	III	Customer Service and Business Assistance	Public Records Act	Comply w/ Public Req for Info	4.75	-	4.75	Ia
57	04	570	III	Operational Support	Purchasing	Purch/Track Svcs & Supplies	2.50	-	2.50	Ia
58	04	571	III	Operational Support	Purchasing/Receiving	Receive/Record SCAQMD Purchases	1.20	-	1.20	Ia
59	04	572	III	Operational Support	Purchasing-Receiving/Stockroom	Track/Monitor SCAQMD Supplies	1.00	-	1.00	Ia
60	27	615	III	Operational Support	Records Information Mgmt Plan	Plan/Impl/Dir/Records Mgmt plan	1.25	-	1.25	Ia
61	27	616	III	Operational Support	Records Services	Records/Documents processing	3.75	-	3.75	Ia,III,IV
62	04	630	III	Operational Support	Cash Mgmt/Revenue Receiving	Receive/Post Pymts/Reconcile	5.25	-	5.25	II,III,IV,XI
63	04	631	III	Customer Service and Business Assistance	Cash Mgmt/Refunds	Research/Doc/Prep/Proc Refunds	0.30	-	0.30	III,IV,XI
64	16	640	III	Operational Support	Risk Management	Liabl/Property/Wk Comp/Selflns	1.00	1.25	2.25	Ia
65	16	717	II	Policy Support	Student Interns	Gov Board/Student Intern Program	0.20	-	0.20	Ia
66	16	720	I	Customer Service and Business Assistance	Subscription Services	Rule & Gov Board Materials	1.70	-	1.70	IV,XVII
67	27	735	III	Operational Support	Systems Maintenance	Maintain Existing Software Prog	4.50	-	4.50	II,III,IV
68	27	736	III	Operational Support	Systems Implementation/PeopleS	Fin/HR PeopleSoft Systems Impl	1.50	-	1.50	Ia
69	27	770	I	Timely Review of Permits	Title V	Dev/Maintain Title V Program	1.00	0.50	1.50	III
70	04	791	III	Ensure Compliance	Toxics/AB2588	AB2588 Toxics HS Fee Collection	0.15	-	0.15	X
71	27	791	III	Ensure Compliance	Toxics/AB2588	AB2588 Database Software Supp	0.50	-	0.50	X
72	04	805	III	Operational Support	Training	Continuing Education/Training	0.20	-	0.20	Ib
73	04	825	III	Operational Support	Union Negotiations	Official Labor/Mgmt Negotiate	0.02	-	0.02	Ia
74	04	826	III	Operational Support	Union Steward Activities	Rep Employees in Grievance Act	0.01	-	0.01	Ia
75	04	855	II	Operational Support	Web Tasks	Create/edit/review web content	0.02	-	0.02	Ia
76	27	855	II	Operational Support	Web Tasks	Create/edit/review web content	3.25	-	3.25	Ia
						Total Administrative Office	131.00	0.25	131.25	

Administrative Office Line Item Expenditures						
Major Object / Account # **/** Account Description		**FY 2015-16 Actuals**	**FY 2016-17 Adopted Budget**	**FY 2016-17 Amended Budget**	**FY 2016-17 Estimate ***	**FY 2017-18 Proposed Budget**
Salary & Employee Benefits						
51000-52000	Salaries	$ 10,660,808	$ 11,970,016	$ 12,146,293	$ 11,926,216	$ 12,597,695
53000-55000	Employee Benefits	6,213,188	6,862,559	6,862,561	6,670,023	7,198,339
Sub-total Salary & Employee Benefits		$ 16,873,996	$ 18,832,575	$ 19,008,854	$ 18,596,240	$ 19,796,034
Services & Supplies						
67250	Insurance	$ 1,115,560	$ 1,317,400	$ 1,317,400	$ 1,253,716	$ 1,317,400
67300	Rents & Leases Equipment	110,288	132,382	149,382	142,161	147,563
67350	Rents & Leases Structure	-	-	-	-	-
67400	Household	528,429	721,521	682,521	600,000	760,866
67450	Professional & Special Services	2,566,353	2,858,996	2,993,519	2,848,810	2,795,862
67460	Temporary Agency Services	297,480	568,320	462,724	440,356	562,960
67500	Public Notice & Advertising	37,209	58,250	50,250	47,821	58,500
67550	Demurrage	240	1,430	1,470	1,399	1,430
67600	Maintenance of Equipment	412,695	302,982	292,982	283,030	444,314
67650	Building Maintenance	994,148	831,479	814,479	755,895	831,479
67700	Auto Mileage	8,959	6,938	10,688	10,171	9,938
67750	Auto Service	308,796	470,000	470,000	447,280	470,000
67800	Travel	17,379	9,600	24,794	23,595	10,660
67850	Utilities	1,791,287	2,213,288	2,134,948	2,031,743	2,213,288
67900	Communications	144,179	217,700	217,700	207,176	218,700
67950	Interest Expense	3,954,555	3,863,482	3,863,482	3,863,482	3,756,716
68000	Clothing	19,447	10,048	21,548	18,922	12,008
68050	Laboratory Supplies	-	-	-	-	-
68060	Postage	129,073	177,019	172,019	(110,461)	177,019
68100	Office Expense	804,595	725,922	819,657	1,029,298	752,882
68200	Office Furniture	29,370	54,000	43,700	38,373	96,125
68250	Subscriptions & Books	11,979	36,018	33,744	29,631	35,990
68300	Small Tools, Instruments, Equipment	1,854	7,030	7,030	(49,862)	7,030
68400	Gas and Oil	212,728	372,000	372,000	326,658	372,000
69500	Training/Conference/Tuition/ Board Exp.	88,012	86,242	86,910	82,709	88,887
69550	Memberships	4,159	7,690	7,690	7,318	7,378
69600	Taxes	23,990	72,000	60,000	48,312	72,000
69650	Awards	15,915	27,342	27,342	30,056	27,342
69700	Miscellaneous Expenses	17,085	27,800	30,800	34,063	31,525
69750	Prior Year Expense	(46,391)	-	-	-	-
69800	Uncollectable Accounts Receivable	435,327	-	-	-	-
89100	Principal Repayment	2,235,598	2,331,010	2,331,010	2,331,010	2,432,798
Sub-total Services & Supplies		$ 16,270,296	$ 17,507,889	$ 17,499,789	$ 16,772,661	$ 17,712,660
77000	**Capital Outlays**	$ 838,344	$ 775,000	$ 1,433,337	$ 1,364,048	$ 925,317
79050	**Building Remodeling**	$ -	$ -	$ -	$ -	$ -
Total Expenditures		$ 33,982,636	$ 37,115,464	$ 37,941,980	$ 36,732,950	$ 38,434,011
* Estimates based on July 2016 through March 2017 actual expenditures and budget amendments.						

CLERK OF THE BOARDS

DENISE GARZARO
CLERK OF THE BOARDS

At a Glance:	
FY 2016-2017 Budget	$1.1M
FY 2017-2018 Request	$1.3M
Percent of SCAQMD Request	0.9%
Total Requested FTEs	6

DESCRIPTION OF MAJOR SERVICES:

Clerk of the Boards coordinates the activities, provides operational support, and maintains the official records for both the Governing Board and the Hearing Board. The Office is responsible for preparing the legal notices for hearings and meetings, and ensuring that such notices are published as required. Clerk of the Boards' staff assist petitioners and attorneys in the filing of petitions before the Hearing Board and explain the Hearing Board's functions and procedures. Staff prepares Minute Orders, Findings and Decisions of the Hearing Board, and Summary Minutes of Governing Board meetings. The Clerk acts as communication liaison for the Boards with SCAQMD staff and state and federal agencies.

ACCOMPLISHMENTS:

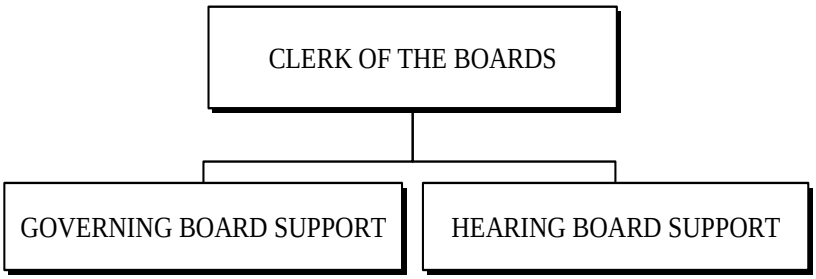
RECENT

- Received and processed 98 subpoenas, public/administrative records requests, and claims against the District.
- Provided support for 12 Governing Board meetings, including: preparing an agenda and minutes for each meeting; preparation, distribution, and publication of 30 meeting and public hearing notices; preparation of 20 Board Resolutions.
- Provided support for 77 hearings, pre-hearing conferences, and general meetings held by the Hearing Board, including: processing 96 petitions; preparation, distribution, and publication of 85 meeting and public hearing notices; preparation of 105 Minute Orders, Findings & Decisions, Pre-hearing Memoranda, and General Meeting Reports of Actions; and preparation and distribution of 120 daily agendas and monthly case calendars.
- Planned/coordinated efforts and provided clerical support for special offsite meetings, including: Governing Board – Mobile Board Meeting 10/3/2015 in Los Angeles; Hearing Board – off-site hearings held on the following Saturdays – 11/7/2015, 1/9/2016, 1/16/2016, 1/23/2016, 2/6/2016, 2/20/2016 and 4/2/2016 in Huntington Beach, Commerce, Woodland Hills, Canoga Park, Granada Hills and Torrance

ANTICIPATED:

- Provide support for approximately 100 hearings, pre-hearing conferences, and general meetings held by the Hearing Board, including: processing approximately 160 petitions; preparation, distribution, and publication of 110-120 meeting and public hearing notices; preparation of over 150 Minute Orders, Findings and Decisions, Pre-hearing Memoranda, and General Meeting Reports of Actions; and preparing and distributing more than 160 daily agendas and monthly case calendars.

ORGANIZATIONAL CHART:



POSITION SUMMARY: 6 FTEs

Clerk of the Boards Unit	Amended FY 2016-17	Change	Proposed FY 2017-18
Governing/Hearing Board Support	6	-	6

STAFFING DETAIL:

2017-18 Requested Staffing

Position	Title
1	Clerk of the Board
3	Deputy Clerk/Transcriber
1	Office Assistant
1	Senior Deputy Clerk
6	Total Requested Positions

Clerk of the Boards Work Program by Office										
#	Program Code		Goal	Program Category	Program	Activities	FTEs FY 2016-17	+/-	FY 2017-18	Revenue Categories
1	17	024	III	Operational Support	Admin/SCAQMD/GB/HB Mgmt	Admin Governing/Hearing Brds	1.25	-	1.25	Ia,VII,XV
2	17	275	III	Operational Support	Governing Board	Attend/Record/Monitor Meetings	1.40	-	1.40	Ia
3	17	364	I	Ensure Compliance	Hearing Board/Abatement Orders	Attnd/Recrd/Monitr Mtgs	0.10	-	0.10	IV
4	17	365	I	Ensure Compliance	Hearing Board/Variances/Appeal	Attend/Record/Monitor HB Mtgs	3.20	-	3.20	IV,V,VII
5	17	565	III	Customer Service and Business Assistance	Public Records Act	Comply w/ Public Rec Requests	0.02	-	0.02	Ia
6	17	855	II	Operational Support	Web Tasks	Create/edit/review web content	0.03	-	0.03	Ia
						Total Clerk of the Boards	6.00	-	6.00	

Clerk of the Boards Line Item Expenditure						
Major Object / Account # **/** Account Description		**FY 2015-16 Actuals**	**FY 2016-17 Adopted Budget**	**FY 2016-17 Amended Budget**	**FY 2016-17 Estimate ***	**FY 2017-18 Proposed Budget**
Salary & Employee Benefits						
51000-52000	Salaries	$ 436,269	$ 407,101	$ 367,101	$ 404,011	$ 382,381
53000-55000	Employee Benefits	249,310	248,282	248,281	239,668	266,774
Sub-total Salary & Employee Benefits		$ 685,579	$ 655,383	$ 615,382	$ 643,679	$ 649,156
Services & Supplies						
67250	Insurance	$ -	$ -	$ -	$ -	$ -
67300	Rents & Leases Equipment	-	-	-	-	-
67350	Rents & Leases Structure	-	-	-	-	-
67400	Household	-	-	-	-	-
67450	Professional & Special Services	84,630	25,400	85,450	81,319	85,500
67460	Temporary Agency Services	-	-	-	-	-
67500	Public Notice & Advertising	13,157	40,000	19,950	18,986	40,000
67550	Demurrage	-	-	-	-	-
67600	Maintenance of Equipment	-	200	200	190	200
67650	Building Maintenance	-	-	-	-	-
67700	Auto Mileage	174	100	160	152	100
67750	Auto Service	-	-	-	-	-
67800	Travel	-	200	200	190	200
67850	Utilities	-	-	-	-	-
67900	Communications	101	500	500	476	500
67950	Interest Expense	-	-	-	-	-
68000	Clothing	-	-	-	-	-
68050	Laboratory Supplies	-	-	-	-	-
68060	Postage	862	1,200	1,200	1,054	1,200
68100	Office Expense	12,684	6,600	6,600	5,796	6,600
68200	Office Furniture	-	-	-	-	-
68250	Subscriptions & Books	-	-	-	-	-
68300	Small Tools, Instruments, Equipment	-	-	-	-	-
68400	Gas and Oil	-	-	-	-	-
69500	Training/Conference/Tuition/ Board Exp.	372,274	391,873	391,573	372,644	534,200
69550	Memberships	-	-	300	285	-
69600	Taxes	-	-	-	-	-
69650	Awards	-	-	-	-	-
69700	Miscellaneous Expenses	263	500	440	419	500
69750	Prior Year Expense	-	-	-	-	-
69800	Uncollectable Accounts Receivable	-	-	-	-	-
89100	Principal Repayment	-	-	-	-	-
Sub-total Services & Supplies		$ 484,145	$ 466,573	$ 506,573	$ 481,511	$ 669,000
77000	**Capital Outlays**	$ -	$ -	$ -	$ -	$ -
79050	**Building Remodeling**	$ -	$ -	$ -	$ -	$ -
Total Expenditures		$ 1,169,724	$ 1,121,956	$ 1,121,955	$ 1,125,190	$ 1,318,156
* Estimates based on July 2016 through February 2017 actual expenditures and budget amendments.						

COMPLIANCE & ENFORCEMENT

BAYRON GILCHRIST
ACTING DEPUTY EXECUTIVE OFFICER

At a Glance:	
FY 2016-2017 Budget (was budgeted in E&P)	**N/A**
FY 2016-2017 Request	**$20.2M**
Percent of SCAQMD Request	**13.5%**
Total Requested FTEs	**153**

DESCRIPTION OF MAJOR SERVICES:

The office of Compliance and Enforcement (C&E) ensures public health by conducting unannounced field inspections to verify compliance with SCAQMD, State and Federal rules and regulations and investigating air quality complaints and equipment breakdowns. Title V and RECLAIM sources are inspected at least annually; with the exception of select industries targeted for more frequent evaluation (e.g., at least quarterly inspection of chrome plating facilities), all other 27,000 stationary sources and 10,000 PERP engines/equipment are inspected at least once every three years. Notices to Comply are issued when additional information is required of a source to determine compliance, and for minor administrative violations; Notices of Violation are issued for more serious, typically emissions-based, violations. Other activities include participation in Emergency Response and joint inspection activities with other agencies, providing expert testimony before the SCAQMD Hearing Board, and conducting training classes for the public and regulated community.

KEY ACCOMPLISHMENTS*:

RECENT:

- Completed 244 inspections of chrome plating facilities (quarterly inspections of 119 facilities)
- Completed 233 Title V facility inspections
- Completed 26 RECLAIM facility audits
- Completed inspections of 5,860 other permitted stationary source facilities
- Completed inspections of 2,330 PERP-registered engines/ equipment
- Completed 3 “Blue Sky” team inspections at refineries
- Completed inspections of 53 new businesses
- Responded to 5,953 complaints (93% of those received)
- Responded to 485 breakdown notifications (60% of those received)

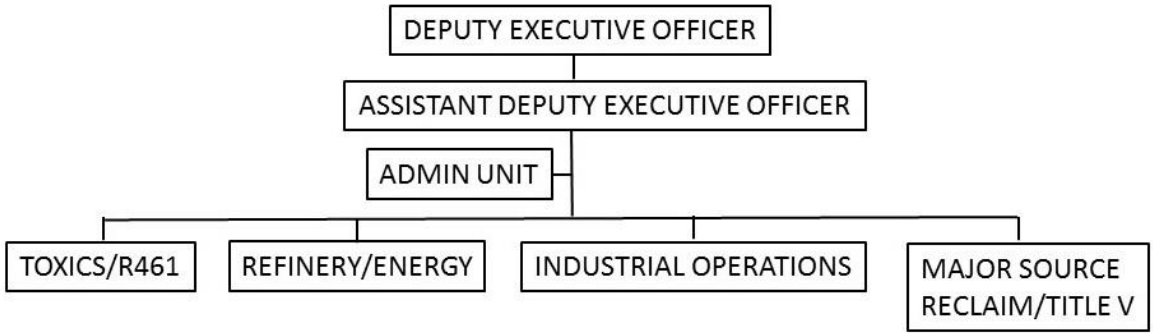
- Conducted 192 multi-agency targeted inspections to identify and confirm possible sources of excess Cr6 emissions in the City of Paramount
- Issued 1,975 Notices to Comply and 227 Notices of Violation
- Implemented web-based Rule 1403 Demolition and Asbestos Removal Notification system
- Conducted 20 training classes for members of the public and the regulated community
- Promoted 19 AQ Inspectors II to Staff Specialist (2), Supervising AQ Inspector (9) and AQ Inspector III (8) positions

*FY 2016-17, through February 20, 2017

ANTICIPATED:

- Selecting and training approximately 22 candidates to fill Inspector vacancies
- Restructuring Division to increase inspection efficiencies
- Conducting additional multi-agency inspection sweeps to identify and confirm possible sources of excess Cr6 emissions in other communities
- Reducing paperwork and streamlining report writing process to increase inspection efficiencies
- Improving timeliness of complaint response
- Efficiently getting NOV reports to the General Counsel's office
- Working closely with the General Counsel's office to address significant violations
- Working closely with monitoring and rule-making staff to identify, assess, and address facilities with high emissions
- Updating policies and procedures governing enforcement actions

ORGANIZATIONAL CHART:



CURRENT POSITION SUMMARY: 151 FTEs

Office of Compliance and Enforcement Units	Amended FY 2016-17	Proposed Change	Proposed FY 2017-18
RECLAIM Admin/R461	28	-	28
Industrial Operations	60	-	60
Toxics/Refinery/Energy	60	2	62
Senior Admin/Staff	3	-	3
Total	151	2	153

STAFFING DETAIL:

2017-18 Requested Staffing

Position	Title
6	AQ Analysis & Compliance Supervisor
89	AQ Inspector II
14	AQ Inspector III
1	Assistant Deputy Executive Officer
1	Deputy Executive Officer
11	Office Assistant
2	Senior Office Assistant
4	Senior Enforcement Manager
3	Staff Specialist
1	Senior Administrative Secretary
4	Secretary
17	Supervising AQ Inspector
153	Total Requested Positions

Compliance & Enforcement
Work Program by Office

#	Program Code		Goal	Program Category	Program	Activities	FTEs FY 2016-17	FTEs +/-	FTEs FY 2017-18	Revenue Categories
1	60	038	III	Customer Service and Business Assistance	Admin/Office Budget	Dev/Coord Goals/Policies/Overs	-	6.00	6.00	Ib
2	60	047	I	Customer Service and Business Assistance	Admin/Operations Support	Budget/Contracts/Reports/Projects	-	6.00	6.00	Ib
3	60	070	I	Ensure Compliance	CARB PERP Program	CARB Audits/Statewide Equip Reg	-	5.00	5.00	XIX
4	60	148	I	Policy Support	Climate Change	GHG/Climate Chg Support	-	0.10	0.10	IV,IX
5	60	152	III	Ensure Compliance	Compliance/IM Related Activiti	Assist IM: Design/Review/Test	-	0.50	0.50	IV
6	60	155	I	Ensure Compliance	Compliance Guidelines	Procedures/Memos/Manuals	-	2.50	2.50	IV
7	60	157	I	Ensure Compliance	Compliance/Special Projects	Prog Audits/Data Req/Brd Supp	-	5.00	5.00	II
8	60	158	I	Ensure Compliance	Compliance Testing	R461/Combustion Equip Testing	-	0.50	0.50	IV
9	60	210	II	Monitoring Air Quality	Emergency Response	Emerg Tech Asst to Public Saf	-	0.10	0.10	IV,XV
10	60	276	I	Policy Support	Board Committees	Admin/Stationary Source Committee	-	0.15	0.15	Ia
11	60	365	I	Ensure Compliance	Hearing Bd/Variances	Variances/Orders of Abatement	-	2.00	2.00	VII
12	60	375	I	Ensure Compliance	Inspections	Compliance/Inspection/Follow-up	-	83.10	83.10	II,V,XV
13	60	377	I	Ensure Compliance	Inspections/RECLAIM Audits	Audit/Compliance Assurance	-	15.00	15.00	II,IV
14	60	416	I	Policy Support	Legislative Activities	Legislative Activities	-	0.05	0.05	Ia
15	60	492	II	Customer Service and Business Assistance	Outreach/Business	Pub Events/Conf/Rideshare Fair	-	0.20	0.20	IX
16	60	538	I	Ensure Compliance	Port Comm AQ Enforcement	Port Comm AQ Enforcement	-	-	-	IX
17	60	539	I	Ensure Compliance	Procedure 5 Review	Evaluate Proc 5 Asbestos Plans	-	0.40	0.40	XVII
18	60	550	II	Ensure Compliance	Public Complaints/Breakdowns	Compltresp/Invflwup/Resolutn	-	10.00	10.00	II,IV,V,XV
19	60	565	III	Customer Service and Business Assistance	Public Records Act	Comply w/ Public Req for Info	-	2.00	2.00	Ia
20	60	605	I	Ensure Compliance	RECLAIM/Admin Support	Admin/Policy/Guidelines	-	5.00	5.00	II,III,IV,XV
21	60	650	I	Develop Rules	Rulemaking	Dev/Amend/Impl Rules	-	-	-	IV,XV
22	60	657	I	Develop Rules	Rulemaking/Support PRA	Provide Rule Development Supp	-	0.50	0.50	IV,XV
23	60	678	I	Ensure Compliance	School Siting	Identify Haz. Emission Sources near Schools	-	0.05	0.05	IV
24	60	690	I	Customer Service and Business Assistance	Source Education	Prov Tech Asst To Industries	-	0.40	0.40	III,IV,V,XV
25	60	717	II	Policy Support	Student Interns	Gov Board/Student Intern Program	-	0.05	0.05	Ia
26	60	751	I	Ensure Compliance	Title III Inspections	Title III Comp/Insp/Follow Up	-	0.10	0.10	IV
27	60	771	I	Ensure Compliance	Title V	Title V Compl/Inspect/Follow Up	-	3.50	3.50	II,IV
28	60	791	I	Ensure Compliance	Toxics/AB2588	Risk Reduct Plan Rvw/Comm Mtgs	-	0.10	0.10	X
29	60	805	III	Operational Support	Training	Dist/Org Unit Training	-	4.00	4.00	Ib
30	60	825	III	Operational Support	Union Negotiations	Official Labor/Mgmt Negotiate	-	0.10	0.10	Ia
31	60	826	III	Operational Support	Union Steward Activities	Rep Employees in Grievance Act	-	0.10	0.10	Ia
32	60	855	II	Operational Support	Web Tasks	Creation/Update of Web Conten	-	0.50	0.50	Ia
						Total Compliance & Enforcement	-	153.00	153.00	

Compliance & Enforcement Line Item Expenditure						
Major Object / Account # **/** Account Description		**FY 2015-16 Actuals**	**FY 2016-17 Adopted Budget**	**FY 2016-17 Amended Budget**	**FY 2016-17 Estimate ***	**FY 2017-18 Proposed Budget**
Salary & Employee Benefits						
51000-52000	Salaries			$ 13,048,939	$ 11,752,597	$ 12,769,476
53000-55000	Employee Benefits			6,465,918	5,987,440	6,684,445
Sub-total Salary & Employee Benefits		$ -	$ -	$ 19,514,857	$ 17,740,037	$ 19,453,921
Services & Supplies						
67250	Insurance			$ -	$ -	$ -
67300	Rents & Leases Equipment			-	-	-
67350	Rents & Leases Structure			90,828	86,438	106,791
67400	Household			-	-	-
67450	Professional & Special Services			12,500	11,896	9,500
67460	Temporary Agency Services			4,000	3,807	2,000
67500	Public Notice & Advertising			-	-	-
67550	Demurrage			250	238	250
67600	Maintenance of Equipment			20,500	19,509	20,500
67650	Building Maintenance			-	-	-
67700	Auto Mileage			1,000	952	1,000
67750	Auto Service			1,000	952	1,000
67800	Travel			17,555	16,706	17,555
67850	Utilities			-	-	-
67900	Communications			117,350	111,677	117,350
67950	Interest Expense			-	-	-
68000	Clothing			17,670	15,516	19,590
68050	Laboratory Supplies			7,160	6,287	9,000
68060	Postage			6,500	5,708	3,000
68100	Office Expense			117,904	103,533	33,800
68200	Office Furniture			9,250	8,123	1,250
68250	Subscriptions & Books			400	351	400
68300	Small Tools, Instruments, Equipment			22,919	20,125	20,009
68350	Film					
68400	Gas and Oil			-	-	-
69500	Training/Conference/Tuition/ Board Exp.			41,050	39,066	26,250
69550	Memberships			750	714	750
69600	Taxes			-	-	-
69650	Awards			-	-	-
69700	Miscellaneous Expenses			5,000	4,758	5,000
69750	Prior Year Expense			-	-	-
69800	Uncollectable Accounts Receivable			-	-	-
89100	Principal Repayment			-	-	-
Sub-total Services & Supplies		$ -	$ -	$ 493,586	$ 456,355	$ 394,995
77000	**Capital Outlays**			$ -	$ -	$ 361,000
79050	**Building Remodeling**			$ -	$ -	$ -
Total Expenditures		$ -	$ -	$ 20,008,443	$ 18,196,392	$ 20,209,916
* Estimates based on July 2016 through February 2017 actual expenditures and budget amendments.						

SOUTH COAST

AIR QUALITY MANAGEMENT DISTRICT

ENGINEERING & PERMITTING

LAKI TISOPULOS
DEPUTY EXECUTIVE OFFICER

At a Glance:	
FY 2016-2017 Budget (Included C&E)	**$42.1M**
FY 2017-2018 Request	**$24.2M**
Percent of SCAQMD Request	**16.1%**
Total Requested FTEs	**159**

DESCRIPTION OF MAJOR SERVICES:

The office of Engineering & Permitting (E&P) is responsible for processing applications for Permits to Construct & Operate, and special services. The permit processing activities involve nearly 400 major facilities that have been issued Title V Federal Operating permits, almost 300 facilities in the RECLAIM program, and over 27,000 large and small business operations. In addition, staff also participate in activities with other agencies, assist with Economic Development and Business Retention programs, provide engineering support to other Divisions, and evaluate and implement Permit Streamlining activities.

KEY ACCOMPLISHMENTS

RECENT:

- Developed and commenced implementation of a comprehensive Action Plan to reduce the permit application backlog and total pending permit applications, improve permit processing efficiency and timely issuance of permits.
- Since the commencement of the backlog reduction effort in July 2016, reduced total pending applications by 25%, from more than 7,300 to less than 5,600 within the first six months of the effort.
- Processed 4,500 applications for Permits, Plans, and ERCs in the first two quarters of FY 2016-2017. Exceeded Goals and Objectives target of the first six month period in FY 2016-17 by 40%.
- Issued more than 950 Permits to Construct in the first two quarters of FY 2016-2017. Exceeded Goals and Objectives target of the first six month period in FY 2016-17 by 6%. (The processing of the applications for these Permits to Construct are included in the 4,500 applications processed mentioned above.)
- Issued more than 70 Title V renewal and modification permits in calendar year 2016.
- Re-issued 130 permits for chrome plating and anodizing facilities to facilitate their compliance with applicable State and Federal requirements.
- Initiated development of Online Permit Processing tools and other automation efforts.
- Developed and deployed an online Permit Dashboard tool on SCAQMD's website displaying total pending permit application inventory and tracking monthly progress.

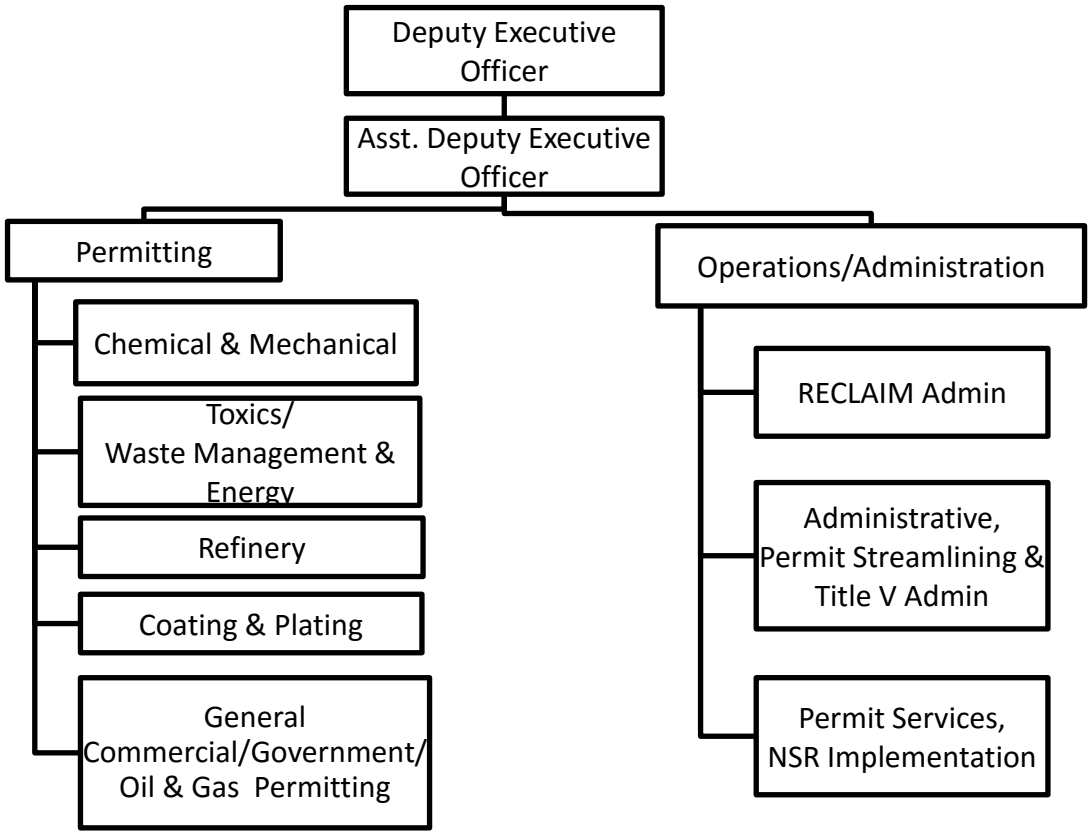
- Participated in public meetings to address public concerns regarding high toxic risks and emissions.
- Participated in a two-day, multi-agency neighborhood sweep in the City of Paramount to investigate hexavalent chromium and other toxic air contaminant-emitting sources in the city.
- Provided technical guidance of grinding operations at metal forging and metal finishing operations and lead emitting facilities to PRDAS.
- Assisted in developing and amending SCAQMD Rules and Regulations such as Rule 1420.1, Rule 219, Reg III and Reg XX.
- Provided Pre- and Post-application conferences to help permit applicants.
- Participated, reviewed and provided permit remedies to permit holders from 78 Fee Review cases in calendar year 2016.
- Provided technical support to IM to test and troubleshoot CLASS programs issues.
- Provided engineering support and/or expert testimony in 81 hearing board cases in calendar year 2016.
- Organized and administered the annual Certified Permit Processing (CPP) Professional exam for 28 participants. Certified 9 new CPP holders as well as provided support to 150 existing CPP holders.

ANTICIPATED:

- Continue with the backlog reduction efforts by implementing all elements of the Action Plan.
- Seek to reduce pending permit application inventory by approximately 50% during FY2017/18.
- Seek to process more than 1,800 Permit to Construct and a total of 7,500 applications for Permits, Plans, and ERCs during FY2017/18.
- Complete timely renewal of more than 80 Title V permits during FY2017/18.
- Continue efforts to streamline and expedite permit issuance and reduce permit application backlog through:
  a) Equipment certification/registration programs
  b) Streamlined standard permits
  c) Enhancement of permitting systems
  d) Expedited Permit Processing Program.
- Continue certification of Permit Processing (CPP) professionals.
- Complete the development of and deploy online permitting and permit automation tools for three of the most commonly permitted equipment (service stations, dry cleaning equipment, and automotive spray booths) to improve permit processing capacity and efficiency.
- In an effort to continue with the permit automation efforts, identify additional candidate equipment/processes suitable for online permitting and commence development of online permitting capabilities.

- Develop and deploy a Permit Application Status Dashboard tool on the SCAQMD website for improved monitoring of the status of individual permit applications by prospective applicants.
- Implement action plan to improve Title V program pursuant to EPA's recommendations.
- Develop capability to publish Title V permits online.
- In an effort to improve permit processing efficiency, monitor the operational efficiency of each permitting team.
- Initiate a program to recognize top performing individuals and teams to help maintain high morale and acknowledge good performance.
- Continue soliciting stakeholder input on permit application backlog reduction and permit streamlining efforts through quarterly Permit Streamlining Task Force Subcommittee meetings.
- Provide quarterly status reports on permit backlog reduction efforts to Stationary Source Committee.
- Continue to improve operational and permitting efficiency by enhancing permitting tools, standardizing permit conditions, streamlining workflow, and reviewing and updating existing Policies and Procedures.
- Continue to improve customer services and public outreach by:
  a) Providing public education by attending public meetings and addressing public concerns,
  b) Providing assistance to permit applicants through pre- and post-conferences, and
  c) Providing permitting information for Public Record requests.
- Review and comment on additional Rule 1402 Risk Reduction Plans per new requirements from Rule 1402.
- Continue to provide critical input to PRDAS in developing and amending SCAQMD Rules.
- Continue to provide critical input to C&E in enforcing SCAQMD Rules.
- Continue to provide support in Fee Review cases and Hearing Board cases.
- Conduct a thorough evaluation of the Expedited Permitting Program and propose improvements as warranted.

ORGANIZATIONAL CHART:



POSITION SUMMARY: 161 FTEs

Compliance & Enforcement Units	Amended FY 2016-17	Change	Proposed FY 2017-18
Administration	4	-	4
Engineering	128	-	128
Operations	27	-	27
Total	159	-	159

STAFFING DETAIL:

2017-18 Requested Staffing

Position	Title
92	Air Quality Engineer II
2	Air Quality Specialist
1	Assistant Deputy Executive Officer
2	Data Technician
1	Deputy Executive Officer
1	Office Assistant
1	Principal Office Assistant
1	Program Supervisor
4	Secretary
2	Senior Administrative Secretary
20	Senior Air Quality Engineer
4	Senior Air Quality Engineering Manager
17	Senior Office Assistant
2	Staff Specialist
8	Supervising Air Quality Engineer
1	Supervising Office Assistant
159	Total Requested Positions

Engineering & Permitting
Work Program by Office

#	Program Code		Goal	Program Category	Program	Activities	FTEs FY 2016-17	FTEs +/-	FTEs FY 2017-18	Revenue Categories
1	50	038	I	Customer Service and Business Assistance	Admin/Office Management	Dev/Coord Goals/Policies/Overs	5.00	(4.00)	1.00	Ib
2	50	047	I	Customer Service and Business Assistance	Admin/Operations Support	Budget/Contracts/Reports/Projects	5.00	(3.00)	2.00	Ib
3	50	070	I	Ensure Compliance	CARB PERP Program	CARB Audits/Statewide Equip Reg	7.00	(7.00)	-	XIX
4	50	071	I	Ensure Compliance	Arch Ctgs - Admin	Report Review	0.10	(0.10)	-	XVIII
5	50	072	I	Ensure Compliance	Arch Ctgs - End User	Compliance/Rpts/RuleImpmenta	0.10	(0.10)	-	XVIII
6	50	073	I	Ensure Compliance	Arch Ctgs - Other	Compliance/Rpts/Rule Implementation	4.50	(4.50)	-	XVIII
7	50	120	I	Timely Review of Permits	Certification/Registration Pro	Certification/Registration Prog	-	2.00	2.00	III
8	50	148	I	Policy Support	Climate Change	GHG/Climate Change Support	0.50	-	0.50	II,IX
9	50	152	III	Ensure Compliance	Compliance/IM Related Activiti	Assist IM: Design/Review/Test	0.50	(0.50)	-	II
10	50	155	I	Ensure Compliance	Compliance Guidelines	Procedures/Memos/Manuals	0.50	(0.50)	-	II
11	50	156	I	Ensure Compliance	Perm Proc/Info to Compliance	Prov Permit Info to Compliance	3.00	-	3.00	III,IV,XV
12	50	157	I	Ensure Compliance	Compliance/Special Projects	Prog Audits/Data Req/Board Supp	5.00	(5.00)	-	IV
13	50	158	I	Ensure Compliance	Compliance Testing	R461/Combustion Equip Testing	1.00	(1.00)	-	II
14	50	200	I	Customer Service and Business Assistance	Economic Dev/Bus Retention	Perm Proc/Public Participation	0.10	-	0.10	III
15	50	210	II	Monitoring Air Quality	Emergency Response	Emerg Tech Asst to Public Saf	0.25	(0.25)	-	II,XV
16	50	240	I	Ensure Compliance	Environmental Justice	R461/Combustion Equip Testing	-	0.50	0.50	II,IV,XV
17	50	253	I	Timely Review of Permits	ERC Appl Processing	Process ERC Applications	3.50	-	3.50	III
18	50	260	III	Customer Service and Business Assistance	Fee Review	Fee Review Committee	0.45	-	0.45	II,III,IV
19	50	276	I	Policy Support	Board Committees	Admin/Stationary Source Committees	0.25	-	0.25	Ia
20	50	365	I	Ensure Compliance	Hearing Bd/Variances	Variances/Orders of Abatement	1.50	(0.75)	0.75	VII
21	50	367	I	Timely Review of Permits	Hearing Board/Appeals	Appeals: Permits & Denials	0.50	(0.25)	0.25	III
22	50	375	I	Ensure Compliance	Inspections	Compliance/Inspection/Follow-up	79.20	(79.20)	-	II,V,XV
23	50	377	I	Ensure Compliance	Inspections/RECLAIM Audits	Audit/Compliance Assurance	23.80	(17.80)	6.00	II,IV
24	50	416	I	Policy Support	Legislative Activities	Legislative Activities	0.25	-	0.25	Ia
25	50	425	I	Customer Service and Business Assistance	Lobby Permit Services	Supp Perm Proc/Customer Svc	1.00	-	1.00	III
26	50	475	I	Timely Review of Permits	NSR Implementation	Implement NSR/Allocate ERCs	2.50	-	2.50	II,III,V,XV
27	50	476	I	Timely Review of Permits	NSR Data Clean Up	Edit/Update NSR Data	0.50	-	0.50	II
28	50	492	I	Ensure Compliance	Customer Service	Compliance/Inspection/Follow-up	-	0.50	0.50	II,V,IX,XV
29	50	515	I	Timely Review of Permits	Perm Proc/Non TV/Non RECLAIM	PP: Non TitlV/TitlIII/RECLAIM	57.30	(5.55)	51.75	III,XV
30	50	517	I	Timely Review of Permits	Permit Services	Facility Data-Create/Edit	12.50	-	12.50	III,XV
31	50	518	I	Timely Review of Permits	RECLAIM Non-Title V	Process RECLAIM Only Permits	4.50	-	4.50	III,IV,XV
32	50	519	I	Timely Review of Permits	Perm Proc/Title III (Non TV)	Process Title III Permits	1.00	-	1.00	III
33	50	520	I	Customer Service and Business Assistance	Perm Proc/Pre-Appl Mtg Outreac	Pre-App Mtgs/Genl Prescreening	4.00	(3.00)	1.00	III
34	50	521	I	Timely Review of Permits	Perm Proc/Expedited Permit	Proc Expedited Permits (301OT)	0.50	3.50	4.00	III
35	50	523	I	Timely Review of Permits	Permit Streamlining	Permit Streamlining	3.75	-	3.75	III
36	50	538	I	Ensure Compliance	Port Comm AQ Enforcement	Port Comm AQ Enforcement	0.50	(0.50)	-	IX
37	50	542	I	Ensure Compliance	Prop 1B:Goods Movement	Prop 1B: Gds Mvmnt/Inspect	0.30	(0.30)	-	IX
38	50	550	II	Ensure Compliance	Public Complaints/Breakdowns	Compltresp/Invflwup/Resolutn	10.00	(10.00)	-	II,IV,V,XV
39	50	565	III	Customer Service and Business Assistance	Public Records Act	Comply w/ Public Req for Info	0.50	(0.25)	0.25	Ia
40	50	605	I	Ensure Compliance	RECLAIM/Admin Support	Admin/Policy/Guidelines	10.00	(3.50)	6.50	II,III,IV,XV

Engineering & Permitting (Cont.)
Work Program by Office

#	Program Code		Goal	Program Category	Program	Activities	FTEs FY 2016-17	FTEs +/-	FTEs FY 2017-18	Revenue Categories
41	50	607	I	Timely Review of Permits	RECLAIM & Title V	Process RECLAIM & TV Permits	12.40	6.00	18.40	III
42	50	643	I	Timely Review of Permits	Rule 222 Filing Program	Rule 222 Filing Program	-	0.50	0.50	IV
43	50	650	I	Develop Rules	Rulemaking	Dev/Amend/Impl Rules	0.50	(0.25)	0.25	II,XV
44	50	657	I	Develop Rules	Rulemaking/Support PRA	Provide Rule Development Supp	0.50	(0.25)	0.25	II,XV
45	50	678	I	Ensure Compliance	School Siting	Identify Haz. Emission Sources near Schools	1.00	(0.75)	0.25	II
46	50	680	I	Ensure Compliance	Small Business Assistance	Asst sm bus w/ Permit Process	0.50	-	0.50	III,IV
47	50	690	I	Customer Service and Business Assistance	Source Education	Prov Tech Asst To Industries	2.80	-	2.80	III,IV,V,XV
48	50	728	I	Timely Review of Permits	Perm Proc/IM Programming	Assist IM: Design/Review/Test	2.00	0.55	2.55	II,III,IV
49	50	751	I	Ensure Compliance	Title III Inspections	Title III Comp/Insp/Follow Up	0.50	(0.50)	-	IV
50	50	752	I	Develop Rules	Title III Rulemaking	Title III Dev/Implement Rules	0.25	-	0.25	II,V,XV
51	50	771	I	Ensure Compliance	Title V Inspections	Title V Compl/Inspect/Follow Up	11.00	(11.00)	-	II,IV
52	50	773	I	Develop Rules	Title V & NSR Rulemaking-Supp	Title V Rules Dev/Amend/Impl	0.25	-	0.25	II
53	50	774	I	Timely Review of Permits	TV/Non-RECLAIM	Process Title V Only Permits	18.00	-	18.00	III
54	50	775	I	Timely Review of Permits	Title V – Admin	Title V Administration	1.00	-	1.00	III
55	50	791	I	Ensure Compliance	Toxics/AB2588	AB2588 Rev Rprts/Risk Redplans	0.25	-	0.25	X
56	50	805	III	Operational Support	Training	Dist/Org Unit Training	6.00	(2.90)	3.10	Ib
57	50	825	III	Operational Support	Union Negotiations	Official Labor/Mgmt Negotiate	0.10	(0.05)	0.05	Ia
58	50	826	III	Operational Support	Union Steward Activities	Rep Employees in Grievance Act	0.10	(0.05)	0.05	Ia
59	50	850	I	Ensure Compliance	VEE Trains	Smoking Trains-Compl/Inspec/FU	0.50	(0.50)	-	IX,XV
60	50	855	II	Operational Support	Web Tasks	Creation/Update of Web Content	0.50	(0.25)	0.25	Ia
						Total Engineering & Permitting	309.00	(150.00)	159.00	

* FY 2016-17 Includes Compliance & Enforcement Office

Engineering & Permitting Line Item Expenditure						
Major Object / Account # **/** Account Description		**FY 2015-16 Actuals**	**FY 2016-17 Adopted Budget**	**FY 2016-17 Amended Budget**	**FY 2016-17 Estimate ***	**FY 2017-18 Proposed Budget**
Salary & Employee Benefits						
51000-52000	Salaries	$ 24,728,098	$ 27,589,566	$ 14,725,766	$ 14,316,146	$ 15,902,868
53000-55000	Employee Benefits	11,910,109	13,903,011	7,437,093	6,825,445	7,882,580
Sub-total Salary & Employee Benefits		$ 36,638,207	$ 41,492,577	$ 22,162,859	$ 21,141,591	$ 23,785,448
Services & Supplies						
67250	Insurance	$ -	$ -	$ -	$ -	$ -
67300	Rents & Leases Equipment	-	-	-	-	10,000
67350	Rents & Leases Structure	95,162	106,791	15,963	15,191	10,000
67400	Household	-	-	-	-	-
67450	Professional & Special Services	781,741	10,000	2,500	2,379	2,500
67460	Temporary Agency Services	24,399	30,000	32,000	30,453	32,000
67500	Public Notice & Advertising	71,800	80,000	127,000	120,861	160,000
67550	Demurrage	120	500	250	238	250
67600	Maintenance of Equipment	20,012	20,500	-	-	-
67650	Building Maintenance	-	-	-	-	-
67700	Auto Mileage	19,589	15,000	27,500	26,171	26,500
67750	Auto Service	-	1,000	-	-	-
67800	Travel	26,277	35,110	17,555	16,706	17,555
67850	Utilities	-	-	-	-	-
67900	Communications	151,518	128,000	10,650	10,135	10,650
67950	Interest Expense	-	-	-	-	-
68000	Clothing	13,802	20,600	2,930	2,573	2,930
68050	Laboratory Supplies	4,562	7,160	-	-	-
68060	Postage	26,320	40,000	37,000	32,490	37,000
68100	Office Expense	93,014	81,050	58,700	51,545	57,700
68200	Office Furniture	2,271	2,500	3,550	3,117	3,050
68250	Subscriptions & Books	-	800	400	351	400
68300	Small Tools, Instruments, Equipment	4,121	22,919	-	-	-
68400	Gas and Oil	-	-	-	-	-
69500	Training/Conference/Tuition/ Board Exp.	30,904	30,050	3,500	3,331	3,500
69550	Memberships	-	1,500	750	714	750
69600	Taxes	-	-	-	-	-
69650	Awards	-	-	-	-	-
69700	Miscellaneous Expenses	4,135	10,000	2,500	2,379	5,000
69750	Prior Year Expense	(109)	-	-	-	-
69800	Uncollectable Accounts Receivable	-	-	-	-	-
89100	Principal Repayment	-	-	-	-	-
Sub-total Services & Supplies		$ 1,369,639	$ 643,480	$ 342,748	$ 318,634	$ 379,785
77000	**Capital Outlays**	$ 136,133	$ -	$ -	$ -	$ 20,000
79050	**Building Remodeling**	$ -	$ -	$ -	$ -	$ -
Total Expenditures		$ 38,143,979	$ 42,136,057	$ 22,505,607	$ 21,460,226	$ 24,185,233
* Estimates based on July 2016 through February 2017 actual expenditures and budget amendments.						

LEGAL OFFICE

KURT R. WIESE
GENERAL COUNSEL

At a Glance:	
FY 2016-2017 Budget	$6.4M
FY 2017-2018 Request	$6.5M
Percent of SCAQMD Request	4.3%
Total Requested FTEs	32

DESCRIPTION OF MAJOR SERVICES:

The General Counsel's Office is responsible for advising the SCAQMD Board and staff on all legal matters and enforcing SCAQMD rules and state laws related to air pollution control. Attorneys review and assist in the drafting of SCAQMD rules and regulations to ensure they are within the District's authority, and are written in a clear and enforceable manner. Attorneys ensure that all legal requirements for noticing, public workshop, CEQA analysis, and socioeconomic analysis of proposed rules and air quality management plans are satisfied.

The General Counsel's Office is also responsible for representing the SCAQMD Board and staff in court proceedings and administrative hearings related to matters arising out of staff's performance of official duties as SCAQMD officers and employees.

The Office is responsible for the enforcement of all SCAQMD rules and regulations and applicable state law. In addition, staff attorneys represent the Executive Officer in all matters before the SCAQMD Hearing Board, including variances, permit appeals, and abatement orders. Staff investigators support civil penalty and litigation and settlement efforts, including the minor source penalty program which is handled by investigators.

ACCOMPLISHMENTS:

RECENT:

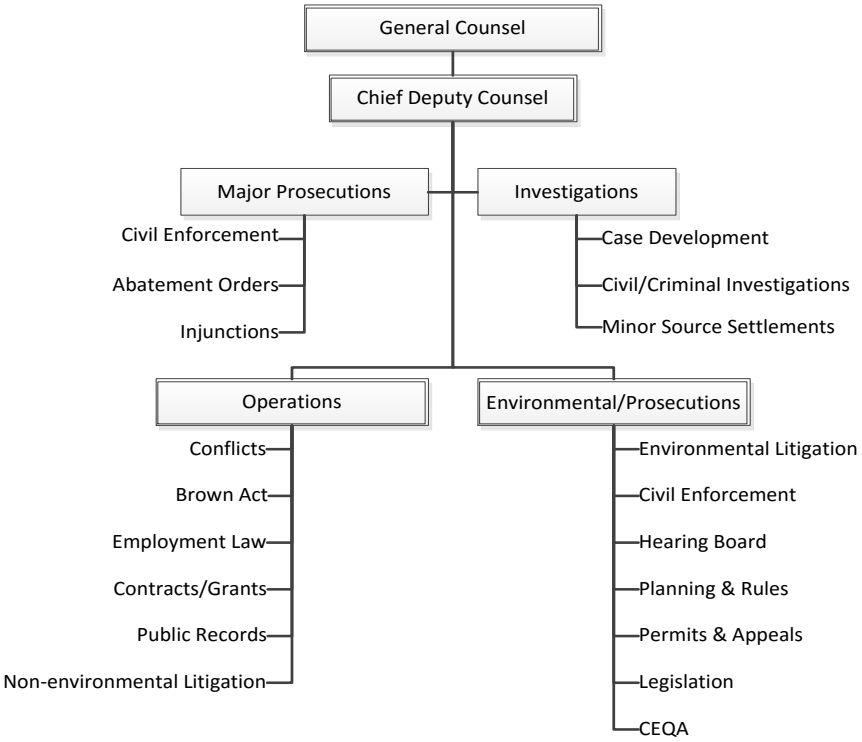
- Petitioned the US EPA to adopt lower NO_X emission standards on a nation-wide basis for heavy-duty trucks. The District's staff, including Legal staff, led a coalition of state and local air pollution control agencies in support of the petition. U.S. EPA responded that they planned to initiate a rulemaking.
- Obtained an Order for Abatement requiring the operators of the Sunshine Canyon Landfill to take significant and far-reaching efforts to reduce landfill odors. Those efforts include development of infrastructure projects for the diversion of organic waste from landfills, such as for composting and anaerobic digestion. Some of these projects are designed to result in the production of useable biofuels.

- Obtained Orders for Abatement in the City of Paramount requiring facilities that had been identified as signification contributors to high hexavalent chrome levels in the community to take immediate steps to reduce emissions. The Legal Department's efforts contributed to a staff effort that caused a significant reduction of hexavalent chrome levels in Paramount and the elimination of a significant threat to public health.
- Won a lawsuit challenging the Southern California International Gateway railyard project at the Port of Los Angeles. The judge in the case agreed with the District that the project proponents had not adequately analyzed the effects of the project on the surrounding communities. The District is hopeful that the decision will lead to the introduction of zero emission trucks and low emitting locomotives at the railyard.
- Provided legal advice for development of the 2016 AQMP and Funding Incentives Plan, evaluating potential options and relative legal benefits/risks. Reviewed AQMP, appendices, CEQA document, socioeconomic assessment, and all responses to comments.
- Obtained Order for Abatement against Southern California Gas Company regarding Aliso Canyon leak, requiring Gas Company to pay for a health study of impacts from the leak. Filed lawsuit for public nuisance violations against Gas Company for Aliso Canyon leak-associated odors and health impacts.
- Settled violations with Exxon Mobil for 2015 explosion and flaring mitigation fees in the amount of $4,712,500 (½ for civil penalties; ½ for environmental projects).
- Provided legal advice for all rule amendments including October 2016 RECLAIM amendments dealing with facility shutdowns, avoiding potential legal challenges such as claims of takings.

ANTICIPATED:

- Develop high impact enforcement cases to maximize deterrence for air pollution violations.
- Implement training programs to broaden staff knowledge of and ability to handle all types of work handled by the office.
- Provide legal advice concerning the SCAQMD's priority projects such as the 2016 AQMP, SoCal Gas leak, and rules to implement the 2012 and 2016 AQMPs and reducing toxic exposure.

ORGANIZATIONAL CHART:



POSITION SUMMARY: 32 FTEs

Legal Units	Amended FY 2016-17	Proposed Change	Proposed FY 2017-18
Office Administration	4	-	4
General Counsel	22	-	22
Investigations	6	-	6
Total	32	-	32

STAFFING DETAIL:

2017-18 Requested Staffing

Position	Title
4	Administrative Secretary/Legal
1	Assistant Chief Deputy – Major Prosecutions
1	Chief Deputy Counsel
1	General Counsel
1	Investigations Manager
4	Investigator
3	Legal Secretary
2	Paralegal
4	Principal Deputy District Counsel
8	Senior Deputy District Counsel
1	Senior Office Assistant
1	Senior Paralegal
1	Supervising Investigator
32	Total Requested Positions

Legal
Work Program by Office

#	Program Code		Goal	Program Category	Program	Activities	FTEs FY 2016-17	FTEs +/-	FTEs FY 2017-18	Revenue Categories
1	08	001	I	Advance Clean Air Technology	AB2766/Mob Src/Legal Advice	AB2766 Leg Adv: Trans/Mob Source	0.05	-	0.05	IX
2	08	003	I	Advance Clean Air Technology	AB2766/MSRC	Legal Advice: MSRC Prog Admin	0.15	-	0.15	IX
3	08	009	I	Develop Programs	AB 1318 Mitigation	AB 1318 Projects Admn/Impl	0.05	-	0.05	XVII
4	08	010	I	Develop Programs	AQMP	AQMP Revision/CEQA Review	0.20	-	0.20	II,IV,IX
5	08	025	III	Operational Support	Admin/SCAQMD-Legal Research	Legal Research/Staff/Exec Mgmt	1.20	(0.10)	1.10	Ia
6	08	038	III	Operational Support	Admin/Office Management	Attorney Timekeeping/Perf Eval	3.50	-	3.50	Ib
7	08	071	I	Operational Support	Arch Ctgs - Admin	Rule Dev/TA/Reinterpretations	0.05	-	0.05	XVIII
8	08	072	I	Ensure Compliance	Arch Ctgs - End User	Case Dispo/Rvw, Track, Prep NOVs	0.05	-	0.05	XVIII
9	08	073	I	Ensure Compliance	Arch Ctgs - Other	Case Dispo/Rvw, Track, Prep NOVs	0.05	-	0.05	XVIII
10	08	102	II	Operational Support	CEQA Document Projects	CEQA Review	1.00	(0.50)	0.50	II,III,IX
11	08	115	I	Ensure Compliance	Case Disposition	Trial/Dispo-Civil Case/Injunct	5.00	-	5.00	II,IV,V,VII,XV
12	08	131	I	Advance Clean Air Technology	Clean Fuels/Legal Advice	Legal Advice: Clean Fuels	0.05	-	0.05	VIII
13	08	154	I	Ensure Compliance	Compliance/NOV Administration	Review/Track/Prep NOVs/MSAs	1.20	(0.20)	1.00	IV
14	08	185	I	Ensure Compliance	Database Management	Support IM/Dev Tracking System	0.25	0.50	0.75	IV
15	08	227	III	Operational Support	Employee/Employment Law	Legal Advice: Employment Law	1.00	(0.50)	0.50	Ia
16	08	235	I	Ensure Compliance	Enforcement Litigation	Maj Prosecutions/Civil Actions	2.00	-	2.00	IV
17	08	275	III	Operational Support	Governing Board	Legal Advice:Attend Board/Cmte Mtgs	1.00	-	1.00	Ia
18	08	366	I	Ensure Compliance	Hearing Board/Legal	Hear/Disp-Varian/Appeal/Rev	3.00	-	3.00	IV,V,XV
19	08	380	I	Ensure Compliance	Interagency Coordination	Coordinate with Other Agencies	0.20	-	0.20	II,V
20	08	401	III	Operational Support	Legal Advice/SCAQMD Programs	General Advice: Contracts	2.00	-	2.00	Ia
21	08	403	III	Ensure Compliance	Legal Rep/Litigation	Prep/Hearing/Disposition	3.50	-	3.50	Ia,II
22	08	404	I	Customer Service and Business Assistance	Legal Rep/Legislation	Draft Legis/SCAQMD Position/Mtgs	0.05	0.20	0.25	II,IX
23	08	416	I	Policy Support	Legislative Activities	Lobbying: Supp/Promote/Influence legis/Adm	0.10	-	0.10	Ia
24	08	457	I	Advance Clean Air Technology	Mob Src/C Moyer/Leg Advice	Moyer/Implem/Program Dev	0.10	-	0.10	IX
25	08	465	I	Ensure Compliance	Mutual Settlement	Mutual Settlement Program	3.00	-	3.00	IV
26	08	516	I	Timely Review of Permits	Permit Processing/Legal	Legal Advice: Permit Processing	0.20	-	0.20	III
27	08	565	III	Customer Service and Business Assistance	Public Records Act	Comply w/ Public Rec Requests	1.00	0.50	1.50	Ia
28	08	651	I	Develop Rules	Rules/Legal Advice	Legal Advice: Rules/Draft Regs	1.00	-	1.00	II
29	08	661	I	Develop Rules	Rulemaking/RECLAIM	RECLAIM Legal Adv/Related Iss	0.05	0.20	0.25	II
30	08	681	III	Customer Service and Business Assistance	Small Business/Legal Advice	Legal Advice: SB/Fee Review	0.05	-	0.05	II,III
31	08	717	II	Policy Support	Student Interns	Gov Board/Student Intern Program	0.20	(0.10)	0.10	Ia
32	08	770	I	Timely Review of Permits	Title V	Leg Advice: Title V Prog/Perm Dev	0.05	-	0.05	II,IV
33	08	772	I	Timely Review of Permits	Title V Permits	Leg Advice: New Source Title V Permit	0.05	-	0.05	III
34	08	791	I	Ensure Compliance	Toxics/AB2588	AB2588 Legal Advice: Plan & Impl	0.05	-	0.05	X
35	08	805	III	Ensure Compliance	Training	Continuing Education/Training	0.50	-	0.50	Ib
36	08	825	III	Operational Support	Union Negotiations	Legal Adv: Union Negotiations	0.05	-	0.05	Ia
37	08	826	III	Operational Support	Union Steward Activities	Rep Employees in Grievance Act	0.05	-	0.05	Ia
						Total Legal	32.00	(0.00)	32.00	

Legal Line Item Expenditure						
Major Object / Account # **/** Account Description		**FY 2015-16 Actuals**	**FY 2016-17 Adopted Budget**	**FY 2016-17 Amended Budget**	**FY 2016-17 Estimate ***	**FY 2017-18 Proposed Budget**
Salary & Employee Benefits						
51000-52000	Salaries	$ 3,926,373	$ 3,809,944	$ 3,764,309	$ 3,760,033	$ 3,867,700
53000-55000	Employee Benefits	2,052,778	2,083,166	2,083,166	2,035,575	2,135,617
Sub-total Salary & Employee Benefits		$ 5,979,151	$ 5,893,111	$ 5,847,475	$ 5,795,609	$ 6,003,317
Services & Supplies						
67250	Insurance	$ -	$ -	$ -	$ -	$ -
67300	Rents & Leases Equipment	-	-	-	-	-
67350	Rents & Leases Structure	-	-	-	-	-
67400	Household	-	-	-	-	-
67450	Professional & Special Services	2,846,984	279,500	1,279,500	1,217,648	279,500
67460	Temporary Agency Services	-	7,500	7,500	7,137	7,500
67500	Public Notice & Advertising	2,303	2,500	2,000	1,903	2,500
67550	Demurrage	1,531	5,000	5,000	4,758	4,000
67600	Maintenance of Equipment	-	300	300	285	300
67650	Building Maintenance	-	-	-	-	-
67700	Auto Mileage	308	1,600	1,600	1,523	1,600
67750	Auto Service	-	-	-	-	-
67800	Travel	13,929	15,000	15,000	14,275	15,000
67850	Utilities	-	-	-	-	-
67900	Communications	3,155	10,300	10,300	9,802	10,300
67950	Interest Expense	-	-	-	-	-
68000	Clothing	-	250	250	220	250
68050	Laboratory Supplies	-	-	-	-	-
68060	Postage	2,902	4,750	4,750	4,171	4,750
68100	Office Expense	14,013	15,000	15,000	13,172	16,000
68200	Office Furniture	2,857	5,000	5,000	4,391	5,000
68250	Subscriptions & Books	112,341	110,000	115,000	100,983	112,000
68300	Small Tools, Instruments, Equipment	-	-	-	-	-
68400	Gas and Oil	-	-	-	-	-
69500	Training/Conference/Tuition/ Board Exp.	14,491	22,500	17,500	16,654	19,500
69550	Memberships	300	750	750	714	750
69600	Taxes	-	-	-	-	-
69650	Awards	-	-	-	-	-
69700	Miscellaneous Expenses	474	1,000	46,566	44,315	2,000
69750	Prior Year Expense	-	-	-	-	-
69800	Uncollectable Accounts Receivable	-	-	-	-	-
89100	Principal Repayment	-	-	-	-	-
Sub-total Services & Supplies		$ 3,015,589	$ 480,950	$ 1,526,016	$ 1,441,950	$ 480,950
77000	**Capital Outlays**	$ -	$ -	$ -	$ -	$ 25,000
79050	**Building Remodeling**	$ -	$ -	$ -	$ -	$ -
Total Expenditures		$ 8,994,740	$ 6,374,061	$ 7,373,491	$ 7,237,559	$ 6,509,267

* Estimates based on July 2016 through February 2017 actual expenditures and budget amendments.

LEGISLATIVE & PUBLIC AFFAIRS/MEDIA OFFICE

DERRICK ALATORRE
DEPUTY EXECUTIVE OFFICER

At a Glance:	
FY 2016-2017 Budget	$7.7M
FY 2017-2018 Request	$9.0M
Percent of SCAQMD Request	6.0%
Total Requested FTEs	47

DESCRIPTION OF MAJOR SERVICES:

Legislative & Public Affairs/Media Office (LPAM) provides a broad range of services to internal and external stakeholders. These services include:

Legislative/Communications:

- **State and Federal Legislative Program**:

The State and Federal Legislative Program works with state and federal legislators and legislative staff to support a clean air agenda by promoting SCAQMD legislative priorities and sponsored legislation, seeking to satisfy funding needs for clean air efforts, and by securing support for the AQMP. This unit also works to defend against legislative activities by others which are detrimental to the goals and priorities of clean air. Finally, this unit works to foster coalitions of stakeholders at the local, state, and federal levels to work in in tandem with these clean air supportive efforts.

- **Communications and Public Information:**

Communications & Public Information includes a telephone call center designed to serve and assist members of the public who wish to report air quality/air pollution complaints, contact SCAQMD staff or acquire additional information regarding SCAQMD programs. The Communications Center and its associated toll free numbers, along with the SCAQMD main line, provide easy access to the public for reporting a wide variety of air quality related concerns. The Public Information Center (PIC), which is located in the SCAQMD lobby, serves as a walk-up resource for all visitors to the SCAQMD. The PIC assists with other inquiries made by the public, which can range from requests for available materials to consultations on SCAQMD programs and regulations.

- **Graphics:**

Graphics' responsibility is to provide all graphic services for the agency from conceptual design to final design of projects.

Local Government/Community Outreach:

Local Government/Community Outreach (Community Affairs) provides government and community relations efforts in all four-counties in SCAQMD's jurisdiction, including 86 cities in

Los Angeles, 34 cities in Orange County, 27 cities in Riverside and 16 cities in San Bernardino. Activities include monitoring government actions on all levels (local, state and federal); facilitating a two-way flow of communication between SCAQMD and stakeholders; assisting with inquiries from government offices, community members, health and environmental justice organizations, and business organizations; and, promoting and providing information on SCAQMD programs and initiatives.

Small Business Assistance:
The South Coast Air Quality Management District's (SCAQMD) Small Business Assistance (SBA) program is required under Section 40448 of the California Health and Safety Code to provide administrative and technical services and information to small businesses and the public. SBA is part of the Public Advisor's Office and its objectives are three fold: 1) provide timely and accurate information about air quality issues facing the region and the impact to the business community; 2) provide easy to understand information about compliance and incentives programs offered to small businesses and technology advancement options to control air pollution; and, 3) provide opportunities for the business community and other individuals to ask questions, provide comments, become involved and give feedback on rulemaking.

Media Office:
The Media Office serves as the agency's official liaison with news media in its many forms, including: the Internet; newspapers and radio; broadcast, cable and satellite TV; books, magazines and newsletters; digital and social media. The Media Office also supports programs and policies of SCAQMD and its Board with a wide range of proactive media and public relations programs. The Media Office provides strategic counsel to the Executive Officer, Board members and their staff, and Executive Council members on sensitive, high-profile media relations issues as well as building public awareness of air quality issues.

ACCOMPLISHMENTS:

RECENT:
Federal Legislative

- LPAM supported the effort by the Legal Division on the District's Petition to EPA to establish Ultra-Low NOx emission standards for heavy-duty trucks.
- Board Members and staff traveled to Washington, DC, seeking signatories for a letter SCAQMD prepared in support of EPA establishing the ultra-low NOx standard. A meeting was held with Board Members and staff educating them on the Ultra-Low NOx issue and SCAQMD hosted a reception for Members of Congress and their staff. A meeting was also held with representatives of several key business organizations to discuss the issue.

- Together with our federal consultants, 29 signatures were secured (from three Senators and 26 Members of Congress) on the joint letter and a separate letter from a 30th House Member in support of EPA establishing the ultra-low NOx standard.
- On September 29th, staff from five Congressional offices in the region joined SCAQMD staff on a bus tour of key areas in the Inland Empire to highlight the increased air pollution challenges and some of the businesses who are developing technologies to address it. The group toured the SCAQMD Headquarters and was briefed by executive staff after being shown a number of alternative fuel medium and heavy-duty trucks and buses on display in the parking lot.
- Supervised our three federal consultants to ensure they were continuing to develop relationships with key policymakers in Washington DC. Ensured they were keeping the agency apprised of any policies being considered that can potentially threaten our authority. Directed consultants to research any funding opportunities applicable to the funding needs that SCAQMD can apply for that will ensure that our region meets the federal attainment standards.

State Legislative

SCAQMD took positions on 11 bills in 2016, including:

- Supporting, with suggested amendments, SB 32 (Pavley) which extended the state GHG emission reduction goals to ensure levels are reduced to 40% below the 1990 level by 2030, and which was signed into law.
- Supporting AB 1550 (Gomez) that requires Greenhouse Gas Reduction Fund monies to, at a minimum, be allocated as follows: 25% in disadvantaged communities (DACs), 5% in low-income communities near DACs, and 5% in low-income communities anywhere in the state, which was signed into law.
- Opposing SB 1387 (De Leon) which would have expanded the SCAQMD Governing Board and increased CARB authority over SCAQMD decision-making, which failed passage.
- Supporting and working with the authors on SB 886/380* (Pavley), SB 887 (Pavley), and SB 888 (Allen), which cumulatively provided for a moratorium on the Aliso Canyon Natural Gas Well, and provided for additional protections for the community by increasing regulation and oversight over natural gas wells and establishing the Office of Emergency Services as the lead agency for emergency efforts for any future similar type leak that causes a risk to the public health or environment. All three of these bills were signed into law. (The content of SB 886 was amended into SB 380.)
- Successfully worked with state legislators and Capitol staff (members and committees) to promote SCAQMD legislative priorities and to defend against legislative efforts detrimental to the goals and priorities of clean air.

Community Affairs

- Government and community relations efforts in all four-counties in SCAQMD jurisdiction including 86 cities in Los Angeles, 34 cities in Orange County, 27 cities in Riverside and 16 cities in San Bernardino. Activities included monitoring government actions on all

levels (local, state and federal); facilitating a two-way flow of communication between the District and stakeholders; assisting with inquiries from government offices, community members, health and environmental justice organizations, and business organizations; and, promoting and providing information on SCAQMD programs and initiatives.

- Assisted with communications, outreach and issue management for high profile issues such as Exide Technologies, Hixson, Gerdau, Torrance Refinery (formerly ExxonMobil), Southern California Gas Aliso Canyon Storage Facility, Sunshine Canyon Landfill, Quemetco, Carlton Forge, and the air quality investigation in Paramount.
- Coordinated and staffed 26 city council presentations for Governing Board Member Cacciotti to provide information on SCAQMD programs.
- Produced quarterly newsletters for four Governing Board Members.
- Organized logistics, conducted outreach and staffed 12 Hearing Board proceedings in the community; three AB2588 Toxic Hotspots Community Meetings; nine Town Hall/Community Meetings; eleven Rule-related or 2016 AQMP meetings; and, one Title V Meeting.
- Coordinated with, organized logistics and staffed five Department of Toxic Substances Control (DTSC) and SCAQMD Exide Community Advisory Group meetings throughout the communities in the area of Exide Technologies.
- Participated in and represented SCAQMD throughout the four-county region at 65 community events ranging from health and environmental justice resources fairs to Council of Government General Assemblies to air quality related forums and conferences.
- Planned, organized and produced the 2016 “Martin Luther King, Jr. Day of Service Forum” which had more than 400 attendees at the California Science Center in Los Angeles.
- Planned, organized and produced the 2016 “Cesar Chavez Day of Remembrance” which had more than 300 attendees at California State University, Los Angeles and honored Senate President pro Tempore Kevin de León.
- Planned, organized and produced the 2016 “Clean Air Awards” which honored 10 individuals, businesses, and organizations. Over 350 attended the event.
- Revamped the “Clean Air Awards” which, in 2016, were held for the first time in its 28 years in the Inland Empire. The award categories were updated and modernized in 2016 and the nomination process is now conducted entirely online.
- Partnered with Environmental Science, Engineering, and Technology (ESET) program to plan and hold an alternative fuel Car Show at Carson High School.

Environmental Justice

- Developed and implemented the Chairman’s Environmental Justice Community Partnership Initiative which coordinated six community workshops, presented four EJ leadership recognition events, established an Advisory Council of 13 representatives, and held an environmental justice conference.

- Held four Environmental Justice Advisory Group meetings and gave the following staff presentations to the members.

  January 29, 2016
  - Discussion on Proposed Guidelines for Disbursement and Tracking of Funds Received Pursuant to Rule 1304.1 – Electrical Generating Facility Fee for Use of Offset Exemption.
  - Report on EPA's Proposed Revisions to Deadlines for Processing Environmental Justice Complaints.
  - Presentation on the 2016 Air Quality Management Plan.

  April 22, 2016
  - Update on the Aliso Canyon Natural Gas Leak in Porter Ranch.
  - Update on the Clean Communities Plan.
  - Presentation on Near Roadway Monitoring.
  - Update on the Environmental Justice Community Partnership.

  July 29, 2016
  - Presentation on Southern California Edison Company's Charge Ready Program.
  - Update on the 2016 Air Quality Management Plan.
  - Update on AB 1318 Mitigation Fee Projects.
  - Presentation on Opportunities for Clean Freight.

  October 28, 2016
  - Update on the 2016 Air Quality Management Plan.
  - Review of the Environmental Justice Advisory Group Goals and Objectives for 2017.
  - Update on the Environmental Justice Community Partnership.

Media

- Issued 22 Smoke Advisories, 21 Odor Advisories, 12 No-burn Alerts, 36 news releases, and responded to 1,450 media inquiries.
- Drafted talking points, conducted interviews on major issues including Aliso Canyon, Exxon Mobil/PBF and Paramount.
- Provided media relations services and strategic counsel for additional high-profile media issues through press releases, media advisories, in-person and on-camera interviews, and opinion pieces and letters to the editor.
- Recruited and hired a new Senior Public Information Specialist to oversee SCAQMD's "micro-sites" on the agency website.
- Implemented an advertising campaign with Google to promote SCAQMD's signature film "The Right to Breath" and "Do One Thing" video, Residential EV Charging Incentive Program and Lawn Mower Exchange Program through pre-roll videos on YouTube and banner ads on websites.

- Implemented the fourth year of an enhanced winter "Check Before You Burn" advertising and outreach campaign, including radio, cable TV and online ads to continue educating and informing residents about the program and mandatory no-burn days.
- Conducted editorial board meetings with three print media outlets (LA Times, Southern California Newspaper Group, Desert Sun) on the 2016 AQMP.
- Supported the 2016 Lawn Mower Exchange Program.
- Supported SCAQMD's school air filtration program with a joint press event with US EPA at one of three schools that received new air filtration systems through an EPA settlement.
- Wrote and submitted an article published in Air and Waste Management's January 2016 issue of *EM* journal on SCAQMD's petition to US EPA for a new, nationwide ultra-low-NOx standard for trucks.

The Communications & Public Information Unit

- Received and handled about 46,000 main line calls from the public in the form of Cut Smog calls, after hour calls, Spanish line calls, and Clean Air Connection calls. These calls include complaints, breakdown and emergency response.
- The Communications Center assisted the Small Business Assistance Unit by performing nearly 1,200 initial calls to businesses with expired permits to remind them about the expired status of the permits, and to encourage them to bring the permits current.
- The Public Information Center in the SCAQMD lobby handled 2,824 walk-up inquiries.
- Assisted in updating/publishing about 230 web pages, including specific web pages relating to: 1) the Aliso Canyon Natural Gas Leak; 2) Ongoing air monitoring activities in Paramount; 3) Sunshine Canyon Landfill; 4) Torrance Refinery; and 5) the Exide Lead Battery Recycling facility.

Small Business Assistance

- Conducted 1,738 Permit Application Assistances/Technical Consultations
- Conducted 36 On-Site "No-Fault" Inspections
- Conducted 19 Recordkeeping Assistances
- Conducted 6 Variance Assistances
- Issued 4 Dry Cleaning Grants
- Outreach to 1,291 businesses as part of the Expired Permit Program
- Prepared and considered 79 Fee Review Cases, out of which 39 were granted
- Issued 287 Clearance Letters
- Participated in 22 SBA events

Graphics

- Nearly 1,000 major graphics projects completed
- Collateral Brochures and Promotional Items
- Bi-Monthly Advisor Publication
- Quarterly Governing Board Member Newsletters

- Yearly Clean Car Buying Guide
- Program Announcements
- Educational Materials
- Advertisements
- Signage
- The Sentinel Newspaper Wrap
- Informational material for Town Hall Meetings, Community Meetings and Events (including the Clean Air Awards, the Martin Luther King Jr. Day event, Cesar Chavez Day event, and the Environmental Justice Conference).

Social Media

- Facebook – 951 Posts
- Twitter – 1,137 Posts
- Instagram – 118 Posts

ANTICIPATED:

Federal Legislative

- Travel to Washington, DC to support EPA's continued development of an Ultra-Low NOx standard for heavy duty trucks and try to secure funding to support the implementation of control measures in the 2016 AQMP.
- Host a tour of SCAQMD and a bus tour of air pollution challenges and solutions for key Washington, DC-based Congressional staffers.

State Legislative

- Introduce legislation based on Governing Board direction to address other funding for the AQMP as well as authority for the Executive Officer to issue Temporary Order for Abatements under conditions that pose an imminent and substantial endangerment to the community and environment.
- Strengthen our state legislative education and outreach by increased engagement with state legislators and Capitol staff (members and committees) to promote SCAQMD legislative priorities, sponsored legislation, and to support AQMP efforts.
- Strengthen our legislative education, partnership, outreach, and coalition building efforts by increased engagement with all stakeholders to promote SCAQMD legislative priorities, sponsored legislation, and to support AQMP efforts.
- Enhance the Communication Plan to effectively communicate to the public, government agencies, stakeholders and elected officials in a timely fashion.
- Work with the relevant departments to improve the efficiency and ease with which existing data can be extracted on a recurring basis for specified, approved purposes for the benefit of Public Outreach and Governmental Relations (CLASS and Peoplesoft).

Community Affairs

- Improve internal communication to facilitate Senior Public Information Specialists' (Field Representatives) ability to serve SCAQMD and the public, including elected officials, city/county entities, environmental, health, businesses and other stakeholders.
- Compile a "Hot List" on an on-going basis for Field Representatives including, but not limited to: Governing Board initiatives; Committee, Advisory Group meetings; Permitting and Compliance information for counties and cities; SBA activities to better promote city/county awareness of SCAQMD programs both for their own information and for businesses in their communities; Legislative issues; "Business opportunities" at SCAQMD to create and maintain an updated list of RFPs, grants and other opportunities; Rules, Title V, AB 2588 and other processes as related to their assigned geographic regions or in general; and, STA projects and programs such as Carl Moyer, Prop 1B, Residential Charging and others.
- Improve information dissemination and crisis communications (For Community Relations, there will be a specific emphasis on improving a two-way flow of communications with communities affected by toxics, Title V facilities, refineries and other issues).
- Provide workshops or print materials to educate community members on issues such as odors, smoke, and other air quality issues.
- Coordinate with the Public Advisor on developing a system to better inform communities/stakeholders throughout the region, including a Crisis Management Plan.
- Determine if setting up depositories throughout the region would be helpful in disseminating SCAQMD information.
- Improve email blasts and coordination with social media to provide clear information in a timely fashion.
- Improve Governing Board Member Newsletter Team coordination to expedite the process and to improve the quality of articles.
- Increase relationship building with all levels of government, community, health, environmental, business and other stakeholder groups. A focused subset of this outreach for specific geographic regions will focus on environmental justice.
- Coordinate with the other LPAM Managers to prioritize key individuals and organizations to strengthen relationships with SCAQMD.
- Create and implement a schedule by which the assigned geographic outreach staff will meet with targeted individuals and organizations including Chambers of Commerce.
- Build upon Community Partnership concept to develop relationships and shared actions to promote air quality related health issues and other SCAQMD initiatives.
- Develop an effective format for an SCAQMD Air in Brief or other such document that can be used in outreach efforts. The information will be developed from the improved internal communications such as RFP opportunities, compliance and permitting, rules, events, and other issues as appropriate for the stakeholder. Also, subscriptions to the Advisor and invitations to view new issues will be incorporated.
- Improve database and list management to increase successful communications.

- Work with SBA to provide information on their programs and services. Support SBA efforts by facilitating relationships with cities/counties, business organizations, and community groups. Improve community access to SBA programs through outreach efforts as directed by Public Advisor and SBA Manager.
- Work with Legislative staff to ensure that the Local Government and Community Relations staff are well informed and appropriately conversant in state and federal issues. Support Legislative Team to promote key initiatives/goals. Assist with bill analysis and other activities. Provide and facilitate a two-way flow of communication between local, state and federal elected officials and their staff, along with businesses, and community organizations to assist with legislative efforts.
- Invite staff from inside LPAM and other departments to participate/present at weekly team meetings to increase collaboration and awareness of current programs and services.
- Coordinate the efforts to redesign the SCAQMD booth and collateral materials with the other Legislative & Public Affairs Managers to provide the resources to assist with marketing efforts. Assemble a team from the Senior Public Information Specialists to assist with booth redesign and the writing and editing of collateral materials. For example, Everyday Choices/Sustainable Living (similar to Clean Air Choices); The Road to Clean Air; Health Effects; and, Factory to Store (Goods movement is relevant to many of the environmental justice communities that staff work in from Los Angeles/Long Beach all the way into the Inland Valley). Also, create interactive demonstrations to relate to messages.
- Collaborate and assist other SCAQMD Departments on major initiatives and projects including, but not limited to, Title V permits and other permits, compliance and enforcement issues, rule making process, AQMP, AB2588 Toxic Hotspots program, AB2766 outreach to cities, incentive programs, "Check Before You Burn," and other projects.
- Partner with environmental education organizations, develop and implement an educational outreach program to reach youth and their families. It is possible that SCAQMD can provide technical expertise to an existing educational program that is being implemented.
- Build relationships with organizations to expand air quality awareness among young adults and professionals. For example, participate in the U.S. Green Building Council to promote sustainability and air quality issues.

Environmental Justice

- Coordinate four regional Environmental Justice Community Partnership events (with leadership recognition portions), an educational bus tour for youth, and a summit on best practices in dealing with environmental complaints for government agencies and EJ groups.
- Present the third annual Environmental Justice Conference in November 2017.
- Host the 29th Annual SCAQMD Clean Air Awards in October 2017.

- Establish a Young Leaders Advisory Council with representatives of the youth and young adults from each of the four counties in the South Coast basin.

Media

- Be proactive in getting SCAQMD's message out.
- Provide media training to executive level staff and senior managers to ensure that they are capable of responding to media requests when their expertise is called upon.
- Provide media relations services and strategic counsel for high-profile media issues as well as ongoing SCAQMD programs and projects through press releases, media advisories, talking points, in-person and on-camera interviews, opinion pieces and letters to the editor.
- Develop policies and procedures for creating and updating SCAQMD web micro-sites on high-profile issues, and maintain those sites;
- Oversee production of a new SCAQMD signature video;
- Support the 2017 Lawn Mower Exchange program with media outreach; and
- Implement outreach for the 2017-18 "Check Before You Burn" season to continue to educate media and the public about the program and mandatory no-burn days.

The Communications & Public Information Unit

- Receive and handle about 45,000-50,000 main line calls from the public in the form of Cut Smog calls, after hour calls, Spanish line calls, and Clean Air Connection calls. These calls also include air quality complaints, reports of equipment breakdowns, and emergency response requests.
- Assist the Small Business Assistance Unit by performing about 1,200 initial calls to businesses with expired permits to remind them about the expired status of the permits, and to encourage them to bring the permits current.
- Handle 2,500-3,000 walk-up inquiries via the Public Information Center in the SCAQMD lobby.
- Assist in updating/publishing about 230 web pages to enhance efficient access of information to the public, including specific web pages relating to: 1) the Aliso Canyon Natural Gas Leak; 2) Ongoing air monitoring activities in Paramount; 3) Sunshine Canyon Landfill; 4) Torrance Refinery; and 5) the Exide Lead Battery Recycling facility.

Small Business Assistance

- Conduct 1,738 Permit Application Assistances/Technical Consultations
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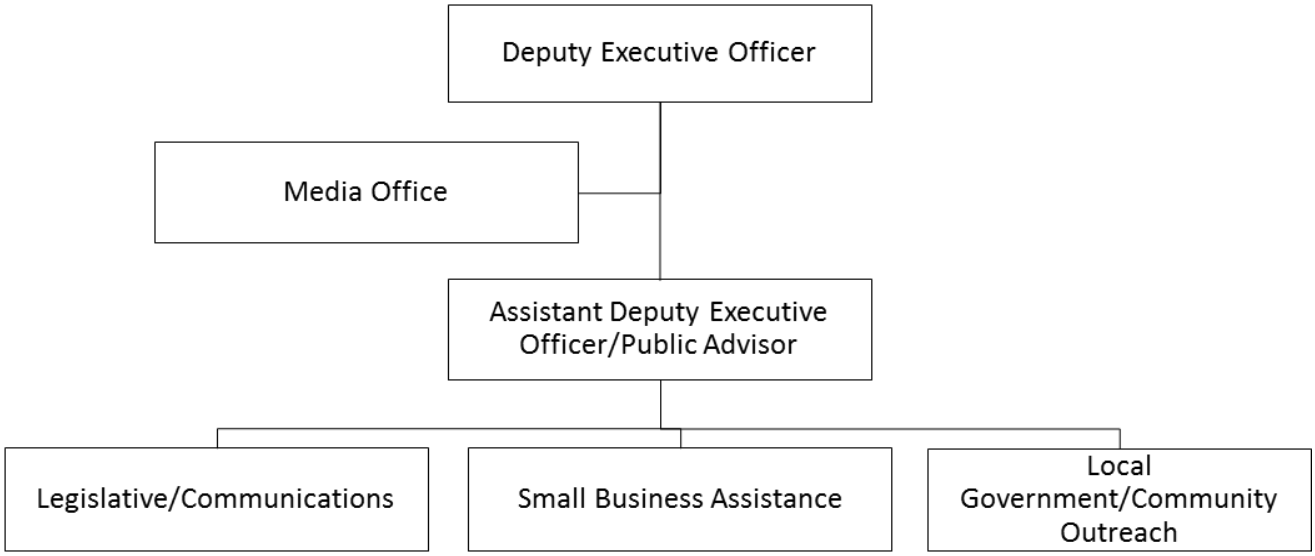
- Issue 4 Dry Cleaning Grants
- Outreach to 1,291 businesses as part of the Expired Permit Program
- Prepare and consider 79 Fee Review Cases, out of which 39 were granted
- Issue 287 Clearance Letters

- Participate in 22 SBA events

Graphics

- Complete about 1,000-1,100 major graphics projects, including: 1) Collateral Brochures and Promotional Items; 2) Bi-Monthly Advisor Publication; 3) Quarterly Governing Board Member Newsletters; 4) Yearly Clean Car Buying Guide; 5) Signage, and informational material for Town Hall Meetings, Community Meetings and Events; 6) Educational Materials; 7) Advertisements; 8) Program Announcements.
- Develop SCAQMD collaterals and social media content that include a consistent message and focuses on the branding of the SCAQMD throughout all public materials.
- Continue to build, maintain and update our outreach databases and management systems to communicate more effectively to stakeholders, impacted communities and the public at large.

CURRENT ORGANIZATIONAL CHART:



POSITION SUMMARY: 47 FTEs

Legislative & Public Affairs Units	Amended FY 2016-2017	Change	Proposed FY 2017-2018
Administration	6	-	6
Legislative & Public Affairs	35	1	36
Media Office	-	5*	5
Total	41	6	47

*Transfer from former Media Office Unit

STAFFING DETAIL:

2017-18 Requested Staffing

Position	Title
2	Air Quality Engineer
2	Air Quality Inspector
1	Assistant Deputy Executive Officer
3	Community Relations Manager
1	Deputy Executive Officer
1	Director of Communications
3	Graphic Illustrator II
1	Office Assistant
1	Program Supervisor
1	Public Affairs Specialist
7	Radio Telephone Operator
3	Secretary
2	Senior Administrative Secretary
2	Senior Office Assistant
1	Senior Public Affairs Manager
12	Senior Public Information Specialist
1	Senior Staff Specialist
2	Staff Assistant
1	Supervising Radio Telephone Operator
47	Total Requested Positions

Legislative & Public Affairs/Media Office
Work Program by Office

#	Program Code		Goal	Program Category	Program	Activities	FTEs FY 2016-17	FTEs +/-	FTEs FY 2017-18	Revenue Categories
1	35	046	III	Customer Service and Business Assistance	Admin/Prog Mgmt	Admin Office/Units/SuppCoord Staff	3.02	1.00	4.02	Ib
2	35	111	II	Ensure Compliance	Call Center/CUT SMOG	Smoking Vehicle Complaints	8.00	-	8.00	IX,XV
3	35	126	II	Customer Service and Business Assistance	Clean Air Connections	Coord of region-wide community group	1.00	-	1.00	II,IX
4	35	205	II	Customer Service and Business Assistance	Environmental Education	Curriculum Dev/Project Coord	0.25	-	0.25	II,IX,XV
5	35	240	I	Customer Service and Business Assistance	Environmental Justice	Impl Board's EJ Pgrms/Policies	2.00	-	2.00	II,IV
6	35	260	III	Customer Service and Business Assistance	Fee Review	Cmte Mtg/Fee-Related Complaint	0.50	-	0.50	II,III,IV,XV
7	35	280	I	Policy Support	Advisory Group/Ethnic Comm	GB Ethnic Comm Advisory Group	0.40	-	0.40	II,IX
8	35	281	I	Policy Support	Advisory Group/Small Business	SBA Advisory Group Staff Support	0.50	-	0.50	IV,IX
9	35	283	I	Policy Support	Governing Board Policy	Brd sup/Respond to GB req	0.55	-	0.55	Ia
10	35	345	II	Policy Support	Goods Mvmt&Financial Incentive	Goods Movement & Financial Incentives Progr	1.00	-	1.00	IX
11	35	350	III	Operational Support	Graphic Arts	Graphic Arts	2.00	-	2.00	Ia
12	35	381	III	Customer Service and Business Assistance	Interagency Liaison	Interact Gov Agns/Promote SCAQMD	0.15	-	0.15	Ia,XV
13	35	390	I	Customer Service and Business Assistance	Intergov/Geographic Deployment	Dev/Impl Local Govt Outreach	9.50	-	9.50	II,IX
14	35	412	I	Policy Support	Legislation/Federal	Lobbying/Analyses/Tracking/Out	0.25	-	0.25	Ia
15	35	413	I	Policy Support	Legislation/Exec Office Suppor	Coord Legis w/ EO, EC, Mgmt	0.25	-	0.25	Ia
16	35	414	I	Policy Support	Legislation-Effects	Lobbying/Analyses/Tracking/Out	0.80	-	0.80	Ia,IX
17	35	416	I	Policy Support	Legislative Activities	Supp/Promote/Influence Legis/Adm	0.50	-	0.50	Ia
18	35	491	II	Customer Service and Business Assistance	Outreach/Business	Chambers/Business Meetings	1.00	-	1.00	II,IV
19	35	492	II	Customer Service and Business Assistance	Public Education/Public Events	Pub Events/Conf/Rideshare Fair	1.00	-	1.00	II,V,IX,XV
20	35	494	I	Policy Support	Outreach/Collateral Developmen	Edits,Brds,Talk shows,Commercl	0.60	5.00	5.60	Ia
21	35	496	II	Customer Service and Business Assistance	Outreach/Visiting Dignitary	Tours/Briefings-Dignitary	0.25	-	0.25	Ia
22	35	514	I	Customer Service and Business Assistance	Permit: Expired Permit Program	Assist w Permit Reinstatement	0.30	-	0.30	IV
23	35	555	II	Customer Service and Business Assistance	Public Information Center	Inform public of unhealthy air	1.00	-	1.00	II,V,IX
24	35	560	I	Develop Programs	Public Notification	Public notif of rules/hearings	0.50	-	0.50	II,IV,IX
25	35	565	III	Customer Service and Business Assistance	Public Records Act	Comply w/ Public Req for Info	0.10	-	0.10	Ia
26	35	679	III	Customer Service and Business Assistance	Small Business Assistance	Small Business/Financial Assistance	1.00	-	1.00	III
27	35	680	I	Timely Review of Permits	Small Business/Permit Streamln	Asst sm bus to comply/SCAQMD req	3.95	-	3.95	II,III,IV,V,XV
28	35	710	I	Customer Service and Business Assistance	Speakers Bureau	Coordinate/conduct speeches	0.10	-	0.10	Ia
29	35	717	II	Policy Support	Student Interns	Student Interns	0.10	-	0.10	Ia
30	35	791	I	Customer Service and Business Assistance	Toxics/AB2588	Outreach/AB 2588 Air Toxics	0.01	-	0.01	X
31	35	825	III	Operational Support	Union Negotiations	Official Labor/Mgmt Negotiate	0.01	-	0.01	Ia
32	35	826	III	Operational Support	Union Steward Activities	Union Steward Activities	0.01	-	0.01	Ia
33	35	855	II	Operational Support	Web Tasks	Create/edit/review web content	0.40	-	0.40	Ia
						Total Legislative & Public Affairs/Media Office	41.00	6.00	47.00	

Legislative & Public Affairs Line Item Expenditure						
Major Object / Account # **/** Account Description		**FY 2015-16 Actuals**	**FY 2016-17 Adopted Budget**	**FY 2016-17 Amended Budget**	**FY 2016-17 Estimate ***	**FY 2017-18 Proposed Budget**
Salary & Employee Benefits						
51000-52000	Salaries	$ 4,035,208	$ 3,984,138	$ 3,682,375	$ 4,485,383	$ 4,320,002
53000-55000	Employee Benefits	2,102,594	2,252,725	2,252,724	2,265,564	2,431,358
Sub-total Salary & Employee Benefits		$ 6,137,802	$ 6,236,863	$ 5,935,099	$ 6,750,948	$ 6,751,360
Services & Supplies						
67250	Insurance	$ -	$ -	$ -	$ -	$ -
67300	Rents & Leases Equipment	13,977	7,000	31,000	29,501	7,000
67350	Rents & Leases Structure	21,107	9,000	44,000	41,873	9,000
67400	Household	-	-	-	-	-
67450	Professional & Special Services	1,719,354	1,648,846	2,066,447	1,966,553	1,648,846
67460	Temporary Agency Services	49,845	114,000	94,000	89,456	114,000
67500	Public Notice & Advertising	3,015	26,600	26,600	25,314	26,600
67550	Demurrage	400	-	-	-	-
67600	Maintenance of Equipment	650	9,000	-	5,000	9,000
67650	Building Maintenance	-	-	-	-	-
67700	Auto Mileage	12,356	24,800	24,800	23,601	24,800
67750	Auto Service	16	-	-	-	-
67800	Travel	34,275	45,200	45,200	43,015	45,200
67850	Utilities	-	-	-	-	-
67900	Communications	52,633	47,000	47,500	45,204	47,000
67950	Interest Expense	-	-	-	-	-
68000	Clothing	-	-	205	180	-
68050	Laboratory Supplies	-	-	-	-	-
68060	Postage	53,960	137,800	107,800	94,660	137,800
68100	Office Expense	64,590	45,300	49,499	43,466	45,300
68200	Office Furniture	-	-	-	-	-
68250	Subscriptions & Books	19,789	18,200	18,200	15,982	18,200
68300	Small Tools, Instruments, Equipment	-	-	-	-	-
68400	Gas and Oil	-	-	-	-	-
69500	Training/Conference/Tuition/ Board Exp.	10,216	8,500	8,500	8,089	8,500
69550	Memberships	19,517	26,250	26,250	24,981	26,250
69600	Taxes	-	-	-	-	-
69650	Awards	35,825	49,681	49,681	47,279	49,681
69700	Miscellaneous Expenses	42,548	43,100	42,895	40,821	43,100
69750	Prior Year Expense	-	-	-	-	-
69800	Uncollectable Accounts Receivable	-	-	-	-	-
89100	Principal Repayment	-	-	-	-	-
Sub-total Services & Supplies		$ 2,154,073	$ 2,260,277	$ 2,682,577	$ 2,544,976	$ 2,260,277
77000	**Capital Outlays**	$ -	$ -	$ -	$ -	$ 19,400
79050	**Building Remodeling**	$ -	$ -	$ -	$ -	$ -
Total Expenditures		$ 8,291,875	$ 8,497,140	$ 8,617,676	$ 9,295,924	$ 9,031,037
* Estimates based on July 2016 through February 2017 actual expenditures and budget amendments.						

PLANNING, RULE DEVELOPMENT & AREA SOURCES

PHILIP FINE
DEPUTY EXECUTIVE OFFICER
PROGRAM STATEMENT

At a Glance:	
FY 2016-17 Budget	$17.7M
FY 2017-18 Request	$19.8M
Percent of SCAQMD Request	13.2%
Total Requested FTEs	120

DESCRIPTION OF MAJOR SERVICES:

The Office of Planning, Rule Development and Area Sources (PRDAS) is responsible for the majority of SCAQMD's air quality planning functions, including State Implementation Plan (SIP)-related activities, air quality management and maintenance plans, reporting requirements and other federal Clean Air Act requirements. PRDAS is also responsible for developing proposals for new rules and amendments to existing rules to implement the SIP obligations, to seek funding for air quality projects through grants, to reduce air toxic emissions/exposures, to conduct socioeconomic and environmental assessments of Air Quality Management Plans (AQMPs) and rulemaking actions. All permit modeling review and California Environmental Quality Act (CEQA) functions are part of this office including acting as lead agency (for SCAQMD permitting projects and rulemaking projects), responsible agency, and commenting agency under CEQA. In addition, this office is responsible for developing and implementing the SCAQMD's Clean Communities Plan which is an overall plan for air toxics and includes communities that support the agency's overall goals for environmental justice. PRDAS implements AB2588, the state Toxic Hot Spots Program, as well as the Annual Emissions Reporting program (AER), and is responsible for climate change and energy policy. The office also conducts air quality evaluations and forecasting, inventories of area sources, and compliance activities related to area sources. In addition, PRDAS is responsible overseeing the development of the Multiple Air Toxics Exposure Study and for providing input and guidance on health effects associated with air quality policies and other air quality related issues that arise from individual facilities or communities throughout the air basin. The Transportation Program in PRDAS implements Rule 2202 and provides AB2766 Subvention fund program assistance and training to the regulated community and local governments. The section of the Mobile Source team transferred to PRDAS from the Science & Technology Advancement Office in FY 2016-17 focuses on fleet rules, mobile source policy, and facility-based measures.

ACCOMPLISHMENTS:

RECENT:

AQMP/SIP

- Completed the development of the 2016 AQMP for the attainment demonstration of the 8-hour and 1-hour ozone federal standards as well as the 24 hour and annual PM2.5 federal standards for both the South Coast Air Basin and Coachella Valley.
- The 2016 AQMP included updated emissions inventories, a comprehensive control strategy, modeling and demonstration of compliance with other Clean Air requirements such as Reasonably Available Control Technology (RACT)/Reasonably Available Control Measures (RACM) analyses, RFP, Vehicle Miles Traveled (VMT) demonstration and transportation conformity budgets. We held over 170 meetings with stakeholders, the AQMP Advisory Group and the Scientific, Technical & Modeling Peer Review (STMPR) groups to solicit input on the Plan, and worked with federal, state, and local government and other stakeholders.

Air Quality Forecasting

- Upgraded the air quality forecasting program to improve PM2.5 and ozone forecasting and to improve and support implementation of Rule 445, the Check Before You Burn program.

Health Effects

- Completed 10 reports and fact sheets for public audiences related to high-profile and/or emergency response situations. These reports and fact sheets are posted on the website.
- Completed Appendix I of the 2016 AQMP, the Health Effects of Air Pollution.

Rule Development

- Amended Regulation XX, RECLAIM to further implement control measure CMB-01 (Further Reductions from RECLAIM) from the 2012 AQMP. The amendments addressed the treatment of RECLAIM trading credits upon NOx RECLAIM facility shutdowns.
- Amended Rules 307.1, 1401, 1402 to incorporate a Voluntary Risk Reduction Program that will achieve greater risk reductions sooner than the previous Rule 1402, provisions for Potentially High Risk Level Facilities, and other requirements to streamline implementation of the AB2588 Toxic Hot Spots Program.
- Amendments to Rules 1302 and 1325 were made relative to the 24-hour PM2.5 re-designation and based on U.S. EPA guidance for implementing the PM2.5 standard.
- Amended Rule 1113 to reduce VOC emissions from architectural coatings and to clarify the rule and improve enforceability.
- Amended Rules 1401, and 1402 to reference and harmonize specific rule provisions with the Revised Office of Environmental Health Hazard Assessment (OEHHA) Guidelines and to use the Revised OEHHA Guidelines to estimate health risks from air toxics during permitting and AB 2588.
- Contracted with an independent third party to review SCAQMD's Rule 1147 Technology Assessment. Incorporated recommendations from a third party consultant and finalized Rule 1147 Technology Assessment.

AB2588

- Completed a significant update of all of the guidance documents for the AB 2588 program, including the Prioritization Procedures, Supplemental Guidelines, Public Notification Guidelines, and the new Voluntary Risk Reduction Program Guidelines.
- Conducted significant analysis of potential health risks from metal working facilities, particularly from hexavalent chromium in the community of Paramount. Designated the first two facilities in the 'Potentially High Risk Level Facility' category under recently amended Rule 1402.

Annual Emissions Reporting

- Completed emissions inventories and collected annual emissions fees for about 1,800 facilities.
- Updated the Annual Emissions Reporting web tool software.

CEQA

- Reviewed and commented on over 1,000 CEQA documents prepared by other lead agencies.
- Completed the Program Environmental Assessment for the 2016 AQMP.

Socioeconomic Report

- Completed the Draft Socioeconomic Report for the 2016 AQMP where several recommendations from the 2014 Abt review were implemented, including, working with stakeholders to come to consensus regarding defining baseline for socioeconomic analyses; updating, enhancing and expanding health benefits and environmental justice analyses; reporting cost-effectiveness using both discounted cash flow and levelized cash flow methods; evaluating uncertainty of REMI amenity modeling; and improving process transparency and document clarity.

Transportation

- Assisted local governments with the implementation of AB 2766 funds to reduce mobile source emissions. The annual report submitted in 2016 covered FY 2014-15 and reflected 162 eligible cities, and funded 368 projects of which 229 had quantified mobile emission reductions.
- Assisted regulated employers in the development of their Rule 2202 plans. Evaluated and processed over 1,300 Rule 2202 plan submittals.

Clean Communities Plan

- Completed implementation of EPA's Targeted Air Shed Grant. Approximately $3 million was spent on the following programs: residential lawn mower exchanges, collaboration with Southern California Gas Company on a weatherization program, aqueous brake cleaning systems for auto repair shops, air filtration for several schools, Super Compliant coatings for several beautification projects, pilot program to test and demonstrate commercial mowers at municipal agencies, and EV chargers for non-profit organizations. Completed final report for U.S. EPA.

Other

- Finalized guidelines to implement emission reduction funding programs via fees paid for use of offsets by electrical generating facilities (EGFs).
- Completed contract management for three PM control related projects funded by AB 1318.
- Continued testing of control technologies for underfired charbroilers and worked with stakeholders to develop protocols and conduct NOx characterization study of residential and commercial food service equipment (ovens, fryers, griddles, etc.).
- Continued inventory, and implementation and enforcement of rules relative to area sources of emissions.

ANTICIPATED:

SIP/AQMP

- Adopt and implement the 2016 AQMP SIP obligations through development of new and amended VOC, NOx, and PM2.5 rules, as well as development of incentive programs and guidelines per U.S. EPA requirements. In addition, update as necessary Administrative and NSR rules.
- Continue working on Funding Plan for 2016 AQMP and initiate stakeholder working group meetings.
- Continue working groups and rule amendments per SIP measures, including RECLAIM, Facility-based measures, life-cycle emissions assessment, SCAQMD's solar initiative, etc.
- Adopt Rule 1430 to control emissions from metal grinding operations at metal forging facilities.
- Amend Rules 219 and 222 to add equipment categories for exemption due to low criteria and toxic emissions potential, remove exemptions for equipment that have a potential to emit toxic emissions (i.e., toxic metals), make other changes to utilize the Rule 222 registration process in lieu of a permit and other clarifications to simplify and streamline the administration of the permit system.
- Amend Rule 1147 to address compliance issues for low-emitting NOx sources.
- Develop a tracking system for emission reductions achieved as a co-benefit to existing climate change programs.

MATES V

- Work with Monitoring and Analysis staff, develop the plan for the implementation of MATES V, work toward deployment of monitors in 2018.

Rule Development

- Develop or amend rules to address emissions from refinery flares (Rule 1118), refinery fence line and community monitoring (Rule 1180), and hydrogen fluoride use at refineries (Rule 1410).
- Develop or amend rules to address toxic metal emissions such as metal finishing operations (Rules 1469 and 1426), lead sources (Rule 1420), laser cutting operations (Rule 1435), and metal heat treating operations (Rule 1445).

- Amend flaring rule for landfills (Rule 1150.1) and non-refinery flares (Rule 1118.1).
- Initiate Working Group Meetings to develop options for the future of RECLAIM. The 2016 AQMP control measure CMB-05 commits to further reduction of NOx RTC holdings.
- Continue ongoing rulemaking efforts to meet commitments in the 2016 AQMP, such as further volatile organic compounds (VOC) reductions from adhesive and sealant applications (Rule 1168), coating of metal parts and products (Rule 1107), wood products coatings (Rule 1136), and solvent cleaning operations (Rule 1171). Further evaluate potential adverse impacts from lowering VOC limits.
- Re-engage stakeholders to address odors from animal rendering processes (Proposed Rule 415) and odors from kitchen trap grease transport and processing (Proposed Rule 416).
- Continue rulemaking efforts to support permit streamlining initiatives through effective use of registration and adjustments to permitting exemption thresholds for *de minimis* or potentially toxic emission sources.
- Continue rulemaking efforts to amend Rule 1153.1 to address rule applicability and emission limits based on incoming required source test results and transfer rule applicability for food ovens from Rule 1147 to Rule 1153.1.
- Continue working with stakeholders to assess implementation of Rule 1111 and the development of new Rule 1111.1, if necessary.
- Amend Rule 1135 in support of the RECLAIM opt-out provisions for EGFs (or draft a new rule in place of Rule 1135).
- Finalize tBAc Assessment White Paper and bring to Governing Board to resolve issues around exempt compounds and move forward with VOC rulemaking efforts.
- Amend Rule 1401 to incorporate the OEHHA Guidelines for Estimating Health Risks for spray booths and gas stations.

AB2588

- Implement the new OEHHA health risk guidelines and Rule 1402 amendments in the AB 2588 program.
- Update the Industry-Wide AB 2588 Health Risk Assessment for gas stations using new health risk guidelines from OEHHA and new emission factors from CARB.

Annual Emissions Reporting

- Continue evaluating emissions inventories and annual emissions fees.
- Improve AER on-line reporting system to facilitate data entry for users.

CEQA

- Update policy documents to reflect 2015 Revised OEHHA Guidelines for Estimating Health Risk and current air quality standards.
- Continue developing and reviewing CEQA lead agency projects (rules and permitting projects) and commenting on CEQA documents through the SCAQMD's Intergovernmental Review program.

Socioeconomic

- Oversee an ongoing consulting contract based on Abt's recommendation to review methods and data for evaluating small scale socioeconomic impacts; staff implementation of consultant recommendations will follow.
- Issue Requests for Proposal (RFPs) or sole-source contracts to further implement the remaining Abt recommendations including updates to non-health benefits.
- Conduct socioeconomic analyses for rule projects.

Transportation Programs

- Continue conducting Employee Transportation Coordinator training sessions and review and analyze Rule 2202.
- Work towards the development of an on-line Rule 2202 plan submittal process.
- Work towards the development of an on-line Rule 2202 Employee Transportation Coordinator training platform.

Clean Communities Plan

- Summarize pilot studies for Clean Communities Plan for San Bernardino and Boyle Heights.

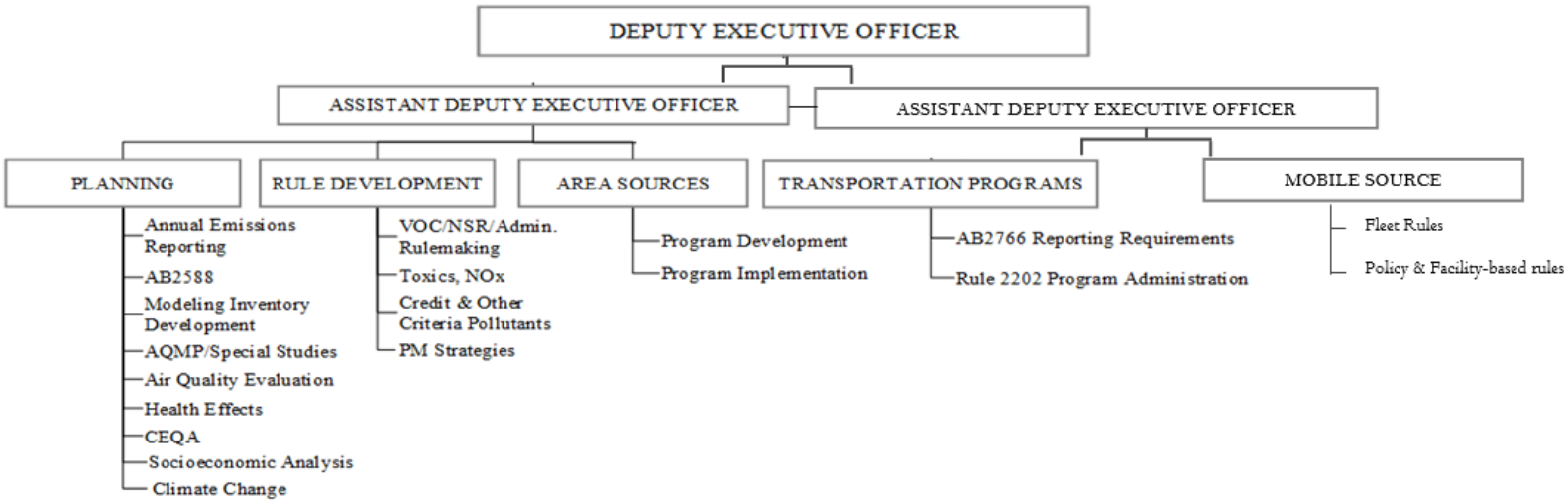
Mobile Source

- Continue working on implementation of existing fleet rules, and implement mobile source 2016 AQMP measures, such as facility based measures and fleet rule amendments.

Other

- Continued support for PM reduction projects funded under AB 1318.
- Continue inventory and implementation of rules in support of rulemaking efforts and compliance verification activities, inclusive of Rule 317 accounting.
- Establish technical assessments and incentive guideline development for rule development, as needed.
- Track the potential need for use of internal offsets by EGFs.
- Launch the Architectural Coatings Publically Searchable Database.
- Complete development and launch on-line Rule 1415 registration.

ORGANIZATIONAL CHART:



POSITION SUMMARY: 120 FTEs

Planning, Rule Development and Area Sources Units	Amended FY 2016-17	Proposed Change	Proposed FY 2017-18
Office Administration	6	-	6
Planning	66	2	68
Rule Development	12	2	14
Area Sources	10	-	10
Transportation Programs	13	-	13
Health Effects	2	-	2
Mobile Source *	0	7	7
Total	109	11	120

*In FY 2016-17, 7 FTEs were reassigned from Science & Technology Advancement to Planning, Rule Development & Area Sources.

STAFFING DETAIL:

2017-18 Requested Staffing

Position	Title
2	Administrative Secretary
9	Air Quality Engineer II
4	Air Quality Inspector II
1	Air Quality Inspector III
44	Air Quality Specialist
2	Assistant Deputy Executive Officer
1	Deputy Executive Officer - Planning, Rule Development & Area Sources
1	Director of Strategic Initiatives
1	Health Effects Officer
6	Office Assistant
6	Planning and Rules Manager
20	Program Supervisor
8	Secretary
3	Senior Administrative Secretary
3	Senior Air Quality Engineer
1	Senior Meteorologist
3	Senior Office Assistant
3	Senior Staff Specialist
2	Transportation Plan Reviewer
120	Total Requested Positions

Planning, Rule Development & Area Sources Work Program by Office										
#	Program Code		Goal	Program Category	Program	Activities	FTEs FY 2016-17	+/-	FY 2017-18	Revenue Categories
1	26	002	I	Develop Programs	AB2766/Mobile Source	AB2766 Mobile Source Outreach	0.90	0.14	1.04	IX
2	26	007	I	Customer Service and Business Assistance	AB2766/MSRC	AB2766 Prov Tech Asst to Cities	1.10	0.12	1.22	IX
3	26	009	I	Develop Programs	AB 1318 Mitigation	AB 1318 Projects Admn/Impl	0.25	0.05	0.30	XVII
4	26	010	I	Develop Programs	AQMP	AQMP Special Studies	2.00	-	2.00	IV,V,IX,XV
5	26	038	I	Develop Programs	Admin/Office Management	Coordinate Off/Admin Activities	0.75	3.80	4.55	Ib
6	26	040	I	Timely Review of Permits	Admin/Office Mgmt/AQ Impl	Admin/Modeling/New Legis/Sm Sr	0.47	(0.47)	-	Ib
7	26	042	I	Ensure Compliance	Admin/Office Mgmt/Compliance	Admin: Compl w SCAQMD Rules	0.50	(0.50)	-	Ib
8	26	044	I	Timely Review of Permits	Admin/Office Mgmt/Permit & Fee	Admin: Resolve Perm/Fee Issues	0.10	(0.10)	-	Ib
9	26	046	I	Ensure Compliance	Admin/Office Mgmt/Compliance	Admin: Compl of Existing Source	0.75	(0.75)	-	Ib
10	26	048	I	Policy Support	Admin/Prog Mgmt/Policy	Admin: GB/Committee Support	1.25	(1.25)	-	Ib
11	26	049	I	Develop Programs	Admin/Prog Mgmt/AQMP	Admin: AQMP Development	1.00	(1.00)	-	Ib
12	26	050	I	Develop Rules	Admin/Rule Dev/PRA	Admin: Rule Development	1.25	(0.65)	0.60	Ib
13	26	057	I	Develop Programs	Admin/Transportation Prog Mgmt	Admin: Transportation Programs	0.75	(0.75)	-	Ib
14	26	061	I	Monitoring Air Quality	Air Quality Evaluation	Air Quality Evaluation	1.05	1.20	2.25	IX
15	26	068	II	Develop Programs	SCAQMD Projects	Prepare Environmental Assessments	4.10	(0.75)	3.35	II,IV,IX
16	26	071	I	Develop Rules	Arch Ctgs - Admin	Rdev/Aud/DB/TA/SCAQMD/Rpts/AER	1.00	0.10	1.10	XVIII
17	26	072	I	Ensure Compliance	Arch Ctgs - End User	Compliance/Rpts/Rule Implementation	1.00	(0.20)	0.80	XVIII
18	26	073	I	Ensure Compliance	Arch Ctgs - Other	Compliance/Rpts/Rule Implementation	1.00	(0.20)	0.80	XVIII
19	26	076	I	Ensure Compliance	Area Sources/Compliance	Area Source Compliance	5.00	(0.30)	4.70	III,IV,V,IX,XV
20	26	077	I	Develop Rules	Area Sources/Rulemaking	Dev/Eval/Impl Area Source Prog	2.00	0.05	2.05	II,IX
21	26	083	II	Policy Support	Brain Tumor & Air Poll Fdn	Brain Tumor & Air Poll Foundation Support	0.10	-	0.10	Ia,II,IV
22	26	084	I	Develop Rules	Blk Carbon Stdy EPA	EPA Blck Carbon Climate Study	0.20	(0.20)	-	V,XVII
23	26	102	II	Develop Programs	CEQA Document Projects	Review/Prepare CEQA Comments	4.00	(0.50)	3.50	II,IX
24	26	104	I	Develop Programs	CEQA Policy Development	ID/Develop/Impl CEQA Policy	0.90	0.30	1.20	IV,IX
25	26	128	I	Develop Programs	Cln Communities Pln	Cln Communities Plan Admn/Impl	0.20	0.05	0.25	II,IX
26	26	148	I	Policy Support	Climate Change	GHG/Climate Change Policy Development	2.10	1.00	3.10	IV,XVII
27	26	165	I	Develop Rules	Conformity	Monitor Transp. Conformity	0.40	(0.15)	0.25	V,IX
28	26	215	I	Ensure Compliance	Annual Emission Reporting	Annl Des/Impl/Emiss Monitor Sys	7.50	0.50	8.00	II,V
29	26	216	I	Customer Service and Business Assistance	AER Public Assistance	AER Design/Impl/Monitor Emiss	2.00	-	2.00	II
30	26	217	I	Develop Programs	Emissions Inventory Studies	Dev Emiss DB/Dev/Update Emiss	2.00	(1.30)	0.70	II,V,IX,XV
31	26	218	I	Develop Programs	AQMP/Emissions Inventory	Dev Emiss Inv: Forecasts/RFPs	1.30	-	1.30	II,IX
32	26	219	I	Develop Programs	Emissions Field Audit	Emissions Field Audit	0.50	-	0.50	II
33	26	240	I	Policy Support	EJ-AQ Guidance Document	AQ Guidance Document	0.40	(0.35)	0.05	II,IX
34	26	276	I	Policy Support	Advisory Group/Home Rule	Governing Board Advisory Group	0.30	-	0.30	Ia
35	26	277	I	Policy Support	Advisory Group/AQMP	Governing Board AQMP Advisory Group	0.05	-	0.05	II,IX
36	26	278	I	Policy Support	Advisory Group/Sci,Tech,Model	Scientific/Tech/Model Peer Rev	1.15	(1.00)	0.15	II,IX
37	26	358	I	Ensure Compliance	GHG Rules-Compl	Green House Gas Rules-Compliance	-	1.05	1.05	IV
38	26	362	II	Develop Rules	Health Effects	Study Health Effect/Toxicology	1.90	0.35	2.25	II,III,IX
39	26	385	I	Develop Rules	Criteria Pollutants/Mob Srcs	Dev/Impl Intercredit Trading	0.75	-	0.75	IV,IX
40	26	397	II	Develop Programs	Lead Agency Projects	Prep Envrnmt Assmts/Perm Proj	1.10	0.65	1.75	III

Planning, Rule Development & Area Sources (Cont.) Work Program by Office										
#	Program Code		Goal	Program Category	Program	Activities	FTEs FY 2016-17	+/-	FY 2017-18	Revenue Categories
41	26	416	I	Policy Support	Legislative Activities	Supp/Promote/Influence Legis/Adm	0.10	0.40	0.50	Ia
42	26	443	I	Monitoring Air Quality	MATES V	MATES V	-	0.30	0.30	II,IX
43	26	445	I	Monitoring Air Quality	Meteorology	ModelDev/Data Analysis/Forecast	2.15	(0.10)	2.05	II,V,IX
44	26	448	I	Develop Programs	Mobile Src Strategies-Off Road	CARB Off-Road Mob Src ctrl strategy for SIP	-	1.00	1.00	XVII
45	26	449	I	Develop Rules	Mob Src/SCAQMD Rulemaking	Prepare SCAQMD Mob Src rulemaking proposals	-	0.81	0.81	IX
46	26	451	I	Develop Programs	Mob Src/CARB/EPA Monitoring	CARB/US EPA Mob Src Fuel Policies	-	1.50	1.50	IX
47	26	452	I	Develop Programs	Mob Src/CEC/US DOE Monitoring	CEC/US DOE Mob Src rulemaking proposals	-	1.00	1.00	IX,XVII
48	26	454	I	Policy Support	Mob Src:Greenhs Gas Reduc Meas	Provide comments on mob src portion of AB32	-	0.89	0.89	XVII
49	26	460	I	Develop Rules	Regional Modeling	Rule Impact/Analyses/Model Dev	5.30	-	5.30	II,V,IX
50	26	461	I	Timely Review of Permits	Permit & CEQA Modeling Review	Review Model Permit/Risk Assmt	1.50	(0.20)	1.30	III
51	26	503	I	Develop Programs	PM Strategies	PM10 Plan/Analyze/Strategy Dev	4.95	(1.55)	3.40	II,V,XV
52	26	530	I	Monitoring Air Quality	Photochemical Assessment	Photochemical Assessment	0.25	-	0.25	II,V
53	26	565	III	Customer Service and Business Assistance	Public Records Act	Comply w/ Public Rec Requests	0.53	0.04	0.57	Ia
54	26	600	I	Develop Programs	Credit Generation Programs	Dev RFP/AQMP Ctrl Strats/Inter	-	-	-	II,V,IX
55	26	620	I	Ensure Compliance	Refinery Pilot Project	Refinery Pilot Project	0.25	-	0.25	II
56	26	643	I	Timely Review of Permits	Rule 222 Filing Program	Rule 222 Filing Program	-	-	-	IV
57	26	645	I	Ensure Compliance	Rule 1610 Plan Verification	Rule 1610 Plan Verification	0.50	0.25	0.75	V,IX
58	26	654	I	Develop Rules	Rulemaking/NOX	Rulemaking/NOx	2.70	(0.20)	2.50	II,IV,XV
59	26	655	I	Develop Rules	NSR/Adm Rulemaking	Amend/Develop NSR & Admin Rules	2.00	0.50	2.50	II,IV,V,XV
60	26	656	I	Develop Rules	Rulemaking/VOC	Dev/Amend VOC Rules	3.00	2.70	5.70	II,IV,XV
61	26	659	I	Develop Rules	Rulemaking/Toxics	Develop/Amend Air Toxic Rules	7.50	2.00	9.50	II,XV
62	26	661	I	Develop Rules	Rulemaking/RECLAIM	RECLAIM Amend Rules/Related Is	0.57	1.93	2.50	II
63	26	685	I	Develop Programs	Socio-Economic	Apply econ models/Socio-econ	4.00	0.10	4.10	II,IV
64	26	716	I	Ensure Compliance	Spec Monitoring/R403	Rule 403 Compliance Monitoring	1.05	(1.05)	-	III,IV,IX,XV
65	26	717	II	Policy Support	Student Interns	Gov Bd/Student Intern Program	0.01	0.24	0.25	Ia
66	26	738	I	Advance Clean Air Technology	Target Air Shed EPA	Targeted Air Shed Admin/Impl	0.25	-	0.25	V,XVII
67	26	745	I	Develop Programs	Rideshare	Dist Rideshare/Telecommute Prog	1.05	(0.44)	0.61	IX
68	26	794	I	Ensure Compliance	Toxics/AB2588	AB2588 Core, Tracking, IWS	9.40	3.60	13.00	X
69	26	805	III	Operational Support	Training	Training	0.05	0.20	0.25	Ib
70	26	816	I	Develop Programs	Transportation Regional Progs	Dev AQMP Meas/Coord w/Reg Agn	1.00	(0.65)	0.35	V,IX
71	26	825	III	Operational Support	Union Negotiations	Official Labor/Mgmt Negotiate	0.01	0.01	0.02	Ia
72	26	826	III	Operational Support	Union Steward Activities	Rep Employees in Grievance Act	0.01	0.01	0.02	Ia
73	26	833	II	Customer Service and Business Assistance	Rule 2202 ETC Training	Rule 2202 ETC Training	1.30	(0.37)	0.93	XI
74	26	834	I	Develop Programs	Rule 2202 Implement	Rule 2202 Proc/Sub Plans/Tech Eval	3.40	(0.85)	2.55	XI
75	26	836	I	Develop Programs	Rule 2202 Support	R2202 Supt/CmptrMaint/WebSubmt	3.00	(0.41)	2.59	V,XI
76	26	855	II	Operational Support	Web Tasks	Create/edit/review web content	0.10	0.40	0.50	Ia
						Total Planning, Rule Development, and Area Sources	109.00	11.00	120.00	

Planning, Rule Development & Area Sources Line Item Expenditure						
Major Object / Account # **/** Account Description		**FY 2015-16 Actuals**	**FY 2016-17 Adopted Budget**	**FY 2016-17 Amended Budget**	**FY 2016-17 Estimate ***	**FY 2017-18 Proposed Budget**
Salary & Employee Benefits						
51000-52000	Salaries	$ 9,385,632	$ 10,605,729	$ 10,605,513	$ 10,085,280	$ 11,873,576
53000-55000	Employee Benefits	4,631,463	5,354,141	5,354,141	4,793,409	6,118,764
Sub-total Salary & Employee Benefits		$ 14,017,095	$ 15,959,870	$ 15,959,654	$ 14,878,689	$ 17,992,339
Services & Supplies						
67250	Insurance	$ -	$ -	$ -	$ -	$ -
67300	Rents & Leases Equipment	-	-	-	-	-
67350	Rents & Leases Structure	3,587	2,000	32,000	30,453	2,000
67400	Household	-	-	-	-	-
67450	Professional & Special Services	1,067,448	1,122,500	1,164,946	1,108,632	1,173,000
67460	Temporary Agency Services	113,110	50,000	135,000	128,474	50,000
67500	Public Notice & Advertising	50,426	100,000	75,000	71,374	100,000
67550	Demurrage	2,786	1,000	1,000	952	1,000
67600	Maintenance of Equipment	7,987	5,000	47,500	45,204	5,000
67650	Building Maintenance	-	1,000	11,000	10,468	1,000
67700	Auto Mileage	4,929	3,500	3,500	3,331	3,500
67750	Auto Service	-	-	-	-	-
67800	Travel	17,932	45,000	38,000	36,163	40,000
67850	Utilities	-	-	-	-	-
67900	Communications	40,840	40,000	59,500	56,624	40,000
67950	Interest Expense	-	-	-	-	-
68000	Clothing	455	800	800	702	800
68050	Laboratory Supplies	-	-	-	-	-
68060	Postage	40,163	50,000	55,150	48,428	50,000
68100	Office Expense	77,431	150,000	167,000	146,645	150,000
68200	Office Furniture	10,470	-	-	-	-
68250	Subscriptions & Books	230	2,000	2,000	1,756	2,000
68300	Small Tools, Instruments, Equipment	-	-	3,500	3,073	-
68400	Gas and Oil	-	-	-	-	-
69500	Training/Conference/Tuition/ Board Exp.	13,386	20,000	14,000	13,323	25,000
69550	Memberships	6,108	6,000	6,000	5,710	4,000
69600	Taxes	-	-	-	-	-
69650	Awards	-	-	-	-	-
69700	Miscellaneous Expenses	36,258	25,000	41,000	39,018	27,000
69750	Prior Year Expense	-	-	-	-	-
69800	Uncollectable Accounts Receivable	-	-	-	-	-
89100	Principal Repayment	-	-	-	-	-
Sub-total Services & Supplies		$ 1,493,544	$ 1,623,800	$ 1,856,896	$ 1,750,330	$ 1,674,300
77000	**Capital Outlays**	$ 300,105	$ 75,000	$ 75,000	$ 71,374	$ 180,000
79050	**Building Remodeling**	$ -	$ -	$ -	$ -	$ -
Total Expenditures		$ 15,810,744	$ 17,658,670	$ 17,891,550	$ 16,700,394	$ 19,846,639
* Estimates based on July 2016 through February 2017 actual expenditures and budget amendments.						

SOUTH COAST

AIR QUALITY MANAGEMENT DISTRICT

SCIENCE & TECHNOLOGY ADVANCEMENT

MATT MIYASATO
DEPUTY EXECUTIVE OFFICER

At a Glance:	
FY 2016-17 Budget	$25.3M
FY 2017-18 Request	$27.0M
Percent of SCAQMD Request	18.0%
Total Requested FTEs	171

DESCRIPTION OF MAJOR SERVICES:

The Office of Science & Technology Advancement (STA) is responsible for three key areas of operation: monitoring and analysis; technology research and development; and technology implementation. The Monitoring & Analysis Division maintains the SCAQMD's air monitoring network, operates the analytical laboratory and conducts source tests and evaluation, responds to local community monitoring requests, implements quality assurance programs, evaluates low cost sensors, evaluates and implements optical remote sensing (ORS) technologies for emission measurements, and provides meteorological, sampling and analytical support as part of the SCAQMD's emergency response program and special monitoring projects for the agency. The Technology Advancement Office (TAO) implements the Clean Fuels Program to commercialize advanced low- and zero-emission technologies and fund incentive programs such as the Carl Moyer, Lower-Emission School Bus, and Proposition 1B-Goods Movement programs. TAO will also provide support for the Enhanced Fleet Modernization Program (EFMP) and the Mobile Source Air Pollution Reduction Review Committee (MSRC).

ACCOMPLISHMENTS:

RECENT:

- Continued the implementation of the Carl Moyer, Surplus Off-Road Opt-In for NOx (SOON), Lower-Emission School Bus, and the Proposition 1B-Goods Movement programs with total funding exceeding $135 million. Implemented the Voucher Incentive Program (VIP) for replacement of on-road trucks on a first-come-first-served basis. Awarded an additional $9 million to Southern California Regional Rail Authority with the remaining $27 million to be considered with the progress of the project, to replace ten Tier 0 locomotives with Tier 4 locomotives. The total SCAQMD contribution to this project after completion will amount to $110 million. Completed the replacement of about 1,800 older diesel trucks with a funding of $75 million under the Proposition 1B-Goods Movement program.
- Continued the Clean Fuels program, which is the research, development, demonstration and early deployment program for the SCAQMD. Executed over $10.7 million in contracts with $47.3 million in total project costs (1:4 leveraging). Projects in key technical areas include heavy-duty electric drive technologies, near-zero emission heavy-duty engines,

in-use emissions testing of heavy-duty trucks, local renewable natural gas production, and refueling infrastructure for alternative fuels (natural gas, electricity and hydrogen).

- Continued implementation of incentive programs for old vehicle scrapping, off-road equipment repowers and replacement of Tier 0 locomotives with Tier 4 locomotives.
- Continued to assess ambient air quality in the Basin, operated and maintained approximately 43 air monitoring sites resulting in 70,000 valid pollutant data points per month, collection and analysis of 3,800 canisters for ambient Volatile Organic Compounds (VOCs) and toxics and over 15,000 filters for components including mass, ions, carbon and metals. The monitoring network and analysis is in support of federal programs including those for National Air Toxics Trends Stations (NATTS), Photochemical Assessment Monitoring Stations (PAMS), National Core (NCORE) PM2.5 Speciation, and Near-Road Monitoring. Data from this monitoring and analysis provides the basis for compliance with the national ambient air quality standards (NAAQS) and helps with verifying emission models and understanding source contributions for future control measures.
- Continued special monitoring efforts to respond to community concerns and better characterize emissions from oil reclamation activities, metal finishing, metal forging and recycling, battery recycling facilities, hydraulic fracturing operations, emissions leaking from a gas storage facility, and metals from various forging and grinding operations. Continued to operate additional near road monitors. Monitoring for federal programs provided analysis of over 20,000 samples in the laboratory for total suspended particulates, PM10, PM2.5 and VOCs. This analysis included chemical speciation of particulate matter to better understand source signatures and toxics within the samples.
- Continued PM2.5 monitoring to assess potential impacts from the CPV Sentinel power plant in Coachella Valley and PM10 monitoring in the city of Duarte to assess potential impacts from mining operations. Also maintained monitoring efforts near the Salton Sea measuring hydrogen sulfide and PM10 and provide information for alerting the public to potential dust and/or odor events.
- To support and verify compliance with current rules and regulations, analyzed over 2,100 samples for asbestos from demolition sites based on complaints and concerns about fallout (deposition), analyzed approximately 500 products for VOC and Hazardous Air Pollutants (HAP) content; and conducted over 1,800 Source Test (ST) protocol and report evaluations, Continuous Emissions Monitoring System (CEMS) certifications, Laboratory Approval Program (LAP) application reviews and ST observations.
- Performed audit of laboratory test methods in support of federal programs including those for NATTS, PAMS and PM2.5 Speciation; performed field audit of monitoring stations in support of federal programs including those for NCORE, NATTS, PAMS, Criteria Pollutants, and PM2.5 Speciation; performed 2015 data certification and review.
- Continued SCAQMD's audit program to improve quality assurance by including "in-house" audits for air toxics, Total Suspended Particulate (TSP), PM10 and PM2.5 performed by SCAQMD staff.
- More than 30 "low-cost" air quality sensors have been evaluated within the AQ-SPEC program since the July 2014 inception. The AQ-SPEC website (www.aqmd.gov/aq-spec) has been substantially enhanced and now includes detailed information about our sensor testing program, technical information on the use of commercially available air quality

sensors, reports and tables summarizing all available testing results, and other useful information for people interested in the use of air quality sensors.

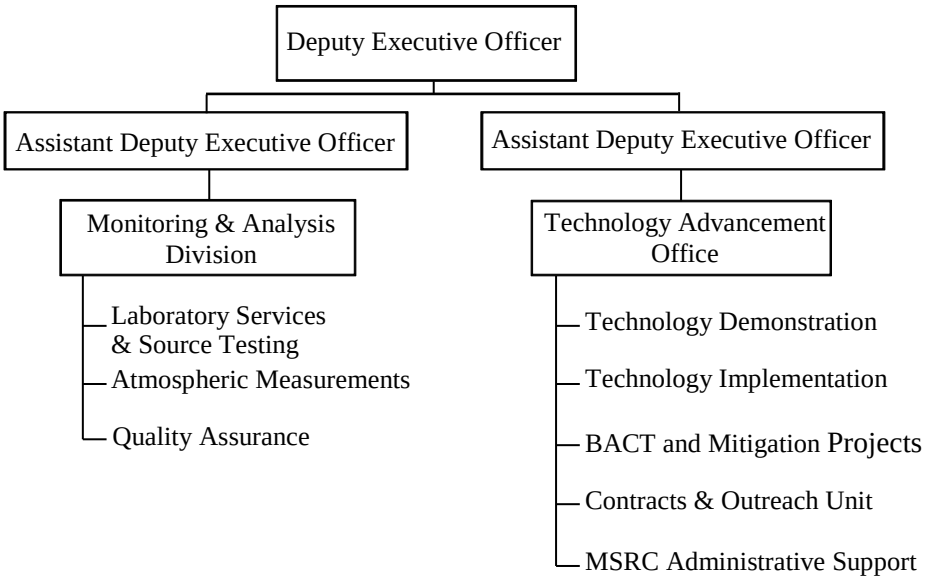
- Although AQ-SPEC was solely funded to perform routine field and laboratory testing of commercially available sensors, staff has been experimenting with the field deployment of different particle and gas sensors and with the development of small sensor networks for specific applications. For example, a network of 10 particle sensors has been deployed at the fenceline of Rainbow Environmental in Huntington Beach to monitor fugitive emissions of PM2.5 and PM10 from this facility in real time. Also, a network of 25 particle sensors has been deployed in the Redlands/Mentone/Highlands/Yucaipa region to test the performance and durability of these devices, increase the spatial distribution of PM measurements in that area, and test the capabilities of Microsoft Azure IoT Cloud platform.
- AQ-SPEC staff applied for several grant opportunities related to the implementation of sensor technologies and has received more than $1.6M in external funding, including a $750K grant to "engage, educate, and empower California communities on the use and applications of “low-cost” air monitoring sensors" (awarded as part of the prestigious EPA's Science To Achieve Results (STAR) program).
- Finalized reports from a comprehensive five-week Optical Remote Sensing study to measure actual emissions from the major six refineries in the Basin and other sources. This study was conducted in 2015 as part of SCAQMD’s fenceline monitoring program and was divided into three separate projects, namely: Project 1 (Quantification of Fugitive Emissions from Large Refineries; Project 2 (Quantification of Gaseous Emissions from Gas Stations, Oil Wells, and Other Small Point Sources); and Project 3 (Quantification of Stack Emissions from Marine Vessels).
- Convened the Best Available Control Technologies (BACT) Scientific Review Committee and updated the BACT guidelines.

ANTICIPATED:

- Continue the development and demonstration of heavy-duty zero emission cargo transport trucks and off-road equipment, and initiate the development and demonstration of a zero emission goods movement corridor utilizing overhead catenary to power heavy-duty hybrid electric trucks near the Ports.
- Continue the implementation of the VIP on a first-come-first-served basis; and solicit for heavy-duty on- and off-road projects under the “Year 19” Carl Moyer and Proposition 1B-Goods Movement Programs. Also, issue a new solicitation for the school bus replacement and retrofit program.
- Increase deployment of cleaner construction equipment, locomotives, and on-road heavy-duty vehicles through the continued implementation of funding incentive programs.
- Implement enhanced ozone monitoring strategy for the U.S. EPA Photochemical Assessment Monitoring Station program as an early adopter to a re-engineering of the program to provide more relevant and robust data sets for VOCs that are ozone precursors.

- Continue with the implementation of routine and special monitoring and analysis efforts critical to the SCAQMD operations, including compliance verification efforts and rule development, including the Paramount effort and expanding to other areas to assess toxic metal levels in industrialized areas.
- Continue to provide support for EFMP-including review and processing of applications and facilitation community outreach elements.
- Continue to provide staff support to the MSRC and MSRC-Technical Advisory Committee.
- Continue to enhance and modernize the District's telemetry system and data management system that receives and validates the incoming data from the air monitoring stations and special monitoring locations.
- Continue to enhance and modernize the laboratory instrumentation, methodologies, and analysis capabilities to help with special monitoring projects and emergency response.
- Continue source test protocol and report evaluations, CEMS certifications, LAP application reviews and ST observations.
- Improve operational integrity, efficiency and quality assurance through monthly internal audits of laboratory and field monitoring stations.
- Continue with the implementation of the remote sensing technology projects and experimentation with other next generation monitoring technologies and formulate appropriate recommendations for the Board on how to best integrate such monitoring tools into the SCAQMD's current arsenal.
- Organize a conference on novel sensor technologies for measuring air quality, on current networking capabilities for developing sensor networks, and on available cloud-based platforms for storing, validating, analyzing, and visualizing sensor data. Continue operational efficiency improvement by investing in latest software, automated instruments and equipment and other workflow streamlining efforts.
- Continue with full-scale testing of air quality sensors in AQ-SPEC and share testing results with the public.
- Deploy and pilot several air quality sensor networks for the purposes of developing new low-cost monitoring capabilities for SCAQMD, regulated entities, and the public. Continue the operation and development of the PM sensor network around/near Rainbow Environmental to study the correlation between fugitive PM emissions and activity information at the facility (e.g., truck traffic, recycling operations). Additional monitoring devices will be deployed to assess the potential impact of fugitive emissions in nearby communities.
- Utilize recent grants received to conduct emission studies in EJ communities around refineries utilizing optical remote sensing technologies in conjunction with air quality sensors. Further develop the goals and objectives of the EPA STAR grant to engage, educate, and empower California communities on the use and applications of "low-cost" air monitoring sensors.
- Develop monitoring strategy for the Multiple Air Toxics Exposure Study (MATES V) to characterize and spatially identify hazardous air pollutant exposure in the Basin.

ORGANIZATIONAL CHART:



POSITION SUMMARY: 174 FTEs

Science & Technology Advancement Units	Amended FY 2016-17	Change	Proposed FY 2017-18
Office Administration	11	1	12
Monitoring & Analysis	111	2	113
Mobile Source Division*	12	(12)	0
Technology Advancement	40	6	46
Total	174	(3)	171

* In FY 2016-17, 7 FTES were reassigned from Science & Technology Advancement to Planning, Rule Development & Area Sources.

STAFFING DETAIL:

2017-18 Requested Staffing

Position	Title
25	Air Quality Chemist
10	Air Quality Engineer II
2	Air Quality Inspector II
20	Air Quality Instrument Specialist I
16	Air Quality Instrument Specialist II
13	Air Quality Specialist
2	Assistant Deputy Executive Officer/Science & Technology Advancement
2	Atmospheric Measurement Manager
10	Contracts Assistant
1	Deputy Executive Officer/Science & Technology Advancement
5	Laboratory Technician
1	Meteorologist Technician
8	Office Assistant
2	Planning and Rules Manager
3	Principal Air Quality Chemist
3	Principal Air Quality Instrument Specialist
12	Program Supervisor
5	Secretary
3	Senior Administrative Secretary
6	Senior Air Quality Chemist
3	Senior Air Quality Engineer
8	Senior Air Quality Instrument Specialist
1	Senior Enforcement Manager
1	Senior Public Information Specialist
1	Senior Office Assistant
1	Senior Staff Specialist
2	Staff Assistant
3	Staff Specialist
1	Supervising Air Quality Engineer
1	Technology Implementation Manager
171	Total Requested Positions

Science & Technology Advancement
Work Program by Office

#	Program Code		Goal	Program Category	Program	Activities	FTEs FY 2016-17	FTEs +/-	FTEs FY 2017-18	Revenue Categories
1	44	003	I	Advance Clean Air Technology	AB2766/MSRC	Mob Src Review Comm Prog Admin	0.50	-	0.50	IX
2	44	004	I	Advance Clean Air Technology	AB2766/MSRC/Contract Admin	AB2766 Admin Discretionary Prog	3.00	-	3.00	IX
3	44	009	I	Develop Programs	AB 1318 Mitigation	AB 1318 Projects Admn/Impl	0.75	-	0.75	XVII
4	44	012	I	Advance Clean Air Technology	AQMP/Control Tech Assessment	Tech Supp: Quantify Cost Effec	0.10	-	0.10	VIII
5	44	015	I	Ensure Compliance	Acid Rain Program	Acid Rain CEMS Eval/Cert	0.50	-	0.50	II,IV
6	44	038	I	Monitoring Air Quality	Admin/Office Mgmt/Monitoring	Overall Program Mgmt/Coord	1.40	-	1.40	Ib
7	44	039	I	Advance Clean Air Technology	Admin/Office Mgt/Tech Adv	Admin Support/Coordination	0.77	-	0.77	VIII
8	44	041	I	Policy Support	Admin/Office Mgmt/Policy Supp	Overall Policy Supp/Mgmt/Coord	0.49	-	0.49	Ib
9	44	042	I	Ensure Compliance	Admin/Office Mgmt/Compliance	Compliance: Assign/Manage/Supp	0.37	-	0.37	Ib
10	44	043	I	Develop Rules	Admin/Office Mgmt/Rules	Rules: Assign/Manage/Supp	0.15	-	0.15	Ib
11	44	046	I	Monitoring Air Quality	Admin/Program Management	STA Program Administration	2.00	-	2.00	Ib
12	44	048	I	Advance Clean Air Technology	Admin/Prog Mgmt/Tech Advance	Overall TA Program Mgmt/Coord	1.55	-	1.55	VIII
13	44	052	I	Operational Support	Admin/Prog Mgmt/Mob Src	Admin: Mobile Source	1.80	(1.80)	-	Ib
14	44	063	I	Monitoring Air Quality	Ambient Air Analysis	Analyze Criteria/Tox/Pollutants	7.91	1.00	8.91	II,V,IX
15	44	064	I	Monitoring Air Quality	Ambient Network	Air Monitoring/Toxics Network	19.05	0.80	19.85	II,IV,V,IX
16	44	065	I	Monitoring Air Quality	Air Quality Data Management	AM Audit/Validation/Reporting	1.00	-	1.00	II,V,IX
17	44	066	I	Advance Clean Air Technology	AQIP Marine SCR DPF	AQIP Marine SCR DPF/Admin/Impl	0.15	-	0.15	IX
18	44	067	II	Monitoring Air Quality	Ambient Lead Monitoring	Lead Monitoring/Analysis/Reporting	0.50	-	0.50	IV
19	44	069	I	Develop Programs	AQIP Evaluation	AQIP Contract Admin/Evaluation	0.65	-	0.65	IX
20	44	072	I	Ensure Compliance	Arch Ctgs - End User	Sample Analysis/Rpts	5.00	(3.00)	2.00	XVIII
21	44	073	I	Monitoring Air Quality	Arch Ctgs - Other	Sample Analysis/Rpts	2.00	-	2.00	XVIII
22	44	079	II	Monitoring Air Quality	AQ SPEC	AQ SPEC	3.00	-	3.00	XVII
23	44	081	I	Monitoring Air Quality	Air Filtration EPA	Air Filtration EPA/Admn/Impl	0.25	(0.10)	0.15	V
24	44	082	I	Monitoring Air Quality	Air Fltration Other	Air Filtration Other/Admn/Impl	0.25	(0.10)	0.15	XVII
25	44	084	I	Monitoring Air Quality	Blk Carbon Stdy EPA	EPA Blck Carbon Climate Study	-	0.20	0.20	XVII
26	44	095	I	Advance Clean Air Technology	CA Natural Gas Veh Partnership	CA Natural Gas Veh Partnership	0.05	-	0.05	VIII
27	44	105	I	Ensure Compliance	CEMS Certification	CEMS Review/Approval	6.15	-	6.15	II,III,VI
28	44	130	I	Advance Clean Air Technology	Clean Fuels/Contract Admin	Admin/Project Supp for TA Cont	6.57	(3.17)	3.40	VIII
29	44	132	I	Advance Clean Air Technology	Clean Fuels/Mobile Sources	Dev/Impl Mobile Src Proj/Demo	4.35	1.65	6.00	VIII
30	44	134	I	Advance Clean Air Technology	Clean Fuels/Stationary Combust	Dev/Demo Clean Combustion Tech	0.70	(0.20)	0.50	VIII
31	44	135	I	Advance Clean Air Technology	Clean Fuels/Stationary Energy	Dev/Demo Alt Clean Energy	0.70	(0.15)	0.55	VIII
32	44	136	I	Advance Clean Air Technology	Clean Fuels/Tech Transfer	Disseminate Low Emiss CF Tech	1.20	0.05	1.25	VIII
33	44	175	I	Ensure Compliance	DB/Computerization	Develop Systems/Database	0.44	-	0.44	II,IV,VI
34	44	187	I	Advance Clean Air Technology	DERA Sch Bus Repl	DERA Sch Bus Repl Admin/Impl	0.03	-	0.03	V
35	44	188	I	Advance Clean Air Technology	DERA FY 13 Veh Repl	DERA Vehicle Repl Admin/Impl	0.20	-	0.20	XVII
36	44	190	I	Advance Clean Air Technology	Diesel Projects EPA	Diesel Projects EPA/Admin/Impl	0.11	-	0.11	V
37	44	203	I	Advance Clean Air Technology	EFMP Program Support	EFMP Program Support	-	1.19	1.19	XVII
38	44	240	I	Monitoring Air Quality	Environmental Justice	Implement Environmental Justice	0.45	-	0.45	II,IX
39	44	248	I	Monitoring Air Quality	EPA Community Scale AQ-SPEC	EPA Community Scale AQ-SPEC	1.00	-	1.00	V,XVII
40	44	276	I	Policy Support	Advisory Group/Technology Adva	Tech Adv Advisory Group Supp	0.10	-	0.10	VIII

Science & Technology Advancement (Cont.)
Work Program by Office

#	Program Code		Goal	Program Category	Program	Activities	FTEs FY 2016-17	FTEs +/-	FTEs FY 2017-18	Revenue Categories
41	44	356	I	Advance Clean Air Technology	GGRF ZEDT Demo	GGRF ZEDT Demo Admin	1.10	-	1.10	XVII
42	44	361	I	Advance Clean Air Technology	HD Trucks DOE ARRA	DOE HD Trucks Admin (ARRA)	2.00	-	2.00	V,XVII
43	44	396	I	Develop Programs	Lawnmower Exchange	Lawn Mower Admin/Impl/Outreach	0.30	-	0.30	XVII
44	44	410	I	Policy Support	Legislation	Support Pollution Reduction thru Legislatio	0.50	-	0.50	IX
45	44	448	I	Develop Programs	Mobile Src Strategies-Off Road	CARB Off-Road Mob Src ctrl strategy for SIP	0.15	(0.15)	-	XVII
46	44	449	I	Develop Rules	Mob Src/SCAQMD Rulemaking	Prepare SCAQMD Mob Src rulemaking proposals	2.00	(2.00)	-	VIII,IX
47	44	450	I	Ensure Compliance	Microscopic Analysis	Asbestos/PM/Metals Analysis	2.00	-	2.00	VI
48	44	451	I	Develop Programs	Mob Src/CARB/EPA Monitoring	CARB/US EPA Mob Src Fuel Policies	1.50	(1.50)	-	IX
49	44	452	I	Develop Programs	Mob Src/CEC/US DOE Monitoring	CEC/US DOE Mob Src rulemaking proposals	1.00	(1.00)	-	IX,XVII
50	44	453	I	Advance Clean Air Technology	Mob Src: Emiss Inven Method	Rvw CARB/US EPA emissions inven methodology	1.50	-	1.50	VIII,IX
51	44	454	I	Policy Support	Mob Src:Greenhs Gas Reduc Meas	Provide comments on mob src portion of AB32	0.89	(0.89)	-	XVII
52	44	456	I	Develop Rules	MS & AQMP Control Strategies	AQMP Control Strategies	0.30	-	0.30	VIII
53	44	457	I	Advance Clean Air Technology	Mob Src/C Moyer Adm/Outreach	Carl Moyer: Impl/Admin Grant	8.81	2.34	11.15	IX
54	44	458	I	Develop Programs	Mobile Source Strategies	Implement Fleet Rules	0.85	0.15	1.00	VIII
55	44	459	I	Advance Clean Air Technology	Mob Src/C Moyer/Impl/Prg Dev	Moyer/Implem/Program Dev	2.80	-	2.80	IX
56	44	460	I	Advance Clean Air Technology	VIP Admin	VIP Admin/Outreach/Impl	0.80	-	0.80	IX
57	44	468	I	Monitoring Air Quality	NATTS(Natl Air Tox Trends Sta)	NATTS (Natl Air Tox Trends)	1.50	-	1.50	II,V,IX
58	44	469	I	Monitoring Air Quality	Near Roadway Mon	Near Roadway Monitoring	1.50	-	1.50	IV,V,IX
59	44	497	I	Advance Clean Air Technology	Plug-in Hybrid EV DOE ARRA	DOE Plug-in Hybrid EV Admin (ARRA)	0.75	-	0.75	V
60	44	500	I	Ensure Compliance	PM2.5 Program	Est/Operate/Maint PM2.5 Network	11.30	-	11.30	II,V,IX
61	44	505	I	Monitoring Air Quality	PM Sampling Program (EPA)	PM Sampling Program - Addition	10.60	-	10.60	V
62	44	507	I	Monitoring Air Quality	PM Sampling Spec	PM Sampling Special Events	0.10	-	0.10	V
63	44	530	I	Monitoring Air Quality	Photochemical Assessment	Photochemical Assess & Monitor	3.00	-	3.00	V,IX
64	44	533	I	Advance Clean Air Technology	POLB AMECS Demo	POLB AMECS Demo-Admin/Impl	0.47	-	0.47	XVII
65	44	542	I	Develop Programs	Prop 1B:Goods Movement	Prop 1B:Goods Movement	9.87	(0.17)	9.70	IX
66	44	545	I	Timely Review of Permits	Protocols/Reports/Plans	Eval Test Protocols/Cust Svc	0.10	-	0.10	III,IV
67	44	546	I	Timely Review of Permits	Protocols/Reports/Plans	Eval Test Protocols/Compliance	6.15	-	6.15	IV,VI
68	44	565	III	Customer Service and Business Assistance	Public Records Act	Comply w/ Public Req for Info	0.17	-	0.17	Ia
69	44	585	I	Monitoring Air Quality	Quality Assurance	Quality Assurance Branch	3.00	-	3.00	II,V,IX
70	44	653	I	Develop Rules	Rulemaking/BACT	Dev/Amend BACT Guidelines	2.00	-	2.00	II
71	44	657	I	Develop Rules	Rulemaking/Support PRA	Assist PRA w/ Rulemaking	0.05	-	0.05	II
72	44	663	I	Monitoring Air Quality	Salton Sea Monit	Mon/Analyze Hydrogen Sulfide	0.25	-	0.25	XVII
73	44	677	I	Advance Clean Air Technology	School Bus/Lower Emission Prog	School Bus Program Oversight	0.70	-	0.70	IX
74	44	700	I	Ensure Compliance	Source Testing/Compliance	Conduct ST/Prov Data/Compl	2.25	-	2.25	VI
75	44	701	I	Customer Service and Business Assistance	Source Testing/Customer Svc	Conduct ST/Prov Data/Cust Svc	0.05	-	0.05	VI
76	44	702	I	Develop Programs	ST Methods Development	Eval ST Methods/Validate	0.95	-	0.95	II
77	44	704	I	Ensure Compliance	ST/Sample Analysis/Compliance	Analyze ST Samples/Compliance	4.00	-	4.00	VI
78	44	705	I	Develop Programs	ST Sample Analysis/Air Program	Analyze ST Samples/Air Prgms	0.25	-	0.25	II
79	44	706	I	Develop Rules	ST Sample Analysis/Air Program	Analyze ST Samples/Rules	0.25	-	0.25	II
80	44	707	I	Ensure Compliance	VOC Sample Analysis/Compliance	VOC Analysis & Rptg/Compliance	7.00	-	7.00	IV,XV

Science & Technology Advancement (Cont.) Work Program by Office										
#	Program Code		Goal	Program Category	Program	Activities	FTEs FY 2016-17	+/-	FY 2017-18	Revenue Categories
81	44	708	I	Develop Rules	VOC Sample Analysis/Rules	VOC Analysis & Rptg/Rules	0.25	-	0.25	II,XV
82	44	709	I	Customer Service and Business Assistance	VOC Sample Analysis/SBA/Other	VOC Analysis & Reptg/Cust Svc	0.50	-	0.50	VI
83	44	715	II	Monitoring Air Quality	Spec Monitoring/Emerg Response	Emergency Response	0.50	-	0.50	II
84	44	716	I	Ensure Compliance	Special Monitoring	Rule 403 Compliance Monitoring	2.20	-	2.20	III,IV,IX,XV
85	44	725	I	Timely Review of Permits	Permit Processing/Support E&C	Assist EAC w/ Permit Process	0.05	-	0.05	III
86	44	738	I	Advance Clean Air Technology	Target Air Shed EPA	Targeted Air Shed Admin/Impl	0.15	-	0.15	V,XVII
87	44	740	I	Advance Clean Air Technology	Tech Adv/Commercialization	Assess CFs/Adv Tech Potential	0.25	-	0.25	VIII
88	44	741	I	Advance Clean Air Technology	Tech Adv/Non-Combustion	Dev/Demo Non-Combustion Tech	0.10	-	0.10	VIII
89	44	794	I	Ensure Compliance	Toxics/AB2588	Eval Protocols/Methods/ST	1.25	3.00	4.25	X
90	44	795	I	Ensure Compliance	Toxics/Engineering	R1401 Toxics/HRA Prot/Rpt Eval	0.05	-	0.05	VI,X
91	44	816	I	Advance Clean Air Technology	Transportation Research	Transport Research/Adv Systems	0.50	-	0.50	VIII
92	44	821	II	Monitoring Air Quality	TraPac Air Filt Prg	Admin/Tech Suppt/Reptg/Monitor	0.15	0.85	1.00	XVII
93	44	825	III	Operational Support	Union Negotiations	Labor/Mgmt Negotiations	0.05	-	0.05	Ia
94	44	826	III	Operational Support	Union Steward Activities	Rep Employees in Grievance Act	0.05	-	0.05	Ia
						Total Science & Technology Advancement	174.00	(3.00)	171.00	

Science & Technology Advancement Line Item Expenditure						
Major Object / Account # **/** Account Description		**FY 2015-16 Actuals**	**FY 2016-17 Adopted Budget**	**FY 2016-17 Amended Budget**	**FY 2016-17 Estimate ***	**FY 2017-18 Proposed Budget**
Salary & Employee Benefits						
51000-52000	Salaries	$ 15,037,515	$ 15,489,191	$ 15,603,365	$ 16,352,064	$ 15,216,665
53000-55000	Employee Benefits	7,576,264	8,248,036	8,248,037	8,149,283	8,118,155
Sub-total Salary & Employee Benefits		$ 22,613,779	$ 23,737,227	$ 23,851,402	$ 24,501,347	$ 23,334,820
Services & Supplies						
67250	Insurance	$ 39,629	$ -	$ 45,000	$ 42,825	$ -
67300	Rents & Leases Equipment	103,238	36,800	49,019	46,649	36,800
67350	Rents & Leases Structure	162,010	169,000	164,270	156,329	169,000
67400	Household	416	500	500	-	500
67450	Professional & Special Services	614,530	80,000	1,820,320	1,732,324	1,455,000
67460	Temporary Agency Services	699,397	141,600	574,493	546,722	141,600
67500	Public Notice & Advertising	27,736	37,000	35,400	33,689	22,000
67550	Demurrage	73,672	55,000	77,242	73,508	55,000
67600	Maintenance of Equipment	470,519	200,000	484,747	471,314	205,000
67650	Building Maintenance	21,874	50,000	55,000	52,341	170,000
67700	Auto Mileage	70,788	3,909	108,581	103,332	3,909
67750	Auto Service	764	-	-	-	-
67800	Travel	82,278	48,403	100,204	95,360	48,403
67850	Utilities	-	-	5,500	5,234	-
67900	Communications	252,776	231,000	269,260	256,244	231,000
67950	Interest Expense	-	-	-	-	-
68000	Clothing	7,336	4,000	12,975	11,393	4,000
68050	Laboratory Supplies	437,290	295,000	553,848	495,262	295,000
68060	Postage	37,770	22,318	30,839	21,158	17,318
68100	Office Expense	100,298	41,393	124,334	106,179	41,393
68200	Office Furniture	2,289	-	14,000	12,294	-
68250	Subscriptions & Books	2,941	1,527	2,027	1,780	1,527
68300	Small Tools, Instruments, Equipment	229,344	130,000	312,736	282,617	195,000
68400	Gas and Oil	-	-	-	-	-
69500	Training/Conference/Tuition/ Board Exp.	30,784	9,000	25,900	24,648	107,000
69550	Memberships	67,195	2,250	90,720	86,335	2,250
69600	Taxes	3,244	2,000	29,660	28,226	2,000
69650	Awards	-	-	-	-	-
69700	Miscellaneous Expenses	8,523	2,600	41,900	39,875	2,600
69750	Prior Year Expense	-	-	-	-	-
69800	Uncollectable Accounts Receivable	-	-	-	-	-
89100	Principal Repayment	-	-	-	-	-
Sub-total Services & Supplies		$ 3,546,638	$ 1,563,300	$ 5,028,475	$ 4,725,638	$ 3,206,300
77000	**Capital Outlays**	$ 1,799,792	$ -	$ 2,537,914	$ 2,415,229	$ 420,000
79050	**Building Remodeling**	$ -	$ -	$ -	$ -	$ -
Total Expenditures		$ 27,960,209	$ 25,300,527	$ 31,417,791	$ 31,642,214	$ 26,961,120
* Estimates based on July 2016 through February 2017 actual expenditures and budget amendments.						

SCAQMD Quick Facts

- Created by the 1977 Lewis Air Quality Management Act; amended by 1988 Lewis-Presley Air Quality Management Act (Health & Safety Code §40400-40540).
    - Regional governmental agency (Special District)
- Jurisdiction for comprehensive air pollution control over all of Orange County, all of Los Angeles County except for the Antelope Valley, the non-desert portion of western San Bernardino County and the western and Coachella Valley portion of Riverside County
    - 10,743 Square Miles; Population of 16,894,297 (2015)
    - Boundaries are Pacific Ocean to the west; San Gabriel, San Bernardino and San Jacinto Mountains to the north and east, and the San Diego County line to the south
    - Vehicle Registrations - 13,265,118 (2015); Average Daily Miles Traveled Per Vehicle – 29 (2015)
    - Two of the world's busiest seaports are within its boundaries, Port of Los Angeles and Port of Long Beach, who combined handle over 4,000 vessel calls and more than 15 million 20-foot long container units or 20-foot equivalent units (TEUs) annually (2016)
- Responsibilities include:
    - Monitoring air quality - 41 air monitoring stations
    - Planning, implementing, and enforcing programs to attain and maintain state and federal ambient air quality standards
        - Developing air quality rules and regulations that regulate stationary source emissions from such facilities as oil refineries, power plants, paint spray booths, incinerators, manufacturing plants, dry cleaners, and service stations
        - Establishing permitting requirements and issuing permits for stationary sources (27,432 operating locations with 74,343 permits)
- Decision-making body is a 13 member Governing Board
    - Total of 10 elected officials with four appointed by the Board of Supervisors from each of the four counties and six appointed by cities within the District
    - Three officials appointed by the Governor, the Speaker of the State Senate, and the Rules Committee of the State Senate

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
Operating Indicators by Function
Last Nine Fiscal Years

Program Category	2008	2009	2010	2011	2012	2013	2014	2015	2016
Advance Clean Air Technology									
Contracts awarded	295	292	530	526	556	938	523	1,047	421
Total Funding awarded ($M)	$91.3	$89.4	$180.7	$131.4	$82.5	$207.2	$216.1	$123.2	$153.9
Ensure Compliance with Clean Air Rules									
Inspections	33,742	40,558	33,735	33,560	34,191	32,535	29,501	22,871	24,037
Notices of Violations	1,321	1,908	1,530	1,254	1,211	965	956	811	499
Hearing Board Orders for Abatement	30	36	35	47	93	51	46	411	23
Hearing Board Appeals	22	19	20	2	7	3	7	-	3
Customer Service									
Public Information Requests	3,528	4,962	3,821	3,410	3,543	3,460	4,505	4,012	4,958
Community/Public Meetings attended	145	198	202	190	274	294	264	217	239
Small Business Assistance Contacts	2,680	2,662	2,578	2,497	2,574	2,266	1,850	1,711	1,865
Develop Programs to Achieve Clean Air									
Transportation Plans processed	1,534	1,412	1,372	1,385	1,392	1,371	1,333	1,329	1,337
Emission Inventory Updates	439	586	703	521	530	408	460	336	356
Develop Rules to Achieve Clean Air									
Rules Developed	29	32	15	40	8	20	24	24	16
Monitoring Air Quality									
Samples Analyzed by the Laboratory	31,530	25,400	29,685	28,915	29,520	32,520	29,340	30,824	32,400
Source Testing Analyses/Evaluations/Review	794	718	740	1,030	952	1,035	968	996	936
Timely Review of Permits									
Applications Processed	9,599	11,564	9,627	13,044	12,225	14,153	13,217	9,495	10,116
Applications Received-Small Business	-	627	694	798	732	615	514	629	594
Applications Received-All Others	9,297	10,954	10,941	10,769	11,682	11,709	11,156	9,961	9,894
Policy Support									
News releases	51	76	69	64	57	61	62	76	89
Media Calls	684	334	313	252	520	1,131	774	532	1,450
Media Inquiries Completed	684	334	313	252	520	1,131	774	532	1,450

FINANCIAL POLICIES

SCAQMD is required to follow specific sections of the California Health & Safety Code, which guide SCAQMD's overall financial parameters. The Governing Board also provides financial direction to SCAQMD staff through the adoption of various financial-related policies. In addition, the Executive Officer's Administrative Policies and Procedures offer further financial guidance. Below is an overview of the guidelines and procedures for the applicable financial-related policies.

California Health & Safety Code (CA H&SC)

- District Budget Adoption – CA H&SC §40130

  The District shall prepare, and make available to the public at least 30 days prior to public hearing, a summary of its budget and any supporting documents, including, but not limited to, a schedule of fees to be imposed by the district to fund its programs. The district shall notify each person who was subject to fees imposed by the district in the preceding year of the availability of information. The district shall notice and hold a public hearing for the exclusive purpose of reviewing the budget and of providing the public with the opportunity to comment upon the proposed district budget.

- Fees Assessed on Stationary Sources – CA H&SC §40500.1

  Fees assessed on stationary sources shall not exceed, for any fiscal year, the actual costs of district programs for the immediately preceding fiscal year with an adjustment not greater than the change in the California Consumer Price Index (CPI), for the preceding calendar year, from January 1 of the prior year to January 1 of the current year. Unless specifically authorized by statute, the total amount of all of the fees collected from stationary sources of emissions in the 1995-96 fiscal year, and in each subsequent fiscal year, shall not exceed the level of expenditure in the 1993-94 fiscal year, except that the total fee amount may be adjusted annually by not more than the percentage increase in the California CPI. Any new state or federal mandate that is applicable to the SCAQMD on and after January 1, 1994 shall not be subject to this section.

- Limitation on Increase in Permit Fees – CA H&SC §40510.5

  Existing permit fees shall not increase by a percentage greater than any percentage increase in the California CPI for the preceding calendar year, unless the board makes a finding, based upon relevant information in a rulemaking record, that the fee increase is necessary and will result in an apportionment of fees that is equitable. Any fee increase above CPI shall be phased in over a period of at least two years.

SCAQMD Governing Board Policy

- Rule 320 - Automatic Fee Adjustment

  Rule 320 provides that all Regulation III fees, with specified exceptions, are automatically adjusted July 1 of each year by the California Consumer Price Index for the preceding calendar year unless the Governing Board decides not to implement a fee adjustment, or to implement a different adjustment for a given year, either for all fees or for a specified fee or fees. The Executive Officer is directed to prepare annually a socioeconomic impact of the effect of the fee adjustment for review by stakeholders and the Governing Board and to hold a public hearing on the automatic fee adjustment to receive any public comments. Public comments and any responses, along with recommendations by the Budget Advisory Committee, are to be forwarded to the Governing Board by April 15 of each year.

- Unreserved Fund Balance Policy

  The Unreserved Fund Balance Policy, originally adopted by the Board in June 2005 and adjusted in June 2014, states that the Unreserved Fund Balance in the General Fund should be maintained at a minimum of 20 percent of revenues. GFOA Recommended Best Practices prescribe a minimum 17% reserve amount plus an additional amount based on the organization's reliance on revenue over which it has no control. The 20% reserve amount is derived from the minimum 17% plus an additional 3% to account for SCAQMD's reliance on state subvention ($4M), U.S. EPA Section 103/105 grants ($5M), and one-time penalties and settlements ($5M).

- Fund Balance Use

  When both restricted and unrestricted resources are available for use, it is SCAQMD's policy to use restricted resources first and then unrestricted resources as they are needed. When using unrestricted fund balance amounts, SCAQMD's Governing Board approved policy is to use committed amounts first, followed by assigned and then assigned.

- Annual Investment Policy

  The Annual Investment Policy sets forth the investment guidelines for all general, special revenue, trust, agency and enterprise funds of the South Coast Air Quality Management District (SCAQMD). The purpose of this policy is to ensure all of SCAQMD's funds are prudently invested to preserve principal and provide necessary liquidity, while earning a market average rate of return. The SCAQMD Annual Investment Policy conforms to the California Government Code as well as customary standards of prudent investment management.

The objectives of the policy, in priority order, are Safety of Principal, Liquidity, and Market Rate of Return. The policy establishes and defines investable funds, authorized instruments, credit quality requirements, maximum maturities and concentrations, collateral requirements, and qualifications of brokers, dealers, and financial institutions doing business with or on behalf of the SCAQMD.

The policy provides the Governing Board, the Treasurer, the Chief Administrative Officer, and the Investment Oversight Committee with set duties and responsibilities to execute the policy.

- Treasury Operations Contingency Plan and Procedures

  The Treasury Operations Contingency Plan and Procedures states the course of action that may be implemented by the SCAQMD to protect the safety and liquidity of the SCAQMD funds and to protects SCAQMD from disruptions to ongoing operations if: 1) the financial stability of Los Angeles County may jeopardize SCAQMD funds invested through the Los Angeles County Treasurer; and/or 2) the Los Angeles County Treasurer, as Treasurer of SCAQMD, can no longer provide the treasury services currently provided in a satisfactory manner.

  Under authority granted by Resolution 97-32, the Executive Officer, upon recommendation of the Chief Administrative Officer and concurrence of the Administrative Committee, can appoint either the Chief Administrative Officer or Controller as Acting Treasurer to immediately begin implementing the defined procedures to safeguard SCAQMD funds.

- Budget Advisory Committee

  Established by the SCAQMD Governing Board, the Budget Advisory Committee serves in an advisory capacity to the SCAQMD on budgeting and financial planning matters. The committee, made up of members from the business and environmental community, provides additional insight during the annual budget process by reviewing and commenting on the proposed budget. The Budget Advisory Committee's comments are required to be provided to the Governing Board by April 15th of each year pursuant to SCAQMD Rule 320.

- Administrative Code

  The Administrative Code of Rules and Procedures prescribes the responsibilities, conduct and specified reimbursements of SCAQMD employees and SCAQMD Board members. Sections include, but are not limited to, mileage reimbursement, travel expenses, tuition reimbursement, professional licenses and memberships, and bilingual pay.

- Procurement Policy and Procedure

  The Procurement Policy and Procedure provides the guidelines for the contracting and/or purchasing of services, material, equipment, supplies and fixed assets (i.e. capital outlays) by the SCAQMD under the direction of the Procurement Manager. These guidelines include, but are not limited to, purchasing methods, bidding procedures, signature authorization levels, fixed asset acquisition and disposition, and publication requirements for advertised procurements.

  Procedures are in place to ensure that all businesses including minority business enterprises, women business enterprises, disabled veteran business enterprises and small businesses have a fair and equitable opportunity to compete for and participate in SCAQMD contracts and that SCAQMD utilizes, when necessary, the most highly qualified outside consultants/contractors to carry out the organization's responsibilities. SCAQMD Executive Officer, Deputy/Assistant Deputy Executive Officers, Legal Counsel, the Procurement Section, and staff all have responsibilities to execute the Procurement Policy and Procedure.

<u>Executive Officer Administrative Policies and Procedures</u>

- Travel

  The Travel Policy provides guidance on allowable travel expenses, travel advances, and documentation requirements.

- Fixed Assets and Controlled Items

  The Fixed Assets and Controlled Items policy provides guidance on the receipt, transfer, inventory, accountability, and disposal of fixed assets and controlled items.

- Purchasing of Non-Consultant Services and Supplies

  The Purchasing of Non-Consultant Services and Supplies policy provides guidance in implementing the purchase of non-consultant services and supplies as addressed in Section IV of the SCAQMD Procurement Policy and Procedure document.

BUDGET GLOSSARY

Adopted Budget	The annual budget for the General Fund that has been approved by SCAQMD's Governing Board.
Amended Budget	The adopted budget plus any modifications approved by SCAQMD's Governing Board during the fiscal year.
Appropriation	A specific amount of money authorized by SCAQMD's Governing Board which permits the SCAQMD to incur obligations and to make expenditures of resources.
Assigned Fund Balance	The portion of the fund balance that has been allocated by SCAQMD's Governing Board for a specific purpose but does not meet the criteria to be classified as committed or nonspendable.
Budget Advisory Committee	A committee made up of representatives from the business and environmental communities who review and provide feedback on SCAQMD's financial performance and proposed budget.
Budgetary Basis of Accounting	A form of accounting used in the budget where encumbered amounts are recognized as cash expenditures.
Balanced Budget	A budget in which planned expenditures do not exceed planned revenues.
Capital Asset	Tangible asset with an initial individual cost of $5,000 or more and a useful life of at least three years or intangible assets with an individual cost of $5,000 or more and a useful life of at least one year.
Capital Outlays	Expenditures for capital assets; A Major Object, or classification of expenditures, within SCAQMD's budget.
Committed Fund Balance	The portion of the fund balance that includes amounts that can be used only for specific purposes as determined by the SCAQMD Governing Board. Contract encumbrances at year-end make up the committed fund balance.
CPI-Based Fee Increase	Increases to fees (emission, annual operating, permit processing, Hot Spots, area sources, transportation, source test/analysis, and Hearing Board) based on the change in the Consumer Price Index for the preceding calendar year as reported for California Department of Finance–All Urban Consumer Series. This is in accordance with the California Health and Safety Code §40510.5.

BUDGET GLOSSARY

Debt Service The cost to cover the repayment of interest and principal on a debt for a particular period of time.

Debt Structure The make-up of long-term debt. SCAQMD's long-term debt has been taken on to fund building and pension obligations.

Designation A portion of the Fund Balance that has been assigned for specific purposes by actions of SCAQMD's Governing Board.

Encumbrance An amount of money committed for the payment of goods and services that have not yet been received or paid for.

Expenditures Charges incurred for goods and services.

Fee Schedule The State Legislature has authorized air districts to levy fees to support industry related programs which improve air quality. The schedule of fees levied by SCAQMD is approved by SCAQMD's Governing Board as part of the annual budget process. (Also see Regulation III.)

Fiscal Year A period of 12 consecutive months selected to be the budget year. SCAQMD's fiscal year runs from July 1 to June 30.

FTE Full Time Equivalent; A measure of the level of staffing. One FTE equates to 2,080 hours of paid time within a 12 month period.

Fund Balance The accumulation of revenues less expenditures within a fund for a specific year. SCAQMD's fund balance is broken out into Reserves (nonspendable and committed) and Unreserved Designations. Unreserved Designations is further broken out into Assigned and Unassigned Fund Balance. This terminology is in accordance with GASB 54.

GASB 54 New standards issued by the Government Accounting Standards Board (GASB) to guide fund balance reporting.

General Fund The primary operating fund for SCAQMD where expenditures and revenues associated with the daily operations of SCAQMD are accounted for.

Grant A sum of money given by an organization for a particular purpose. The grants which provide funding to SCAQMD's General Fund are primarily received from the Environmental Protection Agency (EPA), the Department of Homeland Security (DHS), and the Department of Energy (DOE).

Inventory	Value at cost of office, computer, cleaning and laboratory supplies at year-end.
Major Object	A term representing the classification of SCAQMD's annual budget into three categories: Salaries and Employee Benefits, Services and Supplies, and Capital Outlays.
Mobile Source Revenues	Revenues received from motor vehicle registrations and from the administration of motor vehicle programs aimed at reducing air pollution from motor vehicles.
Nonspendable Fund Balance	Amounts in the fund balance that are not in a spendable form. In SCAQMD's General Fund, inventory makes up the nonspendable fund balance.
Pension Obligation Bonds (POBs)	A method of financing used by SCAQMD to refinance its obligations to its employees' pension fund.
Proposed Budget	The annual budget that has been developed by SCAQMD and made available to the public for review but not yet presented to its Governing Board for approval.
Regulation III	The rule that establishes the fee rates and schedules associated with permitting, annual renewals, emissions and other activities that help fund most of SCAQMD's regulatory programs and services. (Also see Fee Schedule.)
Reserves	Funding within the Fund Balance that is set aside for a specific future use and not available for any other purpose. It consists of both nonspendable amounts (inventory of supplies) and committed amounts (encumbrances).
Revenue	Monies the SCAQMD receives as income. SCAQMD's revenue is mainly from fees charged to control or regulate emissions.
SBCERA	San Bernardino County Employment Retirement System manages the retirement plan for SCAQMD employees.
Salaries and Employee Benefits	Expenditures for Salary expenses and employee, retirement and insurance benefits. It is a Major Object, or classification of expenditures, within SCAQMD's budget.
Services and Supplies	Expenditures for items and services needed for the daily operations of the SCAQMD including professional services, utilities, office expenses, maintenance, and debt service. It is a Major Object, or classification of expenditures, within SCAQMD's budget.

Special Revenue Fund A fund used to account for revenues and expenditures from specific sources earmarked for specific purposes. SCAQMD's main operating fund is its General Fund. All other funds are designated as Special Revenue Funds. The SCAQMD does not adopt a budget for Special Revenue Funds.

State Subvention Assistance provided by the state for a specific purpose. The state of California provides assistance to air districts in recognition that they perform mandated functions such as compliance assistance, planning, and rule development that should be covered by state funding sources.

Stationary Source Fees Revenues collected from emission fees, permit fees, and annual operating fees to support activities for improving air quality.

Transfer In/Out A transfer of funds between different funds within SCAQMD. A transfer of cash from the General Fund to a Special Revenue Fund would be a Transfer Out for the General Fund and a Transfer In for the Special Revenue Fund.

Unassigned Fund Balance The residual fund balance of the General Fund. It is not designated for a specific purpose and can only be used upon approval of SCAQMD's Governing Board.

Unreserved Designations The portion of the Fund Balance that has not been committed by SCAQMD's Governing Board or is nonspendable due to specific Board constraints. It is further broken down into either amounts assigned by SCAQMD's Governing Board for specific purposes or an unassigned amount that can only be used upon approval of SCAQMD's Governing Board.

Work Programs Activities carried out by SCAQMD staff. Work Programs are classified into nine Work Program Categories according to the nature of the activity being performed.

Air Quality Historical Timeline

Photo courtesy of Los Angeles Times Collection, Department of Special Collections, UCLA Library

First recognized episodes of smog occur in Los Angeles in the summer of 1943.

1943

1947

Los Angeles County Air Pollution Control District (APCD) established–the first of its kind in the nation.

1950

Orange County APCD established.

1957

San Bernardino and Riverside County APCDs formed.

1966

California adopts first automobile tailpipe emission standards in the nation.

1968

California Air Resources Board (CARB) holds its first meeting with Dr. Arie J. Haagen-Smit as its first chairman.

1970

Federal Clean Air Act is enacted, establishing the basic U.S. program for controlling air pollution.

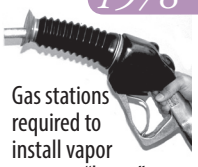
1971

U.S. EPA, created in 1970,adopts first national air quality standards.

1977

SCAQMD formed through merger of Los Angeles, Orange, Riverside and San Bernardino APCDs.

1978



Gas stations required to install vapor recovery "boots" on gas nozzles.

1984

California's Smog Check program takes effect.

1987

SCAQMD establishes ridesharing requirements for region's employers.

1989

SCAQMD adopts first Air Quality Management Plan to show attainment of clean air standards.

1990

Federal Clean Air Act Amendments of 1990 enacted. Established new programs aimed at curbing urban ozone, toxic emissions, and vehicle emissions.

1993

RECLAIM (REgional CLean Air Incentives Market) emissions trading program adopted.

1998

The Carl Moyer Program established to reduce mobile source emissions.

2002

SCAQMD adopts the nation's first phase-out of the toxic chemical perchloroethylene (or "perc") used at dry cleaners.

2003

SCAQMD Mow Down Air Pollution Electric Lawnmower Exchange Program begins.

2006

California Global Warming Solutions Act of 2006 (AB 32) enacted to establish first ever comprehensive program to reduce greenhouse gases.

2008

SCAQMD adopts Climate Change Policy.

2011

Federal agencies and the State of California establish single timeframe for corporate average fuel economy (CAFE) and greenhouse gas standards for the next generation of cars and light-duty trucks.

2014-2027

Projected achievement of current air quality health standards in South Coast air basin.

South Coast
Air Quality Management District

21865 Copley Drive
Diamond Bar, CA 91765-4178

www.aqmd.gov

Clean Fuels Program
2016 Annual Report and 2017 Plan Update

March 2017

Technology Advancement Office

Leading the way to zero and near-zero emission technologies

South Coast
Air Quality
Management District

South Coast AQMD

South Coast Air Quality Management District

Governing Board

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Marion Ashley
Supervisor, Riverside County

Shawn Nelson
Supervisor, Orange County

Janice Rutherford*
Supervisor, San Bernardino County

State Representatives

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Governor's Appointee

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Senate Rules Committee Appointee

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Councilmember, City of Los Angeles
City of Los Angeles

Michael Cacciotti
Mayor, City of South Pasadena
Los Angeles County, Eastern Region Cities

Larry McCallon*
Mayor Pro Tem, City of Highland
San Bernardino County Cities

Judith Mitchell*
Councilmember, City of Rolling Hills Estates
Los Angeles County, Western Region Cities

Dwight Robinson*
Councilmember, City of Lake Forest
Orange County Cities

Executive Officer

Wayne Nastri

*Technology Committee Members **Technology Committee Chairman

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This year's Annual Report and Plan Update
is dedicated in remembrance of

John J. Benoit

Supervisor, Fourth District, Riverside County

South Coast Air Quality Management District
Governing Board Member 2010-2016

Technology Committee Chairman 2012-2016

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South Coast Air Quality Management District
Technology Advancement Office

Matt Miyasato, Ph.D., Deputy Executive Officer, Science & Technology Advancement
Fred Minassian, Assistant Deputy Executive Officer, Technology Advancement Office
Naveen Berry, Technology Demonstration Manager
Lourdes Cordova Martinez, Sr. Public Affairs Manager

Al Baez, Program Supervisor
Brian Choe, Program Supervisor
Connie Day, Program Supervisor
Ranji George, Program Supervisor
Joseph Impullitti, Program Supervisor
Lisa Mirisola, Program Supervisor
Vicki White, Program Supervisor

Jason Aspell, Sr. Air Quality Engineer

Vasken Yardemian, Sr. Staff Specialist

Walter Shen, Staff Specialist

Mark Coleman, Air Quality Specialist
Seungbum Ha, Air Quality Specialist
Patricia Kwon, Air Quality Specialist
Joseph Lopat, Air Quality Specialist
Von Loveland, Air Quality Specialist
Krystle Martinez, Air Quality Specialist
Ashkaan Nikravan, Air Quality Specialist
Greg Ushijima, Air Quality Specialist
Mei Wang, Air Quality Specialist
Andrew Yoon, Air Quality Specialist

Greta Grier, Air Quality Inspector II

Drue Hargis, Sr. Public Information Specialist

Penny Shaw Cedillo, Sr. Administrative Secretary
Pat Krayser, Sr. Administrative Secretary

Marjorie Eaton, Secretary
Alejandra Vega, Secretary
Donna Vernon, Secretary

Michelle White, Staff Assistant

Deanna Doerr, Contracts Assistant
Liliana Garcia, Contracts Assistant
Cassie Johnson, Contracts Assistant
Frances Maes, Contracts Assistant
Mariel Maranan, Contracts Assistant
Genette Prudhomme, Contracts Assistant
Benigna Taylor, Contracts Assistant
Ana Troccoli, Contracts Assistant

Cynthia Synder, Office Assistant

Other Staff Contributors
Henry Hogo, Assistant Deputy Executive Officer, Mobile Sources
Ana Ponce, Sr. Administrative Secretary
Dean Saito, On-Road Mobile Source Manager
Angelica Enriquez, Secretary
Michael Krause, Planning & Rules Manager
Philip Barroca, Air Quality Specialist
Lori Berard, Air Quality Specialist
Richard Carlson, Air Quality Specialist

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Table of Contents

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EXECUTIVE SUMMARY

Introduction

The South Coast Air Quality Management District (SCAQMD) is the air pollution control agency for all of Orange County and the urban portions of Los Angeles, Riverside and San Bernardino counties. This region, which encompasses all of the South Coast Air Basin plus small portions of the Mojave Desert and Salton Sea Air Basins, historically experiences the worst air quality in the nation due to the natural geographic and atmospheric conditions of the region, coupled with the high population density and associated mobile and stationary source emissions. Recognizing this challenge, in 1988 the state established the SCAQMD's Clean Fuels Program (Program), along with the SCAQMD's Technology Advancement Office (TAO). The Clean Fuels Program affords the SCAQMD the ability to fund development, demonstration and accelerated deployment of clean fuels and transportation technologies.

For over 20 years, using funding received through a $1 motor vehicle registration fee, the Clean Fuels Program has encouraged, fostered and supported clean fuels and transportation technologies, such as hydrogen and fuel cells, natural gas engines and infrastructure, battery electric vehicles, plug-in hybrid electric vehicles and related fueling infrastructure. A key strategy of the Program, which allows significant leveraging of the Clean Fuels funding (typically $3-$4 to every $1 of Clean Fuels funds), is its public-private partnership with private industry, technology developers, academic institutions, research institutions and government agencies. Further, while the TAO aggressively seeks to leverage funds to accomplish more with every dollar, it also strives to be a leader in technology development and commercialization to accelerate the reduction of criteria pollutants. As a result, the TAO Clean Fuels Program has traditionally supported a portfolio of technologies, in different stages of maturity, to provide a continuum of emission reductions and health benefits over time. This approach provides the greatest flexibility and optimizes the region's ability to achieve National Ambient Air Quality Standards (NAAQS).

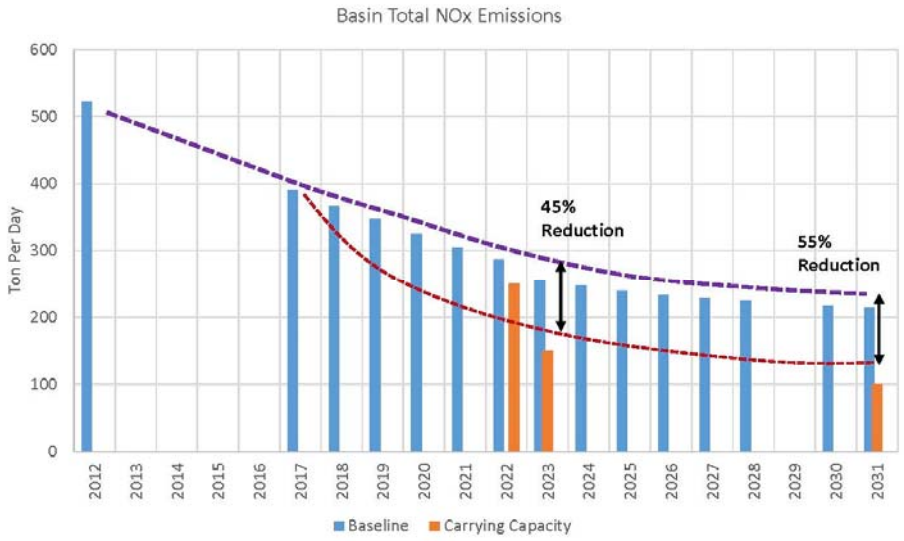
Health & Safety Code (H&SC) 40448.5.1 requires the SCAQMD to prepare, and submit to the Legislative Analyst each year, a Clean Fuels Annual Report and Plan Update. The Clean Fuels Annual Report looks at what the Program accomplished in the prior calendar year (CY) and the Clean Fuels Plan Update looks ahead at proposed expenditures for the next CY, essentially re-calibrating the technical emphasis of the Program. Preliminary review and comment by SCAQMD's Governing Board, advisory groups, technical experts and other interested parties are incorporated into the Final Plan Update, along with the Clean Fuels Annual Report, which are due to the Legislative Analyst by March 31 of every year.

The overall strategy of the TAO's Clean Fuels Program is based, in large part, on emission reduction technology needs identified through the Air Quality Management Plan (AQMP) process and the SCAQMD Governing Board's directives to protect the health of residents in Southern California, with its approximately 17 million people (nearly half the population of California). The AQMP is the long-term regional "blueprint" that defines:

- basin-wide emission reductions needed to achieve federal ambient air quality standards;
- regulatory measures to achieve those reductions;
- timeframes to implement these proposed measures; and
- technologies required to meet these future proposed regulations.

The emission reductions and control measures in the Draft 2016 AQMP, which will be considered for adoption by the SCAQMD Governing Board on March 3, 2017, rely on a mix of currently available technologies as well as the expedited development and commercialization of lower-emitting mobile

and stationary advanced technologies in the Basin to achieve air quality standards. The Draft 2016 AQMP projects that an approximate 45 percent reduction in NOx is required by 2023 and an additional 55 percent reduction by 2031. The majority of these NOx reductions must come from mobile sources, both on- and off-road. Notably, the SCAQMD is currently only one of two regions in the nation recognized as an extreme ozone nonattainment area (the other is San Joaquin Valley). Ground level ozone (a key component of smog) is created by a chemical reaction between NOx and volatile organic compound (VOC) emissions. This is especially noteworthy because in the South Coast Air Basin the largest contributor to ozone is NOx emissions, and mobile sources contribute approximately 88 percent of the NOx emissions in this region. Furthermore, NOx emissions, along with VOC emissions, also lead to the formation of PM2.5 [particulate matter measuring 2.5 microns or less in size, expressed as micrograms per cubic meter ($\mu g/m^3$)]. The following illustrates the South Coast Air Basin's carrying capacity for NOx in tons per day and illustrates the sharp reductions needed for attainment.



The Draft 2016 AQMP includes integrated strategies and measures to demonstrate attainment of the following National Ambient Air Quality Standards:

Standard	Concentration	Classification	Latest Attainment Year
2008 8-hour Ozone	75 ppb	Extreme	2031
2012 Annual PM2.5	12 $\mu g/m^3$	Serious*	2025
2006 24-hour PM2.5	35 $\mu g/m^3$	Serious	2019
1997 8-hour Ozone	80 ppb	Extreme	2023
1979 1-hour Ozone	120 ppb	Extreme	2022

* The 2016 AQMP requests a reclassification from moderate to serious non-attainment for this standard

On a positive note, the Draft 2016 AQMP for the first time envisions Southern California achieving attainment through regulations and specifying further deployment of cleaner technologies formerly undefined as "blackbox" measures. This is due in part because of deployment of zero and near-zero technologies either commercialized or nearing commercialization, albeit with pathways that still require more specificity and scalability, and in part because of the emission reduction co-benefits from carbon dioxide (CO2) reductions expected from achievement of climate change goals as well as an adequate level of funds to incentivize the deployment of these cleaner technologies. There are significant challenges to getting there, however, including EPA and CARB moving forward with changing the heavy-duty engine exhaust NOx standard from 0.2 grams per break horsepower-hour (g/bhp-hr) to 0.02

g/bhp-hr, as well as identifying financial incentives to offset the higher cost of these emerging clean technologies.

In connection with that challenge, on June 3, 2016, the EPA received a Petition, led by SCAQMD and joined by many other state air quality management agencies, to initiate rulemaking guidelines to create a national standard for ultra-low NOx heavy-duty engines. The EPA has since acknowledged a need for additional NOx reductions through a harmonized and comprehensive national NOx reduction program for heavy duty on-highway engines and vehicles. The EPA has initiated action towards proposed rulemaking for a revised heavy-duty NOx program, with the intent of proposing standards that could begin model year 2024, consistent with the lead-time requirements of the Clean Air Act.

The Draft 2016 AQMP also takes an initial look at the emission reductions needed to meet the new federal 8-hour ozone air quality standard of 70 ppb and projects that an additional 25 tons per day (tpd) in NOx reductions between 2031 and 2037 will be needed for attainment in 2037, to be accomplished in part through greater implementation of incentivized zero emission technologies.

The daunting challenge to reduce NOx and PM2.5 to meet standards requires the Clean Fuels Program to encourage and accelerate advancement of advanced clean fuel and transportation technologies, leading the way to commercialization of progressively lower-emitting fuels and vehicles. Given the relationship between NOx, ozone and PM2.5, the 2017 Plan Update must emphasize emission reductions in all these areas. However, the confluence of federal, state and local planning efforts on climate change, greenhouse gases (GHGs), petroleum reduction, air quality and other environmental areas should provide co-benefits that may help the region.

Since development of the 2012 AQMP, given the region's thriving goods movement industry, it became clear that the effect of moving containers through the Ports of Los Angeles and Long Beach and the subsequent movement of goods throughout the region not only has a dramatic impact on air quality but also the quality of life in the communities along the major goods movement corridors. In recognition of these impacts, the SCAQMD has been leading a concerted effort to develop and demonstrate zero and near-zero emissions goods movement technologies, such as electric trucks, plug-in hybrid trucks with all-electric range, fuel cell and natural gas range-extended trucks, and catenary technology. The SCAQMD goods movement projects that have been initiated or anticipated incorporate a variety of fuels, including electricity, natural gas, biofuels, hydrogen and diesel. The prioritization of these types of projects is reflected in this Draft 2017 Plan Update.

The proposed funding allocations and prioritization are commensurate with the emissions inventory for the various categories that need significant NOx emission reductions. Staff has also included a simplified "Consumer Reports" type project ranking (Appendix D) for the core technologies discussed in the Annual Report and Plan.

2016 Annual Report

During CY 2016 the SCAQMD executed 60 new contracts, projects or studies and modified 6 continuing projects adding additional dollars toward research, development, demonstration and deployment (RDD&D) of alternative fuel and clean fuel technologies. Table 2 (page 38) lists these 66 projects or studies, which are further described in this report. The SCAQMD Clean Fuels Program contributed nearly $21.8 million in partnership with other governmental organizations, private industry, academia and research institutes, and interested parties, with total project costs of a bit more than $198 million. Table 3 (page 41) provides information on outside funding received into the Clean Fuels Fund ($3.42 million in 2016) as cost-share passed through the SCAQMD for the contracts executed in CY 2016. Table 4 (page 41) provides a comprehensive summary of federal, state and other revenue awarded to the SCAQMD during CY 2016 (approximately $48.9 million) for projects to be included within the

Clean Fuels Program or which align well with and are complementary to the Clean Fuels Program. The significant project scopes of a few key contracts executed in 2016 resulted in leveraging $9 for every $1 of Clean Fuels funding, whereas typical leveraging is $3-$4 for every $1 in Clean Fuels funding. Leveraging dollars and aggressively applying for additional funds whenever funding opportunities arise is more important than ever given the magnitude of additional funding identified in the Draft 2016 AQMP to achieve federal ozone air quality standards.

The projects or studies executed in 2016 addressed a wide range of issues and opportunities with a diverse mix of advanced technologies. The following core areas of technology advancement for 2016 executed contracts (in order of funding percentage) include:

- Electric and Hybrid Vehicle Technologies and Related Infrastructure (emphasizing electric and hybrid electric trucks and container transport technologies with zero emission operations);
- Fueling Infrastructure and Deployment (predominantly natural gas and renewable fuels);
- Hydrogen and Mobile Fuel Cell Technologies and Infrastructure;
- Engine Systems (emphasizing alternative and renewable fuels for truck and rail applications);
- Technology Transfer/Assessment and Outreach; and
- Fuels and Emission Studies.

The pie chart on page 36 shows the distribution by percentage of executed agreements in 2016 across these core technologies.

During CY 2016, the SCAQMD supported a variety of projects and technologies, ranging from near-term to long-term research, development, demonstration and deployment activities. This "technology portfolio" strategy provides the SCAQMD the ability and flexibility to leverage state and federal funding while also addressing the specific needs of the South Coast Air Basin (Basin). Projects executed in CY 2016 included but are not limited to continued development and demonstration of electric and hybrid technologies with an emphasis on zero emission goods movement technologies, large-scale production of renewable natural gas (RNG) as well as demonstration of next generation engines using RNG, development and demonstration of hydrogen technologies and infrastructure, and development and demonstration of heavy-duty natural gas and ultra-low emission diesel engines and vehicles.

As of January 1, 2017, there were 93 open contracts (Appendix B) in the Clean Fuels Program.

Thirty-two (32) RDD&D projects or studies and 11 technology assessment and transfer contracts were completed in 2016, as listed in Table 6 (page 63). Appendix C comprises two-page summaries of the technical projects completed in 2016. In accordance with California Health and Safety Code Section 40448.5.1(d), this report must be submitted to the state legislature by March 31, 2017, after approval by the SCAQMD Governing Board.

2017 Plan Update

The overall strategy is based in large part on technology priorities and opportunities identified in the SCAQMD's AQMP and the SCAQMD Governing Board's directives to protect the health of residents in the Basin. The NOx, VOC and PM emission sources of greatest concern are heavy-duty on-road vehicles, medium- and light-duty on-road vehicles, and off-road equipment. Ocean-going vessels and locomotives remain a concern for the region, but at this time only the federal government has the authority to regulate them. Notwithstanding, TAO works with maritime and railroad companies to push the envelope in these areas as well.

Every year TAO staff re-evaluates the Clean Fuels Program to develop a Plan Update which essentially serves to re-assess the technology progress and direction for the agency. The Program continually seeks to support the development and deployment of lower-emitting technologies. The design and implementation of the Program Plan must balance the needs in the various technology sectors with technology readiness, emissions reduction potential and cofunding opportunities. As the state and federal governments have turned a great deal of their attention to climate change and petroleum reduction goals, the SCAQMD has remained committed to developing, demonstrating and commercializing zero and near-zero emission technologies. Fortunately many, if not the majority, of technology sectors that address our need for NOx reductions also garner reductions in greenhouse gas (GHG) and petroleum use. Due to these "co-benefits," the SCAQMD has been successful in partnering with the state and federal government, which allows the Clean Fuels Program to leverage its funding extensively.

To identify technology and project opportunities where funding can make a significant difference in deploying progressively cleaner technologies in the Basin, the SCAQMD employs a number of outreach and networking activities. These activities range from close involvement with state and federal collaboratives, partnerships and industrial coalitions, to the issuance of Program Opportunity Notices to solicit project ideas and concepts as well as issuance of Requests for Information (RFI) to determine the state of various technologies and the development and commercialization challenges faced by those technologies. For example, last year an RFI was released to solicit information from diesel engine manufacturers and other entities to identify ultra-low NOx emission technology strategies that will result in commercially viable diesel engine technologies capable of using renewable diesel for on-road heavy-duty vehicles that are capable of achieving emission levels 90% cleaner than the current 2010 emission standards for NOx and reduce particulate matter emissions to the greatest extent possible. Potential projects resulting from this RFI are included conceptually within the Draft 2017 Plan Update.

The Plan Update includes projects to develop, demonstrate and commercialize a variety of technologies, from near-term to long-term commercialization, that are intended to provide solutions to the emission control needs identified in the Draft 2016 AQMP. As noted, the Draft 2016 AQMP analysis indicates that an approximate 45 percent reduction in NOx is required by 2023 with an additional 55 percent NOx reduction by 2031. Given the need for these significant reductions over the next 6-14 year timeframe, mid- and longer-term alternative fuels, hybrid, electric and fuel cell based technologies are emphasized. Areas of focus include:

- reducing emissions from port-related activities, such as cargo handling equipment and container movement technologies, including demonstration and deployment of cargo container movement systems with zero emission range;
- mitigating criteria pollutant increases from renewable fuels, such as renewable natural gas, diesel and hydrogen as well as other renewable fuels and waste streams;
- developing and demonstrating electric-drive (fuel cell, battery, plug-in hybrid and hybrid) technologies across light-, medium- and heavy-duty platforms;
- producing transportation fuels and energy from renewable and waste stream sources; and
- establishing large-scale hydrogen refueling and EV charging infrastructure to help accelerate the introduction zero emission vehicles into the market.

Table 7 (page 79) lists the potential projects across the nine core technologies identified in this report. Potential projects for 2017 total $16.5 million, with anticipated leveraging of more than $4 for every $1 of Clean Fuels funding, for total project costs of nearly $70 million. The proposed projects may also be funded by revenue sources other than the Clean Fuels Program, especially VOC and incentive projects.

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CLEAN FUELS PROGRAM
Background & Overview

Program Background

The South Coast Air Basin, which comprises all of Orange County and the urban portions of Los Angeles, San Bernardino and Riverside Counties, has the worst air quality in the nation due to a combination of factors, including high vehicle population, high vehicle miles traveled within the region and geographic and atmospheric conditions favorable for photochemical oxidant (smog) formation. Due to these challenges, the state legislature enabled the SCAQMD to implement the Clean Fuels Program to accelerate the implementation and commercialization of clean fuels and advanced technologies. In 1999, state legislation was passed which amended and extended the Clean Fuels Program. Specifically, as stated in the California Health and Safety Code (H&SC) section 40448.5.1(d), the SCAQMD must submit to the Legislature, on or before March 31 of each year, an annual report that includes:

1. A description of the core technologies that the SCAQMD considers critical to ensure attainment and maintenance of ambient air quality standards and a description of the efforts made to overcome barriers to commercialization of those technologies;
2. An analysis of the impact of the SCAQMD's Clean Fuels Program on the private sector and on research, development and commercialization efforts by major automotive and energy firms, as determined by the SCAQMD;
3. A description of projects funded by the SCAQMD, including a list of recipients, subcontractors, cofunding sources, matching state or federal funds and expected and actual results of each project advancing and implementing clean fuels technology and improving public health;
4. The title and purpose of all projects undertaken pursuant to the Clean Fuels Program, the names of the contractors and subcontractors involved in each project and the amount of money expended for each project;
5. A summary of the progress made toward the goals of the Clean Fuels Program; and
6. Funding priorities identified for the next year and relevant audit information for previous, current and future years covered by the project.

Furthermore, H&SC section 40448.5.1(a)(2) requires the SCAQMD to find that the proposed program and projects funded as part of the Clean Fuels Program will not duplicate any other past or present program or project funded by the state board and other government and utility entities. This finding does not prohibit funding for programs or projects jointly funded with another public or private agency where there is no duplication. The following section describes the panel of external experts that helps review the Clean Fuels Program.

Program Review

In 1990, the SCAQMD initiated an annual review of its technology advancement program by an external panel of experts. That external review process has evolved, in response to SCAQMD policies and legislative mandates, into two external advisory groups. The Technology Advancement Advisory Group (one of six standing Advisory Groups that make up the SCAQMD Advisory Council) is made up of stakeholders representing industry, academia, regulatory agencies, the scientific community and environmental impacts. The Technology Advancement Advisory Group serves to:

- Coordinate the SCAQMD program with related local, state and national activities;

- Review and assess the overall direction of the program; and
- Identify new project areas and cost-sharing opportunities.

In 1999, the second advisory group was formed as required by SB 98 (Alarcon). Under H&SC Section 40448.5.1(c), this advisory group must comprise 13 members with expertise in clean fuels technology and policy or public health and appointed from the scientific, academic, entrepreneurial, environmental and public health communities. This legislation further specified conflict-of-interest guidelines prohibiting members from advocating expenditures towards projects in which they have professional or economic interests. The objectives of the SB 98 Clean Fuels Advisory Group are to make recommendations regarding projects, plans and reports, including consulting with regarding approval of the required annual report prior for submittal to the SCAQMD Governing Board. Also in 1999, in light of the formation of the Clean Fuels Advisory Group, the SCAQMD also revisited the charter and membership of the Technology Advancement Advisory Group to ensure their functions would complement each other.

On an as-needed basis, changes to the composition of the Clean Fuels Advisory Group are reviewed by the SCAQMD Governing Board while changes to the Technology Advancement Advisory Group are reviewed by the SCAQMD Governing Board's Technology Committee. Current membership changes to both advisory groups, if required, will be considered by the SCAQMD Governing Board and its Technology Committee, respectively, as part of consideration of the 2016 Annual Report and 2017 Plan Update. The current members of the SB 98 Clean Fuels Advisory Group and Technology Advancement Advisory Group are listed in Appendix A, with any proposed changes, subject to SCAQMD Governing Board approval, duly noted.

The review process of the Clean Fuels Program now includes at minimum: 1) two full-day retreats of the two Advisory Groups, typically in the summer and winter; 2) review by other technical experts; 3) occasional technology forums or roundtables bringing together interested parties to discuss specific technology areas; 4) review by the Technology Committee of the SCAQMD Governing Board; 5) a public hearing of the Annual Report and Plan Update before the full SCAQMD Governing Board, along with adoption of a resolution finding that the proposed program and projects funded as part of the Clean Fuels Program will not duplicate any other past or present program or project funded by the state board and other government and utility entities, as required by the H&SC; and 6) finally submittal of the Clean Fuels Program Annual Report and Plan Update to the Legislature by March 31 of every year.

The Need for Advanced Technologies & Clean Fuels

Achieving federal and state clean air standards in Southern California will require emission reductions from both mobile and stationary sources beyond those expected using current technologies. Figure 1 reflects the top NOx emission sources in 2023, emphasizing the need to target technology advancements in the goods movement industry as well as off-road equipment. The need for advanced technologies and clean fuels is best illustrated by Figure 2 below, which identifies NOx emissions by category and identifies just how far those emissions must be reduced to meet federal standards by 2023 and 2031.

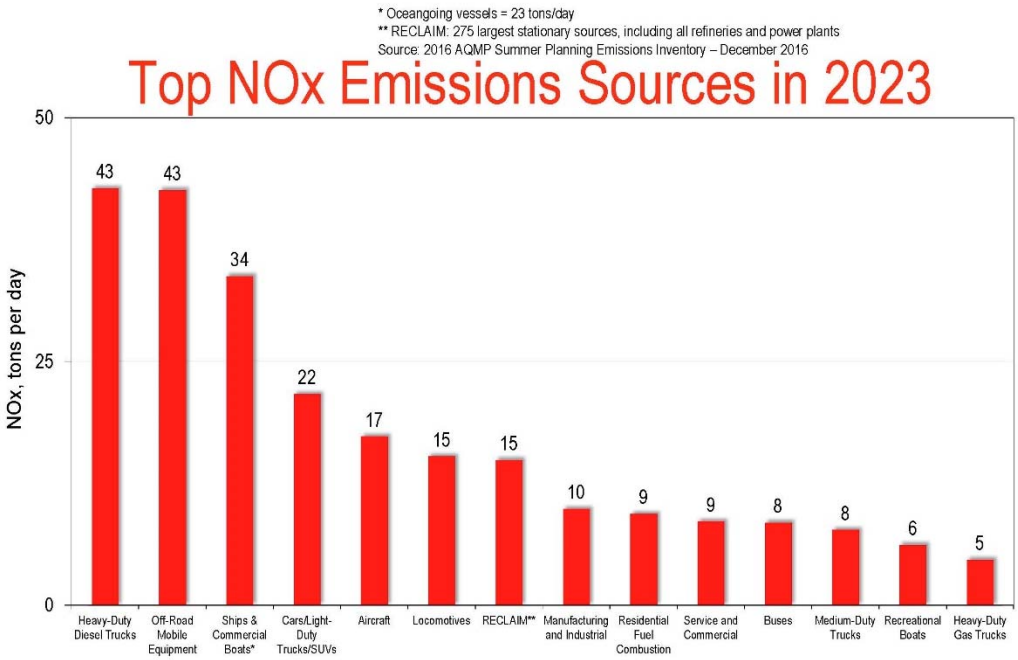

Figure 1: Top NOx Sources in 2023

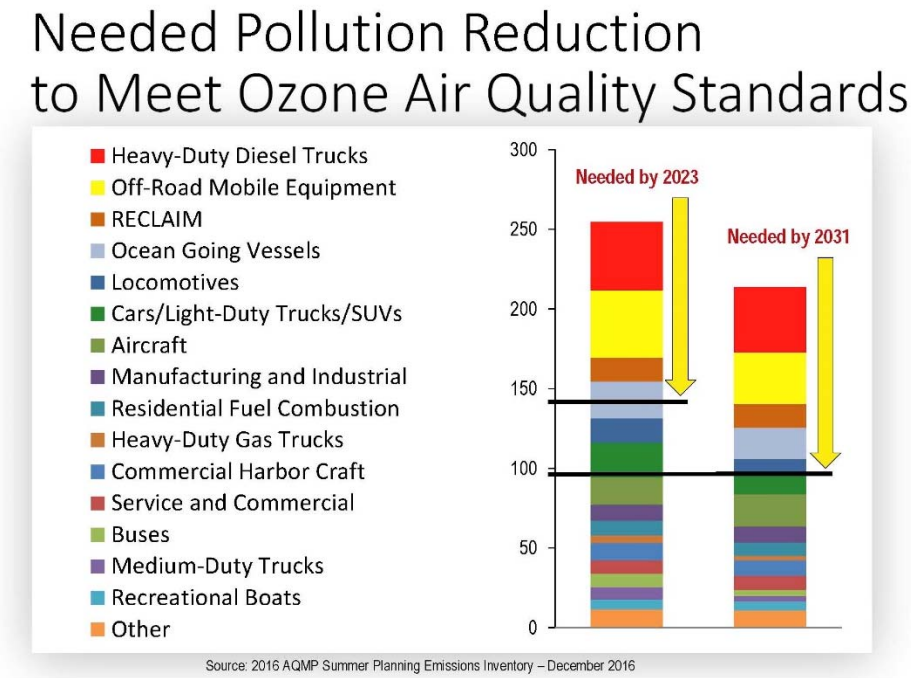

Figure 2: NOx Reductions Needed by 2023 & 2031

The above charts reflects NOx contributors by sector, sharply illustrating the impact of mobile sources on air quality and why the Draft 2016 AQMP calls for an approximate 45 percent reduction of NOx by 2023.

To fulfill long-term emission reduction targets, the Draft 2016 AQMP relies on a mix of currently available technology as well as the expedited development and demonstration of advanced technologies that are not yet ready for commercial use. Significant reductions are anticipated from implementation

of advanced control technologies for both on-road and off-road mobile sources. In addition, the air quality standards for ozone (80 ppb, 8-hour average) and fine particulate matter, promulgated by the U.S. Environmental Protection Agency (U.S. EPA) in 1997 and 2006, are projected to require additional long-term control measures for both NOx and VOC. The Draft 2016 AQMP's estimate of needed NOx reductions will require the SCAQMD Clean Fuels Program to encourage and accelerate advancement of clean transportation technologies that are used as control strategies in the AQMP.

Health studies also indicate a greater need to reduce NOx emissions and toxic air contaminant emissions. For example, the goal of SCAQMD's Multiple Air Toxics Exposure Study (MATES) IV, initially launched in 2012, like the prior three MATES efforts, was to assess air toxic levels, update risk characterization, and determine gradients from selected sources. However, MATES IV added ultrafine PM and black carbon monitoring components as well. The study found a dramatic decrease in ambient levels of diesel particulate matter and other air toxics. Diesel PM was still the major driver of air toxics health risks. While the levels and exposures decreased, a revision to the methods used to estimate cancer risk from toxics developed by the California Office of Health Hazard Identification increased the calculated risk estimates from these exposures by a factor of up to three.

In October 2015, the Governor signed SB 350 (De León) to codify goals outlined in his January 2015 inaugural address to help California meet climate targets for 2030 and beyond, including increasing the amount of electricity generated from renewable sources from 33 to 50 percent, a goal that will dramatically reshape California's energy economy over the next decade. Furthermore, in July 2016, in response to an Executive Order issued by Governor Brown the previous year, a draft California Sustainable Freight Action Plan was released[1], outlining a transition to a more efficient, economically competitive, and cleaner freight transport system. In November 2016, CARB also released a revised draft of the Short Lived Climate Pollutant strategy to address emissions from methane, black carbon and hydrofluorocarbons (HFCs).

The emission reductions needed for this region are outlined further in CARB's draft "Mobile Source Strategy" (May 2016)[2], which is an integrated plan to transform California's mobile sector. Specifically, it calls for California to build upon its successful efforts to meet critical air quality and climate goals, as summarized below:

- Attaining federal health-based air quality standards for ozone in 2023 and 2031 in the South Coast and San Joaquin Valley, and fine particulate matter (PM2.5) standards in the next decade;
- Achieving GHG emission reduction targets of 40 percent below 1990 levels by 2030;
- Reducing our petroleum use by up to 50 percent by 2030;
- Minimizing health risk from exposure to toxic air contaminants; and
- Increasing energy efficiency and deriving 50 percent of our electricity from renewable sources by 2030.

The document focuses on mobile sources, both on- and off-road equipment, that are responsible for approximately 80 percent of smog-forming NOx emissions, 95 percent of diesel particulate matter emissions and 50 percent of GHG emissions. Given this contribution, significant cuts in pollution from these sources are needed, therefore the proposed mobile source strategy calls for establishing requirements for cleaner technologies (both zero and near-zero) and deploying these technologies into the fleet, requiring cleaner and renewable fuels, and ensuring continued clean performance in use. Actions to accelerate the deployment of cleaner technologies through incentives, efficiency increases in moving people and freight, and support for the use of advanced transportation technologies

[1] http://www.dot.ca.gov/casustainablefreight/theplan.html

[2] https://www.arb.ca.gov/planning/sip/2016sip/2016mobsrc.pdf

such as intelligent transportation systems and autonomous vehicles, are also needed. Taken together, these actions would provide the reductions necessary from mobile sources to achieve the air quality and climate goals outlined above.

In summary, advanced, energy efficient and renewable technologies are needed not only for attainment, but also to protect the health of those who reside within the SCAQMD's jurisdiction; to reduce long-term dependence on petroleum-based fuels; and to support a more sustainable energy future. Conventional strategies and traditional supply and consumption need to be retooled in order to achieve the federal air quality goals. To help meet this need for advanced, clean technologies, the SCAQMD Governing Board continues to aggressively carry out the Clean Fuels Program and promote alternative fuels through its Technology Advancement Office (TAO).

The Clean Fuels Program is intended to assist in the accelerated development and deployment of progressively lower-emitting technologies and fuels through innovative public-private partnership. Since its inception, SCAQMD's TAO has cofunded projects in cooperative partnerships with private industry, technology developers, academic and research institutions and local, state and federal agencies. The following sections describe program funding, provide a 2016 overview and describe core technologies of the Clean Fuels Program.

Program Funding

The Clean Fuels Program is established under California H&SC Sections 40448.5 and 40512 and Vehicle Code Section 9250.11. This legislation establishes mechanisms to collect revenues from mobile and stationary sources to support the program objectives and identifies the constraints on the use of funds. In 2008, these funding mechanisms were reauthorized under SB 1646 (Padilla), which removed the funding sunset of January 1, 2010, and established the five percent administrative cap instead of the previous cap of two-and-half percent.

The Program is funded through a $1 fee on motor vehicles registered in the SCAQMD. Revenues collected from these motor vehicles must be used to support mobile source projects. Stationary source projects are funded by an emission fee surcharge on stationary sources emitting more than 250 tons of pollutants per year within the SCAQMD. For CY 2016 the funds available through each of these mechanisms were as follows:

- Mobile sources (DMV revenues) $13,446,456
- Stationary sources (emission fee surcharge) $325,326

The SCAQMD Clean Fuels Program also receives grants and cost-sharing revenue contracts from various agencies, on a project-specific basis, that supplement the SCAQMD program. Historically, such cooperative project funding revenues have been received from CARB, the CEC, the U.S. EPA, the U.S. Department of Energy (DOE) and the U.S. Department of Transportation (DOT). These supplemental revenues depend in large part on the originating agency, its budgetary and planning cycle and the specific project or intended use of the revenues. Table 3 (page 41) lists supplemental grants and revenues totaling $3.42 million for contracts executed in CY 2016. Table 4 (page 41) lists federal and state revenue totaling nearly $48.9 million awarded to the SCAQMD in 2016 for projects that will be part of the Clean Fuels Program or align well and will complement the Clean Fuels Program.

The final and perhaps most significant funding source can best be described as an indirect source, i.e., funding not directly received by the SCAQMD. This indirect source is the cost-sharing provided by private industry and other public and private organizations. Historically, the Technology Advancement Office has been successful in leveraging its available public funds with $3 to $4 of outside funding for each $1 of SCAQMD funding. For 2016, the Clean Fuels Program leveraged each $1 to more than $9 of outside funding. This atypical leverage was the result of a few key contracts with significant project scopes executed in 2016, such as the $23 million award from CARB's California Climate Investment

Program (see Table 2 for more information on these key projects). Through these public-private partnership, the SCAQMD has shared the investment risk of developing new technologies along with the benefits of expedited development and commercial availability, increased end-user acceptance, reduced emissions from the demonstration projects and ultimately increased use of clean technologies in the Basin. While the SCAQMD aggressively seeks leverage funds to accomplish more with every dollar, it also strives to act as a leader in technology development and commercialization in an effort to accelerate the reduction of criteria pollutants. Leveraging dollars and aggressively applying for additional funds whenever funding opportunities arise is more important than ever given the magnitude of additional funding identified in the Draft 2016 AQMP to achieve federal ozone air quality standards. The SCAQMD's Clean Fuels Program has also avoided duplicative efforts by coordinating and jointly funding projects with major funding agencies and organizations. The major funding partners for 2016 are listed in Table 1 (page 16).

2016 Overview

This report summarizes the progress of the SCAQMD Clean Fuels Program for CY 2016. The SCAQMD Clean Fuels Program cosponsors projects to develop and demonstrate zero, near-zero and low-emission clean fuels and advanced technologies and to promote commercialization and deployment of promising or proven technologies in Southern California. These projects are conducted through public-private partnerships with industry, technology developers, academic and research institutes and local, state and federal agencies.

This report also highlights achievements and summarizes project costs of the SCAQMD Clean Fuels Program in CY 2016. During the period between January 1 and December 31, 2016, the SCAQMD executed 60 new contracts, projects or studies and modified 6 continuing projects adding additional dollars during CY 2016 that support clean fuels and advanced zero, near-zero and low-emission technologies. The SCAQMD Clean Fuels Program contribution for these projects was approximately $21.8 million, inclusive of $3.42 million received into the Clean Fuels Fund as cost-share for contracts executed in this reporting period, with total project costs of a bit more than $198 million. These projects address a wide range of issues with a diverse technology mix. The report not only provides information on outside funding received into the Clean Fuels Fund as cost-share for contracts executed in this period (summarized in Table 3, page 41), but also funds awarded to the SCAQMD for projects to be included in the Clean Fuels Program or which align well and are complementary to the Clean Fuels Program ($48.9 million in 2016, see Table 4). More details on this financial summary can be found later in this report. The SCAQMD will continue to pursue federal, state and private funding opportunities in 2017 to amplify leverage, while acknowledging that support of a promising technology is not contingent on outside cost-sharing and affirming that SCAQMD will remain committed to acting as a leader in developing advanced technologies that lower criteria pollutants.

Core Technologies

Given the diversity of sources that contribute to the air quality problems in the Basin, there is no single technology or "Silver Bullet" that can solve all of the problems. A number of technologies are required and these technologies represent a wide range of applications, with full emissions benefit "payoffs," i.e., full commercialization and mass deployment occurring at different times. The broad technology areas of focus – the "Core Technologies" – for the Clean Fuels Program are as follows:

- Hydrogen and Fuel Cell Technologies and Infrastructure (especially large-scale refueling facilities)
- Electric and Hybrid Vehicle Technologies and Infrastructure (emphasizing electric and hybrid electric trucks and container transport technologies with zero emission operation)
- Engine Systems (emphasizing heavy-duty alternative and renewable fuel engines for truck and rail applications)

- Fueling Infrastructure and Deployment (predominantly natural gas and renewable fuels)
- Health Impacts, Emissions and Fuel Studies
- Stationary Clean Fuels Technologies
- Emission Control Technologies
- Technology Assessment/Transfer and Outreach

The SCAQMD continually seeks to support the deployment of lower-emitting technologies. The Clean Fuels Program is shaped by two basic factors:

1. Low, near-zero and zero emission technologies needed to achieve clean air standards in the Basin; and
2. Available funding to support technology development within the constraints imposed by that funding.

The SCAQMD strives to maintain a flexible program to address dynamically evolving technologies and the latest progress in the state of the technology while balancing the needs in the various technology sectors with technology readiness, emissions reduction potential and cofunding opportunities. Although the SCAQMD program is significant, national and international activities affect the direction of technology trends. As a result, the SCAQMD program must be flexible in order to leverage and accommodate these changes in state, national and international priorities. Nonetheless, while the state and federal governments have in recent years turned a great deal of their attention to climate change, SCAQMD has remained committed to developing, demonstrating and commercializing zero and near-zero emission technologies. Fortunately many, if not the majority, of technology sectors that address our need for NOx reductions also garner greenhouse gas (GHG) reductions. Due to these "co-benefits," the SCAQMD has been successful in partnering with the state and federal government. Even with the leveraged funds, the challenge for the SCAQMD remains the need to identify project or technology opportunities in which its available funding can make a difference in achieving progressively cleaner air in the Basin.

To achieve this, the SCAQMD will need to continue to employ a number of outreach and networking activities as well as evaluate new ways to expand these activities. Typical activities range from intimate involvement with state and federal collaboratives, partnerships and industrial coalitions, to the issuance of Program Opportunity Notices to solicit project ideas and concepts as well as the issuance of Requests for Information to determine the state of various technologies and the challenges faced by those technologies for commercialization. While employing a number of creative outreach and networking activities to try to overcome these challenges, SCAQMD's TAO annually develops a comprehensive plan to encourage and accelerate the development and demonstration of cleaner technologies. Every year TAO staff re-evaluates the Clean Fuels Program to develop a comprehensive plan (referred to as the 2017 Plan Update within this document) to essentially re-assess the technology progress and direction for the agency.

Historically, mobile source projects have targeted low-emission developments in automobiles, transit buses, medium- and heavy-duty trucks and non-road applications. These vehicle-related efforts have focused on advancements in engine design, electric power-trains and energy storage/conversion devices (e.g., fuel cells and batteries); and implementation of clean fuels (e.g., natural gas, propane and hydrogen) including their infrastructure development. Stationary source projects have included a wide array of advanced low NOx technologies and clean energy alternatives such as fuel cells, solar power and other renewable and waste energy systems. The focus on recent years has been on zero and near-zero emission technologies to reduce emissions from mobile sources, which contribute to more than 80 percent of the current NOx emissions in this region. However, while mobile sources include both on- and off-road vehicles as well as aircraft and ships, only the federal government has the authority to regulate emissions from aircraft and ships. The SCAQMD is exploring opportunities to expand its

authority in ways that would allow the agency to do more to foster technology development for ship and train activities as they relate to goods movement.

Specific projects are selected for cofunding from competitive solicitations, cooperative agency agreements and unsolicited proposals. Criteria considered in project selection include emissions reduction potential, technological innovation, potential to reduce costs and improve cost effectiveness, contractor experience and capabilities, overall environmental impacts or benefits, commercialization and business development potential, cost sharing and consistency with program goals and funding constraints. The core technologies for the SCAQMD programs that meet both the funding constraints as well as Draft 2016 AQMP needs for achieving clean air are briefly described below.

Electric and Hybrid Vehicle Technologies and Infrastructure

There has been an increased level of activity and attention on electric and hybrid vehicles due to a confluence of factors, including the highly successful commercial introductions of hybrid passenger vehicles and more recently plug-in electric vehicles (PEVs) by almost all of the automakers and increased public attention on global warming, as well as several Executive Orders issued by Governor Brown over the last couple of years. At the federal level, there is also the continued push for PEVs through the EV Everywhere Program.

The growing awareness by both government and the public for the need for better air quality is leading to stricter emissions targets and a demand for greater fuel efficiency for vehicles. As a result, there is now a window of opportunity to leverage state and federal activities in the development and deployment of technologies that can accelerate advanced electric and hybrid technologies, including medium- and heavy-duty hybrid vehicle deployment, energy storage technologies and other power options, development of medium- and heavy-duty hybrid emission certification cycles, battery durability testing and establishment of driver use patterns. Such technology developments, if successful, are considered enabling because they can be applied to a variety of fuels (e.g., gasoline, natural gas, biofuels and hydrogen) and propulsion systems - e.g., internal combustion engines (ICEs), batteries and fuel cells. In particular, utilizing electric drive technologies to enable zero emission mile capable heavy-duty trucks for goods movement remains a top priority. Electric and hybrid technologies are also being explored to address one of the SCAQMD's 2016-17 Goals and Priority Objectives, which is to continue development and demonstration of zero emission goods movement technologies.

EV adoption surpassed a huge milestone in 2016 selling a quarter of a million electric vehicles in California, according to the PEV Collaborative, and recent announcements by automakers (e.g., Chevrolet, Nissan, Tesla and BMW) on the extended range of upcoming EV models is especially promising. For example, the 2017 Chevy Bolt EV has an estimated EPA range of 238 miles with an affordable price target after incentives. However, in order to achieve the fleet penetration required for clean air, the need for charging infrastructure is significant. One sign of progress in this area is last year's California Public Utility Commission action recognizing the need for transportation electrification and approving Southern California Edison's (SCE's) $22 million "Charge Ready" pilot program to support installation of as many as 1,500 EV charging stations in their service territory. The SCAQMD will work with SCE to identify the best strategy for EV infrastructure (e.g., destination and residential charging) to complement this new program and continue to work with CEC, other government agencies and private entities to implement installation of charging infrastructure in our region.

Hydrogen and Mobile Fuel Cell Technologies and Infrastructure

Toyota and Hyundai commercialized light-duty fuel cell vehicles in 2015, Honda started delivering their Fuel Cell Clarity in 2016, and numerous others have plans to commercialize their own in the near future. As automakers continue to collaborate on development efforts (e.g., Honda and GM) and commercialize fuel cell vehicles, in the interim plug-in hybrid technology could help enable fuel cells

by using larger capacity batteries until fuel cell components mature. For example, Mercedes-Benz announced production of a plug-in fuel cell model GLC for 2018. However, the greatest challenge for the viability of fuel cell vehicles remains the installation and operations of hydrogen fueling stations. AB 8 requires the CEC to allocate $20 million annually from the Alternative and Renewable Fuel and Vehicle Technology Program until there are at least 100 publicly accessible hydrogen stations in operation in California. Of the 51 stations funded by CEC and CARB by the end of 2016, partially funded by SCAQMD for those in our region, there are five non-retail and 25 retail operational in California, but most if not all 51 are expected to be operational by the end of 2017 with capacity for more than 10,000 fuel cell vehicles. AB 8 also requires CARB to annually assess current and future FCVs and hydrogen stations in the marketplace. *The Joint Agency Staff Report on Assembly Bill 8: 2016 Assessment of Time and Cost Needed to Attain 100 Hydrogen Refueling Stations in California*[3] released in January 2017 reporting on 2016 findings states that there were 925 fuel cell vehicles registered in California by October 2016. However, CARB's annual survey of automakers projects 10,500 fuel cell vehicles in California by the end of 2018 and 34,300 by the end of 2021. Clearly, the SCAQMD must continue to support the infrastructure required to refuel retail fuel cell vehicles. To that end, SCAQMD is also actively engaged in finding alternatives to reducing the cost of hydrogen (e.g., large-scale hydrogen refueling stations) and potential longer term fuel cell power plant technology.

Engine Systems

Medium- and heavy-duty on-road vehicles contributed approximately 33 percent of the Basin's NOx based on Draft 2016 AQMP data. More importantly, on-road heavy-duty diesel trucks account for 33 percent of the on-road mobile source PM2.5, which has known toxic effects. These figures notably do not include the significant contribution from off-road mobile sources, which contribute significantly to NOx and PM2.5 emissions in the Basin. Furthermore, while MATES IV found a dramatic decrease in ambient levels of diesel PM and other air toxics, diesel PM is still the major driver of air toxics health risks. Clearly, significant emission reductions will be required from mobile sources, especially from the heavy-duty sector, to attain the federal clean air standards.

The use of alternative fuels in heavy-duty vehicles can provide significant reductions in NOx and particulate emissions. The current NOx emissions standard for heavy-duty engines is 0.2 g/bhp- hr. The SCAQMD, along with various local, state and federal agencies, continues to support the development and demonstration of alternative-fueled low emission heavy-duty engine technologies, using natural gas, renewable diesel and potentially other renewable or waste stream liquid fuels, for applications in heavy-duty transport trucks, transit and school buses, rail operations, and refuse collection and delivery vehicles to meet future federal emission standards. The SCAQMD's FY 2016-17 Goals and Priority Objectives also includes development and demonstration of next-generation natural gas engines/hybrid vehicles with the goal of developing engines 75-90 percent cleaner than the current emissions standard for NOx. Additionally, options for integrating with hybrid systems and alternative fuels need to be explored to provide additional NOx reductions.

In connection with the challenge to develop cleaner engine systems, on June 3, 2016, the EPA received a Petition, led by SCAQMD and joined by many other state air quality management agencies, to initiate rulemaking guidelines to create a national standard for ultra-low NOx heavy-duty engines. The EPA has since acknowledged a need for additional NOx reductions through a harmonized and comprehensive national NOx reduction program for heavy duty on-highway engines and vehicles. The EPA has initiated action towards proposed rulemaking for a revised heavy-duty NOx program, with the intent of proposing standards that could begin model year 2024, consistent with the lead-time requirements of the Clean Air Act and the AQMP goals. If EPA adopts a more stringent heavy-duty NOx standard for the nation, engine manufacturers will be required to step up further to develop cleaner

[3] http://www.energy.ca.gov/2017publications/CEC-600-2017-002/CEC-600-2017-002.pdf

engines, and this region will also benefit from cleaner vehicles coming into the state as part of the goods movement industry.

Fueling Infrastructure and Deployment (NG/RNG)

A key element for increased use of alternative fueled vehicles and resulting widespread acceptance is the availability of the supporting refueling infrastructure. The refueling infrastructure for gasoline and diesel fuel is well established and accepted by the driving public. Alternative, clean fuels such as alcohol-based fuels, propane, hydrogen, and even electricity are much less available or accessible, whereas natural gas and renewable fuels have recently become more readily available and cost-effective. Nonetheless, to realize emissions reduction benefits, alternative fuel infrastructure, especially fuels from renewable feedstocks, must be developed in tandem with the growth in alternative fueled vehicles. While California appears to be on track to meet its Renewable Portfolio Standard targets of 33% by 2020 and 50% by 2030 as required by SB 350 (chaptered October 2015), the objectives of the SCAQMD are to expand the infrastructure to support zero and near-zero emission vehicles through the development, demonstration and installation of alternative fuel vehicle refueling technologies. However, this category is predominantly targeted at natural gas and renewable natural gas (RNG) infrastructure and deployment (electric and hydrogen fueling are included in their respective technology categories). Changes to the Carl Moyer Program as a result of SB 513 (chaptered October 2015) may help stimulate deployment of alternative and natural gas vehicles and related infrastructure. The Clean Fuels Program will continue to examine opportunities where current incentive funding is either absent or insufficient. Market offerings such as Ford's 2016 F-150 which has the ability to run on natural gas may help further spur demand in this area.

Health Impacts, Emissions and Fuel Studies

The monitoring of pollutants in the Basin is extremely important, especially when focused on (1) a particular sector of the emissions inventory (to identify the responsible technology) or (2) exposure to pollution (to assess the potential health risks). Several studies indicate that areas with high levels of air pollution can produce irreversible damage to children's lungs. This information highlights the need for further emissions and health studies to identify the emissions from high polluting sectors as well as the health effects resulting from these technologies. Considering the transition to alternative and renewable fuels, accelerated by federal and state requirements, it is important to understand the impacts that changing fuel composition will have on exhaust emissions and in turn on ambient air quality. This area focuses on exhaust emission studies, with a focus on NOx and PM2.5 emissions and a detailed review of other potential toxic tailpipe emissions, for alternative fuel and diesel engines, especially in the heavy-duty sector, as well as light- and heavy-duty engines that operate on renewable fuels or higher compression spark- ignited engines. These types of in-use emissions studies have found significantly higher emissions than certification values for heavy-duty diesel engines, depending on the duty-cycle.

Stationary Clean Fuel Technologies

Given the limited funding available to support low emission stationary source technology development, this area has historically been limited in scope. To gain the maximum air quality benefits in this category, higher polluting fossil fuel-fired electric power generation needs to be replaced with clean, renewable energy resources or other advanced near zero-emission technologies, such as solar, wind, geo-thermal energy, bio-mass conversion and stationary fuel cells. Although combustion sources are lumped together as stationary, the design and operating principles vary significantly and thus also the methods and technologies for control of their emissions. Included in the stationary category are boilers, heaters, gas turbines and reciprocating engines. The key technologies for this category focus on using advanced combustion processes, development of catalytic add-on controls, alternative fuels and technologies and stationary fuel cells in novel applications.

Emission Control Technologies

This broad category refers to technologies that could be deployed on existing mobile sources, aircraft, locomotives, marine vessels, farm and construction equipment, cargo handling equipment, industrial equipment, and utility and lawn-and-garden equipment. The in-use fleet comprises the majority of emissions, especially the older vehicles and non-road sources, which are typically uncontrolled and unregulated, or controlled to a much lesser extent than on-road vehicles. The authority to develop and implement regulations for retrofit on-road and non-road mobile sources lies primarily with the U.S. EPA and CARB.

Low-emission and clean-fuel technologies that appear promising for on-road mobile sources should be effective at reducing emissions from a number of non-road sources. For example, immediate benefits are possible from particulate traps and selective catalytic reduction (SCR) that have been developed for diesel applications. Clean fuels such as natural gas, propane, hydrogen and hydrogen-natural gas mixtures may also provide an effective option to reduce emissions from some non-road applications. Reformulated gasoline, ethanol and alternative diesel fuels, such as biodiesel and gas-to-liquid (GTL), also show promise when used in conjunction with advanced emissions controls and new engine technologies.

Technology Assessment/Transfer and Outreach

Since the value of the Clean Fuels Program depends on the deployment and adoption of the demonstrated technologies, technology assessment and transfer efforts are essential to its success. This core area encompasses assessment of advanced technologies, including retaining outside technical assistance as needed, efforts to expedite the implementation of low emission and clean fuels technologies, and coordination of these activities with other organizations. Technology transfer efforts also include support for various clean fuel vehicle incentive programs. The other spectrum of this core technology is information dissemination to educate the end user and increase awareness. While SCAQMD's Public Affairs office oversees and carries out the majority of such education and awareness efforts on behalf of the entire agency, TAO cosponsors and occasionally hosts various technology-related events to complement their efforts. These efforts range from general outreach and partnerships to convening or cosponsoring events. Some examples include: 1) partnerships with local colleges such as Cal State Los Angeles' Hydrogen Research and Fueling Facility; 2) SCAQMD's A World We Can Change high school conferences; 3) participation in the Jet Propulsion Laboratory's Annual Climate Day for middle schoolers promoting STEM education; 4) partnerships for national events such as Drive Electric Week; and 5) hosting tours of SCAQMD's clean fuel vehicle fleet and their respective fueling platforms.

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CLEAN FUELS PROGRAM BARRIERS, SCOPE AND IMPACT

Overcoming Barriers

Commercialization and implementation of advanced technologies come with a variety of challenges and barriers. A combination of real-world demonstrations, education, outreach and regulatory impetus and incentives is necessary to bring new, clean technologies to market. To reap the maximum emissions benefits from any technology, widespread deployment and user acceptance must occur. The product manufacturers must overcome technical and market barriers to ensure a competitive and sustainable business. Barriers include project-specific issues as well as general technology concerns.

Technology Implementation Barriers

- Viable commercialization Path
- Technology price/performance parity with convention technology
- Consumer acceptance
- Fuel availability/convenience issues
- Certification, safety and regulatory barriers
- Quantifying emissions benefits
- Sustainability of market and technology

Project-Specific Issues

- Identifying a committed demonstration site
- Overall project cost and cost-share using public monies
- Securing the fuel
- Identifying and resolving real and perceived safety issues
- Quantifying the actual emissions benefits
- Viability of the technology provider

Other barriers include reduced or shrinking research budgets, infrastructure and energy uncertainties and risks, sensitivity to multi-media environmental impacts and the need to find balance between environmental needs and economic constraints. The SCAQMD seeks to address these barriers by establishing relationships through unique public-private partnerships with key stakeholders; e.g., industry, end-users and other government agencies with a stake in developing clean technologies. Partnerships that involve all the key stakeholders have become essential to address these challenges in bringing advanced technologies from development to commercialization.

Each of these stakeholders and partners contributes more than just funding. Industry, for example, can contribute technology production expertise as well as the experience required for compatibility with process operations. Academic and research institutes bring state-of-the- technology knowledge and testing proficiency. Governmental and regulatory agencies can provide guidance in identifying sources with the greatest potential for emissions reduction, assistance in permitting and compliance issues, coordinating of infrastructure needs and facilitation of standards setting and educational outreach. Often, there is considerable synergy in developing technologies that address multiple goals of public and private bodies regarding the environment, energy and transportation.

Scope and Benefits of the Clean Fuels Program

Since the time needed to overcome barriers can be long and the costs high, both manufacturers and end-users tend to be discouraged from considering advanced technologies. The Clean Fuels Program addresses these needs by cofunding research, development, demonstration and deployment projects to share the risk of emerging technologies with their developers and eventual users.

Figure 3 provides a conceptual design of the wide scope of the Clean Fuels Program. As mentioned in the Core Technologies section, various stages of technology projects are funded not only to provide a portfolio of emissions technology choices but to achieve emission reduction benefits in the nearer as well as over the longer term.

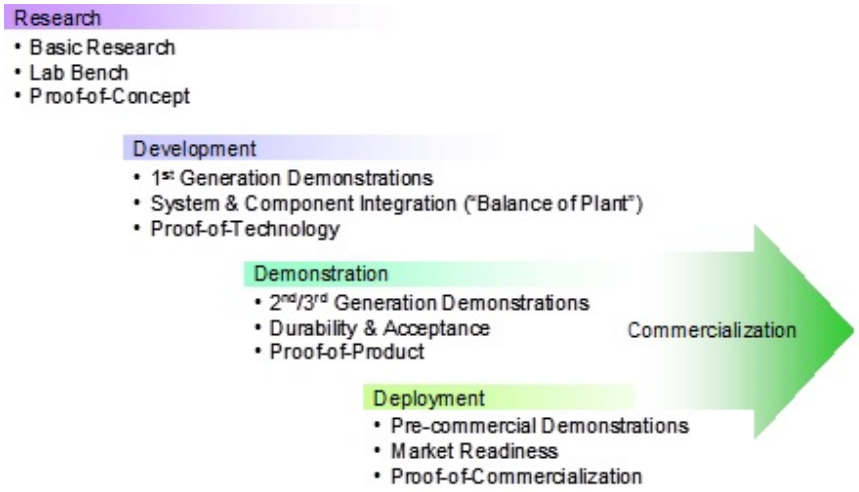

Figure 3: Stages of Clean Fuels Program Projects

Due to the nature of these advanced technology research, development, demonstration and deployment projects, the benefits are difficult to quantify since their full emission reduction potential may not be realized until sometime in the future, or perhaps not at all if displaced by superior technologies. Nevertheless, a good indication of the impact and benefits of the Clean Fuels Program overall is provided by this selective list of sponsored projects that have resulted in commercialized products or helped to advance the state-of-the-technology.

➢CNG Engine Development for Heavy-Duty Vehicles

- Emission Solutions: 7.6L (NG)
- Cummins Westport: low-NOx natural gas ISL G 8.9L engines (0.2 & 0.02 g/bhp-hr)
- Westport Power: ISX 15L (LNG), Westport GX 15 L (dual fuel)
- Detroit Diesel: Series 60G (CNG/LNG), Series 50G (CNG/LNG);
- John Deere: 6068 (CNG), 6081 (CNG);
- Mack: E7-400G (LNG); and
- Clean Air Partners/Power Systems (Caterpillar): 3126B (Dual Fuel), C-10 (Dual Fuel), C-12 (Dual Fuel).

➢Fuel Cell Development and Demonstrations

- Ballard Fuel Cell Bus (first of its kind);
- Retail light-duty passenger fuel cell vehicles (Toyota Mirai, Hyundai Tucson, Honda Clarity);
- SunLine Transit Agency Advanced Fuel Cell Bus projects;
- Commercial stationary fuel cell demonstration with UTC and SoCalGas (first of its kind); and
- Orange County Sanitation District hydrogen and combined heat and power generation from biogas using molten carbonate fuel cell technology (as well as their renewable hydrogen station).
- New Flyer Transit Bus at OCTA
- UPS demonstration of fuel cell delivery trucks

- Fuel cell Class 8 trucks under Zero Emission Cargo Transport (ZECT) II Program

➢ Electric and Hybrid Electric Vehicle Development and Demonstrations

- EPRI hybrid vehicle evaluation study;
- Hybrid electric vehicle demonstrations with SCE, UC Davis and AC Propulsion;
- Plug-in Hybrid Electric Van with EPRI, DaimlerChrysler and SCE;
- Hybrid electric delivery trucks with NREL, FedEx and UPS;
- Proterra battery electric transit bus and fast charging system;
- Municipal battery electric utility truck;
- South Bay City Council of Governments' electric vehicle project;
- EVI/UPS electric truck;
- Plug-in hybrid work truck with Odyne Systems;
- Plug-in hybrid van and pickup with VIA Motors;
- BYD all-electric transit bus;
- LACMTA battery electric buses;
- Electric school buses with V2G capability; and
- TransPower/US Hybrid battery electric heavy-duty truck and yard hostlers.

➢ Aftertreatment Technologies for Heavy-Duty Vehicles

- Johnson Matthey and Engelhard trap demonstrations on buses and construction equipment; and
- Johnson Matthey SCRT and SCCRT NOx and PM reduction control devices on heavy-duty on-road trucks.

SCAQMD played a leading or major role in the development of these technologies, but their benefits could not have been achieved without all stakeholders (i.e., manufacturer, end-users and government) working collectively to overcome the technology, market and project-specific barriers encountered at every stage of the research, development, demonstration and deployment process.

Strategy and Impact

In addition to the feedback and input detailed in Program Review (pages 1-2), the SCAQMD actively seeks additional partners for its program through participation in various working groups, committees and task forces. This participation has resulted in coordination of the SCAQMD program with a number of state and federal government organizations, including CARB, CEC, EPA and U.S. DOE and several of its national laboratories. Coordination also includes the AB 2766 Discretionary Fund Program administered by the Mobile Source Air Pollution Reduction Review Committee (MSRC), various local air districts, National Association of Fleet Administrators (NAFA), major local transit districts and local gas and electric utilities. The list of organizations with which the SCAQMD coordinates research and development activities also includes organizations specified in H&SC Section 40448.5.1(a)(2).

In addition, the SCAQMD holds periodic meetings with several organizations specifically to review and coordinate program and project plans. For example, the SCAQMD staff meets with CARB staff to review research and development plans, discuss project areas of mutual interest, avoid duplicative efforts and identify potential opportunities for cost-sharing. Periodic meetings are also held with industry-oriented research and development organizations, including but not limited to the California Fuel Cell Partnership (CaFCP), the California Stationary Fuel Cell Collaborative, the California Natural Gas Vehicle Partnership (CNGVP), the California Plug-In Electric Vehicle (PEV) Collaborative, the California Hydrogen Business Council (CHBC) the Electric Power Research Institute (EPRI), the Electric Drive Transportation Association (EDTA), the SoCalEV Collaborative, the West Coast Collaborative, which is part of the National Clean Diesel Campaign, and the Transportation Research Board. The coordination efforts with these various stakeholders have resulted in a number of cosponsored projects.

Descriptions of some of the key contracts executed in CY 2016 are provided in the next section of this report. It is noteworthy that most of the projects are cosponsored by various funding organizations and include the active involvement of original equipment manufacturers. Such partnerships are essential to address commercialization barriers and to help expedite the implementation of advanced low emission technologies. Table 1 below lists the major funding agency partners and manufacturers actively involved in SCAQMD projects for this reporting period. It is important to note that, although not listed, there are many other technology developers, small manufacturers and project participants who make important contributions critical to the success of the SCAQMD program. These partners are identified in the more detailed 2016 Project Summaries (beginning page 43) contained within this report.

Table 1: SCAQMD Major Funding Partners in CY 2016

Research Funding Organizations	Major Manufacturers/Providers
California Air Resources Board	BYD North America
California Energy Commission	Cummins Inc.
National Renewable Energy Laboratory	Cummins Westport, Inc.
U.S. Department of Energy	Kenworth
U.S. Environmental Protection Agency	KORE Industries
MSRC/AB 2766 Discretionary Fund Program	Peterbilt
	Ports of Los Angeles & Long Beach
	Southern California Gas Company
	TransPower
	University of California Riverside/ CE-CERT
	Volvo

The following two subsections broadly address the SCAQMD's impact and benefits by describing specific examples of accomplishments and commercial—or near-commercial— products supported by the Clean Fuels Program in CY 2016. Such examples are provided in the following sections on the Technology Advancement Office's Research, Development and Demonstration projects and Technology Deployment and Commercialization efforts.

Research, Development and Demonstration

Important examples of the impact of the SCAQMD research and development coordination efforts include: (a) development and demonstration of zero emissions goods movement technologies; (b) development, integration and demonstration of ultra-low emission natural gas engines for heavy-duty vehicle applications; (c) development and demonstration of a Class 8 fuel cell range-extended electric drayage truck; and (d) develop and demonstrate fuel cell extended-range electric medium-duty truck and powertrain for parcel delivery trucks

Develop and Demonstrate Class 8 Zero Emission Drayage Truck Technologies

Heavy-duty diesel trucks in the South Coast Air Basin remain a significant source of emissions with adverse health impact, especially in the surrounding communities along the goods movement corridors near the Ports of Los Angeles and Long Beach (Ports), and next to major freeways. In order to mitigate

the impact and attain stringent national ambient air quality standards for the region, SCAQMD has been aggressively promoting and supporting development and demonstration of advanced zero emission cargo transport technologies, in partnership with the Southern California Regional Zero Emission Truck Collaborative, comprised of the Los Angeles Metropolitan Transportation Authority, the Ports of Los Angeles and Long Beach, the Southern California Association of Governments, and the Gateway Cities Council of Governments.

Figure 5: TransPower Battery Electric Trucks

With two grants, totaling approximately $14 million from the DOE's Zero Emission Cargo Transport (ZECT) Program, the SCAQMD has engaged leading EV integrators, including BAE Systems, Transportation Power (TransPower) and US Hybrid, as well as a major truck manufacturer, Kenworth, to develop and demonstrate a variety of Class 8 electric drayage trucks, consisting of eleven zero emission trucks – six battery electric and five fuel cell trucks – and seven hybrid electric trucks with extended range using CNG, LNG or diesel ICEs. These trucks are deployed in real world drayage operations to evaluate the trucks' performance and capability as well as to identify limitations in supporting demanding drayage duty cycles. To date, five battery electric trucks (BETs) have been completed and deployed in field demonstration with drayage fleets at the Ports. With an estimated range of 80 to 100 miles per charge, these BETs are deployed in near-dock and local operations within a 20-mile radius from the Ports and have been providing dependable service with positive feedback from fleet drivers on its quiet and smooth operations with sufficient power and torque. In addition, one CNG plug-in hybrid electric truck (PHET), with 30-40 miles in all-electric range (AER) and 150-200 miles of total operating range, is currently undergoing final validation testing before deployment and four more trucks, including two fuel cell trucks with 150-200 miles of range, are expected to be completed in Q1 2017.

Figure 4: US Hybrid CNG PHET

Leveraging the technologies and expertise gained from the ZECT program, SCAQMD proposed and received a $23.6 million grant from CARB under the Low Carbon Transportation Greenhouse Gas Reduction Fund (GGRF) Investment Program for a larger-scale demonstration of advanced electric drayage truck technologies in 2016. The project is to develop a portfolio of most commercially promising zero and near-zero emission drayage trucks for a statewide demonstration, across a variety of drayage applications in and around the Ports of Long Beach, Los Angeles, Oakland, Stockton and San Diego. SCAQMD has partnered with the four largest and most emission-impacted air districts in the state, namely Bay Area AQMD, Sacramento Metropolitan AQMD, San Joaquin Valley APCD and San Diego APCD, to build a comprehensive and coordinated approach to demonstrate the electric drayage trucks in diverse geographic and operational challenges across the state's interconnected goods movement system. For the project, the SCAQMD has successfully engaged three major truck OEMs – Kenworth, Peterbilt and Volvo, and an international OEM leader in heavy-duty electrification, BYD, to drive commercially-viable product development stages in a targeted portfolio of zero-emission and near-zero emission technologies and efficiency solutions, consisting of two battery-electric trucks, and two plug-in hybrid electric trucks with extended range capability, using natural gas or diesel ICEs, as follows:

Figure 6: BYD T9 Prototype

BYD will develop 25 battery electric trucks based on their T9 prototype, which is optimized to serve near-dock and short regional drayage routes with a range of up to 100 miles. The truck is designed to provide similar operating experience compared to equivalent diesel and CNG trucks with matching or exceeding power and torque, using two 180 kW in-line traction motors.

Kenworth will develop four plug-in hybrid electric trucks with natural gas range extender, leveraging the prototype development under the ZECT program. These vehicles will target longer regional drayage routes, based a well-balanced blend of all electric and CNG-based hybrid operation to provide 250 miles in total operating range with a capability to operate 30-40 miles in zero emission mode in disadvantaged communities near ports, rail yards and distribution centers. The powertrain system includes a 200 kW genset using the recently certified 8.9L near-zero CNG engine and two AC traction motors, with comparable power output to Class 8 diesel trucks.

Peterbilt has partnered with TransPower to develop 12 battery electric drayage trucks, building on a platform developed under the ZECT program, incorporating lessons learned from ongoing demonstrations to further refine and optimize the electric drive system. Eight of the twelve trucks will be designed to provide up to 80-100 miles in range to support near-dock drayage routes, and four extended-range battery electric trucks will incorporate a new, higher energy density battery cells to provide up to 120-150 miles of operation to service regional drayage routes, such as from the San Pedro Bay Ports terminals to Inland Empire warehouses.

Volvo will build on the success of a past SCAQMD/DOE-funded project by focusing on efficiency and emission optimization of a commercially attractive, highly-flexible product, while ensuring zero emission miles for operations in the most heavily emissions-impacted communities. Furthermore, Volvo, in partnership with LA Metro, will also integrate ITS connectivity solutions, such as vehicle-to-infrastructure and vehicle-to-vehicle communications targeting dynamic speed harmonization and reduced idling, to reduce fuel use and emissions.

Figure 7: Another BYD T9 Prototype

This exceptional portfolio features demonstrations of truly commercial-pathway trucks. Highlighting the commercial path reality of this portfolio, the principal contractors are all major heavy-duty truck OEMs. This is significant because major OEMs can bring necessary engineering resources, manufacturing capability, and a distribution/service network to support the future commercialization of these demonstration vehicles. Our partnership also includes LA Metro's participation with ITS efficiency integration, electric utility participation, and 13 confirmed end-user fleets who are experienced with the specific challenges and opportunities associated with early technology integration efforts. The relationships and technologies in this project represent a culmination of years of experience: leading truck manufacturers, innovative large and medium suppliers, air quality management districts and industry groups all coordinated in a focused push to create OEM-quality, commercially-viable products that both reduce criteria and carbon emissions.

Develop, Integrate and Demonstrate Ultra-Low Emission Natural Gas Engines from On-Road Heavy-Duty Engines

Heavy-duty on-road diesel vehicles are currently one of the largest sources of NOx emissions in the South Coast Air Basin. This source category is still projected to be one of the largest contributors to NOx emissions, even as the legacy fleet of older and higher polluting vehicles are retired from operation and replaced by the vehicles meeting the most stringent emission levels required by 2010 emissions standards. NOx reductions in excess of 50% will be needed from all source categories to meet future federal ambient air quality standards for ozone. Diesel engines have not achieved the necessary ultra-low emission levels. Natural gas engines, such as the Cummins Westport ISL-G NZ, have achieved a 90% reduction from the 2010 NOx emission standard and are currently entering the market in new

transit buses, school buses, and medium-heavy duty trucks as an engine repower option for vehicles already equipped with 0.2 g/bhp-hr ISL-G engines. Near-zero NOx emission engines are likely to be adopted sooner and at lower cost than possible with zero emission technologies since the near-zero engine technology is an evolution of existing natural gas engines that are in widespread use in many vehicle fleets.

SCAQMD, with funding from the California Energy Commission and the Southern California Gas Company, supported development of the 8.9-liter Cummins Westport engine and a new 15-liter natural gas engine from Cummins, Inc., that could meet a target of 0.02 g/bhp-hr NOx. The engines cover a range of power and vehicle applications that represent a significant fraction of the on-road heavy duty vehicle population. In 2015, the Cummins Westport 8.9-liter ISL-G NZ (near zero) engine was certified by CARB as meeting the Optional 0.02 g/bhp-hr NOx standard. The 15-liter Cummins engine also achieved the Optional 0.02 g/bhp-hr NOx standard but it was not certified or introduced into commerce due to high capital cost of building a new engine and current limited demand. The technology, drawing from light duty natural gas engines, and optimized with extensive computer simulations and engine testing was shown to offer improved performance, fuel efficiency, and emissions compared to other heavy-duty natural gas engines that were derived from diesel engine platforms. The Cummins technology is scalable over an 8-15-liter engine size range and will be incorporated in any new natural gas engine introduced by Cummins.

In 2015, SCAQMD, with funding from the Southern California Gas Company, awarded a contract for development of an 8.8-liter V-8 natural gas engine derived from a gasoline engine design. This engine was expected to be a better fit in light-heavy duty or medium duty conventional pick-up and van chassis than engines derived from diesel engines. The project team is led by the Gas Technology Institute and uses the Power Solutions International natural gas engine with ultra-low emission technology developed by Ricardo, Inc. Design work was completed in 2016. This project is now in the prototype fabrication stage with engine testing scheduled for 2017. At this time, the project does not include vehicle integration or an on-road demonstration.

Figure 8: Typical Heavy Duty Drayage Truck

In 2016 SCAQMD, with funding from the California Energy Commission, the Southern California Gas Company, and Clean Energy, Inc., awarded a contract to Cummins Westport to develop an ultra-low NOx emission version of the 11.9-liter ISX12-G engine. This project will apply the engine and after-treatment technologies developed for the 8.9-liter ISL-G NZ engine to a larger engine better suited to drayage and regional goods movement than the ISL-G engine. Development is well underway with early Alpha prototype engines now entering the demonstration phase.

Figure 9: ISL-G Natural Gas Engine

Figure 10: 8.8-Liter PSI Natural Gas Engine

Develop and Demonstrate Class 8 Fuel Cell Range-Extended Electric Drayage Truck

The I-710 and CA-60 highways are key transportation corridors in the Southern California region that are heavily used on a daily basis by heavy duty drayage trucks that transport the cargo from the ports to the inland transportation terminals. These terminals, which include store/warehouses, inland-railways, are anywhere from 5 to 50 miles in distance from the ports. The concentrated operation of these drayage vehicles in these corridors has had and will continue to have a significant impact on the air quality in this region whereby significantly impacting the quality of life in the communities surrounding these corridors. To reduce these negative impacts, it is critical that zero and near-zero emission technologies be developed and deployed in the region. A potential local market size of up to 46,000 trucks exists in the South Coast Air Basin, based on near-dock drayage trucks and trucks operating on the I-710 freeway.

Under project management by CTE, BAE Systems and Kenworth Trucks, this effort will develop a battery electric truck with a hydrogen range extender. This project will leverage the expertise of BAE Systems and Ballard Power Systems to test their hybrid electric fuel cell propulsion system, currently used for transit buses, in drayage applications. The power output of the electric drive train is comparable to currently used Class 8 truck engines power output. The vehicle will operate primarily from the batteries, engaging the fuel cell system only when the batteries reach a specified state of charge; BAE anticipates that the truck will provide approximately 112 miles of range between re-fueling.

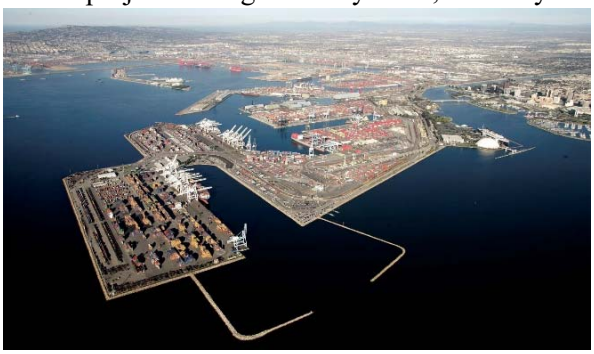

Figure 11: Los Angeles-Goods Movement and Industrial Corridor

Figure 12: Proposed Kenworth Truck Chassis

The primary objective for this project is to reduce criteria pollutants in the South Coast Air Basin by reducing diesel emissions from the transportation and movement of goods from the ports to intermodal and warehousing facilities throughout Southern California. Our technical objective is to accelerate the introduction and penetration of fuel cell technologies into the cargo transport sector, which will help achieve our primary objective to substantially reduce criteria pollutants, and as a side benefit, reduce petroleum consumption and greenhouse gases. Fuel cell range extenders, however, faces many challenges in the process of commercialization: proper sizing of the fuel cell stack, battery and fueling system; system integration and packaging of power train components and systems for safe, efficient and economical deployment of the technology are just a few of the challenges.

The proposed project area is known as the Los Angeles Goods Movement and Industrial Corridor. This area is adjacent to the Ports of Long Beach and Los Angeles, the busiest port complex in North America. The area is also a known Environmental Justice Community made up of predominantly low-income and minority populations.

Develop and Demonstrate Fuel Cell Extended-Range Electric Medium-Duty Truck and Powertrain for Parcel Delivery Trucks

Transitioning to zero and near-zero emission vehicles is one of the objectives of the Draft 2016 AQMP control strategies to attain Federal air quality standards for the South Coast Air Basin. According to UPS their parcel delivery Class 6 truck chassis go through several diesel repowers during its lifecycle which improves the return on assets for the company. In the transition to zero emission vehicles in the medium duty vehicle sector repowering to electric would make both economic and environmental sense for parcel delivery services like UPS.

UPS and CTE have joined together to develop an electric van with a fuel cell range extender. CTE sought and received funding from the DOE and CEC for the development of a fuel cell walk-in van. These vans will have a smaller battery and a small fuel cell with hydrogen storage to meet the majority of range needs for UPS and also the ability to refuel with hydrogen quickly for longer routes.

Figure 13: UPS Truck Chassis for Conversion

The Fuel Cell Hybrid Electric Medium-Duty Truck project offers substantial air quality and other environmental benefits. The project will help eliminate criteria pollutant and greenhouse gas emissions with fuel cell hybrid electric parcel delivery trucks. Unlike typical EV deployments, which usually displace cleaner current year diesel engines through annual retirement and purchasing plans, this proposed project will immediately terminate the use of a pre-2006 diesel engine that would otherwise continue to operate for many more years. The repowered vehicles will eliminate PM2.5 emissions completely, and will result in significant healthcare cost savings due to the elimination of harmful emissions throughout California communities.

This project is proposed in two-phases. In Phase 1, a pre-2006 model diesel-powered walk-in van will be converted to electric drive and then integrated with the fuel cell, power electronics, hydrogen storage system and controls. If the performance specifications are met and DOE approves Phase 2 will commence. In Phase 2, additional fuel cell hybrid walk-in vans will be built for operation under real-world conditions at UPS's distribution facilities in Northern California and in the South Coast Air Basin for at least 5,000 hours of operation. At least four of the vehicles will be deployed in the South Coast Air Basin. Any design updates will be incorporated due to lessons learned from the demonstration and validation phase.

Figure 14: Phase 1 Vehicle Modeling

In addition to co-funding the Fuel Cell Hybrid Electric Medium-Duty Trucks project, SCAQMD is also co-funding a related project with UPS and Calstart. That project seeks to develop a medium-duty fuel cell extended-range delivery truck with the fuel cell provided by another OEM for demonstration in parcel delivery services at the UPS Ontario Regional Hub. The demonstration project will validate the performance and reliability of a fuel cell hybrid electric powertrain, as well as to assess its commercial viability in urban delivery operations.

Technology Deployment and Commercialization

One function of the Clean Fuels Program is to help expedite the deployment and commercialization of low and zero emission technologies and fuels needed to meet the requirements of the AQMP control measures. In many cases, new technologies, although considered "commercially available," require assistance to fully demonstrate the technical viability to end-users and decision-makers.

The following projects contracted during the CY 2016 reporting period illustrate the impact of the SCAQMD's technology deployment and commercialization efforts and include: (a) construction of renewable natural gas production facilities and vehicle demonstrations; (b) hydrogen infrastructure rollout efforts throughout the year; and (c). electric/hybrid vehicle and infrastructure deployment and commercialization efforts in 2016.

Alternative Renewable Natural Gas (RNG) Fuel Development, Demonstration and Deployment

Air quality in the South Coast Air Basin (SCAB) is significantly impacted by emissions from on-road heavy-duty vehicles (HDVs). These vehicles consume significant amounts of fossil fuel which contribute to local NOx and PM emissions as well as GHG emissions. Near-zero NOx natural gas engines fueled with renewable natural gas (RNG) provide a commercially proven and cost effective strategy to reduce NOx emissions in the near term as well as help reduce GHG emissions from U.S. on-road HDVs. The development and use of RNG as a transportation fuel also helps to solve additional California goals including the 50% Renewable Portfolio Standard, the Low Carbon Fuel Standard, and the 75% diversion of organics from landfills. Locally produced and consumed RNG helps to reduce emissions of methane associated with out-of-state natural gas, and it transportation and distribution. Finally, as a transportation fuel, RNG has the lowest carbon intensity of all the heavy-duty, internal combustion engine-driven truck pathways. Three contracts executed in 2016 are contributing to the local production and use of RNG as a transportation fuel, demonstrating the use of RNG in near-zero NOx emission heavy-duty vehicles, and providing greater public awareness of CNG and RNG as a viable and cost effective transportation fuel.

CR&R Incorporated Environmental Services' (CR&R) Anaerobic Digestion and Biomethane Facility (ADBF) in Perris, CA is a large scale biomass to renewable natural gas (RNG) production project located in the South Coast Air Basin. The CR&R ADBF is designed to be constructed in four phases and has received financial support from the California Energy Commission and Cal Recycle to implement Phases 1 and 2. CR&R's ADBF is deemed a "zero-waste" operation by the waste collection industry as it produces no waste products. The anaerobic digesters convert the biomass feedstock into gases that are conditioned to pipeline quality methane, and the remaining solids and liquids are returned into the carbon cycle as compost, soil amendment and fertilizer to help promote new plant growth and animal feed, and other related organics that can result in new biomass feedstock. The vehicles used to collect the feedstock are powered with the RNG produced at the ADBF to collect additional feedstock, closing a renewable biofuel cycle and reducing or eliminating the use of fossil-based CNG in this cycle. Nationally and globally, using locally produced RNG as a transportation fuel displaces petroleum-based or fossil based transportation fuels, reduces GHGs, and helps address transmission-related emission impacts from out-of-state produced natural gas and its transportation and pipeline distribution.

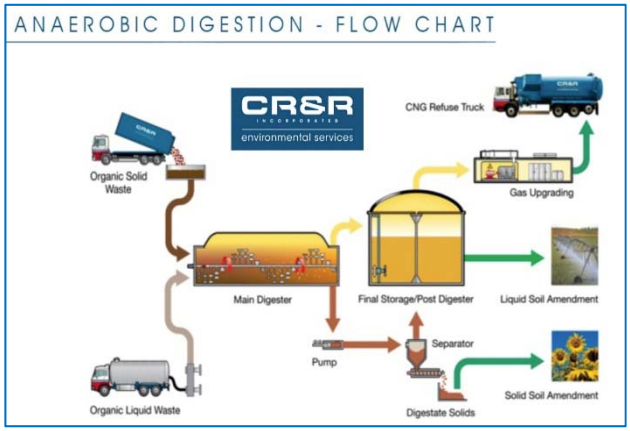

Figure 15: CR&R's Anaerobic Digestion Flow Chart

The contract with CR&R is to support the second phase of four phases of the ADBF, the production of RNG in excess of CR&R's fleet demand, the introduction of pipeline quality RNG into the Southern California Gas Company's natural gas grid, and the demonstration of RNG in near-zero NOx emission heavy-duty natural gas engines that meet or exceed CARB's Optional Low-NOx Standard. CR&R's ADBF will convert high solids organic waste from residential and commercial refuse and green wastes into RNG and soil amendments and fertilizers. The contract will also demonstrate the use of this local RNG in at least two different near-zero emission on-road heavy-duty solid waste collection type vehicles. The vehicles will be owned and operated by CR&R and will be powered by the 8.9L Cummins Westport (CW) ISL G NZ that is currently CARB certified to 0.02gNOX/bhp-hr. This engine is used in many curbside collection vehicles. The other engine is expected to be the CW 11.9L ISX12 G NZ that is being developed for CARB certification to same Optional Low NOx Standard as the ISL G NZ. The larger engine is used in transfer trucks. These "demonstration vehicles" will be deployed into CR&R's fleet and will perform routine solid waste collection services in the SCAB and provide reporting information on various performance parameters.

The CR&R ADBF project will help expand the production of locally produced RNG. Each phase of the ADBF is expected to produce 890,000 diesel gallon equivalents (DGE) of RNG annually. The expected goals of this project include the completion of Phase 2, the doubling of RNG production (from Phase 1), the demonstration of this fuel in a minimum of two near-zero emission heavy-duty natural gas powered refuse collection vehicles, and the successful introduction of RNG into the local natural gas pipeline grid.

Figure 16: CR&R's Anaerobic Digester

In addition to the expected local air quality benefits associated with this project, expansion of the ADBF is expected to help State programs such as AB 32 by reducing an estimated 15,000 metric tons per year of greenhouse gases (GHGs) that can be attributed to decomposition of these organic

wastes in landfills and, recently adopted legislations, AB1826 and AB1594, which require diverting organic waste from landfills and directing this waste product to recycling operations.

KORE Infrastructure, LLC recently completed a six year pilot program with the Los Angeles County Sanitation District (LACSD) to develop a biosolids to renewable biofuels process. KORE's proprietary system uses pyrolysis to thermochemically decompose the organic materials from partially treated waste water it receives from public owned treatment works (POTW), into syngas and biochar. The syngas comprised of hydrogen, carbon monoxide, carbon dioxide, and methane is catalytically and chemically reformed into biofuel such as renewable natural gas (RNG) and the resulting solids, known as biochar (carbon), is used as a soil amendment.

Figure 17: KORE Pyrolysis Unit

This project supports the construction, operation, and production of a commercial scale Biosolids to Transportation Fuel (BTF) facility in the City of Rialto, CA. KORE will design, construct and operate the BTF based on the extensive work and data collected in the pilot program with LACSD. Due to its location, the feedstock will be transported by truck from the POTW to the BTF where it will be received in an odor controlled solids handing area. The feedstock will be partially heated to remove moisture prior to being transferred into the pyrolysis chamber where indirect heat at high temperature and low vacuum to produce the pyrogas and solid biochar. The pyrogas is cleaned and conditioned to remove contaminants, resulting in a cleaned syngas. The cleaned syngas is upgraded to RNG via a methanation process that combines the carbon monoxide, carbon dioxide, and hydrogen into CH4 or RNG. The RNG is then compressed and stored or consumed as a transportation fuel or injected into the natural gas pipeline. Offtake agreements including injection into the pipeline grid and biochar distribution are to be defined under this contract. This project will also demonstrate the use of locally produced RNG as transportation fuel in conventional and near-zero NOx CNG-powered vehicles. KORE will demonstrate the RNG in two of its natural gas-powered heavy-duty vehicles, each vehicle to have engines and exhaust system certified by the California Air Resources Board (CARB) to a NOx emission standard equal to or less than 0.02gNOx/bhp-hr. The KORE project is expected to produce up to 1,000 gasoline gallon equivalents (GGE) of RNG per day.

Figure 18: Methanation

Ontario CNG Station, Inc. (Ontario CNG) is a public access fueling facility located adjacent to the Ontario International Airport and the I-10 freeway corridor. The facility has all the appearances, amenities and visibility of a retail conventional fuel station. It is located at a well-travelled intersection and has driveway access from both from Vineyard Ave. and E. Holt Blvd. The facility sits on 53,000 square feet of property and has four fueling islands, a 24 hour per day / 7 day per week manned convenience store, restrooms, and a car wash giving consumers a conventional

Figure 19: Ontario CNG Station

fueling experience. Retail fuels that are sold at this facility include gasoline and diesel, renewable diesel, CNG/RNG (with RNG incorporated into the supply), hydrogen and electric vehicle charging ports. Two of the four fueling islands are dedicated to conventional fuels and renewable diesel. The other two islands have a total of four CNG dispensers and one hydrogen fuel dispenser. This project will also introduce RNG to Ontario CNG and requires a minimum of 240,000 GGE of renewable natural gas (RNG) annually for three years. The hydrogen fuel will be produced on-site by an electrolysis system funded through the CEC and the SCAQMD. Adjacent to the convenience store is one DC Fast charger and two Type 2 electric chargers. Funding support for the EV system is from the CEC. The 9,000 square feet of canopy covering the fueling islands will be equipped with electric photovoltaic solar panels to help offset electricity usage. The large area and multiple fueling island design of the station provide easy access to motorists, particularly long-haul tractor trailer rigs.

As a business model, Ontario CNG believes co-locating alternative fuels with conventional fuels in a conventional and familiar retail setting helps attract customers and also allows the business to be price competitive and profitable. In addition, co-locating alternative fuels with conventional fuels helps bring greater awareness of alternative fuels to the general public.

The objective of this contract is to successfully implement the expansion of CNG/RNG fueling at a public access, multi-fuel retail station in Ontario, California near the well-travelled Interstate 10 freeway and the Ontario International Airport. The location of this station will provide incentive for goods movement operators, municipal fleets, school districts and private fleet operators to adopt or expand the use of natural gas vehicle technology. This project will support increasing CNG/RNG fuel capabilities and fuel delivery systems, particularly for heavy duty Class 7 and 8 vehicles, and introduce the use and dispensing of renewable natural gas at this station.

Figure 20: Class 8 and MDV CNG Refueling

This contract will result in doubling on-site CNG/RNG compression to 972 cfm, doubling the number of dispensers to four and expanding on-site CNG/RNG storage by 36,000scf. The two new fast-fill dispensers each have two fuel hoses that dispense CNG/RNG at 3600 psig; two of the four CNG/RNG dispensers have one hose that employ a high flow Type 2 nozzle that is specifically designed to fuel heavy-duty long range tractor trailer vehicles which typically have 150 GGE of on-board storage. The expected result of this station design and equipment selection is a faster and more efficient refueling experience for all CNG vehicle operators.

Figure 21: CNG Storage Spheres

Hydrogen Infrastructure Rollout Efforts throughout 2016

For 2016, the SCAQMD continued to identify the development and deployment of hydrogen infrastructure as one of the agency's top priorities in order to attain federal air quality standards. Hydrogen infrastructure is consistent with the Passenger Transportation and Goods Movement White Papers developed for the Draft 2016 AQMP, which was adopted by the SCAQMD Governing Board on February 3, 2016; the goods movement strategy for zero emission trucks and infrastructure outlined in SCAG's 2016-2040 Transportation Systems/Goods Movement Appendix to the Regional Transportation Plan, and CARB's 2016 Mobile Source Strategy, adopted on May 16, 2016. Zero emission truck deployment is proposed through the year 2040 to meet goals outlined in SCAG's 2016-

2040 Regional Transportation Plan/Sustainable Communities Strategy, adopted in April 2016.

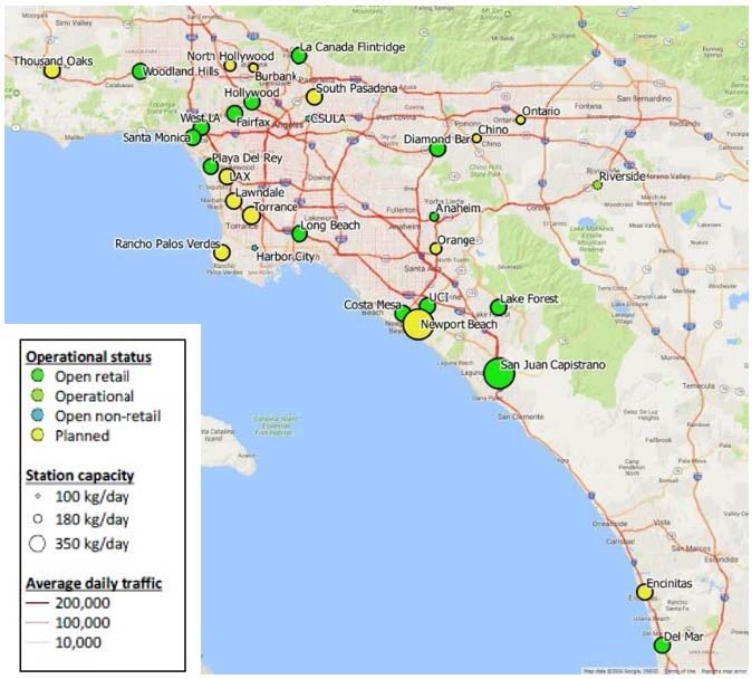

Figure 22: Hydrogen Infrastructure Rollout in the SCAQMD
Source: National Renewable Energy Laboratory

As part of the planned statewide rollout of new and upgraded hydrogen fueling stations, CEC and CARB released the annual Joint Agency Staff Report on Assembly Bill 8: 2016 Assessment of Time and Cost Needed to Attain 100 Hydrogen Refueling Stations in California (map above), describing 14 open retail stations, four open non-retail stations, and 14 stations and a temporary fueler in the process of being constructed and/or upgraded within the South Coast Air Quality Management District in the 2017-2018 timeframe. California as a whole has 25 retail hydrogen stations open from San Diego to San Francisco and Lake Tahoe. The newest rollout of hydrogen fueling stations are considered retail hydrogen stations because they are typically embedded within an existing gasoline station. Examples of recently opened retail hydrogen stations include Air Liquide system at the 76 station in Anaheim and the Linde system at the 76 station in San Juan Capistrano; retail stations to be opened in 2017-2018 include the Shell station in Torrance, 76 station in Ontario and Hyundai Chino station. Examples of retail hydrogen stations are shown in Figures 23-25. SCAQMD is cofunding, in conjunction with CEC (whose AB 118 dollars are the primary source of funding), most of the retail hydrogen stations under construction in our region, including FirstElement's eight station contract and H2 Frontier's temporary mobile fueler contract, both executed in 2016.

Figure 23: CDFA/DMS Testing Air Liquide System Co-located at Anaheim 76 station with NREL HyStEP Equipment

Figure 24: San Juan Capistrano Retail Hydrogen Station Co-located by Linde at 76 Gas Station

Linde delivers liquid hydrogen to the 350 kg/day hydrogen station in San Juan Capistrano, which is an example of the largest current capacity stations. SCAQMD cofunded the station development, originally to be located in Laguna Niguel. In early 2016, SCAQMD added cofunding to help address increased costs due to the site change.

Figure 25: FirstElement Retail Hydrogen Station Co-located at ARCO Gas Station in Long Beach

Following operation of the Burbank demonstration station through 2016 with SCAQMD funds as well as some financial assistance from CARB, which is described in more detail in the Key Projects Completed section, an upgrade of the Burbank station is planned as part of a larger $6.69 million CEC grant for hydrogen upgrades including the upgrades of the Torrance and LAX stations to retail sales. As part of this CEC contract, funds for partial upgrade of the Mebtahi Chevron station in Harbor City were redirected to enable a more retail-oriented upgrade of the Burbank station, after Mebtahi was unable to execute their proposed upgrade contract.

Current retail hydrogen stations include point of sale (POS) dispensers capable of conducting retail transactions for the sale of hydrogen on a per kg basis using credit cards, and meet hydrogen quality, metrology and fueling protocols to ensure a safe, fast, full fill. Collectively, the stations would meet Renewable Portfolio Standard (RPS) requirements for providing hydrogen fuel with at least 33% renewable hydrogen. Some of the stations such as the Hyundai Chino station are designed to provide 100% renewable fuel. The renewable hydrogen requirement is fulfilled by solar, energy storage or renewable energy certificates, providing 100% renewable electricity to the station such as for local generation using an electrolyzer or reformer, or by the delivery of 33% or 100% renewable hydrogen produced by a central natural gas reformer, or by a mix of local generation and delivered hydrogen.

The California Department of Food and Agriculture, Division of Weights and Measures (DMS), must pre-certify POS dispensers so that stations can legally sell hydrogen by the kilogram to refuel fuel cell vehicles. DMS is continuing its metrology field testing effort on hydrogen dispensers in 2017.

Previously, U. S. DOE, along with automakers and other stakeholders, launched H2USA, a public-private partnership to address key challenges of hydrogen infrastructure. U. S. DOE, through H2First, a consortium of national labs, funded NREL to develop a new Hydrogen Station Equipment Performance (HyStEP) device to validate or audit fill performance of hydrogen stations to meet SAE J2601 light-duty fueling protocol using test method CSA HGV 4.3 under development. SCAQMD (with CARB, CEC, CaFCP and automakers) will be executing a contract in 2017 to support HyStEP to test stations in California.

Following completion of the 100% renewable non-retail hydrogen station at the Orange County Sanitation District facility in Fountain Valley which had been operated by Air Products and Chemicals,

Inc. from 2009 through 2015, SCAQMD is seeking partners and planning to support larger capacity hydrogen stations, including increasing production from renewable sources.

Previously, Energy Independence Now (EIN), in partnership with SCAQMD, completed a project to develop a Hydrogen Network Investment Plan (H2NIP) in order to examine market success factors relative to the looming launch of FCVs and support infrastructure.

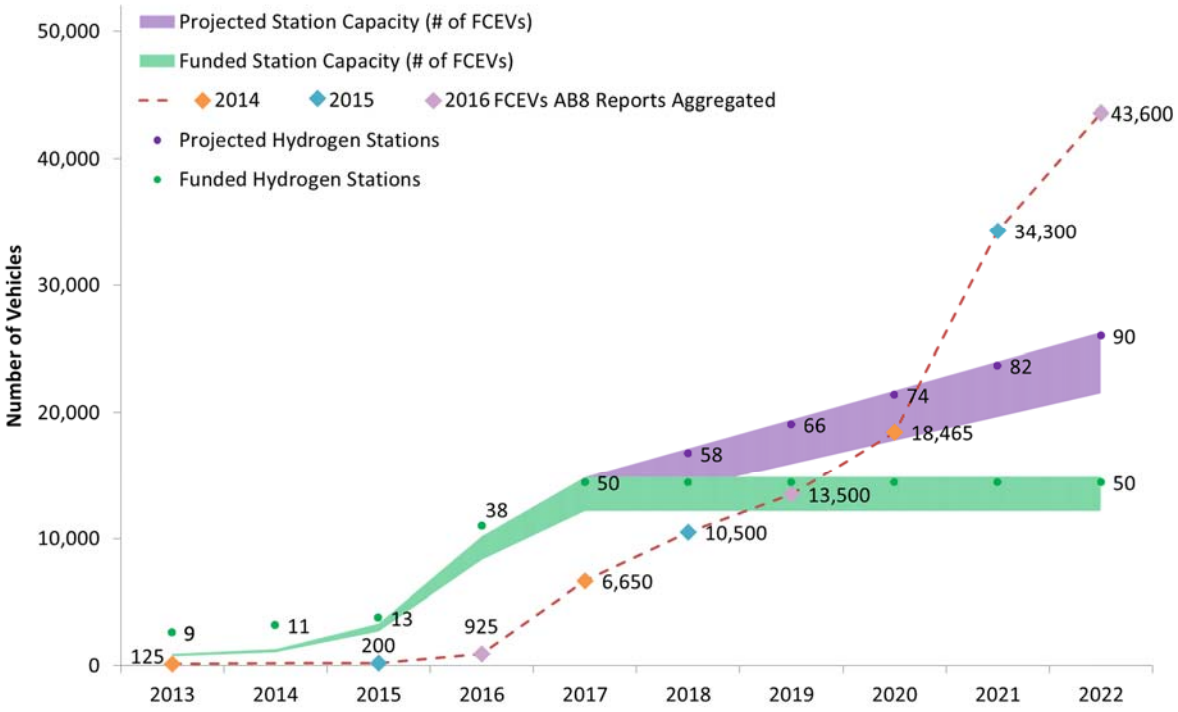

Figure 26: Station Shortfall Projection
Source: Joint Agency Staff Report on AB 8 released January 2017

Further research into renewable hydrogen pathways, economics and incentive structures is ongoing in order to establish and validate viable actions that stakeholders can take to ensure that the FCV community maximizes reductions in carbon emissions and other pollutants with adverse impacts to public well-being. This work is of critical importance in the developmental phase of support infrastructure.

Work conducted by EIN towards development of the H2NIP and effectiveness of incentives in the renewable hydrogen market was part of a larger hydrogen readiness project funded by CEC with the California Fuel Cell Partnership, "Hydrogen Readiness in Early Markets: Best Practices to Support the Introduction of Hydrogen Fuel Cell Vehicles in California".

The hydrogen readiness project examined potential policy proposals, incentives and financing options, as well as looking at best practices, training to emergency responders, procurement strategies, education outreach and assessing hydrogen readiness in early market communities. The hydrogen readiness project was completed in 2016, and key recommendations included:

- Make hydrogen from renewable sources eligible for credits under California's Low Carbon Fuel Standard. This will create an additional revenue stream to help producers cover costs.
- The average time to permit and build a hydrogen station has decreased significantly in just a few years. Shortening the process further is possible through improved understanding of codes and standards by authorities having jurisdiction.

- Station owners need succinct messaging about the benefits of adding a hydrogen fueling station and realistic information about the number of cars they can expect to fuel.
- For fire and safety training, train-the-trainer courses are vital for reaching all firefighters.
- Targeted messaging to ZEV buyers and fleet buyers will encourage increased adoption of FCEVs, and a wide-reaching awareness campaign will help other audiences select FCEVs for their future car purchase.
- Government and industry participation in stakeholder organizations is critical to reducing station costs and bringing more renewable hydrogen into the fuel supply.

The next couple of years should reveal huge strides in fuel cell vehicle technology and hydrogen infrastructure growth, and SCAQMD plans to continue to be a leader in this core technology.

Electric/Hybrid Vehicle and Infrastructure Deployment and Commercialization Efforts in 2016

The SCAQMD has identified the development and deployment of electric vehicle (EV) infrastructure as one of the agency's top priorities in order to attain federal air quality standards. EV infrastructure is consistent with the goods movement strategy for zero-emission trucks and infrastructure proposed in SCAQMD's 2017 *Air Quality Management Plan*, SCAG's 2016 *Regional Transportation Plan* as well as the joint CARB, SCAQMD and SJVAPCD *Vision for Clean Air: A Framework for Air Quality and Climate Planning*. Zero-emission truck deployment is proposed through the year 2040 to meet goals outlined in the 2016 *Regional Transportation Plan/Sustainable Communities Strategy*.

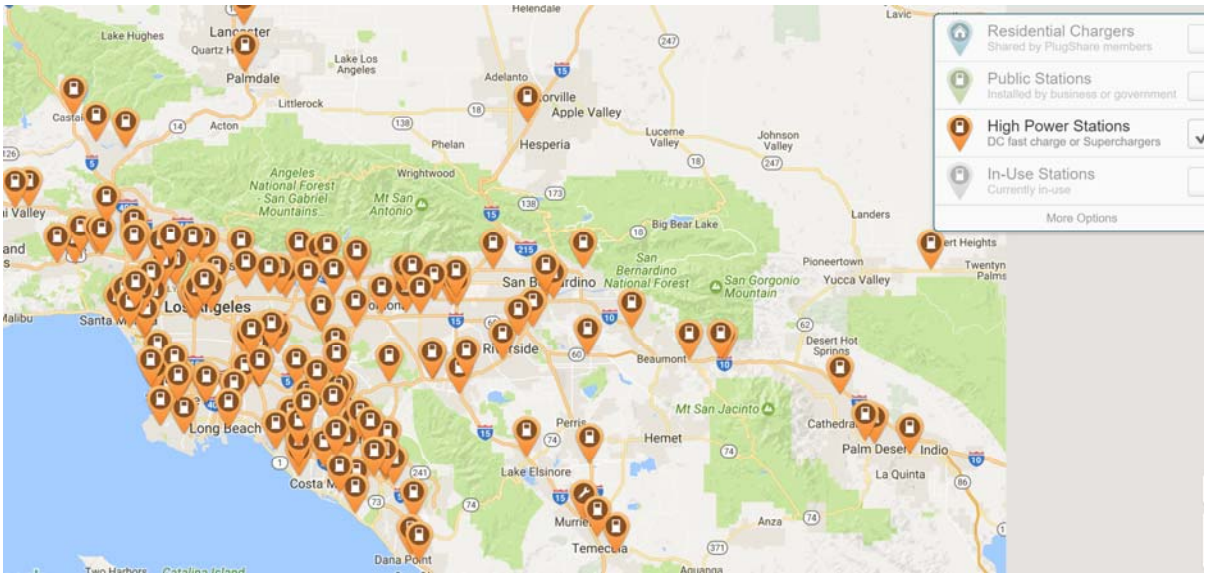

Figure 27: DC Fast Charging Station in SCAQMD

The California Public Utilities Commission has also recognized transportation electrification and recently permitted investor-owned utilities (e.g., Southern California Edison locally) to invest in charging infrastructure. California expects to be the largest U.S. market for Plug-In Electric Vehicles (PEVs), especially in the greater Los Angeles region with over 44% of the state's population and a historic and ingrained car-centric culture. As part of the planned statewide rollout of new DC fast charging corridors funded by CEC (see Figure 28), there are 27 DC fast charging stations sited along major freeway corridors that have been completed or in the process of construction by CEC funded projects managed by SCAQMD in the 2017 timeframe. This will extend the growing DC fast charging corridor east and west to locations in the Coachella Valley, further connecting Los Angeles, San Diego, Santa Barbara and Palm Springs.

Figure 28: CEC Funded DC Fast Charging Corridors in SoCal

For this project SCAQMD is partnered with EVgo as the network provider who will own, operate and maintain the DC fast charging network; Clean Fuel Connection, Inc. as the installation partner; UCLA Luskin Center for Innovation who is responsible for site selection modeling; and Three Squares, Inc. who organizes press events and is designing an education outreach campaign targeted to EV drivers.

Site locations were selected using UCLA Luskin Center's sophisticated PEV adoption modeling software that seeks to maximize charge station utilization by identifying travel patterns between census tracts where PEV drivers actually reside, work and shop. This is combined with land use data on local densities of workplaces, MUDs and retail establishments, data on pre-existing charging station locations. Finally, demographic data and the characteristics of the local transportation system are used as described in the *Southern California PEV Readiness Plan* (written by the UCLA Luskin Center and winner of the 2013 Planning Excellence Award by the Los Angeles section of the American Planning Association). Project partners also provided input on the site selection and site substitution process. The UCLA Luskin Center analyzed selected locations to maximize the effectiveness of the overall DCFC deployment.

Project sites were selected because these sites are situated alongside major freeways linking urban areas on heavily traveled routes and highly visible locations. The sites selected for the DC fast charging stations are in the parking lots of grocery stores or similar destinations. These are ideal locations for DC fast charging stations because the average consumer visiting a grocery store spends over 30 minutes shopping, which provides enough time for a complete charge. Chargers will provide 24-hour public access.

Examples of recently opened DC fast charging stations are located at the City of Calabasas City Hall (see Figure 29) and City of Palm Desert City Hall. An additional five DC fast charging stations will be installed by April 2017, and an additional 20 DC fast charging stations will be installed by December 2017. These DC fast charging stations are located throughout the four-county SCAQMD jurisdiction. Locations include the Cities of Moreno Valley, Palm Springs, Temecula, Monterey Park, and West Hollywood. Sites are part of the larger EVgo network and can be accessed using pay per use or subscription payment.

Figure 29: DC Fast Charging Station at City of Calabasas City Hall

Prior to each station opening, Three Squares will organize a custom press event to inform the public about the availability of a new DC fast charging station and educate consumers. Press events will take different formats based on the needs of each city. Below is a postcard advertising the grand opening of the DC fast charging station at the City of Calabasas City Hall, which took place in August 2016.

Figure 30: SoCalFast Education Outreach Campaign for PEV Drivers

Installation of EV Infrastructure at SCAQMD Headquarters

In September 2016, the Governing Board approved the execution of a contract with Clean Fuel Connection, Inc. to install Level 2 charging stations at the SCAQMD headquarters facility. Installation of charging stations took place in several phases.

Figure 31: Areas of EV Charger Installations at SCAQMD Headquarters

The first phase of installation of 36 Level 2 charging ports in the upper deck parking lot was completed in December 2016. An additional 25 level 2 charging ports were installed under the solar carport and upper deck in January 2017, to be followed by 15 charging ports in the CC8 parking lot and 12 charging ports in the front lobby/guest parking lot in spring 2017.

Figure 32: Installations in Progress

As part of this installation project, EV charger transactions and user notifications are managed through the Greenlots Sky networking software platform and data from the EV chargers are collected on the Greenlots network and will be shared with the future Siemens energy management system (EMS) that will be purchased and installed at SCAQMD headquarters. As part of the tie in with the building's EMS, electricity demand from the EV chargers can be ramped down or turned off in response to the building's overall demand and to avoid demand charges during peak hours in the summer months. The charging stations can be accessed through the Greenlots phone app or the RFID card and users will automatically be notified by text or email when a charging session starts, ends, is interrupted, ramped down, turned off, or subject to a different rate structure. Screens from the Greenlots phone app are shown below in Figure 33.

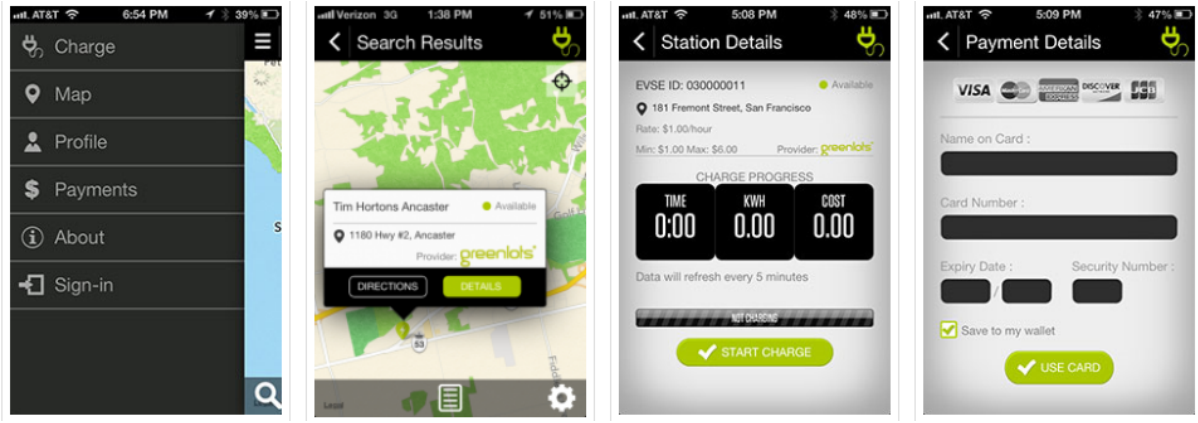

Figure 33: Greenlots Phone App and Networking Software

2016 FUNDING & FINANCIAL SUMMARY

The SCAQMD Clean Fuels Program supports clean fuels and technologies that appear to offer the most promise in reducing emissions, promoting energy diversity, and in the long-term, providing cost-effective alternatives to current technologies. In order to address the wide variety of pollution sources in the Basin and the need for reductions now and in the future, using revenue from a $1 motor vehicle registration fee (see Program Funding on Page 5), the SCAQMD seeks to fund a wide variety of projects to establish a diversified technology portfolio to proliferate choices with the potential for different commercial maturity timing. Given the evolving nature of technology and changing market conditions, such a representation is only a "snapshot-in-time," as reflected by the projects approved by the SCAQMD Governing Board.

As projects are approved by the SCAQMD Governing Board and executed into contracts throughout the year, the finances may change to reflect updated information provided during the contract negotiation process. As such, the following represents the status of the Clean Fuels Fund as of December 31, 2016.

Funding Commitments by Core Technologies

The SCAQMD continued its successful leveraging of public funds with outside investment to support the development of advanced clean air technologies. During the period from January 1 through December 31, 2016, a total of 66 contracts, projects or studies that support clean fuels were executed or amended, as shown in Table 2 (page 38). The major technology areas summarized are (listed in order of funding priority during the CY): engine systems, electric/hybrid technologies and infrastructure, fueling infrastructure and deployment, hydrogen and mobile fuel cell technology and infrastructure, engine systems, technology assessment/transfer and outreach, and fuels and emission studies. The distribution of funds based on technology area is shown graphically in Figure 34 (page 36). This wide array of technology support represents the SCAQMD's commitment to researching, developing, demonstrating and deploying potential near-term and longer-term technology solutions.

The project commitments that were contracted or purchased for the 2016 reporting period are shown below with the total projected project costs:

- SCAQMD Clean Fuels Fund Contribution $21,760,365
- Total Cost of Clean Fuels Projects $198,190,157

Each year, the SCAQMD Governing Board approves funds to be transferred to the General Fund Budget for Clean Fuels administration. For 2016, the Board transferred $1 million for workshops, conferences, cosponsorships and outreach activities as well as postage, supplies and miscellaneous costs for participation in special conferences. Only the funds committed by December 31, 2016, are included within this report. Any portion of the Clean Fuels Funds not spent by the end of Fiscal Year 2016-17 ending June 30, 2017, will be returned to the Clean Fuels Fund.

Partially included within the SCAQMD contribution are supplemental sponsorship revenues from various organizations that support these technology advancement projects. This supplemental revenue for pass-through contracts executed in 2015 totaling $3.42 million is listed within Table 3 (page 41).

Appendix B lists the 93 Clean Fuels Fund contracts that were open and active as of January 1, 2017.

For Clean Fuels executed and amended contracts, projects and studies in 2016, the average SCAQMD contribution is approximately 11 percent of the total cost of the projects, identifying that each dollar from the SCAQMD was leveraged with more than $9 of outside investment. The typical leverage amount is $3-$4 for every $1 of SCAQMD Clean Fuels funds, but 2016 notably had

several significant contracts, significant both in funding and in the impact they hopefully will make in strides toward developing and commercializing clean transportation technologies.

During 2016, the distribution of funds for SCAQMD executed contracts, purchases and contract amendments with additional funding for the Clean Fuels Program totaling approximately $21.8 million are shown in Figure 34 below.

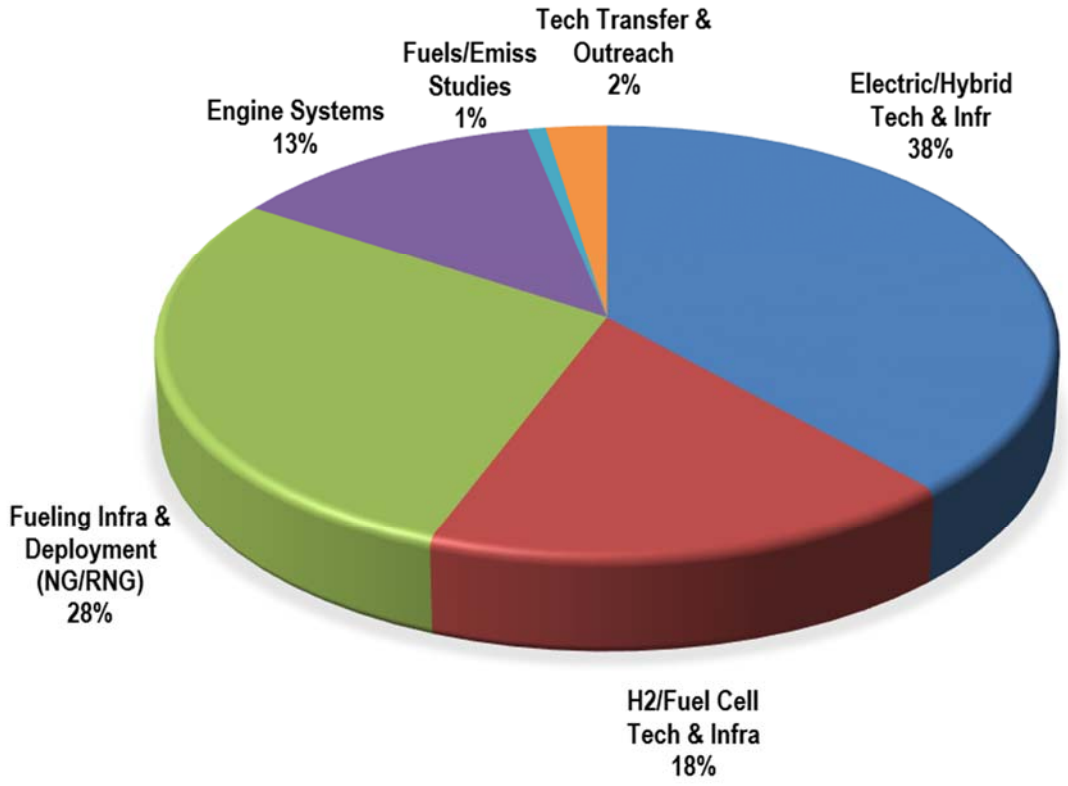

Figure 34: Distribution of Funds for Executed Clean Fuels Projects CY 2016 ($21.8M)

Table 2 (page 38) provides a breakdown of this $21.8 million in executed contracts. Table 3 (page 41) provides information on outside funding recognized and received into the Clean Fuels Fund ($3.42 million) for contracts executed in CY 2016. Additionally, the SCAQMD continued to seek funding opportunities and Table 4 (page 41) lists the additional $48.9 awarded in 2016 for projects that will be implemented as part of the Clean Fuels Program or which align well or will be complementary to the Clean Fuels Program.

Review of Audit Findings

State law requires an annual financial audit after the closing of each SCAQMD's fiscal year. The financial audit is performed by an independent Certified Public Accountant selected through a competitive bid process. For the fiscal year ended June 30, 2016, the firm of Simpson and Simpson, CPAs conducted the financial audit. As a result of this financial audit, a Comprehensive Annual Financial Report (CAFR) was issued. There were no adverse internal control weaknesses with regard to SCAQMD financial statements, which include the Clean Fuels Program revenue and expenditures. Simpson and Simpson CPAs gave the SCAQMD an "unmodified opinion," the highest obtainable. Notably, the SCAQMD has achieved this rating on all prior annual financial audits.

Project Funding Detail by Core Technologies

The 66 new and continuing contracts, projects and studies that received SCAQMD funding in 2016 are summarized in Table 2, together with the funding authorized by the SCAQMD and by the collaborating project partners.

Table 2: Contracts Executed or Amended (w/$) between January 1 & December 31, 2016

Contract	Contractor	Project Title	Start Term	End Term	SCAQMD $	Project Total $
Hydrogen/Mobile Fuel Cell Technologies and Infrastructure						
12057	Linde, LLC	Expand Hydrogen Fueling Infrastructure	11/02/12	04/01/19	80,000	160,000
15618	FirstElement Fuel, Inc.	Installation of Eight Hydrogen Stations in Various Cities (two renewable, six delivered)	02/05/16	02/04/21	1,000,000	16,442,000
15635	Center for Transportation and Environment	ZECT II: Develop and Demonstrate One Class 8 Fuel Cell Range-Extended Electric Drayage Truck	04/27/16	10/26/20	821,198	7,109,384
16025	Center for Transportation and the Environment	Develop and Demonstrate Fuel Cell Hybrid Electric Medium-Duty Trucks	02/05/16	08/04/20	980,000	7,014,050
16251	H2 Frontier, Inc.	Develop and Demonstrate Commercial Mobile Hydrogen Fueler	05/06/16	05/05/21	200,000	1,665,654
17030	Bevilacqua-Knight, Inc.	Participate in California Fuel Cell Partnership for Calendar Year 2016 and Provide Support for Regional Coordinator	01/0/1/16	12/31/16	135,000	1,705,233
17059	Calstart Inc.	Develop and Demonstrate Fuel Cell Extended-Range Powertrain for Parcel Delivery Trucks	10/27/16	04/26/18	589,750	1,574,250
Electric/Hybrid Technologies and Infrastructure						
13410	Selman Chevrolet Company	Lease Three 2013 Chevrolet Volt Extended-Range Electric Vehicles for Three Years Then Purchase Vehicles	04/03/13	04/02/16	84,450	84,450
13429	Longo Toyota	Lease One Toyota RAV4 Electric Vehicle for Three Years Then Purchase Vehicle	04/19/13	04/02/16	22,410	22,410
14184	Clean Fuel Connection, Inc.	DC Fast Charging Network Provider	04/04/14	06/30/20	920,000	1,153,880
16200	California State University Los Angeles	Cost-Share Regional Universities for U.S. DOE EcoCAR 3 Competition	04/14/16	04/15/20	100,000	800,000
16227	Selman Chevrolet Company	Lease One 2016 Chevrolet Volt Extended-Range Electric Vehicle for Three Years	02/01/16	01/31/19	15,677	15,677
16081	Broadband TelCom Power, Inc.	Provide EV Hardware and Control System at SCAQMD Headquarters including Installation Support, Warranty and Networking	04/27/16	04/26/22	367,425	367,425
17065	Clean Fuel Connection, Inc.	EV Infrastructure Installer	12/02/16	12/31/21	805,219	805,219

Table 2: Contracts Executed or Amended (w/$) between January 1 & December 31, 2016

Contract	Contractor	Project Title	Start Term	End Term	SCAQMD $	Project Total $
Electric/Hybrid Technologies and Infrastructure (cont'd)						
Transfer	Transfer from Clean Fuels	Zero Emission Drayage Truck Demonstration Project	03/04/16	03/04/16	6,001,531	40,122,470
Direct Pay	Clean Fuel Connection, Inc.	Electric Vehicle Supply Equipment Installation	01/01/16	02/29/16	20,677	20,677
Direct Pay	Southern California Edison	Short Circuit Study for Headquarters Electric Vehicle Infrastructure	01/01/16	01/01/16	400	400
Engine Systems						
16205	Cummins Westport, Inc.	Develop, Integrate and Demonstrate Ultra-Low Emission 12-Liter Natural Gas Engines for On-Road Heavy-Duty Vehicles	06/03/16	06/30/18	2,750,000	6,250,000
Fueling Infrastructure and Deployment (NG/RNG)						
16075	City of Desert Hot Springs	Purchase One Heavy-Duty CNG-Powered Truck	03/11/16	03/10/20	38,000	63,000
16244	CR&R, Inc.	Renewable Natural Gas Production and Vehicle Demonstration Project	09/03/16	03/02/20	900,000	55,000,000
16333	Ontario CNG Station, Inc.	Implement Alternative Fuel Station Expansion	05/13/16	11/12/19	200,000	798,535
17092	Kore Infrastructure, LLC	Construct RNG Production Facility and Demonstrate RNG with Next Generation Natural Gas Engine	10/14/16	10/13/21	2,500,000	25,500,000
Direct Pay	Varies	Cost-Share Local Match for 2015-16 Enhanced Fleet Modernization Program (EFMP) Plus-Up	01/08/16	01/08/16	1,033,500	8,100,500
Direct Pay	Varies	Purchase of Electric Leaf Blowers and Trimmers for Lawn and Garden Demonstration Program	03/31/16	03/31/16	4,195	4,195
Direct Pay	Varies	Cost-Share Local Match for 2016-17 Enhanced Fleet Modernization Program (EFMP) Plus-Up	09/02/16	09/02/16	1,503,000	18,209,000
Fuels/Emissions Studies						
16198	Gladstein, Neandross & Associates, LLC	Study of Opportunities and Benefits of Deploying Next Generation Heavy-Duty Natural Gas Vehicles Operating on Renewable Natural Gas	09/02/16	09/02/16	50,000	250,000
16254	University of California Berkeley	Evaluate Ozone and Secondary Aerosol Formation from Diesel Fuels	10/25/16	08/31/17	106,361	106,361

Table 2: Contracts Executed or Amended (w/$) between January 1 & December 31, 2016

Contract	Contractor	Project Title	Start Term	End Term	SCAQMD $	Project Total $
Fuels/Emissions Studies (cont'd)						
17060	University of California Riverside	Bailment Agreement for Equipment Use for In-Use Emissions Testing of Heavy-Duty Inspection and Maintenance Program	10/13/16	10/12/18	0	0
Technology Assessment/Transfer and Outreach						
08210	Sawyer Associates	Technical Assistance on Mobile Source Control Measures and Future Consultation on TAO Activities	02/22/08	02/28/18	10,000	10,000
17037	Clean Fuel Connection, Inc.	Technical Assistance with Alternative Fuels, Electric Vehicles, Charging and Fueling Infrastructure and Renewable Energy	11/18/16	11/17/18	50,000	50,000
17097	Gladstein, Neandross & Associates, LLC	Technical Assistance with Alternative Fuels and Fueling Infrastructure, Emissions Analysis and On-Road Sources	11/04/16	11/03/18	100,000	100,000
Direct Pay	Hartford/Alliant Insurance	Insurance for Alternative Fuel Vehicles in Technology Advancement Office's Fleet Demonstration Program	01/01/16	12/31/16	31,414	31,414
Transfer	Transfer from Clean Fuels	Participation in California Natural Gas Vehicle Partnership for Fiscal Year 2016-17 and 2017-18	07/08/16	07/08/16	25,000	236,872
Direct Pay	Transportation Research Board	Participation for Membership for July through December 2016	09/01/16	09/01/16	32,500	223,500
Direct Pay	Various	Cosponsor 24 Conferences, Workshops & Events plus 4 Memberships	01/01/16	12/31/16	282,658	4,300,523

Table 3: Supplemental Grants/Revenue Received into the Clean Fuels Fund (31) in CY 2016

Revenue Agreement #	Revenue Source	Project Title	Contractor	SCAQMD Contract #	Award Total $
16217	Southern California Gas Company	Develop, Integrate and Demonstrate Ultra-Low Emission 12L Natural Gas Engines for On-Road Heavy-Duty Vehicles	Cummins Westport Inc.	16205	1,000,000
14051	California Energy Commission	DC Fast Charging Network	Clean Fuel Connection, Inc.	14184	420,000
15441	California Energy Commission	DC Fast Charging Network	Clean Fuel Connection, Inc.	14184	500,000
Transfer	BP ARCO Settlement Agreement Fund (46)	Construction of an RNG Production Facility in Rialto and Demonstration of RNG with Next Generation Natural Gas Engines	KORE Infrastructure, Inc.	17092	1,500,000
Table 3 lists revenue recognized by SCAQMD into the Clean Fuels Fund (31) only if the pass-through contract was executed during the reporting CY (2016).					3,420,000

Table 4: Summary of Federal, State and Local Funding Awarded or Recognized in CY 2016

Awarding Entity or Program	Award or Board Date	Purpose	Contractors	Award Total $/Fund
CARB's Low Carbon Transportation GGRF	01/12/16	Zero Emission Drayage Truck Demonstration	BYD Motors, Kenworth Truck Company, Peterbilt Motors, & Volvo Technology of America	23,658,500 Fund 67
Bay Area AQMD	03/04/16	Zero Emission Drayage Truck Demonstration	BYD Motors, Kenworth Truck Company, Peterbilt Motors, & Volvo Technology of America	3,000,000 Fund 67
San Joaquin Valley APCD	03/04/16	Zero Emission Drayage Truck Demonstration	BYD Motors, Kenworth Truck Company, Peterbilt Motors, & Volvo Technology of America	1,000,000 Fund 67
San Diego APCD	03/04/16	Zero Emission Drayage Truck Demonstration	BYD Motors, Kenworth Truck Company, Peterbilt Motors, & Volvo Technology of America	200,000 Fund 67
San Diego Gas & Electric	03/04/16	Zero Emission Drayage Truck Demonstration	BYD Motors, Kenworth Truck Company, Peterbilt Motors, & Volvo Technology of America	200,000 Fund 67

Table 4: Summary of Federal, State and Local Funding Awarded or Recognized in CY 2016 (cont'd)

Awarding Entity or Program	Award or Board Date	Purpose	Contractors	Award Total $/Fund
California Energy Commission	04/01/16	On-Road In-Use Emissions Testing and Usage Assessment	University of California Riverside & West Virginia University	2,000,000 Fund 31
Southern California Gas Company	04/01/16	On-Road In-Use Emissions Testing and Usage Assessment	University of California Riverside & West Virginia University	500,000 Fund 31
U.S. Environmental Protection Agency	06/03/16	Develop and Demonstrate Ultra-Low Emission Natural Gas Switcher Locomotive	VeRail	500,000 Fund 31
Southern California Gas Company	06/03/16	Develop and Demonstrate Ultra-Low Emission Natural Gas Switcher Locomotive	VeRail	500,000 Fund 31
CARB	09/02/16	On-Road In-Use Emissions Testing and Usage Assessment	University of California Riverside & West Virginia University	150,000 Fund 31
CARB/BAR	09/02/16	FY 2016-17 Implementation of the Retire and Replace Component of Enhanced Fleet Modernization Program	Various	3,700,000 Fund 56
CARB	09/02/16	FY 2016-17 Implementation of the Retire and Replace Component of Enhanced Fleet Modernization Program (EFMP) Plus-Up	Various	10,000,000 Fund 56
California Energy Commission	10/07/16	Develop, Integrate & Demo Ultra-Low Emission 12L NG Engines for On-Road Heavy-Duty Vehicles	Cummins Westport, Inc.	1,000,000 Fund 31
U.S. EPA 2016 Targeted Air Shed Grant	11/17/16	Battery Electric Yard Tractors Replacement Project	Westside Basin Container Terminal	2,477,250 Fund 17
Table 4 provides a comprehensive summary of revenue awarded to SCAQMD during the reporting CY (2016) if it will be considered part of, or complementary to, the Clean Fuels Program, regardless of whether the pass-through contract has been executed.				**48,885,750**

Project Summaries by Core Technologies

The following represents summaries of the contracts, projects and studies executed, or amended with additional dollars, in 2016. They are listed in the order found in Table 2 by category and contract number. The summaries provide the project title, contractors and subcontractors, SCAQMD cost-share, cosponsors and their respective contributions, contract term and a description of the projects as required by H&SC Section 40448.5.1(d).

Hydrogen and Mobile Fuel Cell Technologies and Infrastructure

12057: Expand Hydrogen Fueling Infrastructure

Contractor: Linde, LLC	SCAQMD Cost-Share	$ 80,000
	Cosponsor	
	Linde	80,000
Term: 11/02/12 – 04/01/19	Total Cost:	$ 160,000

Linde, LLC, was originally awarded funding to demonstrate that hydrogen fueling can be successfully integrated with retail gasoline fueling stations in Laguna Niguel, an area identified by the OEMs as an early adopter location. A new site in another city but still within Orange County had to be identified after negotiations with the original site owner fell through. An amendment was executed in early 2016 to address additional permitting and local jurisdictional requirements as well as higher project costs relating to the site location change. The project timeline was also modified to provide for three years of operational reporting. The SCAQMD and Linde, LLC, equally cost-shared the higher project costs and the hydrogen station is now commissioned and in operation.

15618: Installation of Eight Hydrogen Stations in Various Cities (two renewable, six delivered)

Contractor: FirstElement Fuel, Inc.	SCAQMD Cost-Share	$ 1,000,000
	Cosponsor	
	California Energy Commission	11,608,000
	FirstElement Fuel, Inc.	3,834,000
Term: 02/05/16 – 02/04/21	Total Cost:	$ 16,442,000

First Element submitted a proposal dated February 14, 2014 to CEC's PON-13-607. CEC is providing the majority of funding with co-funding from SCAQMD to install eight public access hydrogen fueling stations in the following cities: South Pasadena, Los Angeles (2 stations), Long Beach, Costa Mesa, La Canada Flintridge, Laguna Niguel and Lake Forest. Six of the stations shall have hydrogen delivered with 33% renewable content, and the remaining two stations shall have 100% renewable hydrogen delivered. The fueling stations shall be capable of delivering up to 100 kg of hydrogen per day nominal capacity, be able to fuel multiple vehicles back to back without delay to avoid congestion, and provide data according to the template in the NREL Data Collection Tool approved by CEC.

15635: ZECT II: Develop and Demonstrate One Class 8 Fuel Cell Range-Extended Electric Drayage Truck

Contractor: Center for Transportation and the Environment	SCAQMD Cost-Share	$ 821,198
	Cosponsor	
	Department of Energy *(previously received as pass-through funds into Fund 61)*	3,554,691
	California Energy Commission *(previously received as pass-through funds into Fund 61)*	2,400,000
	Ports TAP Program *(previously received as pass-through funds into Fund 61)*	283,495
	Center for Transportation and the Environment	50,000
Term: 4/27/16 – 10/26/20	Total Cost:	$ 7,109,384

Under project management by CTE, BAE Systems will develop a battery electric truck with a hydrogen range extender. This project will leverage the expertise of BAE Systems and Ballard Power Systems to test their hybrid electric fuel cell propulsion system, currently used for transit buses, in drayage applications. The power output of the electric drive train is comparable to currently used Class 8 truck engines power output. AC traction motors will be mounted one on each rear drive axle and the electric drive train in the architecture is set up to be fully redundant. The vehicle will operate primarily from the batteries, engaging the fuel cell system only when the batteries reach a specified state of charge. BAE anticipates that the 30 kg of hydrogen (25 kg usable) will provide approximately 112 miles of range between re-fueling.

16025: Develop and Demonstrate Fuel Cell Hybrid Electric Medium-Duty Trucks

Contractor: Center for Transportation and the Environment	SCAQMD Cost-Share	$ 980,000
	Cosponsors	
	Department of Energy	2,857,560
	United Parcel Service	2,076,490
	California Energy Commission	1,100,000
Term: 02/05/16 – 08/04/20	Total Cost:	$ 7,014,050

The Fuel Cell Hybrid Electric Walk-In Van Deployment Project is proposed in two phases. In Phase 1, CTE along with its vehicle integrators will demonstrate and validate lead final analysis and design for integration of the fuel cell power train into a base electric utility vehicle. A pre-2006 model diesel-powered walk-in van provided by UPS will be converted to electric drive by one of CTE's vehicle integrators, and this base electric vehicle will be shipped to their fuel cell system integrator who will integrate the Hydrogenics fuel cell, power electronics, hydrogen storage system and controls into the electric van. At the end of Phase 1, there will be a go/no-go decision made by the DOE. If the performance specifications have been proven, CTE will request approval from DOE to initiate Phase 2-Deployment. In Phase 2, up to 17 additional fuel cell hybrid walk-in vans will be built for operation

under real-world conditions at UPS distribution facilities in Sacramento and the South Coast Air Basin for at least 5,000 hours. Up to six of the vehicles will be deployed in the South Coast Air Basin. These vehicles will also be converted from pre-2006 model diesel-power UPS vans. Any design updates will be incorporated due to lessons learned from the demonstration and validation phase.

16251: Develop and Demonstrate Commercial Mobile Hydrogen Fueler

Contractor: H2 Frontier, Inc.	SCAQMD Cost-Share	$ 200,000
	Cosponsors	
	California Energy Commission	999,677
	U.S. Hybrid	375,913
	H2 Frontier, Inc.	75,000
	Gas Technology Institute	15,064
Term: 05/06/16 – 05/05/21	Total Cost:	$ 1,665,654

To ensure customers can continue to fuel at the hydrogen stations being upgraded in the Basin, CEC through PON 13-607 awarded Gas Technology Institute (GTI) $999,677 to develop and demonstrate a commercial temporary hydrogen fueler, which would be used during upgrade transitions and temporary dispensing issues. GTI has partnered with U.S. Hybrid and H2 Frontier, Inc. The temporary fueler can be a stand-alone unit for remote filling or integrated into stations experiencing temporary dispensing issues during transition to upgraded equipment or repairs. The fueler will connect to the onsite hydrogen storage supply and have the ability to connect with existing hydrogen dispensers to fill onboard storage. It will use renewable fuel if possible and would be deployed at hydrogen stations as needed. SCAQMD is providing additional co funding to H2 Frontier, Inc.

17030: Participate in California Fuel Cell Partnership for Calendar Year 2016 and Provide Support for Regional Coordinator

Contractor: Bevilacqua-Knight, Inc.	SCAQMD Cost-Share	$ 135,000
	Cosponsors	
	SCAQMD (in-kind)	10,440
	7 automakers, 6 public agencies, 2 industry stakeholders, 25 Full & Associate Members	1,559,793
Term: 01/01/16 – 12/31/16	Total Cost:	$ 1,705,233

In April 1999, the California Fuel Cell Partnership (CaFCP) was formed with eight members; SCAQMD joined and has participated since 2000. The CaFCP and its members are demonstrating and deploying fuel cell passenger cars and transit buses with associated hydrogen fueling infrastructure in California. Since the CaFCP is a voluntary collaboration, each participant contracts with Bevilacqua-Knight, Inc. (BKi) for their portion of the CaFCP's administration. In 2016, the SCAQMD Governing Board contributed $85,000 for membership and up to $50,000, along with four cubicles at SCAQMD Headquarters, to provide support for the CaFCP Regional Coordinator.

17059: Develop and Demonstrate Fuel Cell Extended-Range Powertrain for Parcel Delivery Trucks

Contractor: Calstart	SCAQMD Cost-Share	$ 589,750
	Cosponsors	
	United Parcel Service	749,500
	Unique Electric Solutions, LLC	165,000
	Calstart	70,000
Term: 10/27/16 – 04/26/18	Total Cost:	$ 1,574,250

UPS and CALSTART, together with engineering/technical lead UES and project team CCW, Nuvera and Nidec, will integrate, validate and demonstrate a commercial-path, optimized Fuel Cell Range Extended Electric Delivery Truck (FCXRDT) for demonstration out of the UPS Ontario Regional Hub and using hydrogen fueling available near the facility. The project team will integrate an electric driveline, consisting of a 120 kilowatt electric motor and 45-60 kWh battery pack together with a 30kW fuel cell and roughly 10kg of hydrogen storage onto an existing UPS Class 6 delivery truck. The resulting vehicle should demonstrate a daily guaranteed range of 125 miles, 65mph top speed and diesel-equivalent or better driving performance, all with zero emissions. The project leverages in excess of $900,000 of UPS and partner investment and commitment to bring this complete driveline to the road.

Electric/Hybrid Technologies and Infrastructure

13410: Lease Three 2013 Chevrolet Volt Extended-Range Electric Vehicles for Three Years then Purchase Vehicles

Contractor: Selman Chevrolet Company	SCAQMD Cost-Share	$ 84,450
Term: 04/03/13 – 04/02/16	Total Cost:	$ 84,450

The SCAQMD operates a number of alternative fuel vehicles (AFVs) including electric vehicles (EVs), fuel cell vehicles (FCVs) and plug-in hybrid electric vehicles (PHEVs). The primary objective of having these vehicles as part of the SCAQMD's Fleet Demonstration Program is to continue to support the use of zero emission vehicles and bring awareness to the public of their viability. In 2016 this lease was modified to provide for the purchase of the three 2013 Chevrolet Volts, adding them permanently to the Fleet Demonstration Program and ensuring the green carpool stickers could continue to be utilized when out in the community.

13429: Lease One Toyota RAV4 Electric Vehicle for Three Years then Purchase Vehicle

Contractor: Longo Toyota	SCAQMD Cost-Share	$ 22,410
Term: 04/03/13 – 04/02/16	Total Cost:	$ 22,410

As noted, the SCAQMD operates a number of AFVs in its Fleet Demonstration Program to support the use of zero emission vehicles and bring awareness to the public of their viability. Toyota used 40 kWh Tesla battery packs for this 5-passenger mid-sized SUV, providing the second longest-range BEV in 2012 for a modest price. In 2016 this lease for one Toyota RAV4 EV was modified to provide for the purchase of the vehicle, adding it permanently to the Fleet Demonstration Program and ensuring the white carpool sticker could continue to be utilized when out in the community.

14184: DC Fast Charging Network Provider

Contractor: Clean Fuel Connection, Inc.	SCAQMD Cost-Share (*received as pass-through funds)*	$ 920,000
	Cosponsor	
	EVgo	233,880
Term: 04/04/14 – 06/30/20	Total Cost:	$ 1,153,880

Clean Fuel Connection, Inc. (CFCI) was previously selected as the network provider for the 27-site DC fast charging network. CFCI is working in partnership with EVgo to serve as the installer and network provider. CFCI has installed over 8,000 EVSE since 1999 and is one of the most experienced installers of EVSE in the U.S. These sites will be in addition to EVgo's CPUC settlement of installing 200 DC fast chargers in California and will be integrated into the EVgo network. CFCI and EVgo will operate the network for five years beyond the date of installation and will provide pay per use and subscription payment models to users. Two installations were completed in 2016 in the Cities of Calabasas and Palm Desert, with an additional five DC fast charging stations to be completed by April 2017 and an additional 20 DC fast charging stations to be completed by December 2017. CEC has awarded two revenue grants ARV-12-053 and ARV-13-026 of $720,000 and $500,000 respectively, with an additional $883,800 in required cost sharing being provided by the project partners. DC fast chargers will be installed along major freeway corridors throughout the four-county SCAQMD jurisdiction to extend electric driving range throughout the region including to the Coachella Valley, San Diego, and Central Coast regions.

16200: Cost-Share Regional Universities for U.S. DOE EcoCAR 3 Competition

Contractor: California State University Los Angeles	SCAQMD Cost-Share	$ 100,000
	Cosponsors	
	Competition Sponsors: DOE, GM, NSF, EPRI. Team Sponsors: CSULA, Xerox, Enerdel, Modern Kit Car	700,000
Term: 04/14/16 – 04/15/20	Total Cost:	$ 800,000

EcoCAR 3 is an advanced plug-in hybrid passenger vehicle design-and-build competition sponsored by U.S. DOE and General Motors and managed by Argonne National Laboratory. California State University Los Angeles (CSULA) is the only competitor in California of 16 North American universities chosen to redesign a stock 2016 gasoline Chevrolet Camaro into a hybrid vehicle that will reduce the environmental impact of vehicles, minimize fuel consumption, retain performance, safety and consumer appeal, and provide research and innovation. For EcoCAR 3, the CSULA team has selected a police theme with pursuit capability. Switching to alternative fuels, enabling electric air conditioning, powering energy intensive loads from the battery pack and EV patrol modes will allow CSULA's vehicle to provide appreciable fuel economy along with substantial pollution and GHG reductions. Competition and Team Sponsors also contributed in-kind resources.

16227: Lease One 2016 Chevrolet Volt Extended-Range Electric Vehicle for Three Years

Contractor: Selman Chevrolet Company	SCAQMD Cost-Share	$	15,677
Term: 02/01/16 – 01/13/19	Total Cost:	$	15,677

As noted, the SCAQMD operates a number of AFVs in its Fleet Demonstration Program to support the use of zero emission vehicles and bring awareness to the public of their viability. In 2016 this lease for one 2016 Chevrolet Volt extended-range electric vehicle was executed, adding it to the Fleet Demonstration Program. The improved 2016 Volt offers many new features and up to 53 pure electric miles and up to 420 miles with a full charge and a full tank of gas and qualifies for incentives including green carpool stickers.

16081: Provide EV Hardware and Control System at SCAQMD Headquarters including Installation Support, Warranty and Networking

Contractor: Broadband TelCom Power, Inc.	SCAQMD Cost-Share	$	367,425
Term: 04/27/16 – 06/26/22	Total Cost:	$	367,425

A contract with Broadband TelCom Power, Inc. (BTC) was selected through an RFP process as the hardware provider for Level 2 charging stations to be installed at SCAQMD headquarters. BTC will provide up to 90 Level 2 charging ports in various areas of the parking lot, including the upper deck, solar carport, CC8, and front lobby. This contract was later modified to include additional funds for installation of Greenlots networking software and of a network of wifi gateways to enable EV charging stations to communicate with the Greenlots network. The Greenlots Sky networking software is able to handle EV charging sessions, provide user notifications on charging status and real-time availability, and data collection for analysis and sharing with the building's energy management system to ramp down or turn off charging activity in response to overall building demand to minimize demand charges during peak hours in the summer months. The Sky platform is also capable of customizing charging rates per kWh, per hour, flat rate, time of day, duration of charging session, or other criteria and can provide customized messaging screens to inform EV drivers of fees to be charged and limitations on dwell time at charging stations.

17065: EV Infrastructure Installer

Contractor: Clean Fuel Connection, Inc.	SCAQMD Cost-Share	$	805,219
Term: 12/02/16 – 12/31/21	Total Cost:	$	805,219

SCAQMD had selected a contractor to install EV charging stations at SCAQMD headquarters in May 2016 but this contractor withdrew their bid. As a result, another installation contractor, Clean Fuel Connection, Inc. (CFCI) was selected to perform the installation work. Installation work commenced in October 2016 with the first phase of installation completed in January 2017. As part of this installation, there will be up to 90 new Level 2 charging ports (including up to six ADA accessible charging ports) completed in spring 2017. This project will include the replacement of existing Level 2 charging stations and upgrading of electrical infrastructure including transformers and electrical panels in multiple sections of the parking lot (upper deck, solar carport, CC8, front lobby).

Transfer: Zero Emission Drayage Truck Demonstration Project

Contractors: BYD Motors, Kenworth Truck Company, Peterbilt Motors and Volvo Technology of America	SCAQMD Cost-Share	$ 6,001,531
	Cosponsors	
	California Air Resources Board	23,658,500
	Original Equipment Manufacturers	6,062,439
	Bay Area AQMD	3,000,000
	San Joaquin Valley APCD	1,000,000
	San Diego APCD	200,000
	San Diego Gas & Electric	200,000
Term: 03/04/16 – 03/04/16	Total Cost:	$ 40,122,470

This project is to develop a portfolio of most commercially promising zero and near-zero emission drayage truck technologies for statewide demonstrations in and around the Ports of Los Angeles, Long Beach, Oakland, Stockton and San Diego, in collaboration with four other air districts: Bay Area AQMD, Sacramento Metropolitan AQMD, San Joaquin Valley APCD and San Diego APCD. For this project, SCAQMD has partnered with four major Original Equipment Manufacturers (OEMs) to build a total of 43 demonstration trucks, based on two BEV platforms by BYD and Peterbilt, that are well suited for local operations with approximately 100 miles in operating range, and two PHEV trucks, by Kenworth and Volvo respectively, to service a wider range of drayage operations with an operating range of 250 or higher miles. Participation of major OEMs with necessary technical and financial resources will not only ensure successful outcome of this demonstration, but will also lead to commercialization of these truck technologies, providing much needed air quality and public health benefits for the Basin, especially in the communities that are disproportionately exposed to harmful diesel emissions from cargo transport operations.

Direct Pay: Electric Vehicle Supply Equipment Installation

Contractor: Clean Fuel Connection, Inc.	SCAQMD Cost-Share	$ 20,677
Term: 01/01/16 - 02/29/16	Total Cost:	$ 20,677

This project provides funds for the demonstration of Level 2 electric vehicle charging stations from several manufacturers including ChargePoint, Clipper Creek, LiteOn, AeroVironment, and BTC Power, Inc. Clean Fuel Connection, Inc. purchased and installed Level 2 chargers at various locations. These chargers have been utilized extensively by SCAQMD Governing Board members, staff, and the general public.

Direct Pay: Short Circuit Study for Headquarters Electric Vehicle Infrastructure

Contractor: Southern California Edison	SCAQMD Cost-Share	$ 400
Term: 01/01/16 – 01/01/16	Total Cost:	$ 400

The City of Diamond Bar required a short circuit study as part of SCAQMD's upgrade of electric vehicle service equipment at SCAQMD's Headquarters. This was in conjunction with the work being

performed by Broadband TelCom Power, Inc. and Clean Fuel Connection, Inc.

Engine Systems

16205: Develop, Integrate and Demonstrate Ultra-Low Emission 12-Liter Natural Gas Engines for On-Road Heavy-Duty Vehicles

Contractor: Cummins Westport, Inc.	SCAQMD Cost-Share *(partially received as pass-through funds)*	$ 2,750,000
	Cosponsors	
	California Energy Commission	2,000,000
	Cummins Westport, Inc. (in-kind)	1,000,000
	Clean Energy	500,000
Term: 06/03/16 – 06/30/18	Total Cost:	$ 6,250,000

Heavy-duty on-road diesel vehicles are projected to be among the top sources of NOx emissions in the South Coast Air Basin (SCAB) in 2023. Development of ultra-low emission engines that emit 90% lower NOx than the 2010 0.2 g/bhp-hr NOx standard would significantly reduce their emissions and assist the region in meeting federal ambient air quality standards in future years. The Cummins Westport ISL-G NZ 8.9-liter natural gas engines, developed with the funding from the SCAQMD, the California Energy Commission, and Southern California Gas Company, was certified by CARB to the Optional 0.02 g/bhp-hr NOx standard and is now in production. However, the 8.9-liter engine is too small for heavy-heavy duty vehicles in Class 8. The objective of this project is to apply the ultra-low emission engine and after-treatment technologies developed for the 8.9-liter ISL-G Z engine to the 11.9-liter ISX12-G Cummins Westport engine. The project includes (1) engine and after-treatment system design, development, and emission testing (2) integration of the engine and after-treatment system into multiple vehicle chassis, and 3) on-road demonstrations including chassis dynamometer testing. Development targets are (1) power and torque suitable for heavy-heavy duty Class 80 vehicles, (2) commercially viable, (3) certification to the CARB Optional NOx standard of 0.02 g/bhp-hr, and (ammonia emissions and fuel economy penalties as low as possible. Additionally, this contract will be modified in 2017 to add both the California Energy Commission's $2,000,000 and Clean Energy's $500,000 cost-share as pass-through funds.

Fueling Infrastructure and Deployment (NG/RNG)

16075: Purchase One Heavy-Duty CNG-Powered Truck

Contractor: City of Desert Hot Springs	SCAQMD Cost-Share	$ 38,000
	Cosponsor	
	AB 2766 Discretionary Fund Program/MSRC	25,000
Term: 03/11/16 – 03/10/20	Total Cost:	$ 63,000

Alternative fueled vehicles play an important role in Southern California's efforts to meet federally mandated fine particulate and ozone air quality standards. In July 2015 the Board approved co-funding of $38,000 with the MSRC to purchase a heavy-duty CNG-powered stakebed truck for the City of Desert Hot Springs that was originally awarded in 2009. In 2016 the City purchased and immediately deployed a 12-foot stakebed truck built on a Ford F450 chassis. The base gasoline engine is the spark-ignited

6.8L Ford Triton V-10. The vehicle was converted to dedicated CNG fuel with a heavy-duty CNG system manufactured and CARB certified by IMPCO. The vehicle is fitted with 31 GGE of on-board CNG storage. The F450 replaced an older gasoline powered Ford F150 Pickup truck. The total cost of the vehicle was $61,388.

16244: Renewable Natural Gas Production and Vehicle Demonstration Project

Contractor: CR&R, Inc.	SCAQMD Cost-Share	$ 900,000
	Cosponsors	
	CR&R, Inc.	46,080,000
	California Energy Commission	4,520,000
	CalRecycle	3,000,000
	AB 2766 Discretionary Fund Program/MSRC	500,000
Term: 09/03/16 – 03/02/20	Total Cost:	$ 55,000,000

Heavy-duty vehicles powered by conventional fossil fuels contribute significantly to local air pollution and contribute significantly to GHG emissions. The use of near-zero emission heavy-duty engine fueled with renewable natural gas can have a significant effect on addressing both of these air quality objectives. In October 2015 the Board approved $900,000 to support the expansion (Phase 2) of CR&R's anaerobic digestion and biomethane production facility in Perris, CA. Anaerobic digestion uses microorganisms to convert organic matter into useable and renewable natural gas (RNG), and into soil amendments that enhance plant growth and soil cultivation. The organic matter or feedstock for this facility is municipal solid waste, such as food and green waste that is collected in residential and commercial trash collection. The RNG produced at this facility will fuel CR&R's fleet of CNG-powered heavy-duty refuse collection vehicles, and the soil amendment produced at this facility will be used to grow plants and animal feed that will make its way back into the food and green waste cycle. This project will also demonstrate near-zero emission heavy-duty refuse collection vehicles powered by the Cummins-Westport 8.9L and 12L engines certified to CARB's Optional Low NOx Standard. These vehicles will be fueled with RNG produced at this facility. Finally, the RNG produced at this facility that is not used by CR&R will be introduced into the gas pipeline grid in cooperation with the Southern California Gas Company. Each phase of this facility is expected to generate 890,000 DGE of RNG annually.

16333: Implement Alternative Fuel Station Expansion

Contractor: Ontario CNG Station, Inc.	SCAQMD Cost-Share	$ 200,000
	Cosponsors	
	Ontario CNG Station, Inc.	448,535
	AB 2766 Discretionary Fund Program/MSRC	150,000
Term: 05/13/16 – 11/12/19	Total Cost:	$ 798,535

Alternative fueled vehicles play an important role in Southern California's efforts to meet federally mandated fine particulate and ozone air quality standards. In March 2016 the Board approved $200,000 to support the expansion of compressed natural gas (CNG) fueling at a public access, multi-fuel retail station positioned in a high vehicle volume area near the Interstate 10 freeway, the Ontario International Airport and Ontario Convention Center. OntarioCNG sells conventional gasoline and diesel fuels, biodiesel, and also hydrogen fuel. It has a car wash and a 24/7 manned convenience store with

restrooms. This project will increase CNG refueling capabilities and fuel delivery systems, with two high flow nozzles designed to reduce refueling time for heavy-duty Class 7-8 vehicles. The project will add one new 486 scfm CNG compressor, 36,000 scf of additional CNG fuel storage capacity, two new CNG dispensers and four fueling hoses, a second fueling island, and will introduce the marketing of RNG fuel. Overall, this project is expected to add greater visibility of alternative fuels to a conventional fuel consumer base as well as increase CNG fueling and the number of CNG fueled vehicles in this region.

17092: Construct RNG Production Facility and Demonstrate RNG with Next Generation Natural Gas Engine

Contractor: KORE Infrastructure, LLC	SCAQMD Cost-Share (*partially received as pass-through funds)*	$ 2,500,000
	Cosponsors	
	KORE Infrastructure, LLC & Partners	23,000,000
Term: 03/11/16 – 03/10/20	Total Cost:	$ 25,500,000

In order to increase supply of renewable natural gas (RNG), KORE Infrastructure is to construct a new full-scale modular biomethane production facility in Rialto, CA using a proprietary process developed and demonstrated over a six-year period at a local wastewater plant. The proposed facility will utilize a fully integrated system to process biosolids from wastewater treatment facilities into RNG that can be used locally as transportation fuel in the next generation natural gas engines that are certified to achieve 90 percent lower NOx emissions than the existing 2010 heavy-duty engine exhaust emissions standard. This project will utilize a thermochemical process to decompose the organic material into gases and a solid known as biochar. This thermochemical process is called pyrolysis and involves heating the almost dry organic materials to elevated temperatures in the absence of oxygen. The gases produced are primarily comprised of hydrogen, carbon monoxide, carbon dioxide, and methane. The components of this gas can then be reformed into other products including RNG. In September 2016 the Board approved $1 million dollars from the Clean Fuels Fund and $1.5 million from the BP ARCO Settlement Projects Fund (46). Kore's patented process consists of five stages: (1) material handling, (2) drying, (3) pyrolysis, (4) methanation (pyrolysis gas conversion to RNG), and (5) compression. The facility is expected to process nearly 300 tons per day of biosolids and produce about 1,000 GGE of transportation fuel grade RNG. The RNG production and dispensing facility is anticipated to be fully operational in 2018. KORE will initially convert up to two diesel trucks from their fleet to operate on the RNG produced at the new facility and work with local fleets to provide RNG for fleet vehicles equipped with low-NOx technology engines.

Direct Pay: 2015-16 Enhanced Fleet Modernization Program (EFMP) Plus-Up

Contractor: various	SCAQMD Cost-Share	$ 1,033,500
	Cosponsors	
	California Air Resources Board/Bureau of Automotive Repair	5,000,000
	MSRC/AB 2766 Discretionary Fund Program	1,550,250
	Special Revenue Fund/AB 923	516,750
Term: 01/08/16 – 01/08/16	Total Cost:	$ 8,100,500

The Enhanced Fleet Modernization Program is a state-funded program which is branded as the "Replace Your Ride" program in the SCAQMD. Through this pilot program, low- and moderate-income participants are offered incentives to replace their existing vehicles with cleaner, more fuel-efficient vehicles, or alternatively, to obtain vouchers for alternative transportation such as transit passes and ridesharing. Additional incentives are available to participants who live in disadvantaged communities and obtain advanced technology replacement vehicles such hybrids, PHEVs, and ZEVs. The program has been well received in the SCAQMD. Local match funds were provided in FY 2015-16 by the Clean Fuels Fund, MSRC, and the Special Revenue Fund, which support SCAQMD's high rate of program participation.

Direct Pay: Purchase of Electric Leaf Blowers and Trimmers for Lawn and Garden Demonstration Program

Contractor: Varies		$ 4,195
Term: 03/31/16 – 03/31/16	Total Cost:	$ 4,195

In 2014 SCAQMD launched a Commercial-Grade Electric Lawn and Garden Equipment Program to demonstrate commercial-grade electric lawn mowers and cordless electric hand-held lawn and garden equipment to promote and accelerate market penetration of such equipment in the South Coast Air Basin. The program was implemented with participating local gardening and landscape professionals as well as municipalities, universities and other eligible entities. The Program loans the equipment to participants on a rotating basis for 60-90 days and equipment contractors have been responsible for training users on safe and proper operation and maintenance of the equipment and providing necessary technical and logistical support. In 2016 additional equipment was purchased to continue the successful demonstration efforts.

Direct Pay: 2016-17 Enhanced Fleet Modernization Program (EFMP) Plus-Up

Contractor: various	SCAQMD Cost-Share	$ 1,503,000
	Cosponsors	
	California Air Resources Board	13,700,000
	MSRC/AB 2766 Discretionary Fund Program	2,254,500
	Special Revenue Fund/AB 923	751,500
Term: 09/02/16 – 09/02/16	Total Cost:	$18,209,000

Implementation of the Enhanced Fleet Modernization Program continues in FY 2016-17 with the support of local match funds from the Clean Fuels Fund, MSRC, and the Special Revenue Fund. The vast majority of funding has benefitted low-income participants who live in disadvantaged communities. Through this program, over 1,300 participants have scrapped their vehicles and replaced them with cleaner vehicles, primarily hybrids, PHEVs and BEVs.

Fuels/Emissions Studies

16198: Study of Opportunities and Benefits of Deploying Next Generation Heavy-Duty Natural Gas Vehicles Operating on Renewable Natural Gas

Contractor: Gladstein, Neandross & Associates, LLC	SCAQMD Cost-Share	$ 50,000

	Cosponsors	
	American Gas Association	50,000
	California Natural Gas Vehicle Partnership	50,000
	Clean Energy	50,000
	Southern California Gas Company	50,000
Term: 03/11/16 – 03/10/20	Total Cost:	$ 250,000

The next generation of cleaner ultra-low-NOx on-road heavy-duty combustion engines that achieve a 90 percent reduction in NOx emissions compared to the current emissions standard are currently being developed. These "near-zero" emission engines will play a significant role for the region to attain federal ambient air quality standards. Given the focus on climate change, the natural gas industry has been expanding its efforts to provide biomethane or renewable natural gas (RNG) to the transportation fuels market. As RNG use continues to increase, there is interest in further understanding the opportunities to introduce RNG as a transportation fuel and how RNG can be introduced into the natural gas pipeline. In November 2015 the Board approved a cost share of $50,000 to conduct a study on the opportunities and benefits of deploying next generation heavy-duty natural gas vehicles fueled by RNG. The resulting technical whitepaper, titled "Gamechanger – Next Generation Heavy-Duty Natural Gas Engines Fueled by Renewable Natural Gas", considered criteria pollutant and greenhouse gas benefits of ultra-low-NOx natural gas engines, the opportunities and cost to deploy such engines, and an evaluation of the market successes of RNG, future opportunities and challenges of increasing the use of RNG as a transportation fuel, and expanding the commercial deployment of ultra-low NOx heavy-duty vehicles locally, and regionally.

16254: Evaluate Ozone and Secondary Aerosol Formation from Diesel Fuels

Contractor: University of California Berkeley	SCAQMD Cost-Share	$ 106,361
Term: 10/25/16 – 08/31/17	Total Cost:	$ 106,361

Diesel vehicle exhaust and unburned diesel fuel are major sources of intermediate volatile organic compounds (IVOCs) and may contribute to the formation of urban ozone and secondary organic aerosol (SOA), which is an important component of particulate matter 2.5 (PM2.5). The characterization of IVOC emissions is critical in assessing ozone and SOA precursor production rates. Traditionally, laboratory measurements of IVOCs have been prohibitively difficult. For this project, novel experimental measurements and emissions modeling of typical diesel blends under varying temperatures and wind speeds will be used to determine potential ozone and SOA yields in urban areas.

17060: Bailment Agreement for Equipment Use for In-Use Emissions Testing of Heavy-Duty Inspection and Maintenance Program

Contractor: University of California Riverside	SCAQMD Cost-Share	$ 0
Term: 10/13/16 – 10/12/18	Total Cost:	$ 0

The University of California, Riverside's Bourn's College of Engineering – Center for Environmental Research and Technology (UCR/CE-CERT) is currently initiating a program entitled "Heavy-Duty On-Road Vehicle Inspection and Maintenance (I/M) Program" that is being funded by the California Air Resources Board. This program is to provide important information that will be utilized in the enhancement of CARB's Heavy-Duty I/M program. It is expected that any updates to CARB's Heavy-Duty I/M program would be implemented throughout the state and would become a critical part of emission reduction strategies in future Air Quality Management Plans for the SCAQMD. An important element of this CARB study will be an extensive emissions evaluation of over 50 heavy-duty trucks before and after repairs. The CARB program covers the costs associated with the chassis dynamometer testing and repairs, but does not incorporate budget for the necessary emissions analyzers. This in-kind contribution from the SCAQMD would be a critical element in the success of this specific project. In exchange for the loan of the emissions analyzers for approximately a two-year period, UCR/CE-CERT will provide emissions analysis information that will be used to help the SCAQMD achieve its goals in improved air quality.

Technology Assessment/Transfer and Outreach

08210: Technical Assistance on Mobile Source Control Measures and Future Consultation on TAO Activities

Contractor: Sawyer Associates	SCAQMD Cost-Share	$ 10,000
Term: 02/22/08 – 02/28/18	Total Cost:	$ 10,000

The Office of Science and Technology Advancement (STA) augments in-house expertise with consultants who perform through level-of-effort technical assistance contracts. Under this contract executed in 2008, Dr. Robert F. Sawyer provides technical assistance to further develop and refine the mobile source control measures. In addition, he provides assistance in air toxics control measures, review of SCAQMD programs such as the Clean Fuels projects, input to greenhouse gas and energy diversity policies, and state regulatory activities, such as the ZEV and ZBus regulations. Dr. Sawyer is the former Chairman of the California Air Resources Board and has over 50 years of domestic and international experience specializing in automotive emissions, alternative fuels, air pollution and environmental issues. He has additional experience in air pollution regulatory policy advising. Dr. Sawyer is a Professor of the Graduate School and the Class of 1935 Professor of Energy Emeritus at the University of California at Berkeley and a Visiting Professor of Energy and Environment at University College London. Dr. Sawyer serves on the Clean Fuels Advisory Committee.

17037: Technical Assistance with Alternative Fuels, Electric Vehicles, Charging and Fueling Infrastructure and Renewable Energy

Contractor: Clean Fuel Connection, Inc.	SCAQMD Cost-Share	$ 50,000
Term: 11/18/16 – 11/17/18	Total Cost:	$ 50,000

SCAQMD relies on expert input, consultation and support to manage a number of programs

conducted under the Clean Fuels Program and incentive programs. Clean Fuel Connection, Inc. CFCI), is providing technical assistance with alternative fuels, renewable energy and electric vehicles as well as outreach activities to promote, assess, expedite and deploy the development and demonstration of advanced, low and zero emissions mobile and stationary technologies. This contract is for technical and administrative support to enable the range of activities involved in implementing the Clean Fuels Program and associated complimentary programs as needed.

17097: Technical Assistance with Alternative Fuels and Fueling Infrastructure, Emissions Analysis and On-Road Sources

Contractor: Gladstein, Neandross & Associates LLC	SCAQMD Cost-Share	$ 100,000
Term: 11/04/16 – 11/03/18	Total Cost:	$ 100,000

This contract leverages staff resources with specialized outside expertise. Gladstein, Neandross & Associates LLC (GNA) has previously assisted SCAQMD with implementing a wide-array of incentive programs to deploy lower-emitting heavy-duty vehicles and advanced transportation technologies. Under this contract, GNA will provide technical expertise across a broad spectrum of emission reduction technologies, including alternative and renewable fuels and fueling infrastructure, emissions analysis and heavy-duty on-road sources on an-as-needed basis.

Direct Pay: Insurance for Alternative Fuel Vehicles in Technology Advancement Office's Fleet Demonstration Program

Contractor: Hartford/Alliant Insurance	SCAQMD Cost-Share	$ 31,414
Term: 01/01/16 – 12/31/16	Total Cost:	$ 31,414

In order to showcase and demonstrate advanced, low-emission technologies, the SCAQMD often leases and/or purchases clean alternative fuel vehicles to educate public and private organizations on the benefits of advanced technologies, as well as provide valuable in-use test data to the manufacturers. These vehicles are displayed at outreach events and conferences, used in Ride-and-Drive demonstrations, and are part of the SCAQMD carpool fleet. Private insurance is obtained for these advanced technology vehicles to ensure proper coverage.

Transfer: Participation in California Natural Gas Vehicle Partnership for Fiscal Year 2016-17 and 2017-18

Contractor: Transfer from Clean Fuels	SCAQMD Cost-Share	$ 25,000
	Cosponsors	
	CNGVP Participating Members	130,000
Term: 07/08/16 – 07/08/16	Total Cost:	$ 155,000

The California Natural Gas Vehicle Partnership (CNGVP) was formed to accelerate the development of advanced natural gas vehicle technologies to provide a benchmark for lowering emissions from petroleum-based engines and to provide a pathway to future fuel cell use in the next two decades. The SCAQMD spearheaded the formation of this strategic alliance, which comprises state and federal air quality, transportation and energy agencies, vehicle and engine manufacturers, fuel providers, and transit and refuse hauler organizations. Partnership Steering Committee members contribute monies to fund specific projects intended to achieve the goal of the Partnership. In July 2016 the SCAQMD approved $25,000 for the SCAQMD's participation in the Steering Committee for the next two years.

Direct Pay: Participation for CY 2016 Membership in Transportation Research Board

Contractor: Transportation Research Board	SCAQMD Cost-Share	$ 32,500
	Cosponsors	
	Core Program Participating Members	191,000
Term: 07/01/16 – 12/31/16	Total Cost	$ 223,500

In 2016 the SCAQMD supported the Transportation Research Board (TRB) by participating as a member. The mission of the TRB is to promote innovation and progress in transportation through research. In an objective and interdisciplinary setting, TRB facilitates the sharing of information on transportation practice and policy by researchers and practitioners; stimulates research and offers research management services that promote technical excellence; provides expert advice on transportation policy and programs; and disseminates research results broadly and encourages their implementation. TRB's varied activities annually engage more than 7,000 engineers, scientists, and other transportation researchers and practitioners from the public and private sectors and academia, all of whom contribute their expertise in the public interest by participating on TRB committees, panels and task forces. TRB is one of six major divisions of the National Research Council (NRC) - a private, nonprofit institution that is jointly administered by the National Academy of Sciences, the National Academy of Engineering and the Institute of Medicine - and is the principal operating agency of the National Academies in providing services to the government, the public and the scientific and engineering communities. Sponsors and affiliates provide support for TRB core programs and activities. Sponsors are the major source of financial support for TRB's core technical activities. Federal, state, and local government agencies and professional societies and organizations that represent industry groups are eligible to be TRB sponsors. TRB's annual expenditures for program activities exceed $90 million.

Direct Pay: Cosponsor 24 Conferences, Workshops & Events plus 4 Memberships

Contractor: Various	SCAQMD Cost-Share	$ 282,658
	Cosponsors	
	Various	4,017,865
Term: 01/01/16 – 12/31/16	Total Cost	$ 4,300,523

The SCAQMD regularly participates in and hosts or cosponsors conferences, workshops and events. These funds provide support for the 24 conferences, workshops and events sponsored throughout 2016 as follows: Calstart's Clean Low Carbon Fuels Summit in February; Linn-Benton Community College's Green Transportation Summit & Expo in February; UC Riverside's Solar Conference in February; UC Riverside's 2016 PEMS Conference in March; UCI's 2016 ICEPAG/MGS Conference in March; Coordinating Research Council's 2016 Real World Emissions Workshop in March; U.S. EPA's West Coast Collaborative Meeting in April; California Science Fair in May; GNA's 2016 ACT Expo in May; CleanTechOC's Advanced Transportation Symposium in June; GNA's 2016 Rethink Methane Symposium in June; 2016 Women in Green Forum in August; 2016 FuturePorts Annual Conference in June; SCCAA's LA Environmental Forum in August; JPL's 2016 Climate Day in September; Clean Fuels Advisory Group Retreats in January & September 2016; Adopt-A-Charger's 2016 National Drive Electric Week Event in September; Platia Productions' 2016 Santa Monica AltCar Expo & Conference in September; GNA's Ultra-Low NOx Heavy-Duty Engines Workshop in October; BRC's 2016 Southern California Energy Water + Green Living Summit in October; Energy Vision's Renewable Natural Gas for California Workshop in October; CalETC's 2016

Los Angeles Auto Show Events in November; CHBC's Hydrogen & Fuel Cells in the Ports Workshop in November; as well as GNA's upcoming 2017 Rethink Methane Symposium. Additionally, for 2016 four memberships were renewed for participation in the PEV Collaborative, the Fuel Cell & Hydrogen Energy Association, the California Hydrogen Business Council, and the Air & Waste Management Association.

PROGRESS AND RESULTS IN 2016

Key Projects Completed

A large number of emission sources contribute to the air quality problems in the South Coast Air Basin. Given the diversity of these sources, there is no single technology or "silver bullet" that can solve all of the region's problems. Accordingly, the SCAQMD continues to support a wide range of advanced technologies, addressing not only the diversity of emissions sources, but also the time frame to commercialization of these technologies. Projects cofunded by the SCAQMD's Clean Fuels Program include emission reduction demonstrations for both mobile and stationary sources, although legislative requirements limit the use of available funds primarily to on-road mobile sources.

Historically, mobile source projects have targeted low-emission technology developments in automobiles, transit buses, medium- and heavy-duty trucks and off-road applications. These vehicle-related efforts have focused on: 1) development, integration and demonstration of ultra-low emission natural gas natural gas engines for on-road heavy-duty engines; 2) Develop and Demonstrate Plug-In Hybrid Electric Drive System for Medium- and Heavy-Duty Vehicles; and 3) Operation & Maintenance of City of Burbank Hydrogen Fueling Station.

Table 6 (page 63) provides a list of 43 projects and contracts completed in 2016. Summaries of the completed technical projects are included in Appendix C. Selected projects which represent a range of key technologies from near-term to long-term are highlighted below.

Develop, Integrate and Demonstrate Ultra-Low Emission Natural Gas Engines for On-Road Heavy-Duty Engines

Heavy-duty on-road diesel vehicles are currently, and expected to remain, one of the largest contributors of NOx emissions, even as the legacy fleet of older vehicles are retired and replaced by vehicles meeting the 2010 emissions standards. Ultra-low NOx emission engines provide a path to significantly reduce NOx emissions from the heavy-duty vehicle source category and are the linchpin for achieving the federal ambient air quality standards in the future. SCAQMD staff has worked closely with the California Energy Commission, Southern California Gas Company, U.S. Department of Energy and others on developing a range of engine sizes (6-15 liter) that could be considered an ultra-low NOx emissions engine for heavy-duty vehicles, ranging from Class 4-8. Concurrently, CARB also adopted optional NOx emission standards, including 0.02 g/bhp-hr, to enable incentive funding for new vehicles equipped with certified ultra-low emission engines.

In late 2013, the Board awarded a contract to Cummins, Inc., to develop an ultra-low NOx emission 15-liter natural gas engine. The project included emission targets of 0.02 g/bhp-hr NOx, other 2010 criteria pollutant standards, and 10 ppm ammonia or as low as possible using EPA and CARB certification test procedures. In addition, other objectives affecting commercial viability of the engine included minimal energy efficiency loss compared to diesel and providing power, life cycle cost, performance, drive quality, and durability similar to diesel.

The project was completed in June 2016. The engine was derived from the Cummins 14.9-liter ISX15 diesel engine but had newly designed manifolds, heads, camshaft, piston, EGR, turbocharger and catalyst aftertreatment all specifically designed for optimal performance with natural gas. The final technology configuration consisted of:

Figure 35: ISX15-G Ultra Low NOx Test Engine

- Stoichiometric air-fuel ratio
- Port fuel injection
- Big intake - small exhaust valves
- Improved cooling of head and spark plugs
- Flow-optimized intake manifold
- Flow-optimized exhaust manifold
- High energy ignition system
- Cooled EGR
- Waste-gate turbocharger
- Close-coupled and main underbody three-way catalyst system

An engine containing the final internal and external engine hardware, optimized control software, and after treatment system was tested according to the cold/hot Heavy Duty Engine Federal Test Procedure (HD-FTP) and was operated without failure for more than 500 hours under a wide range of speed and load conditions. The engine and aftertreatment system achieved the near-zero emission targets, fuel consumption lower than current natural gas engines; and incorporated design changes to improve engine robustness and driving performance, particularly during transient operation, and reduce maintenance cost. Ammonia emissions, although not achieving the target, were substantially lower than current production natural gas engines. Further optimization of software controls and the aftertreatment system is expected to reduce ammonia below 20 ppm.

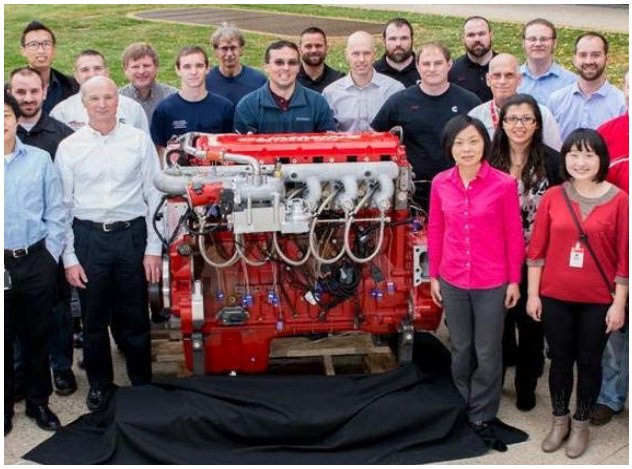

Figure 36: ISX15-G Ultra Low NOx Prototype Engine

Table 5: Emissions Testing Results

Parameter	Target	ISX15-G
NOx	0.02	0.003
PM	0.01	0.004
NMHC	0.14	0.010
CO	15.5	1.85
Ammonia	10 ppm	58 ppm
BTE loss*	minimal	1%

*Brake Thermal Efficiency Loss vs Diesel

This project demonstrated that a well-designed natural gas engine can achieve both ultra-low NOx emissions as well as thermal efficiency and performance equivalent to diesel engines. The project also

provided a design pathway for developing other ultra-low NOx natural gas engines with performance similar to a diesel engine which is described in the final report and two technical papers. Unfortunately, market demand for a 15-liter natural gas engine is currently insufficient to justify launching this new engine at this time. The technology is scalable over an 8- to 15-liter size range, and Cummins intends to incorporate this technology in the next natural gas engine which is expected to be released in the 2019-2020 timeframe.

In 2015, the 8.9L Cummins Westport was also certified to a 0.02 g/bhp-hr NOx standard and has since been fully commercialized, with ongoing efforts to develop, certify and commercialize the 6.7L and 11.9L natural gas engines. Furthermore, CARB and SCAQMD are collectively working on parallel efforts to develop liquid-fueled, large displacement engines suitable for long-haul operations that can also meet the 0.02 g/bhp-hr for NOx.

Based on the success of the engine development efforts, the SCAQMD, along with CARB and numerous other states, petitioned the U.S. EPA to establish a national near-zero NOx heavy-duty engine standard. In November 2016, CARB initiated the California heavy-duty emission standard rule development effort, and subsequently, in December 2016, U.S. EPA informed the petitioners of their goal to evaluate and consider the national heavy-duty engine standard. If the federal or state standard is revised, a market for the 15-liter engine developed under this contract is expected to develop.

Develop and Demonstrate Plug-In Hybrid Electric Drive System for Medium- and Heavy-Duty Vehicles

The Odyne Systems' hybrids are in Class 6 to Class 8 trucks. These are parallel plug-in hybrid vehicles and can improve fuel economy by up to 50% and reduce emissions. The Odyne hybrids come equipped with 6 or 12 kW of export power. The hybrid system adapts to the traction and the aerial hydraulics of the vehicle. The Odyne equipped trucks were designed, developed, validated and produced within this SCAQMD program and a DOE ARRA funded program. Odyne now has the capability to produce more of these vehicles. Cost analysis has been done to understand future cost reduction.

The Odyne hybrid system is a simple, parallel hybrid system that allows the torque of the electric motor to augment the torque output of the diesel engine, thus saving fuel. The motor speed is synchronized with the engine speed through the power take-off (PTO) unit. The traction motor drives the PTO, adding torque to the rear axle, or converts torque from the PTO into power to charge the hybrid batteries. Six patents have been granted, and other patents are pending.

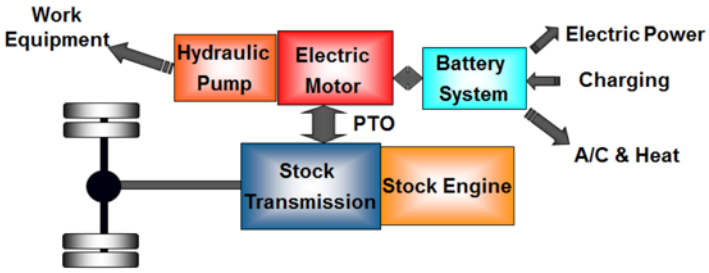

Figure 37: Odyne Plug In Hybrid System

The motor can also drive the hydraulic pump that controls the aerial device. A clutch in the PTO allows the motor to drive the hydraulic pump for the aerial device. If the clutch is closed, the diesel engine torque drives the pump and concurrently charges the hybrid batteries through the traction motor.

The advantages of the electrically driven hydraulic pump are reduction in sound level at the job site, improved fuel consumption, and reduced emissions. The diesel engine need not idle during the hydraulic pump control. The pump is activated only when the operator provides the control to move the hydraulics. This feature saves energy when the aerial device is being used.

Operation & Maintenance of City of Burbank Hydrogen Fueling Station

Figure 38: Odyne Utility Bucket Truck

Steam methane reformation (SMR) is currently used to produce the majority of hydrogen in California, typically from a large central plant that primarily produces hydrogen for petroleum refining and other industrial uses, but a portion of which can be further purified and transported to light-duty hydrogen fueling stations. Onsite reformers can eliminate hydrogen transportation (reducing emissions), but smaller onsite reformers are not as cost-effective. This onsite reformer station was built in 2009 by British Petroleum, with funding and support provided by U.S. DOE and General Motors, following the completion of the original electrolysis-based hydrogen fueling station, which was part of the Five Cities Hydrogen Demonstration Program.

In 2010, in order to support the continued and growing need for hydrogen fueling in the region, U. S. DOE, CARB, CEC, and SCAQMD contracted with Hydrogen Frontier, Inc. to repair equipment, restart, operate and maintain this hydrogen fueling station, train staff in use of equipment and procedures, and provide detailed vehicle fueling reports to NREL. SCAQMD added funds to continue operation and maintenance and pay for the increase in utility services (electricity and natural gas) for the onsite reformer and station.

Flexible fueling protocols satisfied a variety of automaker needs during development and demonstration of new fuel cell vehicles, but now, the need for longer range and fast refueling under a wide range of ambient conditions has resulted in a new standardized protocol. As with other non-retail hydrogen stations operating during this time period, access was controlled by PIN codes issued to drivers that completed hydrogen safety training. The SMR has nearly 19,000 runtime hours and demonstrates that operation and maintenance of on-site reformation can be a reasonable-cost option. New stations are increasing monitoring of hydrogen quality to protect the operation of fuel cell vehicles.

With the continued support of the City of Burbank, this location near the intersection of two major freeways remains desirable and has proven a viable asset to the infrastructure network. However, most new light-duty hydrogen stations are being co-located at gasoline stations in a retail environment. Continued operation and maintenance of hydrogen fueling at this site helped bridge the gap in preparation for additional upgrades commencing in 2017 to provide retail sale of hydrogen for light-duty vehicles using funding from a grant award under the CEC AB 118 Program.

Figure 39: Burbank Hydrogen Station

Table 6: Projects Completed between January 1 & December 31, 2016

Contract	Contractor	Project Title	Date
Hydrogen and Mobile Fuel Cell Technologies and Infrastructure			
11150	Hydrogen Frontier Inc.	Operation and Maintenance of City of Burbank Hydrogen Fueling Station	Jan-2016
16151†	Toyota Motor Sales USA	No Cost Loan of 2015 Toyota Mirai Fuel Cell Vehicle	Jan-2016
17030	Bevilacqua-Knight, Inc.	Participate in California Fuel Cell Partnership for Calendar Year 2016 and Provide Support for Regional Coordinator	Dec-2016
Electric/Hybrid Technologies and Infrastructure			
10659	Electric Power Research Institute	Data Collection to Further Evaluate Performance and Operational Benefits to Optimize Fleet of Medium-Duty Plug-In Hybrid Vehicles	Sep-2016
11606	Odyne Systems, LLC	Develop and Demonstrate Plug-In Hybrid Electric Drive System for Medium- and Heavy-Duty Vehicles	Nov-2016
11615	Parker Hannifin	Develop and Demonstrate Heavy-Duty Hydraulic Hybrid Vehicles	Aug-2016
13404†	Penske Honda of Ontario	Lease Two Honda Fit Electric Vehicles for Three Years	May 2016
13410†	Selman Chevrolet Company	Lease Three 2013 Chevrolet Volt Extended-Range Electric Vehicles for Three Years Then Purchase Vehicles	Apr-2016
13429†	Longo Toyota	Lease One Toyota RAV4 Electric Vehicle for Three Years Then Purchase Vehicle	Apr-2016
14202	Adopt-A-Charger	SoCalEV Infrastructure MOA to Install & Upgrade EV Charging Infrastructure	Apr-2016
14204	Associated of Los Angeles	SoCalEV Infrastructure MOA to Install & Upgrade EV Charging Infrastructure	Apr-2016
14336	Los Angeles Department of Water & Power	Install and Upgrade EV Charging Infrastructure (Administer SoCalEV Infrastructure Project)	Apr-2016
15021	Transportation Power, Inc. (TransPower)	Upgrade and Demonstrate Two Electric Yard Tractors	Dec-2016
17058†	Adopt-A-Charger	Cosponsor the Los Angeles National Drive Electric Week 2016	Sep-2016
Engine Systems			
14364	Cummins, Inc.	Develop, Integrate and Demonstrate Ultra-Low Emission Natural Gas Engines for On-Road Heavy-Duty Vehicles	Aug-2016

Table 6: Projects Completed between January 1 & December 31, 2016

Contract	Contractor	Project Title	Date
Fueling Infrastructure and Deployment (NG/RNG)			
05250	Downs Commercial Fueling, Inc.	Purchase & Install New L/CNG Fueling System at Commercial Fueling Station in Temecula	Apr-2016
06042	UCLA Fleet & Transit Services	Upgrade Existing CNG Public Access Station with Dispenser and Card Reader	Dec-2016
06084	Clean Energy	Upgrade Existing LNG Facility to L/CNG at Riverside County Waste Management Department's Aqua Mansa Facility	Feb-2016
06091	City of Whittier	Purchase and Install New Public Access CNG Fueling Station at City Yard	Dec-2016
07153	Foothill Transit	Purchase and Install New Public Access CNG Fueling Station in Irwindale	Jun-2016
07320	Orange County Transportation Authority	Install New CNG Refueling Station in the City of Santa Ana	Mar-2016
08043	University of California Los Angeles	Public Access CNG Fueling Station Upgrade for UCLA Transportation	Dec-2016
08044	Beaumont Unified School District	Install Limited Access CNG Refueling Station	Dec-2016
09218	Rim of the World Unified School District	Install Mountain Safety Equipment on CNG School Buses	Dec-2016
10067	Rim of the World Unified School District	Install Mountain Safety Equipment on CNG School Buses	Dec-2016
11548†	Clean Energy (novated from Mansfield Gas Equipment Systems)	Buydown Incentive Program for CNG Home Refueling Appliance "Phill"	Jan-2016
13401	Nite-Hawk Sweepers LLC	Demonstrate Natural Gas-Powered Parking Lot Sweepers	May-2016
Fuels/Emissions Studies			
13402	University of California Davis	Cost-Share Next Sustainable Transportation Energy Pathways (STEPs) Program	Jul-2016
Stationary Clean Fuel Technologies			
10723	Eastern Municipal Water District	Retrofit Digester as Engine with NOxTech Aftertreatment Emission Control Technology	Mar-2016
Health Impacts Studies			
12208	University of California Riverside/CE-CERT	Determine the Physical and Chemical Composition and Associated Health Effects of Tailpipe PM Emissions	Jan-2016
12865	University of California Los Angeles	Develop Quantitative Cellular Assays to Understand the Chemical Basis of Air Pollutant Toxicity	Jul-2016
14172	University of California Irvine	Study of Oxidative Stress in Relation to Particulate Air Pollution Exposures in Elderly	Aug-2016

Table 6: Projects Completed between January 1 & December 31, 2016

Contract	Contractor	Project Title	Date
Technology Assessment/Transfer and Outreach			
00069†	Walsh Consulting	Technical Assistance Relating to the Use of Alternative Fuels in Mobile Sources	Feb-2016
07062†	The Tioga Group, Inc.	Technical Assistance Related to Air Quality Impacts of Regional Goods	Nov-2016
12380†	The Tioga Group, Inc.	Technical Assistance Related to Emissions, Advanced Technologies and Goods Movement	Apr-2016
13198†	Gladstein, Neandross & Associates LLC	Technical Assistance with Alternative fuels, Emissions Analysis and On-Road Sources	Dec-2016
15344†	Clean Fuel Connection, Inc.	Technical Assistance with Alternative Fuels, Electric Vehicles, Charging and Fueling Infrastructure and Renewable Energy	Sep-2016
15415†	Gladstein, Neandross & Associates LLC	Technical Assistance with Alternative Fuels and Fueling Infrastructure, Emissions Analysis and On-Road Sources	Nov-2016
16055†	University of California Irvine	Cosponsor Solar Decathlon to Develop and Demonstrate Solar-Powered House at 2016	Feb-2016
16263†	Gladstein, Neandross & Associates LLC	Cosponsor ACT Expo 2016	Sep-2016
16388†	CleanTech OC	Cosponsor the 2016 Advanced Transportation Symposium & Expo	Aug-2016
17062†	Burke Rix Communications	Cosponsor the Southern California Energy Water & Green Living 2016 Summit	Dec-2016
17088†	Energy Vision	Cosponsor the Power of Waste: Renewable Natural Gas (RNG) for California Workshop	Dec-2016

†Two-page summary reports (as provided in Appendix C) are not required for level-of-effort technical assistance contracts, leases or cosponsorships; or it was unavailable at time of printing this report.

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CLEAN FUELS PROGRAM
2017 PLAN UPDATE

The Clean Fuels Program (Program) was first created in 1988, along with the SCAQMD's Technology Advancement Office (TAO). Funding for the Program is received through a $1 motor vehicle registration fee. The Clean Fuels Program continually seeks to support the development and deployment of zero and near-zero emission technologies over a broad array of applications and spanning near- and long-term implementation. Planning has been and remains an ongoing activity for the Program, which must remain flexible to address evolving technologies as well as the latest progress in the state-of-technologies, new research areas and data.

Every year the SCAQMD re-evaluates the Clean Fuels Program based on the region's ongoing need for emissions reductions and develops a Plan Update for the upcoming calendar year (CY) targeting near-term projects to help achieve those reductions. This document is for the upcoming calendar year 2017.

Overall Strategy

The overall strategy of the SCAQMD's Clean Fuels Program is based primarily on technology needs identified through the AQMP process and the SCAQMD Governing Board's directives to protect the health of residents in Southern California, which encompasses approximately 17 million people (nearly half the population of California). The AQMP is the long-term "blueprint" that defines:

- basin-wide emission reductions needed to achieve federal ambient air quality standards;
- regulatory measures to achieve those reductions;
- timeframes to implement these proposed measures; and
- technologies required to meet these future proposed regulations.

The emission control needs and measures identified in the Draft 2016 AQMP projects that an approximate 43 percent reduction in NOx is required by 2023 and a 55 percent reduction by 2031, the majority of which must come from mobile sources. Notably, the SCAQMD is currently only one of two regions in the nation recognized as an extreme ozone nonattainment area (the other is San Joaquin Valley). Ground level ozone (a key component of smog) is created by a chemical reaction between NOx and VOCs emissions. This is especially noteworthy because in the South Coast Air Basin the largest contributor to ozone is NOx emissions, and mobile sources (on- and off-road as well as aircraft and ships) contribute to approximately 88 percent of the NOx emissions in this region. Furthermore, NOx and VOC emissions also lead to the formation of PM2.5, particulate matter measuring 2.5 microns or less in size, expressed as micrograms per cubic meter ($\mu g/m^3$).

The Draft 2016 AQMP includes integrated strategies and measures to demonstrate attainment of the following National Ambient Air Quality Standards (NAAQS):

- 8-hour Ozone (75 parts per billion or ppb) by 2031
- Annual PM2.5 (12 $\mu g/m^3$) by 2025
- 24-hour PM2.5 (35 $\mu g/m^3$) by 2019
- 8-hour Ozone (80 ppb) by 2023 (updated from the 2012 AQMP)
- 1-hour Ozone (120 ppb) by 2022 (updated from the 2012 AQMP)

The Draft 2016 AQMP also takes an initial look at the emission reductions needed to meet the new federal 8-hour ozone air quality standard of 70 ppb and projects that an additional 25 tpd in NOx reductions between 2031 and 2037 will be needed for attainment by 2037.

The daunting challenge to reduce NOx and PM2.5 to meet increasingly stringent standards require the Clean Fuels Program to encourage and accelerate advancement of clean fuel and transportation technologies, leading the way to commercialization of progressively lower-emitting fuels and vehicles. The NOx and VOC emission sources of greatest concern to this region are heavy-duty on-road and off-road vehicles. To underscore this concern, the 2015 Vehicle Technologies Market Report[4], summarizing national data, released in spring 2016 by the Oak Ridge National Laboratory for the Department of Energy, and corroborated by EMFAC 2014 projections, notes that Class 8 trucks comprise 41% of the medium- and heavy-duty truck fleet but consume 78% of the fuel use in this sector. This is especially significant since the report also notes that Class 8[5] truck sales have increased 45% from 2011 to 2015; and Class 4-7 trucks, 49%. Given the relationship between NOx, ozone and PM2.5, the 2017 Plan Update must continue to emphasize emission reductions in all these areas.

Since development of the 2012 AQMP, it became clear that the effect of moving containers through the Ports of Los Angeles and Long Beach and the subsequent movement of goods throughout the region not only have a dramatic impact on air quality but also the quality of life in the communities along the major goods movement corridors. The findings from the MATES IV[6], which included local scale studies near large sources such as ports and freeways, reinforce the importance of these impacts and the need for transformative transportation technologies, especially near the ports and goods movement corridor. In recognition of these impacts, the SCAQMD added as a key element to its strategy a concerted effort to develop and demonstrate zero and near-zero emissions' goods movement technologies, such as electric trucks, plug-in hybrid trucks with all-electric range, zero emission container transport technologies, trucks operating from wayside power including catenary technology and heavy-duty technologies.

For over 28 years, a key strategy of the Clean Fuels Program has been its public-private partnership with private industry, technology developers, academic institutions, research institutions and government agencies. This public-private partnership has allowed the Program to leverage its funding with $3-$4 of spending on R&D projects to every $1 of SCAQMD funds. While the SCAQMD thus aggressively seeks leverage funds to accomplish more with every dollar, it also strives to act as a leader in technology development and commercialization to accelerate the reduction of criteria pollutants.

As the state and federal governments have been turning much of their attention to climate change (CO2 reductions), the SCAQMD remains committed to developing, demonstrating and commercializing zero and near-zero emission technologies. Fortunately the majority of technologies that address our need for NOx reductions also enable greenhouse gas (GHG) reductions. Because of these "co-benefits," we have successfully pursued partnering with the state and federally-funded projects that promise emission reductions.

Program and Funding Scope

This 2017 Plan Update includes projects to develop, demonstrate and commercialize a variety of technologies, from near-term to long-term, that are intended to provide solutions to the emission control

[4] http://cta.ornl.gov/vtmarketreport/pdf/2015_vtmarketreport_full_doc.pdf

[5] 33,001 pounds and greater (Class 4-7 trucks, 14,001-33,000 pounds)

[6] http://www.aqmd.gov/home/library/air-quality-data-studies/health-studies/mates-iv

measures identified in the Draft 2016 AQMP to address the increasing challenges this region is facing to meet air quality standards, including:

1) implementation of new and changing federal requirements, such as the federal 8-hour ozone standard of 70 ppb promulgated by U.S. EPA in late 2015;
2) implementation of new technology measures by including accelerated development of technologies getting ready for commercialization and deploying ready technologies; and
3) continued development of cost-effective approaches.

The overall scope of projects in the 2017 Plan Update also needs to remain sufficiently flexible to address new challenges and measures that are identified in the Draft 2016 AQMP, consider dynamically evolving technologies, and take into account new research and data. The latter, for example, includes the findings from the MATES IV study, which was undertaken to update the emissions inventory of toxic air contaminants, measure the concentration of ultrafine particles and black carbon (an indicator of diesel particulate emissions), and conduct a regional modeling effort to characterize risk to health across the Basin.

The Clean Air Act, in addition to providing for specific control measures based on known technologies and control methods, has provisions for more general measures based on future, yet-to-be-developed technologies. These "black box" measures are identified under Section 182(e)(5) of the Clean Air Act for regions that are extreme non-attainment areas, such as the South Coast Basin. In the past, some of the technologies that have been developed and demonstrated in the Clean Fuels Program may have served as guidance for the "black box." However, the Draft 2016 AQMP calls for elimination on the reliance of these "black box" (future technologies) to the maximum extent possible. In fact, the Draft 2016 AQMP for the first time envisions Southern California achieving attainment without a reliance on "black box" technology. This is due in large part to the progress in the development and commercialization of zero and near-zero technologies, albeit with pathways that still require more specificity and in part because of the emission reduction co-benefits from carbon dioxide (CO2) reductions expected from pursuit of climate change goals. There are significant challenges to getting there, however, including EPA moving forward with changing the heavy-duty engine exhaust NOx standard from 0.2 grams per break horsepower-hour (g/bhp-hr) to 0.02 g/bhp-hr as well as identifying financial incentives to offset the cost of cleaner technologies.

Within the core technology areas defined later in this section, project objectives range from near-term to long-term. However, the SCAQMD Clean Fuels Program concentrates on supporting development, demonstration and technology commercialization and deployment efforts rather than fundamental research. The nature and typical time-to-product for the Program's projects is described below, from near-term to longer-term.

- *Deployment* or technology commercialization efforts focus on increasing the utilization of clean technologies in conventional applications, promising immediate and growing emissions reduction benefits. However, it is often difficult to transition users to a non-traditional technology or fuel, even if such a technology or fuel offers significant societal benefits. As a result, in addition to government's role to reduce risk by funding technology development and testing, one of government's roles is to support and offset any incremental cost through incentives to help accelerate the transition and use of the cleaner technology. The increased use and proliferation of these cleaner technologies often depends on this initial support and funding as well as efforts intended to increase confidence of stakeholders that these technologies are real, cost-effective in the long term and will remain applicable.
- Technologies ready to begin field *demonstration* in 2017, are expected to result in a commercial product in the 2018-2019 timeframe, and technologies being field demonstrated generally are in the process of being certified. The field demonstrations provide a controlled environment for

manufacturers to gain real-world experience and address any end-user issues that may arise prior to the commercial introduction of the technology. Field demonstrations provide real-world evidence of a technology's performance to help allay any concerns by potential early adopters.

- Finally, successful technology *development* projects are expected to begin during 2017 with durations of at least two years. Additionally, field demonstrations to gain longer-term verification of performance may also be needed prior to commercialization. Certification and ultimate commercialization would be expected to follow. Thus, development projects identified in this plan may result in technologies ready for commercial introduction as soon as 2020-2021. Projects are also proposed that may involve the development of emerging technologies that are considered longer term and, perhaps higher risk, but with significant emission reduction potential. Commercial introduction of such long-term technologies would not be expected until 2021 or later.

Core Technologies

The following technologies have been identified as having the largest potential and best prospects to enable the emission reductions need to achieve NAAQS and thus form the core of the Program.

Not all project categories will be funded due to funding limitations, and focus will remain on control measures identified in the 2016, with consideration for availability of suitable projects. The technical areas identified below are clearly appropriate within the context of the current air quality challenges and opportunities for technology advancement. Within these areas there is significant opportunity for SCAQMD to leverage its funds with other funding agencies to expedite the implementation of cleaner alternative technologies in the Basin. A concerted effort is continually made to form private partnerships to leverage Clean Fuels funds. For example, in January 2016, the SCAQMD was awarded $23.5 million from CARB's Low Carbon Transportation Greenhouse Gas Emission Reduction Fund for heavy-duty truck projects. Finally, several of the core technologies discussed below are synergistic. For example, a heavy-duty vehicle such as a transit bus or drayage truck, may utilize an electric drive train with a fuel cell operating on hydrogen fuel or an internal combustion engine operating on natural gas or another alternative fuel as a range extender.

These priorities may shift during the year in keeping with the diverse and flexible "technology portfolio" approach. Changes in priority may occur to leverage opportunities such as cost-sharing by the state government, the federal government, or other entities. Priorities may also shift to address specific technology issues which affect residents within the SCAQMD's jurisdiction.

The following nine core technology areas are listed by current SCAQMD priorities based on the goals for 2017.

Electric/Hybrid Technologies & Infrastructure

Growing awareness of the need for better air quality is leading to stricter emission targets for vehicles in the near future. If the region expects to meet the federal standards for PM2.5 and ozone, a primary focus must be on zero and near-zero emission technologies. A leading strategy to achieve these goals is the electrification of transportation technologies on a wide and large scale. With that in mind, the SCAQMD supports projects to address the main concerns regarding cost, battery lifetime, travel range, charging station infrastructure and original equipment manufacturer (OEM) commitment. Integrated transportation systems can encourage further reduction of emissions by matching the features of electric vehicles (zero emissions, zero start-up emissions, modest all electric range) to typical consumer demands for mobility by linking them to transit. Additionally, the impact of fast charging on battery life and infrastructure costs needs to be better understood. This is especially important today when every month roughly 10,000 new plug-in vehicles are sold or leased in the U.S., and this number may

increase significantly if the Chevy Bolt and Tesla Model 3 with anticipated 200+ mile ranges become widely available.

The development and deployment of zero emission goods movement systems remains one of the top priorities for the SCAQMD to support a balanced and sustainable growth in the port complex. The SCAQMD continues to work with our regional partners, in particular the Ports of Los Angeles and Long Beach, the Southern California Association of Governments (SCAG) and Los Angeles County Metropolitan Transportation Association (LACMTA) to identify technologies that could be beneficial to and garner support from all stakeholders. Specific technologies include zero emission trucks (using batteries and/or fuel cells), near-zero emission trucks with all-electric range using wayside power (catenary or roadbed electrification) or with plug-in hybrid powertrains, locomotives with near-zero emissions (e.g., 90% below Tier 4), electric locomotives using battery tender cars and catenary, and linear synchronous motors for locomotives and trucks. Additionally, just this past July, the California Sustainable Freight Action Plan was released, outlining a blueprint to transition the state's freight system to an environmentally cleaner, more efficient and more economical one than it is today, including a call for a zero and near-zero emissions vehicle pilot project in Southern California. The Port of Los Angeles's Sustainable City Plan corroborates this effort, setting a goal of 15 percent of zero emission goods movement trips by 2025 and 35 percent by 2035.

There are now over 19 light-duty plug-in hybrid (PHEVs) and pure battery electric vehicles (BEVs) commercially available. All of these vehicles offer the benefits of higher fuel economy and range, as well as lower emissions. Continued advancements in the light-duty arena may have applications for medium- and heavy-duty vehicles.

Opportunities to develop and demonstrate technologies that could enable expedited widespread use of electric and hybrid-electric vehicles in the Basin include the following:

- demonstration of electric and hybrid technologies for cargo container transport operations, e.g., heavy-duty battery electric or plug-in electric drayage trucks with all electric range;
- demonstration of medium-duty electric and hybrid electric vehicles in package delivery operations, e.g., electric walk-in vans with fuel cell or CNG range extender ;
- development and demonstration of CNG hybrid vehicle technology;
- demonstration of niche application battery electric vehicles, including school and transit buses and refuse trucks with short-distance fixed service routes;
- demonstration of integrated programs that make best use of electric drive vehicles through interconnectivity between fleets of electric vehicles and mass transit, and web-based reservation systems that allow multiple users;
- development of eco-friendly intelligent transportation system (ITS) strategies, optimized load-balancing strategies for cargo freight and market analysis for zero emission heavy-duty trucks; and
- demonstration and installation of EV infrastructure to support the electric and hybrid-electric vehicle fleets currently on the roads or soon entering the market, and to reduce cost, improve convenience and integrate with renewable energy and building demand management strategies (e.g., vehicle-to-grid or vehicle-to-building functionality).

Hydrogen & Fuel Cell Technologies & Infrastructure

The SCAQMD supports hydrogen infrastructure and fuel cell technologies as one option in our technology portfolio and is dedicated to assisting federal and state government programs to deploy light-duty fuel cell vehicles (FCVs) by supporting the required refueling infrastructure.

Calendar Years 2015-2018 are a critical timeframe for the introduction of hydrogen fueling infrastructure. In 2014, Hyundai introduced the Tuscon FCV for lease, in 2015, Toyota commercialized the first FCV available to consumers for purchase, and in December 2016, Honda started delivering its

2017 Honda Clarity Fuel Cell, and other OEMS have similarly disclosed plans to commercialize FCVs in 2017 and 2018. Since hydrogen refueling stations need 18-36 month lead times for permitting, construction and commissioning, plans for stations need to be implemented now. While coordination efforts with the Division of Measurement Standards to establish standardized measurements for hydrogen fueling started in 2014, additional efforts to offer hydrogen for sale to general consumers are still needed. In addition, SCAQMD continues to review the market to understand new business models and new sources of funding besides grants for construction necessary to enable the station operations to remain solvent during the early years until vehicle numbers ramp up. Lastly, a deliberate and coordinated effort is necessary to ensure that the retail hydrogen stations are developed with design flexibility to address specific location limitations, and with refueling reliability matching those of existing gasoline and diesel fueling stations.

Fuel cells can also play a role in medium- and heavy-duty applications where battery capacity is insufficient to meet range requirements. The CaFCP's Medium- and Heavy-Duty Fuel Cell Electric Truck Action Plan completed in October 2016 focuses on Class 4 parcel delivery trucks and Class 8 drayage trucks with infrastructure development and establishes metrics for measuring progress.

The 2017 Plan Update identifies key opportunities while clearly leading the way for pre-commercial demonstrations of OEM vehicles. Future projects may include the following:

- continued development and demonstration of distributed hydrogen production and fueling stations, including energy stations with electricity and hydrogen co-production and higher pressure (10,000 psi) hydrogen dispensing and scalable/higher throughput;
- development and demonstration of cross-cutting fuel cell applications (e.g. plug-in hybrid fuel cell vehicles);
- development and demonstration of fuel cells in off-road, locomotive and marine applications;
- demonstration of fuel cell vehicles in controlled fleet applications in the Basin;
- development and implementation of strategies with government and industry to build participation in the hydrogen market including certification and testing of hydrogen as a commercial fuel to create a business case for investing as well as critical assessments of market risks to guide and protect this investment; and
- coordinate with fuel cell vehicle OEMs to develop an understanding of their progress in overcoming the barriers to economically competitive fuel cell vehicles and develop realistic scenarios for their large scale introduction.

Engine Systems

Natural gas engines are experiencing huge market growth due to the low cost of fuel. In order to achieve the emission reductions required for the South Coast Air Basin, the internal combustion engines (ICEs) used in the heavy-duty sector will require emissions that are 90% lower than the 2010 standards. This year the commercialization of the Cummins 8.9-liter natural gas engine achieving 90% below the existing federal standard was a game changer. By 2018, Cummins Westport, with SCAQMD and others as project partners, hopes to certify and commercialize a near-zero emission version of its existing 12-liter natural gas engine. The Draft 2017 Plan Update continues to incorporate pursuit of cleaner engines for the heavy-duty sector. Future projects will support the development, demonstration and certification of engines that can achieve these massive emission reductions using an optimized systems approach. Specifically, these projects are expected to target the following:

- development of ultra-low emission, natural gas engines for heavy-duty vehicles and high horsepower applications;
- continued development and demonstration of gaseous- and liquid-fueled, advanced fuels or alternantive fuel medium-duty and heavy-duty engines and vehicles;
- development and demonstration of alternative fuel engines for off-road applications;
- evaluation of alternative engine systems such as hydraulic plug-in hybrid vehicles;

- development and demonstration of engine systems that employ advanced engine design features,waste heat recovery, improved exhaust or recirculation systems, and aftertreatment devices; and
- Development of cold start technologies for hybrids and diesels where high level emissions occur

The National Highway Traffic Safety Administration's finalized standards to improve fuel efficiency of medium- and heavy-duty vehicles for model year 2018 and beyond should spur further interest by manufacturers to partner on engine system development. The EPA's recent initiation to create a rule for a national low NOx standard for all on highway heavy duty engines will require all manufacturers to participate by 2024

Fueling Infrastructure and Deployment (NG/RNG)

The importance of natural gas, renewable natural gas (RNG) and related refueling infrastructure cannot be overemphasized for the realization of large deployment of alternative fuel technologies. Significant demonstration and commercialization efforts funded by the Clean Fuels Program as well as other local, state and federal agencies are underway to: 1) support the upgrade and buildup of public and private infrastructure projects, 2) expand the network of public-access and fleet fueling stations based on the population of existing and anticipated vehicles, and 3) put in place infrastructure that will ultimately be needed to accommodate transportation fuels with very low gaseous emissions.
Compressed and liquefied natural gas (CNG and LNG) refueling stations are being positioned to support both public and private fleet applications. Upgrades and expansions are also needed to refurbish or increase capacity for some of the stations installed five or more years ago as well as standardize fueling station design, especially to ensure growth of alternative fuels throughout the South Coast Air Basin and beyond, along with partial or complete transition to renewable natural gas delivered through the pipeline. Funding has been provided at key refueling points for light-, medium- and heavy-duty natural gas vehicle users traveling from the local ports, along I-15 and The Greater Interstate Clean Transportation Corridor (ICTC) Network. SB 350 (De León) further establishes a target to double the energy efficiency in electricity and natural gas end uses by 2030.

Active participation in the development of National Fire Protection Association (NFPA) fire and safety codes and standards, evaluation of the cost and economics of the new fuels, public education and training and emergency response capability are just a few areas of the funded efforts that have overcome public resistance to these new technologies. Some of the projects expected to be developed and cofunded for infrastructure development are:

- development and demonstration of renewable natural gas as a vehicle fuel from renewable feedstocks and biowaste;
- development and demonstration of advanced, cost effective methods for manufacturing synthesis gas for conversion to renewable natural gas;
- enhancement of safety and emissions reduction from natural gas refueling equipment;
- expansion of fuel infrastructure, fueling stations, and equipment; and
- expansion of infrastructure connected with existing fleets, public transit, and transportation corridors, including demonstration and deployment of closed loop systems for dispensing and storage.

Health Impacts, Emissions and Fuel Studies

The monitoring of pollutants in the Basin is extremely important, especially when focused on (1) a particular sector of the emissions inventory (to identify the responsible technology) or (2) exposure to pollution (to assess the potential health risks). In fact, studies indicate that smoggy areas can produce irreversible damage to children's lungs. This information highlights the need for further emissions and

health studies to identify the emissions from high polluting sectors as well as the health effects resulting from these technologies.

Over the past few years, the SCAQMD has funded emission studies to evaluate the impact of tailpipe emissions of biodiesel and ethanol fueled vehicles mainly focusing on criteria pollutants and greenhouse gas (GHG) emissions. These studies showed that biofuels, especially biodiesel, can contribute to higher NOx emissions while reducing other criteria pollutant emissions. Furthermore, despite recent advancements in toxicological research related to air pollution, the relationship between particle chemical composition and health effects is still not completely understood, especially for biofuels. Therefore, a couple of years ago the SCAQMD funded studies to investigate the physical and chemical composition and toxicological potential of tailpipe PM emissions from biodiesel and ethanol fueled vehicles to better understand their impact on public health. Studies continued in 2015 to further investigate the toxicological potential of emissions, such as ultrafine particles and vapor phase substances, and to determine whether or not other substances such as volatile or semi-volatile organic compounds are being emitted in lower mass emissions that could pose harmful health effects. In addition, as the market share for gasoline direct injection (GDI) vehicles has rapidly increased from 4% of all vehicle sales in the U.S. in 2009 to 38% in 2014, with an expectation to top 60% by 2016, it is important to understand the impact on air quality from these vehicles. As such, SCAQMD has either funded or will be funding studies to investigate both physical and chemical composition of tailpipe emissions, focusing on PM from GDI vehicles.

In recent years, there has also been an increased interest both at the state and national level on the use of alternative fuels including biofuels to reduce petroleum oil dependency, GHG emissions and air pollution. In order to sustain and increase biofuel utilization, it is essential to identify feedstocks that can be processed in a more efficient, cost-effective and sustainable manner. One such fuel that the Clean Fuels Program is interested in pursuing is dimethyl ether (DME). This synthetic fuel can be made from renewable natural gas resources and has characteristics similar to gas-to-liquids fuels, i.e., high cetane, zero aromatics and negligible emissions of particulate matter. Volvo has considered commercializing Class 8 trucks using DME, and staff would like to ensure these trucks have lower NOx than the existing standard.

Some areas of focus include:

- demonstration of remote sensing technologies to target different high emission applications and sources;
- studies to identify the health risks associated with ultrafine and ambient particulate matter including their composition to characterize their toxicity and determine specific combustion sources;
- in-use emissions studies using biofuels, including DME to evaluate in-use emission composition;
- in-use emissions studies to determine the impact of new technologies, in particular PEVs on local air quality as well as the benefit of telematics on emissions reduction strategies;
- lifecycle energy and emissions analyses to evaluate conventional and alternative fuels; and
- analysis of fleet composition and its associated impacts on criteria pollutants.

Stationary Clean Fuel Technologies

Although stationary source emissions are small compared to mobile sources in the South Coast Air Basin, there are applications where cleaner fuel technology can be applied to reduce NOx, VOC and PM emissions. For example, a recent demonstration project funded in part by the SCAQMD at a local sanitation district consisted of retrofitting an existing biogas engine with a digester gas cleanup system and catalytic exhaust emission control. The retrofit system resulted in significant reductions in NOx, VOC and CO emissions. This project demonstrated that cleaner, more robust renewable distributed generation technologies exist that could be applied to not only improve air quality, but enhance power quality and reduce electricity distribution congestion.

The use of renewable feedstocks for energy production is a possible option to provide sustainable power for future needs while reducing greenhouse gas emissions and achieving domestic energy diversity. One of the projects that the SCAQMD recently supported in this effort was a bench scale demonstration project using a steam hydrogasification process to produce natural gas from biomass and biosolid (sewage sludge) feedstocks. Steam Hydrogasification Reaction (SHR) has been developed to produce various forms of energy products from carbonaceous resources. SHR is capable of handling wet feedstocks like sludge, does not require expensive oxygen plants and has been demonstrated to be most efficient and cost-effective compared to other conventional gasification technologies. This project successfully demonstrated that the SHR process coupled with a water-gas shift (WGS) reactor can produce gas containing up to 90% methane.

Additionally, alternative energy storage could be achieved through vehicle-to-grid or vehicle-to-building technologies. The University of California Riverside's Sustainable Integrated Grid Initiative, funded in part by the SCAQMD and launched in 2014, for example could assist in the evaluation of these technologies. Projects conducted under this category may include:

- development and demonstration of reliable, low emission stationary technologies (e.g., low NOx burners, fuel cells or microturbines);
- exploration of renewables as a source for cleaner stationary technologies;
- evaluation, development and demonstration of advanced control technologies for stationary sources; and
- vehicle-to-grid or vehicle-to-building demonstration projects to develop sustainable, low emission energy storage alternatives.

Emission Control Technologies

Although engine technology and engine systems research is required to reduce the emissions at the combustion source, dual fuel technologies and post-combustion cleanup methods are also needed to address the current installed base of on-road and off-road technologies. Existing diesel emissions can be greatly reduced with introduction of natural gas into the engine or via aftertreatment controls such as particulate matter (PM) traps and catalysts, as well as lowering the sulfur content or using additives with diesel fuel. Gas-to-Liquid (GTL) fuels, formed from natural gas or other hydrocarbons rather than petroleum feedstock and emulsified diesel, provide low emission fuels for use in diesel engines. As emissions from engines become lower and lower, the lubricant contributions to VOC and PM emissions become increasingly important. The most promising of these technologies will be considered for funding, specifically:

- evaluation and demonstration of new emerging liquid fuels, including alternative and renewable diesel and GTL fuels;
- development and demonstration of dual fuel engines and advanced aftertreatment technologies for mobile applications (including diesel particulate traps and selective catalytic reduction catalysts); and non thermal regen technology
- development and demonstration of low-VOC and PM lubricants for diesel and natural gas engines.

Technology Assessment/Transfer & Outreach

Since the value of the Clean Fuels Program depends on the deployment and adoption of the demonstrated technologies, outreach and technology transfer efforts are essential to its success. This core area encompasses assessment of advanced technologies, including retaining outside technical assistance as needed, efforts to expedite the implementation of low emission and clean fuels technologies, coordination of these activities with other organizations and information dissemination to educate the end user. Technology transfer efforts include support for various clean fuel vehicle incentive programs as well.

Target Allocations to Core Technology Areas

Figure 40 below presents the potential allocation of available funding, based on SCAQMD projected program costs of $16.5 million for all potential projects. The expected actual project expenditures for 2017 will be less than the total SCAQMD projected program cost since not all projects will materialize. The target allocations are based on balancing technology priorities, technical challenges and opportunities discussed previously and near-term versus long-term benefits with the constraints on available SCAQMD funding. Specific contract awards throughout 2017 will be based on this proposed allocation, the quality of proposals received and evaluation of projects against standardized criteria and ultimately SCAQMD Governing Board approval.

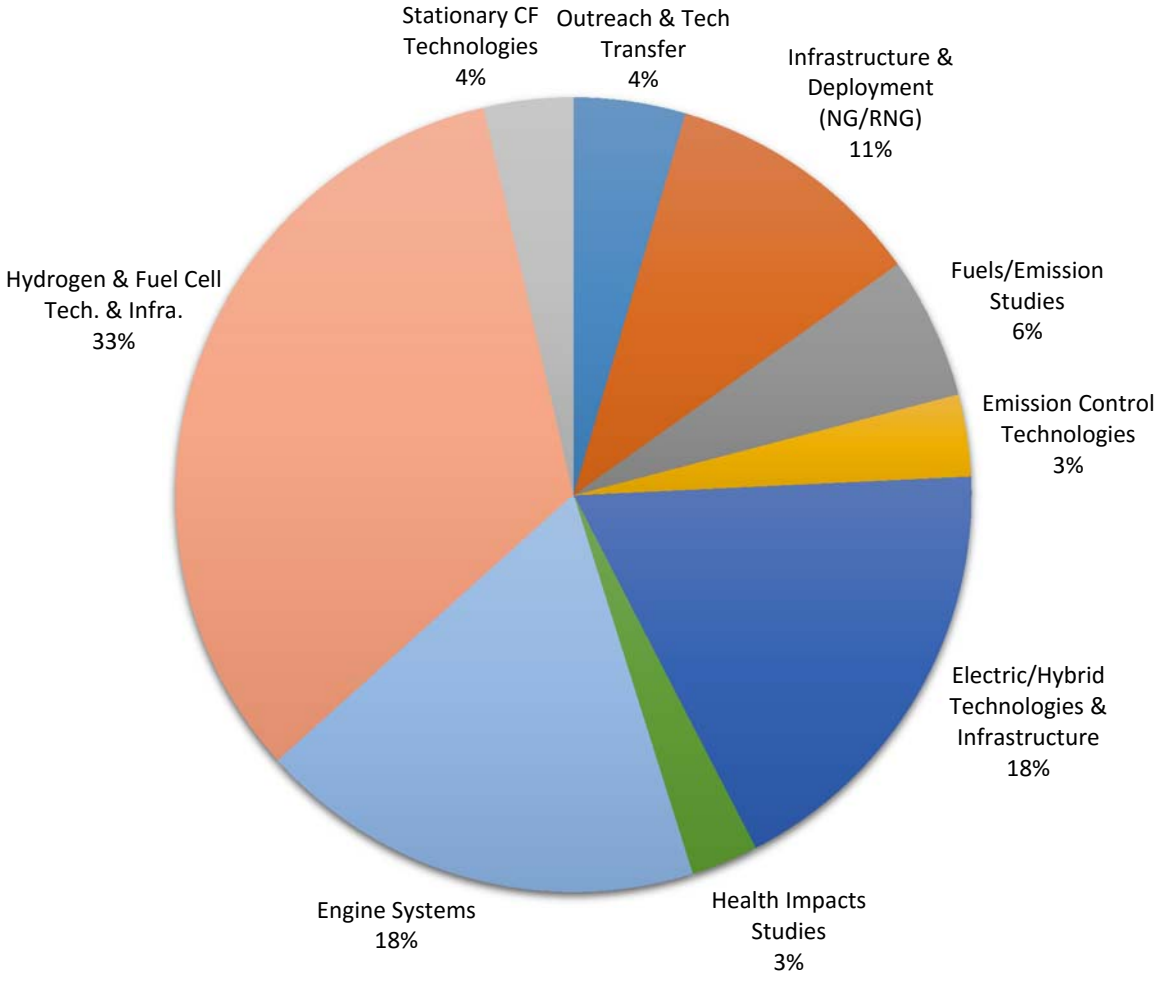

Figure 40: Projected Cost Distribution for Potential SCAQMD Projects in 2017 ($16.5M)

Program Plan Update for 2017

This section presents the Clean Fuels Program Plan Update for 2017. The proposed projects are organized by program areas and described in further detail, consistent with the SCAQMD budget, priorities and the best available information on the state-of-the-technology. Although not required, this Plan also includes proposed projects that may be funded by revenue sources other than the Clean Fuels Program, specifically related to VOC and incentive projects.

Table 7 (page 79) summarizes potential projects for 2017 as well as the distribution of SCAQMD costs in some areas as compared to 2016. The funding allocation continues the focus toward development and demonstration of zero and near-zero emission technologies including the infrastructure for such technologies. For the 2017 Plan, the SCAQMD shifts some emphasis onto hydrogen and fuel cell technologies to incentivize large-scale hydrogen infrastructure projects at the Ports and in the Inland Empire and in light of current and projected roll out of fuel cell vehicles in 2016-2017, with a small decrease in electric and hybrid-electric technologies in light of the large award the SCAQMD received in early January 2016 from the Greenhouse Gas Reduction Fund Program. A small funding shift to Engine Systems and Fueling Infrastructure and Deployment (natural gas and renewable fuels) is also recommended for biogas production and to ensure continued development and deployment of near-zero natural gas engines and liquid-fueled high horsepower engines for long-haul trucks. The other areas will continue with similar allocations for 2017. As in prior years, the funding allocations again align well with the SCAQMD's FY 2016-17 Goals and Priority Objectives. Overall, the Program is designed to ensure a broad portfolio of technologies and leverage state and federal efforts, and maximize opportunities to leverage technologies in a synergistic manner.

Staff has developed a project ranking approach that includes a simple "Consumer Reports" like format, based on feedback and direction from some Governing Board members and both advisory groups, mainly to further support the proposed fund allocations for the core technology areas. For each of the core technologies, staff considers numerous factors that influence the proposed allocation of funds, ranging from overall Environment & Health Benefits to Technology Maturity and Compatibility to and Cost, and these influences are considered for the proposed ranking system. Within each broad factor, staff has included sub-factors for each specific type of project that may be considered. This approach is included as Appendix D, which summarizes staff ranking of the potential projects anticipated in the Clean Fuels Fund Plan Update for 2017, and it is noted that technology developers, suppliers and other experts may differ in their approach to ranking these projects. This approach has been reviewed with the Clean Fuels and Technology Advancement Advisory Groups, as well as the Governing Board.

Each of the proposed projects described in this Plan, once fully developed, will be presented to the SCAQMD Governing Board for approval prior to contract initiation. This development reflects the maturity of the proposed technology and identifies contractors to perform the projects, participating host sites, and securing sufficient cost-sharing needed to complete the project and other necessary factors. Recommendations to the SCAQMD Governing Board will include descriptions of the technology to be demonstrated and in what application, the proposed scope of work of the project and the capabilities of the selected contractor and project team, in addition to the expected costs and expected benefits of the projects as required by H&SC 40448.5.1.(a)(1). Based on communications with all of the organizations specified in H&SC 40448.5.1.(a)(2) and review of their programs, the projects proposed in this Plan do not appear to duplicate any past or present projects.

Funding Summary of Potential Projects

The remainder of this section contains the following information for each of the potential projects summarized in Table 7.

Proposed Project: A descriptive title and a designation for future reference.

Expected SCAQMD Cost: The estimated proposed SCAQMD cost share as required by H&SC 40448.5.1.(a)(1).

Expected Total Cost: The estimated total project cost including the SCAQMD cost share and the cost share of outside organizations expected to be required to complete the proposed project. This is an indication of how much SCAQMD public funds are leveraged through its cooperative efforts.

Description of Technology and Application: A brief summary of the proposed technology to be developed and demonstrated, including the expected vehicles, equipment, fuels, or processes that could benefit.

Potential Air Quality Benefits: A brief discussion of the expected benefits of the proposed project, including the expected contribution towards meeting the goals of the AQMP, as required by H&SC 40448.5.1.(a)(1). In general, the most important benefits of any technology research, development and demonstration program are not necessarily realized in the near-term. Demonstration projects are generally intended to be proof-of-concept for an advanced technology in a real-world application. While emission benefits, for example, will be achieved from the demonstration, the true benefits will be seen over a longer term, as a successfully demonstrated technology is eventually commercialized and implemented on a wide scale.

Table 7: Summary of Potential Projects for 2017

Proposed Project	Expected SCAQMD Cost $	Expected Total Cost $
Electric/Hybrid Technologies & Infrastructure		
Develop and Demonstrate Electric and Hybrid Vehicles	1,000,000	2,000,000
Develop and Demonstrate Infrastructure for Deployment of Plug-in Electric and Hybrid Electric Vehicles	700,000	3,000,000
Demonstrate Alternative Energy Storage	300,000	2,000,000
Develop and Demonstrate Electric Container Transport Technologies	1,000,000	4,000,000
Subtotal	$3,000,000	$11,000,000
Hydrogen and Fuel Cell Technologies and Infrastructure		
Develop and Demonstrate Operation and Maintenance Business Case Strategies for Hydrogen Stations	350,000	4,000,000
Develop and Demonstrate Hydrogen Production and Fueling Stations	2,000,000	6,000,000
Develop and Demonstrate Medium- and Heavy-Duty Fuel Cell Vehicles	3,000,000	10,000,000
Demonstrate Light-Duty Fuel Cell Vehicles	100,000	100,000
Subtotal	$5,450,000	$20,100,000
Engine Systems		
Develop and Demonstrate Advanced Gaseous- and Liquid-Fueled Medium- and Heavy-Duty Engines and Vehicle Technologies to Achieve Ultra-Low Emissions	2,300,000	5,600,000
Develop and Demonstrate Alternative Fuel and Clean Conventional Fueled Light-Duty Vehicles	200,000	1,500,000
Develop and Demonstrate Cold-Start Technologies	250,000	1,000,000
Develop and Demonstrate Waste-Heat Recovery on Heavy-Duty Diesel Engines	250,000	1,000,000
Subtotal	$3,000,000	$9,100,000
Fueling Infrastructure and Deployment (NG/RNG)		
Deploy Natural Gas Vehicles in Various Applications	500,000	2,000,000
Develop, Maintain & Expand Natural Gas Infrastructure	250,000	1,500,000
Demonstrate Natural Gas Manufacturing and Distribution Technologies Including Renewables	1,000,000	10,000,000
Subtotal	$1,750,000	$13,500,000
Fuels/Emission Studies		
Conduct In-Use Emissions Studies for Advanced Technology Vehicle Demonstrations	300,000	800,000
Conduct Emissions Studies on Biofuels and Alternative Fuels	400,000	1,000,000

Table 7: Summary of Potential Projects for 2017 (cont'd)

Proposed Project	Expected SCAQMD Cost $	Expected Total Cost $
Fuels/Emission Studies (cont'd)		
Identify and Demonstrate In-Use Fleet Emissions Reduction Technologies & Opportunities	250,000	2,000,000
Subtotal	$950,000	$3,800,000
Stationary Clean Fuel Technologies		
Develop and Demonstrate Reliable, Advanced Emission Control Technologies, and Low Emission Monitoring Systems and Test Methods	150,000	500,000
Develop and Demonstrate Clean Stationary Technologies	250,000	750,000
Develop and Demonstrate Renewables-Based Energy Generation Alternatives	200,000	1,000,000
Subtotal	$600,000	$2,250,000
Emission Control Technologies		
Develop and Demonstrate Advanced Aftertreatment Technologies	300,000	5,000,000
Demonstrate On-Road Technologies in Off-Road and Retrofit Applications	250,000	1,000,000
Subtotal	$550,000	$6,000,000
Health Impacts Studies		
Evaluate Ultrafine Particle Health Effects	150,000	2,000,000
Conduct Monitoring to Assess Environmental Impacts	150,000	500,000
Assess Sources and Health Impacts of Particulate Matter	150,000	300,000
Subtotal	$450,000	$2,800,000
Outreach and Technology Transfer		
Assess and Support Advanced Technologies and Disseminate Information	425,000	800,000
Support Implementation of Various Clean Fuels Vehicle Incentive Programs	325,000	400,000
Subtotal	$750,000	$1,200,000
TOTALS FOR POTENTIAL PROJECTS	**$16,500,000**	**$ 69,750,000**

Technical Summaries of Potential Projects

Electric/Hybrid Technologies & Infrastructure

Proposed Project: Develop and Demonstrate Electric and Alternative Fuel Transportation

Expected SCAQMD Cost: $700,000

Expected Total Cost: $2,000,000

Description of Technology and Application:

The significance of transportation in overall carbon emissions is increasing as energy utilities move toward cleaner and more sustainable ways to generate electricity. In the United States, the EPA estimated that in 2015, transportation was responsible for about 28% of the nation's carbon emissions, second only to power plants at 31%.

The global light-duty vehicle market is changing rapidly on behalf of government-led initiatives to improve fuel economy and market demand for alternative transportation options. These changes are being driven primarily by the adoption of vehicles with various levels of drivetrain electrification. The SCAQMD has long supported the concept of using increased battery power to allow a portion of the driving cycle to occur in all-electric mode for true zero emission miles. This battery dominant strategy is accomplished by incorporating an advanced battery pack initially recharged from the household grid or EV chargers. This "plug-in" hybrid EV strategy allows reduced emissions and improved fuel economy. In 2009, CARB adopted Plug-In Hybrid Electric Vehicle Test Procedure Amendments and Aftermarket Parts Certification and several automobile manufacturers have announced demonstration or early production plans of "blended" plug-in hybrid electric, extended-range electric vehicles (E-rEV), or highway capable battery electric vehicles (BEVs). Electric utilities refer to PHEVs, E-rEVs and BEVs as plug-in electric drive vehicles (PEVs) and are working with automakers to support PEVs. Long-range BEVs are now competitive in price among economy brands after subsidies and the affordable 200+ mile BEV will have a big impact on the vehicle market. Plug-in hybrids (PHEVs) are also making significant advances. Continued market expansion is likely to result from expanding OEM applications of the powertrain in new, larger vehicle body types.

Recently, automakers have commercialized fuel cell vehicles, with some concepts with plug-in charge capability. Development and demonstration of dual fuel, zero emission vehicles could expand the acceptance of battery electric vehicles and accelerate the introduction of fuel cells in vehicle propulsion.

The SCAQMD has long been a leader in promoting early demonstrations of next generation light-duty vehicle propulsion technologies (and fuels). However, given the current and planned market offerings in this category, priorities have shifted. Nevertheless, the SCAQMD will continue to evaluate market offerings and proposed technologies in light-duty vehicles to determine if any future support is required.

Medium- and heavy-trucks make up 4.3% of vehicles in the United States and drive 9.3% of all miles driven each year, yet are responsible for more than 25% of all the fuel burned annually. However, hybrid technologies have gained momentum in the light-duty sector with commercial offerings by most of the automobile manufacturers. Unfortunately, the medium- and heavy-duty platforms are where most emissions reductions are required, especially for the in-use fleet due to low turnover.

Federal Recovery Act funding combined with state and local support, has accelerated the development and demonstration of medium-duty plug-in hybrid electric truck platforms. Analysis of project data and use profiles will help optimize drive systems, target applications for early commercialization and fill gaps in product offerings.

The SCAQMD has investigated the use of hybrid technologies to achieve similar performance as the conventional-fueled counterparts while achieving both reduced emissions and improved fuel economy. Development and validation of emission test procedures is needed, but is complicated due to the low volume and variety of medium- and heavy-duty vehicles.

Platforms to be considered include utility trucks, delivery vans, shuttle buses, transit buses, waste haulers, construction equipment, cranes and other off-road vehicles. Innovations that may be considered for demonstration include: advancements in the auxiliary power unit, either ICE or other heat engine; battery-dominant hybrid systems utilizing off-peak re-charging, with advanced battery technologies such as lithium-ion; and hydraulic energy storage technologies where applicable. Alternative fuels are preferred in these projects, e.g., natural gas, especially from renewable sources, LPG, hydrogen, GTL and hydrogen-natural gas blends, but conventional fuels such as gasoline, clean diesel, or even biodiesel may be considered if the emissions benefits can be demonstrated as equivalent or superior to alternative fuels. Both new designs and retrofit technologies and related charging infrastructure will be considered.

This project category is to develop and demonstrate:

- various PEV architectures;
- anticipated costs for such architectures;
- customer interest and preferences for each alternative;
- integration of the technologies into prototype vehicles and fleets;
- evaluation of any new promising light-duty vehicle propulsion technologies or fuels; and
- electric and hybrid-electric medium- and heavy-duty vehicles (e.g., utility trucks, delivery vans, shuttle buses, transit buses, waste haulers, construction equipment, cranes and other off-road vehicles)

Potential Air Quality Benefits:

The Draft 2016 AQMP identifies zero or near-zero emitting vehicles as a key attainment strategy. Plug-in HEV technologies have the potential to achieve near-zero emissions while retaining the range capabilities of a conventionally gasoline-fueled combustion engine vehicle, a key factor expected to enhance broad consumer acceptance. Given the variety of PEV systems under development, it is critical to determine the true emissions and performance utility compared to conventional vehicles. Successful demonstration of optimized prototypes would promise to enhance the deployment of near-ZEV and ZEV technologies.

Expected benefits include the establishment of criteria for emissions evaluations, performance requirements, and customer acceptability of the technology. This will help both regulatory agencies and OEMs to expedite introduction of zero and near-zero emitting vehicles in the South Coast Basin, which is a high priority of the AQMP.

Proposed Project: Develop and Demonstrate Infrastructure for Deployment of Plug-in Electric and Hybrid Electric Vehicles

Expected SCAQMD Cost: $800,000

Expected Total Cost: $3,000,000

Description of Technology and Application:

There is a critical need to address gaps in EV charging infrastructure which has resulted in a deficiency of EV charging infrastructure availability. Almost half (47%) of the 561,022 EVs sold in the U.S. were in California, and of those sales in California, it is estimated that almost half (45%) were in Southern California or the greater Los Angeles region. In addition, the California ZEV Action Plan, which was updated in 2016, calls for 1.5 million ZEVs by 2025, calling for an increase of about 200,000 ZEVs annually between now and 2025.

The recent adoption of revised recommended practice SAE J1772 enables passenger vehicles to charge from 110/120V AC (Level 1), 220/240V AC (Level 2), and faster 440/480V DC charging using a common conductive connector in 30 minutes or less in the U.S. and Europe. Together with the growing adoption of long range EVs, the technology and infrastructure of three fast DC charging systems (SAE combo, CHAdeMO and Tesla) are developing as well. Technological developments improving the driving range of EVs, as well as increasing availability and speed of charging infrastructure, could change the need for charging infrastructure in the future. SCAQMD is committed to continuing to support the successful deployment of EV charging infrastructure.

The SCAQMD is actively pursuing development of intelligent transportation systems to improve traffic efficiency of electric and hybrid cargo container trucks. This system provides truck drivers real-time vehicle operation advice based on changing traffic and road conditions where trucks can dynamically change their speed to better flow through intersections. A truck eco-routing system can provide the most eco-friendly travel route based on truck engine/emission control characteristics, loaded weight, road grade and real-time traffic conditions. Integrated programs can interconnect fleets of electric drive vehicles with mass transit via Web-based reservation systems that allow multiple users. These integrated programs can match the features of EVs (zero emissions, zero start-up emissions, short range) to typical consumer demands for mobility in a way that significantly reduces emissions of pollutants and greenhouse gases.

This project category is one of SCAQMD's continued efforts to:

- deploy a network of DC fast charging infrastructure and rapidly expand the existing network of public plug-in EV charging stations;
- develop intelligent transportation system strategies for cargo containers;
- develop freight load-balancing strategies as well as to conduct market analysis for zero emission heavy-duty trucks in goods movement; and
- support for local government outreach and charging installation permit streamlining.

Potential Air Quality Benefits:

The Draft 2016 AQMP identifies zero or near-zero emitting vehicles as a key attainment strategy. Hybrid technologies have the potential to redirect previously wasted kinetic energy into useable vehicle power. This proposed project category will reduce Particulate Matter (PM) pollution along major roadways through the expansion of the public plug-in EV charging infrastructure network by allowing drivers to shift away from petroleum-fueled vehicles to plug-in EVs. In addition, this project will assist in achieving improved fuel economy and lower tailpipe emissions, further helping the region to achieve federal ambient air quality standards and protect public health. Expected benefits include the establishment of criteria for emissions evaluations, performance requirements and customer acceptability of the technology. This will help both regulatory agencies and OEMs to expedite

introduction of near-zero emitting vehicles in the South Coast Basin, which is a high priority of the AQMP.

Proposed Project: Demonstrate Alternative Energy Storage

Expected SCAQMD Cost: $300,000

Expected Total Cost: $2,000,000

Description of Technology and Application:

The SCAQMD has been involved in the development and demonstration of energy storage systems for electric and hybrid-electric vehicles, mainly Lithium ion chemistry battery packs. Over the past few years, additional technology consisting of nickel sodium chloride, lithium-ion and lithium iron phosphate batteries have shown robust performance. Other technology manufacturers have also developed energy storage devices including beyond lithium-ion batteries, flywheels, hydraulic systems and ultracapacitors. Energy storage systems optimized to combine the advantages of ultracapacitors and high-energy but low-power advanced batteries could yield further benefits. Beyond lithium-ion batteries (e.g., lithium-sulfur, lithium-oxygen, sodium-ion, flow, and solid-state batteries) also have opportunities to achieve higher energy density, longer cycle life, and cheaper cost.

This project category is to apply these advanced storage technologies in vehicle platforms to identify best fit applications, demonstrate their viability (reliability, maintainability and durability), gauge market preparedness and provide a pathway to commercialization.

The long-term objective of this project is to decrease fuel consumption and resulting emissions without any changes in performance compared to conventional vehicles. This effort will support several projects for development and demonstration of different types of low emission hybrid vehicles using advanced energy strategies and conventional or alternative fuels. The overall net emissions and fuel consumption of these types of vehicles are expected to be much lower than traditional engine systems. Both new and retrofit technologies will be considered.

Potential Air Quality Benefits:

Certification of low emission vehicles and engines and their integration into the Basin's transportation sector is a high priority under the Draft 2016 AQMP. This project is expected to further efforts to develop alternative energy storage technologies that could be implemented in medium- and heavy-duty trucks, buses and other applications. Benefits will include proof of concept for the new technologies, diversification of transportation fuels and lower emissions of criteria, toxic pollutants and greenhouse gases.

Proposed Project: Develop and Demonstrate Electric Container Transport Technologies

Expected SCAQMD Cost: $1,200,000

Expected Total Cost: $4,000,000

Description of Technology and Application:

Advanced transportation systems can be used to transfer cargo containers from ports to both local and "distant" intermodal facilities, thereby significantly reducing emissions from on-road trucks and locomotives and also reducing traffic congestion in local transportation corridors. Such systems could be stand-alone systems that use magnetic levitation (maglev), linear synchronous motors or linear induction motors on dedicated guideways. A more near-term design could use existing roadways that are electrified with catenary electric lines or linear electric motors to move containers on modified trucks equipped to run on electricity. In both scenarios, containers are transported relatively quietly and without direct emissions. The footprints for such systems are similar to conventional rail systems but have reduced impact on adjacent property owners including noise and fugitive dust. These systems can even be built above or adjacent to freeways or on elevated guideways. These container freight systems are not designed to carry any operators on the guideways, where the over-the-roadway system may require the operator to actively control the transport of the containers.

One of the container transportation concepts the SCAQMD is actively pursuing is the eHighway catenary hybrid truck system by Siemens Mobility. Siemens and their partners have developed a catenary system and hybrid electric trucks to utilize the catenary for zero emission transport of containers. The hybrid drive system will extend the operating range of the truck beyond the all-electric range of the catenary system, thus enabling the truck to perform regional drayage operations and bridge gaps in catenary infrastructure as it is deployed on a regional level. The proposed Siemens pantograph system will allow for seamless connection and disconnection from the catenary wires. When entering the catenary system corridor, the pantograph system will verify the presence of catenary lines and allow the driver to raise the pantograph from within the cab of the truck. Upon leaving the catenary system, the pantograph automatically retracts and the truck switches to on-board power systems. The on-board power systems could be a range of technologies, including batteries, fuel cells, or internal combustion engines. In addition, SCAQMD is administering a project to develop and demonstrate zero emission drayage trucks for goods movement operations, consisting of three different battery electric truck technologies and a fuel cell hybrid electric truck platform. This project is funded by a $4.2 million award from Department of Energy to promote the deployment of zero emission cargo transport technologies. These trucks can be also upfitted to connect to wayside power via a catenary or LSM system in the future. Recently, CARB awarded SCAQMD more than $23 million towards the development, demonstration and deployment of up to 43 trucks for goods movement, either with all electric operation or all electric range within disadvantaged communities. The total project cost is approximately $40 million, with the remainder funds cost-shared between five sister air quality agencies, OEMs and demonstration sites.

In addition to these technologies, there are other options for electric container applications such as dual-mode locomotives, hybrid electric technologies with battery storage, a battery tender car, magnetic levitation, fuel cell propulsion systems and other wayside power alternatives. This technical review will evaluate all available technology options to determine whether their systems can be successfully developed and deployed, financially viable, and reliably operated on a long-term basis.

Potential Air Quality Benefits:

On-road heavy-duty diesel truck travel is an integral part of operations at the ports moving cargo containers into the Basin and beyond. The Draft 2016 AQMP proposes to reduce emissions from this activity by modernizing the fleet and retrofitting NOx and PM emission controls on older trucks. An alternative approach, especially for local drayage to the nearby intermodal facilities, is to use advanced

container transport systems that use electric propulsion for the containers on fixed guideways or modified trucks able to operate on electricity which will eliminate local diesel truck emissions. The emission benefits have not yet been estimated because the fate of the displaced trucks has not been determined.

Hydrogen and Fuel Cell Technologies & Infrastructure

Proposed Project: Develop and Demonstrate Operation and Maintenance Business Case Strategies for Hydrogen Stations

Expected SCAQMD Cost: $350,000

Expected Total Cost: $4,000,000

Description of Technology and Application:

California regulations require automakers to place increasing numbers of zero emission vehicles into service every year. By 2050, CARB projects that 87% of light-duty vehicles on the road will be zero emission battery and fuel cell vehicles with fuel cell electric becoming the dominant powertrain.

In 2013, cash-flow analysis resulting in a Hydrogen Network Investment Plan and fuel cell vehicle development partnership announcements by major automakers enabled the passage of AB 8 which provides $20 million per year for hydrogen infrastructure cofunding through the CEC. This resulted in limited fuel cell vehicle production announcements by Hyundai, Toyota and Honda in 2014-2015.

In mid-2014, the CaFCP published the *Hydrogen Progress, Priorities and Opportunities* (HyPPO) report, an update of their roadmap describing the first network of commercial hydrogen stations in California. In October 2016, the CaFCP released its Medium- and Heavy-Duty Fuel Cell Electric Truck Action Plan focusing on Class 4 parcel delivery trucks and Class 8 drayage trucks with infrastructure development and establishing metrics for measuring progress.

In 2015, Hyundai and Toyota commercialized fuel cell vehicles, with Honda initiating delivery in 2016 and others to follow soon.

Government actions over the last couple of years, coupled with early adopter response, is helping to establish demand and thus a business case model for hydrogen stations. Additional work in this project category includes developing a plan to secure long-term funding to complete the hydrogen fueling network build-out, provide details how funding can be invested, assess alternative revenue streams such as renewable incentives, propose alternative financing structures to leverage/extend CEC funding, and support station operation during the transition to commercial viability, including optimizing designs with flexibility to address individual site characteristics, as well as ensuring higher levels of dispensing availability and reliability. Furthermore, in the next couple of years an evaluation of actual market penetration of FCVs should be conducted to guide and protect local and state investments in the hydrogen market.

Potential Air Quality Benefits:

The Draft 2016 AQMP identifies the use of alternative fuels and zero emission transportation technologies as necessary to meet federal air quality standards. One of the major advantages of Fuel Cell vehicles (FCEVs) is the fact that they use hydrogen, a fuel that can be domestically produced from a variety of resources such as natural gas, electricity (stationary turbine technology, solar or wind) and biomass. The technology and means to produce hydrogen fuel to support FCEVs are available now. The deployment of large numbers of FCEVs, which is an important strategy to attain air quality goals, requires a well-planned and robust hydrogen fueling infrastructure. This SCAQMD project, with significant additional funding from other governmental and private entities, will provide the hydrogen fueling infrastructure that is necessary in the South Coast Air Basin. The deployment of FCEVs and the development of the necessary fueling infrastructure will lead to substantial reductions in NO~~x~~, VOC, CO, PM and toxic air contaminants from vehicles.

Proposed Project: Develop and Demonstrate Distributed Hydrogen Production and Fueling Stations

Expected SCAQMD Cost: $2,000,000

Expected Total Cost: $6,000,000

Description of Technology and Application:

Alternative fuels, such as hydrogen and the use of advanced technologies, such as fuel cell vehicles, are necessary to meet future clean air standards. A key element in the widespread acceptance and resulting increased use of alternative fuel vehicles is the development of a reliable and robust infrastructure to support the refueling of vehicles, cost-effective production and distribution and clean utilization of these new fuels.

A major challenge to the entry and acceptance of direct-hydrogen fuel cell vehicles is the limited number of hydrogen refueling sites. This project would support the development and demonstration of hydrogen refueling technologies. Proposed projects would address:

Fleet and Commercial Refueling Stations: Further expansion of the hydrogen fueling network based on retail models, providing renewable generation, adoption of standardized measurements for hydrogen refueling, other strategic refueling locations and increased dispensing pressure of 10,000 psi and compatibility with existing CNG stations may be considered.
Energy Stations: Multiple-use energy stations that can produce hydrogen for fuel cell vehicles or for stationary power generation are considered an enabling technology with the potential for costs competitive with large-scale reforming. System efficiency, emissions, hydrogen throughput, hydrogen purity and system economics will be monitored to determine the viability of this strategy for hydrogen fueling infrastructure deployment and as a means to produce power and hydrogen from renewable feedstocks (e.g., biomass, digester gas).

Home Refueling Appliances: Home refueling/recharging is an attractive advancement for alternative clean fuels due to the limited conventional refueling infrastructure. This project would evaluate a hydrogen home refueler for cost, compactness, performance, durability, emission characteristics, ease of assembly and disassembly, maintenance and operations. Other issues such as building permits, building code compliance and UL ratings for safety would also be evaluated.

It is estimated that approximately 13,500 fuel cell vehicles will be deployed by 2019 in California and the majority of these vehicles will be in the South Coast Air Basin. To provide fuel for these vehicles, the hydrogen fueling infrastructure needs to be significantly increased and become more reliable in terms of availability. SCAQMD will seek additional funding from CEC and CARB to construct and operate hydrogen fueling stations.

Potential Air Quality Benefits:

The Draft 2016 AQMP identifies the use of alternative clean fuels in mobile sources as a key attainment strategy. Pursuant to AQMP goals, the SCAQMD has in effect several fleet rules that require public and certain private fleets to purchase clean-burning alternative-fueled vehicles when adding or replacing vehicles to their vehicle fleets. Fuel cell vehicles constitute the cleanest alternative-fuel vehicles today. Since hydrogen is a key fuel for fuel cell vehicles, this project would address some of the barriers faced by hydrogen as a fuel and thus assist in accelerating its acceptance and ultimate commercialization. In addition to supporting the immediate deployment of the demonstration fleet, expanding the hydrogen fuel infrastructure should contribute to the market acceptance of fuel cell technologies in the long run, leading to substantial reductions in NOx, VOC, CO, PM and toxic compound emissions from vehicles.

Proposed Project: Develop and Demonstrate Medium- and Heavy-Duty Fuel Cell Vehicles

Expected SCAQMD Cost: $3,000,000

Expected Total Cost: $10,000,000

Description of Technology and Application:

This proposed project would support evaluation including demonstration of promising fuel cell technologies for applications using direct hydrogen with proton exchange membrane (PEM) fuel cell technology. Battery dominant fuel cell hybrids are another potential technology being mentioned by battery experts as a way of reducing costs and enhancing performance of fuel cell vehicles.

The California ZEV Action Plan specifies actions to help deploy an increasing number of zero emission vehicles, including medium- and heavy-duty ZEVs. Fleets are useful demonstration sites because economies of scale exist in central refueling, in training skilled personnel to operate and maintain the vehicles, in the ability to monitor and collect data on vehicle performance and for manufacturer technical and customer support. In some cases, medium- and heavy-duty fuel cell vehicles could leverage the growing network of hydrogen stations, providing an early base load of fuel consumption until the number of passenger vehicles grows. These vehicles could include hybrid-electric vehicles powered by fuel cells and equipped with batteries capable of being charged from the grid and even supplying power to the grid.

In 2012, the DOE awarded SCAQMD funds to demonstrate Zero Emission Container Transport (ZECT) technologies. In 2015, the DOE awarded SCAQMD additional funds to develop and demonstrate additional fuel cell truck platforms and vehicles under ZECT II.

This category may include projects in the following applications:

On-Road:	Off-Road:
Transit Buses	Vehicle Auxiliary Power Units
Shuttle Buses	Construction Equipment
Medium- & Heavy-Duty Trucks	Lawn and Garden Equipment
	Cargo Handling Equipment

Potential Air Quality Benefits:

The Draft 2016 AQMP identifies the need to implement zero emission vehicles. SCAQMD adopted fleet regulations require public and some private fleets within the Basin to acquire alternatively fueled vehicles when making new purchases. In the future, such vehicles could be powered by zero emission fuel cells operating on hydrogen fuel. The proposed projects have the potential to accelerate the commercial viability of fuel cell vehicles. Expected immediate benefits include the establishment of zero- and near-zero emission proof-of-concept vehicles in numerous applications. Over the longer term, the proposed projects could help foster wide-scale implementation of zero emission fuel cell vehicles in the Basin. The proposed projects could also lead to significant fuel economy improvements, manufacturing innovations and the creation of high-tech jobs in Southern California, besides realizing the air quality benefits projected in the AQMP.

Proposed Project: Demonstrate Light-Duty Fuel Cell Vehicles
Expected SCAQMD Cost: $100,000

Expected Total Cost: $100,000

Description of Technology and Application:

This proposed project would support the demonstration of limited production and early commercial fuel cell passenger vehicles using gaseous hydrogen with proton exchange membrane (PEM) fuel cell technology, mainly through showcasing this technology. Recent designs of light-duty fuel cell vehicles include hybrid batteries to recapture regenerative braking and improve overall system efficiency.

With the implementation of the California ZEV Action Plan, supplemented by the existing and planned hydrogen refueling stations in the Southern California area, light-duty fuel cell limited-production vehicles are planned for retail deployment in early commercial markets near hydrogen stations by several automakers. Fleets are useful demonstration sites because economies of scale exist in central refueling, in training skilled personnel to operate and maintain the vehicles, in the ability to monitor and collect data on vehicle performance and for manufacturer technical and customer support. SCAQMD has included fuel cell vehicles as part of its demonstration fleet since our first hydrogen station began operation in 2005; strengthening support, education, and outreach regarding fuel cell vehicle technology on an on-going basis. In addition, demonstration vehicles could include hybrid-electric vehicles powered by fuel cells and equipped with larger batteries capable of being charged from the grid and even supplying power to the grid.

Recently, Hyundai, Toyota and Honda have commercialized fuel cell vehicles in California, with Mercedes-Benz announcing a plug-in fuel cell model for 2018. Innovative strategies and demonstration of dual fuel, zero emission vehicles could expand the acceptance of battery electric vehicles and accelerate the introduction of fuel cells in vehicle propulsion.

Potential Air Quality Benefits:

The Draft 2016 AQMP identifies the need to implement zero emission vehicles. SCAQMD adopted fleet regulations require public and some private fleets within the Basin to acquire alternatively fueled vehicles when making new purchases. In the future, such vehicles could be powered by zero emission fuel cells operating on hydrogen fuel. The proposed projects have the potential to accelerate the commercial viability of fuel cell vehicles. Expected immediate benefits include the deployment of zero-emission vehicles in SCAQMD's demonstration fleet. Over the longer term, the proposed projects could help foster wide-scale implementation of zero emission fuel cell vehicles in the Basin. The proposed projects could also lead to significant fuel economy improvements, manufacturing innovations and the creation of high-tech jobs in Southern California, besides realizing the air quality benefits projected in the AQMP.

Engine Systems

Proposed Project: Develop and Demonstrate Advanced Gaseous- and Liquid-Fueled Medium- and Heavy-Duty Engines and Vehicles

Expected SCAQMD Cost: $2,800,000

Expected Total Cost: $5,600,000

Description of Technology and Application:

The objective of this proposed project is to support development and certification of near commercial prototype low-emission medium- and heavy-duty gaseous- and liquid-fueled engine technologies and integration and demonstration of these technologies in on-road vehicles. The NOx emissions target for this project area is 0.02 g/bhp-hr and lower and the PM emissions target is below 0.01 g/bhp-hr. To achieve these targets, an effective emission control strategy must employ advanced fuel system and engine design features, aggressive engine calibration and improved thermal management, improved exhaust gas recirculation systems, and aftertreatment devices that are optimized using a system approach. This effort is expected to result in several projects, including:

- Development and demonstration of advanced engines in medium- and heavy-duty vehicles and high horsepower applications;
- development of durable and reliable retrofit technologies to partially or fully convert engines and vehicles from petroleum fuels to alternative fuels; and
- anticipated fuels for these projects include but are not limited to alternative fuels (fossil fuel-based and renewable natural gas, propane, hydrogen blends, electric and hybrid), conventional and alternative diesel fuels, ultra-low sulfur diesel, emulsified diesel, dimethyl ether and gas-to-liquid fuels. The project proposes to expand field demonstration of these advanced technologies in various vehicle fleets operating with different classes of vehicles.

The use of alternative fuel in heavy-duty trucking applications has been demonstrated in certain local fleets within the Basin. These vehicles typically require 200-400 horsepower engines. Higher horsepower alternative fuel engines are beginning to be introduced. However, vehicle range, lack or limited accessible public infrastructure, lack of experience with alternative fuel engine technologies and limited selection of appropriate alternative fuel engine products have made it difficult for more firms to consider significant use of alternative fuel vehicles. For example, in recent years, several large trucking fleets have expressed interest in using alternative fuels. However, at this time the choice of engines over 400 HP or more is limited. Continued development of cleaner dedicated alternative gaseous- or diesel-fueled engines over 400 HP would increase availability to end-users and provide additional emission reductions.

Potential Air Quality Benefits:

This project is intended to expedite the commercialization of low-emission gaseous- liquid-fueled medium- and heavy-duty engine technology in California, both in the Basin and in intrastate operation. The emission reduction benefit of replacing one 4.0 g/bhp-hr heavy-duty engine with a 0.2 g/bhp-hr engine in a vehicle that consumes 10,000 gallons of fuel per year is about 1,400 lb/yr of NOx. Clean neat or blended alternative fuels can also reduce heavy-duty engine particulate emissions by over 90 percent compared to current diesel technology. This project is expected to lead to increased availability of low-emission alternative fuel heavy-duty engines. Fleets can use the engines and vehicles emerging from this project to comply with SCAQMD fleet regulations.

Proposed Project: Develop and Demonstrate Alternative Fuel and Clean Conventional Fueled Light-Duty Vehicles

Expected SCAQMD Cost: $200,000

Expected Total Cost: $1,500,000

Description of Technology and Application:

Although new conventionally fueled vehicles are much cleaner than their predecessors, not all match the lowest emissions standards often achieved by alternative fuel vehicles. This project would assist in the development, demonstration and certification of both alternative-fueled and conventional-fueled vehicles to meet the strictest emissions requirements by the state, e.g., SULEV for light-duty vehicles. The candidate fuels include CNG, LPG, ethanol, GTL, clean diesel, bio-diesel and ultra low-sulfur diesel, and compressed air technologies. The potential vehicle projects may include:

- certification of CNG light-duty sedans and pickup trucks used in fleet services;
- assessment of "clean diesel" vehicles, including hybrids and their ability to attain SULEV standards; and
- assessment of compressed air technologies.

Other fuel and technology combinations may also be considered under this category.

Potential Air Quality Benefits:

The Draft 2016 AQMP identifies the use of alternative clean fuels in mobile sources as a key attainment strategy. Pursuant to AQMP goals, the SCAQMD has in effect several fleet rules that require public and certain private fleets to purchase clean-burning alternative-fueled vehicles when adding or replacing vehicles to their vehicle fleets. This project is expected to lead to increased availability of low emission alternative-and conventional-fueled vehicles for fleets as well as consumer purchase.

Fueling Infrastructure and Deployment (NG/RNG)

Proposed Project: Deploy Natural Gas Vehicles in Various Applications

Expected SCAQMD Cost: **$**500,000

Expected Total Cost: $2,000,000

Description of Technology and Application:

Natural gas vehicles (NGVs) have been very successful in reducing emissions in the South Coast Air Basin due to the deployment of fleets and heavy-duty vehicles utilizing this clean fuel. In order to maintain the throughput, utility and commercial potential of the natural gas infrastructure and the corresponding clean air benefits, deploying additional models of NGVs in existing applications are needed. This technology category seeks to support the implementation of early-commercial vehicles in a wide variety of applications, such as taxis, law enforcement vehicles, shuttle buses, delivery vans, transit buses, waste haulers, class 8 tractors and off-road equipment such as construction vehicles and yard hostlers. It also seeks to deploy low-emission natural gas vehicles using renewable fuels to achieve further emission reductions.

Potential Air Quality Benefits:

Natural gas vehicles have inherently lower engine criteria pollutant emissions than conventional vehicles, especially in the heavy-duty applications where older diesel engines are being replaced. Incentivizing these vehicles in city fleets, goods movement applications and transit bus routes help to reduce the local emissions and exposure to nearby residents. Natural gas vehicles also can have lower greenhouse gas emissions and increase energy diversity depending on the feedstock and vehicle class. Deployment of additional NGVs is in agreement with SCAQMD's AQMP as well as the state's Alternative Fuels Plan as part of AB 1007 (Pavley).

Proposed Project: Develop, Maintain & Expand Natural Gas Infrastructure

Expected SCAQMD Cost: $250,000

Expected Total Cost: $1,500,000

Description of Technology and Application:

This project supports the development, maintenance and expansion of natural gas fueling station technologies and incorporate advancing concepts to increase the overall number of such fueling stations in strategic locations throughout the Basin including the Ports, reduce the cost of natural gas equipment, develop and demonstrate closed loop systems for dispensing and storage, standardize fueling station design and construction and help with the implementation of SCAQMD's fleet rules. As natural gas fueling equipment begins to age or has been placed in demanding usage, components begin to age and deteriorate. This project offers an incentive to facilities to replace worn-out equipment or to upgrade existing fueling and/or garage and maintenance equipment to offer increased fueling capacity to public agencies, private fleets and school districts.

Potential Air Quality Benefits:

The AQMP identifies the use of alternative clean fuels in mobile sources as a key attainment strategy. NGVs have significantly lower emissions than gasoline vehicles and represent the cleanest internal combustion engine powered vehicles available today. The project has the potential to significantly reduce the installation and operating costs of NGV refueling stations, besides improving the refueling time. While new or improved NGV stations have an indirect emissions reduction benefit, they help facilitate the introduction of low emission, NGVs in private and public fleets in the area, which have a direct emissions reduction benefit. The increased exposure and fleet and consumer acceptance of NGVs would lead to significant and direct reductions in NOx, VOC, CO, PM and toxic compound emissions from mobile sources. Such increased penetration of NGVs will provide direct emissions reductions of NOx, VOC, CO, PM and air toxic compounds throughout the Basin.

Proposed Project: Demonstrate Natural Gas Manufacturing and Distribution Technologies Including Renewables

Expected SCAQMD Cost: $1,000,000

Expected Total Cost: $10,000,000

Description of Technology and Application:

Lack of sufficient statewide LNG production results in increased fuel costs and supply constraints. The cost of transporting LNG from production facilities out-of-state increases the fuel cost anywhere from 15 to 20 cents per gallon of LNG and subjects users to the reliability of a single supply source. High capital costs prevent construction of closer, large scale liquefaction facilities. Small-scale, distributed LNG liquefaction systems may provide 25 percent lower capital costs than conventional technology per gallon of LNG produced. Because these smaller plants can be sited near fleet customers, costs for transporting the LNG to end users are much lower than those for remote larger plants. Beyond these cost reductions, the smaller plants offer key benefits of much smaller initial capital investment and wider network of supply than the larger plant model. Renewable feed stocks including landfill gas, green waste and waste gases can be processed to yield LNG or CNG.

Industry and government agree that LNG promises to capture a significant share of the heavy-duty vehicle and engine market. LNG is preferred for long distance trucking as it provides twice the energy per unit volume as CNG. This translates to longer driving ranges and lower-weight vehicle fuel storage.

The main objectives of this project are to investigate, develop and demonstrate:

- commercially viable methods for converting renewable feed stocks into CNG or LNG (e.g., production from biomass);
- economic small-scale natural gas liquefaction technologies;
- utilization of various gaseous feed stocks locally available;
- commercialize incentives for fleets to site, install and use LNG and L/CNG refueling facilities; and
- strategic placement of LNG storage capacity sufficient to provide supply to users in the event of a production outage.

Potential Air Quality Benefits:

The SCAQMD relies on a significant increase in the penetration of zero- and low-emission vehicles in the South Coast Basin to attain federal clean air standards by 2014, 2023 and 2032. This project would help develop a number of small-scale liquefaction technologies that can reduce LNG costs to be competitive with diesel fuel. Such advances are expected to lead to greater infrastructure development. This would make LNG fueled heavy-duty vehicles more available to the commercial market leading to direct reductions in NOx, PM and toxic compound emissions.

Fuels/Emission Studies

Proposed Project: Conduct In-Use Emissions Studies for Advanced Technology Vehicle Demonstrations

Expected SCAQMD Cost: $300,000

Expected Total Cost: $800,000

Description of Technology and Application:

Hybrid electric, hybrid hydraulic, plug-in electric hybrid and pure EVs will all play a unique role in the future of transportation. Each of these transportation technologies has attributes that could provide unique benefits to different transportation sectors. Identifying the optimal placement of each transportation technology will provide the co-benefits of maximizing the environmental benefit and return on investment for the operator.

The environmental benefit for each technology class will be highly duty-cycle and application specific. Identifying the attributes of a specific application or drive cycle that would take best advantage of a specific transportation technology would speed the adoption and make optimal use of financial resources in the demonstration and deployment of a technology. The adoption rates would be accelerated since the intelligent deployment of a certain technology would ensure that a high percentage of the demonstration vehicles showed positive results. These positive results would spur the adoption of this technology in similar applications, as opposed to negative results derailing the further development or deployment of a certain technology.

The proposed project would review and potentially coordinate application specific drive cycles to for specific applications. The potential emissions reductions and fossil fuel displacement for each technology in a specific application would be quantified on a full-cycle basis. This information could be used to develop a theoretical database of potential environmental benefits of different transportation technologies when deployed in specific applications.

Another proposed project would be the characterization of intermediate volatility organic compound (IVOC) emissions which is critical in assessing ozone and SOA precursor production rates. Diesel vehicle exhaust and unburned diesel fuel are major sources of and contribute to the formation of urban ozone and secondary organic aerosol (SOA), which is an important component of PM2.5.

Finally, while early developments in autonomous and vehicle-to-vehicle controls are focused on light-duty passenger vehicles, the early application of this technology to heavy-duty, drayage and container transport technologies is more likely. The impact on efficiency and emissions could be substantial. A project to examine this technology to assess its effect on goods movement and emissions associated with goods movement could be beneficial at this time.

Potential Air Quality Benefits:

The development of an emissions reduction database, for various application specific transportation technologies, would assist in the targeted deployment of new transportation technologies. This database coupled with application specific vehicle miles traveled and population data would assist in intelligently deploying advanced technology vehicles to attain the maximum environmental benefit. These two data streams would allow vehicle technologies to be matched to an application that is best suited to the specific technology, as well as selecting applications that are substantial enough to provide a significant environmental benefit. The demonstration of a quantifiable reduction in operating cost through the intelligent deployment of vehicles will also accelerate the commercial adoption of the various technologies. The accelerated adoption of lower emitting vehicles will further assist in attaining SCAQMD's air quality goals.

Proposed Project: Conduct Emissions Studies on Biofuels and Alternative Fuels

Expected SCAQMD Cost: $400,000

Expected Total Cost: $1,000,000

Description of Technology and Application:

The use of biofuels can be an important strategy to reduce petroleum dependency, air pollution and greenhouse gas emissions. Biofuels are in fact receiving increased attention due to national support and state activities resulting from AB 32, AB 1007 and the Low-Carbon Fuel Standard. With an anticipated increase in biofuel use, it is the objective of this project to further analyze these fuels to better understand their benefits and impacts not only on greenhouse gases but also on air pollution and associated health effects.

In various diesel engine studies, replacement of petroleum diesel fuel with biodiesel fuel has demonstrated reduced PM, CO and air toxics emissions. Biodiesel also has the potential to reduce greenhouse gas emissions because it can be made from renewable feedstocks, such as soy and canola. However, certain blends of biodiesel have a tendency to increase NOx emissions, which exacerbates the ozone and PM2.5 challenges faced in the Basin. In addition, despite recent advancements in toxicological research in the air pollution field, the relationship between biodiesel particle composition and associated health effects is still not completely understood.

Ethanol is another biofuel that is gaining increased national media and state regulatory attention. CARB has recently amended the reformulated gasoline regulation to further increase the ethanol content to 10% as a means to increase the amount of renewable fuels in the state. It is projected that the state's ethanol use will increase from 900 million gallons in 2007 to 1.5 billion gallons by 2012 as a result. As in the case of biodiesel, ethanol has demonstrated in various emission studies to reduce PM, CO and toxic emissions; however, the relationship between particle composition and associated health effects from the combustion of ethanol is not well understood either.

DME is another fuel which requires evaluation of in-use emissions, especially NOx, in light of Volvo's announcement in 2015 that they will commercialize class 8 trucks using DME in the near future. Furthermore, CARB recently proposed a regulation on the commercialization of alternative diesel fuels, including biodiesel and renewable diesel, while noting that biodiesel in older heavy-duty vehicles can increase NOx and the need for emerging alternative diesel fuels to have clear ground rules for commercialization. The impact of natural gas fuel composition on emissions from heavy-duty trucks and transit buses is also being studied.

In order to address these concerns on potential health effects associated with biofuels, namely biodiesel and ethanol blends, this project will investigate the physical and chemical composition and associated health effects of tailpipe PM emissions from light- to heavy-duty vehicles burning biofuels in order to ensure public health is not adversely impacted by broader use of these fuels. This project also supports future studies to identify mitigation measures to reduce NOx emissions for biofuels. Additionally, a study of emissions from well-to-wheel for the extraction and use of shale gas might be considered.

Potential Air Quality Benefits:

If biodiesel and biodiesel blends can be demonstrated to reduce air pollutant emissions with the ability to mitigate any NOx impact, this technology will become a viable strategy to assist in meeting air pollutant standards as well as the goals of AB 32 and the Low-Carbon Fuel Standard. The use of biodiesel is an important effort for a sustainable energy future. Emission studies are critical to understanding the emission benefits and any tradeoffs (NOx impact) that may result from using this alternative fuel. With reliable information on the emissions from using biodiesel and biodiesel blends, the SCAQMD can take actions to ensure the use of biodiesel will obtain air pollutant reductions without creating additional NOx emissions that may exacerbate the Basin's ozone problem.

Proposed Project: Identify and Demonstrate In-Use Fleet Emissions Reduction Technologies and Opportunities

Expected SCAQMD Cost: $250,000

Expected Total Cost: $2,000,000

Description of Technology and Application:

New technologies, such as alternative fueled heavy-duty engines, are extremely effective at reducing emissions because they are designed to meet the most stringent emissions standards while maintaining vehicle performance. In addition, many new vehicles are now equipped with telematics enabling motorists to obtain transportation information such as road conditions to avoid excessive idling and track information about the vehicle maintenance needs, repair history, tire pressure and fuel economy. Telematics have been shown to reduce emissions from new vehicles. Unfortunately, the in-use fleet lacks telematic systems--particularly heavy-duty engines in trucks, buses, construction equipment, locomotives, marine vessels and cargo handling equipment--have fairly long working lifetimes (up to 20 years due to remanufacturing in some cases). Even light-duty vehicles routinely have lifetimes exceeding 200,000 miles and 10 years. And it is the in-use fleet, especially the oldest vehicles, which are responsible for the majority of emissions.

This project category is to investigate near-term emissions control technologies which can be economically applied to reduce emissions from the in-use fleet. The first part of the project is to identify and conduct proof-of-concept demonstrations of feasible candidate technologies, such as:

- remote sensing for heavy-duty vehicles;
- annual testing for high mileage vehicles (>100,000 miles);
- replace or upgrade emissions control systems at 100,000 mile intervals;
- on-board emission diagnostics with remote notification;
- low-cost test equipment for monitoring and identifying high emitters;
- test cycle development for different class vehicles (e.g. four wheel drive SUVs);
- electrical auxiliary power unit replacements; and
- development, deployment and demonstration of smart vehicle telematic systems

Potential Air Quality Benefits:

Many of the technologies identified can be applied to light-duty and heavy-duty vehicles to identify and subsequently remedy high-emitting vehicles in the current fleet inventory. Estimates suggest that 5 percent of existing fleets account for up to 80 percent of the emissions. Identification of higher emitting vehicles would assist with demand-side strategies, where higher emitting vehicles have correspondingly higher registration charges.

Stationary Clean Fuel Technologies

Proposed Project: Develop and Demonstrate Reliable, Advanced Emission Control Technologies, and Low-Emission Monitoring Systems and Test Methods

Expected SCAQMD Cost: $150,000

Expected Total Cost: $500,000

Description of Technology and Application:

Currently, the inability of air/fuel ratio control (AFRC) systems to keep rich-burn engines in compliance contributes significantly to air pollution in the basin. Reliable, low-cost emission monitoring systems are needed for small-to-intermediate size combustion devices, including stationary engines, boilers, heaters, furnaces and ovens that are not large enough to justify a continuous emission monitoring system (CEMS). This class of combustion device is often permitted on the basis of a single demonstration or periodic demonstrations of NOx and CO emissions meeting SCAQMD rule requirements or a RECLAIM concentration limit. However, SCAQMD-unannounced tests on engines and boilers have found that in many cases NOx and/or CO levels have increased significantly above levels that have been initially or periodically demonstrated due to equipment malfunction and/or inadequate operator attention. It is suspected that the same may be true of heaters, furnaces and ovens.

A recent demonstration project funded in part by the SCAQMD consisted of retrofitting a biogas engine with a digester gas clean up system and catalytic oxidizer at the exhaust followed by SCR which resulted in significant reductions of NO_x, VOC and CO. Based on the successful deployment of this project, further emission reductions may be achieved by other biogas combustion sources such as gas turbines and boilers by the continued development of specialized low cost biogas clean up systems that will allow for the use of catalytic after control systems.

Demonstrations of newer technologies in recent years could result in a commercially viable alternative to CEMS that is both reliable and feasible in terms of lower costs. For example, manufacturers of flue gas analyzers have, in recent years, developed low-cost multi-gas analyzers suitable for portable or stack-mounted use. Some preliminary testing of a new type of AFRC, which uses a different type of O2 sensor known as a wide-band O2 sensor, is another alternative that can be analyzed. Another technical approach might be to deploy technology utilizing the O2 signature of a post-catalyst O2 sensor and additional control concepts being developed by manufacturers. Since an underlying problem has been that engine, catalyst and AFRC manufacturers have developed systems independently, a system being co-developed to perform continuous diagnostics to assist operators in keeping rich-burn engines in compliance is possibly another alternative for demonstration.

Potential Air Quality Benefits:

Stationary engines, boilers, heaters, furnaces and ovens account for approximately 11 percent of total NO_x emissions and about 6 percent of total CO emissions. There has been a long-standing compliance problem with rich-burn IC engines in the basin and evidence indicates that many of these devices are operating with NOx and/or CO emissions above levels required in their permits. Projects could potentially reduce a significant class of NOx and CO emissions that are in excess of the assumptions in the AQMP and further enhance SCAQMD's ability to enforce full-time compliance.

Proposed Project: Develop and Demonstrate Clean Stationary Technologies

Expected SCAQMD Cost: $250,000

Expected Total Cost: $750,000

Description of Technology and Application:

Stationary sources, including VOC sources such as large printing facilities and furniture manufacturers, have become cleaner and cleaner due to the regulatory requirements for low emissions and the advancements in technology to meet those requirements. Best Available Control Technology (BACT) regulations, however, are only required for new, modified, or relocated sources. This project category is to develop and demonstrate new technologies that can provide emissions reductions in new installations or as retrofit modifications. Possible technology examples include:

- low NOx technologies (burners and ICEs);
- low-Btu gas technologies (e.g., digester, landfill, or diary gases);
- alternative fuels and hydrogen blends;
- alternative diesel fuels (emulsified, gas-to-liquids, biodiesel with aftertreatment);
- low emission refinery flares;
- catalytic combustion;
- cost-effective fuel cell and fuel cell hybrid distributed generation;
- fumes-to-fuel technology to replace thermal oxidizers and capture VOC emissions for electricity generation while ensuring no emission of air toxics; and
- boiler optimization design and strategies to improve efficiencies.

Depending on the technology, a proof-of-concept project, demonstration, or pre-commercial deployment would be considered to garner further information on the technology. Issues to investigate include viability (reliability, maintainability and durability) of the technology, cost-effectiveness and operator ease-of-use in order to assess commercialization.

Potential Air Quality Benefits:

The SCAQMD has a substantial number of older, small, stationary source technologies within its jurisdiction. Since these devices are not subject to continuous emissions monitoring system requirements, evidence suggests that these devices may not be operating at their permitted NOx, CO, hydrocarbon and PM emissions levels. Replacing these devices with cleaner and more reliable technologies or technology/fuel combinations can have dramatic reductions in all of these criteria pollutants. VOC emission reductions may also be achieved at larger stationary VOC sources to achieve the new federal ozone and PM2.5 standards.

Proposed Project: Develop and Demonstrate Renewables-Based Energy Generation Alternatives

Expected SCAQMD Cost: $200,000

Expected Total Cost: $1,000,000

Description of Technology and Application:

The objective of this proposed project is to support the development and demonstration of clean energy, renewable alternatives in stationary and mobile applications. The technologies to be considered include thermal, photovoltaic and other solar energy technologies; wind energy systems; energy storage and conservation potentially including vehicle to grid or vehicle to building functionalities for alternative energy storage; biomass conversion; and other renewable energy and recycling technologies. Innovative solar technologies, such as solar thermal air conditioning and photovoltaic-integrated roof shingles, are of particular interest. Also, in the agricultural sections of the Basin, wind technologies could potentially be applied to drive large electric motor-driven pumps to replace highly polluting diesel-fired pumps. Besides renewable technologies, electrolyzer technology could be used to generate hydrogen, a clean fuel. Hydrogen, when used in regular engines, can substantially reduce tail-pipe emissions, while in fuel cells the emissions are reduced to zero.

The project is expected to result in pilot-scale production demonstrations, scale-up process design and cost analysis, overall environmental impact analysis and projections for ultimate clean fuel costs and availability. This project is expected to result in several projects addressing technological advancements in these technologies that may improve performance and efficiency, potentially reduce capital and operating costs, enhance the quality of natural gas generated from renewable sources for injection into natural gas pipelines, improve reliability and user friendliness and identify markets that could expedite the implementation of successful technologies.

Potential Air Quality Benefits:

The Draft 2016 AQMP identifies the development and ultimately the implementation of non-polluting power generation. To gain the maximum air quality benefit, polluting fossil fuel-fired electric power generation needs to be replaced with clean renewable energy resources or other advanced zero emission technologies, such as hydrogen fuel cells, particularly in a distributed generation context.

The proposed project is expected to accelerate the implementation of advanced zero emission energy sources. Expected benefits include directly reducing the emissions by the displacement of fossil generation; proof-of-concept and potential viability for such zero emission power generation systems; increased exposure and user acceptance of the new technology; reduced fossil fuel usage; and the potential for increased use, once successfully demonstrated, with resulting emission benefits, through expedited implementation. These technologies would also have a substantial influence in reducing global warming emissions.

Emission Control Technologies

Proposed Project: Develop and Demonstrate Advanced Aftertreatment Technologies

Expected SCAQMD Cost: $300,000

Expected Total Cost: $5,000,000

Description of Technology and Application:

There are a number of aftertreatment technologies which have shown substantial emission reductions in diesel engines. These technologies include diesel particulate filters (DPFs), oxidation catalysts, selective catalytic reduction (SCR) systems and NOx adsorbers. This project category is to develop and demonstrate these aftertreatment technologies alone or in tandem with an alternative fuel to produce the lowest possible PM, ultrafine particles, nanoparticles, NOx, CO, carbonyl and hydrocarbon emissions in retrofit and new applications. With the increasing focus on zero- and near-zero emission goods movement technologies, this category should examine idle reduction concepts and technologies that can be employed at ports and airports.

Possible projects include advancing the technologies for on-road retrofit applications such as heavy-duty line-haul diesel engines, street sweepers, waste haulers and transit buses. Applications for non-road may include construction equipment, yard hostlers, gantry cranes, locomotives, marine vessels, ground support equipment and other similar industrial applications. Potential fuels to be considered in tandem are low-sulfur diesel, emulsified diesel, biodiesel, gas-to-liquids, hydrogen and natural gas. This project category will also explore the performance, economic feasibility, viability (reliability, maintainability and durability) and ease-of-use to ensure a pathway to commercialization.

Potential Air Quality Benefits:

The transfer of mature emission control technologies, such as DPFs and oxidation catalysts, to the off-road sector is a potentially low-risk endeavor that can have immediate emissions reductions. Further development and demonstration of other technologies, such SCR and NOx adsorbers, could also have NOx reductions of up to 90%.

Proposed Project: Demonstrate On-Road Technologies in Off-Road and Retrofit Applications

Expected SCAQMD Cost: $200,000

Expected Total Cost: $1,000,000

Description of Technology and Application:

Heavy-duty on-road engines have demonstrated progress in meeting increasingly stringent Federal and state requirements. New heavy-duty engines have progressed from 2 g/bhp-hr NOx in 2004 to 0.2 g/bhp-hr NOx in 2010, which is an order of magnitude decrease in just six years. Off-road engines, however, have considerably higher emissions limits depending on the engine size. For example, Tier-3 standards for heavy-duty engines require only 3 g/bhp-hr NOx. There are apparent opportunities to implement cleaner on-road technologies in off-road applications. There is also an opportunity to replace existing engines in both on-road and off-road applications with the cleanest available technology. Current regulations require a repower (engine exchange) to only meet the same emissions standards as the engine being retired. Unfortunately, this does not take advantage of recently developed clean technologies.

Exhaust gas cleanup strategies, such as SCR, electrostatic precipitators, baghouses and scrubbers, have been used successfully for many years on stationary sources. The exhaust from the combustion source is routed to the cleaning technology, which typically requires a large footprint for implementation. This large footprint has made installation of such technologies on some mobile sources prohibitive. However, in cases where the mobile source is required to idle for long periods of time, it may be more effective to route the emissions from the mobile source to a stationary device to clean the exhaust stream.

Projects in this category will include utilizing proven clean technologies in novel applications, such as:

- demonstrating certified LNG and CNG on-road engines in off-road applications including yard hostlers, switcher locomotives, gantry cranes, waste haulers and construction equipment;
- implementing lower emission engines in repower applications for both on-road and off-road applications; and
- applying stationary best available control technologies, such as SCR, scrubbers, baghouses and electrostatic precipitators, to appropriate on- and off-road applications, such as idling locomotives, marine vessels at dock and heavy-duty line-haul trucks at weigh stations.

Potential Air Quality Benefits:

The transfer of mature emission control technologies, such as certified engines and SCR, to the non-road and retrofit sectors offers high potential for immediate emissions reductions. Further development and demonstration of these technologies will assist in the regulatory efforts which could require such technologies and retrofits.

Health Impacts Studies

Proposed Project: Evaluate Ultrafine Particle Health Effects

Expected SCAQMD Cost: $150,000

Expected Total Cost: $2,000,000

Description of Technology and Application:

Reducing diesel exhaust from vehicles has become a high priority in the South Coast Air Basin since CARB identified the particulate phase of diesel exhaust as a surrogate for all of the toxic air contaminant emitted from diesel exhaust. Additionally, health studies indicate that the ultrafine portion of particulate matter may be more toxic on a per-mass basis than other fractions. Several technologies have been introduced and others are under development to reduce diesel emissions. These include among others low-sulfur diesel fuel, particulate matter traps and heavy-duty engines operating on alternative fuel such as CNG and LNG. Recent studies have shown that control technologies applied to mobile sources have been effective in reducing the mass of particulates emitted. However, there is also evidence that the number of ultrafine particles on and near roadways has increased, even while the mass of particulates has decreased. To have a better understanding of changes in ultrafine particulate emissions from the application of the new technologies and the health effects of these emissions, an evaluation and comparison of ultrafine particulate matter and the potential impacts on community exposures are necessary.

In this project, measurements and chemical composition of ultrafine particulates will be done, as well as studies conducted to characterize their toxicity. The composition of the particulates can further be used to determine the contribution from specific combustion sources. Additionally, engine or chassis dynamometer testing may be conducted on heavy-duty vehicles to measure, evaluate and compare ultrafine particulate matter, PAH and other relevant toxic emissions from different types of fuels such as CNG, low-sulfur diesel, biofuels and others. This project needs to be closely coordinated with the development of technologies for alternative fuels, aftertreatment and new engines in order to determine the health benefits of such technologies.

Furthermore, gasoline direct injection (GDI) vehicles are known for higher efficiency and power output but the PM emissions profile is not well understood especially on secondary organic aerosol (SOA) formation potential. As manufacturers introduce more GDI models in the market to meet new fuel economy standards, it is important to understand the SOA potential from these vehicles as it could lead to further impact on the ambient PM concentration in our region. Consequently, in 2015 a project was initiated with UCR/CE-CERT to investigate the physical and chemical composition of aerosols from GDI vehicles using a mobile environmental chamber that has been designed and constructed to characterize secondary emissions. Based on this initial results indicating an increase in particle numbers, follow-up in-use studies to assess PM emissions including with and without particle filters will be beneficial.

Potential Air Quality Benefits:

The AQMP for the South Coast Basin relies on significant penetration of low emission vehicles to attain federal clean air standards. Reduction of particulate emissions from the combustion of diesel and other fuels is a major priority in achieving these standards. This project would help to better understand the nature and amount of ultrafine particulates generated by different types of fuels and advanced control technologies as well as provide information on potential health effects of ultrafine particles. Such an understanding is important to assess the emission reduction potentials and health benefits of these technologies. In turn, this will have a direct effect on the policy and regulatory actions for commercial implementation of alternative fuel vehicles in the Basin.

Proposed Project: Conduct Monitoring to Assess Environmental Impacts

Expected SCAQMD Cost: $150,000

Expected Total Cost: $500,000

Description of Technology and Application:

Facilities, buildings, structures, or highways which attract mobile sources of pollution are considered "indirect" sources. Ambient and saturation air monitoring near sources such as ports, airports, rail yards, distribution centers and freeways is important to identify the emissions exposure to the surrounding communities and provide the data to then conduct the health impacts due to these sources. This project category would identify areas of interest and conduct ambient air monitoring, conduct emissions monitoring, analyze the data and assess the potential health impacts from mobile sources. The projects would need to be at least one year in duration in order to properly assess the air quality impacts in the area.

Potential Air Quality Benefits:

The proposed project will assist in the evaluation of adverse public health impacts associated with mobile sources. The information will be useful in (a) determining whether indirect sources have a relatively higher impact on residents living in close proximity; and (b) providing guidance to develop some area-specific control strategies in the future should it be necessary.

Proposed Project: Assess Sources and Health Impacts of Particulate Matter

Expected SCAQMD Cost: $150,000

Expected Total Cost: $300,000

Description of Technology and Application:

Previous studies of ambient levels of toxic air contaminants, such as the MATES series of studies, have found that diesel exhaust is the major contributor to health risk from air toxics. Analyses of diesel particulate matter in ambient samples have been based on measurements of elemental carbon. While the bulk of particulate elemental carbon in the South Coast Air Basin is thought to be from combustion of diesel fuels, it is not a unique tracer for diesel exhaust.

The MATES III study collected particulate samples at ten locations in the South Coast Air Basin. Analysis of particulate bound organic compounds was utilized as tracers to estimate levels of ambient diesel particulate matter as well as estimate levels of particulate matter from other major sources. Other major sources that were taken into consideration include automobile exhaust, meat charbroiling, road dust, wood smoke and fuel oil combustion. Analyzing for organic compounds and metals in conjunction with elemental carbon upon collected particulate samples was used to determine contributing sources.

MATES IV, initiated in mid-2012, included an air monitoring program, an updated emissions inventory of toxic air contaminants and a regional modeling effort to characterize risk across the Basin. In addition to air toxics, MATES IV also measured ultrafine particle concentrations and black carbon at the monitoring sites as well as near sources such as airports, freeways, rail yards, busy intersections and warehouse operations.

This project category would include other related factors, such as toxicity assessment based on age, source (heavy-duty, light-duty engines) and composition (semi-volatile or non-volatile fractions) to better understand the health effects and potential community exposures. Additionally, early identification of new health issues could be of considerable value and could be undertaken in this project category.

Potential Air Quality Benefits:

Results of this work will provide a more robust, scientifically sound estimate of ambient levels of diesel particulate matter as well as levels of particulate matter from other significant combustion sources, including gasoline and diesel generated VOCs. This will allow a better estimation of potential exposures to and health effects from toxic air contaminants from diesel exhaust in the South Coast Air Basin. This information in turn can be used to determine the health benefits of promoting clean fuel technologies.

Technology Assessment/Transfer & Outreach

Proposed Project: Assess and Support Advanced Technologies and Disseminate Information

Expected SCAQMD Cost: $425,000

Expected Total Cost: $800,000

Description of Project:

This project supports the assessment of clean fuels and advanced technologies, their progress towards commercialization and the dissemination of information on demonstrated technologies. The objective of this project is to expedite the transfer of technology developed as a result of Technology Advancement Office projects to the public domain, industry, regulatory agencies and the scientific community. This project is a fundamental element in the SCAQMD's outreach efforts to expedite the implementation of low emission and clean fuels technologies and to coordinate these activities with other organizations.

This project may include the following:

- technical review and assessment of technologies, projects and proposals;
- support for alternative fuel refueling and infrastructure;
- advanced technology curriculum development, mentoring and outreach to local schools;
- emissions studies and assessments of zero emission alternatives;
- advanced technology vehicle demonstrations;
- preparation of reports, presentations at conferences, improved public relations and public communications of successful demonstrations of clean technologies;
- participation in and coordination of workshops and various meetings;
- support for training programs related to fleet operation, maintenance and refueling of alternative fuel vehicles;
- publication of technical papers, reports and bulletins; and
- production and dissemination of information, including web sites.

These objectives will be achieved by consulting with industry, scientific, health, medical and regulatory experts and co-sponsoring related conferences and organizations, resulting in multiple contracts. In addition, an ongoing outreach campaign will be conducted to encourage decision-makers to voluntarily switch to alternatively fueled vehicles and train operators to purchase, operate and maintain these vehicles and associated infrastructure.

Potential Air Quality Benefits:

SCAQMD adopted fleet regulations requiring public and private fleets within the Basin to acquire alternatively fueled vehicles when making new purchases. Expected benefits of highlighting success stories in the use of advanced alternatively fueled vehicles could potentially expedite the acceptance and commercialization of advanced technologies by operators seeking to comply with the provisions of the recently adopted SCAQMD fleet rules. The resulting future emissions benefits will contribute to the goals of the AQMP.

Proposed Project: Support Implementation of Various Clean Fuels Vehicle Incentive Programs

Expected SCAQMD Cost: $325,000

Expected Total Cost: $400,000

Description of Project:

This project supports the implementation of zero emission vehicle incentive programs, the Carl Moyer incentives program and the school bus incentives program. Implementation support includes application approval, grant allocation, documentation to the CARB, verification of vehicle registration and other support as needed. Information dissemination is critical to successful implementation of a coordinated and comprehensive package of incentives. Outreach will be directed to vehicle dealers, individuals and fleets.

Potential Air Quality Benefits:

As described earlier, the SCAQMD will provide matching funds to implement several key incentives programs to reduce diesel emissions in the Basin. Furthermore, the SCAQMD recently adopted fleet regulations requiring public and private fleets within the Basin to acquire alternatively fueled vehicles when making new purchases. Expected benefits of highlighting zero emission vehicle incentives could potentially expedite the acceptance and commercialization of advanced technologies by operators seeking to comply with the provisions of the recently adopted SCAQMD fleet rules. The resulting future emissions benefits will contribute to the goals of the AQMP. The school bus program and the Carl Moyer incentives program will also reduce large amounts of NOx and PM emissions in the basin in addition to reducing toxic air contaminants.

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Appendix A

SCAQMD Advisory Groups

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Technology Advancement Advisory Group

Dr. Matt Miyasato, Chair	SCAQMD
Pending	Non-Governmental Organization
Dr. Alberto Ayala	California Air Resources Board
Pending	U.S. Department of Energy
Dr. John Froines	Professor Emeritus University of California, Los Angeles
Gretchen Hardison	Los Angeles Department of Water and Power; Chair of Technical Advisory Committee of the Mobile Source Air Pollution Reduction Review Committee
*Dawn Wilson	Southern California Edison
*David Pettit	Natural Resources Defense Council
Randall Lewis	Lewis Group of Companies
Tim Olson	California Energy Commission
*Nick Economides	Western States Petroleum Association
Cherif Youssef	Southern California Gas Company

*Newly appointed members

SB 98 Clean Fuels Advisory Group

Dr. Matt Miyasato, Chair	SCAQMD
Robert Bienenfeld	American Honda Motor Company Inc
Pending	Independent Consultant in Combustion Technology
Dr. Mridul Gautam	West Virginia University, Adjunct Professor, & University of Nevada-Reno
Dr. Fritz Kalhammer	Independent Consultant in Energy and Process Technology
*John Faust	California Environmental Protection Agency, Office of Environmental Health Hazard Assessment
Dr. Wayne Miller	University of California, Riverside, College of Engineering, Center for Environmental Research and Technology
Dr. Vernon Roan	University of Florida, Professor Emeritus
Dr. Scott Samuelsen	University of California, Irvine, Combustion Laboratory/National Fuel Cell Research Center
Dr. Robert Sawyer	Sawyer Associates
Kevin Walkowicz	National Renewable Energy Laboratory
Pending	Independent Consultant in Fuel Cell Technologies
Michael Walsh	Independent Consultant in Motor Vehicle Pollution Control

*Newly appointed members

Appendix B

Open Clean Fuels Contracts as of January 1, 2017

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Contract	Contractor	Project Title	Start Term	End Term	SCAQMD $	Project Total $
Hydrogen and Mobile Fuel Cell Technologies and Infrastructure						
10482	California State University Los Angeles	Install and Demonstrate PEM Electrolyzer, Providing Hydrogen Fueling for Vehicles and Utilizing the Technology in the Engineering Technology Curriculum at the University	03/04/11	10/03/17	250,000	1,662,000
11555	University of California Los Angeles	Construct Hydrogen Fueling Infrastructure	12/07/12	12/31/19	400,000	2,589,990
12057	Linde, LLC	Expand Hydrogen Fueling Infrastructure	11/02/12	04/01/19	80,000	160,000
13155	Fletcher Jones Motor Cars (Mercedes-Benz)	Lease Two F-Cell Fuel Cell Vehicles for Two Years	02/08/13	02/08/17	44,995	44,995
14139	Hyundai America Technical Center Inc.	No-Cost Lease of Fuel Cell Vehicle for Two Years	12/13/13	12/31/17	0	0
14684	California Department of Food and Agriculture, Division of Measurement Standards	Conduct Hydrogen Station Site Evaluations for Site Certifications for Commercial Sale of Hydrogen	12/11/15	08/31/17	100,000	100,000
15150	Air Products and Chemicals Inc.	Install and Upgrade Eight Hydrogen Fueling Stations Throughout SCAB (including SCAQMD's Diamond Bar Hydrogen Station)	10/10/14	04/09/19	1,000,000	17,335,439
15366	EPC LLC	Operate and Maintain Publicly Accessible Hydrogen Fueling Station at SCAQMD's Headquarters	10/10/14	09/14/17	0	0
15609	ITM Power, Inc.	Installation of Riverside Renewable Hydrogen Fueling Station	10/06/15	10/05/19	200,000	2,325,000
15611	Ontario CNG Station, Inc.	Installation of Ontario Renewable Hydrogen Fueling Station	07/10/15	07/09/20	200,000	2,325,000
15618	FirstElement Fuel, Inc.	Installation of Eight Hydrogen Stations in Various Cities (two renewable, six delivered)	02/05/16	02/04/21	1,000,000	16,442,000
15619	H2 Frontier Inc.	Installation of Chino Renewable Hydrogen Station	12/04/15	12/03/20	200,000	4,558,274
15635	Center for Transportation and Environment	ZECT II: Develop and Demonstrate One Class 8 Fuel Cell Range-Extended Electric Drayage Truck	04/27/16	10/26/20	821,198	7,109,384
15641	Hardin Hyundai	Three-Year Lease of 2015 Tucson Fuel Cell Vehicle	06/15/15	06/14/18	22,862	22,862
16025	Center for Transportation and Environment	Develop and Demonstrate Fuel Cell Hybrid Electric Medium-Duty Trucks	02/05/16	08/04/20	980,000	7,014,000
16039	Lawrence Livermore National Laboratory	Demonstrate Prototype Hydrogen Sensor and Electronics Package	12/10/15	02/09/17	175,000	350,000
16171	Longo Toyota	Three-Year Lease of 2015 Toyota Mirai Fuel Cell Vehicle	12/15/15	12/14/18	24,567	24,567
16251	H2 Frontier, Inc.	Develop and Demonstrate Commercial Mobile Hydrogen Fueler	05/06/16	05/05/21	200,000	1,665,654

Contract	Contractor	Project Title	Start Term	End Term	SCAQMD $	Project Total $
Hydrogen and Mobile Fuel Cell Technologies and Infrastructure (cont.)						
17030	Bevilacqua-Knight, Inc.	Participate in California Fuel Cell Partnership for Calendar Year 2016 and Provide Support for Regional Coordinator	01/01/16	12/31/16	135,000	1,694,793
17059	Calstart Inc.	Develop and Demonstrate Fuel Cell Extended-Range Powertrain for Parcel Delivery Trucks	10/27/16	04/26/18	589,750	1,574,250
Electric/Hybrid Technologies and Infrastructure						
08063	Quantum Fuel Systems Technologies Worldwide, Inc.	Develop & Demonstrate 20 Plug-In Hybrid Electric Vehicles	01/22/08	01/31/18	2,165,613	2,899,057
12028	Electric Vehicle International, Inc.	Demonstrate and Replace UPS Diesel Delivery Trucks with Zero-Emission Medium-Duty Trucks	09/09/11	09/08/17	1,400,000	4,872,000
13058	Capstone Turbine Corporation	Develop Microturbine Series Hybrid System for Class 7 Heavy-Duty Vehicle Applications	08/12/13	12/31/17	360,000	1,210,000
13396	Transportation Power Inc.	Develop and Demonstrate Seven Class 8 Zero Emission Electric Trucks	04/19/13	09/30/17	375,000	2,285,368
13426	Transportation Power, Inc.	Develop & Demonstrate Catenary Class 8 Trucks (1 Electric & 1 CNG Platform)	06/07/13	07/31/18	2,617,887	3,182,795
13433	U.S. Hybrid Corporation	Develop and Demonstrate Two Class 8 Zero-Emission Electric Trucks	06/26/13	09/30/17	75,000	150,000
13439	City of Carson	MOU for Catenary Zero Emission Goods Movement Project	10/01/13	07/31/18	0	0
14052	Altec Capital Services, LLC	Lease of Two Plug-In Hybrid Electric Vehicles	01/02/15	01/01/20	61,302	61,302
14062	Siemens Industry Inc.	Develop and Demonstrate Catenary Zero Emissions Goods Movement System and Develop and Demonstrate Diesel Catenary Hybrid Electric Trucks	07/14/14	07/13/18	5,500,000	14,780,000
14156	Galpin Motors Inc. (Galpin Ford)	Lease of Two Fusion Energi and One C-Max Energi PHEVs for a Three-Year Period	01/28/14	01/27/17	49,298	49,298
14184	Clean Fuel Connection Inc.	DC Fast Charging Network Provider	04/04/14	06/30/20	920,000	1,220,000
14222	Odyne Systems,LLC	Develop and Demonstrate Plug-In Hybrid Electric Retrofit System for Class 6 to 78 Trucks	04/24/14	05/31/17	389,000	2,226,571
14224	Complete Coach Works	Develop and Test Retrofit All Electric Transit Bus	04/24/14	02/28/17	395,000	867,182
14256	National Strategies LLC	Develop and Demonstrate Vehicle-2-Grid Technology	09/05/14	03/04/18	250,000	3,377,689
14323	Selman Chevrolet Company	Lease Two 2014 Chevrolet Volt Extended-Range Electric Vehicles for Three Years	03/28/14	03/27/17	30,932	30,932
15382	ChargePoint, Inc.	Install Electric Charging Infrastructure	01/23/15	01/22/17	162,000	162,000

Contract	Contractor	Project Title	Start Term	End Term	SCAQMD $	Project Total $
Electric/Hybrid Technologies and Infrastructure (cont.)						
15448	University of California Los Angeles	Site Selection for DC Fast Charge Network	04/21/15	04/30/17	10,000	10,000
15650	University of California San Diego	Develop and Demonstrate Solar Forecasting for Larger Solar Arrays with Storage and EV Charging	07/17/15	01/16/18	98,908	1,655,278
15680	National Renewable Energy Laboratory	ComZEV – Develop Detailed Technology and Economics-Based Assessment for Heavy-Duty Advanced Technology Development	08/28/15	04/14/17	500,000	500,000
16022	Gas Technology Institute	ZECT II: Develop and Demonstrate One Class 8 CNG Hybrid Electric Drayage Truck	12/04/15	06/30/20	1,578,802	5,627,319
16046	Transportation Power, Inc.	ZECT: Develop and Demonstrate Two Class 8 CNG Plug-In Hybrid Electric Drayage Trucks	12/04/15	09/30/17	195,326	2,103,446
16047	U.S. Hybrid Corporation	ZECT: Develop and Demonstrate Three Class 8 LNG Plug-In Hybrid Electric Drayage Trucks	11/06/15	09/30/17	22,896	1,996,675
16081	Broadband TelCom Power, Inc.	Provide EV Hardware and Control System at SCAQMD Headquarters including Installation Support, Warranty and Networking	04/27/16	04/26/22	367,425	367,425
16200	California State University Los Angeles	Cost-Share Regional Universities for U.S. DOE EcoCAR 3 Competition	04/14/16	04/15/20	100,000	300,000
16227	Selman Chevrolet Company	Lease One 2016 Chevrolet Volt Extended-Range Electric Vehicle for Three Years	02/01/16	01/31/19	15,677	15,677
17065	Clean Fuel Connection, Inc.	EV Infrastructure Installer	12/02/16	12/31/21	805,219	805,219
Engine Systems						
15626	Cummins Westport, Inc.	Develop, Integrate and Demonstrate Ultra Low-Emission Natural Gas Engines for On-Road Heavy-Duty Vehicles	07/10/15	07/30/17	3,500,000	7,233,000
15632	Gas Technology Institute	Develop Ultra Low-Emission Natural Gas Engine for On-Road Medium-Duty Vehicles	09/01/15	06/30/17	750,000	1,800,0000
16205	Cummins Westport, Inc.	Develop, Integrate and Demonstrate Ultra-Low Emission 12-Liter Natural Gas Engines for On-Road Heavy-Duty Vehicles	06/03/16	06/30/18	2,750,000	6,307,000
Fueling Infrastructure and Deployment (NG/RNG)						
07246	USA Waste of California, Inc., dba L.A. Metro	Purchase & Install New LNG Storage Tank at Long Beach LNG Refueling Station	12/24/08	06/30/17	200,000	440,000
08098	Redlands Unified School District	Purchase & Install New CNG Refueling Station	01/25/08	12/31/17	525,000	700,000
09364	Rim of the World Unified School District	Construct & Install a CNG Fueling Station	12/30/10	10/31/18	257,000	425,000

Contract	Contractor	Project Title	Start Term	End Term	SCAQMD $	Project Total $
Fueling Infrastructure and Deployment (NG/RNG) (cont.)						
12135	Placentia-Yorba Linda Unified School District	Upgrade CNG Fueling Station	11/18/11	11/30/17	60,000	60,000
12667	West Covina Unified School District	Upgrade CNG Fueling Facility	10/12/12	12/31/17	60,000	60,000
12851	Clean Energy	Install, Operate and Maintain Three LNG Fueling Stations (Fontana, Coachella and Perris)	10/05/12	12/31/18	1,400,000	4,277,323
12852	City of Covina	Construct Public Access CNG Fueling Stations	10/12/12	12/31/18	200,000	618,429
12853	Rainbow Disposal Co. Inc.	Upgrade CNG Fueling Station	03/08/13	12/31/18	200,000	400,000
12854	Waste Management, Inc.	Upgrade LNG Fueling Station at Baldwin Park Facility	08/17/12	12/31/18	300,000	1,588,100
14219	City of West Covina	Upgrade CNG Station at City Yard	05/15/14	06/15/17	200,000	618,429
14311	Southern California Gas Company	Install and Maintain CNG Fueling Station in Murrieta for SoCalGas	07/11/14	12/31/17	217,000	1,385,000
15438	United Parcel Service, Inc.	Refurbish/Upgrade Ontario UPS LCNG Infrastructure	12/31/14	06/30/18	246,707	484,535
16075	City of Desert Hot Springs	Purchase One Heavy-Duty CNG-Powered Truck	03/11/16	03/10/20	38,000	63,000
16076	Coachella Valley Association of Governments	Purchase and Deploy One Heavy-Duty CNG Paratransit Vehicle	12/01/15	11/20/19	140,000	140,000
16244	CR&R, Inc.	Renewable Natural Gas Production and Vehicle Demonstration Project	09/03/16	03/02/20	900,000	55,000,000
16333	Ontario CNG Station, Inc.	Implement Alternative Fuel Station Expansion	05/13/16	11/12/19	200,000	798,535
17092	Kore Infrastructure, LLC	Construct RNG Production Facility and Demonstrate RNG with Next Generation Natural Gas Engine	10/14/16	10/13/21	2,500,000	25,500,000
Fuels/Emission Studies						
10722	University of California Riverside/CE-CERT	Re-Establish Testing Facility & Quantify PM Emission Reductions from Charbroiling Operations	08/06/10	06/30/17	60,000	321,700
14162	National Renewable Energy Laboratory	Utilization of Fleet DNA Approach and Capabilities to Provide Vehicle Vocational Analysis in SCAQMD	02/26/14	06/30/17	174,985	199,985
15607	University of California Riverside/CE-CERT	Innovative Transportation System Solutions for NOx Reductions in Heavy-Duty Fleets	12/19/15	05/30/17	79,980	139,980
15623	University of California Riverside/CE-CERT	Ozone and SOA Formation from Gasoline and Diesel Compounds	10/02/15	03/31/17	75,000	480,338
15625	University of California Riverside/CE-CERT	Evaluate SOA Formation Potential from Light-Duty GDI Vehicles	10/02/15	06/30/17	149,972	224,972
15636	University of California Riverside/CE-CERT	Evaluate PEV Utilization Through Advanced Charging Strategies in a Smart Grid System	12/15/15	08/31/17	170,000	270,000

Contract	Contractor	Project Title	Start Term	End Term	SCAQMD $	Project Total $
Fuels/Emission Studies (cont.)						
16198	Gladstein, Neandross & Associates, LLC	Study of Opportunities and Benefits of Deploying Next Generation Heavy-Duty Natural Gas Vehicles Operating on Renewable Natural Gas	09/02/16	09/02/16	50,000	250,000
16254	University of California Berkeley	Evaluate Ozone and Secondary Aerosol Formation from Diesel Fuels	10/25/16	08/31/17	106,361	106,361
17060	University of California Riverside	Bailment Agreement for Equipment Use for In-Use Emissions Testing of Heavy-Duty Inspection and Maintenance Program	10/13/16	10/12/18	0	0
Stationary Clean Fuels Technology						
13045	ClearEdge (novated from UTC Power Corp.)	Energy Supply and Services Agreement to Install One 400 kW Phosphoric Acid Fuel Cell at SCAQMD Headquarters	09/28/12	09/27/22	450,000	4,252,680
13408	University of California Irvine	Demonstrate Building Integration of Electric Vehicles, Photovoltaics and Stationary Fuel Cells	09/30/13	09/01/17	150,000	270,000
Health Impacts Studies						
14171	Southern California Research Center/Allergy & Asthma Associates of Southern California	Risk of Incident Asthma Among Children from In-Utero Exposures to Traffic Related Pollutants	09/22/14	03/21/16	99,670	317,119
Technology Assessment/Transfer & Outreach						
05128	Mid-Atlantic Research Institute LLC	Development, Outreach and Commercialization of Advanced Heavy-Duty ad Off-Road Technologies	08/08/05	03/31/17	70,000	70,000
08210	Sawyer Associates	Technical Assistance on Mobile Source Control Measures and Future Consultation on TAO Activities	02/22/08	02/28/18	10,000	10,000
09252	JWM Consulting Services	Technical Assistance with Review and Assessment of Advanced Technologies, Heavy-Duty Engines, and Conventional and Alternative Fuels	12/20/08	06/30/18	30,000	30,000
12376	University of California Riverside	Technical Assistance with Alternative Fuels, Biofuels, Emissions Testing and Zero-Emission Transportation Technology	06/13/14	05/31/18	75,000	75,000
12381	Integra Environmental Consulting Inc.	Technical Assistance Related to Emission Inventories, Goods Movement and Off-Road Sources	04/06/12	04/30/18	110,000	110,000

Contract	Contractor	Project Title	Start Term	End Term	SCAQMD $	Project Total $
Technology Assessment/Transfer & Outreach (cont.)						
12453	Tech Compass	Technical Assistance with Alternative Fuels, Fuel Cells, Emissions Analysis and Aftertreatment Technologies	06/21/12	05/30/18	75,000	75,000
13194	Clean Fuel Connection Inc.	Technical Assistance with Alternative Fuels, Renewable Energy and Electric Vehicles	12/07/12	03/31/17	140,000	140,000
14185	Three Squares Inc.	Conduct Education Outreach for the Basin DC Fast Charging Network Project	04/11/15	04/30/17	89,183	89,183
15369	Breakthrough Technologies Institute, Inc.	Technical Assistance with Low- and Zero-Emission Vehicles, Fuel Cells, Stationary Applications and Emissions Analysis	11/07/14	12/31/17	30,000	30,000
15380	ICF Resources LLC	Technical Assistance with Goods Movement, Alternative Fuels and Zero-Emission Transportation Technologies	12/12/14	12/11/18	30,000	30,000
15507	Jerald Cole	Technical Assistance with Alternative Fuels, Emissions Analysis, and Combustion Technologies	01/09/15	01/08/17	30,000	30,000
15516	Cordoba Corporation	Technical Assistance with Construction of Zero Emissions Goods Movement Demonstration Project	03/27/15	03/31/18	74,500	74,500
15610	Goss Engineering, Inc.	Conduct Engineering Services at SCAQMD Headquarters	06/02/15	12/31/17	50,000	50,000
17037	Clean Fuel Connection, Inc.	Technical Assistance with Alternative Fuels, Electric Vehicles, Charging and Fueling Infrastructure and Renewable Energy	11/18/16	11/17/18	50,000	50,000
17097	Gladstein, Neandross & Associates, LLC	Technical Assistance with Alternative Fuels and Fueling Infrastructure, Emissions Analysis and On-Road Sources	11/04/16	11/03/18	100,000	100,000

Appendix C

Final Reports for 2016

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SCAQMD Contract #11150 **January 2016**

Operation & Maintenance of City of Burbank Hydrogen Fueling Station

Contractor

Hydrogen Frontier, Inc.

Cosponsors

California Energy Commission (CEC)
California Air Resources Board (CARB)
U. S. Department of Energy (DOE)
SCAQMD

Project Officer

Larry Watkins/Lisa Mirisola

Background

The City of Burbank has hosted a hydrogen fueling station since 2006, starting with hydrogen generated by electrolysis as part of the Five Cities Hydrogen Demonstration Program under Contract #05165 with Air Products and Chemicals, Inc. This onsite reformer station was built in 2009 by BP, with funding and support provided by U.S. DOE and GM.

Project Objective

In 2010, the project plan was to provide hydrogen to the Burbank station via a tube trailer that would off-load into existing storage containers, and the steam methane reformer would be restored for use when fueling demand increased. SCAQMD approved a contract with Hydrogen Frontier, Inc. to repair unsafe or inoperable equipment, and for restarting, operation and maintenance, training of staff in use of equipment and procedures, and providing detailed vehicle fueling reports. Funds for utilities were not included in the budget.

Due to increased need for hydrogen fueling services, and in order to continue operation and maintenance and pay for the increase in utility services (electricity and natural gas) for the onsite reformer and station, an amendment to the contract with Hydrogen Frontiers, Inc., was required to add funding and expand the scope.

Technology Description

This hydrogen fueling facility consists primarily of a 108 kg/day steam methane reformer (SMR), 240 kg of ground storage at 430 bar, with vehicle dispensing at both 350 & 700 bar refueling with associated supporting equipment.

This station is unique in its ability to use a compress-to-car top-off fueling profile, allowing more back-to-back fills without waiting for the station to replenish high pressure storage. As more zero emission cars are put on the road, it will be important to provide the customer a positive fueling experience.

Status

When Hydrogen Frontier took over the station from BP, it was a nonfunctioning 700 bar -20C and poor performing 350 bar delivery. With no support from prior companies, Hydrogen Frontier had to dissect all systems and review and rewrite operating codes for full functioning, achieving the best operating uptime of all stations in California for a period between 2011 & 2014. The SMR has nearly 19,000 runtime hours and still produces a kg of hydrogen for $3.86. The station while almost ten years old is showing its age; maintenance schedules & mean time between failures are shorter. However, this location remains desirable and has proven a viable asset to the infrastructure network.

Figure 1: Burbank H2 Station

Results

This station recorded 11 consecutive back-to-back fills all to 98% SOC (state of charge). No other station to date has yet to meet or exceed this achievement.

During operation and maintenance it was imperative all data be collected to substantiate

performance and maintenance schedules for reliable uptime and cost forecasting. Hydrogen Frontier designed and implemented a comprehensive data collection system that could be accessible through any internet connection. All captured data was then able to be exported into NREL (National Renewable Energy Laboratory) format for ease of reporting.

Monitoring and recording over 152 different parameters allowed management and technicians to effectively and safely operate equipment remotely. This data allowed diagnosing potential failures before they happened and summon the proper experienced technician to respond. This reduced overall operating costs and the need to be onsite or travel to site to diagnose problems after events happened.

Measured performance was interesting compared to other stations. With the ability to produce hydrogen onsite even initially with a low throughput, emissions from delivered hydrogen operations were reduced. As the throughput increased, station efficiency increased and it became economically viable at 12 cars a day. The production of hydrogen was adjusted to 55 kg/day to meet actual dispensing demand.

Achieving operational efficiency with the highest uptime with the limited funds available in less than a year is a significant accomplishment.

While this station was a compress-to-car fueling profile, all automakers brought fuel cell vehicles to fill and were happy with its reliability and performance. There has been a movement to only favor SAE J2601-2014 cascade-fill profiles. This protocol is very conservative; one disadvantage is that "state of charge" (SOC) will drop as more cars are waiting in line for the station to replenish the cascade pressure. Total hydrogen produced over four years was 162,000 kilograms.

Benefits

The project benefits are directly reduced emissions, increased hydrogen production/dispensing, energy efficiency and reduced global warming gases. This project provided important lessons learned on station operation and maintenance, which can be applied to subsequent hydrogen stations.

Project Costs

Original project costs were $1,060,000, as follows: U. S. DOE, $360,000; CARB, $300,000 (pass-through to SCAQMD); CEC, $200,000; and SCAQMD $200,000. However, SCAQMD augmented this funding with an additional $275,000 to continue station operation and maintenance though January 2016 under this contract.

The project costs were relatively low since all the major equipment was already paid for and this project mainly focused on evaluations of go or no-go decisions. All subsystems were evaluated for current operational status and then matrixes of additional elements were defined to ensure proper cost evaluations for operational status. Evaluation of critical spare components helped to achieve an operational goal of 99% uptime. These two models were used to reduce potential overspending for equipment that would not meet performance specifications. After initial funding sources were exhausted, additional funds were available to continue the operational and maintenance program based on past success.

Hydrogen cost at the dispenser was just under $5/kg and sold for $15/kg. With the small volume of cars during this period, actual costs varied by volume of throughput. Sometimes all the hydrogen produced was used, and at other times, only 20%. This made a baseline cost difficult to predict.

Commercialization and Applications

This type of operation and maintenance practice with this type of fill profile have provided valuable insights for the commercialization market. Energy efficiencies are better than conventional stations and back-to-back performance is virtually limited only by hydrogen production or delivery. Unfortunately, the SAE J2601 fueling profile will not be met 100% of the time without more funding for research and testing.

The station has become an important connector station for fuel cell vehicles in Southern California and provided up to 60 kg per day. Continued operation and maintenance of hydrogen fueling at this site helped bridge the gap in preparation for additional upgrade to provide retail sale of hydrogen for light-duty vehicles to be funded by a grant award under the CEC AB 118 program.

As the number of hydrogen vehicles on the road increases, different products with larger capacities, such as liquid hydrogen or pipeline supply and larger compressors, would need to be installed. Consideration should also be given to the use of renewable electricity generation, such as solar for the electrolyzers, due to the significant impact on operational costs and greenhouse gas emissions.

SCAQMD Contract #17030 **December 2016**

Participate in California Fuel Cell Partnership for CY 2016 & Provide Support for Regional Coordinator

Contractor

Bevilacqua-Knight, Inc. (BKi)

Cosponsors

7 Automakers
6 Public agencies
1 Technology provider
12 Associate members
14 Affiliate members

Project Officer

Lisa Mirisola

Background

Established with eight members in 1999, the California Fuel Cell Partnership (CaFCP) is a collaboration in which private and public entities are independent participants. It is not a joint venture, legal partnership or unincorporated association. Therefore, each participant contracts with Bevilacqua-Knight, Inc. (BKi) for their portion of CaFCP administration. SCAQMD joined the CaFCP in April 2000, and the CaFCP currently includes a total of 40 organizations interested in demonstrating fuel cell vehicle and fueling infrastructure technology.

Project Objectives

Several key goals for 2016:

- Develop the necessary infrastructure and processes to support early commercial launch and expanded vehicle rollout.
- Provide forums and opportunities for members to advance group collaboration and progress within CaFCP and among stakeholders.
- Reach target markets and communities to educate, inform and promote hydrogen and FCEVs.
- Restructure CaFCP to be more inclusive and capable of meeting the expanding commercial market needs and opportunities, broadening the member base, and being the voice of all stakeholder participants.

Status

The members of the CaFCP intend to continue their cooperative demonstration efforts and have set goals through 2016, subject to a budget approved annually. This final report covers the SCAQMD Contract #17030 for 2016 membership. This contract was completed on schedule.

Figure 1: CaFCP participated with SCAQMD in the annual Glendale Cruise Night in July, educating attendees about fuel cell vehicles, such as the Toyota Mirai.

Technology Description

The CaFCP members together or individually are demonstrating fuel cell passenger cars and transit buses and associated fueling infrastructure in California. The passenger cars include Daimler's B Class F-CELL, Honda's Clarity, Hyundai's Tucson, and Toyota's Mirai. The fuel cell transit buses include 13 placed at AC Transit (Van Hool buses with US Hybrid and Ballard fuel cells) and five placed at Sunline Transit (1 Ballard/New Flyer and 3 Ballard/BAE/ElDorado), one placed with Orange County Transportation Authority and one placed with UC Irvine Student Transportation..

Results

Specific accomplishments include:

- More than 1,000 consumers and fleets have purchased or leased FCEVs since FCEVs entered the commercial market in 2015;
- Transit agency members have demonstrated 28 fuel cell buses since 1999, with 20 currently in operation and more than 30 funded in 2016 (see Technology Description section);
- There are 25 retail and six other non-retail hydrogen fueling stations in operation in California and 26 in development.

- CaFCP staff and members continue to conduct outreach and education in communities throughout California;
- CaFCP, the Governor's Office of Business and Economic Development and the California Energy Commission, continue advising and responding to city staff across the state of California to optimize station permitting.
- CaFCP created and maintain the Station Operational Status System (SOSS) that more than 30 hydrogen stations in the U.S. use to report status to seven front-end systems.

Benefits

Compared to conventional vehicles, fuel cell vehicles can offer zero or near-zero smog-forming emissions, reduced water pollution from oil leaks, higher efficiency and much quieter and smoother operation. If alternative or renewable fuels are used as a source for hydrogen, fuel cell vehicles will also encourage greater energy diversity and lower greenhouse gas emissions (CO_2).

By combining efforts, the CaFCP can accelerate and improve the commercialization process. The members have a shared vision about the potential of fuel cells as a practical solution to many of California's environmental issues and similar issues around the world. The CaFCP provides a unique forum where technical and interface challenges can be identified early, discussed, and potentially resolved through cooperative efforts.

Project Costs

Auto members provide vehicles, and the staff and facilities to support them. Energy members engage in fueling infrastructure activities. The CaFCP's annual operating budget is about $2 million, and includes facility operating costs, program administration, joint studies and public outreach and education. Each member makes an annual contribution of approximately $85,000 towards the common budget. Some government agencies contribute additional in-kind products and services. SCAQMD provides an additional $50,000 annually to support a Southern California Regional Coordinator and provides office space for additional staff in-kind at SCAQMD. SCAQMD's contribution for 2016 was $134,800.

Commercialization and Applications

While research by multiple entities will be needed to reduce the cost of fuel cells and improve fuel storage and infrastructure, the CaFCP can play a vital role in demonstrating fuel cell vehicle reliability and durability, fueling infrastructure and storage options and increasing public knowledge and acceptance of the vehicles and fueling.

From 2013 to 2016, CaFCP's goals relate to Preparing for Market Launch through coordinated individual and collective effort. During this fourth phase, CaFCP members, individually or in groups, will focus on the following important goals:

- Prepare for larger-scale manufacturing, which encompasses cost reduction, supply chain and production.
- Work on the customer channel, including identifying and training dealers and service technicians.
- Reduce costs of station equipment, increase supply of renewable hydrogen at lower cost, and develop new retail station approaches.
- Support cost reduction through incentives and targeted RD&D projects.
- Continue research, development and demonstration of advanced concepts in renewable and other low-carbon hydrogen.
- Provide education and outreach to the public and community stakeholders on the role of FCEVs and hydrogen in the evolution to electric drive.

In 2017, the primary goals are to:

- Decrease hydrogen station development time lines and costs
- Identify technology challenges and information gaps within the state's hydrogen station network
- Coordinate and collaborate on consensus approaches to achieving first 100 hydrogen stations in California
- Identify new concepts & approaches to initiate exponential station network growth
- Communicate progress of FCEVs and hydrogen to current and new stakeholder audiences.
- Facilitate implementation of two FCEB (Fuel Cell Electric Bus) Centers of Excellence (No. and So. Calif.)
- Increase awareness and market participation of fuel cell electric trucks, including supporting the deployment of funded pilot projects
- Coordinate nationally and internationally to share and align approaches

SCAQMD Contract #10659 **September 2016**

Extended Data Collection for Plug-In Hybrid Medium-Duty Truck Demonstration

Contractor
Electric Power Research Institute (EPRI)

Cosponsors
EPRI
SCAQMD

Project Officer
Joseph Impullitti

Background
This project was to perform extended data collection for a project, *Develop and Demonstrate a Fleet of Medium-Duty Plug-In Hybrid Electric Vehicles Program*, which was sponsored by the U.S. Department of Energy (DOE) using American Recovery and Reinvestment Act of 2009 funding. This report provides insight to the data that was collected on the vehicles during the original project as well as during the extended period.

Project Objective
The original purpose of the Program was to develop a path to migrate plug-in hybrid electric vehicle (PHEV) technology to medium-duty vehicles by demonstrating and evaluating vehicles in diverse applications. The Program also provided three production-ready PHEV systems—Odyne Systems, Inc. (Odyne) Class 6-8 trucks, VIA Motors, Inc. (VIA) half-ton pickup trucks, and VIA three-quarter-ton vans. The vehicles were designed, developed, validated, produced and deployed. Data were gathered and tests were run to understand the performance improvements, allow cost reductions, and provide future design changes. The objective of the extended program was to provide another ten months of collected data from the fleets and provide analysis.

Technology Description
The VIA design is a series PHEV system. The electric motor provides all the propulsion power directly to the wheels. The gasoline engine provides torque to a generator that provides power to the battery pack and traction motor. The vehicles have up to 47 miles of all-electric range before the engine turns on and provides load-follower torque to the driveshaft while running in charge-sustaining mode. The general assembly process is that VIA purchases completed 2014 trucks from Chevrolet, eliminates the transmissions, and replaces them with generators. A motor and gearbox are attached to the prop shaft for traction torque, and two inverters are used to control the generator and the motor.

The Odyne hybrid system is a simple, parallel hybrid system that allows the torque of the electric motor to augment the torque output of the diesel engine, thus saving fuel. The motor speed is synchronized with the engine speed through the power take-off (PTO) unit. The traction motor drives the PTO, adding torque to the rear axle, or converts torque from the PTO into power to charge the hybrid batteries. Six patents have been granted, and other patents are pending.

Status
Sixty-two different utilities, municipalities, or companies participated from 23 states, as well as Washington, D.C.; British Columbia; and Manitoba. The participants demonstrated and evaluated 296 vehicles (52 VIA vans, 125 VIA pickup trucks and 119 Odyne trucks). Data were collected on each participant's trucks during normal working times to establish data for analysis. Although data collection for the project has been completed, the Program continues with the vehicles remaining in the fleet.

Results
Data were collected during the day and sent to the server daily. Data collected include the following:

- Motor, battery, charger and export power current and voltage
- Motor and engine torque and speed
- Odometer
- Vehicle speed
- Accelerator and brake pedal position
- Fuel used
- Charger time; and
- Software and calibration level.

To summarize the table below, more than 10,000 charge events (vehicles plugged in) were recorded with over 274,000 miles driven and more than 116,000 hours of data collected.

Total Summary Data

Variable	Measure	Units
All Event Types		
Number of events	67,651	Events
Number of active vehicles	272	Vehicles
Duration of all the events together	116,545	Hours
Number of Drive Events	49,708	Events
Number of Charge Events	10,150	Events
Number of Operate Events	7,793	Events
DRIVE INFORMATION		
Drive: Total Duration	11,588	Hours
Drive: Total Distance	274,615	Miles
Drive: Distance on Electric	102,298	Miles
Drive: Number of Events (CD+CS)	12,743	Events
Drive: Number of Events (CD)	30,203	Events
Drive: Number of Events (CS)	5,525	Events
Drive: Idle Duration	222	Hours
Drive: Fuel used during Drives	17,386	Gallons
CHARGE INFORMATION		
Charge: Plugged in Duration	99,386	Hours
Charge: Charging Duration	46,351	Hours
Charge: Wall Energy	105,565	kWh
Charge: Battery Energy	72,577	kWh
Level 1		
Charge Level 1: Number of charges	910	Events
Charge Level 1: Plugged in Duration	11,842	Hours
Charge Level 1: Charging Duration	6,968	Hours
Charge Level 1: Wall Energy	7,102	kWh
Charge Level 1: Battery Energy	4,278	kWh
Level 2		
Charge Level 2: Number of charges	7,373	Events
Charge Level 2: Plugged in Duration	87,405	Hours
Charge Level 2: Charging Duration	39,302	Hours
Charge Level 2: Wall Energy	98,411	kWh
Charge Level 2: Battery Energy	68,148	kWh
OPERATE INFORMATION		
Operate: Duration	6,060	Hours
Operate: Fuel Used	508	gallons
Operate: Export Electric Energy Used	987	kWh
Operate: Electricity Used	8,189	kWh

This program has accomplished the following:

- A large database for medium-duty truck PHEVs has been established.
- Fleet traits have been identified.
- Fleet fuel consumption and range have been determined.
- Charging traits have been identified; and
- More powerful charging stations are widespread.

Benefits

One of benefit of the Odyne system is to combine the fuel and emissions savings while driving with the engine-off benefits of hybrid jobsite operation. To accurately assess the system, the combined benefits are calculated in the full-day work cycle. Using the data that were gathered on the fleet, an average day's parameters can be calculated. The average drive distance is 26 miles, the average stationary work is complete in 2.8 hours, and the average idle time is 1.6 hours. Two calibrations were completed for the Odyne vehicles. One calibration was considered aggressive (strong), and the other was considered mild. The difference is that the aggressive calibration caused the battery energy to be depleted more quickly during the drive phase to the job site than did the mild calibration. Development tests were performed at Southwest Research Institute. The results indicated that there is improvement with both the aggressive and mild calibrations. The mild calibration improved fuel economy by 12% to 15%, and the aggressive calibration had a 30% to 46% improvement.

Project Costs

The SCAQMD provided $250,000 in Clean Fuels funding to perform the extended data collection with EPRI cost-sharing the effort with $93,748.

Commercialization and Applications

On the pathway to commercialization is emission certification. Both the VIA van and pickup truck are certified with the U.S. EPA. Currently, VIA is CARB compliant with executive orders from CARB indicating that the vehicles are certified with exception. The exception is that all the onboard diagnostic monitors are not being set as frequently as they should be. VIA is working on these exceptions and plans to meet the full certifications. Both the van and the pickup truck have received executive orders from CARB for vehicle sale; U.S. EPA has also approved them for sale. VIA worked with each agency to establish the requirements, and then VIA conducted and successfully passed the required tests, which included tailpipe emissions and evaporative emissions.

The extended data collection shows the durability, reliability and the lessons learned from the vehicles in real-world usage. It is imperative for a project like this to have a substantial amount of data, which was achieved from the project extension, and will be used for future development of this technology.

SCAQMD Contract #11606 **November 2016**

Develop and Demonstrate Plug-in Hybrid Electric Drive System for Medium- & Heavy-Duty Vehicles

Contractor
Odyne Systems, LLC

Cosponsors
Department of Energy
Odyne Systems, LLC

Project Officer
Joseph Impullitti

Background

Odyne Systems, LLC, has become a leading designer and manufacturer of parallel plug-in hybrid electric vehicle systems for the commercial medium- and heavy-duty truck market. The project was proposed in conjunction with a $1.9M DOE grant to develop and validate Odyne's second-generation plug-in hybrid system for commercial production, utilizing lithium-ion battery technology.

Project Objective

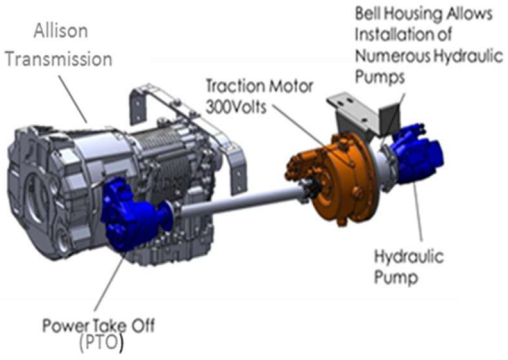
The project objectives were to develop, test, validate and deploy advanced medium-heavy-duty plug-in hybrid electric vehicles for work truck applications. The primary objectives of the project were:

- To match the size of the energy storage device relative to customer duty cycle
- To improve specific aspects of the existing system through use of a lithium-ion battery system
- To optimize the system and selected powertrain components for high-volume production
- To qualify improvements in fuel economy and emissions through prototype test and deployment of two medium-heavy-duty work trucks within the South Coast Air Quality Management District

Technology Description

The Odyne second generation plug-in hybrid system incorporates a novel approach in connecting the hybrid drive train to the vehicle offering idle reduction, regenerative braking, launch assist, climate control and exportable power. Odyne's unique, modular design interfaces seamlessly with a vehicle's transmission and can be installed on a wide range of chassis, powertrains and work truck applications. The minimally intrusive design provides both hybrid driving functionality and jobsite anti-idle electrification without significant redesign of the existing vehicle platforms.

Figure 1: Odyne PHEV Powertrain



Status

This project was completed in November 2016. The demonstration vehicles deployed at Anaheim Public Utilities and Los Angeles Department of Water and Power remain in daily use within the utility fleets.

Results

Odyne launched a 'clean sheet design' (i.e. developing a system from only a set of requirements) incorporating many automotive grade components and state-of-the-art lithium ion batteries (1X14kWh, 2X14kWh) produced by Johnson Controls. Full functional design validation was completed to verify performance. The testing demonstrated the capability to power equipment requiring up to 40 kW (53 HP), export 120/240V power up to 6 kW, support 12V vehicle loads up to 1.2 kW and provide 16,000 BTU of cabin heat or air conditioning.

Telematics systems were utilized to determine the real-world duty cycles for the deployment vehicles. The LADWP vehicle is utilized close to the fleet base with an average daily distance of approximately 11 miles and an average speed of just over 14 miles per hour. The Anaheim vehicle is used over a wider area with an average daily distance of 35 miles and an average speed of 23 MPH. At the job site, the LADWP unit is more heavily utilized, averaging 3.52 worksite hours vs. 1.06 hours for Anaheim.

Emissions testing was performed at the UC Riverside/CE-CERT facility. Results applied to the vehicle duty cycles determined by telematics analysis yielded the average savings displayed in Table 1.

Anaheim Avg. Full Day Emissions (35.9 Miles, 1.1 hour ePTO)				
	CO2 g	NOx g	Fuel gal	Grid Energy kWh
Conventional	71425	78.7	7.194	0.00
Hybrid	54197	62.5	5.458	4.36
Hybrid Change	-24%	-21%	-24%	X

LADWP Avg. Full Day Emissions (10.8 Miles, 3.5 hour ePTO)				
	CO2 g	NOx g	Fuel gal	Grid Energy kWh
Conventional	61474	94.5	6.192	0.00
Hybrid	16338	18.8	1.645	7.94
Hybrid Change	-73%	-80%	-73%	X

Table 1. Demonstration vehicle average daily fuel and emissions savings

Benefits

The differing results of the two vehicles demonstrates that the benefits of the Gen2 Odyne second generation Plug-in Hybrid System deployed in this project become more significant when the vehicle is more jobsite oriented. This is due to the initial focus and high value of eliminating jobsite diesel emissions. Regardless of application, the project demonstrated the capability of the system to reduce work truck fuel use and emissions. A full cycle (wells-to-wheels) analysis of the emissions results utilizing the CA-GREET 2.0 model information with the duty cycles identified demonstrated that the inclusion of wells-to-tank emissions did not significantly alter the results of Table 1.

Costs

The SCAQMD cost-share for this project was $494,000. The Department of Energy cost-sharing project DE-EE0001077 was completed at a final contribution of $2,986,315.

Commercialization and Applications

The Odyne system developed in this project was further deployed under SCAQMD contract #10659 funded by the American Recovery and Reinvestment Act and is now released for commercial sale. Based, in part, on the testing performed in this project, the Odyne second generation plug-in hybrid system was approved for use in California under Executive Order D-750. Odyne is continuing to work with suppliers on reducing component costs and working with supporting agencies to initiate projects to increase the driving and full-day fuel and emissions savings in order to continue to improve the customer value and return on investment.

SCAQMD Contract #11615 **August 2016**

Develop and Demonstrate Heavy-Duty Hydraulic Hybrid Vehicles

Contractor
Parker Hannifin Corporation

Cosponsors
California Energy Commission
Parker Hannifin Corporation
SCAQMD

Project Officer
Brian Choe

Background
Despite being a relatively small percentage of the vehicle population, heavy-duty vehicles represent a significant source of NOx and PM emissions in the South Coast Air Basin. Hybridization is one of the key strategies to reduce emissions from this segment, but more studies and demonstrations are needed to match technologies to vocations with duty cycles that are well suited. For example, hydraulic hybrids are power dense, which allows them to absorb and release energy at high rates; however, these systems are not sufficiently energy dense to store a large amount of energy onboard. Based on these attributes, refuse and delivery vehicles, with intensive stop-and-go driving behavior, will be ideal applications for the technology.

Project Objective
The primary objective of this project was to demonstrate potential for fuel savings, emissions reduction and overall economic benefits of hydraulic hybrid trucks in parcel delivery and refuse collection operations. The project was also to collect real-world data to evaluate and validate fuel savings and emissions reduction benefits in comparison to that of conventional diesel-fueled vehicles.

Technology Description
Parker's "RunWise" hydraulic hybrid system uses pumps and accumulators to capture kinetic energy otherwise lost during braking, and then utilizes this stored energy to propel the vehicle from standstill. The Parker control unit interprets driver demand and keeps the engine at or close to idle, while the hydraulic pumps/motors are used to accelerate the vehicle. This results in significantly lower fuel consumption which in turn reduces emissions. The system can turn the engine off under certain operating conditions in the parcel delivery vehicles. The vehicles are then powered by the stored hydraulic pressure only, further reducing emissions.

Figure 1: Parker's RunWise Hydraulic Hybrid System

Status
In this project, Parker Hannifin (Parker) deployed eight refuse and four parcel delivery vehicles with fleets and municipalities for an 18-month demonstration. The vehicles were equipped with an onboard telematics system to record vehicle performance, including vehicle speed, idle time, fuel consumption, collection arm cycles (refuse) and engine-off duration (parcel). This project was completed in June 2016 and a final report has been submitted to the SCAQMD.

Results
This demonstration provided data that validated that hydraulic-hybrid vehicles can be more fuel efficient and produce fewer harmful emissions when compared with diesel-powered vehicles equipped with conventional automatic transmissions.

The parcel delivery vehicles collectively covered a distance of 35,500 miles during the demonstration period, with an average fuel economy of 9.2 miles per gallon or 51% improvement versus the baseline of 6.1 mpg, and approximately 29 tons of reductions in CO2 emissions.

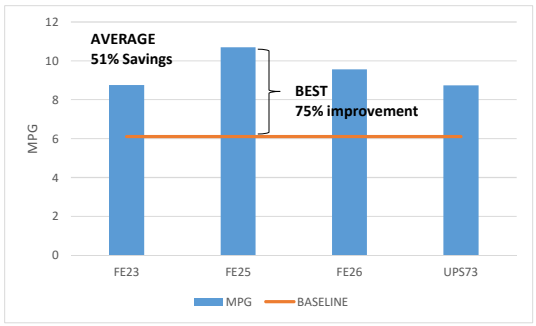


Table 1: Parcel truck fuel economy improvement vs baseline

Refuse vehicles covered a distance of over 106,000 miles, with an average fuel burn rate of 2.4 gallons per hour or 47% savings versus the baseline of 4.5 gph, which is consistent with the estimated national fuel savings average for the entire North American fleet at 43%. Approximately 210 metric tons of CO2, 921 lbs. of CO, and 203 lbs. of NOx were eliminated by the refuse vehicles during the demonstration period. Furthermore, zero brake pad replacements were reported on both refuse and parcel delivery vehicles, and the total cost savings realized by the fleet operators, as a result of using the Parker hydraulic hybrid system, is over $110,000 on fuel costs and $54,000 on brake maintenance.

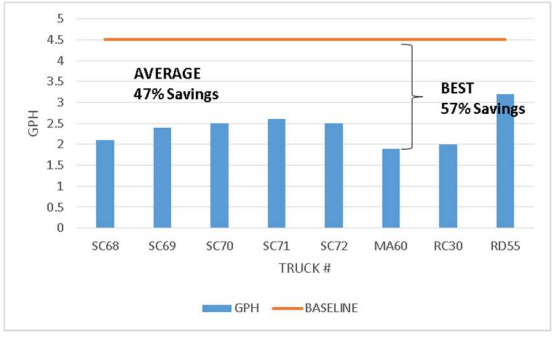


Table 2: RunWise fuel savings vs baseline

Benefits

Refuse vehicles consume approximately 50 gallons of fuel each day whereas the Parker's hydraulic hybrid system can reduce this by an average of 47% per vehicle with corresponding reductions in emissions. Extrapolating this over the entire fleet of approximately 75,000 refuse vehicles in California, the emissions reductions could reach 1.9 million metric tons of CO2, 8.6 million lbs. of CO and 1.9 million lbs. of NOx.

In addition, the total cost savings achieved by the eight refuse and four parcel delivery vehicles during the demonstration was approximately $164,000, between fuel costs and brake maintenance. An extrapolation of these savings over the entire refuse fleet in California would yield an annual saving of over $600 million.

Project Costs

The total project cost was $3,925,000 with the SCAQMD and CEC cost-sharing $250,000 and $750,000, respectively. The remaining $2,925,000 was cost-shared by Parker and demonstration fleets.

Commercialization and Applications

Parker's first-generation hydraulic hybrid technology ("RunWise"), used in refuse vehicles, has been commercialized and is currently available for sale in all 50 states. This technology is unique to the refuse vehicle application and therefore market penetration is limited as approximately 10,000 Class 8 refuse vehicles are sold annually in the U.S., of which only 30% are automated side loaders, which is the 'sweet spot' in U.S. terms of performance optimization for this system.

The technology used on the parcel delivery vehicles is second-generation with a very broad market potential. This product, while similar in function, is lighter, less complex, more reliable and significantly less expensive than the first-generation system. This system can be applied in place of a conventional transmission in any stop/start duty cycle application–from parcel delivery vehicles to transit buses.

This second-generation product costs approximately between one-third and one-half that of the RunWise system (depending on application), providing up to 40% fuel savings, which would realize a return on investment for the end-user in two to three years. Parker expects the cost of the second-generation system to decrease even more as volume increases. Parker has completed the development of this next-generation system and would be ready to go to market if favorable demand conditions occurred in the U.S. Currently, the product is being marketed in South America and Asia.

When compared with other alternate fuel and electric hybrid technologies, this is a technology on the market today that delivers fuel and emissions savings at a price point that can provide a return within a few years of ownership and that does not require significant investment in infrastructure to deploy on a broad scale.

SCAQMD Contracts #14202, et al. **April 2016**

SoCalEV Infrastructure MOA to Install & Upgrade EV Charging Infrastructure

Contractor
Various SoCalEV partner organizations

Cosponsor
SCAQMD
California Energy Commission (CEC)

Project Officer
Patricia Kwon

Background

The Southern California Regional Plug-In Electric Vehicle Plan (SoCalEV) is a regional collaborative among cities, utilities, automakers, local and regional government agencies, businesses and others in the region who are actively engaged in supporting and building the necessary infrastructure for the commercial launch of electric vehicles. The SoCalEV Ready project was funded by a CEC grant to deploy 321 Level 2 and two DC fast charging stations throughout the four-county South Coast air district, with the grant administered by SCAQMD. These chargers were deployed starting in 2013, with all installations completed by April 2016.

Project Objective

Under multiple contracts or memoranda of agreement (MOAs) executed with SoCalEV partners, chargers are sited at local government agencies, universities, hospitals, and cultural destinations to create greater availability of public charging infrastructure, supplementary to residential and workplace charging. Installations were performed either by SoCalEV partners or contracted installers with experience in commercial installations. CEC funds were used for a portion of the costs associated with hardware and/or installation, and SoCalEV partners used their own funds as required cost sharing (39%) for the CEC grant to pay remaining costs. SoCalEV partners that completed their installations include the Cities of Claremont, Covina, Lake Elsinore and Palmdale; County of Los Angeles; California State University campuses at Fullerton, Long Beach, Los Angeles (Department of Water and Power), and San Bernardino; California State Polytechnic University, Pomona; and University of California Irvine. Participating installers included the non-profit Adopt-A-Charger and Associated of Los Angeles (ALA).

Figure 1: Los Angeles Zoo, DC Fast Charger and Level 2 EVSE (electric vehicle supply equipment)

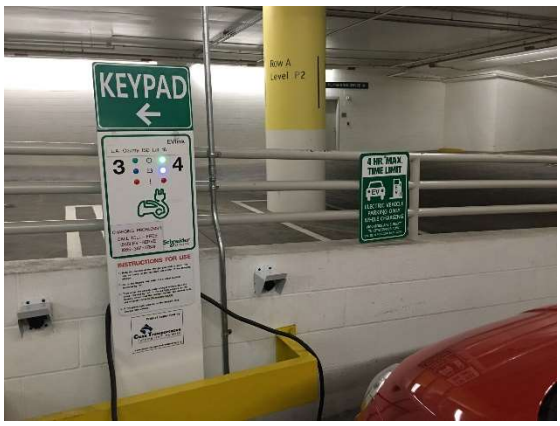


Figure 2: Los Angeles County Disney Center parking structure, Level 2 EVSE

Technology Description

EV charging stations are commercially available technology including Level 2 (240V) charging stations with SAE J1772 connectors and DC (480V) fast charging stations with CHAdeMO and CCS connectors. These connectors worked with all of the EVs available on the market: all EVs can use the J1772 connector for Level 2 charging. Asian manufacture EVs use the CHAdeMO connector while American/European manufacture EVs use the CCS for DC fast charging.

Figure 3: Getty Center parking structure, Level 2 EVSE

Status

The majority of installations were completed by December 2015, with a few installations completed by April 2016. As part of MOA terms and conditions, SoCalEV partners provided charger utilization data and lessons learned on this project. CEC sent a program evaluator in November 2015 to visit a dozen sites to confirm charger performance and high level of utilization. The following MOAs under this project were closed in 2016 and are as follows:

SoCalEV Partner	Contract #
Adopt-A-Charger	14202
Associated of Los Angeles (ALA)	14204
Los Angeles Department of Water & Power	14336

Results

In April 2016, SCAQMD created a final report to CEC on the overall deployment effort, data analysis and policy recommendations. Charger utilization data includes Table 1 below for chargers installed at California State University Los Angeles.

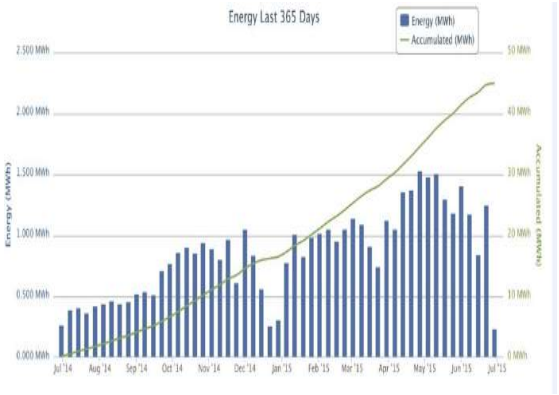


Table 1: Charger Utilization at CSULA

Benefits

This project was important in increasing the deployment of public charging infrastructure at a variety of workplaces and destinations. It also assisted in making EV infrastructure more visible to the general public addressing 'range anxiety', and significantly increasing the electric range of EVs to allow for longer and more frequent zero-emission trips and vehicle miles traveled.

Project Costs

The CEC grant provided funding towards hardware and/or installation in the amount of $840,750 with SoCalEV partners providing additional cost sharing in the amount of $542,659. Total project costs were $1,383,409. In addition to the 321 funded installations, two DC fast charging stations were installed at the Los Angeles Zoo and Los Angeles International Airport through a partnership with Los Angeles Department of Water and Power and Adopt-A-Charger.

Commercialization and Applications

Level 2 and DC fast charging stations are fully available commercial technologies which have been and will continue to be deployed for a variety of purposes including residential, public, workplace, and destination charging. This deployment project assisted in accelerating the availability of public charging infrastructure which is much needed to go beyond the early adopter stage and have the technology embraced by the general public.

SCAQMD Contract #15021 **December 2016**

Upgrade and Demonstrate Two Electric Yard Tractors

Contractor
Transportation Power, Inc. (TransPower)

Cosponsors
SCAQMD
U.S. EPA Region IX-Clean Air Technology Initiative (CATI)

Project Officer
Richard Carlson

Background

In 2013, Transportation Power, Inc., (TransPower) developed and placed into regular revenue service two prototype electric yard tractors hauling heavy containers at a San Antonio, TX retailer facility under demanding duty cycles similar to those at port terminals, warehouse distribution centers and railyards. The tractors accumulated nearly 1,000 miles of actual service and demonstrated they could operate under the duty cycle for as long as 13 hours between battery charges.

Consequently, SCAQMD worked with TransPower to identify system improvements incorporating lessons learned from the initial deployment in San Antonio. TransPower staff believed that deploying the yard tractors upgraded with the latest TransPower energy storage and drive technology at various facilities such as warehouse distribution centers in Southern California would provide additional information on the performance of zero-emission yard tractors under various operations and facilitate user acceptance.

Project Objective

This Project included upgrading the two yard tractors with the latest TransPower energy storage, battery management system, power controls, and drive system and then demonstrating the two yard tractors at distribution centers in the South Coast Air Basin.

Technology Description

The TransPower "ElecTruck-YT" system includes the following major subsystems:

- 160 kWh lithium iron phosphate (LiFePO4) energy storage system
- On-board 70 kW fast charger
- 150 kW PMAC electric drive motor
- 6 speed Eaton Automated Manual Transmission
- Electric accessories (power steering, battery/motor cooling system, cabin air conditioning/heating system, and alternator).

The upgraded yard tractors included the following improvements:

- adaptation of a heavier-duty transmission and shifting mechanism
- automated shifting software
- monitoring and protection of batteries when vehicles are unattended
- integration of battery monitoring and overall tractor control software
- battery management system sensor design
- electrically driven accessory inverter
- battery cell packaging to improve accessibility for servicing.

Status

Upgrade of both yard tractors was completed in 2014. In 2015 and 2016, the two yard tractors were demonstrated at a number of port terminals and warehouse terminals in Southern California. To meet the San Antonio facility requirements, the two yard trucks were built with dual rear axles. However, most facilities in Southern

California preferred single rear axle tractors due to space limitations, which unfortunately limited our demonstration site options. Nonetheless, the two yard trucks served as successful demonstration vehicles and helped commercialize the technology.

Figure 1: Upgraded Electric Yard Tractors

Results

One tractor has accumulated 350 hours and 1,560 miles in 2015 and 2016 while operating at a recycling facility and regional building material distribution center. It has operated satisfactorily except for a radiator leak caused by a broken cooling fan bracket and an inverter failure both of which have been repaired. The second tractor has accumulated 92 hours and 165 miles in 2015 and 2016. It has been used primarily as a demonstrator and show vehicle. It was also tested at Southern California Edison for evaluation of electrical loads during charging.

Benefits

The electric yard tractor project promoted the commercialization of zero-emission goods movement equipment, specifically involving ports, warehouses and distribution centers in the South Coast Air Basin. Zero-emission transportation and goods movement technologies are included within SCAG's Regional Transportation Plan and SCAQMD's 2016 Air Quality Management Plan.

This successful demonstration of battery electric yard tractors will move the technology closer to commercialization for wide-scale market deployment and the region closer to attainment of clean air standards by eliminating diesel particulate matter and NO_x emissions. Additionally, since yard tractors are used to move goods in and around warehouse distribution centers, marine port terminals, and railyards, the application of zero-emission technologies will improve the air quality in these disproportionately impacted communities.

Project Costs

The total fixed price of this contract was $405,000 of which $330,000 was contributed by the U.S EPA CATI program and $75,000 was from the SCAQMD Clean Fuels Fund.

Commercialization and Applications

The technology demonstrated in this project has been commercialized. These two yard tractors serve as demonstrators of the technology and its capability to perform in commercial applications. Based on favorable responses from fleets seeing and using these yard tractors, other vehicles including yard trucks, drayage trucks, and school buses have been built or are on order.

Electric vehicles are currently produced by converting an existing vehicle. Future effort is being devoted to scaling up production by linking TransPower with one or more vehicle manufacturers that will assemble new vehicles with electric drive.

SCAQMD Contract #14364 **August 2016**

Develop, Integrate and Demonstrate Ultra-Low Emission Natural Gas Engines for On-Road Heavy-Duty Vehicles

Contractor

Cummins, Inc.

Cosponsors

California Energy Commission-Public Interest Energy Research (PIER)
SCAQMD
Southern California Gas Company

Project Officer

Richard Carlson

Background

The 2012 AQMP identified heavy-duty diesel trucks as one of the largest source categories for NOx emissions. currently and in future years, even as the legacy fleet of older and higher-polluting vehicles were to be retired and replaced with vehicles meeting the 2010 NOx standard of 0.2 g/bhp-hr. The 2012 AQMP also showed that NOx reductions in excess of 60% would be required from all source categories in order to meet future federal ambient air quality standards for ozone.

In 2012, diesel engines and diesel engine emission control technologies did not appear capable of achieving NOx emissions significantly lower than the 2010 standard. SCAQMD had previously worked successfully with engine manufacturers to introduce heavy-duty natural gas engines which had NOx emissions meeting the 2010 standards earlier than diesel engines. SCAQMD worked with CEC to develop a jointly funded program to develop a natural gas engine targeting NOx emissions 90% lower than the 2010 standard.

In 2013, SCAQMD issued a request for proposals to develop and demonstrate an ultra-low NOx natural gas engine. Cummins, Inc., was one of two organizations selected from the competitive solicitation.

Project Objectives

This project included the following emission objectives using U.S. EPA/CARB certification test procedures:

- Meeting 0.02 g/bhp-hr NOx
- Meeting other 2010 pollutant standards
- Achieving 10 ppm ammonia average or as low as possible

Other objectives affecting commercial viability of the engine included:

- Minimizing fuel consumption loss vs diesel
- Maintaining same power as diesel
- Complying with U.S. EPA/CARB certification requirements
- Providing cost, performance, drive quality and durability similar to diesel.

Technology Description

The engine was derived from Cummins 14.9-liter ISX15 diesel engine but had newly designed manifolds, heads, camshaft, piston, EGR, turbocharger, and catalyst after treatment, all purposely designed for optimal performance with natural gas. The final technology configuration consisted of:

- Stoichiometric air-fuel ratio
- Port fuel injection
- Big intake - small exhaust valves
- Improved cooling of head and spark plugs
- Flow-optimized intake manifold and exhaust manifold
- High energy ignition system
- Cooled EGR
- Waste-gate turbocharger
- TWC aftertreatment: close-coupled and main underbody

Status

Extensive simulation modeling was conducted to evaluate alternative design strategies. The goal was to improve the following engine characteristics: cylinder-to-cylinder variation, cycle-to-cycle variation, residual in-cylinder gases, combustion efficiency, pre-ignition knocking and pumping efficiency. These characteristics compromise performance of natural gas engines converted from diesel engines. Several test engines were

assembled as part of the design and development work. An engine containing the final internal and external engine hardware, optimized control software, and after treatment system was tested according to the cold/hot Heavy Duty Engine Federal Test Procedure (HD-FTP) and was operated without failure for more than 500 hours under a wide range of speed and load conditions.

Figure 1: Test Engine on Dynamometer

The design and integrated technology has been demonstrated using a variety of engine dynamometer tests to meet all program objectives except 10 ppm ammonia. Unfortunately, market demand for a 15-liter natural gas engine is currently insufficient to justify launching this new engine at this time. The technology is scalable over an 8- to 15-liter size range and Cummins intends to incorporate this technology in the next natural gas engine which is expected to be released in the 2019-2020 timeframe.

Results

The ISX15-G engine has achieved the following results. All except ammonia achieved and surpassed the project targets. Further optimization of software controls and the after treatment system is expected to reduce ammonia below 20 ppm.

Parameter	Target	ISX15-G
NOx	0.02	0.003
PM	0.01	0.004
NMHC	0.14	0.010
CO	15.5	1.850
Ammonia	10 ppm	58 ppm

The Brake Thermal Efficiency (BTE) target was zero or no loss compared to diesel on an equivalent energy basis. BTE in the final configuration was 11.5% higher than the baseline natural gas engine configuration resulting in a BTE loss of less than 1% compared to typical diesel engines.

Benefits

This program demonstrated that a well-designed natural gas engine can achieve both near-zero NOx emissions and thermal efficiency and performance equivalent to diesel engines. The Program provided a design pathway for developing other near-zero NOx natural gas engines with performance similar to a diesel engine.

Project Costs

A contract for $2,061,000 was executed from the Clean Fuels Fund, which included $250,000 and $561,000 in revenue from CEC and SoCalGas, respectively. Cummins contributed $1,808,000 in cost-share for a project total of $3,869,000.

Commercialization and Applications

The engine and after treatment systems developed in this study have been shown to meet the near-zero emission targets as well as provide fuel consumption lower than current natural gas engines; and incorporate design changes to improve engine robustness, reduce maintenance, and provide improved driving performance, particularly during transient operation. Unfortunately, the low cost of diesel fuel and limited natural gas fueling facilities nationwide limit the national sales potential of this large natural gas engine. Commercialization of this natural gas engine requires new tooling, the cost of which cannot be justified by the current low sales volume of natural gas engines. As a result, this ISX15-G engine will not be certified or introduced into the market at this time.

Cummins will evaluate market conditions for large natural gas engines and can apply the technologies developed in this program to engines in the 9-liter to 15-liter size range. A number of options are under consideration for certification and eventual commercialization of the technologies developed as a result of this project in the early 2020 timeframe.

SCAQMD Contract #05250 **April 2016**

Purchase and Install New L/CNG Fueling System at Commercial Fueling Station in Temecula

Contractor

Downs Energy

Cosponsors

California Energy Commission
City of Temecula
MSRC/AB 2766 Discretionary Fund
SCAQMD

Project Officer

Larry Watkins/Phil Barroca

Background

Downs Energy sought to construct, with funding, through the support of granting agencies and local municipalities, the first publicly accessible LNG station in Southern California. This station was a critical link in the network of natural gas stations in Western Riverside County and the South Coast Air Basin. This station utilizes state-of-the-art equipment and serves a variety of light-, medium- and heavy-duty natural gas vehicles, school and transit buses, and refuse and commercial trucks traveling throughout the region. SCAQMD's efforts have increased deployment of alternative fuel vehicles and increased alternative fuel throughput in the region.

Project Objective

The project objective included construction of an LNG and L/CNG station, providing a critical link in the network of natural gas stations in Western Riverside County and the South Coast Air Basin. The new station would have the ability to provide a throughput of 300,000 gasoline-gallon equivalents (GGE) annually.

Technology Description

The scope of the project included: one 15,000 gallon LNG storage tank; one 2-stage pump providing 95 psig minimum differential pressure at 60 gpm;.one LNG single hose dispenser and dual hose dispenser with two nozzles at 3000 and 3600 psi fast fill. Access to the LNG station would be through integration with the Commercial Fueling Network (CFN) or a Downs Energy card. Access to CNG fueling is allowed via the use of common credit cards (Mastercard, Visa, Voyager, WEX).

Status

The station construction was completed in April 2009. The normal startup procedures for the fueling station included a purging and cold shock process, a nitrogen leak test, and an operational demonstration of each of the station's normal operations. The on-site training took place on March 31, 2009 with all-day training in the proper operation and use of the equipment. Commissioning of the station took place on April 16, 2009.

Figure 1: CNG Station in Temecula

There were several unanticipated permitting problems with the City of Temecula due to

conditions not previously encountered for the specific building conditions of an L/CNG station. Therefore, delays were encountered with ADA (Americans with Disabilities Act) compliance which extend the project. A second delay factor was caused by inclement weather issues, which delayed the project an additional two months.

Throughput was lower than projected by year three; as a result, the five-year period of annual reporting was extended by three years for a total of eight years, ending in 2016.

Results

Obtained through construction of the L/CNG station was the availability of a fueling facility within proximity of both Northern and Southern California. The early estimates place the reduction in PM and NOx emissions with the South Coast Air Basin at approximately 15 tons.

Table 1: Throughput 2009-10 to 2015-16

Fiscal Year (Apr-Mar)	Volume (GGEs)
2009-10	29,004
2010-11	40,163
2011-12	92,725
2012-13	153,982
2013-14	141,089
2014-15	123,768
2015-16	124,797

The long-term result will be improved fuel accessibility and additional penetration of clean fuel natural gas vehicles in Southern California providing cleaner air in the region.

Benefits

Alternative fuel technology has been and continues to be a major component in achieving emission reductions from both stationary and mobile sources. This project complements existing efforts promoting alternative fuel technology in the mobile sector, as well as facilitates market readiness for private, public, and commercial operation of natural gas vehicles.

This project benefits the environment of the South Coast Air Basin in several ways beginning with the reduction in diesel particulate emissions and the increased efficiency of having an L/CNG fueling facility located in Temecula, CA. Diesel consumption would be reduced as outlined in Table 1, below, in gasoline gallon equivalents for the Temecula station. This station creates a seamless web of fueling infrastructure along critical transportation corridors to enable low-emission natural gas vehicles to travel more freely throughout California and the western U.S.

Project Costs

LNG/CNG Grant Funding		
California Energy Commission	Equipment only	$250,000.00
AQMD - #02061	All costs	$250,000.00
AQMD - #05250	All costs	$203,137.00
MSRC #MS04052	All costs	$250,000.00
City of Temecula	All costs	$150,000.00
Total Grant Funding		$1,103,137.00
Project Cost		1,232,247.22
Downs Share	11.94%	$147,158.10

Commercialization and Applications

SCAQMD's efforts have increased deployments of alternative fuel vehicles and increased alternative fuel throughput in the region. Consumer education about alternative fuel cost savings, emission regulations and grant/tax incentives is critical to expanding the penetration of alternative fuel vehicles.

SCAQMD Contract #06042 **December 2016**

Upgrade Existing CNG Public Access Station with Dispenser and Card Reader

Contractor
University of California Los Angeles
Clean Energy Fuels (subcontractor)

Cosponsors
Clean Energy Fuels
MSRC/AB 2766 Discretionary Fund Program
SCAQMD
University of California Los Angeles

Project Officer
Larry Watkins/Phil Barroca

Background

The University of California Los Angeles (UCLA) was an early adopter of compressed natural gas (CNG) as a fleet fuel. The station selected for upgrade under the terms of Contract #06042 was a first-generation system, installed in 1993. The original set-up of the station included public use; however, its primary user was the UCLA fleet.

Project Objective

UCLA now operates 62 CNG fleet vehicles, including 14 CNG campus shuttle buses. To meet growing fuel demands of the UCLA fleet and public users, the facility required a system upgrade. The project objective was to replace the existing card reader located at the CNG fueling station at fleet services. The proposed upgrade would expand its potential users and bring this first-generation system to the capability and reliability level found in the state-of-the-art CNG systems installed today.

Technology Description

The selected card reader system was the FuelForce FF 814 card reader system with video training modules for first-time users. The system supports all retail credit card transactions including Visa, MasterCard and Voyager as well as Wright Express and Voyager fleet cards.

The construction of the new system included the installation of a split priority panel, a Greenfield video dispenser, and a credit card terminal.

Status

Station construction commenced in May 2008. A Grand Opening was held on August 28, 2008. A report was submitted to the SCAQMD for consideration in late 2008, but projected throughput was higher than actual gallons dispensed. As a result, the five year period of annual reporting was extended by three years for a total of eight years, ending in 2016.

Figure 1: Card Reader at UCLA

Results

We believe this project to have been a success as the station has seen an increase in transactions and gallons dispensed while remaining robust and reliable. Since completion of the facility upgrade, the UCLA station has dependably supplied CNG fuel to the campus community and local private fleets.

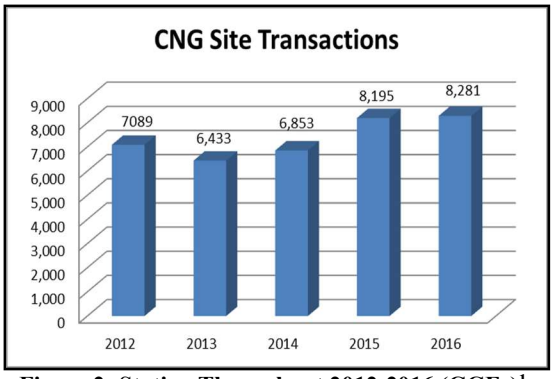


Figure 2: Station Throughput 2012-2016 (GGEs)[1]

At the completion of the upgrade, an average 425 transactions were completed per month. In 2016, the UCLA site averaged 690 transactions per month, the highest number recorded. The facility is technically capable of reaching the throughput requirement of an estimated 920 transactions per month and 150,000 GGE annually.

Benefits

Fueling infrastructure does not provide emission reduction benefits or improved air quality on its own; rather, benefits are achieved from the natural gas vehicles that fuel at reliable stations such as this. The UCLA CNG station provides the UCLA fleet and private West Los Angeles users with a reliable source of fuel for their vehicles.

The UCLA CNG fleet has increased incrementally over the years, thereby reducing the number of traditional gasoline vehicles driven for campus operations. Some CNG operators have since opted for electric vehicles after feeling comfortable with an alternatively fueled vehicle, thus reducing greenhouse gas emissions even further.

Without a state-of-the-art card reader, the original first-generation station would not have been able to service the 8,300 transactions seen in 2016. As such, the upgraded card reader has facilitated a 63% increase in the volume of CNG transactions since its installation and is capable of conducting increasing numbers of transactions over the coming years.

Project Costs

At the time of contracting, the project budget was estimated at $31,842, with the SCAQMD contributing $15,921, or 50% of the project cost, and the MSRC (AB 2766 Discretionary Fund Program) was contributing the remaining 50%. At the close of construction, the total project cost was $61,799, with UCLA paying the remaining project costs and Clean Energy Fuels contributing some in-kind services. The $15,921 contributed by the SCAQMD represented 26% of the total budget.

Commercialization and Applications

Compressed natural gas as a vehicle fuel is commercially available on a limited basis throughout the South Coast Air Basin. This project expanded the transactional capacity of an existing CNG station to allow greater user access, thus expanding the viability of this alternative fuel in the West Los Angeles area.

Future card reader upgrades may include smart card Europay, MasterCard and Visa (EMV) technology, for enhanced security and expansion of payment methods. Although the UCLA Fleet would minimally interact with such a system, the EMV technology would allow for even greater access to the general public, resulting in even more use of the CNG station. The new EMV technology upgrade would cost an estimated $13,000, which includes the additional wiring, permitting, and labor expenses to complete, acquire, and employ.

SCAQMD will continue to explore opportunities to support and fund natural gas fuel projects, as a strong network of publicly accessible infrastructure will help to support the capacity of CNG as an alternative fuel in the South Coast Air Basin. At present, natural gas is the cleanest available fossil fuel technology and provides its users and the communities in which they travel with improved air quality via reduced tailpipe emissions.

[1] *Gallons of gasoline equivalent*

Upgrade Existing LNG Facility to L/CNG at Riverside County Waste Management's Agua Mansa Facility

Contractor
Clean Energy Fuels

Cosponsor
SCAQMD
Clean Energy Fuels

Project Officer
Larry Watkins/Phil Barroca

Background

The SCAQMD awarded Clean Energy Fuels $120,000 in funding to help offset a percentage of the cost to add public access CNG fueling to the County of Riverside's existing LNG fueling station located at 1830 Agua Mansa Road, Riverside, California.

Project Objective

The work to be accomplished under this award was to provide equipment funding to help offset a percentage of the capital costs incurred for a new public access compressed natural gas (CNG) fueling facility to fill an existing current gap in infrastructure in the Inland Empire region of the South Coast Air Basin. Accessible CNG fueling did not exist on the route 60 corridor between the City of Riverside and Ontario International Airport (ONT).

Technology Description

CNG station construction included the installation of a 6 GPM L/CNG pump; 3 storage vessels each with a nominal capacity of 9,400; a 3,600 psi dispenser; a priority panel and all other required station components.

Status

Station construction commenced July 2010. Station start-up processes occurred in early February 2011 and included the fueling of test vehicles. The station was commissioned and became fully operational by the end of February 2011. The completed facility meets all required codes and passed a Fire Marshall Safety Inspection prior to the public opening.

Figure 1: Upgraded Agua Mansa L/CNG Station

Figure 2: CNG Dispenser installed at Agua Mansa LNG Station

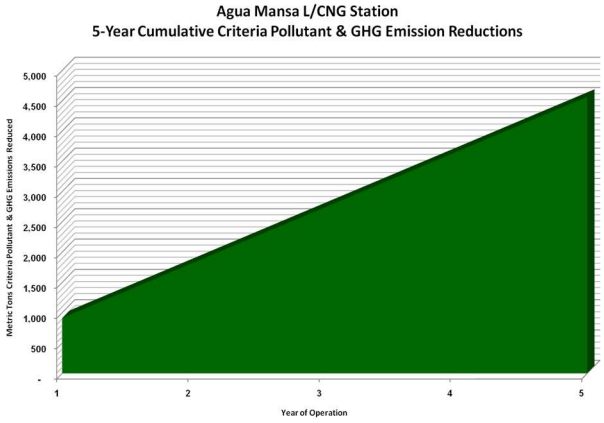
Results

The new County of Riverside CNG station fills a critical gap in the Southern California CNG network. Clean Energy successfully completed the upgrade of the County of Riverside's existing LNG fueling station to provide a public access CNG station. The new public access CNG station meets the specifications outlined in the award agreement and is now open 24-hours per day, 7-days a week. This contract included an annual throughput requirement of 750,975 gasoline gallon equivalents (GGEs) of natural gas by the end of the third full year of operation. As the table below shows, this throughput was met in the second year.

Five-Year Throughput Data			
Year	CNG Dispensed	LNG Dispensed	Total GGE Dispensed
2011	264,040	403,927	667,967
2012	475,367	385,783	861,150
2013	520,751	430,570	951,321
2014	718,252	498,125	1,216,377
2015	718,933	388,108	1,107,041

Benefits

Fueling infrastructure does not provide emission reduction benefits or improved air quality on its own; rather, those benefits are achieved from the natural gas vehicles that fuel at reliable stations such as this. This contract included an annual throughput requirement of 750,975 gasoline gallon equivalents (GGEs) of natural gas by the end of the third full year of operation. Based on this usage, the station would reduce more than 913 metric tons of criteria pollutant & greenhouse gas emissions per year, a total of 4,565 metric tons of criteria pollutant & greenhouse gas emissions would be reduced over a 5-year project life.[1]



Project Costs

The total project cost of the CNG public access upgrade was $535,457. The $120,000 contributed by the SCAQMD represented 22% of the total budget. Clean Energy Fuels provided the remaining capital of $415,457.

Conclusions

The LNG station was effectively upgraded to include a public access CNG station, establishing a vital link in local-area alternative fuel infrastructure.

[1] Emissions reductions were determined utilizing the Clean Cities Area of Interest 4: Alternative Fuel and Advanced Technology Vehicles Pilot Program Emissions Benefits Tool. Assumptions: annual fuel throughput based on commitments included in the original grant proposal; Heavy Duty vehicles=282,975 GGE/year & Light Duty Vehicles=468,000 GGE/year; HDV MPG= 6MPG & LD MP=15 MPG.

SCAQMD Contract #06091 **December 2016**

Purchase and Install New Public Access CNG Fueling Station at City Yard

Contractor
City of Whittier

Cosponsors
SCAQMD
MSRC/AB2766 Discretionary Fund
City of Whittier

Project Officer
Larry Watkins/Phil Barroca

Background

In 2001, the SCAQMD and the California Air Resources Board began to adopt regulations that require public agencies to embark on effectively reducing vehicle PM and NOx emissions.

These regulations prompted the City of Whittier staff to explore the alternative fuel market and the City initiated a work plan to transition its incoming fleet to clean CNG-fueled vehicles.

Project Objective

The objective of this project was to construct a limited-access facility to support clean natural gas powered vehicles and equipment for the City, complying with the regulations while maintaining services for fueling the general public and other fleets in the area, and to promote the use of alternative fuels.

Technology Description

When the City of Whittier began to explore the alternative fuel market, natural gas was recognized as the most economical alternative fuel in this region.

Utilizing natural gas, the City is able to significantly lower its vehicle emission levels while maintaining public service levels, lower overall fuel costs, and lower its dependence on imported oil.

Status

On December 11, 2007, the Whittier City Council approved awarding the construction contract to Allsup Corporation. The entire authorized amount for the station project, including construction, inspection, permitting and contingency was $789,790. Construction began on July 22, 2008 and was completed on November 1, 2008.

Figure 1: Compressor Compound

Figure 2: Time Fill Posts

Because throughput was lower than projected at three years, the five-year period of annual reporting was extended by three years for a total of eight years, ending in 2016.

Results

Concurrent with station construction, the City of Whittier had replaced seven heavy-duty refuse collection trucks (44% of its refuse fleet), one street sweeper, and three light-duty pickup trucks. By replacing those vehicles, the City reduced NOx emissions by more than 2.1 tons and diesel PM was also reduced. The City had also submitted procurements for two heavy-duty refuse collection trucks.

Benefits

The following table reflecting throughput demonstrates displacement of diesel fuel, further reducing both NOx and PM.

Period	Throughput (in Therms)
12/1/08-11/30/09	63,342
12/1/09-11/30/10	66,844
12/1/10-11/30/11	70,407
12/1/11-11/30/12	75,857
12/1/12-11/30/13	80,853
12/1/13-11/30/14	91,012
12/1/14-11/30/15	101,895
12/1/15-11/30/16	76,419

On July 1, 2016 the City of Whittier out-sourced its Solid Waste Collection services, which had an impact on the CNG station load (throughput). Regardless, the City of Whittier continues to replace diesel-powered vehicles with CNG-powered vehicles.

Project Costs

Total project costs and funding sources were as follows:

Source	Amount
City of Whittier	$497,789
MSRC/AB 2766 Discretionary Fund	$83,333
SCAQMD	$150,000
Total	**$731,122**

Commercialization and Applications

The City of Whittier has been transitioning turnover of its heavy-duty diesel vehicle fleet to vehicles which operate by cleaner compressed natural gas (CNG) and a large component of this conversion has been the vehicle refueling station. The City experienced a longer construction time than anticipated presenting the station construction contractor with the, “Notice to Proceed” on January 1, 2008 and finishing almost a year later. The busy station construction market may indicate the use of natural gas, as a vehicle fuel, is becoming more prevalent.

The City plans to operate this facility for many years converting all 43 heavy-duty City trucks to CNG and plans to expand this facility within the next 5 to 6 years. The City also has oral agreements with other fleets to allow access to the station and is working to set up accounts for them, increasing throughput to the station.

The City’s largest obstacle, currently, is vehicle and engine manufacturers not producing OEM CNG vehicle products consistently. Ford was producing light-duty CNG powered vehicles and stopped. Larger truck manufacturers such as Sterling, Detroit Diesel, and John Deere have stopped production. With the use of natural gas becoming more popular and more refueling stations being available, if manufacturers could produce more vehicles, state governments, municipalities, and the general public would be more likely to use these vehicles, emission levels would drop, and the state could lower its dependence on imported oil.

SCAQMD Contract #07153 **June 2016**

Purchase and Install New Public Access CNG Fueling Station in Irwindale

Contractor
Foothill Transit

Cosponsors
Clean Energy
SCAQMD

Project Officer
Larry Watkins/Phil Barroca

Background

The SCAQMD awarded Foothill Transit $250,000 in funding to help offset a percentage of the cost to add a public access CNG fueling station on Foothill Transit's property located at 5640 Peck Road, Irwindale, California.

Project Objective

The work to be accomplished under this contract was to provide equipment funding to help offset a percentage of the capital costs incurred for a new public access CNG fueling facility. The station will provide a source of fuel for natural gas vehicles traveling throughout the area as well as along the 10, 60, 605 and 210 Freeways.

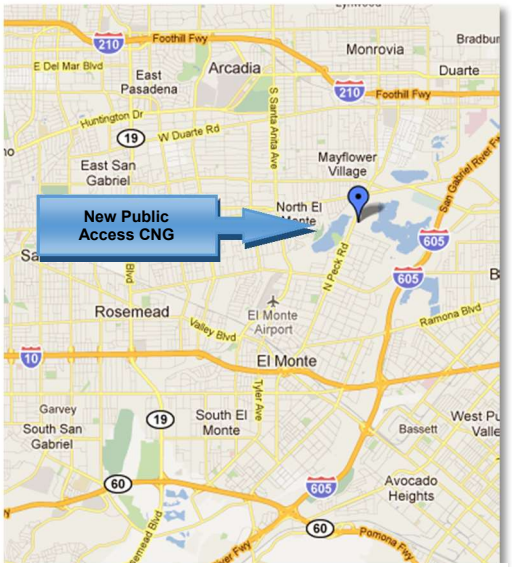


Figure 1: Station Location Near Multiple Freeways

Technology Description

The CNG tation consists of the following components: 5 IMW compressors, 66,000 SCF (standard cubic feet) of ASME American Society of Mechanical Engineers) high-pressure storage vessels, 1 dual hose dispenser and a regenerative dryer capable of meeting SAE standard J1616 moisture requirements. Station start-up processes occurred in July and included the fueling of test vehicles. The completed facility meets all required codes and passed a Fire Marshall Safety Inspection prior to the public opening.

Status

The station was commissioned in July 2011. The new public access CNG station meets the specifications outlined in the contract and is now open 24-hours per day, 7-days a week.


Figure 2: Foothill Transit CNG Station

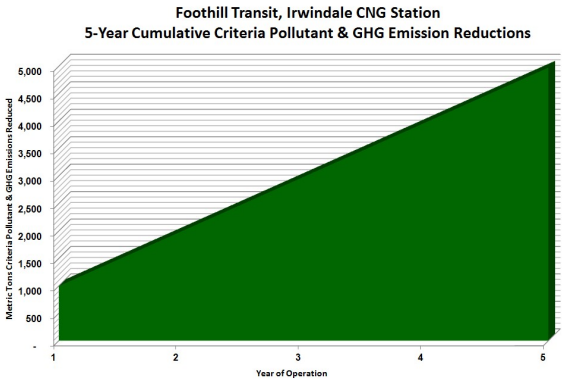
Results

Below are throughput results in gasoline-gallon equivalents (GGEs) for the five years of reporting required under this contract through mid-2016.

Period	Throughput (GGEs)
7/1/11-6/30/12	3,361,679
7/1/12-6/30/13	5,053,531
7/1/13-6/30/14	5,503,938
7/1/14-6/30/15	6,051,595
7/1/15-6/30/16	6,156,746

Benefits

Fueling infrastructure does not provide emission reduction benefits or improved air quality on its own; rather, those benefits are achieved from the natural gas vehicles that fuel at reliable stations such as this. The projected annual throughput in the proposal by the end of the third full year of operation was 900,000 GGEs of natural gas. Based on this use, this station would have reduce more than 995 metric tons of criteria pollutant & greenhouse gas emissions per year, a total of 4,976 metric tons of criteria pollutant and GHGs would be reduced over a five-year project life. This was determined using the Clean Cities Area of Interest 4: Alternative Fuel and Advanced Technology Vehicles Pilot Program Emissions Benefits Tool, and assuming annual fuel throughput based on projections included in the original proposal: heavy-duty vehicles (6 mpg) equal to 405,000 GGE/year and light-duty vehicles (15 mpg) equal to 495,000 GGE/year.



The station fell below this projected throughput during the five years of reporting so while the benefits are not as significant they are still considerable.

Project Costs

The total project cost of the CNG station was over $3 million. The $250,000 contributed by the SCAQMD represents 22% of the total cost. Clean Energy provided the remaining capital required to complete the station, including the required cost-share of $909,798.

Commercialization and Applications

The station has filled a critical gap in the southern California CNG fueling network.

SCAQMD Contract #07320 **March 2016**

Install New CNG Refueling Station in the City Of Santa Ana

Contractor
Orange County Transportation Authority (OCTA)

Cosponsors
Mobile Source Air Pollution Reduction Review Committee (MSRC) AB 2766 Discretionary Fund
OCTA/Local Transportation Funds
SCAQMD

Project Officer
Larry Watkins/Phil Barroca

Background

In an effort to fulfill the Orange County Transportation Authority mission of overseeing integrated bus, commuter rail and paratransit operations while also improving air quality OCTA has decided to move toward the utilization of clean fuels. In this regard, a decision was made that all new fixed-route buses would be fueled with compressed natural gas (CNG). Liquefied natural gas (LNG) was the clean fuel of choice for OCTA since 1998, but the decision was made to switch all new bus purchases to CNG. CNG is more common in the industry and continued fuel delivery problems with LNG have made this the best choice. In order to accommodate the use of CNG buses, CNG fueling facilities are required at some or all of OCTA's bus bases.

Project Objective

OCTA's objective was to construct and operate a new CNG fueling station at the Santa Ana bus base, located at 4301 W. MacArthur Boulevard, Santa Ana, CA 92704. The planned station would be able to fuel 4 buses simultaneously, each with 8,500 SCF of CNG within 5 minutes of connected fueling time. The station would utilize four single-hose CNG dispensers for high-capacity fast-fill bus fueling to 3,600 psi and one two-hose dispenser for light-duty fast-fill fueling with a 3,000 psi hose and a 3,600 psi hose.

The CNG fueling station was designed to be capable of providing an estimated 2.5 million therms of throughput during the first year of operation, increasing to a throughput of 4.5 million therms in the fourth and fifth years of operation. The CNG fueling facility was designed to support a fleet of 250 CNG buses. Trillium was chosen as the contractor to perform the work.

Technology Description

OCTA's CNG fueling station relies on reciprocating compressors fed by pipeline natural gas; specifically four Ariel JGR/4 compressors. All gas is conditioned by a twin-tower, fully automatic, heat-reactivated natural gas dryer before being introduced to the compressors. The compressed gas is stored in four 10,000 SCF storage spheres at up to 4,500 psi. A Sierra Monitor Sentry gas detection system was installed utilizing infra-red sensors to verify that gas leaks do not exist and sound an alarm if one occurs.

Status

Station commissioning was completed in February 2008, with five years of reporting required under the SCAQMD contract. Major construction was complete by February 2007. Performance testing was delayed due to delays in receiving buses. Performance testing occurred by October 2007, but issues arose due to water in the gas. A water

main pipeline break two miles from the project site caused a natural gas pipeline failure and introduced water into the gas. The Southern California Gas Company resolved the problem and dried out the pipeline so that a successful performance test could be accomplished in February 2008.

Figure 1: Single-Hose CNG Dispensers

Results

As of October 2008, there were about 170 CNG buses operating from this location; these replace 10-20 year old diesel transit buses. On average, a 75% reduction in oxides of nitrogen was accomplished. The CNG fueling station is necessary to fuel the buses on schedule.

During the first year of operation – July 2007 through June 2008 - the fuel throughput was 1,490,274 therms. Fueling in 2007 started with five CNG buses and by June 2008 120-140 buses were being fueled. Throughput at three years had been projected at 4,000,000 therms annually but was adjusted to an anticipated 3,000,000 therms. The reduced throughput was likely due to economic conditions and resulting budgetary constraints for both OCTA and surrounding agencies which would have been using the station. As a result, the SCAQMD required three additional years of reporting through 2016. The following table shows the actual usage for Calendar Years 2011-2016.

Table 1: Throughput CY 2011-2016

CY	Therms
2011	3,247,063
2012	2,816,738
2013	2,424,761
2014	2,619,743
2015	3,297,420
2016	3,480,544

Benefits

This CNG fueling station was designed to allow the OCTA to operate up to 250 CNG buses. Those CNG buses are replacing older diesel buses having at least 4 g/bhp-hr NOx emissions. These buses travel about 50,000 miles per year. Currently, about 170 CNG buses operate out of this location. There is a 75% average reduction in the NOx emissions for buses operating out of this location due to the CNG buses replacing diesel buses.

Project Costs

Total project costs were $6,534,274. The SCAQMD provided a $1,000,000 cost-share and the MSRC provided a $200,000 cost-share. The project cost was within the budgeted amount. The remainder of the project was funded through local transportation funds.

Commercialization and Applications

OCTA moved to alternative fuels to do their part to improve air quality. OCTA's experience with the CNG station at Santa Ana encouraged it to continue with the use of CNG and install stations at the Garden Grove, Anaheim and Irvine bus bases. OCTA's experience can be duplicated and shared with others to save on fuel costs, help improve the environment and further safeguard public health.

SCAQMD Contract #08043 **December 2016**

Public Access CNG Fueling Station Upgrade for UCLA Transportation

Contractors
University of California Los Angeles
Clean Energy Fuels (subcontractor)

Cosponsors
Clean Energy Fuels
SCAQMD
UCLA

Project Officer
Larry Watkins/Phil Barroca

Background

The University of California Los Angeles (UCLA) was an early adopter of compressed natural gas (CNG) as a fleet fuel. The station selected for upgrade under the terms of Contract #08043 was a first-generation system, installed in 1993. The original set-up of the station included public use; however, its primary user was the UCLA fleet.

Project Objective

UCLA now operates 62 CNG fleet vehicles, including 14 CNG campus shuttle buses. To meet growing fuel demands of the UCLA fleet and public users, the facility, which is located at 741 Charles Young Drive on the UCLA campus, required a system upgrade. The proposed upgrade would bring this first-generation system to the fueling capacity and reliability level found in the state-of-the-art CNG systems installed today. Clean Energy Fuels was chosen as UCLA's general contractor.

Figure 1: Compressor with Catwalk

Technology Description

Station construction included the installation of a Greenfield compressor with a minimum capacity of 175 SCFM, a 4500 psi storage vessel, a split priority panel, an automated Greenfield video dispenser and a catwalk around the compressor enclosure. Station start-up processes occurred in early August 2008 and included the fueling of test vehicles.

The completed facility met all required regulatory codes and passed a Fire Marshall safety inspection prior to the public opening.

Figure 2: Station Fueling Ports

Status

Station construction commenced in May 2008. A Grand Opening was held on August 28, 2008. A report was submitted to the SCAQMD for consideration in late 2008, but projected throughput was higher than actual gallons dispensed. As a result, the five-year period of annual reporting was extended by three years for a total of eight years, ending in 2016.

Results

Fueling infrastructure does not provide emission reduction benefits or improved air quality on its own; rather, benefits are achieved from the natural gas vehicles that fuel at reliable stations such as this. The UCLA CNG station provides the UCLA fleet and private West Los Angeles users with a reliable source of fuel for their vehicles.

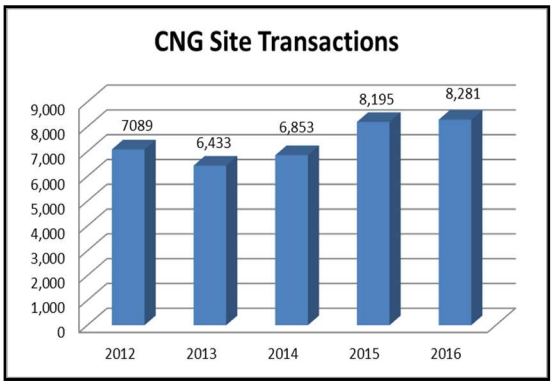


Figure 1: Throughput in GGEs[1] from 2012-2016

We believe this project to have been a success as the station was effectively upgraded from its original first-generation equipment to new state-of-the-art equipment. In 2016, the UCLA site averaged 690 transactions per month, the highest number ever recorded. The facility is technically capable of reaching the throughput requirement of an estimated 920 transactions per month and 150,000 GGE annually.

Benefits

Since completion of the facility upgrade, the UCLA station has displaced an average of 2,500 gallons of petroleum-based fuel (GGEs) per month.

Clean Energy provides its customers with turn-key solutions for natural gas transportation fuel. As a result, station construction and upgrade is able to be standardized.

Project Costs

At the time of contracting, the project budget was estimated at $318,158 with the SCAQMD to contribute $140,000, or 40% of the project cost. At the close of construction, the total project cost was $335,353. The $140,000 contributed by the SCAQMD represented 35% of the total budget. Clean Energy provided cost-share totaling $154,262 with the remaining budget paid by UCLA.

Commercialization and Applications

Compressed natural gas as a vehicle fuel is commercially available on a limited basis throughout the South Coast Air Basin. This project expanded the fueling capacity of an existing CNG station to allow greater user access, thus expanding the viability of this alternative fuel in the West Los Angeles area.

SCAQMD will continue to explore opportunities to support and fund natural gas fuel projects, as a strong network of publicly accessible infrastructure will help to support the capacity of CNG as an alternative fuel in the South Coast Air Basin. At present, natural gas is the cleanest available fossil fuel technology and provides its users and the communities in which they travel with improved air quality via reduced tailpipe emissions.

[1] *Gallons of gasoline equivalent*

SCAQMD Contract #08044 **December 2016**

Install Limited-Access CNG Refueling Station

Contractors

Beaumont Unified School District
Gas Equipment Systems, Inc.
Bogh Construction, Inc.
WLC Construction Services, Inc.
Elrod Fence Company
Southern California Gas Company

Cosponsors

City of Beaumont
SCAQMD

Project Officer

Larry Watkins/Phil Barroca

Background

The City of Beaumont and Beaumont USD explored all avenues available to them in order to meet regulations for public agencies to reduce vehicle PM and NOx emissions. In June of 2004 the City received a grant award in the amount of $150,000 from SCAQMD to construct a CNG fueling station. Due to circumstances beyond their control, the property allotted proved unsuitable for this purpose. Meanwhile, Beaumont USD had been researching ways to reduce PM and NOx emissions produced by their student transport buses.

Project Objective

The primary objective of this project was to construct a CNG fueling station on Beaumont USD's property to provide time-fill refueling to their current and growing fleet of CNG school buses overnight. A key objective was to also accommodate the City, other local entities with fleets of CNG vehicles, and the general public's CNG fueling needs. This meant there was a need to provide general access to the CNG station 24-hours a day, 7-days a week without adding personnel costs to the School District. Adding a card reader to the fast-fill station was added to the objectives.

Technology Description

The following equipment was installed as part of this project:

- (1) Gardner Denver CNG compressor skid
- (1) desiccant absorber gas dryer, Xebec, PST or equal
- (1) 3 band CNG storage units
- (1) fast-fill dispenser
- (1) card reader
- (1) high-pressure filter assembly
- (1) dome load-priority panel
- (8) GESI single hose time-fill assemblies with vented valves and NGVI Type II P36 fill nozzles.

Status

On September 25, 2007, Beaumont USD's Board of Trustees approved an award to Gas Equipment Systems, Inc. to provide services and equipment for the CNG fueling station. Construction began October 1, 2007 and was completed on August 12, 2008. The CNG Fueling station project was completed and opened to the public on September 8, 2008. The card reader allowed users to easily utilize the

Figure 1: Time-Fill Posts Allows Beaumont USD to Fill 8 Buses Overnight

station using major credit cards including MasterCard, Visa, Voyager and Wright, as well as ATM cards that have the Visa or MasterCard logo. Initial throughput for the new CNG

station from August 2008 through February 2009 was 16,943 units.

Projected throughput was higher than actual gallons dispensed. As a result, the five-year period of annual reporting was extended by three years for a total of eight years, ending in 2016.

Results

The addition of a CNG fueling station in Beaumont has helped to decrease emissions and also assists the region collectively to reduce dependence on imported oil. The district has seen financial savings in the cost of natural gas vs. diesel expenditures. Beaumont USD was able to take advantage of labor savings by utilizing the onsite overnight time-fill stations instead of having staff drive the CNG vehicles outside of the City and wait while the tanks fill. Additionally, they no longer pay a markup to another fuel facility and are eligible for the IRS fuel rebate.

Throughput in the first five years of station construction continued to grow. The following table reflects throughput in CNG therms and diesel-gallon equipment (DGEs) or diesel gallons displaced by CNG.

Table 1: Throughput 2008-2013

Period (Jul-Jun)	CNG Therms	DGE
2008-09	28,534	22,848
2009-10	32,882	26,329
2010-11	45,194	36,188
2011-12	54,411	43,569
2012-13	46,564	37,285
2013-14	62,195	49,800
2014-15	67,336	53,917
2015-16	61,761	49,453

Benefits

The District has put in place a plan to replace their older diesel-burning buses with cleaner burning CNG buses in spite of budget restraints. Moving to CNG-fueled school buses will significantly reduce NOx, PM, and air toxic emissions, contributing to overall cleaner air for the region.

Figure 2: Beaumont USD's Public Dispenser

Project Costs

Total construction costs were as follows:

Construction Costs	
Gas Equipment Systems, Inc.	$492,098
Bogh Construction, Inc.	$109,294
WLC Construction Services, Inc.	$66,016
Elrod Fence Company	$6,723
Southern California Gas Co.	$11,703
Total	$685,833

Funding was provided by the SCAQMD in the amount of $150,000, with the MSRC/AB 2766 Discretionary Fund Program providing $288,000. Beaumont USD through its Capital Outlay Fund paid the remaining costs of $247,833.

Commercialization and Applications

Beaumont USD plans to operate this facility for many years and has put in place a plan to convert their heavy-duty diesel vehicles to cleaner burning CNG buses when funding allows. They anticipate that as natural gas use becomes more familiar, manufacturers will meet the needs of the public and produce more vehicles that consume this cleaner-burning fuel. When this happens, it will allow the school district and other entities to additionally replace their fleet of small trucks and utility vehicles with cleaner-burning vehicles.

SCAQMD Contracts #09218 and 10067 **December 2016**

Install Mountain Safety Equipment on CNG School Buses

Contractor
Rim of the World Unified School District

Cosponsors
SCAQMD

Project Officer
Ranji George

Background

Using funding authorized by Proposition 1B, SCAQMD provided significant incentives to school districts to replace their old, higher-polluting school buses with new, primarily CNG, school buses. Rim of the World Unified School District was one of the grantees under this Program. Using SCAQMD's school bus grant funds, Rim of the World USD purchased 11 new CNG buses through manufacturer BlueBird's local distributor, AZ Bus Sales. Rim of the World USD operates its buses on challenging mountain roads and under severe weather conditions, at elevations that reach as high as 4,500 to 6,000 feet above sea level. Areas served by Rim of the World USD include Crestline, Lake Arrowhead, Running Springs and Green Valley Lake communities.

Project Objective

In addition to providing new CNG school buses, SCAQMD used the Clean Fuels Program to provide funding for the installation of mountain safety equipment to enhance the safety and reliability of these new CNG buses. The new equipment was to enable the school district to operate these new buses safely on mountain roads.

Technology Description

The proposed safety equipment for the new school buses assists in helping improve traction, braking and visibility during driving. This is essential for school buses operating on steep mountain roads and curves, especially winter weather conditions which may result in ice and/or snow on the road.

The following specialized equipment was installed on these buses under these two school bus grants:

a) Allison 3000 PTS Transmission with Retarder
b) Rear Air Ride Suspension
c) 10 inch Air Brakes ILO Standard
d) Electric Air Drain Valves ILO Manual
e) Heated Remote Mirrors ILO Heated only
f) Additional Floor Mounted Heater
g) Strobe Light with Pilot
h) Fog Light Front Bumper
i) Stainless Steel Step Well
j) Sanders
k) Block Heater

Figure 1: Type D CNG bus purchased by Rim of the World

Status

The 11 new CNG buses awarded by SCAQMD were equipped with the above special safety equipment in 2011 and were required to operate and report for a minimum of five years under these grants. Currently, all 11 new CNG buses are still operating with the mountain safety equipment, reducing potential for hazards involved in driving school buses at high elevations.

Results

This new equipment has enabled the school district to successfully operate their new CNG school buses safely for several years.

Benefits

New CNG buses emit dramatically reduced air pollutants (NOx, PM, air toxics) relative to the old diesel school buses that were replaced (models 2006 and earlier). The equipment installed in each bus considerably enhanced the safety and operability of the new buses at high elevations.

Project Costs

The cost of the safety additions per bus was on average $13,170 for a total of $144,870 provided by the Clean Fuels Program.

Commercialization and Applications

Installation of this mountain safety equipment ensured that Rim of the World USD would continue on a path to using alternative fuel school buses, thereby reducing toxic diesel pollutants, especially exposure to young people, who are far more susceptible to the adverse health risks of poor air quality.

SCAQMD Contract #13401 **May 2016**

Demonstrate Natural Gas-Powered Parking Lot Sweepers

Contractor
Nite-Hawk Sweepers, LLC

Cosponsors
GoNatural CNG
Haaker Equipment
Isuzu
Nite-Hawk Sweepers, LLC
Pro-Sales
SCAQMD

Project Officer
Phil Barroca

Background
The parking lot sweeper population in the SCAQMD jurisdiction is estimated between 500-700 vehicles. In addition, there are an estimated 100+ private fleet operators providing sweeping services in locations such as retail shopping centers, office parks, shopping malls, school/university campuses and communities overseen by residential homeowner associations. Parking lot sweeper (PLS) vehicles range from converted light- and medium-duty pickup trucks to more sophisticated and purposefully designed vehicles. These vehicles fill a niche not covered by larger more robust, heavy-duty, street sweeping vehicles which are regulated under the SCAQMD Fleet Rule 1186.1. PLS vehicles can accrue as many as 60,000 miles annually and are powered by conventional fuel (gasoline or diesel) engines, representing a significant amount of emissions in this region. In December 2012, the SCAQMD Board awarded up to $90,000 from the Clean Fuels Fund to Nite-Hawk Sweepers, LLC, based in Seattle, WA, based on their proposal to develop and demonstrate a CNG-powered PLS vehicle. Nite-Hawk develops and markets specially designed street sweepers such as the Osprey and Raptor sweepers. The CNG PLS in this project is based on the Raptor design.

Project Objective
Diesel and gasoline-powered parking lot sweepers (PLS) are widely used to clean parking lots in retail shopping centers, office parks, multi-level parking garages, and similar locations. The implementation of new alternative fuel-powered PLS vehicles in public and private fleets that provide such services could generate important emission reductions and reduce exposure to toxic diesel particulate emissions for residents residing near locations where these vehicles are utilized. This project demonstrates a CNG-powered prototype parking lot sweeper that is based on the Raptor sweeper designed and built by Nite-Hawk. The vehicle uses an Isuzu NPR-HD chassis and is powered by a dedicated CNG-powered GM 6.0L spark-ignited V8 engine using a CARB-certified CNG conversion system. The vehicle is designed to hold up to 60 GGE of onboard CNG fuel. The project objective is expected to result in the commercial availability of a dedicated CNG-powered parking lot sweeper vehicle and to provide greater awareness of alternative fuel powered vehicles to a customer base accustomed to conventional fueled vehicles.

Technology Description
The CNG powered PLS vehicle uses a GM spark-ignited 6.0L gasoline engine converted to operate on CNG. A factory installed Engine Control Unit (ECU) monitors various engine sensors and controls engine operations with various actuators. Engine performance is optimized by using CNG's high octane rating and increasing the air/fuel ratio from 14.7:1 (stoichiometric) to 17.2:1 (lean burn). The CNG version is 30% lower in NOx emissions relative to the gasoline version and the lean-fuel mixture provides greater fuel economy.

Figure 1: CNG Nite-Hawk Raptor Edge

Status

Nite-Hawk successfully developed, demonstrated and deployed, in the South Coast Air Basin, a CNG-powered parking lot sweeper vehicle. The now commercially available PLS vehicle is built on an Isuzu NPR-HD chassis rated at 14,500-lbs GVWR and is powered by a GM 6.0L V8 engine converted to CNG-power with a CARB-certified system by Greenkraft (Santa Ana, CA). The vehicle's body is Nite-Hawk's Raptor Edge. Engineering included relocating (and redesigning) the toolbox from the center to the back of the chassis and placing the CNG tanks at center chassis. The vehicle comes with two CNG fuel capacity options: 30 GGE in a single tank or 60 GGE with two identical 30 GGE tanks. The CNG tanks are Type 4 composite cylinders.

The original project called for the development of a medium-duty, CNG-powered PLS on an Isuzu chassis with the Raptor body. Nite-Hawk solicited GoNatural CNG to develop the CNG conversion system and achieve CARB certification. Shortly after completing development of the prototype PLS and commencing demonstration in California in February 2014, GoNatural CNG ceased support of the project and subsequently closed business.[1] Nite-Hawk, unable to find a company to continue these efforts decided to use Greenkraft's CARB-certified CNG conversion system for the 6.0L GM engine in an Isuzu NPR heavy-duty chassis.

Results

The dedicated CNG-powered parking lot sweeper was demonstrated to 21 public or municipal based entities through Haaker Equipment Company, and 15 private sweeping contractors through Pro-Sales Group, Inc. between 2014 and 2016. The vehicle was deployed at airports, apartment complexes, condominium parking lots, construction sites, fairgrounds, streets, parking lots, parks, paths, and shopping centers. Participants found no difference from using a gasoline-powered sweeper and found no performance deficiencies. A common concern was sufficient access to CNG refueling infrastructure. The overall response of the participants to the CNG PLS was favorable.

The CNG PLS accrued over 14,000 miles over a two-year demonstration period with each participant driving the vehicle from 150 to 1000 miles; the average demonstration was 400 miles. A total of 2,060 GGE was consumed; the miles per GGE ranged from 5 to 9.3; the overall average fuel economy was 6.75 miles/GGE. Nite-Hawk reports that a comparably equipped and powered gasoline version has an average fuel economy of 5.7 miles per gallon. On average, a Raptor PLS accrues 36,500 miles and has a 5 to 10 year lifespan. Regional fuel prices during the 2014-2016 CNG PLS demonstration averaged $2.17/GGE for CNG and $2.93/gallon for gasoline. Nite-Hawk estimates that $1,565 in fuel savings was realized from CNG refueling in this demonstration period.

Benefits

Relative to its gasoline-powered counterpart, the CNG version of this vehicle is nearly 50% cleaner in non-methane hydrocarbon + oxides of nitrogen emissions based on CARB certification values. The use of renewable natural gas would greatly reduce GHG impacts associated with vehicle operation as well as displace the use of petroleum-based fuels. The full benefits of this program are yet to be determined.

Project Costs

Total cost for this project was, as projected, $200,000. SCAQMD's contribution from the Clean Fuels Fund was $90,000. Additional in-kind contributions were provided for vehicle leasing, upfits, engineering and CNG conversion as well as the two-year demonstration of the vehicle in the South Coast Air Basin.

Commercialization and Applications

The dedicated CNG-powered Nite-Hawk Raptor Edge Parking Lot Sweeper became commercially available in California in 2014. The 2017 vehicle price differential is $28,000-$33,000 greater for the CNG model relative to the gasoline model (less incentives). California sales include City of Palm Springs Airport, Port of San Diego, and City of Exeter. Prospective sales inquirers include Waste Management, Los Angeles, CA and Los Angeles International Airport.

[1] *Following 2013, no manufacturer certified with CARB a dedicated CNG system for a medium-duty 6.0L GM engine in a medium-duty Isuzu chassis.*

SCAQMD Contract #13402 **July 2016**

Cost-Share Next Sustainable Transportation Energy Pathways (STEPs) Program

Contractor
UC Davis Institute of Transportation Studies

Cosponsors
7 energy providers
9 automakers
6 Public agencies

Project Officer
Lisa Mirisola

Background

NextSTEPS (Sustainable Transportation Energy Pathways) was a four-year (2011-2014), multidisciplinary research consortium at the UC Davis Institute of Transportation Studies. The mission was to generate new insights about the transitions to a sustainable transportation energy future and disseminate that knowledge to decision-makers in the private sector and governmental agencies so that they can make informed technology, investment, and policy choices.

NextSTEPS researchers developed the theory, tools and methods that allow for self-consistent and transparent comparisons of promising alternative energy and vehicle pathways and development of realistic integrative scenarios toward sustainable transportation goals. The NextSTEPS program followed previous UC Davis Institute of Transportation Studies (ITS-Davis) consortium-based research programs on Fuel Cell Vehicle Modeling (1998-2002), Hydrogen Pathways (2003-2006) and Sustainable Transportation Energy Pathways (STEPS) (2007-2010).

Over 200 research publications and reports produced by NextSTEPS researchers are currently available to the public at the following link www.steps.its.ucdavis.edu.

Project Objective

The NextSTEPS Program had input from a team of multi-disciplinary researchers and support from energy companies, automotive manufacturers and government agencies. NextSTEPS analyses include a focus on Southern California as the early market for alternative fueled vehicles, specifically hydrogen fuel cells, plug-in hybrid and battery electric vehicles.

Four specific STEPS projects are described below that have direct relevance to SCAQMD.

Project 1-Transition Scenarios for Alternative Fuels and Vehicles in California (Project # NS86)

NextSTEPS provided stakeholders with two overarching research updates on scenarios and transition strategies of the planned and potential rollouts of alternative vehicles and fuels in California, in order to help inform investment decisions.

NextSTEPS researchers looked at transitions for several types of fuels and vehicles:

Hydrogen - Adoption of H2 fuel cell vehicles is being spurred by new regional stakeholder partnerships, coordinating rollout of vehicles and stations. NextSTEPS transition models show that H2 infrastructure design, economics and consumer utility are improved by "cluster strategy," co-locating early adopters and early stations.

Biofuels – "Incremental" and "Transitional" biofuel investments show the most potential currently (for example, improved corn ethanol technology); "Leapfrog" technologies

(biomass gasification, cellulosic ethanol) are still important for the long term.

Project 2- Consumer Behavior & Vehicle Choice: Longitudinal Tracking Study (Project #NS38)
NextSTEPS provided critical data on consumer perceptions and use of light-duty alternative vehicles over time, which can be used as input to develop strategies for market growth and infrastructure development. Ultimately, the management tools recommended by this study can inform forecasts of transportation fuel demand, retail fuel prices, and shifts in fuel types and vehicle types for stakeholders including the California Energy Commission.

Analysis of early plug-in electric vehicle markets and conditions for growth: Case studies of California and Norway show that the market starts in pockets, loosely characterized as urban, affluent, educated, techies. Public infrastructure is important for growth. A study of California dealers shows that dealers are integral but overlooked in selling PEVs.

Project 3-Best Policy and Incentive Strategies (Project #NS88)
NextSTEPS advised stakeholders on possible policy tools to address goals and to spur the successful early-stage development of alternative vehicles and fuels.

The ITS CA-TIMES energy/economic model was developed by STEPS researchers Sonia Yeh and Chris Yang to explore the prospects for future transportation fuels in California. They found a range of scenarios that enabled deep cuts in GHG emissions (60-80% by 2050), characterized by improved vehicle efficiency, lower carbon fuels, electricity and H2, and overall reductions in energy demand.

Project 4- Low Carbon Options for Non-Light Duty Vehicle (LDV) Subsectors (NS28)
NextSTEPS shall assess low-carbon options for all non-light duty vehicle (non-LDV) subsectors (trucks, buses, rail, marine, and aviation), to help stakeholders evaluate options for AB 118 funding for non-LDV transportation subsectors.

Natural Gas - Abundant natural gas is changing the economics of alternative fuels and opening new opportunities in the U.S. medium/heavy duty trucking sectors.

Status

The NextSTEPS Program, including the four projects listed above, was completed in December 2014.

Results

From 2011 to 2014, NextSTEPS researchers produced over 208 major publications and journal articles as well as numerous research reports. In addition, the Program held 16 symposia, sponsor meetings, and policymaker outreach events in California and Washington D.C. The STEPS website (www.steps.ucdavis.edu) hosts electronic copies of selected publications and other program materials.

Benefits

The NextSTEPS Program, and especially the four projects highlighted above focusing on zero emission vehicles and low-carbon fuels, have a direct relevance to SCAQMD's priorities in evaluating changes to criteria emission levels and vehicle technology options.

Project Costs

SCAQMD contributed $120,000 toward the NextSTEPS Program for 2013 and 2014. The NextSTEPS Program was supported by other industry and government sponsorships and contracts, and the total support was over $6 million over the length of the NextSTEPS Program (2011-2014).

Commercialization and Applications

In addition, outreach and communication of results from the NextSTEPS Program will broaden the public knowledge base and help expedite introduction of zero and near-zero emitting vehicles in the South Coast Basin.

SCAQMD Contract #10723 **March 2016**

Retrofit Digester Gas Engine with Noxtech® Aftertreatment Emission Control Technology

Contractor
Eastern Municipal Water District

Cosponsors
Eastern Municipal Water District
SCAQMD

Project Officer
Al Baez

Background
SCAQMD Rule 1110.2 - Emissions from Gaseous and Liquid-Fueled Engines significantly reduces emission limits for nitrogen oxides (NOx), volatile organic compounds (VOCs), and carbon monoxide (CO) for internal combustion (IC) engines. The Eastern Municipal Water District operates 57 prime internal combustion engines, which include four digester gas-fueled IC engines at their Regional Water Reclamation Facilities. The amended rule requires biogas fueled engines to meet lower emission limits. The SCAQMD Governing Board directed staff to conduct a technology assessment to determine potential cost-effective available technologies to achieve the limits for biogas applications. This pilot study at EMWD's Temecula Valley Regional Water Reclamation Facility was performed as part of this requested assessment.

Project Objective
This pilot test study was to evaluate the ability of the Noxtech aftertreatment system to meet the requirements of the amended Rule 1110.2 for biogas applications.

Technology Description
Eastern Municipal Water District's Temecula Valley Regional Water Reclamation Facility (TVRWRF) utilizes two biogas internal combustion (IC) engines, supplemented by natural gas as needed, to drive aeration blowers for the wastewater treatment process. For this pilot study, the engine exhaust piping for the two biogas engines was modified to vent to the Noxtech reactor for exhaust after-treatment. The Noxtech system is designed to remove NOx, VOC, and CO from the engine exhaust through the patented Noxtech technology, that consists of: a self-sustaining auto thermal combustion process in a reaction chamber and utilizes urea, a low-cost nonhazardous liquid chemical, to chemically treat the exhaust gases. The system utilizes supplemental fuel to maintain an optimal reaction temperature, and fuel consumption is minimized by recovering heat released for temperature control and reaction optimization.

The Noxtech system differs from other biogas engine after-treatment controls, such as selective catalytic reduction (SCR), because it does not use a catalyst and therefore does not require a biogas clean-up system. Catalysts are generally highly susceptible to the impurities in the raw biogas which can typically poison, foul and plug catalysts; therefore, gas cleanup systems are required for those catalyst systems.

Throughout the pilot study, NOx and CO concentrations were measured at the inlet and outlet of the Noxtech reactor using a portable analyzer. This testing was conducted at least weekly or every 150 operating hours. Concentrations of NOx, CO, VOC and ammonia were measured using U.S. EPA and SCAQMD compliance methods during source testing. In addition, digester gas and ammonia samples were collected and analyzed periodically throughout the pilot study.

Status
The construction and installation of the Noxtech equipment at the TVRWRF began in March 2014. The Research and Development Phase, including initial commissioning, commenced in September 2014. The pilot study period and associated data collection commenced April 20, 2015 and ended January 18, 2016. There were a few periods of system downtime during the pilot study, which included a reactor inspection in July 2015, and a lengthy reactor shutdown as a result of biogas unavailability between September 29, 2015 and December 1, 2015. The majority of the testing was conducted with one engine operating on 100% biogas vented to the Noxtech due to issues

encountered with the engine isolation valves. Source testing was conducted on January 5, 2016 by SCEC (now Montrose Environmental), a CARB-approved independent testing contractor.

The Noxtech system was shut down on February 5, 2016 and testing for the pilot study was completed.

Figure 1: TVRWRF Noxtech® Reactor

Results

1. The overall compliance rate with the future Rule 1110.2 biogas concentration limits during the pilot demonstration period was 52% for NOx and 95% for CO based on the portable analyzer testing conducted.
2. Using the NOxtech control, the average exhaust stack concentrations throughout the pilot demonstration following portable analyzer testing protocols were 12.5 ppmvd NOx and 145 ppmvd CO (both corrected to 15% O_2). The average NOx concentration did not meet the future biogas limit of 11 ppmvd @ 15% O_2.
3. Using the NOxtech control, the average exhaust stack concentrations during the source testing by SCEC conducted on January 5, 2016, were 11.92 ppmvd NOx and 84.58 ppmvd CO (both corrected to 15% O_2.) The average NOx concentration did not meet the future biogas limit of 11 ppmvd @ 15% O_2.
4. The VOC concentration at the stack exhaust based on SCAQMD Method 25.3 testing conducted by SCEC averaged 2.34 ppm @ 15% O_2; this is below the future biogas limit of 30 ppm @ 15% O_2 in Rule 1110.2.
5. The overall compliance rate for the free ammonia concentration sampling in accordance with SCAQMD Method 207.1 was 50%. There were four ammonia sampling events during the pilot period, two of which exceeded the permitted limit of 10 ppm @ 15% O_2 for ammonia slip.
6. The reliability of the urea injector components and the NOx analyzer selection may benefit from additional testing to determine the equipment life expectancy and whether an alternative, more suitable component is available.

Benefits

The use of the Noxtech system generally reduced NOx, VOC, and CO emissions from the engine. However, the NOx reductions were not consistently below the amended Rule 1110.2 biogas limits and in some cases CO emissions increased. The pilot study demonstrated that aside from sample conditioning for the continuous analyzers, a digester gas clean-up system is not required for the Noxtech system.

Project Costs

SCAQMD provided $85,000 from the Clean Fuels Fund for this project. EMWD funded the remaining costs for total project costs of $889,000.

Commercialization and Applications

The capital costs to design, procure and install the Noxtech system will vary depending on the site. The estimated cost of a reactor is $400,000 and the installation cost for the pilot study installation of the two dual fuel blower engines at the TVRWRF was approximately $525,000. EMWD staff invested significant additional staff resources throughout the Research and Development Phase as well as the Pilot Demonstration Phase of this test program to make system improvements to resolve short-term problems and identify long-term solutions for the challenges faced during this study. EMWD spent approximately $1.35 million dollars on the TVRWRF Noxtech installation and pilot study. EMWD staff estimates the capital costs for a system similar to the unit installed at the TVRWRF, for two engines, to be up to $1.8 million dollars. The annual estimated O&M costs for the Noxtech system are approximately $77,000. Assuming a 10-year lifespan, the total annualized cost (estimated capital and O&M) is $242,000. The dollars per ton of NOx reduced are estimated to be $579,340. The dollars per ton of VOC reduced are estimated to be $222,510.

SCAQMD Contract #12208 **January 2016**

Determining the Physical and Chemical Composition and Associated Health Effects of Tailpipe PM Emissions

Contractor

University of California Riverside/College of Engineering-Center for Environmental Research & Technology (CE-CERT)

Cosponsors

California Energy Commission
SCAQMD

Project Officer

Brian Choe

Background

In recent years, governmental agencies around the world have implemented legislation that supports the use of alternative and/or renewable fuels in the transportation sector to reduce GHG emissions. In California, the Low Carbon Fuel Standard (LCFS) was implemented beginning in 2011 to reduce the carbon intensity of transportation fuels by 10% by 2020. Among the different oxygenated biofuels being used globally today, ethanol is the most widely employed, particularly in the U.S. Higher alcohols, such as butanol, have also been the subject of increased interest as potential fuels. With an increase in the use of ethanol and other biofuels to lower carbon intensity, it is important to analyze and test these fuel blends to better understand the impacts that changing fuel composition will have on exhaust emissions and in turn on ambient air quality, especially from gasoline direct injection (GDI) vehicles that are the fastest growing market segment in the automobile industry as manufacturers introduce more GDI models to meet new and more stringent fuel economy standards.

Project Objective

The objective of this program was to characterize physicochemical and toxicological properties of PM emissions from GDI vehicles when operating on different ethanol and iso-butanol blends.

Technology Description

As part of this study, physicochemical, and toxicological properties of PM emissions were investigated from one GDI passenger vehicle and two flexible fuel vehicles (FFVs), with port fuel injection (PFI) and direct injection fueling, respectively. This study emphasized the fuel type, composition, and blend level impacts on exhaust emissions and their potential toxicity. The study included both low and high level blends of ethanol and butanol, including E10, E20, Bu16, E51, E83, and Bu55. All testing was conducted on a 48-inch single-role electric dynamometer and a Pierburg Positive Displacement Pump-Constant Volume Sampling system was used to obtain certification-quality measurements. This was a collaborative study led by the College of Engineering-Center for Environmental Research & Technology (CE-CERT) at the University of California, Riverside, with support from the University of California, Los Angeles (UCLA) for toxicological analysis.

Status

This project has been completed and final reporting submitted in June 2016.

Results

PM mass, particle number, and black carbon emissions from the two GDI vehicles were found at higher levels than the PFI-FFV, due to incomplete fuel droplet evaporation and droplet impingement onto the piston and cylinder walls from the direct spray of fuel into the combustion chamber, leading to locally rich fuel combustion or pyrolysis that is prone to PM formation. For the FTP, PM mass ranged from 1.23 to 2.74 mg/mile for the PC-GDI, from 0.79 to 3.06 mg/mile for the PFI-FFV, and from 1.68 to 4.85 mg/mile for the GDI-FFV. For the UC test cycle, PM mass ranged from 0.68 to 2.53 mg/mile for the PC-GDI, from 0.73 to 1.49 mg/mile for the PFI-FFV, and from 1.15 to 4.83 for the GDI-FFV. Overall, the use of higher alcohol content fuels resulted in lower PM mass emissions

for all three vehicles during FTP and UC operations, with the exception of the PFI-FFV. The GDI-FFV exhibited substantially higher soot emissions than the PFI-FFV, suggesting that the PM from the GDI-FFV was primarily elemental carbon in nature.

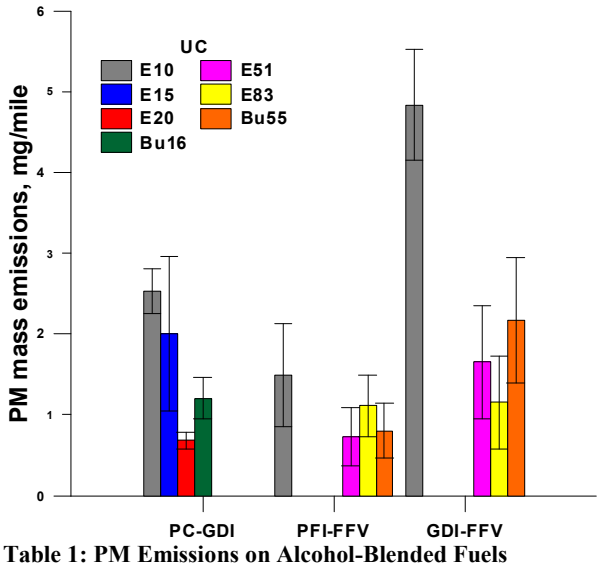


Table 1: PM Emissions on Alcohol-Blended Fuels

More than 100 PAH compounds were identified and quantified in both the gas- and particle-phase exhaust PM for all vehicle/fuel combinations over the FTP test cycle, including non-substituted PAHs, methyl- and ethyl-substituted PAHs, biphenyls, and oxygenated PAHs. Also, the GDI-FFV showed higher levels of total PAH emissions, compared to the other two vehicles, with the higher alcohol blends showing lower total PAH emissions than E10.

The oxidative potential, measured with the DTT assay, did not show any strong trends for the different alcohol fuels tested on both GDI and PFI vehicles. The DTT activity rates of all higher ethanol blends were below the blank/background samples for both the particle- and vapor-phase PM.

Benefits

The outcome of this study provided important information about the potential impacts of mid-level and high-level ethanol and iso-butanol blends on emissions and air quality during the near and medium term implementations of renewable fuel regulations. In addition, the test results are helpful in assessing the health consequences of population exposure to GDI vehicles in Southern California.

Project Costs

The project cost of $175,000 was funded by the SCAQMD. This project was conducted in conjunction with a testing program primarily funded by a $1,200,000 grant from the California Energy Commission to evaluate criteria and other regulated emissions from ethanol- and other alcohol-fueled vehicles.

Commercialization and Applications

In summary, the data from this study confirm that vehicles with direct injection fueling are exhibiting higher PM mass, number and soot emissions compared to PFI vehicles. The addition of higher ethanol blends results in lower particulate emissions for both engine technologies. This result is important since GDI vehicles are becoming more prevalent in the U.S. market and it is expected that they will eventually dominate the market over the conventional PFI vehicles.

The use of ethanol appears to be beneficial for substantially reducing PM mass emissions from GDI vehicles. Our findings show that GDI vehicles produce more toxic and potentially carcinogenic compounds in the tailpipe, such as those of PAHs, compared to PFI vehicles. The application of ethanol fuels, on the other hand, is capable of reducing most PAH compounds in the tailpipe. Overall, this study did not show any redox activity in both GDI and PFI exhaust, with the results being largely inconclusive regarding the health effects impact from current technology GDI and PFI vehicles on alcohol fuels.

Looking ahead, the results suggest that further testing is necessary utilizing next-generation GDI vehicles equipped with either wall-guided or spray-guided architectures on ethanol blends. More importantly, a more comprehensive investigation is necessary on real-world driving emissions using portable emission measurement systems (PEMS).

SCAQMD Contract #12865 **July 2016**

Develop Quantitative Cellular Assays to Understand the Chemical Basis of Air Pollutant Toxicity

Contractor

University of California Los Angeles (UCLA)

Cosponsors

SCAQMD
UC Riverside (UCR)/College of Engineering-Center for Environmental Research & Technology (CE-CERT)

Project Officer

Dr. Jean Ospital/Dr. Jo Kay Ghosh

Background

Regulatory efforts are focused on reduction of emissions of motor vehicles, including diesel-fueled vehicles involved with goods movement in Southern California. These reductions are aimed at meeting ambient air quality standards, including for PM10 and PM2.5, as well as reducing exposure to toxic air contaminants. As lower-emitting technologies are deployed and particle emissions go down, however, a question remains as to the toxicity of the remaining emissions. Although advanced technologies are very effective at lowering the mass of emissions, there are concerns that other substances such as volatile and semi-volatile organic compounds may be emitted that have potential adverse health effects.

Project Objective

The University of California Los Angeles (UCLA) proposed to develop a biological mechanism-based analytical procedure to characterize the toxicity of air pollutants. UCLA would work with UCR/CE-CERT to collect a large quantity of diesel exhaust, including both particulate and vapor phase, from a well-characterized engine using low-sulfur fuel as the standard. Quantitative dose response toxicity assays could then be conducted with, for example, emissions from advanced-technology engines to compare the results from assays using the standard diesel emissions. The project would also build upon the toxicity assays developed under the auspices of the Southern California Particle Center, which was sponsored by the U.S. EPA.

Technology Description

The assays target specific biochemical pathways and proteins that are thought to be involved in the toxicity of pollutants. The pathways include inflammation, cellular oxidation potential and chemical reactions with cellular proteins. Specific chemical assays were used, as well as specific macrophage cell lines that had been used in previous air pollution toxicity studies. A standard protocol was also developed that was applied to collect pollutant samples. The overall response by the cell or the organism will reflect the "balance" between the two opposing responses. Investigators postulated that redox active metals in the particle phase are the major factors in inflammation and volatile organic electrophiles the major factor in adaptation.

Status

This project was done in two phases. The first phase was to conduct development and initial application of the toxicity assays. The second phase was to further develop and apply the toxicity assays to both particulate and vapor phase pollutant samples. This study is now complete.

The project was supposed to include fractionation of a large-scale diesel exhaust particle (DEP) sample coming from Japan. Because it wasn't timely provided during the scope of the project, UCLA was only able to begin some protocol development utilizing a sequential of extraction with the solvent mixtures and dominant chemical species extracted.

Results

Ambient air samples (PM2.5 and semi-volatile organic species) from Commerce (CM), Long Beach (LB) and San Bernardino (SB) were analyzed chemically with the DTT prooxidant and GAPDH electrophile assays and biologically for concentration-dependent effects on inflammation and adaptation, measured by induction of tumor necrosis factor alphas (TNFa) and hemeoxygenase-1 (HO-1), respectively, in a macrophage cell line. Seasonal differences were observed with winter PM2.5 samples from CM and LB containing significantly higher prooxidant content than the corresponding summer samples. Prooxidants were mostly in the particle phase (70-80%) and electrophiles were mostly (80-95%) in the vapor or the volatile organic phase in all samples. Biological analyses of summer PM2.5 samples reflected their

reactive chemical content with the SB sample the most proinflammatory. Analysis of the corresponding vapor samples showed the SB sample, with its highest electrophile content, to be the most potent in inducing adaptation. Aside from the regional and seasonal differences these quantitative analyses demonstrated, the chemical and biological results also pointed out the important contributions the volatile organic species in the ambient air provide to the overall biological effects of the ambient aerosol. The PM2.5 samples are proinflammatory; when examined separately from the vapor phase, they induce an inflammatory response, whereas the vapor phase, with its high electrophile content is pro-adaptive, inducing expression of proteins that suppress inflammation. Then when the vapor and particle effects are examined together, the proinflammatory effects of PM2.5 are reduced by the semi-volatile organic components.

Emission samples from biodiesel-fueled engines and cooking oil smoke samples from CE-CERT were also subjected to these analyses. However, as quantities limited the biological analyses to single concentration instead of three, comparisons between chemical and biological analyses were performed on separate samples at a fixed concentration and the data analyzed by correlation analysis. In general, the results agreed with those found in the three-community study above, in that the particle phase contained prooxidants and the vapor phase contained the electrophiles.

A correlation analysis of assay results and chemical data from CE-CERT was then performed to test the notions that the inflammatory response was related to prooxidant activity and that the adaptive response was reflective of the chemical data linked to organic electrophiles. For the particle samples, the inflammatory TNFa response and prooxidant effect were highly correlated ($p<.04$) and the prooxidant content correlated with redox active metal content ($p<.011$) consistent with the notion of metal-based prooxidant action on the inflammatory response. The electrophile content of the vapor samples was too low for measurement, but prooxidant content was measureable. Analyses of these samples showed a high correlation of the adaptive response with the prooxidant activity ($p<0.014$) which, in turn correlated with the water-soluble organic content ($p<.04$). The objective of the study generating these samples was to compare the emissions for their potential toxicity and the results obtained here show the decreasing order to be ULSD>waste cooking oil≥soy>animal fat methyl esters.

The cooking oil smoke-based results were qualitatively different from the biodiesel, reflecting differences in chemical composition; the adaptive response was dominant for the particles with a high correlation with prooxidant content ($p<.013$). Vapor phase sample adaptive activity did not correlate with either prooxidant or electrophile content.

The objective of the study generating these samples was to compare the effectiveness of three different types of filter systems in removing the toxic components of cooking oil smoke. The results indicate the decreasing order of toxicity to be baseline>Streivor>Innovatech>ES.

Benefits

The project helped to address questions such as which specific chemicals in pollutant samples are associated with cellular toxicity, assess the relative effects of particulate versus vapor phase of emissions, and compare toxic responses of emissions from different fuel types. The results would help form the scientific basis for quantifying how reducing emissions and promoting alternative technologies may improve public health. It helped understanding of the linkage between sources, chemical composition, and toxicity of emissions from motor vehicles, and thus how to assess strategies to protect the public from exposure to motor vehicle emissions.

Project Costs

For Phase 1 the SCAQMD provided $368,457, with UCR/CE-CERT providing in-kind cost-share totaling $60,609. For Phase 2 the SCAQMD provided $319,553. Total project costs were $748,619.

Commercialization and Applications

The results clearly demonstrate the advantages of quantitative chemical and biological analyses in the evaluation of air pollution toxicology. Furthermore, they show that such assays need not be for specific chemical species as much as they need to assay biologically relevant chemical reactivities together with biological responses. Investigators believe that the four relatively simple procedures for prooxidant and electrophile content and for inflammatory and adaptive responses, together with consistent collection procedures, will provide regulators with useful quantitative data in determining the conditions for adverse health associated with aerosol generation and approaches to its amelioration.

SCAQMD Contract #14172 **August 2016**

Study Of Oxidative Stress In Relation To Particulate Air Pollution Exposures In Elderly

Contractor
University of California Irvine

Cosponsors
SCAQMD
BP Group

Project Officer
Dr. Jean Ospital/Dr. Jo Kay Ghosh

Background
Ambient particulate matter (PM), specifically PM2.5 and PM10, has been associated with increases in cardiovascular and respiratory hospitalization and mortality in many epidemiologic time series studies. However, exposure error from the use of PM2.5 and PM10 has likely produced underestimates of PM effects because numerous toxic particle components are not accurately reflected by total mass (Ayres 2008). Furthermore, particle oxidative potential can be independent of mass, because a large fraction of PM mass is biologically inactive, while a temporally and spatially variable smaller fraction has the potential to induce oxidative stress. Oxidative stress is a key effect of air pollutants that is believed to be one of the major pathophysiological mechanisms responsible for the observed morbidity and mortality associations. Specifically, many experimental studies suggest that increased airway inflammation occurs through oxidative stress, which follows exposure to products of fossil fuel combustion, including chemicals with oxidative potential. However, there is little epidemiologic data on relations between such chemical components in PM air pollution including polycyclic aromatic hydrocarbons (PAH) and airway oxidative stress. These issues are important to assess given the multipollutant nature of PM. This has considerable importance to protecting public health since effect estimates from population studies may have underestimated effects by lumping air pollutant components with different toxicities and different target organs into one surrogate exposure such as PM2.5.

Project Objective
We examined relations of air pollution exposures to airway and systemic biomarkers of oxidative stress in a cohort panel of elderly subjects living in the Los Angeles air basin.This was accomplished with 12 weekly measurements of air pollutants and other cardiovascular and respiratory outcomes in a panel study funded by the National Institutes of Health (NIH, NIEHS, R01-ES12243-06). We collected exhaled breath condensates and measured biomarkers of airway oxidative stress and related them to air pollutant exposures. Air pollutants included size-fractionated PM, which was measured under the NIH funding. The biomarkers were assayed in the exhaled breath condensates and included malondialdehyde (a biomarker of lipid peroxidation) measured by fluorescent HPLC. The NIH study provided additional comparison data on airway inflammation, systemic oxidative stress and inflammation in the blood.

Technology Description
We conducted a cohort panel study involving 97 elderly subjects living in the Los Angeles metropolitan area. Airway and circulating biomarkers of oxidative stress and inflammation were measured weekly over 12 weeks and included, exhaled breath condensate malondialdehyde (EBC MDA), fractional exhaled nitric oxide (FeNO), plasma oxidized low-density lipoprotein (oxLDL), and plasma interleukin-6 (IL-6). Exposures included 7-day personal nitrogen oxides (NO_X), daily criteria-pollutant data, five-day average PM measured in three size-fractions and characterized by chemical components including transition metals, and *in vitro* PM oxidative potential (dithiothreitol and macrophage reactive oxygen species). Associations between biomarkers and pollutants were assessed using linear mixed effects regression models.

Status

This project was completed successfully in August 2016. The final report with complete technical details is submitted and on file at SCAQMD.

Results

We found significant positive associations of airway oxidative stress and inflammation with traffic-related air pollutants, ultrafine particles < 0.18 µm in aerodynamic diameter, and transition metals. Results for the airway biomarker of oxidative stress (EBC MDA) are shown in Figure 1.

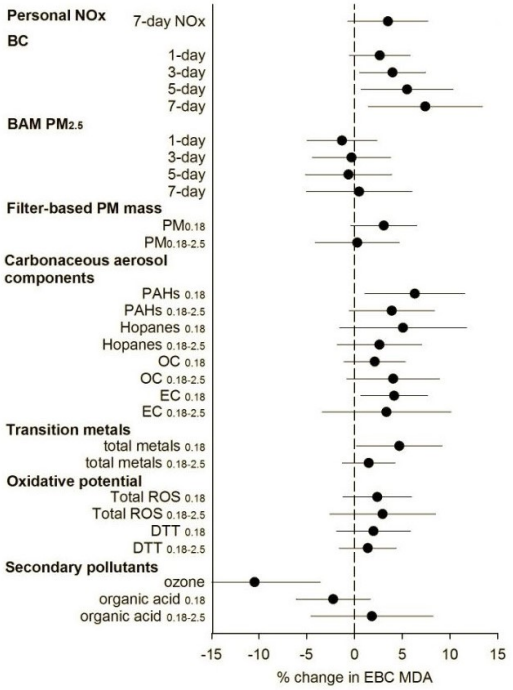


Figure 1. Percent Change (mean and 95 % confidence intervals) in airway inflammatory biomarkers EBC MDA (A) and airway oxidative stress biomarker FeNO (B) with a one interquartile range increase of ambient and personal air pollutants. Exposures were averaged across 5 days except as specified. BC: black carbon; CO: carbon monoxide; DTT: dithiothreitol; EBC MDA: malondialdehyde in exhaled breath condensate; EC: elemental carbon; FeNO: exhaled nitric oxide; NO_X: nitrogen oxides; OC: organic carbon; PAHs: polycyclic aromatic hydrocarbons; ROS: reactive oxygen species.
From Zhang et al. Environ Res, 2016;150:306-319

Positive but nonsignificant associations were observed with markers of PM oxidative potential. The strongest associations were observed among PM variables in the ultrafine range. It was estimated that an interquartile increase in 5-day average ultrafine polycyclic aromatic hydrocarbons was associated with a 6.3% (95% CI: 1.1%, 11.6%) increase in EBC MDA and 6.7% (95% CI: 3.4%, 10.2%) increase in FeNO. In addition, positive but nonsignificant associations were observed between oxLDL and traffic-related pollutants, ultrafine particles and transition metals while plasma IL-6 was positively associated with 1-day average traffic-related pollutants.

Benefits

This study adds to mounting evidence that exposure to prooxidant particle components from fossil fuel combustion sources such as PAH result in oxidative stress and inflammation. The extensive chemical characterization of air pollutant exposures in the present study enabled a comprehensive assessment of airway oxidative stress responses to different air pollutant components. These results were coherent with results from the parent NIH-funded parent study showing other adverse pathophysiological responses, including increased systemic inflammation and microvascular endothelial dysfunction. Results of this research has contributed to knowledge needed to control multipollutant exposures most likely to adversely impact the public's health because we addressed questions about which chemical components and sources of air pollution have the greatest potential for toxicity in people. Findings contribute to regulatory decisions aimed at protecting sensitive populations because putative causal constituents of PM are likely not well-represented by PM2.5 alone.

Project Costs

SCAQMD cost-shared this from the Clean Fuels Fund in the amount of $159,974. The BP Group contributed $216,394, in keeping with the ongoing terms of a 2005 settlement agreement. Total project costs were $376,368.

Commercialization and Applications

This is an epidemiologic study using existing laboratory technology. The methods used can and should be applied to other projects with similar goals of assessing the health impacts of air pollution in susceptible populations. The results can be applied to the decision-making process on whether certain alternative fuel technologies should be developed and deployed.

Appendix D

Project Ranking

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Project Ranking

For each of the core technologies discussed earlier in this report, staff considers numerous factors that influence the proposed allocation of funds, ranging from overall Environment & Health Benefits, Technology Maturity and Compatibility, and Cost, summarized in the proposed ranking system.

Within the broad factors included above, staff has included sub-factors for each specific type of project that may be considered, as summarized below:

Environment and Health

Criteria Pollutant Emission Reduction potential continues to receive the highest priority for projects that facilitate the NOx reduction goals outlined in the 2016 AQMP. Technologies that provide co-benefits of Greenhouse Gas and Petroleum Reduction are also weighted favorably, considering the Clean Fuels Program is able to leverage funds available through several state and federal programs, as well as overall health benefits in reducing exposure to Ozone and PM2.5, especially along disadvantaged communities.

Technology Maturity & Compatibility

Numerous approaches have been used to evaluate technology maturity and risk that include an evaluation of potential uncertainty in real world operations. This approach can include numerous weighting factors based on assessed importance of a particular technology. Some key metrics that can be considered include Infrastructure Constructability that would evaluate the potential of fuel or energy for the technology and readiness of associated infrastructure, Technology Readiness that includes not only the research and development of the technology, but potential larger scale deployments that consider near-term implementation duty and operational compatibility for the end users. These combined factors can provide an assessment for market readiness of the technology.

Cost/Incentives

The long-term costs and performance of advanced technologies are highly uncertain, considering continued development of these technologies is likely to involve unforeseen changes in basic design and materials. Additionally, economic sustainability – or market driven – implementation of these technologies is another key factor for the technology research, development, demonstration and deployment projects. Therefore, in an effort to accelerate the demonstration and deployment, especially some pre-commercialization technologies, incentive programs such as those available from local, state and federal programs are key, but may be underfunded for larger scale deployments. As a part of the 2016 AQMP, staff has also included the Draft Financial Incentives Funding Action Plan to address the funding necessary for full implementation of the control measures included.

Staff has proposed a simplified approach to ranking the core technologies, especially some of the specific platforms and technologies discussed in the draft plan and annual report. The rankings below take into account experience with implementing the Clean Fuels Program for numerous years, as well as understanding the current development and deployment state of the technologies and associated infrastructure, and are based on the following "Consumer Reports" type approach:

● Excellent ◓ Good ○ Satisfactory ◒ Poor ● Unacceptable

The table below summarizes staff ranking of the potential projects anticipated in the draft plan, and it is noted that technology developers, suppliers, and other experts may differ in their approach to ranking these projects. For example, staff ranks Electric/Hybrid Technologies and Infrastructure as Excellent or Good for Criteria Pollutant and GHG/Petroleum Reduction, but Poor to Good for Technology Maturity & Compatibility, and Satisfactory to Unacceptable for Costs and Incentives to affect large

scale deployment. It is further noted that the Clean Fuels Fund's primary focus remains on-road vehicles and fuels, and funds for off-road and stationary sources are limited.

This approach has been reviewed with the Clean Fuels and Technology Advancement Advisory Groups, as well as the Governing Board.

Technologies & Proposed Solutions	Environment & Health			Technology Maturity & Compatibility				Cost	
	Emissions Reduction	GHG/Petroleum Reduction	Health Benefits	Infrastructure Constructability	Technology Readiness	Near-Term Implementation/ Duty Cycle Fulfillment Capability	Operations Compatibility	Relative Cost & Economic Sustainability	Incentives Available
Electric/Hybrid Technologies & Infrastructure									
Plug-In Hybrid Heavy-Duty Trucks with Zero-Emission Range	◓	○	◓	●	○	◓	◓	◒	●
Heavy-Duty Zero-Emission Trucks	●	◓	●	◓	◒	◒	○	●	●
Medium-Duty Trucks	◓	◓	●	◓	○	◒	◒	◒	●
Medium- and Heavy-Duty Buses	●	◓	●	◓	○	◒	○	◒	●
Light-Duty Vehicles	◓	◓	●	◓	◓	◓	◓	◒	◒
Infrastructure	-	-	-	◓	◓	◓	◓	○	◒
Hydrogen & Fuel Cell Technologies & Infrastructure									
Heavy-Duty Trucks	●	◓	◓	○	◒	◒	◒	●	●
Heavy-Duty Buses	●	◓	◓	○	◒	◒	◒	●	●
Off-road – Locomotive/Marine	●	◓	◓	○	◒	◒	◒	●	●
Light-Duty Vehicles	●	◓	◓	○	◓	○	○	○	◒
Infrastructure – Production, Dispensing, Certification	-	-	-	○	○	◒	◒	●	◒
Engine Systems									
Ultra-Low emissions Heavy-Duty Engines	◓	◓	◓	●	○	○	●	◓	○
Alternative Fuel Medium- and Heavy-Duty Vehicles	◓	◓	◓	●	◓	◓	●	◓	○
Off-Road Applications	◓	◓	◓	●	◓	◓	●	◓	○
Fueling Infrastructure & Deployment									
Production of Renewable Natural Gas – Biowaste/Feedstock	◓	●	◓	●	◓	◓	◓	○	○
Synthesis Gas to Renewable Natural Gas	◓	●	◓	●	◓	◓	◓	○	○
Expansion of Infrastructure/Stations/Equipment/RNG Transition	◓	◓	◓	●	◓	◓	◓	◓	○
Stationary Clean Fuel Technologies									
Low-Emission Stationary & Control Technologies	◓	◓	◓	◓	○	○	◓	○	○
Renewable Fuels for Stationary Technologies	○	●	◓	◓	○	○	○	○	○
Vehicle-to-Grid or Vehicle-to-Building/Storage	●	●	◓	○	○	◒	○	○	◒
Emission Control Technologies									
Alternative/Renewable Liquid Fuels	◒	◓	◓	◓	○	○	●	◒	○
Advanced Aftertreatment Technologies	◓	○	◓	○	○	◓	◓	◓	○
Lower-Emitting Lubricant Technologies	○	○	●	-	◓	◓	◓	●	○
● Excellent ◓ Good ○ Satisfactory ◒ Poor ◒ Unacceptable									

Appendix E

List of Acronyms

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LIST OF ACRONYMS

AB—Assembly Bill
AC-absorption chiller
ADA—American with Disabilities Act
AER—all-electric range
AFRC—air/fuel ratio control
AFVs—Alternative Fuel Vehicles
APCD—Air Pollution Control District
AQMD—Air Quality Management District
AQMP—Air Quality Management Plan
ARB—Air Resources Board
ARRA—American Recovery & Reinvestment Act
AWMA—Air & Waste Management Association
BACT—Best Available Control Technology
BET—battery electric truck
BEV—battery electric vehicle
BSNOx—brake specific NOx
BMS—battery management system
CAAP—Clean Air Action Plan
CAFR—Comprehensive Annual Financial Report
CaFCP—California Fuel Cell Partnership
CARB—California Air Resources Board
CATI—Clean Air Technology Initiative
CCF—California Clean Fuels
CCHP—combined cooling, heat and power
CDFA/DMS—California Department of Food &Agriculture/Division of Measurement Standards
CEC—California Energy Commission
CE-CERT—College of Engineering – Center for Environmental Research and Technology
CEMS—continuous emission monitoring system
CEQA—The California Environmental Quality Act
CFCI—Clean Fuel Connection, Inc.
CFD—computational fluid dynamic
CHBC—California Hydrogen Business Council
CNG—compressed natural gas
CNGVP—California Natural Gas Vehicle Partnership
CO_2—carbon dioxide
CO—carbon monoxide
ComZEV—Commercial Zero-Emission Vehicle
CPA—Certified Public Accountant
CPUC—California Public Utilities Commission
CRDS—cavity ring-down spectroscopy
CRT—continuously regenerating technology
CVAG—Coachella Valley Association of Governments
CY—calendar year
DC—direct connection
DCM—dichloromethane
DEG—diesel equivalent gallons
DGE—diesel gallon equivalents
DF—deterioration factor
DME—dimethyl ether
DMS—Division of Measurement Standards
DMV—Department of Motor Vehicles
DOC—diesel oxidation catalysts
DOE—Department of Energy
DOT—Department of Transportation
DPF—diesel particulate filters
DRC—Desert Resource Center
DRI—Desert Research Institute
ECM—emission control monitoring
EDTA—Electric Drive Transportation Association
EGR—exhaust gas recirculation
EIN—Energy Independence Now
EPRI—Electric Power Research Institute
E-rEV—extended-range electric vehicles
ESD—emergency shut down
EV—electric vehicle
FCV—fuel cell vehicle
FTA—Federal Transit Administration
FTP—federal test procedures
g/bhp-hr—grams per brake horsepower per hour
GC/MS—gas chromatography/mass spectrometry
GCW—gross combination weight
GDI—gasoline direct injection
GGE—gasoline gallon equivalents
GGRF—Greenhouse Gas Reduction Relief Fund
GHG—Greenhouse Gas
GNA—Gladstein, Neandross & Associates, LLC
GTL—gas to liquid
H&SC—California Health and Safety Code
HCCI—Homogeneous Charge Combustion Ignition
HCNG—hydrogen-compressed natural gas (blend)
HDDT—highway dynamometer driving schedule
HD-FTP—Heavy-Duty Federal Test Procedure
HDV—heavy-duty vehicle
HEV—Hybrid electric vehicle
HOA—Homeowners Association
HQSA—hydrogen quality sampling adapter
HPDI—High Pressure Diesel Injection
HPLC—high-performance liquid chromatography
HT—high throughput
HTFCs-high-temperature fuel cells
H2NIP—Hydrogen Network Investment Plan
HTPH—high throughput pretreatment and enzymatic hydrolysis
HyPPO—Hydrogen Progress, Priorities and Opportunities report

LIST OF ACRONYMS (cont'd)

ICE—internal combustion engine
ICEV—internal combustion engine vehicle
ICTC—Interstate Clean Transportation Corridor
IVOC—intermediate volatility organic compound
kg—kilogram
LACMTA—Los Angeles County Metropolitan Transit Authority
LADWP—Los Angeles Department of Water and Power
LCFS—Low Carbon Fuel Standard
Li—lithium ion
LIMS—Laboratory Information Management System
LLNL—Lawrence Livermore National Laboratory
LNG—liquefied natural gas
LPG—liquefied petroleum gas or propane
LSV—low-speed vehicle
LUV—local-use vehicle
LVP—low vapor pressure
MATES—Multiple Air Toxics Exposure Study
MECA—Manufacturers of Emission Controls Association
MOA—Memorandum of Agreement
MPa—MegaPascal
MPFI—Multi-Port Fuel Injection
MPG—miles per gallon
MSRC—Mobile Source Air Pollution Reduction Review Committee
MSW—municipal solid wastes
MY—model year
MTA—Metropolitan Transportation Authority (Los Angeles County "Metro")
NAAQS-National Ambient Air Quality Standards
NAFA—National Association of Fleet Administrators
NFPA—National Fire Protection Association
NCP—nonconformance penalty
NEV—neighborhood electric vehicles
NextSTEPS—Next Sustainable Transportation Energy Pathways
NG/NGV—natural gas/natural gas vehicle
NH3—ammonia
NHTSA—Natural Highway Traffic Safety Administration
NMHC—non-methane hydrocarbon
NO—nitrogen monoxide
NO_2—nitrogen dioxide
$NO + NO_2$—nitrous oxide
NOPA—Notice of Proposed Award
NOx—oxides of nitrogen
NRC—National Research Council
NREL—National Renewables Energy Laboratory
NSPS—New Source Performance Standard
NSR—New Source Review
NZ—near zero
OBD—On-Board Diagnostics
OCS—overhead catenary system
OCTA—Orange County Transit Authority
OEHHA—Office of Environmental Health Hazard Assessment
OEM—original equipment manufacturer
PAH—polyaromatic hydrocarbons
PbA—lead acid
PCM—powertrain control module
PEMFC—proton exchange membrane fuel cell
PEMS—portable emissions measurement system
PEV—plug-in electric vehicle
PHET—plug-in hybrid electric truck
PHEV—plug-in hybrid vehicle
PM—particulate matter
PM2.5—particulate matter ≤ 2.5 microns
PM10—particulate matter ≤ 10 microns
POS—point of sale
ppm—parts per million
ppb—parts per billion
PSI—Power Solutions International
PTR-MS—proton transfer reaction-mass spectrometry
RDD&D (or RD3)—research, development, demonstration and deployment
REC—renewable energy certificates
RFP—Request for Proposal
RFS—renewable fuel standards
RI—reactive intermediates
RNG—renewable natural gas
RPS—Renewable Portfolio Standard
RRC—rolling resistance co-efficient
RTA—Riverside Transit Agency
RTP/SCS—Regional Transportation Plan/Sustainable Communities Strategy
SB—Senate Bill
SCAB—South Coast Air Basin or "Basin"
SCAQMD—South Coast Air Quality Management District
SCE—Southern California Edison
SCR—selective catalytic reduction
SHR—Steam Hydrogasification Reaction
SI—spark ignited
SI-EGR—spark-ignited, stoichiometric, cooled exhaust gas recirculation
SIP—State Implementation Plan

LIST OF ACRONYMS (cont'd)

SJVAPCD—San Joaquin Valley Air Pollution Control District
SOAs—secondary organic aerosols
SoCalGas—Southern California Gas Company (A Sempra Energy Utility)
SULEV—super ultra-low emission vehicle
SUV—Sports Utility Vehicle
TAO—Technology Advancement Office
TC—total carbon
TEMS—transportable emissions measurement system
THC—total hydrocarbons
TO—task order
tpd—tons per day
TRB—Transportation Research Board
TSI—Three Squares, Inc.
TWC—three-way catalyst
UCR—University of California Riverside
UCLA—University of California Los Angeles
UDDS—urban dynamometer driving schedule
$\mu g/m^3$—microgram per cubic meter
ULEV—ultra low emission vehicle
UPS—United Postal Service
U.S.—United States
U.S.EPA—United States Environmental Protection Agency
V2B—vehicle-to-building
V2G—vehicle-to-grid
VMT—vehicle miles traveled
VOC—volatile organic compounds
WVU—West Virginia University
ZECT—Zero Emission Cargo Transport
ZEV—zero emission vehicle

South Coast
Air Quality Management District
21865 Copley Drive, Diamond Bar, CA 91765-4178
(909) 396-2000 • www.aqmd.gov

BOARD MEETING DATE: March 3, 2017 AGENDA NO. 38

REPORT: Annual RECLAIM Audit Report for 2015 Compliance Year

SYNOPSIS: The annual report on the NOx and SOx RECLAIM program is prepared in accordance with Rule 2015 - Backstop Provisions. The report assesses emission reductions, availability of RECLAIM Trading Credits (RTCs) and their average annual prices, job impacts, compliance issues, and other measures of performance for the twenty-second year of this program. In addition, recent trends in trading future year RTCs are analyzed and presented in this report. Further, a list of facilities that did not reconcile their emissions for the 2015 Compliance Year is included with the report.

COMMITTEE: Stationary Source, February 17, 2017, Reviewed

RECOMMENDED ACTION:
Approve the attached annual report.

Wayne Nastri
Executive Officer

LT:DL

Background

The Board adopted the RECLAIM program on October 15, 1993 to provide a more flexible compliance program than command-and-control for specific facilities, which represent SCAQMD's largest emitters of NOx and SOx. Although RECLAIM was developed as an alternative to command-and-control, it was designed to meet all state and federal Clean Air Act and other air quality regulations and program requirements, as well as a variety of performance criteria in order to ensure public health protection, air quality improvement, effective enforcement, and the same or lower implementation costs and job impacts. RECLAIM is what is commonly referred to as a "cap and trade" program. Facilities subject to the program were initially allocated declining annual balances of RECLAIM Trading Credits (RTCs, denominated in pounds of emissions in a specified year) based upon their historical production levels and upon emissions

factors established in the RECLAIM regulation. RECLAIM facilities are required to reconcile their emissions with their RTC holdings on a quarterly and annual basis (*i.e.*, hold RTCs equal to or greater than their emissions). These facilities have the flexibility to manage how they meet their emission goals by installing emission controls, making process changes or trading RTCs amongst themselves. RECLAIM achieves its overall emission reduction goals provided aggregate RECLAIM emissions are no more than aggregate allocations.

RECLAIM Rule 2015 - Backstop Provisions requires SCAQMD staff to conduct annual program audits to assess various aspects of the program and to verify that program objectives are met. SCAQMD staff has completed audits of facility records and completed the annual audit of the RECLAIM program for Compliance Year 2015 (which encompasses the time period for Cycle 1 from January 1, 2015 to December 31, 2015 and for Cycle 2 from July 1, 2015 to June 30, 2016). Based on audited emissions in this report and previous annual reports, SCAQMD staff has determined that RECLAIM met its emissions goals for Compliance Year 2015, as well as for all previous compliance years with the only exception of NOx emissions in Compliance Year 2000. For that year, NOx emissions exceeded programmatic allocations (by 11%) primarily due to emissions from electric generating facilities during the California energy crisis. For Compliance Year 2015, audited NOx emissions were 25% less than programmatic NOx allocations and audited SOx emissions were 26% less than programmatic SOx allocations.

Audit Findings

The audit of the RECLAIM Program's Compliance Year 2015 and trades of RTCs that occurred during calendar year 2016 show:

- ***Overall Compliance*** – Audited NOx and SOx emissions from RECLAIM facilities were significantly below programmatic allocations.

- ***Universe*** – The RECLAIM universe consisted of 272 facilities as of June 30, 2015. One facility was included, no facility was excluded, and five facilities in the RECLAIM universe shut down during Compliance Year 2015. Thus, 268 facilities were in the RECLAIM universe on June 30, 2016, the end of the Compliance Year 2015.

  One facility was newly included in NOx RECLAIM because they reported NOx emissions from permitted sources in excess of four tons a year. Of the five facilities that shut down, one facility sold its brand and demolished the facility, and two other facilities consolidated their operations into other company-owned RECLAIM facilities. The fourth facility cited more attractive utility of land and resources, cost of meeting air pollution regulations, including RECLAIM, Rule 1156 and the SCAQMD compliance burden, and an unfriendly business environment as the

reasons for shutdown. Finally, the fifth facility sold both their equipment and property. Staff attempted to contact its parent company for a more descriptive reason for the shutdown, but received no response.

- ***Facility Compliance*** – The vast majority of RECLAIM facilities complied with their allocations during the 2015 compliance year (94% of NOx facilities and 97% of SOx facilities). Eighteen facilities (six percent of total facilities) exceeded their allocations (17 facilities exceeded their NOx allocations, and one facility exceeded its SOx allocation) during Compliance Year 2015. The 17 facilities that exceeded their NOx allocations had total NOx emissions of 387.1 tons and did not have adequate allocations to offset 45.7 of those tons. The exceedances represent 0.47% of total RECLAIM NOx universe allocations and 11.8% of total NOx emissions from the 17 facilities. The one SOx facility that exceeded its SOx allocation had total SOx emissions of 2.7 tons and did not have adequate allocations to offset 0.2 tons. This exceedance represents 0.01% of total RECLAIM SOx universe allocations and 7.4% of total SOx emissions from this facility. Pursuant to Rule 2010(b)(1)(A), all 18 facilities had their respective exceedances deducted from their annual allocations for the compliance year subsequent to SCAQMD's determination that the facilities exceeded their Compliance Year 2015 allocations.

- ***Job Impacts*** – Based on a survey of the RECLAIM facilities, the RECLAIM program had minimal impact on employment during the 2015 compliance year, which is consistent with previous years. RECLAIM facilities reported an overall net gain of 1,329 jobs, representing 1.21% of their total employment. One of the five RECLAIM facilities that shut down during Compliance Year 2015 cited RECLAIM as a contributing factor to the decision to shut down. No other facilities reported a gain or loss of jobs due to RECLAIM. The job loss and job gain data are compiled strictly from reports submitted by RECLAIM facilities, and SCAQMD staff is not able to verify the accuracy of the reported job impacts data.

- ***Trading Activity*** – The RTC trading market activity during calendar year 2016 was lower in terms of number of trades (by 7%), lower with respect to volume (by 31%), and significantly lower with respect to total value (by 40%) when compared to calendar year 2015. A total of over $1.47 billion in RTCs has been traded since the adoption of RECLAIM, of which $118.6 million occurred in calendar year 2016 (compared to $197.1 million in calendar year 2015), excluding swaps. In calendar year 2016, there was a set of four trades between a RECLAIM facility that had discontinued its cement manufacturing operations, and its wholly-owned subsidiary. These trades were not at arms-length and RTC prices were set arbitrarily. As a result, they were excluded from RTC average price computations.

The annual average prices of discrete-year NOx and SOx RTCs for Compliance Years' 2015, 2016, and 2017 and infinite-year block (IYB) NOx and SOx RTCs traded in calendar year 2016 (excluding trades that were not at arms-length) were below the applicable review thresholds for average RTC prices. The annual average prices of RTCs traded during calendar years 2015 and 2016 are summarized and compared to the applicable thresholds in Tables 1 and 2 below:

Table 1 – Average Prices for Discrete-Year RTCs Traded during Calendar Years 2015 and 2016

	Average Price ($/ton)				Review Thresholds ($/ton)	
Year Traded	**2014 NOx RTC**	**2015 NOx RTC**	**2016 NOx RTC**	**2017 NOx RTC**	**Rule 2015 (b)(6)**	**Health and Safety Code §39616(f)**
2015	$1,039	$1,642	$2,833	$4,020	$15,000	$42,627
2016		$1,626	$2,932	$6,606		
Year Traded	**2014 SOx RTC**	**2015 SOx RTC**	**2016 SOx RTC**	**2017 SOx RTC**	**Rule 2015 (b)(6)**	**Health and Safety Code §39616(f)**
2015	$483	$380	None traded	None traded	$15,000	$30,691
2016		$540	$1,255	None traded		

Table 2 – Average Prices for IYB RTCs Traded during Calendar Years 2015 and 2016

	Average Price ($/ton)		Review Threshold ($/ton)
RTCs	Traded in 2015	Traded in 2016	**[Health and Safety Code §39616(f)]**
NOx	$199,685	$380,057	$639,399
SOx	$53,665	$50,000	$460,367

- ***Role of Investors*** – Investors were active in the RTC market. Based on both overall trading values and volume of NOx trades with price, investors' involvement in 2016 was less when compared to calendar year 2015. However, with respect to value and volume of SOx trades with price, investors' involvement increased. Investors were involved in 137 of the 196 discrete NOx trades with price, and 6 of the 8 discrete SOx trades with price. With respect to IYB trades, investors' participation was significant and investors were involved with 16 of 20 IYB NOx trades with price, and the one IYB SOx trade with price. Compared to calendar year 2015, investor holdings of total IYB NOx RTCs and IYB SOx RTCs increased from 1.9% to 3.1% for IYB NOx RTCs, and from 3.3% to 5.0% for IYB SOx RTCs at the end of calendar year 2016. Investors purchase RTCs, but are not RECLAIM facilities or brokers. (Brokers typically do not purchase RTCs, but facilitate trades.)

- ***Other Findings*** – RECLAIM also met other applicable requirements including meeting the applicable federal offset ratio under New Source Review and having no significant seasonal fluctuation in emissions. Additionally, there is no evidence that RECLAIM resulted in any increase in health impacts due to emissions of air toxics. RECLAIM facilities and non-RECLAIM facilities are subject to the same requirements for controlling air toxic emissions.

Attachment
Annual RECLAIM Audit Report for 2015 Compliance Year

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

Annual RECLAIM Audit Report for 2015 Compliance Year

March 3, 2017

Executive Officer
Wayne Nastri

Deputy Executive Officer
Engineering & Permitting
Laki Tisopulos, Ph.D.

Acting Deputy Executive Officer
Compliance & Enforcement
Bayron Gilchrist

Assistant Deputy Executive Officer
Engineering & Permitting
Amir Dejbakhsh

Assistant Deputy Executive Officers
Compliance & Enforcement
Cherie L. Snyder, Ph.D.

Senior Enforcement Manager
RECLAIM Administration
Danny Luong, P.E.

Authors: John Yee, Air Quality Analysis and Compliance Supervisor
Bob Sanford, Senior Air Quality Engineer
Chris Hynes, Air Quality Specialist
Kyu-Kyu Leong Remillard, Air Quality Engineer II
Susan Tsai, Air Quality Engineer II
Bettina Burleigh, Air Quality Engineer I
Ryan Maxwell, Air Quality Engineer I

Contributors: Mark Bassett, Air Quality Specialist
Mark Coleman, Air Quality Specialist
Tom Lee, Air Quality Engineer II

Reviewed by: Laki Tisopulos, Ph.D., Deputy Executive Officer
Bayron Gilchrist, Acting Deputy Executive Officer
Amir Dejbakhsh, Assistant Deputy Executive Officer
Cher Snyder, Ph.D., Assistant Deputy Executive Officer
Danny Luong, P.E., Senior Enforcement Manager
Barbara Baird, Chief Deputy Counsel
William Wong, Principal Deputy District Counsel

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

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Speaker of the Assembly
Appointee

Vice Chairman: Ben Benoit
Mayor Pro Tem, Wildomar
Cities of Riverside County

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Supervisor, Fifth District
County of Riverside

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Councilmember, Fifteenth District
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County of Orange

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Senate Rules Committee Appointee

Dwight Robinson
Councilmember, Lake Forest
Cities of Orange County

Janice Rutherford
Supervisor, Second District
County of San Bernardino

EXECUTIVE OFFICER
Wayne Nastri

TABLE OF CONTENTS

Tables

Appendices

LIST OF ABBREVIATIONS

AAQS	Ambient Air Quality Standards
ACEMS	Alternative Continuous Emissions Monitoring System(s)
AER	Annual Emission Report
APEP	Annual Permit Emissions Program
AQMP	Air Quality Management Plan
BACT	Best Available Control Technology
BARCT	Best Available Retrofit Control Technology
CAA	Clean Air Act
CARB	California Air Resources Board
CCAA	California Clean Air Act
CCR	California Code of Regulations
CEMS	Continuous Emissions Monitoring System(s)
CEQA	California Environmental Quality Act
CGA	Cylinder Gas Audit
CPMS	Continuous Process Monitoring System(s)
DOGGR	Division of Oil, Gas, and Geothermal Resources
EDR	Electronic Data Reporting
EGF	Electricity Generating Facility
ERC	Emission Reduction Credit
IYB RTC	Infinite-Year Block RECLAIM Trading Credit
LAER	Lowest Achievable Emission Rate
LAP	Laboratory Approval Program
MDP	Missing Data Procedures
MRR	Monitoring, Reporting and Recordkeeping
MSERC	Mobile Source Emission Reduction Credit
NAAQS	National Ambient Air Quality Standards
NNI	No Net Increase
NOx	Oxides of Nitrogen
NSR	New Source Review
ODC	Ozone Depleting Compound
OEHHA	Office of Environmental Health Hazard Assessment
QCER	Quarterly Certification of Emissions Report
PPA	Purchase Power Agreement
RACT	Reasonably Available Control Technology
RATA	Relative Accuracy Test Audit
RECLAIM	REgional CLean Air Incentives Market
RTC	RECLAIM Trading Credit
RTU	Remote Terminal Unit
SCAQMD	South Coast Air Quality Management District
SIP	State Implementation Plan
SOx	Oxides of Sulfur
SOON	Surplus Off-Road Opt-In for NOx
SSC	Stationary Source Committee
TAC	Toxic Air Contaminant
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compound
WATERS	Web Access To Electronic Reporting System

EXECUTIVE SUMMARY

Introduction

The South Coast Air Quality Management District (SCAQMD) Governing Board adopted the REgional CLean Air Incentives Market (RECLAIM) program on October 15, 1993. The RECLAIM program represented a significant departure from traditional command-and-control regulations. RECLAIM's objective is to provide facilities with added flexibility in meeting emissions reduction requirements while lowering the cost of compliance. This is accomplished by establishing facility-specific emissions reduction targets without being prescriptive regarding the method of attaining compliance with the targets. Each facility may determine for itself the most cost-effective approach to reducing emissions, including reducing emissions at their facility, and/or purchasing RECLAIM Trading Credits (RTCs) from other RECLAIM facilities, or from other RTC holders.

Rule 2015 - Backstop Provisions includes provisions for annual program audits focusing on specific topics, as well as a one-time comprehensive audit of the program's first three years, to ensure that RECLAIM is meeting all state and federal requirements and other performance criteria. Rule 2015 also provides backstop measures if the specific criteria are not met. This report constitutes the Rule 2015 annual program audit report for Compliance Year 2015 (January 1 through December 31, 2015 for Cycle 1 and July 1, 2015 through June 30, 2016 for Cycle 2 facilities). This annual audit report covers activities for the twenty-second year of the program.

Chapter 1: RECLAIM Universe

When RECLAIM was adopted in October 1993, a total of 394 facilities were identified as the initial "universe" of sources subject to the requirements of RECLAIM. From program adoption through June 30, 2015, the overall changes in RECLAIM participants were 130 facilities included into the program, 70 facilities excluded from the program, and 182 facilities ceased operation. Thus, the RECLAIM universe consisted of 272 active facilities at the end of Compliance Year 2014 (December 31, 2014 for Cycle 1 facilities and June 30, 2015 for Cycle 2 facilities). During Compliance Year 2015 (January 1, 2015 through December 31, 2015 for Cycle 1 facilities and July 1, 2015 through June 30, 2016 for Cycle 2 facilities), one facility was included into the RECLAIM universe, no facility was excluded, and five facilities (one facility in both the NOx and SOx universes and four in the NOx universe only) shut down and are no longer in the active RECLAIM universe. These changes resulted in a net decrease of four facilities in the universe, bringing the total number of active RECLAIM facilities to 268 as of the end of Compliance Year 2015.

Chapter 2: RTC Allocations and Trading

On November 5, 2010, the Governing Board adopted amendments to SOx RECLAIM to phase in SOx reductions beginning in Compliance Year 2013 and full implementation in Compliance Year 2019 and beyond. The amendments will result in an overall reduction of 48.4% (or 5.7 tons/day) in SOx allocations when

fully implemented (Compliance Year 2019 and beyond). For Compliance Year 2015, the third year of implementation, the SOx allocation supply was reduced by 34% (or 4.0 tons/day, which is the same reduction as the previous compliance year) to 2,839 tons. There was no programmatic allocation reduction in NOx RTCs during Compliance Year 2015. However, on December 4, 2015, the Governing Board adopted amendments to NOx RECLAIM to phase in additional NOx reductions which began in Compliance Year 2016 and continue through Compliance Year 2022. The amendment will result in an overall NOx reduction of 45% (or 12 tons/day) when fully implemented for Compliance Year 2022 and beyond.

The overall NOx RTC supply increased by 11.6 tons and the SOx RTC supply decreased by 3.7 tons during Compliance Year 2015. These changes were due to allocation adjustments for clean fuel production pursuant to Rule 2002(c)(12).

In calendar year 2016, there was a set of four trades between a RECLAIM facility that had discontinued its cement manufacturing operations, and its wholly-owned subsidiary. These trades were not at arms-length and RTCs prices were set arbitrarily. As a result, they were considered as “swap trades" and were excluded from RTC average price computations. During calendar year 2016, there were 329 RTC trade registrations with a total value of $118.6 million traded, excluding the values reported for swap trades.

Since the inception of the RECLAIM program in 1994, a total value of over $1.47 billion dollars has been traded in the RTC trading market, excluding swap trades. RTC trades are reported to SCAQMD as either discrete-year RTC trades or infinite-year block (IYB) trades (trades that involve blocks of RTCs with a specified start year and continuing into perpetuity). In terms of volume traded in calendar year 2016, a total of 2,173 tons of discrete-year NOx RTCs, 617 tons of discrete-year SOx RTCs, 613 tons of IYB NOx RTCs and 392 tons of IYB SOx RTCs were traded. The RTC trading market activity decreased during calendar year 2016 compared to calendar year 2015, in terms of number of trades (by 7%), in total volume excluding swaps (by 31%), and in total value excluding swaps (by 40%).

The annual average prices of discrete-year NOx RTCs traded during calendar year 2016 were $1,626, $2,932, and $6,606 per ton for Compliance Years’ 2015, 2016, and 2017 RTCs, respectively. The annual average prices for discrete-year SOx RTCs traded during the same period were $540 and $1,255 per ton for Compliance Years’ 2015 and 2016 RTCs, respectively.

Prices for discrete-year NOx and SOx RTCs for all compliance years are still well below the $42,627 per ton of NOx and $30,691 per ton of SOx discrete-year RTCs pre-determined overall program review thresholds established by the Governing Board pursuant to Health and Safety Code §39616(f), as well as the $15,000 per ton threshold pursuant to Rule 2015(b)(6).

The annual average price during calendar year 2016 for IYB NOx RTCs was $380,057 per ton and the annual average price for IYB SOx RTCs was $50,000 per ton. Therefore, annual average IYB RTC prices did not exceed the $639,399 per ton of IYB NOx RTCs or the $460,367 per ton of IYB SOx RTCs pre-determined overall program review thresholds established by the Governing Board pursuant to Health and Safety Code §39616(f).

Investors were again active in the RTC market during calendar year 2016. They were involved in 137 of the 196 discrete-year NOx trade registrations and six of the eight discrete-year SOx trade registrations with price. Investors were also involved in 16 of 20 IYB NOx and the one IYB SOx trade with price. Investors were involved in 63% of total value and 62% of total volume for discrete-year NOx trades, and 64% of total value and 54% of total volume for discrete-year SOx trades. In addition, investors were involved in 25% of total value and 19% of total volume for IYB NOx trades with price. An investor was involved in the sole IYB SOx trade with price. At the end of calendar year 2016, investors' holdings of IYB NOx RTCs and IYB SOx RTCs were significantly higher at 3.1% and 5.0% of the total RECLAIM RTCs, respectively, compared to that of calendar year 2015.

Chapter 3: Emission Reductions Achieved

For Compliance Year 2015, aggregate NOx emissions were below total allocations by 25% and aggregate SOx emissions were below total allocations by 26%. No emissions associated with breakdowns were excluded from reconciliation with facility allocations in Compliance Year 2015. Accordingly, no mitigation is necessary to offset excluded emissions due to approved Breakdown Emission Reports. Therefore, based on audited emissions, RECLAIM achieved its targeted emission reductions for Compliance Year 2015. With respect to the Rule 2015 backstop provisions, Compliance Year 2015 aggregate NOx and SOx emissions were both well below aggregate allocations and, as such, did not trigger the requirement to review the RECLAIM program.

Chapter 4: New Source Review Activity

The annual program audit assesses New Source Review (NSR) activity from RECLAIM facilities in order to ensure that RECLAIM is complying with federal NSR requirements and state no net increase (NNI) in emissions requirements while providing flexibility to facilities in managing their operations and allowing new sources into the program. In Compliance Year 2015, a total of five NOx RECLAIM facilities had NSR NOx emission increases, and one SOx RECLAIM facility had an NSR SOx emission increase due to expansion or modification. Consistent with all prior compliance years, there were sufficient NOx and SOx RTCs available to allow for expansion, modification, and modernization by RECLAIM facilities.

RECLAIM is required to comply with federal NSR emissions offset requirements at a 1.2-to-1 offset ratio programmatically for NOx emission increases and a 1-to-1 offset ratio for SOx emission increases on a programmatic basis. In Compliance Year 2015, RECLAIM demonstrated federal equivalency with a programmatic NOx offset ratio of 39-to-1 and SOx offset ratio of 4,112-to-1 based on the compliance year's total unused allocations and total NSR emission increases for both NOx and SOx. RECLAIM inherently complies with the federally-required 1-to-1 SOx offset ratio for any compliance year, provided aggregate SOx emissions under RECLAIM are lower than or equal to aggregate SOx allocations for that compliance year. As shown in Chapter 3, there was no programmatic SOx exceedance during Compliance Year 2015. In fact, there was a surplus of SOx RTCs. Therefore, RECLAIM more than complied with the federally-required SOx offset ratio and further quantification of the SOx offset ratio is unnecessary. Compliance with the federally-required offset ratio also

demonstrates compliance with any applicable state NNI requirements for new or modified sources. In addition, RECLAIM requires application of, at a minimum, California Best Available Control Technology (BACT), which is at least as stringent as federal Lowest Achievable Emission Rate (LAER). The same BACT guidelines are used to determine applicable BACT to RECLAIM and non-RECLAIM facilities.

Chapter 5: Compliance

Of the 282 NOx RECLAIM facilities audited during Compliance Year 2015, a total of 265 facilities (94%) complied with their NOx allocations, and 32 of the 33 SOx facilities (97%) complied with their SOx allocations. Eighteen facilities exceeded their allocations (17 facilities exceeded their NOx allocations, and one facility exceeded its SOx allocation) during Compliance Year 2015. The 17 facilities that exceeded their NOx allocations had aggregate NOx emissions of 387.1 tons and did not have adequate allocations to offset 45.7 tons (or 11.8%) of their combined emissions. The one SOx facility that exceeded its SOx allocation had total SOx emissions of 2.7 tons and did not have adequate allocations to offset 0.2 tons (or 7.4%). The NOx and SOx exceedance amounts are relatively small compared to the overall NOx and SOx allocations for Compliance Year 2015 (0.47% of total NOx allocations and 0.01% of total SOx allocations). The exceedances from these facilities did not impact the overall RECLAIM emission reduction goals. Pursuant to Rule 2010(b)(1)(A), these facilities had their respective exceedances deducted from their annual allocations for the compliance year subsequent to the date of SCAQMD's determination that the facilities exceeded their Compliance Year 2015 allocations. The overall RECLAIM NOx and SOx emission reduction targets and goals were met for Compliance Year 2015 (*i.e.*, aggregate emissions for all RECLAIM facilities were well below aggregate allocations).

Chapter 6: Reported Job Impacts

This chapter compiles data as reported by RECLAIM facilities in their Annual Permit Emissions Program (APEP) reports. The analysis focuses exclusively on job impacts at RECLAIM facilities and determination if those job impacts were directly attributable to RECLAIM as reported by those facilities. Additional benefits to the local economy (*e.g.*, generating jobs for consulting firms, source testing firms and CEMS vendors) attributable to the RECLAIM program, as well as factors outside of RECLAIM (*e.g.*, the prevailing economic climate), impact the job market. However, these factors are not evaluated in this report. Also, job losses and job gains are strictly based on RECLAIM facilities' reported information. SCAQMD staff is not able to independently verify the accuracy of the reported job impact information.

According to the Compliance Year 2015 employment survey data gathered from APEP reports, RECLAIM facilities reported a net gain of 1,329 jobs, representing 1.21% of their total employment. One of the five RECLAIM facilities that shut down during Compliance Year 2015 cited RECLAIM as a factor contributing to the decision to shutdown. No other facilities reported any gain or loss of jobs due to RECLAIM.

Chapter 7: Air Quality and Public Health Impacts

Audited RECLAIM emissions have been in an overall downward trend since the program's inception. Compliance Year 2015 NOx emissions decreased 2.7% relative to Compliance Year 2014, and Compliance Year 2015 SOx emissions were 3.7% less than the previous year. Quarterly calendar year 2015 NOx emissions fluctuated within 10% of the mean NOx emissions for the year. Quarterly calendar year 2015 SOx emissions fluctuated within seven percent of the year's mean SOx emissions. There was no significant shift in seasonal emissions from the winter season to the summer season for either pollutant.

The California Clean Air Act (CCAA) required a 50% reduction in population exposure to ozone, relative to a baseline averaged over three years (1986 through 1988), by December 31, 2000. The Basin achieved the December 2000 target for ozone well before the deadline. In calendar year 2016, the per capita exposure to ozone (the average length of time each person is exposed) continued to be well below the target set for December 2000.

Air toxic health risk is primarily caused by emissions of certain volatile organic compounds (VOCs) and fine particulates, such as metals. RECLAIM facilities are subject to the same air toxic, VOC, and particulate matter regulations as other sources in the Basin. All sources are subject, where applicable, to the NSR rule for toxics (Rule 1401 and/or Rule 1401.1). In addition, new or modified sources with NOx or SOx emission increases are required to be equipped with BACT, which minimizes to the extent feasible the increase of NOx and SOx emissions. RECLAIM and non-RECLAIM facilities that emit toxic air contaminants are required to report those emissions to SCAQMD. Those emissions reports are used to identify candidates for the Toxics Hot Spots program (AB2588). This program requires emission inventories and, depending on the type and amount of emissions, facilities may be required to do public notice and/or prepare and implement a plan to reduce emissions. There is no evidence that RECLAIM has caused or allowed higher toxic risk in areas adjacent to RECLAIM facilities.

INTRODUCTION

The South Coast Air Quality Management District (SCAQMD) REgional CLean Air Incentives Market (RECLAIM) program was adopted in October 1993 and replaced certain command-and-control rules regarding oxides of nitrogen (NOx) and oxides of sulfur (SOx) with a new market incentives program for facilities that meet the inclusion criteria. The goals of RECLAIM are to provide facilities with added flexibility in meeting emissions reduction requirements while lowering the cost of compliance. The RECLAIM program was designed to meet all state and federal Clean Air Act (CAA) and other air quality regulations and program requirements, as well as various other performance criteria, such as equivalent or better air quality improvement, enforcement, implementation costs, job impacts, and no adverse public health impacts.

Since RECLAIM represents a significant change from traditional command-and-control regulations, RECLAIM rules include provisions for program audits in order to verify that the RECLAIM objectives are being met. The rules provide for a comprehensive audit of the first three years of program implementation and for annual program audits. The audit results are used to help determine whether any program modifications are appropriate. SCAQMD staff has completed the initial tri-annual program audit and each individual annual program audit report through the 2015 Compliance Year Audit.

This report presents the annual program audit and progress report of RECLAIM's twenty-second compliance year (January 1 through December 31, 2015 for Cycle 1 and July 1, 2015 through June 30, 2016 for Cycle 2 RECLAIM facilities), also known as Compliance Year 2015. As required by Rule 2015(b)(1) – Annual Audits, this audit assesses:

- Emission reductions;
- Per capita exposure to air pollution;
- Facilities permanently ceasing operation of all sources;
- Job impacts;
- Annual average price of each type of RECLAIM Trading Credit (RTC);
- Availability of RTCs;
- Toxic risk reductions;
- New Source Review permitting activity;
- Compliance issues, including a list of facilities that were unable to reconcile emissions for that compliance year;
- Emission trends/seasonal fluctuations;
- Emission control requirement impacts on stationary sources in the program compared to other stationary sources identified in the Air Quality Management Plan (AQMP); and
- Emissions associated with equipment breakdowns.

The annual program audit report is organized into the following chapters:

1. ***RECLAIM Universe***
   This chapter discusses summarizes changes to the universe of RECLAIM sources that occurred up until July 1, 2015 (covered under the Annual RECLAIM Audit Report for 2014 Compliance Year), then discusses changes to the RECLAIM universe of sources in detail through the end of Compliance Year 2015.
2. ***RTC Allocations and Trading***
   This chapter summarizes changes in emissions allocations in the RECLAIM universe, RTC supply and RTC trading activity, annual average prices, availability of RTCs, and market participants.
3. ***Emission Reductions Achieved***
   This chapter assesses emissions trends and progress towards emission reduction goals for RECLAIM sources, emissions associated with equipment breakdowns, and emissions control requirement impacts on RECLAIM sources compared to other stationary sources. It also discusses the latest amendments to the RECLAIM program.
4. ***New Source Review Activity***
   This chapter summarizes New Source Review (NSR) activities at RECLAIM facilities.
5. ***Compliance***
   This chapter discusses compliance activities and the compliance status of RECLAIM facilities. It also evaluates the effectiveness of SCAQMD's compliance program, as well as the monitoring, reporting, and recordkeeping (MRR) protocols for NOx and SOx.
6. ***Reported Job Impacts***
   This chapter addresses job impacts and facilities permanently ceasing operation of all emission sources.
7. ***Air Quality and Public Health Impacts***
   This chapter discusses air quality trends in the South Coast Air Basin, seasonal emission trends for RECLAIM sources, per capita exposure to air pollution, and the toxic impacts of RECLAIM sources.

CHAPTER 1
RECLAIM UNIVERSE

Summary

When RECLAIM was adopted in October 1993, a total of 394 facilities were identified as the initial "universe" of sources subject to the requirements of RECLAIM. From program adoption through June 30, 2015, the overall changes in RECLAIM participants were 130 facilities included into the program, 70 facilities excluded from the program, and 182 facilities ceased operation. Thus, the RECLAIM universe consisted of 272 active facilities at the end of Compliance Year 2014 (December 31, 2014 for Cycle 1 facilities and June 30, 2015 for Cycle 2 facilities). During Compliance Year 2015 (January 1, 2015 through December 31, 2015 for Cycle 1 facilities and July 1, 2015 through June 30, 2016 for Cycle 2 facilities), one facility was included into the RECLAIM universe, no facility was excluded, and five facilities (one facility in both the NOx and SOx universes and four in the NOx universe only) shut down and are no longer in the active RECLAIM universe. These changes resulted in a net decrease of four facilities in the universe, bringing the total number of active RECLAIM facilities to 268 as of the end of Compliance Year 2015.

Background

The RECLAIM program replaced the traditional "command-and-control" rules for a defined list of facilities participating in the program (the RECLAIM "universe"). The criteria for inclusion in the RECLAIM program are specified in Rule 2001 – Applicability. Facilities are generally subject to RECLAIM if they have NOx or SOx reported emissions greater than or equal to four tons per year in 1990 or any subsequent year. However, certain facilities are categorically excluded from RECLAIM. The categorically excluded facilities include dry cleaners; restaurants; police and fire fighting facilities; construction and operation of landfill gas control, landfill gas processing or landfill gas energy facilities; public transit facilities, potable water delivery operations; facilities that converted all sources to operate on electric power prior to October 1993; and facilities, other than electric generating facilities established on or after January 1, 2001, located in the Riverside County portions of the Mojave Desert Air Basin or the Salton Sea Air Basin.

Other categories of facilities are not automatically included but do have the option to enter the program. These categories include electric utilities (exemption only for the SOx program); equipment rental facilities; facilities possessing solely "various locations" permits; schools or universities; portions of facilities conducting research operations; ski resorts; prisons; hospitals; publicly-owned municipal waste-to-energy facilities; publically-owned sewage treatment facilities operating consistent with an approved regional growth plan; electrical power generating systems owned and operated by the Cities of Burbank, Glendale, or Pasadena or their successors; facilities on San Clemente Island; agricultural facilities; and electric generating facilities that are new on or after January 1, 2001 and located in the Riverside County portions of the Mojave Desert Air Basin or the Salton Sea Air Basin. An initial universe of 394 RECLAIM

facilities was developed using the inclusion criteria initially adopted in the RECLAIM program based on 1990, 1991 and 1992 facility reported emissions data.

A facility that is not in a category that is specifically excluded from the program may voluntarily join RECLAIM regardless of its emission level. Additionally, a facility may be required to enter the RECLAIM universe if:

- It increases its NOx and/or SOx emissions from permitted sources above the four ton per year threshold; or
- It ceases to be categorically excluded and its reported NOx and/or SOx emissions are greater than or equal to four tons per year; or
- It is determined by SCAQMD staff to meet the applicability requirements of RECLAIM, but was initially misclassified as not subject to RECLAIM.

At the time of joining RECLAIM, each RECLAIM facility is issued an annually declining allocation of emission credits ("RECLAIM Trading Credits" or "RTCs") based on its historic production level (if the facility existed prior to January 1, 1993), external offsets it previously provided, and any Emission Reduction Credits (ERCs) generated at and held by the facility. Each RECLAIM facility's RTC holdings constitute an annual emissions budget. RTCs may be bought or sold as the facility deems appropriate (see Chapter 2 – RTC Allocations and Trading).

RECLAIM facilities that permanently go out of business are removed from the active emitting RECLAIM universe. Prior to an October 7, 2016 amendment of Rule 2002, facilities that shutdown were allowed to retain all of their RTC holdings and participate in the trading market. For NOx RECLAIM facilities listed in Tables 7 and 8 that shutdown on or after October 7, 2016, the Rule 2002 amendment established a methodology to calculate an amount of reduction that must be made to a facility's future years NOx RTC holdings. A shutdown facility may trade future year RTCs that remain after the RTC adjustment is completed, if any. If the calculated reduction amount exceeds a facility's holdings for any future compliance year, the facility must purchase and surrender sufficient RTCs to fulfill the entire reduction requirement. This situation may result if the facility previously sold its future year allocations.

Staff has periodically initiated the process of reviewing past Annual Emission Reports (AERs) from non-RECLAIM facilities to determine applicability of RECLAIM pursuant to Rule 2001(b) – Criteria for Inclusion in RECLAIM. Commencing in 2012, an annual review process was implemented. This facility inclusion process begins with SCAQMD staff compiling a list of non-RECLAIM (pollutant-specific) facilities that emitted NOx or SOx emissions greater than or equal to four tons per year, as reported under the AER program, for potential inclusion into RECLAIM. This part of the process involves screening for emissions only from equipment that are subject to RECLAIM (*e.g.*, emissions from on-site, off-road mobile sources are not included). From this initial list, each facility's business activities/operations are evaluated based on SCAQMD's records for possible categorical exemption pursuant to Rule 2001(i). Facilities that qualify under these categorical exemptions are removed from the list. The remaining facilities are informed of their potential inclusion into RECLAIM and are given the opportunity to provide records to demonstrate why the facility should

not be included under RECLAIM. This may include additional information about the facility's operations that would qualify it for categorical exemption from RECLAIM pursuant to Rule 2001(i), or correcting their AER-reported emissions with supporting documentation. Once a facility has qualified for inclusion, a draft facility permit is prepared, sent to the facility for comments, finalized and issued.

Universe Changes

In the early years of the RECLAIM program, facilities initially identified for inclusion were excluded upon determination that they did not meet the criteria for inclusion (*e.g.*, some facilities that had reported emissions from permitted sources above four tons in a year were determined to have over-reported their emissions and subsequently submitted corrected emissions reports reflecting emissions from permitted sources below four tons per year). Additionally, facilities that were not part of the original universe were subsequently added to the program based on the inclusion criteria mentioned above. The overall changes to the RECLAIM universe from the date of adoption (October 15, 1993) through June 30, 2015 (the last day of Compliance Year 2014 for Cycle 2 facilities) were: the inclusion of 130 facilities (including 34 facilities created by partial change of operator of existing RECLAIM facilities), the exclusion of 70 facilities, and the shutdown of 182 facilities. Thus, the net change in the RECLAIM universe from October 15, 1993 through June 30, 2015 was a decrease of 122 facilities from 394 to 272 facilities. In Compliance Year 2015 (January 1, 2015 through December 31, 2015 for Cycle 1 facilities and July 1, 2015 through June 30, 2016 for Cycle 2 facilities), one facility was included, no facility was excluded, and five facilities shut down. These changes brought the total number of facilities in the RECLAIM universe to 268 facilities. The Compliance Year 2015 RECLAIM universe includes 237 NOx-only, no SOx-only, and 31 both NOx and SOx RECLAIM facilities. The list of active facilities in the RECLAIM universe as of the end of Compliance Year 2015 is provided in Appendix A.

Facility Inclusions and Exclusions

One facility was included in NOx RECLAIM pursuant to Rule 2001(b) – Criteria for Inclusion in RECLAIM because it reported NOx emissions from permitted sources in excess of four tons a year. Appendix B lists the facility and the reason for its inclusion. No facility was excluded from the RECLAIM universe during Compliance Year 2015. Currently, there are 29 facilities in various stages of the inclusion review process. Additional inclusions will be addressed in future RECLAIM annual program audits as facility eligibility is confirmed. Per Rule 2001(c)(2), a facility is subject to RECLAIM provisions on the date a facility permit containing RECLAIM requirements is issued.

Facilities Permanently Ceasing Operations

Five RECLAIM facilities permanently ceased operations in Compliance Year 2015. One sold its brand and demolished the facility. Staff was not able to obtain further clarification regarding the shutdown. Two other facilities consolidated their operations into other company-owned RECLAIM facilities. The fourth facility cited more attractive utility of land and resources, cost of meeting air pollution regulations, including RECLAIM, Rule 1156 and the SCAQMD

compliance burden, and an unfriendly business environment as reasons for shutdown. The fifth facility sold its equipment and property to a third party. Four of the five facilities permanently ceasing operations were in NOx RECLAIM and the remaining shutdown facility was in both NOx and SOx RECLAIM. Appendix C lists these facilities and provides brief descriptions of the reported reasons for their closures.

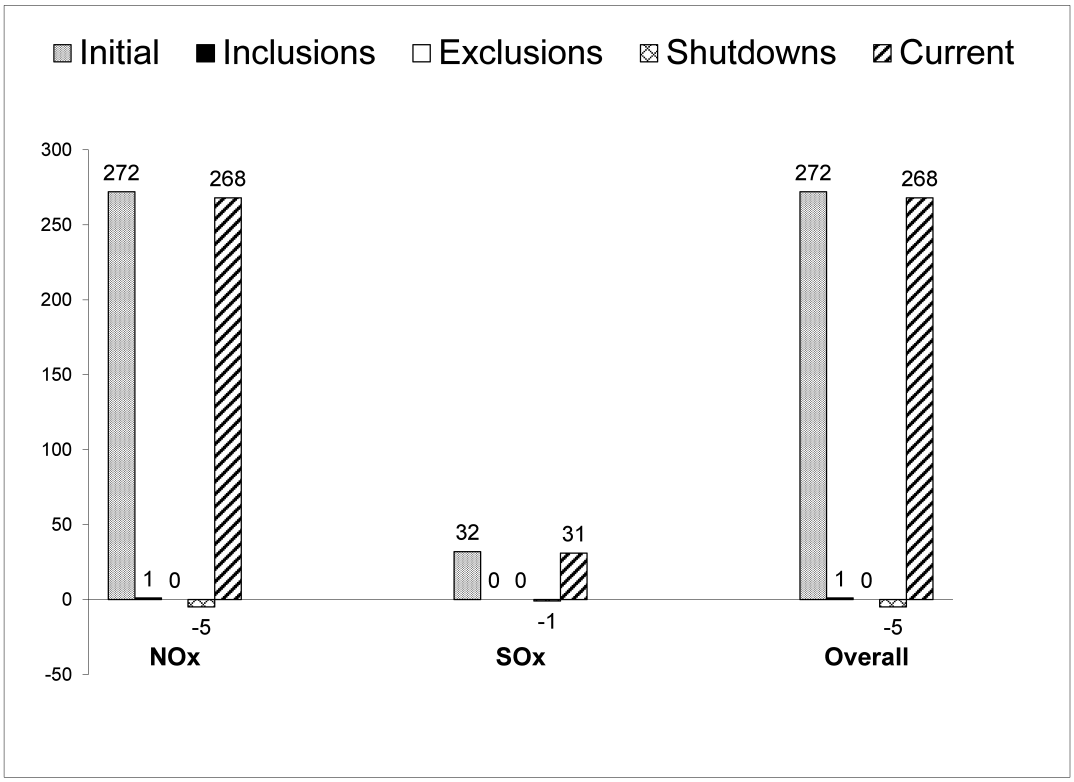
The above mentioned changes to the RECLAIM Universe resulted in a net decrease of four facilities in the RECLAIM universe during Compliance Year 2015. Table 1-1 summarizes overall changes in the RECLAIM universe between the start of the program and end of Compliance Year 2015 (December 31, 2015 for Cycle 1 facilities and June 30, 2016 for Cycle 2 facilities). Changes to the RECLAIM universe that occurred in Compliance Year 2015 are illustrated in Figure 1-1.

Table 1-1
RECLAIM Universe Changes

	NOx Facilities	SOx Facilities	Total* Facilities
Universe – October 15, 1993 (Start of Program)	392	41	394
Inclusions – October 15, 1993 through Compliance Year 2014	130	13	130
Exclusions – October 15, 1993 through Compliance Year 2014	-69	-4	-70
Shutdowns – October 15, 1993 through Compliance Year 2014	-181	-18	-182
Universe – June 30, 2015	272	32	272
Inclusions – Compliance Year 2015	1	0	1
Exclusions – Compliance Year 2015	0	0	0
Shutdowns – Compliance Year 2015	-5	-1	-5
Universe – End of Compliance Year 2015	268	31	268

* "Total Facilities" is not the sum of NOx and SOx facilities due to the overlap of some facilities being in both the NOx and SOx universes.

Figure 1-1
Universe Changes in Compliance Year 2015



CHAPTER 2
RTC ALLOCATIONS AND TRADING

Summary

On November 5, 2010, the Governing Board adopted amendments to SOx RECLAIM to phase in SOx reductions beginning in Compliance Year 2013 and full implementation in Compliance Year 2019 and beyond. The amendments will result in an overall reduction of 48.4% (or 5.7 tons/day) in SOx allocations when fully implemented (Compliance Year 2019 and beyond). For Compliance Year 2015, the third year of implementation, the SOx allocation supply was reduced by 34% (or 4.0 tons/day, which is the same reduction as the previous compliance year) to 2,839 tons. There was no programmatic allocation reduction in NOx RTCs during Compliance Year 2015. However, on December 4, 2015, the Governing Board adopted amendments to NOx RECLAIM to phase in additional NOx reductions which began in Compliance Year 2016 and continue through Compliance Year 2022. The amendment will result in an overall NOx reduction of 45% (or 12 tons/day) when fully implemented for Compliance Year 2022 and beyond.

The overall NOx RTC supply increased by 11.6 tons and the SOx RTC supply decreased by 3.7 tons during Compliance Year 2015. These changes were due to allocation adjustments for clean fuel production pursuant to Rule 2002(c)(12).

In calendar year 2016, there was a set of four trades between a RECLAIM facility that had discontinued its cement manufacturing operations, and its wholly-owned subsidiary. These trades were not at arms-length and RTCs prices were set arbitrarily. As a result, they were considered as "swap trades" and were excluded from RTC average price computations. During calendar year 2016, there were 329 RTC trade registrations with a total value of $118.6 million traded, excluding the values reported for swap trades.

Since the inception of the RECLAIM program in 1994, a total value of over $1.47 billion dollars has been traded in the RTC trading market, excluding swap trades. RTC trades are reported to SCAQMD as either discrete-year RTC trades or infinite-year block (IYB) trades (trades that involve blocks of RTCs with a specified start year and continuing into perpetuity). In terms of volume traded in calendar year 2016, a total of 2,173 tons of discrete-year NOx RTCs, 617 tons of discrete-year SOx RTCs, 613 tons of IYB NOx RTCs and 392 tons of IYB SOx RTCs were traded. The RTC trading market activity decreased during calendar year 2016 compared to calendar year 2015, in terms of number of trades (by 7%), in total volume excluding swaps (by 31%), and in total value excluding swaps (by 40%).

The annual average prices of discrete-year NOx RTCs traded during calendar year 2016 were $1,626, $2,932, and $6,606 per ton for Compliance Years' 2015, 2016, and 2017 RTCs, respectively. The annual average prices for discrete-year SOx RTCs traded during the same period were $540 and $1,255 per ton for Compliance Years' 2015 and 2016 RTCs, respectively.

Prices for discrete-year NOx and SOx RTCs for all compliance years are still well below the $42,627 per ton of NOx and $30,691 per ton of SOx discrete-year RTCs pre-determined overall program review thresholds established by the Governing Board pursuant to Health and Safety Code §39616(f), as well as the $15,000 per ton threshold pursuant to Rule 2015(b)(6).

The annual average price during calendar year 2016 for IYB NOx RTCs was $380,057 per ton and the annual average price for IYB SOx RTCs was $50,000 per ton. Therefore, annual average IYB RTC prices did not exceed the $639,399 per ton of IYB NOx RTCs or the $460,367 per ton of IYB SOx RTCs pre-determined overall program review thresholds established by the Governing Board pursuant to Health and Safety Code §39616(f).

Investors were again active in the RTC market during calendar year 2016. They were involved in 137 of the 196 discrete-year NOx trade registrations and six of the eight discrete-year SOx trade registrations with price. Investors were also involved in 16 of 20 IYB NOx and the one IYB SOx trade with price. Investors were involved in 63% of total value and 62% of total volume for discrete-year NOx trades, and 64% of total value and 54% of total volume for discrete-year SOx trades. In addition, investors were involved in 25% of total value and 19% of total volume for IYB NOx trades with price. An investor was involved in the sole IYB SOx trade with price. At the end of calendar year 2016, investors' holdings of IYB NOx RTCs and IYB SOx RTCs were significantly higher at 3.1% and 5.0% of the total RECLAIM RTCs, respectively, compared to that of calendar year 2015.

Background

SCAQMD issues each RECLAIM facility emissions allocations for each compliance year, according to the methodology specified in Rule 2002 – Allocations for Oxides of Nitrogen (NOx) and Oxides of Sulfur (SOx). For facilities that existed prior to January 1, 1993, the allocation is calculated based on each facility's historic production levels as reported to SCAQMD in its annual emission reports (AERs), NOx emission factors listed in Tables 1, 3, and 6 of Rule 2002 or SOx emission factors in Tables 2 and 4 of Rule 2002 for the appropriate equipment category, any qualified[1] external offsets previously provided by the facility, and any unused Emission Reduction Credits (ERCs) generated at and held by the facility. Facilities entering RECLAIM after 1994 are issued allocations, if eligible, for the compliance year of entry and all years after, and Compliance Year 1994 allocations (also known as the facility's "Starting Allocation") for the sole purpose of establishing New Source Review trigger level.

These allocations are issued as RTCs, denominated in pounds of NOx or SOx with a specified 12-month term. Each RTC may only be used for emissions occurring within the term of that RTC. The RECLAIM program has two staggered compliance cycles—Cycle 1 with a compliance period of January 1 through December 31 of each year, and Cycle 2 with a compliance period of July 1 of each year through June 30 of the following year. Each RECLAIM facility is

[1] Only external offsets provided at a one-to-one offset ratio after the base year used for allocation quantification purposes.

assigned to either Cycle 1 or Cycle 2 and the RTCs it is issued (if any) have corresponding periods of validity.

The issuance of allocations for future years provides RECLAIM facilities guidance regarding their future emission reduction requirements. Facilities can plan their compliance strategies by reducing actual emissions or securing needed RTCs through trade registrations (or a combination of the two), based on their operational needs.

RECLAIM facilities may acquire RTCs issued for either cycle through trading and apply them to emissions, provided that the RTCs are used for emissions occurring within the RTCs' period of validity and the trades are made during the appropriate time period. RECLAIM facilities have until 30 days after the end of each of the first three quarters of each compliance year to reconcile their quarterly and year-to-date emissions, and until 60 days after the end of each compliance year to reconcile their last quarter and total annual emissions by securing adequate RTCs. Please note that, although other chapters in this report present and discuss Compliance Year 2015 data, RTC trading and price data discussed in this chapter are for calendar year 2016.

RTC Allocations and Supply

The methodology for determining RTC allocations is established by Rule 2002. According to this rule, allocations may change when the universe of RECLAIM facilities changes, emissions associated with the production of re-formulated gasoline increase or decrease, reported historical activity levels are updated, or emission factors used to determine allocations are changed. In addition to these SCAQMD-allocated RTCs, RTCs may be generated by conversion of emissions reduction credits from mobile and area sources pursuant to approved protocols. The total RTC supply in RECLAIM is made up of all RECLAIM facilities' allocations, conversions of ERCs owned by RECLAIM and non-RECLAIM facilities[2], emissions associated with the production of re-formulated gasoline, and conversion of emission reduction credits from mobile sources and area sources pursuant to approved protocols. The SCAQMD Governing Board may adopt additional rules that affect RTC supply. Changes in the RTC supply during Compliance Year 2015 are discussed below.

Allocations Adjustments Due to Inclusion and Exclusion of Facilities

Facilities existing prior to October 1993 and entering RECLAIM after 1994 may receive allocations just like facilities that were included at the beginning of the program. However, allocations issued for these facilities are only applicable for the compliance year of entry and forward. In addition, these facilities are issued allocations and Non-tradable/Non-usable Credits for Compliance Year 1994 for the sole purpose of establishing their starting allocation to ensure compliance with offset requirements under Rule 2005 - New Source Review for RECLAIM and the trading zone restriction to ensure net ambient air quality improvement within the sensitive zone established by Health and Safety Code §40410.5. These Compliance Year 1994 credits are not allowed to be used to offset current emissions because they have expired. Similarly, if an existing facility that was

[2] The window of opportunity to convert ERCs to RTCs other than during the process of a non-RECLAIM facility entering the program closed June 30, 1994.

previously included in RECLAIM is subsequently excluded because it is determined to be categorically excluded or exempt pursuant to Rule 2001(i) or to not have emitted four tons or more of NOx or SOx in a year, any RTCs it was issued upon entering RECLAIM are removed from the market upon its exclusion.

The sole NOx facility included in Compliance Year 2015 did not receive any allocation based on reported emissions.

Allocations Adjustments Due to Clean Fuel Production

Rule 2002(c)(12) – Clean Fuel Adjustment to Starting Allocation, provides refineries with RTCs to compensate for their actual emissions increases caused by the production of California Air Resources Board (CARB) Phase II reformulated gasoline. The amount of these RTCs is based on actual emissions for the subject compliance year and historical production data. The quantities of such clean fuels RTCs needed were projected based on the historical production data submitted, and qualifying refineries were issued in 2000 an aggregate baseline of 86.5 tons of NOx and 42.3 tons of SOx for Compliance Year 1999, 101.8 tons of NOx and 41.4 tons of SOx for Compliance Year 2000, and 98.4 tons of NOx and 40.2 tons of SOx for each subsequent Compliance Year on the basis of those projections. These refineries are required to submit, at the end of each compliance year in their Annual Permit Emissions Program (APEP) report, records to substantiate actual emission increases due solely to the production of reformulated gasoline. If actual emission increases for a subject year are different than the projected amount, the RTCs issued are adjusted accordingly (*i.e.*, excess RTCs issued are deducted if emissions were less than projected; conversely, additional RTCs are issued if emissions were higher than projected).

As a result of the amendment to Rule 2002 in January 2005 to further reduce RECLAIM NOx allocations, the NOx historical baseline Clean Fuel Adjustments for Compliance Year 2007 and subsequent years held by the facility were also reduced by the appropriate factors as stated in Rule 2002(f)(1)(A). On the other hand, Rule 2002(c)(12) provides refineries a Clean Fuels adjustment based on actual emissions. Therefore, each refinery is subject to an adjustment at the end of each compliance year equal to the difference between the amount of actual emission increases due solely to production of reformulated gasoline at each refinery and the amount of credits it was issued in 2000 after discounting by the factors for the corresponding compliance year. For Compliance Year 2015, the overall effect of adjusting NOx allocations to account for these differences was a total of 11.6 tons of NOx RTCs (0.1% of total NOx allocation for Compliance Year 2015) added to, and 3.7 tons of SOx RTCs (0.1% of total SOx allocation for Compliance Year 2015) deducted from, refineries' Compliance Year 2015 holdings.

Changes in RTC Allocations Due to Activity Corrections

RECLAIM facilities' allocations are determined by their reported historical activity levels (*e.g.*, fuel usage, material usage, or production) in their AERs. In the case where a facility's AER reported activity levels are updated within five years of the

AER due date, its allocation is adjusted accordingly[3]. There were no changes in RTC allocations due to activity corrections in Compliance Year 2015.

Conversions of Other Types of Emission Reduction Credits

Conversions of Mobile Source Emission Reduction Credits (MSERCs) and other types of emission reduction credits, other than regular stationary source ERCs issued under Regulation XIII – New Source Review, to RTCs are allowed under Rule 2008 – Mobile Source Credits, and several programs under Regulation XVI – Mobile Source Offset Programs and Regulation XXV – Intercredit Trading. Conversion of these credits to RTCs is allowed based on the respective approved protocol specified in each rule. Currently, Rules 1610 – Old-Vehicle Scrapping and 1612 – Credits for Clean On-Road Vehicles allow the creation of MSERCs. However, there are no State Implementation Plan (SIP) approved protocols for conversion of MSERCs to RTCs. No new RTCs were issued by conversion of other types of emission reduction credits in Compliance Year 2015.

Net Changes in RTC Allocations

The changes to RTC supplies described in the above sections resulted in a net increase of 11.6 tons of NOx RTCs (0.1% of the total) and a decrease of 3.7 tons of SOx RTCs (0.1% of the total) for Compliance Year 2015. Table 2-1 summarizes the changes in NOx and SOx RTC supplies that occurred in Compliance Year 2015 pursuant to Rule 2002.

Table 2-1
Changes in NOx and SOx RTC Supplies during Compliance Year 2015 (tons/year)

Source	NOx	SOx
Universe changes	0	0
Clean Fuel/Reformulated Gasoline	11.6	-3.7
Activity corrections	0	0
MSERCs	0	0
Net change	**11.6**	**-3.7**

Note: The data in this table represents the changes that occurred over the course of Compliance Year 2015 to the Compliance Year 2015 aggregate NOx and SOx RTC supplies originally issued pursuant to Rule 2002, not the difference between 2015 aggregate RTC supply and that for any other compliance year.

Allocation Reduction Resulting from BARCT Review

Pursuant to California Health and Safety Code §40440, SCAQMD is required to monitor the advancement in BARCT and periodically re-assess the RECLAIM program to ensure that RECLAIM achieves equivalent emission reductions to the command-and-control BARCT rules it subsumes. This assessment is done periodically as part of AQMP development. This process resulted in 2003 AQMP Control Measure #2003 CMB-10 – Additional NOx Reductions for RECLAIM (NOx) calling for additional NOx reductions from RECLAIM sources. SCAQMD staff started the rule amendment process in 2003, including a detailed analysis of

[3] Pursuant to Rule 2002(b)(5) as amended on December 4, 2015, any AERs (including corrections) submitted more than five years after the original due date are not considered in the RTC quantification process.

control technologies that qualified as BARCT for NOx, and held lengthy discussions with stakeholders—including regulated industry, environmental groups, the California Air Resources Board (CARB), and the United States Environmental Protection Agency (USEPA). On January 7, 2005, the Governing Board implemented CMB-10 by adopting changes to the RECLAIM program that resulted in a 22.5% reduction of NOx allocations from all RECLAIM facilities. The reductions were phased in commencing in Compliance Year 2007 and have been fully implemented since Compliance Year 2011.

On November 5, 2010, the Governing Board adopted changes to the RECLAIM program implementing the 2007 AQMP Control Measure CMB-02 – Further SOx Reductions for RECLAIM (SOx). These amendments resulted in a BARCT-based overall reduction of 5.7 tons SOx per day when fully implemented in Compliance Year 2019 (the reductions are being phased in from Compliance Year 2013 through Compliance Year 2019: 3.0 tons per day in 2013; 4.0 tons per day in years 2014, 2015, and 2016; 5.0 tons per day in 2017 and 2018; and 5.7 tons per day starting in 2019 and continuing thereafter). This reduction in SOx is an essential part of the South Coast Air Basin's effort in attaining the federal 24-hour average PM2.5 standard by the year 2020.

Similarly, the 2012 AQMP adopted by the Governing Board in 2012, included Control Measure CMB-01- Further NOx Reductions for RECLAIM that identified a new group of RECLAIM NOx emitting equipment that should be reviewed for new BARCT. The rule making process for the amendment to the NOx RECLAIM program implementing CMB-01 started in 2012. On December 4, 2015, the Governing Board adopted amendments to the RECLAIM rules that resulted in an additional reduction of 12 tons of NOx per day (45% reduction) when fully implemented in Compliance Year 2022. The reductions are being phased-in with 2 tons per day in Compliance Year 2016 and 2017, 3 tons per day in Compliance Year 2018, 4 tons per day in Compliance Year 2019, 6 tons per day in Compliance Year 2020, 8 tons per day in Compliance Year 2021 and 12 tons per day in Compliance Year 2022 and thereafter.

Figure 2-1 illustrates the total NOx RTC supply through the end of Compliance Year 2023 incorporating all the changes discussed above. Figure 2-2 illustrates the total SOx RTC supply through the end of Compliance Year 2020 incorporating the changes discussed.

Figure 2-1
NOx RTC Supply

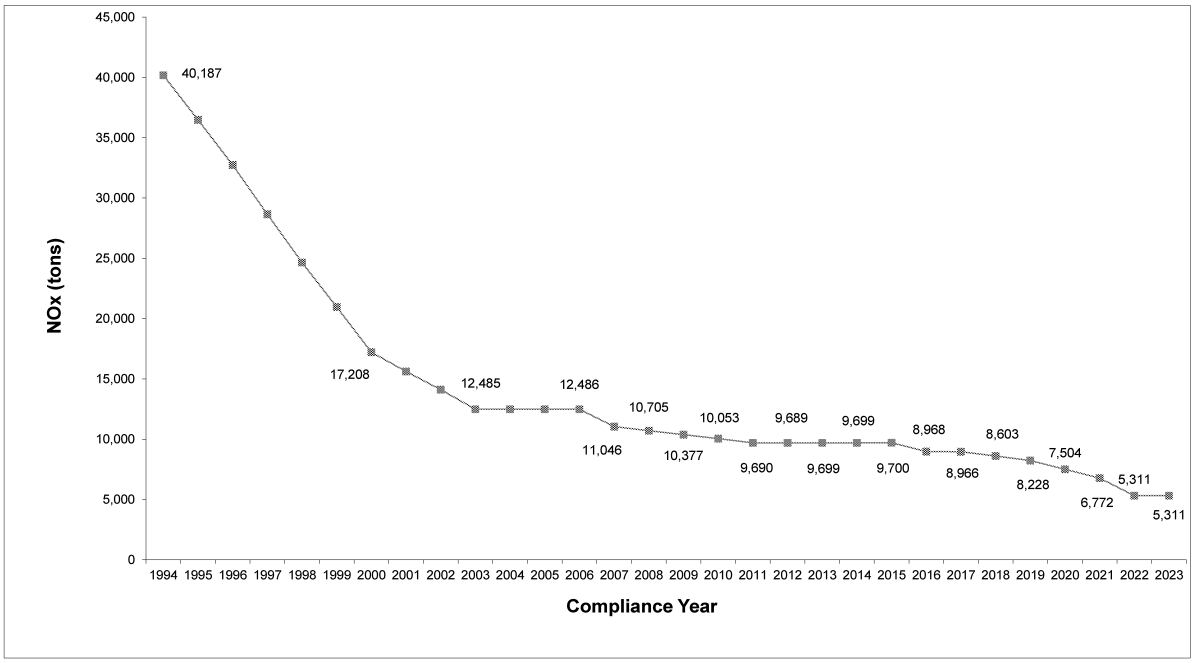
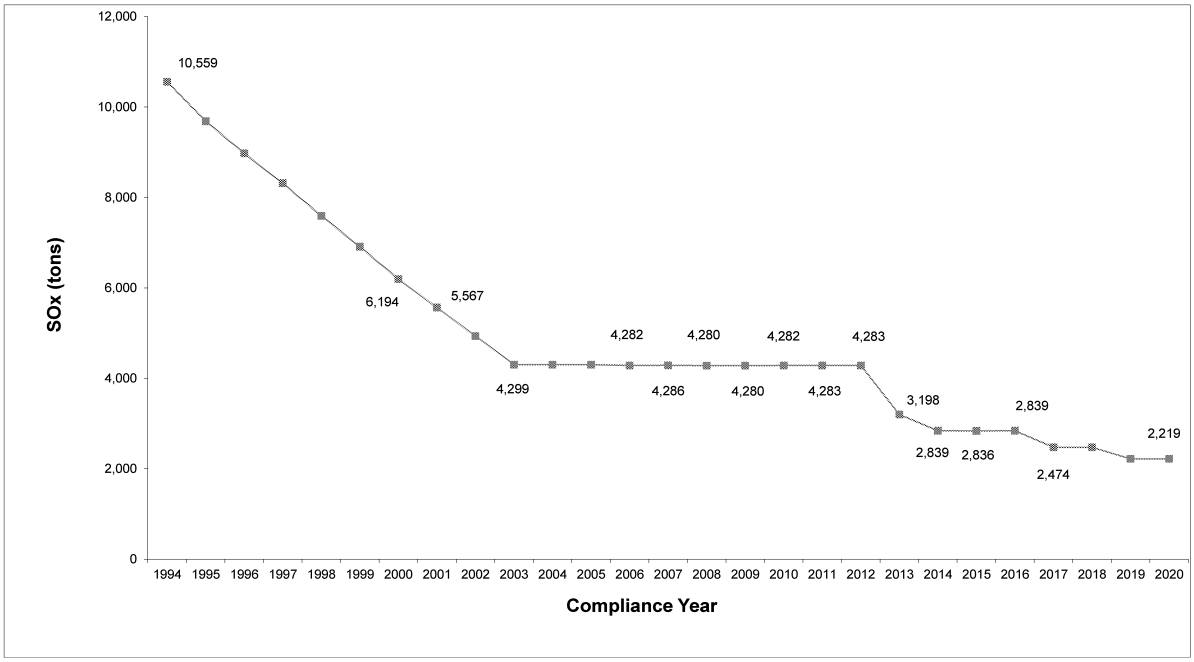


Figure 2-2
SOx RTC Supply



Upcoming Proposals for Credit Generation

Proposed Rule 2511 – Credit Generation Program for Locomotive Head End Power Unit Engines and Proposed Rule 2512 – Credit Generation Program for Ocean-Going Vessels at Berth are two potential rules that could generate credits for the RECLAIM program. Proposed Rule 2511 would allow generation of emission reduction credits through the voluntary repowering of diesel–fueled auxiliary head end power generating units on passenger locomotives with cleaner engines. Proposed Rule 2512 would allow generation of credits for emission through the control of exhaust emissions from auxiliary engines and/or boilers used on Ocean-Going Vessels while at berth in a commercial marine port. Both of these proposed rules are listed on the Rule and Control Measure Forecast as potential rule adoption activities for calendar year 2017.

RTC Trades

RTC Price Reporting Methodology

RTC trades are reported to SCAQMD as one of two types: discrete-year RTC transactions or infinite-year block (IYB) transactions (trades that involve blocks of RTCs with a specified start year and continuing into perpetuity). Prices for discrete-year trades are reported in terms of dollars per pound and prices for IYB trades are reported as total dollar value for total amount of IYB RTCs traded. In addition, the trading partners are required to identify any swap trades. Swap trades occur when trading partners exchange different types of RTCs. These trades maybe of equal value or different values, in which case some amount of money or credits are also included in swap trades (additional details on swap trades are discussed later in this chapter). Prices reported for swap trades are based on the agreed upon value of the trade by the participants, and do not involve exchange of funds for the total value agreed upon. As such, the reported prices for swap trades can be somewhat arbitrary and, therefore, are excluded from the calculation of annual average prices. Annual average prices for discrete-year RTCs are determined by averaging prices of RTCs for each compliance year, while the annual average price for IYB RTCs are determined based on the amount of IYB RTCs (*i.e.,* the amount of RTCs in the infinite stream) regardless of the start year.

RTC Price Thresholds for Program Review

Rule 2015(b)(6) specifies that, if the annual average price of discrete-year NOx or SOx RTCs exceeds $15,000 per ton, the Executive Officer will conduct an evaluation and review of the compliance and enforcement aspects of RECLAIM. The Governing Board has also established average RTC price overall program review thresholds pursuant to Health and Safety Code §39616(f). Unlike the $15,000 per ton threshold for review of the compliance and enforcement aspects of RECLAIM, these overall program review thresholds are adjusted by CPI each year. In addition, according to Rule 2002(f)(1)(S), if the annual average price of discrete-year SOx RTCs for any compliance year from 2017 through 2019 exceeds $50,000 per ton, the Governing Board has the discretion to convert facilities' Nontradable/Nonusable RTCs to Tradable/Usable RTCs. Similarly, Rule 2002(f)(1)(H) specifies that in the event that the NOx RTC prices exceed $22,500 per ton (current compliance year credits) based on the 12-month rolling

average, or exceed $35,000 per ton (current compliance year credits) based on the 3-month rolling average calculated pursuant to subparagraph (f)(1)(E), the Executive Officer will report the determination to the Governing Board. If the Governing Board finds that the 12-month rolling average RTC price exceeds $22,500 per ton or the 3-month rolling average RTC price exceeds $35,000 per ton, then the Non-tradable/Non-usable NOx RTCs, as specified in subparagraphs (f)(1)(B) and (f)(1)(C) valid for the period in which the RTC price is found to have exceeded the applicable threshold, shall be converted to Tradable/Usable NOx RTCs upon Governing Board concurrence. For RTC trades occurring in calendar year 2016, the overall program review thresholds in 2016 dollars, pursuant to Health and Safety Code §39616(f), are $42,627 per ton of discrete-year NOx RTCs, $30,691 per ton of discrete-year SOx RTCs, $639,399 per ton of IYB NOx RTCs, and $460,367 per ton of IYB SOx RTCs.

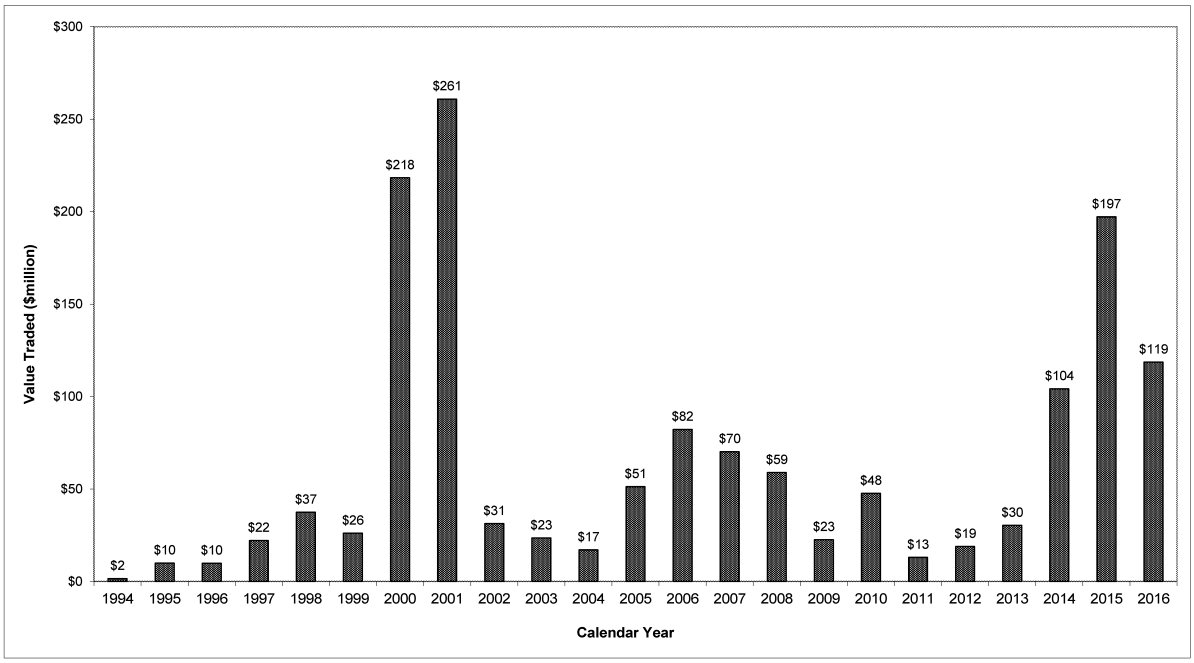
RTC Trading Activity Excluding Swaps

Overall Trading Activity

RTC trades include discrete-year and IYB RTCs traded with prices, discrete-year and IYB RTC transfers with zero price, and discrete-year and IYB RTC swap trades. The RTC market activity in calendar year 2016 was slightly lower (decreased by seven percent) when compared to the market activity in calendar year 2015 in terms of the number of trades. The calendar year 2016 trading activity—329 total registered trades (305 NOx trades and 24 SOx trades)—was slightly lower than the number of trades in calendar year 2015 (356 total registered trades; 335 NOx trades and 21 SOx trades).

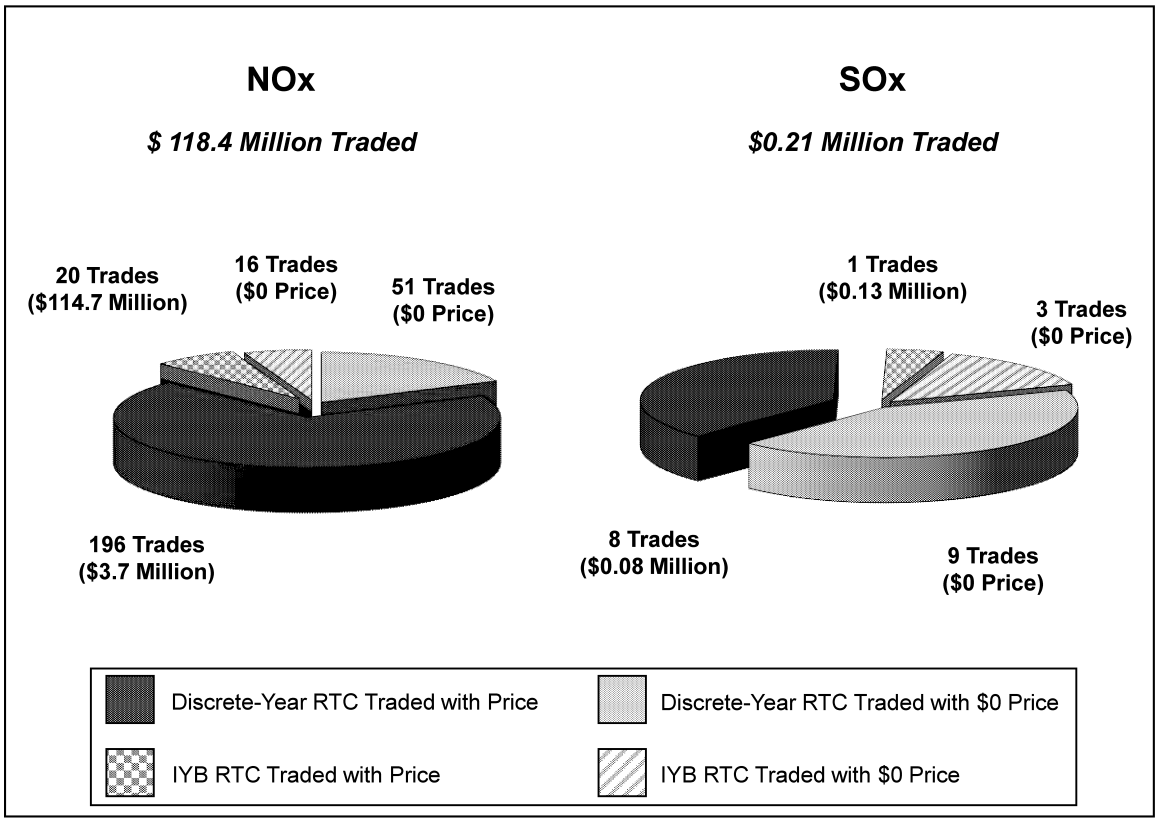
In comparison to calendar year 2015, the value traded in calendar year 2016 was substantially lower (decreased by 40%). Excluding swap trades, a total value of $118.6 million was traded in calendar year 2016 ($118.4 million for NOx and $0.21 million for SOx)—substantially lower than the total value of $197.1 million traded in calendar year 2015 ($193.1 million for NOx and $4.02 million for SOx). Figure 2-3 illustrates the annual value of RTCs traded in RECLAIM since the inception of the program.

Figure 2-3
Annual Trading Values for NOx and SOx (Excluding Swaps)



The total volume traded (excluding swap trades) in calendar year 2016 was 3,795 tons, which is 31% less than the 5,533 tons traded in calendar year 2015. With respect to volume traded (also excluding swap trades), the 2,790 tons of discrete-year RTCs traded in calendar year 2016 were substantially lower than the 3,891 tons of discrete-year RTCs traded in calendar year 2015. In calendar year 2016, there were 1,449 tons of discrete-year NOx RTCs and 134 tons of discrete-year SOx traded with price and 724 tons of discrete-year NOx and 483 tons of discrete-year SOx traded without price. In addition, the 1,005 tons of IYB RTCs traded in calendar year 2016 were also much lower than the 1,642 tons of IYB RTCs traded in 2015. There were 302 tons of IYB NOx and 2.5 tons of IYB SOx traded with price and 311 tons of IYB NOx traded with zero price and 390 tons of IYB SOx traded with zero price. Figure 2-4 summarizes overall trading activity (excluding swaps) in calendar year 2016 by pollutant. Additional information on the discrete-year and IYB trading activities, value, and volume are discussed later in this chapter.

Figure 2-4
Calendar Year 2016 Overall Trading Activity (Excluding Swaps)



There were 79 trades with zero price in calendar year 2016. RTC transfers with zero price generally occur when a seller transfers or escrows RTCs to a broker pending transfer to the purchaser with price, when there is a transfer between facilities under common operator, when a facility is retiring RTCs for a settlement agreement or pursuant to variance conditions, or when there is a transfer between facilities that have gone through a change of operator. Trades with zero price also occur when the trading parties have mutual agreements where one party provides a specific service (*e.g.,* providing steam or other process components) for the second party. In return, the second party will transfer the RTCs necessary to offset emissions generated from the service. In calendar year 2016, the majority of trades with zero price were transfers between facilities under common ownership and facilities that underwent a change of operator.

Discrete-Year RTC Trading Activity

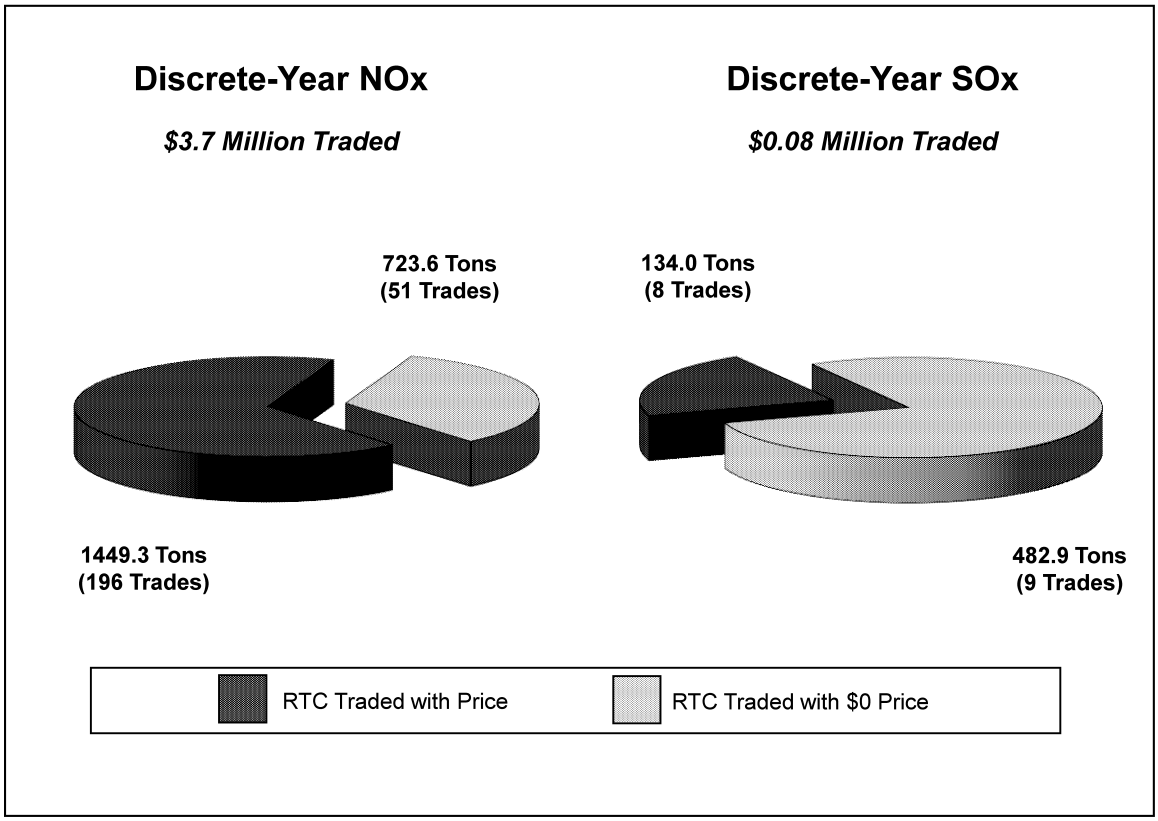
In calendar year 2016, there were a total of 247 discrete-year NOx RTC trades (196 trades with price and 51 trades with zero price) and 17 discrete-year SOx RTC trades (eight trades with price and nine trades with zero price), excluding swap trades. The trading of discrete-year NOx RTCs included RTCs for Compliance Years 2015 through 2017. The trading of discrete-year SOx RTCs included RTCs for Compliance Years 2015 and 2016.

Total discrete-year RTC trading values decreased in calendar year 2016. The 196 NOx trades with price totaled $3.7 million in value, down from $5.7 million in calendar year 2015. However, the eight discrete-year SOx trades with price

totaled $0.08 million in value, which is higher than the $0.02 million traded in calendar year 2015.

In calendar year 2016, the overall quantities of discrete-year NOx RTCs traded were 2,173 tons which is much lower than the 3,371 tons of NOx RTCs traded in calendar year 2015. The 617 tons of discrete-year SOx RTC traded in calendar year 2016 was higher than the 520 tons traded in calendar year 2015. There were 1,449 tons of discrete-year NOx traded with price in calendar year 2016, a significant decrease (40%) from the 2,396 tons of NOx in 2015. However, the 134 tons of discrete-year SOx RTCs traded in 2016 is much higher (185%) than the 47 tons of SOx RTCs traded in 2015. In addition, there were 724 tons of discrete-year NOx RTCs traded with zero price (decreased from 975 tons of NOx in 2015) and 483 tons of discrete-year SOx traded with zero price (a slight increase from 473 tons of SOx in 2015). Figure 2-5 illustrates the trading activity of discrete-year RTCs (excluding swaps) for calendar year 2016.

Figure 2-5
Calendar Year 2016 Trading Activity for Discrete-Year RTCs (Excluding Swaps)



IYB RTC Trading Activity

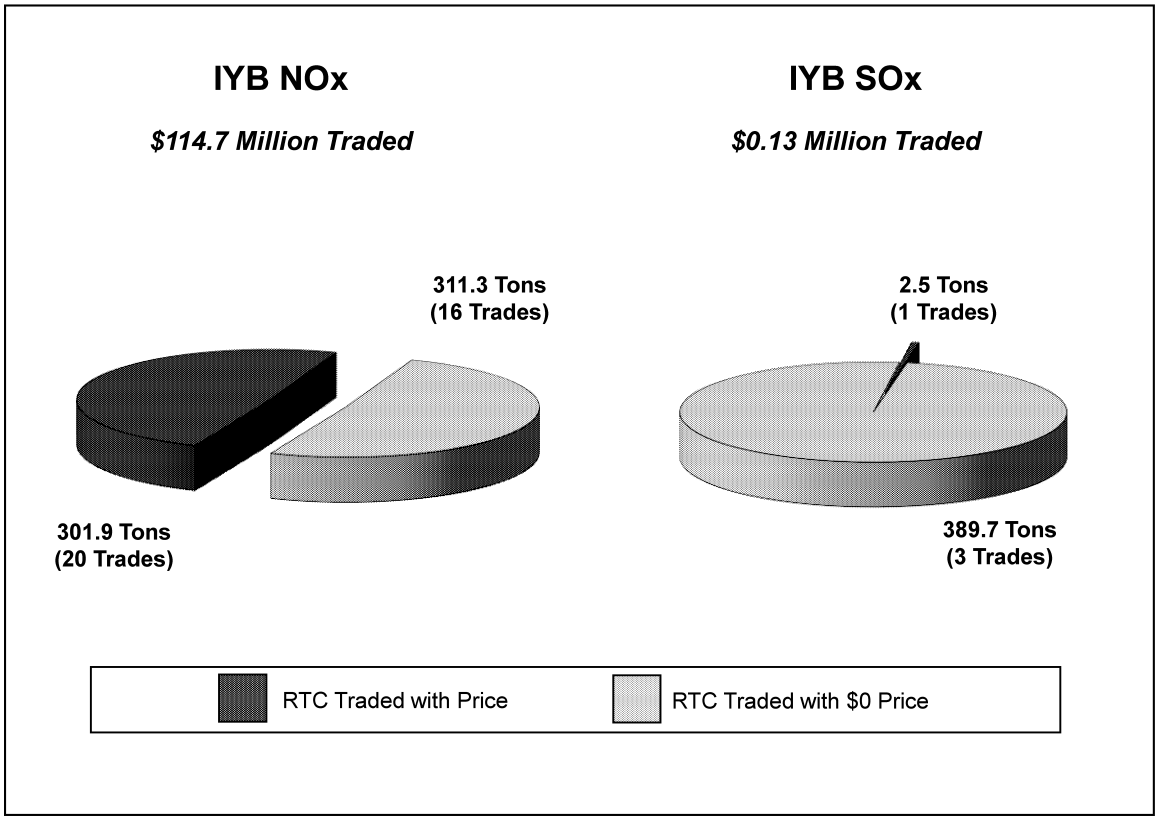
In calendar year 2016, there were 36 IYB NOx trades and four IYB SOx trades, excluding swaps. The IYB NOx trades included RTCs with Compliance Years 2015, 2016, 2017, and 2018 as start years, while the IYB SOx trades had RTCs with Compliance Years 2016and 2017 as start years. Of the 36 IYB NOx trades,

20 trades were with price and 16 trades were with zero price. Of the four IYB SOx trades, one was with price and three were with zero price.

The 20 IYB NOx trades with price totaling over $114.7 million in calendar year 2016 were much lower in value than the $187 million in 2015. The one IYB SOx RTC trades with price with total value of $0.13 million in calendar year 2016 was much lower than the value of $4.0 million traded in 2015.

The total quantity of 613 tons of IYB NOx traded in calendar year 2016 was significantly lower than the 1,234 tons traded in calendar year 2015. The quantity traded with price in calendar year 2016 was 302 tons, which was also significantly lower than the 939 tons traded with price in calendar year 2015. The total quantity of 392 tons of IYB SOx traded in calendar year 2016 was slightly lower than the 408 tons of IYB SOx traded in calendar year 2015. The quantity traded with price in calendar year 2016 was 2.5 tons, which was much lower than the 75 tons of IYB SOx traded with price in calendar year 2015. In calendar year 2016, there were also 311 tons of IYB NOx and 390 tons of IYB SOx traded without price. As described earlier, the majority of these transfers were between facilities under common ownership and facilities that had a change of operator. Figure 2-6 illustrates the calendar year 2016 IYB RTC trading activity excluding swap trades.

Figure 2-6
Calendar Year 2016 Trading Activity for IYB RTCs (Excluding Swaps)



Prior to the amendment of Rule 2007 – Trading Requirements in May 2001, swap information and details of discrete-year and IYB trades were not required to be provided by trade participants. In compiling data for calendar years 1994 through part of 2001, any trade registration involving IYB RTCs was considered as a single IYB trade and swap trades were assumed to be nonexistent. Trading activity since inception of the RECLAIM program is illustrated in Figures 2-7 through 2-10 (discrete-year NOx trades, discrete-year SOx trades, IYB NOx trades, and IYB SOx trades, respectively) based on the trade reporting methodology described earlier in this report.

Figure 2-7
Discrete-Year NOx RTC Trades (Excluding Swaps)

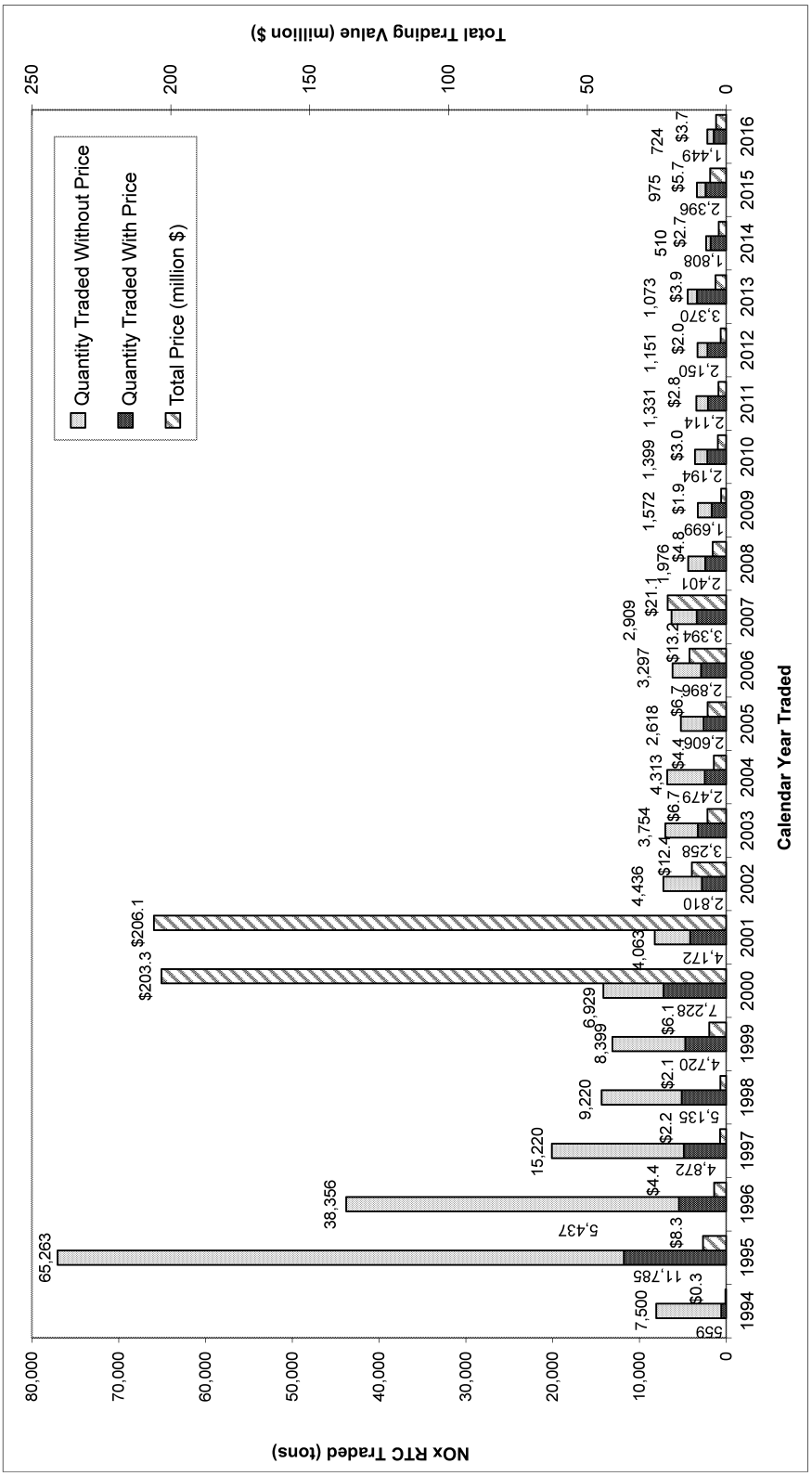


Figure 2-8
Discrete-Year SOx RTC Trades (Excluding Swaps)

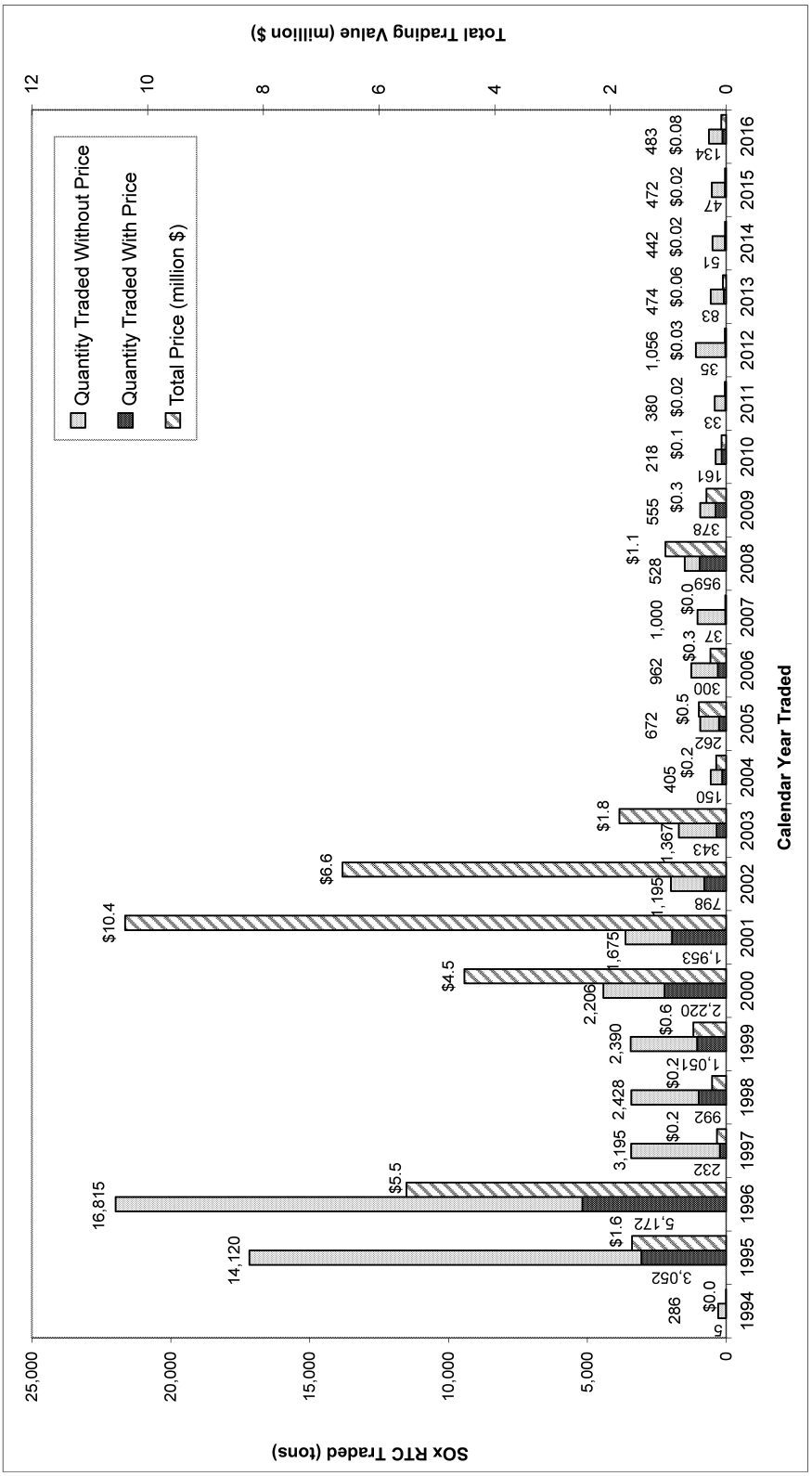


Figure 2-9
IYB NOx RTC Trades (Excluding Swaps)

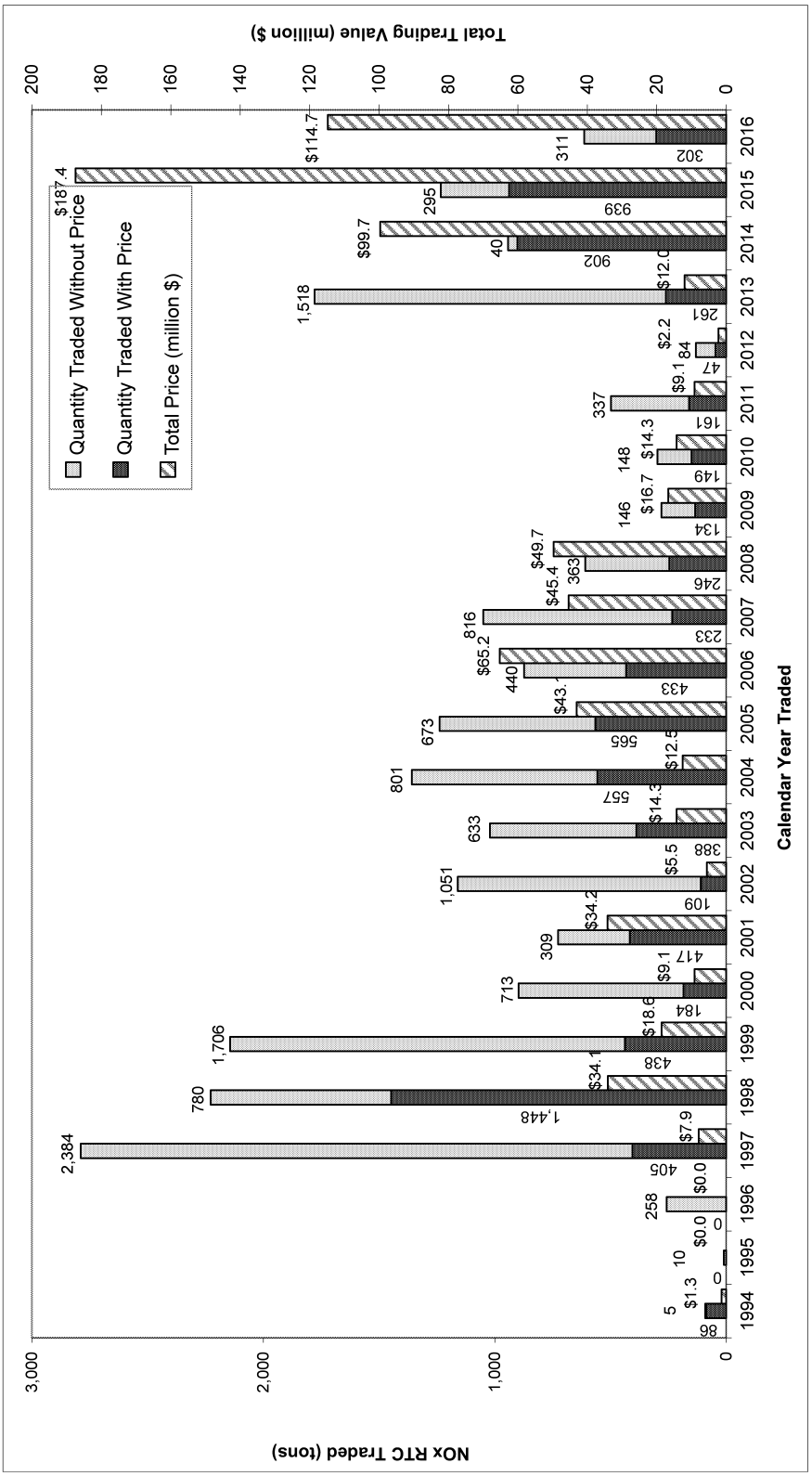
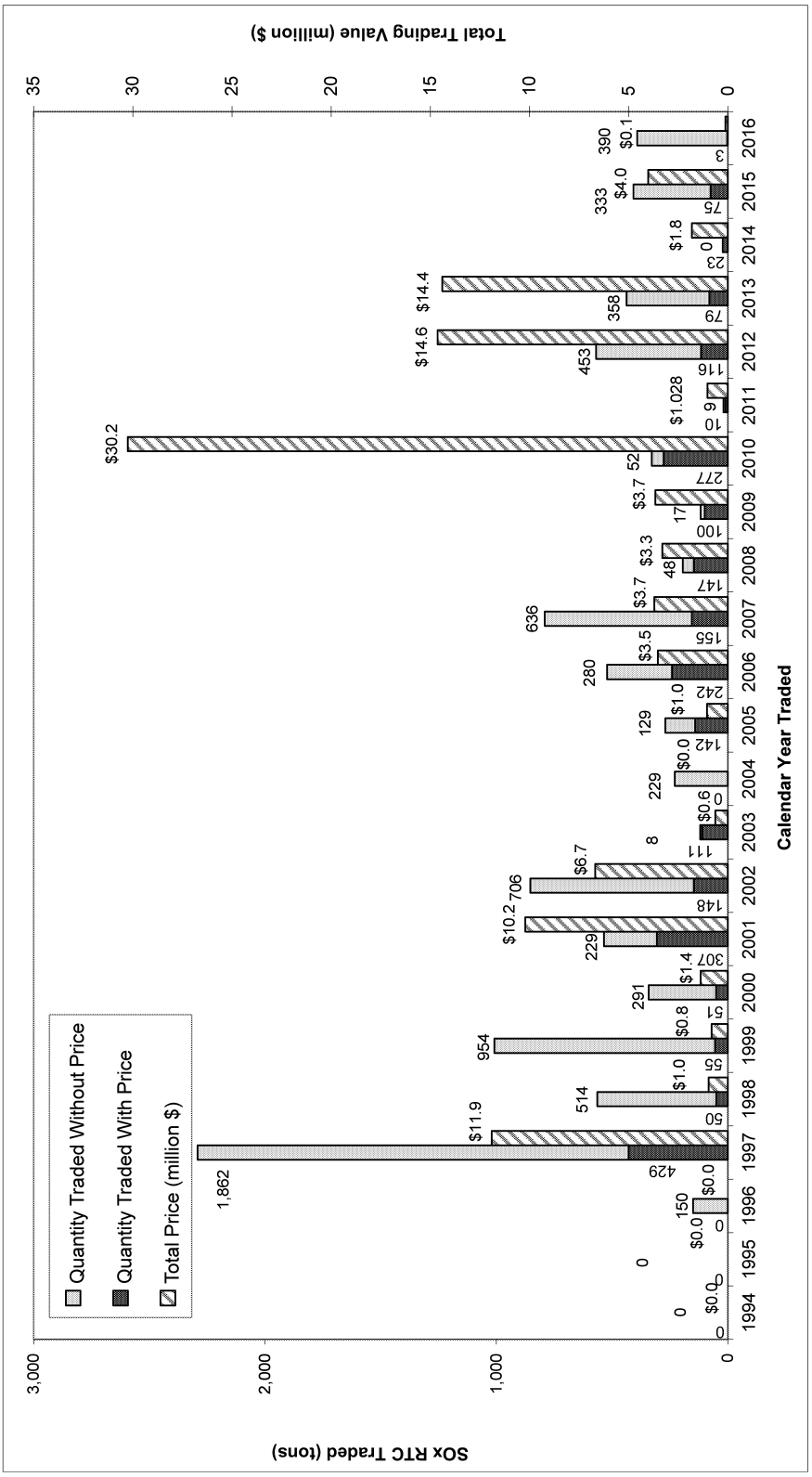


Figure 2-10
IYB SOx RTC Trades (Excluding Swaps)



Swap Trades

In addition to traditional trades of RTCs for a price, RTC swaps also occurred between trading partners. Most of the swap trades were exchanges of RTCs with different zones, cycles, expiration years, and/or pollutants. Some swaps involved a combination of RTCs and cash payment as a premium. There were also swaps of RTCs for ERCs. Trading parties swapping RTCs were required to report the agreed upon price of RTCs for each trade even though, with the exception of the above-described premiums, no money was actually exchanged. In calendar year 2016, there is set of four trades between a RECLAIM facility and its wholly-owned subsidiary that were also classified as swap trades (see detailed discussion later in this chapter). As a result, over $5.8 million in total value was reported from RTCs that were swapped in calendar year 2016, of which two trades involved swapping IYB NOx RTCs for IYB SOx RTCs and were collectively valued at a total of $0.36 million. The swap values are based on the prices reported on the RTC trade registrations. Since RTC swap trades occur when two trading partners exchange RTCs, values reported on both trades involved in the exchange are included in the calculation of the total value reported. However, in cases where commodities other than RTCs are involved in the swap, these commodity values are not included in the above reported total value (*e.g.,* in the case of a swap of NOx RTCs valued at $10,000 for another set of RTCs valued at $8,000 together with a premium of $2,000, the value of such a swap would have been reported at $18,000 in Table 2-2).

For calendar years that have swap trades with large values (*e.g.,* 2009) the inclusion of swap trades in the average trade price calculations would have resulted in calculated annual average prices dominated by swap trades, and therefore, potentially not representative of market prices actually paid for RTCs. Prices of swap trades are excluded from analysis of average trade prices because the values of the swap trades are solely based upon prices agreed upon between trading partners and do not reflect actual funds transferred. Tables 2-2 and 2-3 present the calendar years' 2001 through 2016 RTC swaps for NOx and SOx, respectively.

Table 2-2
NOx Registrations Involving Swaps*

Year	Total Value ($ millions)	IYB RTC Swapped with Price (tons)	Discrete-Year RTC Swapped with Price (tons)	Number of Swap Registrations with Price	Total Number of Swap Registrations
2001	$24.29	6.0	612.2	71	78
2002	$14.31	64.3	1,701.7	94	94
2003	$7.70	69.9	1,198.1	64	64
2004	$3.74	0	1,730.5	90	90
2005	$3.89	18.7	885.3	53	53
2006	$7.29	14.8	1,105.9	49	49
2007	$4.14	0	820.0	43	49
2008	$8.41	4.5	1,945.8	48	50
2009	$55.76	394.2	1,188.4	37	42
2010	$3.73	18.2	928.5	25	31
2011	$2.00	0	775.5	25	32
2012	$1.29	0	928.1	36	36
2013	$2.41	11.6	1,273.5	44	44
2014	$3.24	28.5	489.6	25	25
2015	$6.77	31.0	317.0	15	15
2016	$2.18	1.8	622.8	22	22

* Swaps without price are strictly transfers of RTCs between trading partners and their respective brokers. Information regarding swap trades was not required prior to May 9, 2001.

Table 2-3
SOx Registrations Involving Swaps*

Year	Total Value ($ millions)	IYB RTC Swapped with Price (tons)	Discrete-Year RTC Swapped with Price (tons)	Number of Swap Registrations with Price	Total Number of Swap Registrations
2001	$1.53	18.0	240.0	3	4
2002	$6.11	26.6	408.4	30	30
2003	$5.88	20.9	656.0	32	32
2004	$0.39	0	161.8	13	13
2005	$2.16	43.5	227.8	13	14
2006	$0.02	0	24.4	2	2
2007	$0.00	0	0	0	0
2008	$0.40	0	197.0	5	8
2009	$3.63	55.3	401.3	9	10
2010	$6.89	79.4	417.0	16	18
2011	$0.25	0	228.5	3	4
2012	$27.01	100.0	7.5	4	4
2013	$0.33	3.1	5.5	2	2
2014	$0.01	0.0	14.8	1	1
2015	$0	0.0	0	0	0
2016	$3.68	39.6	44.2	3	3

* Swaps without price are strictly transfers of RTCs between trading partners and their respective brokers. Information regarding swap trades was not required prior to May 9, 2001.

RTC Trade Prices (Excluding Swaps)

As staff was analyzing RTC trade prices, one set of trades stood out in terms of the reported prices. The set included four trades–one each for the transfer of discrete-year NOx RTCs, discrete-year SOx RTCs, IYB NOx RTCs and IYB SOx RTCs. The trades were submitted at the same time and were for the internal transfer of RTCs from one RECLAIM facility to its wholly-owned subsidiary, an apparent holding company for investment trades and not a RECLAIM facility. First, these trades of RTCs were odd in that the same subsidiary had previously transferred a majority of these same RTC's to its parent RECLAIM facility at no cost. That parent RECLAIM facility had discontinued its cement manufacturing operations and, therefore, did not need RTC's for that operation.

Second, the transactions were handled in an unusual fashion. After a shave is adopted (in this case, the December 2015 shave), a facility's pre-shave IYB RTCs become post-shave, a set of lesser IYB RTCs accompanied by discrete-year RTCs resulting from the shave. In trading post-shave RTCs, a facility normally sells its lesser IYB RTCs along with the resulting discrete-year RTCs in a lump trade, as District records show. In the internal trades, the discrete-year RTCs resulting from the shave were broken-out and sold separately to its wholly-owned investment subsidiary. Third, because the buyer is a wholly-owned subsidiary, the trades were not at arms-length. This makes the prices of these trades suspect, since they are not influenced by market prices. RTC prices set in this type of internal trade are analogous to "transfer prices" of goods and services exchanged among different entities under common ownership. It is important to distinguish transfer pricing from competitive market pricing, the latter of which corresponds to the market equilibrium where actual market supply satisfies the market demand. Due to compliance requirements set by financial regulations, transfer pricing usually reflects market prices to a reasonable degree (*i.e.*, the arm's length principle). However, as these regulations may not be applicable to RTC trades, it is less likely that the RTC prices in question were set in accordance with market prices.

Fourth, the traded prices for Compliance Years 2018 and after appear to be arbitrarily set. A comparison of the traded prices in the internal trade of discrete-year NOx RTCs to comparable RTCs of the same expirations shows that the prices for NOx RTCs in this internal trade are substantially higher with the only exception of Compliance Year 2015, as illustrated in Table 2-4 below. As seen in Table 2-4, starting with Compliance Year 2017, the internally traded prices are sometimes more than double the maximum market traded price of comparable RTCs. For Compliance Years 2020 and 2021, where the internally traded price exceeded the $15,000 per ton threshold specified under Rule 2015(b)(6), there were no comparable RTC's traded in the market for the calendar quarter prior to the trade submittal date of January 8, 2016. However, the sale prices for these two years were apparently based on the artificially high price of $10,000 per ton of Compliance Year 2017 RTCs. As shown in Table 2-4, the sale prices for the subsequent compliance years' RTCs, from 2018 through 2021, were arrived at by adding $3,000, $5,000, $7,000, and $8,000 per ton (or $1.50, $2.50, $3.50, and $4.00 per pound) respectively to the price for 2017 compliance year RTCs.

This also shows the arbitrariness of the sale prices set for the Compliance Years' 2020 and 2021 RTCs.

Finally, while discrete-year RTC trades for distant future compliance years may reflect to a certain degree the anticipated demand and supply in the RTC market, they can be also used as a risk management tool to hedge against potential RTC price volatilities, which may or may not materialize in future RTC market. If the trades were not internal, the increasing RTC price over the next compliance years could have reflected the buyer's assumption of an increasingly constricted supply of RTCs due to, *e.g.*, no facilities would install identified BARCT before 2021. However, in the case of internal trades, other factors related to the parent company's internal operations may have come into play, thus resulting in "transfer prices" that may not be reflective of the current and anticipated RTC market performances.

Table 2-4
Comparison of Prices for Discrete-Year NOx RTCs in Last Quarter of Calendar Year 2015 to Traded Prices of the Internal Trade

RTC Compliance Year	Maximum Price ($/ton)	Traded Price ($/ton)
2015	$3,700	$3,400
2016	$6,700	$7,000
2017	$4,200	$10,000
2018	$6,200	$13,000*
2019	$8,200	$15,000*
2020	No Trades	$17,000*
2021	No Trades	$18,000*

* There were no other trades of these compliance years' RTCs in 2016.

Based on the above analysis, it can be concluded that the internally traded prices for the discrete-year RTCs are not reflective of the market as intended under Rule 2015 (b)(6) because:

1. One single trade does not necessarily establish a market price. That single trade included a transfer of discrete-year credits from a RECLAIM facility to its wholly-owned subsidiary, which is an investment holding company, not a RECLAIM facility, and was not at arms-length and therefore not reflective of current and anticipated RTC market performance; and
2. The prices of almost all discrete-year RTC's sold in that single trade were about double the on-going market prices for comparable market-traded discrete-year RTCs, except for Compliance Years' 2020 and 2021 RTCs where there were no comparable trades.

Moreover, another reason for setting a market price threshold for review of the program is that market prices are a good indicator of the balance between supply and demand of a commodity such as RTCs. If there was an imbalance in the program, RTC prices would increase dramatically as in the case when California experienced an energy crisis and there was a surge in emissions from the energy sector. This is certainly not the case in Compliance Year 2015. Based on the

assessment of RTC supply in Compliance Year 2015 presented in Chapter 3 of this report, there are ample excess RTCs after accounting for all the emissions during the compliance year. In fact, emissions have remained relatively level since Compliance Year 2011. So, emission goals have been consistently met in the last five years and there is no basis to expect a shortage in RTC supply five years into the future, or Compliance Year 2020. Furthermore, there is no apparent increased demand for these RTCs since there is only one trade for these specific compliance years. In conclusion, since the prices reported for the transfer of RTCs in this set of four trades should not be regarded as market prices for the reasons cited above, these trades are classified as "swap trades", and are not included in the determination of annual average prices.

Discrete-Year RTC Prices

Table 2-5 lists the annual average prices for discrete-year NOx and SOx RTCs traded in 2016. The table shows that all annual average prices for discrete-year NOx and SOx RTCs were well below the $42,627 per ton of NOx and $30,691 per ton of SOx discrete-year RTCs pre-determined overall program review thresholds established by the Governing Board pursuant to Health and Safety Code §39616(f), and as well as, the $15,000 threshold specified under Rule 2015(b)(6) for reviews of the compliance aspects of the program.

Table 2-5
Annual Average Prices for Discrete-Year RTCs Traded In Calendar Year 2016

RTC Compliance Year	NOx Annual Average Price ($/ton)	SOx Annual Average Price ($/ton)
2015	$1,626	$540
2016	$2,932	$1,255
2017	$6,606	None Traded

For comparison purposes, Table 2-6 lists the annual average prices for discrete-year RTCs traded in calendar year 2016 (excluding swap trades) and also includes internal trades involving discrete-year RTCs that were not at arms-length and therefore do not reflect market prices (see discussions above).

Table 2-6
Annual Average Prices for Discrete-Year RTCs Traded In Calendar Year 2016 Including the Internal Trades

RTC Compliance Year	NOx Annual Average Price ($/ton)	SOx Annual Average Price ($/ton)
2015	$1,654.95	$594.31
2016	$2,984.47	$1,617.71
2017	$7,025.25	$3,000.00*
2018	$13,000.00*	$4,000.00*
2019	$15,000.00*	None Traded
2020	$17,000.00*	None Traded
2021	$18,000.00*	None Traded

* Only one trade was registered for RTCs valid for these compliance years' RTCs.

Rolling Average NOx and SOx RTCs Price Report

On December 4, 2015, the Governing Board amended Rule 2002 to change the 12-month rolling average price of NOx RTCs for all trades for the current compliance year, excluding RTC trades reported at no price and swap transactions, to a $22,500 per ton threshold. It also established a new $35,000 per ton threshold for the three-month rolling average price of current compliance year NOx RTCs and a $200,000 per ton "price-floor" threshold for the twelve-month rolling average price of IYB NOx RTCs that will become effective in 2019. The reporting of the three-month rolling average prices for current compliance year's NOx RTCs and the twelve-month rolling average prices of IYB NOx RTCs started on May 1, 2016.

The December 2015 amendments directed the Executive Officer to report to the Governing Board if (a) the cost of current compliance year NOx RTCs exceeds $22,500 per ton based on the twelve-month rolling average price, or (b) $35,000 per ton based on the three-month rolling average price. If either (a) or (b) above occurs, the Governing Board may convert the Non-tradable/Non-usable NOx RTCs valid for the period in which the RTC price(s) exceeded an applicable threshold to Tradable/Usable NOx RTCs pursuant to Rule 2002(f)(1)(H). Additionally, the Executive Officer's report to the Governing Board will include a "commitment and schedule to conduct a more rigorous control technology implementation, emission reduction, cost-effectiveness, market analysis, and socioeconomic impact assessment of the RECLAIM program." Furthermore, Rule 2002 (f)(1)(I) requires the Executive Officer to calculate the twelve-month rolling average price of IYB NOx RTCs. Beginning in Compliance Year 2019, the Executive Officer needs to report to the Governing Board when the price of IYB NOx RTCs falls below $200,000 per ton.

Starting January 2017, the Executive Officer is calculating and reporting the twelve-month rolling average prices for current compliance year SOx RTCs as required by the November 5, 2010 amendment to Rule 2002. The amendment established the $50,000 per ton of SOx RTC threshold. In the event that the SOx RTC price threshold is exceeded, the Governing Board will decide whether or not to convert any portion of the Non-tradable/Non-usable SOx RTCs to Tradable/Usable SOx RTCs.

Tables 2-7 through 2-10 lists the various rolling average prices[4] described above. The average NOx and SOx RTC prices have all remained well below the applicable reporting thresholds, and the IYB NOx price stayed above the $200,000 per ton "price-floor" threshold.

[4] Rolling average prices that were published since January 2017 included the internal trades. Since these trades are being classified as swap trades, the rolling average prices have been updated accordingly (see discussions above).

Table 2-7
Twelve-Month Rolling Average Prices of Compliance Year 2016 Discrete-Year NOx RTCs

Reporting Month	12-Month Period	Average Price ($/ton)
January 2016	January 2015 through December 2015	$2,833
February 2016	February 2015 through January 2016	$2,833
March 2016	March 2015 through February 2016	$3,032
April 2016	April 15 through March 2016	$3049
May 2016	May 2015 through April 2016	$3,078
June 2016	June 2015 through May 2016	$3,156
July 2016	July 2015 through June 2016	$3,174
August 2016	August 2015 through July 2016	$3,138
September 2016	September 2015 through August 2016	$3,191
October 2016	October 2015 through September 2016	$3,730
November 2016	November 2015 through October 2016	$3,546
December 2016	December 2015 through November 2016	$3,318
January 2017	January 2016 through December 2016	$2,932

Table 2-8
Three-Month Rolling Average Prices of Compliance Year 2016 Discrete-Year NOx RTCs

Reporting Month	12-Month Period	Average Price ($/ton)
May 2016	February 2016 through April 2016	$4,158
June 2016	March 2016 through May2016	$4,188
July 2016	April 2016 through June 2016	$4,304
August 2016	May 2016 through July 2016	$3,953
September 2016	June 2016 through August 2016	$3,747
October 2016	July 2016 through September 2016	$3,623
November 2016	August 2016 through October 2016	$2,778
December 2016	September 2016 through November 2016	$2,438
January 2017	October 2016 through December 2016	$2,741

Table 2-9
Twelve-Month Rolling Average Prices of Compliance Year 2016 IYB NOx RTCs

Reporting Month	12-Month Period	Average Price ($/ton)
May 2016	May 2015 through April 2016	$267,913
June 2016	June 2015 through May2016	$270,819
July 2016	July 2015 through June 2016	$365,654
August 2016	August 2015 through July 2016	$324,943
September 2016	September 2015 through August 2016	$324,449
October 2016	October 2015 through September 2016	$340,759
November 2016	November 2015 through October 2016	$376,628
December 2016	December 2015 through November 2016	$376,638
January 2017	January 2016 through December 2016	$380,057

Table 2-10
Twelve-Month Rolling Average Prices of Compliance Year 2016 Discrete-Year SOx RTCs

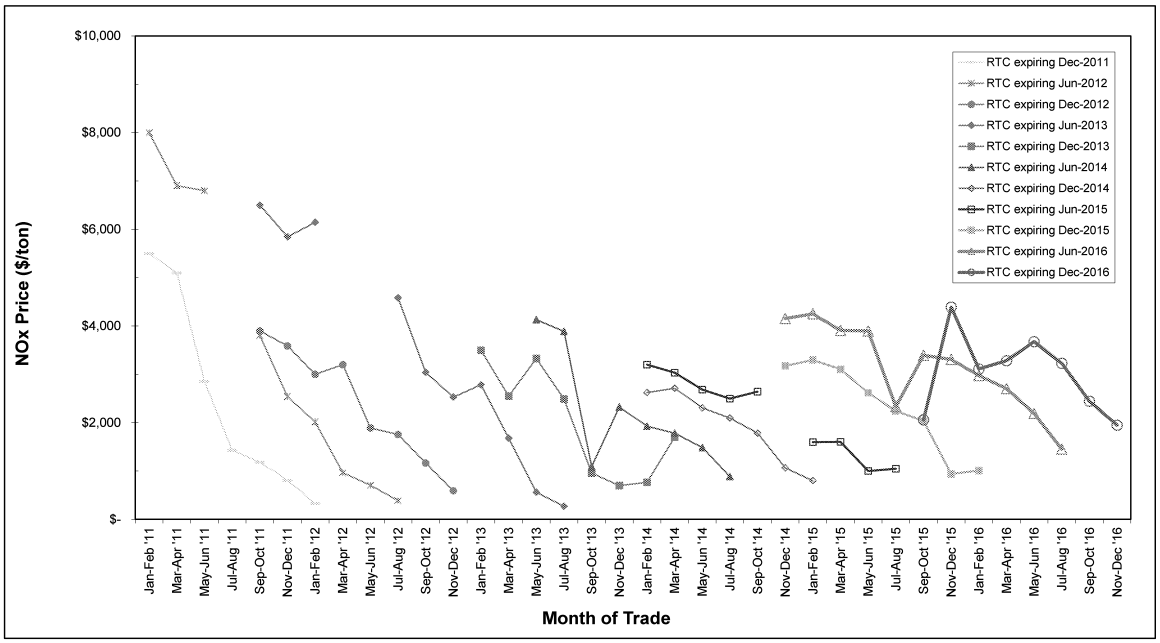
Reporting Month	12-Month Period	Average Price ($/ton)
January 2017	January 2016 through December 2016	$1,255

Average Price for NOx RTCs Nearing Expiration

Generally, RTC prices decrease as their expiration dates approach and during the sixty days after their expiration dates during which they can be traded. RTC prices are usually lowest during the 60 day-period following their expiration date during which facilities are allowed to trade and obtain RTCs to cover their emissions. This general trend has been repeated every year since 1994 except for Compliance Years 2000 and 2001 (during the California energy crisis), when NOx RTC prices increased as the expiration dates approached because the power plants' NOx emissions increased significantly, causing a shortage of NOx RTCs. Prices for NOx RTCs that expired in calendar year 2016 followed the general trend of RTC prices declining over the course of the compliance year and the sixty-day trading period thereafter.

The bi-monthly average price for these near-expiration NOx RTCs is shown in Figure 2-11 to illustrate the general price trend for these RTCs. The general declining trend of RTC prices nearing and just past expiration indicates that there was an adequate supply to meet RTC demand during the final reconciliation period following the end of the compliance years. A similar analysis is not performed for the price of SOx RTCs nearing expiration because there are not enough SOx trades over the course of the year to yield meaningful data. For calendar year 2016, there were only nine discrete-year SOx trades with price for Compliance Years' 2015 and 2016 RTCs. These prices were flat throughout the year.

Figure 2-11
Bi-Monthly Average Price for NOx RTCs near Expiration



Note: Data is presented for a limited number of RTC expiration dates for graphical clarity.

IYB RTC Prices

The annual average price for IYB NOx RTCs traded in calendar year 2016 was $380,057 per ton, which is much higher than the annual average price of $199,685 per ton traded in calendar year 2015. This is expected since the IYB NOx RTCs traded in 2016 are those remaining RTCs after the application of the NOx reduction adopted by the Governing Board on December 4, 2015. The annual average price for IYB SOx RTCs traded in calendar year 2016 was $50,000 per ton, which is slightly lower than the $53,665 per ton traded in calendar year 2015. There was one IYB SOx trade with price totaling 2.5 tons in 2016, compared to the four IYB SOx trades and 75 tons traded in 2015. An investor purchased the IYB SOx traded with price. Data regarding IYB RTCs traded with price (excluding swap trades) for NOx and SOx RTCs and their annual average prices since 1994 are summarized in Tables 2-11 and 2-12, respectively. In calendar year 2016, the annual average IYB RTC prices did not exceed the $639,399 per ton of NOx RTCs or the $460,367 per ton of SOx RTCs program review thresholds established by the Governing Board for IYB RTCs pursuant to California Health and Safety Code §39616(f).

Table 2-11
IYB NOx Pricing (Excluding Swaps)

Calendar Year	Total Reported Value ($ millions)	IYB RTC Traded with Price (tons)	Number of IYB Registrations With Price	Average Price ($/ton)
1994*	$1.3	85.7	1	$15,623
1995*	$0.0	0	0	N/A
1996*	$0.0	0	0	N/A
1997*	$7.9	404.6	9	$19,602
1998*	$34.1	1,447.6	23	$23,534
1999*	$18.6	438.3	19	$42,437
2000*	$9.1	184.2	15	$49,340
2001*	$34.2	416.9	25	$82,013
2002	$5.5	109.5	31	$50,686
2003	$14.3	388.3	28	$36,797
2004	$12.5	557.0	52	$22,481
2005	$43.1	565.3	71	$76,197
2006	$65.2	432.9	50	$150,665
2007	$45.4	233.5	25	$194,369
2008	$49.7	245.6	27	$202,402
2009	$16.7	134.2	14	$124,576
2010	$14.3	149.0	13	$95,761
2011	$9.1	160.7	29	$56,708
2012	$2.2	46.6	13	$48,146
2013	$12.0	260.9	17	$45,914
2014	$99.7	902.2	49	$110,509
2015	$187.4	938.5	47	$199,685
2016	$114.7	301.9	20	$380,057

* No information regarding swap trades was reported until May 9, 2001.

Table 2-12
IYB SOx Pricing (Excluding Swaps)

Calendar Year	Total Reported Value ($ millions)	IYB RTC Traded with Price (tons)	Number of IYB Registrations With Price	Average Price ($/ton)
1994*	$0.0	0	0	N/A
1995*	$0.0	0	0	N/A
1996*	$0.0	0	0	N/A
1997*	$11.9	429.2	7	$27,738
1998*	$1.0	50.0	1	$19,360
1999*	$0.8	55.0	3	$14,946
2000*	$1.4	50.6	5	$27,028
2001*	$10.2	306.8	8	$33,288
2002	$6.7	147.5	5	$45,343
2003	$0.6	110.9	1	$5,680
2004	$0.0	0.0	0	N/A
2005	$1.0	141.5	3	$7,409
2006	$3.5	241.7	12	$14,585
2007	$3.7	155.2	5	$23,848
2008	$3.3	146.8	5	$22,479
2009	$3.7	100.0	4	$36,550
2010	$30.2	277.0	10	$109,219
2011	$1.03	10.0	2	$102,366
2012	$14.6	116.2	4	$125,860
2013	$14.4	79.2	4	$181,653
2014	$1.8	22.5	4	$80,444
2015	$4.0	74.8	4	$53,665
2016	$0.13	2.5	1	$50,000

* No information regarding swap trades was reported until May 9, 2001.

Other Types of RTC Transactions and Uses

Another type of RTC trade, besides traditional trading and swapping activities, is a trade involving the contingent right (option) to purchase RTCs. In those trades, one party pays a premium for the contingent right (option) to purchase RTCs owned by the other party at a pre-determined price within a certain time period. Until RTCs are transferred from seller to buyer, prices for options are not reported, because the seller is not paid for the actual RTCs, but only for the right to purchase the RTCs at a future date. These rights may or may not actually be exercised. RTC traders are obligated to report options to SCAQMD within five business days of reaching an agreement. These reports are posted on SCAQMD's website. There were no reported trades involving the contingent right to buy or sell RTCs in calendar year 2016.

In addition to mitigating emissions at RECLAIM facilities, RTCs were also used by facilities to satisfy variance conditions. During calendar year 2016, three RECLAIM facilities retired a total of 0.7 tons of NOx RTCs for this purpose. These consisted of discrete-year RTCs for Compliance Years 2015 and 2016.

Market Participants

RECLAIM market participants have traditionally included RECLAIM facilities, brokers, commodity traders, and private investors. Starting in calendar year 2004, mutual funds joined the traditional participants in RTC trades. Market participation expanded further in 2006, when foreign investors started participating in RTC trades. However, foreign investors have not participated in any RTC trades since calendar year 2008 and foreign investors do not hold any current or future RTCs at this time.

RECLAIM facilities are the primary users of RTCs and they hold the majority of RTCs as allocations. They usually sell their surplus RTCs by the end of the compliance year or when they have a long-term decrease in emissions. Brokers match buyers and sellers, and usually do not purchase or own RTCs. Commodity traders and private investors actually invest in and own RTCs in order to seek profits by trading them. They do not need RTCs to offset or reconcile any emissions. For purposes of discussion in this report, “investors” include all parties who hold RTCs other than RECLAIM facility permit holders and brokers. Brokers typically do not actually purchase RTCs but facilitate trades.

Investor Participation

In 2016 investors were actively involved in 137 of the 196 discrete-year NOx RTC trades with price, six of the eight discrete-year SOx RTC trades with price, and 16 of the 20 IYB NOx trades with price. An investor was also involved in the one IYB SOx trade with price.

Investors’ involvement in discrete-year NOx and SOx trades registered with price in calendar year 2016 is illustrated in Figures 2-12 and 2-13. Figure 2-12 is based on total value of discrete-year NOx and SOx RTCs traded, and shows that investors were involved in 63% and 64%, respectively, of the discrete-year NOx and SOx trades reported by value. Figure 2-13 is based on volume of discrete-year RTCs traded with price and shows that investors were involved in 62% and 54% of the discrete-year NOx and SOx trades by volume, respectively. Figures 2-14 and 2-15 provide similar data for IYB NOx and SOx trades, and show that investors were involved in 25% of IYB NOx trades on a reported value basis, and 19% of IYB NOx trades on the basis of the volume traded with price. An investor was involved in the sole IYB SOx trade with price in calendar year 2016.

Figure 2-12
Calendar Year 2016 Investor-Involved Discrete-Year NOx and SOx Trades Based on Value Traded

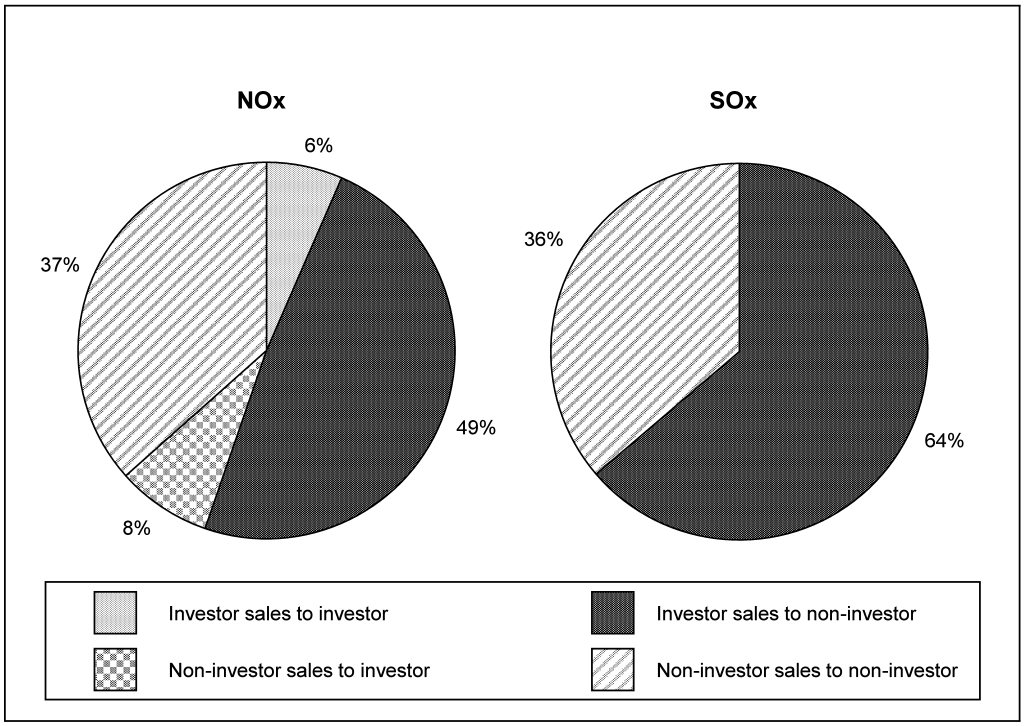


Figure 2-13
Calendar Year 2016 Investor-Involved Discrete-Year NOx and SOx Trades Based on Volume Traded with Price

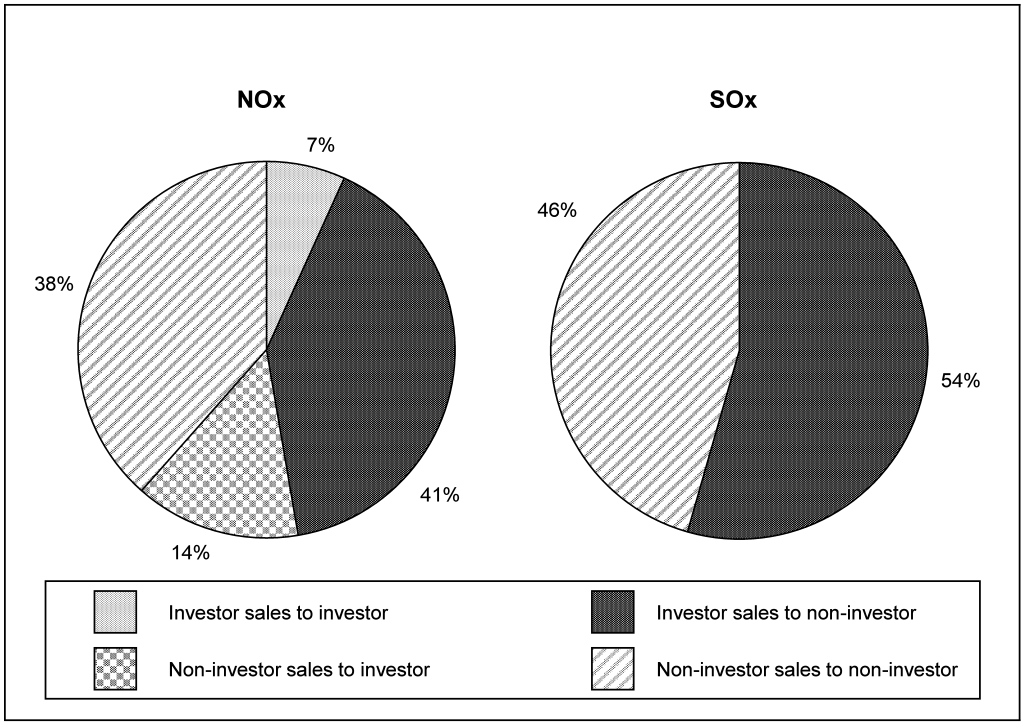


Figure 2-14
Calendar Year 2016 Investor-Involved IYB NOx and SOx Trades Based on Value Traded

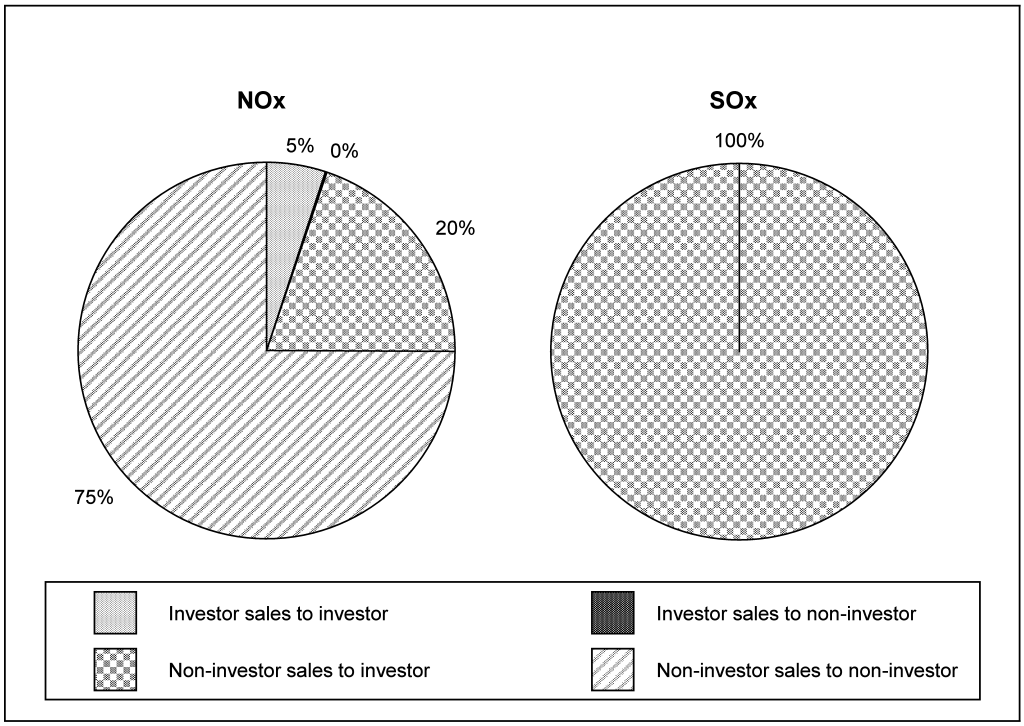
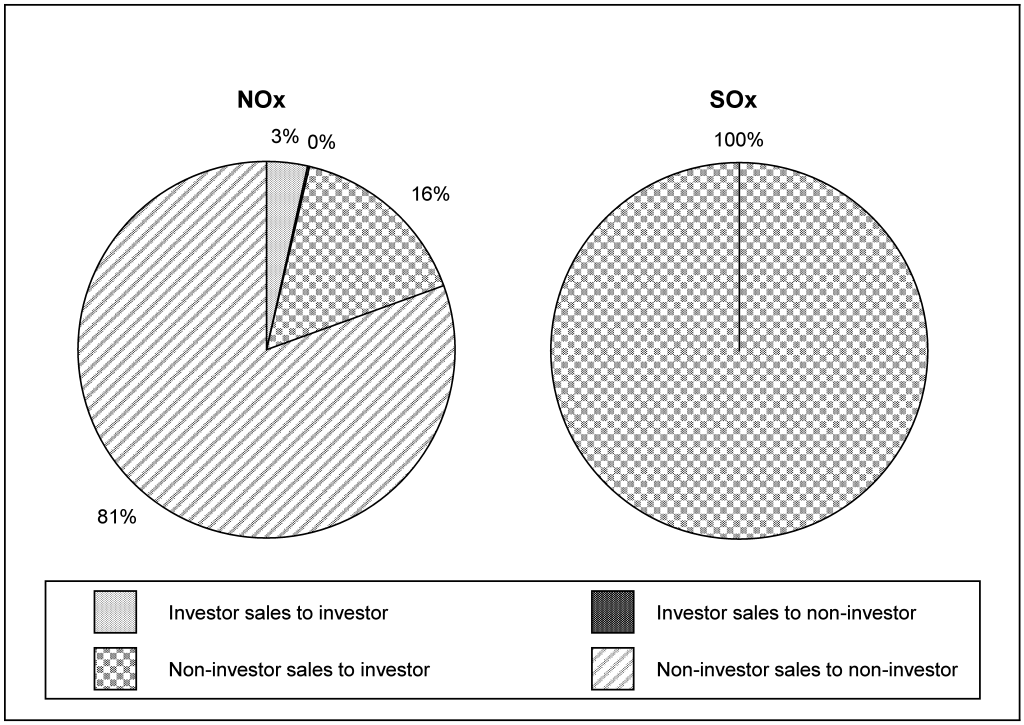


Figure 2-15
Calendar Year 2016 Investor-Involved IYB NOx and SOx Trades Based on Volume Traded with Price



As of the end of calendar year 2016, investors' holding of IYB NOx RTCs had increased to 3.1% compared to 1.9% at the end of calendar year 2015. Mutual fund investors are no longer holders of IYB NOx RTCs, down from a high of 3.3% at the end of calendar year 2011 and 1.4% at the end of calendar year 2014. Investors' holding of IYB SOx RTCs increased to 5.0% at the end of calendar year 2016 from 3.3% at the end of calendar year 2015. No IYB SOx RTCs are currently held by mutual fund investors.

The available supply of IYB RTCs are generally from facilities that have permanently reduced emissions through the installation of control equipment, the modification or replacement of old equipment, or equipment and/or facility shutdowns. There were five RECLAIM facilities that shut down during Compliance Year 2015. These five facilities all participated in the NOx RECLAIM program and held a total of 48.3 tons of IYB NOx RTCs and the one facility also participating in the SOx RECLAIM program held a total of 44.0 tons of IYB SOx. Currently, these facilities hold a total of 2.4 tons of IYB NOx RTCs and 0.01 tons of IYB SOx RTCs. All IYB NOx and SOx RTCs sales from these shutdowns occurred prior to calendar year 2015.

Investor Impacts on RTC Market

Theoretically, the role of investors in this market is to provide capital for installing air pollution control equipment that costs less than the market value of credits. In addition, investors can also improve price competitiveness. This market theory may not fully apply to RECLAIM due to the uniqueness of the program because RECLAIM facility operators have no substitute for RTCs, and short of curtailing operations, pollution controls cannot be implemented within a short time period. That is, there is no alternative source of credits available to RECLAIM facilities when RTC prices increase (they do not have the option to switch to another source of credits when RTCs become expensive). Therefore, RECLAIM facility operators may be at the mercy of owners of surplus or investor-owned RTCs in the short term, particularly during times of rapid price increases, as evidenced in 2000 and 2001 during the California energy crisis.

Generally, RECLAIM facilities hold back additional RTC's for each year as a compliance margin to ensure that they do not inadvertently find themselves exceeding their allocations (failing to reconcile by securing sufficient RTCs to cover their emissions) if their reported emissions increase as the result of any problems or errors discovered by SCAQMD staff during annual facility audits. Facilities have indicated to staff in the past that this compliance margin is approximately 10% of their emissions. For Compliance Year 2015, the total RECLAIM NOx emissions were 7,246 tons. If the future total NOx emissions increased to the Compliance Year 2007 level of 8,796 tons (the first year of the NOx allocation programmatic reduction adopted in January 2005), the NOx RTC surplus would be only 904 tons (9% of allocation), which is almost in line with the 10% compliance margin reportedly held by RECLAIM facilities.

To put investors' holdings in context, at the end of calendar year 2016 the aggregate investors' holdings are 3.1% of IYB NOx RTCs. While it can be argued that the holding of IYB NOx RTCs by investors as a group is small relative to the total supply of IYB NOx RTCs, and given the recent rule

amendment that reduced allocations by 45% to be achieved in future years, there is no clear basis to estimate the level of IYB RTCs available for sale by non-investors. IYB RTCs represent a critical aspect of the program because these streams of RTCs are sought after to support growth at new or existing facilities. Active facilities are less likely to sell their future year RTCs as IYB. As a result, new RECLAIM facilities or facilities with modifications resulting in emissions increases are potentially at the mercy of investors holding IYB RTCs. Investors have the ability to purchase RTCs at any time so there is the potential for investors' holdings of IYB NOx RTCs to increase in the future.

On the other hand, overall emissions in RECLAIM will certainly change and can be affected by various factors including installation of more emission control equipment, production changes, inclusion of additional facilities into the RECLAIM universe, and shifts in industry sectors and in the economy, in general. Staff anticipates that there are two primary mechanisms that drive a facility to implement additional control technologies: Implementation of Best Available Control Technology (BACT) when existing sources reach the end of their useful lives and are replaced, and demand for RTCs approaching the supply driving up RTC prices and incentivizing the installation of emission controls. The first of these mechanisms will occur gradually over time and the second is likely to be significant when RECLAIM facilities increase production or the supply of RTCs decreases as a result of amendments to Rule 2002 implementing BARCT as discussed in Chapter 3. The first iteration of amending Rule 2002 to reduce the NOx RTC supply to reflect changes in BARCT was adopted by the Governing Board in January 2005 and phased in from Compliance Year 2007 through Compliance Year 2011. The first iteration for SOx (adopted November 2010 with phased implementation commencing in Compliance Year 2013 and full implementation starting with Compliance Year 2018) is currently underway. SOx RECLAIM facilities had ample notice and have been able to keep aggregate SOx emissions below aggregate allocations without significant price increases in Compliance Years 2013, 2014, and 2015.

On December 4, 2015, the Governing Board amended Rule 2002 to implement BARCT by reducing the NOx RTC supply for Compliance Year 2016 and after, as further discussed in Chapter 3. Furthermore, on October 7, 2016, the Governing Board approved amendments to prevent facility shutdown RECLAIM Trading Credits (RTCs) from entering the market and potentially delaying the installation of pollution controls at NOx RECLAIM facilities in order to bring this aspect of RECLAIM more in line with non-RECLAIM New Source Review. The December 2015 and October 2016 amendments are expected to put pressure on RECLAIM facility operators to reduce emissions so as to keep them below their RTC holdings. It is too soon to tell how the market will respond to these amendments, but if adequate emissions controls are not implemented in a timely manner there is the potential for a seller's market for NOx RTCs to develop, which would make RTCs held by investors increasingly important to the market, as described above. SCAQMD staff will continue to monitor market activity and prices throughout the implementation and will report back to the Governing Board regularly.

The significance of investors' holdings will certainly depend on the ability of RECLAIM facilities to generate adequate emissions reductions in time to dampen the effect of a sellers' market that may exist if demand surges in a short period of

time, as it did during the California energy crisis of 2000-2001. Proposals to generate emission reduction credits from sources outside of RECLAIM (*i.e.*, mobile and area sources) can also dampen sudden price increases. SCAQMD staff continues to monitor investor participation in the market to ensure that such participation does not adversely impact the RECLAIM program.

CHAPTER 3
EMISSION REDUCTIONS ACHIEVED

Summary

For Compliance Year 2015, aggregate NOx emissions were below total allocations by 25% and aggregate SOx emissions were below total allocations by 26%. No emissions associated with breakdowns were excluded from reconciliation with facility allocations in Compliance Year 2015. Accordingly, no mitigation is necessary to offset excluded emissions due to approved Breakdown Emission Reports. Therefore, based on audited emissions, RECLAIM achieved its targeted emission reductions for Compliance Year 2015. With respect to the Rule 2015 backstop provisions, Compliance Year 2015 aggregate NOx and SOx emissions were both well below aggregate allocations and, as such, did not trigger the requirement to review the RECLAIM program.

Background

One of the primary objectives of the annual RECLAIM program audits is to assess whether RECLAIM is achieving its targeted emission reductions. Those targeted emission reductions are embodied in the annual allocations issued to RECLAIM facilities. In particular, the annual allocations reflect required emission reductions initially from the subsumed command-and-control rules and control measures, as well as from subsequent reductions in allocations as a result of BARCT implementation. In January 2005 and December 2015, the Board adopted amendments to Rule 2002 to further reduce aggregate RECLAIM NOx allocations through implementation of the latest BARCT. The 2005 amendments resulted in cumulative NOx allocation reductions of 22.5% (2,811 tons/year, or 7.7 tons/day) from all RECLAIM facilities by Compliance Year 2011, with the biggest single-year reduction of 11.7% in Compliance Year 2007. The 2015 amendments will reduce NOx allocations by 45.2% (4,380 tons/year, or 12.0 tons/day) by Compliance Year 2022. The reductions are phased-in from Compliance Year 2016 through Compliance Year 2022.

The Board also amended Rule 2002 in November 2010 to implement BARCT for SOx. Specifically, the November 2010 amendments called for certain facilities' RECLAIM SOx allocations to be adjusted to achieve a 48% (2,081 tons/year, or 5.7 tons/day) overall reduction, with the reductions phased-in from Compliance Year 2013 through Compliance Year 2019. About 1,460 tons/year, or 4.0 tons/day (approximately 70% of the scheduled reduction), of SOx allocations were reduced by Compliance Year 2014. The next increment of reduction will be in Compliance Year 2017 and the last increment will be in 2019.

Emissions Audit Process

Since the inception of the RECLAIM program, SCAQMD staff has conducted annual program audits of the emissions data submitted by RECLAIM facilities to ensure the integrity and reliability of RECLAIM emission data. The process includes reviews of APEP reports submitted by RECLAIM facilities and audits of field records and emission calculations. The audit process is described in further detail in Chapter 5 – Compliance.

SCAQMD staff adjusts the APEP-reported emissions based on audit results, as necessary. Whenever SCAQMD staff finds discrepancies, they discuss the findings with the facility operators and provide the operators an opportunity to review changes resulting from facility audits and to present additional data or information in support of the data stated in their APEP reports.

This rigorous audit process, although resource intensive, reinforces RECLAIM's emissions monitoring and reporting requirements and enhances the validity and reliability of the final emissions data. The audited emissions are used to determine if a facility complied with its allocations. The most recent five compliance years' audited NOx emissions for each facility are posted on SCAQMD's web page after the audits are completed. All emissions data presented in this annual RECLAIM audit report are compiled from audited facility emissions.

Emission Trends and Analysis

RECLAIM achieves its emission reduction goals on an aggregate basis by ensuring that annual emissions are below total RTCs. It is important to understand that the RECLAIM program is successful at achieving these emission reduction goals even when some individual RECLAIM facilities exceed their RTC account balances, provided aggregate RECLAIM emissions do not exceed aggregate RTCs issued. Therefore, aggregate audited NOx or SOx emissions from all RECLAIM sources are the basis for determining whether the programmatic emission reduction goals for that emittant are met each year.

Since the last annual report, one facility's previous year audit was re-opened based on reassessment of the facility's records and all information available to the SCAQMD. The re-opened audit affected the facility's NOx emissions reported for Compliance Year 2014. Table 3-1 summarizes the change to the audited emissions for the impacted facility. This audit change caused a decrease of less than 0.002% in the overall audited RECLAIM NOx emissions for Compliance Year 2014.

Table 3-1
Summary of Re-Opened Audits

Compliance Year	Original Audited NOx Emissions (lbs)	Updated Audited NOx Emissions (lbs)	Change in Audited NOx Emissions (lbs)	% Change in Audited NOx Emissions	% Change in RECLAIM NOx Emissions	Number of Facilities Involved
2014	13,584	13,079	-505	-3.7%	-0.003%	1

Incorporating the above, Table 3-2 and Figure 3-1 show aggregate audited NOx emissions for Compliance Years 1994 through 2015. Programmatically, there were excess NOx RTCs remaining after accounting for audited NOx emissions for every compliance year since 1994, except for Compliance Year 2000 when NOx emissions exceeded the total allocations due to the California energy crisis. Since Compliance Year 2007, the first year of the programmatic reduction in RECLAIM NOx allocations that was adopted by the Governing Board as part of

the January 2005 rule amendments, the unused NOx RTCs have been at least 20% of the aggregate allocations. Specifically, Compliance Year 2015 NOx emissions were below total allocations by 25%. Aggregate annual NOx emissions have remained relatively level since Compliance Year 2011.

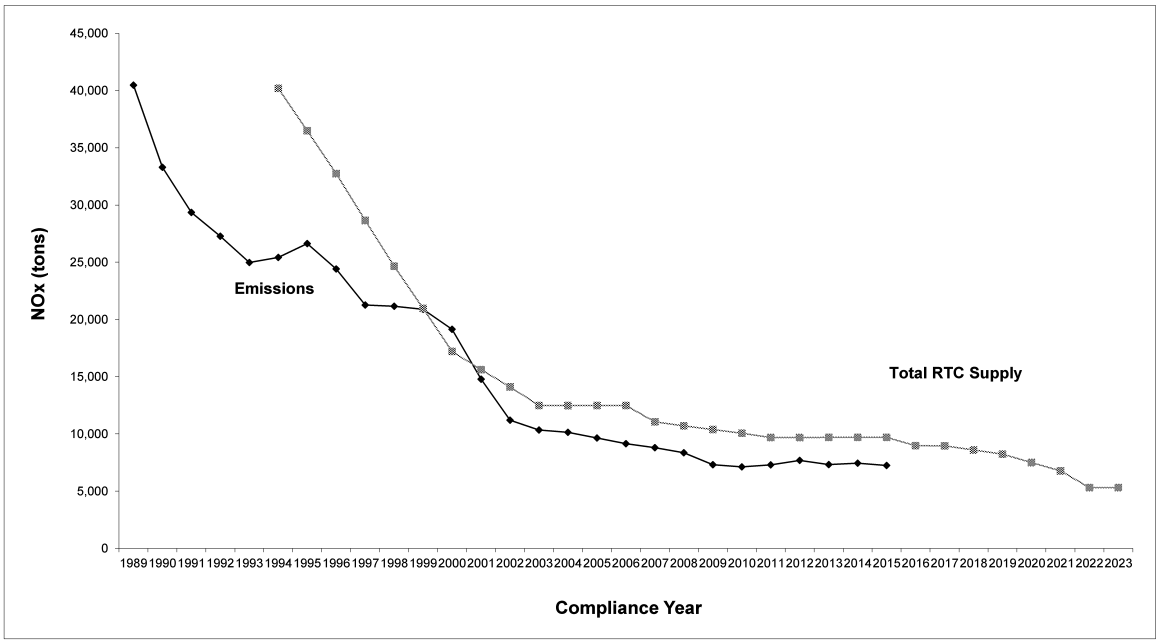
Table 3-2
Annual NOx Emissions for Compliance Years 1994 through 2015

Compliance Year	Audited Annual NOx Emissions[1] (tons)	Audited Annual NOx Emissions Change from 1994 (%)	Total NOx RTCs[2] (tons)	Unused NOx RTCs (tons)	Unused NOx RTCs (%)
1994	25,420	0%	40,187	14,767	37%
1995	26,632	4.8%	36,484	9,852	27%
1996	24,414	-4.0%	32,742	8,328	25%
1997	21,258	-16%	28,657	7,399	26%
1998	21,158	-17%	24,651	3,493	14%
1999	20,889	-18%	20,968	79	0.38%
2000	19,148	-25%	17,208	-1,940	-11%
2001	14,779	-42%	15,617	838	5.4%
2002	11,201	-56%	14,111	2,910	21%
2003	10,342	-59%	12,485	2,143	17%
2004	10,134	-60%	12,477	2,343	19%
2005	9,642	-62%	12,484	2,842	23%
2006	9,152	-64%	12,486	3,334	27%
2007	8,796	-65%	11,046	2,250	20%
2008	8,349	-67%	10,705	2,356	22%
2009	7,306	-71%	10,377	3,071	30%
2010	7,121	-72%	10,053	2,932	29%
2011	7,302	-71%	9,690	2,388	25%
2012	7,691	-70%	9,689	1,998	21%
2013	7,326	-71%	9,699	2,373	24%
2014	7,447	-71%	9,699	2,252	23%
2015	7,246	-71%	9,700	2,454	25%

[1] The RECLAIM universe is divided into two cycles with compliance schedules staggered by six months. Compliance years for Cycle 1 facilities run from January 1 through December 31 and Cycle 2 compliance years are from July 1 through June 30.

[2] Total RTCs = Allocated RTCs + RTCs from ERC conversion.

Figure 3-1
NOx Emissions and Available RTCs



Similar to Table 3-2 and Figure 3-1 for NOx, Table 3-3 presents aggregate annual SOx emissions data for each compliance year based on audited emissions, and Figure 3-2 compares these audited aggregate annual SOx emissions with the aggregate annual SOx RTC supply. As shown in Table 3-3 and Figure 3-2, RECLAIM facilities have not exceeded their SOx allocations on an aggregate basis in any compliance year since program inception. For Compliance Year 2015, SOx emissions were below total allocations by 26%. The unused SOx RTCs from Compliance Year 2008 and on has remained in excess of 20%. The data indicates that RECLAIM met its programmatic SOx emission reduction goals and demonstrated equivalency in SOx emission reductions compared to the subsumed command-and-control rules and control measures. Based on audited emission data, annual SOx emissions decreased by 80 tons (4%) in Compliance Year 2015 compared to SOx emissions in Compliance Year 2014.

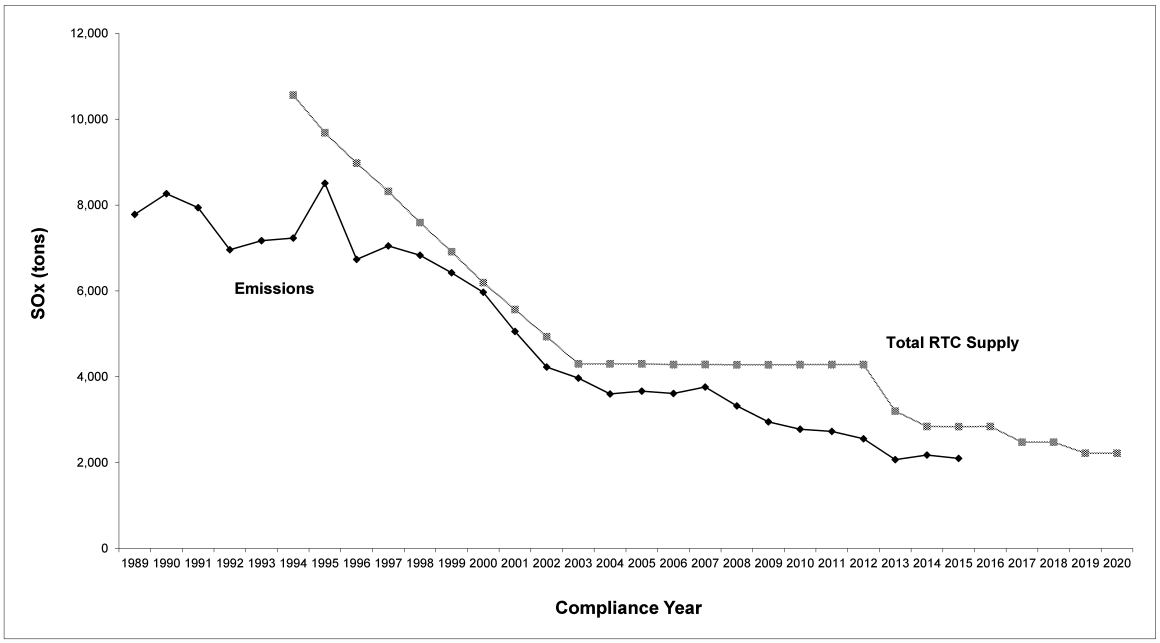
Table 3-3
Annual SOx Emissions for Compliance Years 1994 through 2015

Compliance Year	Audited Annual SOx Emissions[1] (tons)	Audited Annual SOx Emissions Change from 1994 (%)	Total SOx RTCs[2] (tons)	Unused SOx RTCs (tons)	Unused SOx RTCs (%)
1994	7,230	0%	10,559	3,329	32%
1995	8,508	18%	9,685	1,177	12%
1996	6,731	-6.9%	8,976	2,245	25%
1997	7,048	-2.5%	8,317	1,269	15%
1998	6,829	-5.5%	7,592	763	10%
1999	6,420	-11%	6,911	491	7.1%
2000	5,966	-17%	6,194	228	3.7%
2001	5,056	-30%	5,567	511	9.2%
2002	4,223	-42%	4,932	709	14%
2003	3,968	-45%	4,299	331	7.7%
2004	3,597	-50%	4,299	702	16%
2005	3,663	-49%	4,300	637	15%
2006	3,610	-50%	4,282	672	16%
2007	3,759	-48%	4,286	527	12%
2008	3,319	-54%	4,280	961	22%
2009	2,946	-59%	4,280	1,334	31%
2010	2,775	-62%	4,282	1,507	35%
2011	2,727	-62%	4,283	1,556	36%
2012	2,552	-65%	4,283	1,731	40%
2013	2,066	-71%	3,198	1,132	35%
2014	2,176	-70%	2,839	663	23%
2015	2,096	-71%	2,836	740	26%

[1] The RECLAIM universe is divided into two cycles with compliance schedules staggered by six months. Compliance years for Cycle 1 facilities run from January 1 through December 31 and Cycle 2 compliance years are from July 1 through June 30.

[2] Total RTCs = Allocated RTCs + RTCs from ERC conversion.

Figure 3-2
SOx Emissions and Available RTCs



Comparison to Command-and-Control Rules

RECLAIM subsumed a number of command-and-control rules[1] and sought to achieve reductions equivalent to these subsumed rules that continue to apply to non-RECLAIM facilities. RECLAIM facilities are exempt from the subsumed rules' requirements that apply to SOx or NOx emissions once the facilities comply with the applicable monitoring requirements of Rules 2011 – Requirements for Monitoring, Reporting, and Recordkeeping for Oxides of Sulfur (SOx) Emissions or 2012 – Requirements for Monitoring, Reporting, and Recordkeeping for Oxides of Nitrogen (NOx) Emissions, respectively.

The only rule subsumed by RECLAIM and amended during Compliance Year 2015, was Rule 1110.2 - Emissions from Gaseous- and Liquid-Fueled Engines. Amended on December 4, 2015, this rule extended the compliance deadline of January 1, 2016 for several biogas engine operators committed to installing control equipment because procurement and installation took longer than expected. The amendment also provided a compliance option for additional time with the payment of a compliance flexibility fee. Furthermore, U.S. EPA had raised concerns regarding the approvability of Rule 1110.2 into the State Implementation Plan because the existing breakdown provisions of the rule allowed unlimited emissions during reported breakdowns that were not subject to any enforcement action. This amendment addressed U.S.EPA's concerns on breakdowns and potential excess emissions without enforcement, by establishing a limit for exceedances due to breakdowns without enforcement action per calendar quarter. The amendment also removed existing rule language stating that certain breakdowns are not violations of the rule, and added U.S. EPA

[1] See Tables 1 and 2 of Rule 2001.

suggested language making clear that breakdowns may be subject to federal enforcement.

On June 3, 2016, Rule 1110.2, which was amended again to provide relief for one affected facility. This single facility, which operated two landfill gas-fired engines at the Prima Deshecha Landfill, was subject to a power purchase agreement (PPA) that expires on October 1, 2022, and could not economically meet the established compliance deadline of January 1, 2017. The amendments exempted the facility operator from the emission requirements of the rule, contingent upon the facility submitting a retirement plan for the permanent shutdown of all equipment subject to this rule at the expiration date of the PPA.

Neither the December 4, 2015 nor the June 3, 2016 amendments to Rule 1110.2 changed any category-wide equipment emissions limits. Rather, the limits for exceedances established in the December 4, 2015 amendment were for the express purpose of establishing excess emissions concentration thresholds for breakdowns (limiting no more than three per calendar quarter) to address U.S EPA's concern regarding unenforceable excess emissions from breakdowns. The June 3, 2016, amendment also did not impose a category-wide equipment emissions limit change. Rather, this amendment exempted a single non-RECLAIM facility from meeting its current command-and-control emission limit in exchange for the future permanent shutdown of all equipment subject to this rule at this facility. Since neither of these amendments to Rule 1110.2 affected category-wide emission limits and were administrative in nature, they did not result in any limitations requiring emission reductions on NOx or SOx sources at non-RECLAIM facilities. And, since Rule 2001 only exempts those provisions in identified rules applicable to NOx and SOx emissions at RECLAIM facilities, the recent amendments to Rule 1110.2 did not result in disproportionate impacts between RECLAIM and non-RECLAIM sources.

Other rules amended or adopted during Compliance Year 2015, but not subsumed by RECLAIM included Rules 1148.1 – Oil and Gas Production Wells, and Rule 1148.2 - Notification and Reporting Requirements for Oil and Gas Wells and Chemical Suppliers.

On September 4, 2015, the Governing Board amended Rule 1148.1. The amendment provided enforceable mechanisms to reduce odor nuisance potential from emissions associated with oil and gas production facility operations and also updated rule language to promote clarity, consistency and enforceability. The amendment required: 1) the use of odor mitigation best practices; 2) facilities located within 1,500 feet of a sensitive receptor to conduct and submit a specific cause analysis for any confirmed odor event; and 3) facilities with continuing odor issues to develop and implement an approved Odor Mitigation Plan.

Rule 1148.2 - Notification and Reporting Requirements for Oil and Gas Wells and Chemical Suppliers was also amended September 4, 2015. The purpose of this amendment was to establish requirements for owners or operators of oil and gas wells to notify the Executive Officer when conducting well drilling, well reworking, hydraulic fracturing, and other well production stimulation activities. The amendment also included reporting requirements for operators and chemical suppliers to report trade secret and non-trade secret chemicals used. The California Department of Conservation, through its Division of Oil, Gas, and Geothermal Resources (DOGGR) approved Well Stimulation Treatment

Regulations in response to the passage of Senate Bill 4 on December 30, 2014. Chemical reporting requirements for chemicals claimed as trade secret were different between the new DOGGR regulation and Rule 1148.2. Amended Rule 1148.2 included revisions to the chemical reporting requirements to be consistent with DOGGR's regulation.

In contrast to Rule 1110.2, Rules 1148.1 and 1148.2 were not subsumed under RECLAIM and contained no exemptions from their applicability for RECLAIM NOx or SOx sources. Since the requirements of these amended rules apply equally to both RECLAIM and non-RECLAIM facilities, there are no differential impacts in emissions when comparing the applicability of amended rule requirements to NOx and SOx sources under RECLAIM with NOx and SOx sources of non-RECLAIM facilities. Consequently, amendments to rules during Compliance Year 2015, both subsumed by RECLAIM and rules not subsumed by RECLAIM, did not result in any disparate impacts between NOx and SOx sources at RECLAIM and NOx and SOx sources at non-RECLAIM facilities.

Program Amendments

The Governing Board amended Regulation XX on December 4, 2015 to implement the 2012 AQMP Control Measure CMB-01 and adopted a programmatic 12 ton per day NOx RECLAIM trading credit (RTC) reduction (shave) from Compliance Years 2016 through 2022. The incremental shave schedule is 2 tons per day in 2016, 0 tons per day in 2017, 1 ton per day in 2018, 1 ton per day in 2019, 2 tons per day in 2020, 2 tons per day in 2021, and 4 tons per day in 2022.

The 2012 AQMP Control Measure CMB-01 sought to comply with California Health and Safety Code (H&SC) §40440 in regards to implementation of BARCT and to bring the Basin into attainment with the federal 24-hour PM2.5 standard by 2019 and the federal ozone ambient air quality standards by 2023 and 2031.

Among the proposed amendments considered in the December 4, 2015 Board package was a provision to require retirement of all NOx RTCs from complete facility closures or from equipment shutdowns that represent twenty - five percent or more of a facility's emissions for any quarter within the previous 2 compliance years. The objective of these shutdown provisions was to prevent NOx RTCs held by a shutdown facility from entering the market and potentially delaying the installation of pollution controls at other RECLAIM facilities. The Board did not adopt the proposed shutdown provisions and directed staff to return to the Board, after further analysis and discussion with RECLAIM stakeholders, with a proposal that would allow a closer alignment of shutdown credits in the RECLAIM program to requirements under command and control programs.

On October 7, 2016, the Governing Board adopted an amendment of Rule 2002 that included shutdown provisions that addressed the concerns of the Governing Board. The approved shutdown provisions apply only to facilities listed in Tables 7 and 8 of Rule 2002 that were issued initial NOx allocations by the SCAQMD. These facilities held over 90% of the total RTC supply. The revised shutdown provisions include a BARCT-based RTC discounting methodology for shutdown facilities that is more closely aligned to ERC discounting under command and control. When a subject facility shuts down, it will be required to surrender the amount of NOx RTCs equivalent to the difference between: (A) The average of

actual NOx emissions for the highest two of the last five years from equipment that is operated at a level greater than BARCT; and (B) The average NOx emissions from the same equipment that would have occurred if the equipment was operated at BARCT. The total RTC reduction cannot exceed the adjusted initial allocation issued to the shutdown facility by SCAQMD. If the calculated RTC reduction exceeds the facility's future year NOx RTC holdings, the owner or operator of the NOx RECLAIM shutdown facility is required to purchase and surrender a sufficient quantity of RTCs to fulfill the entire reduction requirement. Generally, the shortage was a result of previous sales of future RTCs, or deductions of future year RTCs due to exceedances. The amendments also incorporated exclusions from these provisions to allow facilities under the same ownership as of September 22, 2015 who have submitted a written declaration by November 7, 2016 identifying the facilities under the same ownership. Facilities under the declared same ownership will be allowed to use shutdown RTCs under certain conditions. In addition a provision was included to allow for planned non-operation for up to five years for facilities that met specific criteria.

Breakdowns

Pursuant to Rule 2004(i) – Breakdown Provisions, a facility may request that emission increases due to a breakdown not be counted towards the facility's allocations. In order to qualify for such exclusion, the facility must demonstrate that the excess emissions were the result of a fire or a mechanical or electrical failure caused by circumstances beyond the facility's reasonable control. The facility must also take steps to minimize emissions resulting from the breakdown, and mitigate the excess emissions to the maximum extent feasible. Applications for exclusion of unmitigated breakdown emissions from a facility's total reported annual RECLAIM emissions must be approved or denied by SCAQMD in writing. In addition, facilities are required to quantify unmitigated breakdown emissions for which an exclusion request has been approved in their APEP report.

As part of the annual program audit report, Rule 2015(d)(3) requires SCAQMD staff to determine whether excess emissions approved to be excluded from RTC reconciliation have been programmatically offset by unused RTCs within the RECLAIM program. If the breakdown emissions exceed the total unused RTCs within the program, any excess breakdown emissions must be offset by either: (1) deducting the amount of emissions not programmatically offset from the RTC holdings for the subsequent compliance year from facilities that had unmitigated breakdown emissions, proportional to each facility's contribution to the total amount of unmitigated breakdown emissions; and/or (2) RTCs obtained by the Executive Officer for the compliance year following the completion of the annual program audit report in an amount sufficient to offset the unmitigated breakdown emissions.

As shown in Table 3-4, a review of APEP reports for Compliance Year 2015 found that no facilities requested to exclude breakdown emissions from being counted against their allocations. Thus, for Compliance Year 2015, no additional RTCs are required to offset breakdown emissions pursuant to Rule 2015(d)(3).

Table 3-4
Breakdown Emission Comparison for Compliance Year 2015

Emittant	Compliance Year 2015 Unused RTCs (tons)	Unmitigated Breakdown Emissions[1] (tons)	Remaining Compliance Year 2015 RTCs (tons)
NOx	2,454	0	2,454
SOx	740	0	740

[1] Data for unmitigated breakdown emissions (not counted against Allocation) as reported under APEP reports.

Impact of Changing Universe

As discussed in Chapter 1, one facility was included into and no facilities were excluded from the NOx universe, no facilities were included or excluded from the SOx universe, and five facilities (four NOx only facilities and one NOx and SOx facility) shut down in Compliance Year 2015. Changes to the universe of RECLAIM facilities have the potential to impact emissions and the supply and demand of RTCs, and therefore, may impact RECLAIM emission reduction goals.

Existing facilities (defined by Rule 2000 as those with valid SCAQMD Permits to Operate issued prior to October 15, 1993 and that continued to be in operation or possess valid SCAQMD permits on October 15, 1993) that are not categorically excluded pursuant to Rule 200(i)(1) may choose to enter the program even though they do not meet the inclusion criteria. Existing facilities that are neither categorically excluded nor exempt pursuant to Rule 2001(i)(2) may also be included by SCAQMD if their facility-wide emissions increase to four tons or more per year of NOx or SOx or both. When one of these existing facilities enters the program, they are issued RTC allocations based on their operational history pursuant to the methodology prescribed in Rule 2002. Inclusions of existing facilities may affect demand more than supply because even though these facilities are issued RTCs based on their operational history, the amount may not be sufficient to offset their current or future operations. Overall, inclusions shift the accounting of emissions from the universe of non-RECLAIM sources to the universe of RECLAIM sources without actually changing the overall emissions inventory within the South Coast Air Basin. Finally, inclusions change the rules and requirements that apply to the affected facilities. In Compliance Year 2015, no existing facility elected to opt into the RECLAIM universe. However, one was included into the RECLAIM universe based on the Rule 2001 threshold of actual NOx and/or SOx emissions greater than or equal to four tons per year.

Facilities that received all SCAQMD Permits to Operate on or after October 15, 1993 are defined by Rule 2000 as new facilities. Except as described above for categorically excluded and exempt facilities, new facilities can choose to enter RECLAIM or can be included due to actual NOx or SOx emissions in excess of four tons or more per year. New facilities are not issued RTCs based on operational history, but any external offsets provided by the facility are converted to RTCs. For Compliance Year 2015, no new facilities elected to opt into the

RECLAIM universe or was included into the RECLAIM universe pursuant to the Rule 2001 threshold. When a new facility joins the RECLAIM universe, it is required to obtain sufficient RTCs to offset its NOx or SOx emissions. These RTCs must be obtained through the trading market and are not issued by SCAQMD to the facility (any external offsets previously provided by the facility are converted to RTCs). Such facilities increase the overall demand for the fixed supply of RTCs because they increase total RECLAIM emissions without increasing the total supply of RTCs.

The shutdown of a RECLAIM facility results in a reduction in actual emissions. Prior to the October 7, 2016 amendment of Rule 2002, shutdown facilities could retain its RTC holdings as an investment, transfer to another facility under common ownership, or trade on the market. Therefore, although the facility was no longer emitting, its RTCs could be used at another facility. Shutdown facilities had the opposite effect on the RTC market as did new facilities: the overall demand for RTCs was reduced while the supply remained constant. As reported in Chapter 1, five RECLAIM facilities (four NOx-only facilities and one NOx/ and SOx facility) shut down permanently in Compliance Year 2015.

A facility is excluded from the RECLAIM universe if SCAQMD staff determines that the facility was included in the program in error. In such cases, both the emissions and the RTCs that were issued to the facility for future years are withdrawn, thereby having a neutral impact on the RTC supply. Exclusions have the reverse effect of inclusions, in that the accounting of emissions is shifted from the RECLAIM universe of sources to the non-RECLAIM universe of sources.

Compliance Year 2015 NOx and SOx audited emissions and initial Compliance Year 2015 allocations for facilities that were shut down, excluded, or included into the program during Compliance Year 2015 are summarized in Tables 3-5 and 3-6.

Table 3-5
NOx Emissions Impact from the Changes in Universe (Tons)

Category	Compliance Year 2015 NOx Emissions (tons)	Initial Compliance Year 2015 NOx Allocations (tons)
Shutdown Facilities	2.0	66.4
Excluded Facilities	Not applicable	Not applicable
Included Facilities	7.9	0.0
RECLAIM Universe	7,246	9,700

Table 3-6
SOx Emissions Impact from the Changes in Universe (Tons)

Category	Compliance Year 2015 SOx Emissions (tons)	Initial Compliance Year 2015 SOx Allocations (tons)
Shutdown Facilities	0.0	44.1
Excluded Facilities	Not applicable	Not applicable
Included Facilities	Not applicable	Not applicable
RECLAIM Universe	2,096	2,836

Backstop Provisions

Rule 2015 requires that SCAQMD review the RECLAIM program and implement necessary measures to amend it whenever aggregate emissions exceed the aggregate allocations by five percent or more. Compliance Year 2015 aggregate NOx and SOx emissions were both below aggregate allocations as shown in Figures 3-1 and 3-2. Therefore, there is no need to initiate a program review due to emissions exceeding aggregate allocation in Compliance Year 2015.

CHAPTER 4
NEW SOURCE REVIEW ACTIVITY

Summary

The annual program audit assesses New Source Review (NSR) activity from RECLAIM facilities in order to ensure that RECLAIM is complying with federal NSR requirements and state no net increase (NNI) in emissions requirements while providing flexibility to facilities in managing their operations and allowing new sources into the program. In Compliance Year 2015, a total of five NOx RECLAIM facilities had NSR NOx emission increases, and one SOx RECLAIM facility had an NSR SOx emission increase due to expansion or modification. Consistent with all prior compliance years, there were sufficient NOx and SOx RTCs available to allow for expansion, modification, and modernization by RECLAIM facilities.

RECLAIM is required to comply with federal NSR emissions offset requirements at a 1.2-to-1 offset ratio programmatically for NOx emission increases and a 1-to-1 offset ratio for SOx emission increases on a programmatic basis. In Compliance Year 2015, RECLAIM demonstrated federal equivalency with a programmatic NOx offset ratio of 39-to-1 and SOx offset ratio of 4,112-to-1 based on the compliance year's total unused allocations and total NSR emission increases for both NOx and SOx. RECLAIM inherently complies with the federally-required 1-to-1 SOx offset ratio for any compliance year, provided aggregate SOx emissions under RECLAIM are lower than or equal to aggregate SOx allocations for that compliance year. As shown in Chapter 3, there was no programmatic SOx exceedance during Compliance Year 2015. In fact, there was a surplus of SOx RTCs. Therefore, RECLAIM more than complied with the federally-required SOx offset ratio and further quantification of the SOx offset ratio is unnecessary. Compliance with the federally-required offset ratio also demonstrates compliance with any applicable state NNI requirements for new or modified sources. In addition, RECLAIM requires application of, at a minimum, California Best Available Control Technology (BACT), which is at least as stringent as federal Lowest Achievable Emission Rate (LAER). The same BACT guidelines are used to determine applicable BACT to RECLAIM and non-RECLAIM facilities.

Background

Emissions increases from the construction of new or modified stationary sources in non-attainment areas are regulated by both federal NSR and state NNI requirements to ensure that progress toward attainment of ambient air quality standards is not hampered. RECLAIM is designed to comply with federal NSR

and state NNI requirements without hindering facilities' ability to expand or modify their operations[1].

Title 42, United States Code §7511a, paragraph (e), requires major sources in extreme non-attainment areas to offset emission increases of extreme non-attainment pollutants and their precursors at a 1.5-to-1 ratio based on potential to emit. However, if all major sources in the extreme non-attainment area are required to implement federal BACT, a 1.2-to-1 offset ratio may be used. Federal BACT is comparable to California's BARCT. SCAQMD requires all major sources to employ federal BACT/California BARCT at a minimum and, therefore, is eligible for a 1.2-to-1 offset ratio for ozone precursors (*i.e.*, NOx and VOC). The federal offset requirement for major SO_2 sources is at least a 1-to-1 ratio, which is lower than the aforementioned 1.2-to-1 ratio. Even though the Basin is in attainment with SO_2 standards, SOx is a precursor to PM2.5. The Basin is in Serious Non-attainment with 2006 Federal 24-hours standard and 2012 Federal annual standard for PM2.5. The applicable offset ratio for PM2.5 is at least 1-to-1, thus, the applicable offset ratio for SOx is 1-to-1. Health and Safety Code §40920.5 requires "no net increase in emissions from new or modified stationary sources of non-attainment pollutants or their precursors" (*i.e.*, a 1-to-1 offset ratio on an actual emissions basis). All actual RECLAIM emissions are offset at a 1-to-1 ratio provided there is not a programmatic exceedance of aggregate allocations, thus satisfying the federal offset ratio for SOx and state NNI requirements for both SOx and NOx. Annual RTC allocations follow a programmatic reduction to reflect changes in federal BACT/California BARCT and thereby comply with federal and state offset requirements.

RECLAIM requires, at a minimum, California BACT for all new or modified sources with increases in hourly potential to emit of RECLAIM pollutants. SCAQMD uses the same BACT guidelines in applying BACT to RECLAIM and non-RECLAIM facilities. Furthermore, BACT for major sources is at least as stringent as LAER (LAER is not applicable to minor facilities as defined in Rule 1302(t)). Thus, RECLAIM complies with both state and federal requirements regarding control technologies for new or modified sources. In addition to offset and BACT requirements, RECLAIM subjects RTC trades that are conducted to mitigate emissions increases over the sum of the facility's starting allocation and non-tradable/non-usable credits to trading zone restrictions to ensure net ambient air quality improvement within the sensitive zone established by Health and Safety Code §40410.5. Furthermore, facilities with actual RECLAIM emissions that exceed their initial allocation by 40 tons per year or more are required to analyze the potential impact of their emissions increases through air quality modeling.

Rule 2005 – New Source Review for RECLAIM requires RECLAIM facilities to provide (hold), prior to the start of operation, sufficient RTCs to offset the annual increase in potential emissions for the first year of operation at a 1-to-1 ratio.

[1] Federal NSR applies to federal major sources (sources with the potential to emit at least 10 tons of NOx or 100 tons of SOx per year for the South Coast Air Basin) and state NNI requirements apply to all NOx sources and to SOx sources with the potential to emit at least 15 tons per year in the South Coast Air Basin. RECLAIM's NSR provisions apply to all facilities in the program, including those not subject to federal NSR or state NNI. (Although the threshold for RECLAIM inclusions is four tons per year of NOx or SOx emissions, some RECLAIM facilities have actual emissions much less than 4 tons per year).

The same rule also requires all new RECLAIM facilities[2] and all other RECLAIM facilities that increase their annual allocations above the level of their starting allocations plus non-tradable/non-usable credits to provide sufficient RTCs to offset the annual potential emissions increase from new or modified source(s) at a 1-to-1 ratio at the commencement of each compliance year after the start of operation of the new or modified source(s). Although RECLAIM allows a 1-to-1 offset ratio for emissions increases, RECLAIM complies with the federal 1.2-to-1 offset requirement for NOx on an aggregate basis. This annual program audit report assesses NSR permitting activities for Compliance Year 2015 to verify that programmatic compliance of RECLAIM with federal and state NSR requirements has been maintained.

NSR Activity

Evaluation of NSR data for Compliance Year 2015 shows that RECLAIM facilities were able to expand and modify their operations while complying with NSR requirements. During Compliance Year 2015, a total of five NOx RECLAIM facilities (all in Cycle 1) were issued permits to operate, which resulted in a total of 64.61 tons per year of NOx emission increases from starting operations of new or modified sources, and one SOx RECLAIM facility (Cycle 1) experienced 0.18 tons per year of SOx NSR emission increases that resulted from starting operations of new or modified permitted sources. These emission increases were calculated pursuant to Rule 2005(d) – Emission Increase. As in previous years, there were adequate unused RTCs (NOx: 2,454 tons, SOx: 740 tons; see Chapter 3) in the RECLAIM universe available for use to offset these emission increases at the appropriate offset ratios.

NSR Compliance Demonstration

RECLAIM is designed to programmatically comply with the federal NSR offset requirements. Meeting the NSR requirement (offset ratio of 1.2-to-1 for NOx and at least 1-to-1 for SOx) also demonstrates compliance with the state NNI requirements. Section 173 (c) of the federal Clean Air Act (CAA) states that only emissions reductions beyond the requirements of the CAA, such as federal Reasonably Available Control Technology (RACT), shall be considered creditable as emissions reductions for offset purposes. Since the initial allocations (total RTC supply in Compliance Year 1994) already met federal RACT requirements when the program was initially implemented, any emissions reductions beyond the initial allocations are available for NSR offset purposes until RACT becomes more stringent. The programmatic offset ratio calculations presented in the Annual RECLAIM Audit Reports for Compliance Years 1994 through 2004 relied upon aggregate Compliance Year 1994 allocations as representing RACT. However, staff recognizes that RACT may have become more stringent in the intervening years, so it may no longer be appropriate to calculate the programmatic offset ratio based upon aggregate 1994 allocations.

Aggregate allocations for each compliance year represent federal BACT, which is equivalent to local BARCT. Federal BACT is more stringent than federal RACT (*i.e.*, the best available control technology is more stringent than what is reasonably available), so staff started using current allocations (federal BACT) as

[2] New facilities are facilities that received all District Permits to Construct on or after October 15, 1993.

a surrogate for RACT as the basis for calculating programmatic NOx and SOx offset ratios in the annual program audit report for Compliance Year 2005 and is continuing to do so for NOx in this report. This is a more conservative (*i.e.*, more stringent) approach than using actual RACT and is much more conservative than using aggregate Compliance Year 1994 allocations. The advantage of this approach is that, as long as the calculated NOx offset ratio is at least 1.2-to-1, it provides certainty that RECLAIM has complied with federal and state offset requirements without the need to know exactly what RACT is for RECLAIM facilities. However, if this very conservative approach should ever fail to demonstrate that the aggregate NOx offset ratio for any year is at least 1.2-to-1, that will not necessarily mean RECLAIM has not actually complied with the federally required 1.2-to-1 NOx offset ratio. Rather it will indicate that further analysis is required to accurately identify RACT so that the actual offset ratio can be calculated and a compliance determination made.

On November 3, 2016, EPA issued a proposed disapproval of the SCAQMD RACT demonstration submitted in July 2014 citing that the 2011 RECLAIM NOx emissions did not meet RACT requirements. This assessment was based on the staff report prepared for the 2015 NOx shave. The staff report showed sources operating in Compliance Year 2011 could have achieved lower emissions if all BARCT identified in 2005 were implemented for these sources. Regardless, whether or not the 2011 NOx emission goal should have been lower, staff believes that the November 2015 NOx shave and the rule amendment in October 2016 addressing equipment shutdown have adequately resolved any shortfall in RACT that may have existed in the 2005 NOx shave. Staff is in the process of discussing this with EPA in response to the proposed disapproval. Moreover, the offset ratio (39 to 1; see below) so far exceeds the required offset that there is still assurance that the 1.2 offset ratio is met.

Provided aggregate RECLAIM emissions do not exceed aggregate allocations, all RECLAIM emissions are offset at a ratio of 1-to-1. This leaves all unused allocations available to provide offsets beyond the 1-to-1 ratio for NSR emission increases. Unused allocations are based on all Cycle 1 and Cycle 2 RTCs of a given compliance year and the aggregate RECLAIM emissions for the selected time period. The NSR emission increase is the sum of emission increases due to permit activities at all RECLAIM facilities during the same compliance year. The aggregate RECLAIM offset ratios are expressed by the following formula:

$$\text{Offset Ratio} = \left(1 + \frac{\text{compliance year's total unused allocations}}{\text{total NSR emission increases}}\right)\text{-to-1}$$

As stated in the previous section under the title of "NSR Activity", permits to operate issued to five RECLAIM facilities resulted in 64.61 tons of NOx emission increase pursuant to Rule 2005(d). Additionally, as identified in Table 3-2 (Annual NOx Emissions for Compliance Years 1994 through 2015), 2,454 tons of Compliance Year 2015 NOx RTCs remained unused. Therefore, the Compliance Year 2015 NOx programmatic offset ratio calculated from this methodology is 39-to-1 as shown below:

$$\text{NOx Offset Ratio} = \left(1 + \frac{2{,}454 \text{ tons}}{64.61 \text{ tons}}\right)\text{-to-1}$$

$$= 39\text{-to-}1$$

Permits to operate issued to one RECLAIM facility resulted in 0.18 tons of SOx emission increase pursuant to Rule 2005(d). Additionally, as identified in Table 3-3 (Annual SOx Emissions for Compliance Years 1994 through 2015), 740 tons of Compliance Year 2015 SOx RTCs remained unused. Therefore, the Compliance Year 2015 SOx programmatic offset ratio calculated from this methodology is 4,112-to-1 as shown below:

$$\text{SOx Offset Ratio} = \left(1 + \frac{740 \text{ tons}}{0.18 \text{ tons}}\right)\text{-to-1}$$

$$= 4{,}112\text{-to-}1$$

RECLAIM continues to generate sufficient excess emission reductions to provide a NOx offset ratio greater than the 1.2-to-1 required by federal law. This compliance with the federal offset requirements is built into the RECLAIM program through annual reductions of the allocations assigned to RECLAIM facilities and the subsequent allocation adjustments adopted by the Governing Board to implement BARCT. The required offset ratio for SOx is 1-to-1. Since RECLAIM facilities are required to secure, at a minimum, adequate RTCs to cover their actual emissions, the SOx 1-to-1 offset ratio is met automatically provided there is no programmatic exceedance of aggregate SOx allocations for that compliance year. As stated earlier in Chapter 3, there were 740 tons of excess (unused) SOx RTCs for Compliance Year 2015. Since the offset ratio is 4,112-to-1, there is certainty that both the federally required SOx offset ratio and the California NNI requirement for SOx were satisfied.

BACT and modeling are also required for any RECLAIM facility that installs new equipment or modifies sources if the installation or modification results in an increase in emissions of RECLAIM pollutants. Furthermore, the RTC trading zone restrictions in Rule 2005 – New Source Review for RECLAIM, limit trades conducted to offset emission increases over the sum of the facility's starting allocation and non-tradable/non-usable credits to ensure net ambient air quality improvement within the sensitive zone, as required by state law.

The result of the review of NSR activity in Compliance Year 2015 shows that RECLAIM is in compliance with both state NNI and federal NSR requirements. SCAQMD staff will continue to monitor NSR activity under RECLAIM in order to assure continued progress toward attainment of ambient air quality standards without hampering economic growth in the Basin.

Modeling Requirements

Rule 2004, as amended in May 2001, requires RECLAIM facilities with actual NOx or SOx emissions exceeding their initial allocation in Compliance Year 1994 by 40 tons per year or more to conduct modeling to analyze the potential impact of the increased emissions. The modeling analysis is required to be submitted within 90 days of the end of the compliance year. For Compliance Year 2015,

three RECLAIM facilities were subject to the 40 ton modeling requirement; two facilities for NOx emissions, and one for SOx emissions.

This modeling is performed with an EPA approved air dispersion model to assess the impact of a facilities NOx or SOx emission increase on compliance with all applicable state and federal ambient air quality standards (AAQS). Air dispersion modeling submitted by each facility is reviewed by staff and revised as necessary to comply with SCAQMD's air dispersion modeling procedures including use of appropriate meteorological data for the facility location. Per Rule 2004 (q)(3), the modeling submitted by a facility must include source parameters and emissions for every major source located at the facility. For comparison against applicable state and federal AAQS, the predicted modeling impacts due to a facilities NOx or SOx emission increases are added to the highest background NOx or SOx concentration measured at the nearest ambient air monitoring station during the previous three years. Modeling runs are performed with worst-case emissions data for averaging periods that coincide with the averaging period of each applicable AAQS (*e.g.*, 1-hr, 24-hr, annual).

The SOx facility, which had an initial SOx allocation in 1994 and exceed this initial allocation by more than 40 tons in Compliance Year 2015, submitted modeling that demonstrated that SOx emissions from their major sources during 2015 will not cause an exceedance of any state or federal SO_2 AAQS. One of the NOx facilities had an initial NOx allocation in 1994 and exceeded this initial allocation by more than 40 tons in Compliance Year 2015. This facility submitted modeling that demonstrated that NOx emissions from their major sources during 2015 will not cause an exceedance of any state or federal NO_2 AAQS. The other NOx facility, which had no initial allocation in Compliance Year 1994 and whose NOx emissions were above the 40 ton per year threshold, modeled NOx emissions at a much higher emission level prior to its recent commissioning. This initial modeling determined that the annual NOx emission increase would not cause an exceedance of state or federal NO_2 AAQS. Since the initial modeling was conducted at a much higher emission level than what the facility emitted in 2015, no additional modeling analysis is required (*i.e.*, the fact that modeling conducted during the permitting process demonstrated that emissions at the potential to emit level would not cause an exceedance of the state or federal AAQS for NO_2 provides certainty that the much lower actual emissions level would not cause such an exceedance).

CHAPTER 5
COMPLIANCE

Summary

*Of the 282 NOx RECLAIM facilities audited during Compliance Year 2015, a total of 265 facilities (94%) complied with their NOx allocations, and 32 of the 33 SOx facilities (97%) complied with their SOx allocations. Eighteen facilities exceeded their allocations (17 facilities exceeded their NOx allocations, and one facility exceeded its SOx allocation) during Compliance Year 2015. The 17 facilities that exceeded their NOx allocations had aggregate NOx emissions of 387.1 tons and did not have adequate allocations to offset 45.7 tons (or 11.8%) of their combined emissions. The one SOx facility that exceeded its SOx allocation had total SOx emissions of 2.7 tons and did not have adequate allocations to offset 0.2 tons (or 7.4%). The NOx and SOx exceedance amounts are relatively small compared to the overall NOx and SOx allocations for Compliance Year 2015 (0.47% of total NOx allocations and 0.01% of total SOx allocations). The exceedances from these facilities did not impact the overall RECLAIM emission reduction goals. Pursuant to Rule 2010(b)(1)(A), these facilities had their respective exceedances deducted from their annual allocations for the compliance year subsequent to the date of SCAQMD's determination that the facilities exceeded their Compliance Year 2015 allocations. The overall RECLAIM NOx and SOx emission reduction targets and goals were met for Compliance Year 2015 (*i.e.*, aggregate emissions for all RECLAIM facilities were well below aggregate allocations).*

Background

RECLAIM facilities have the flexibility to choose among compliance options to meet their annual allocations by reducing emissions, trading RTCs, or a combination of both. However, this flexibility must be supported by standardized emission MRR requirements to ensure the reported emissions are real, quantifiable, and enforceable. As a result, detailed MRR protocols are specified in the RECLAIM regulation to provide accurate and verifiable emission reports.

The MRR requirements were designed to provide accurate and up-to-date emission reports. Once facilities install and complete certification of the required monitoring and reporting equipment, they are relieved from command-and-control rule limits and requirements subsumed under Rule 2001. Mass emissions from RECLAIM facilities are then determined directly by monitoring and reporting equipment for some sources and from data generated by monitoring equipment for others. If monitoring equipment fails to produce quality-assured data or the facility fails to file timely emissions reports, RECLAIM rules require emissions be determined by a rule-prescribed methodology known as Missing Data Procedures or "MDP." Depending on past performance of the monitoring equipment (*i.e.*, availability of quality-assured data) and the duration of the missing data period, MDP use a tiered approach to calculate emissions. As availability of quality-assured data increases, the MDP-calculated emissions become more representative of the actual emissions, but when the availability of

quality-assured data is low, MDP calculations become more conservative and approach, to some extent, “worst case” assessments.

Allocation Compliance

Requirements

At the beginning of the RECLAIM program in 1994 or at the time a facility is included in the RECLAIM program, each RECLAIM facility is issued an annual allocation for each compliance year pursuant to methodology prescribed in Rule 2002. For a facility in existence prior to October 1993, it is issued allocations by SCAQMD based on its historical production rate. A facility without an operating history prior to 1994 receives no allocation and must purchase enough RTCs to cover the emissions for their operations, except facilities that have provided ERCs to offset emission increases prior to entering RECLAIM are issued RTCs generated by converting the surrendered ERCs to RTCs. Additionally, all facilities entering RECLAIM holding any ERCs generated at and held by the individual facility itself have those ERCs converted to RTCs and added to their allocated RTCs. Knowing their emission goals, RECLAIM facilities have the flexibility to manage their emissions in order to meet their allocations in the most cost-effective manner. Facilities may employ emission control technology or process changes to reduce emissions, buy RTCs, or sell unneeded RTCs.

Facilities may buy RTCs or sell excess RTCs at any time during the year in order to ensure that their emissions are covered. There is a thirty day reconciliation period commencing at the end of each of the first three quarters of each compliance year. In addition, after the end of each compliance year, there is a 60-day reconciliation period (instead of 30 days as at the end of the first three quarters) during which facilities have a final opportunity to buy or sell RTCs for that compliance year. These reconciliation periods are provided for facilities to review and correct their emission reports as well as securing adequate allocations. Each RECLAIM facility must hold sufficient RTCs in its allocation account to cover (or reconcile with) its quarterly as well as year-to-date emissions for the compliance year at the end of each reconciliation period. By the end of each quarterly and annual reconciliation period, each facility is required to certify the emissions for the preceding quarter and/or compliance year by submitting its Quarterly Certification of Emissions Reports (QCERs) and/or APEP report, respectively.

Compliance Audit

Since the beginning of the program, SCAQMD staff has conducted annual audits of each RECLAIM facility’s emission reports to ensure their integrity and reliability. The audit process includes conducting field inspections to check process equipment, monitoring devices, and operational records. Additionally, emissions calculations are performed in order to verify emissions reported electronically to SCAQMD or submitted in QCERs and APEP reports. For Compliance Year 2015, these inspections revealed that some facilities did not obtain or record valid monitoring data, were unable to substantiate reported emissions with valid records, failed to submit emission reports when due, made errors in quantifying their emissions (*e.g.*, arithmetic errors), used incorrect emission and adjustment factors (*e.g.*, bias adjustment factors), failed to correct fuel usage to standard conditions, used emission calculation methodologies not

allowed under the rules, or used MDP inappropriately. Appropriate compliance actions are also taken based on audit findings.

Whenever an audit revealed a facility's emissions to be in excess of its annual allocation, the facility was provided an opportunity to review the audit and to present additional data to further refine audit results. This extensive and rigorous audit process ensures valid and reliable emissions data.

Compliance Status

During this compliance year, a total of 18 RECLAIM facilities failed to reconcile their emissions (17 NOx-only facilities and one NOx and SOx facility that only exceeded its SOx allocation). Thirteen of the 17 NOx-only facilities failed to secure sufficient RTCs during either the quarterly or annual reconciliation periods to cover their reported emissions. Four of these 13 NOx-only facilities with NOx exceedances based on reported emissions had additional exceedances because they under-reported their emissions and didn't hold sufficient RTCs to reconcile their audited emissions. The remaining four of the 17 facilities with NOx exceedances and the one NOx and SOx facility with a SOx exceedance had exceedances solely because they under-reported their emissions and didn't hold sufficient RTCs to reconcile their audited emissions. Reasons for under-reported NOx emissions include one or more of the following: failure to properly correct measured fuel flow to standard conditions defined as one atmosphere of pressure and a temperature of 60°F or 68°F provided that the same temperature is used throughout the facility, failure to use correct mass conversion factor when fuel flow is corrected to 60°F for process units and large sources with concentration limits, failure to submit emissions for one of the four compliance quarters, failure to use fuel flow commiserate with maximum rated equipment capacity when using timer-based fuel flow determination, failure to use correct emission factor(s), incorrect use of a unit conversion factor, and failure to apply missing data procedures during periods of invalid fuel flow measurement(s).

Overall, the Compliance Year 2015 allocation compliance rates for facilities are 94% (265 out of 282 facilities) for NOx RECLAIM and 97% (32 out of 33 facilities) for SOx RECLAIM. For purposes of comparison, the allocation compliance rates for Compliance Year 2014 were 96% and 97% for NOx and SOx RECLAIM facilities, respectively. The 17 facilities that had NOx emissions in excess of their individual NOx allocations had 387.1 tons of NOx emissions and did not have adequate RTCs to cover 45.7 of those tons (or 11.8%). The SOx facility that exceeded its SOx allocation and had total SOx emissions of 2.7 tons did not have adequate allocations to offset 0.2 tons (or 7.4%). The NOx and SOx exceedance amounts are relatively small compared to the overall allocations for Compliance Year 2015 (0.47% of aggregate NOx allocations and 0.01% of aggregate SOx allocations). Pursuant to Rule 2010(b)(1)(A), all 18 facilities had their respective NOx or SOx Allocation exceedances deducted from their annual emissions allocations for the compliance year subsequent to SCAQMD's determination that the facilities exceeded their Compliance Year 2015 allocations.

Impact of Missing Data Procedures

MDP was designed to provide a method for determining emissions when an emission monitoring system does not yield valid emissions. For major sources,

these occurrences may be caused by failure of the monitoring systems, the data acquisition and handling systems, or by lapses in the Continuous Emissions Monitoring System (CEMS) certification period. Major sources are also required to use MDP for determining emissions whenever daily emissions reports are not submitted by the applicable deadline. When comparing actual emissions with a facility's use of substituted MDP emissions, the range of MDP emissions can vary from "more representative" to being overstated to reflect a "worst case"[1] scenario. For instance, an MDP "worst case" scenario may occur for major sources that fail to have their CEMS certified in a timely manner, and therefore, have no valid CEMS data that can be used for substitution. In other cases, where prior CEMS data is available, MDP is applied in tiers depending on the duration of missing data periods and the historical availability of monitoring systems. As the duration of missing data periods gets shorter and the historical availability of monitoring systems gets higher, the substitute data yielded by MDP becomes more representative of actual emissions[2].

In addition to MDP for major sources, RECLAIM rules also define MDP for large sources and process units. These procedures are applicable when a process monitoring device fails or when a facility operator fails to record fuel usage or other monitored data (*e.g.*, hours of operation). The resulting MDP emissions reports are reasonably representative of the actual emissions because averaged or maximum emissions from previous operating periods may be used. However, for extended missing data periods (more than two months for large sources or four quarters or more for process units) or when emissions data for the preceding year are unavailable, large source and process unit MDP are also based on maximum operation or worst case assumptions.

Based on APEP reports, 98 NOx facilities and 14 SOx facilities used MDP in reporting portions of their annual emissions during Compliance Year 2015. In terms of mass emissions, 6.9% of the total reported NOx emissions and 10.9% of the total reported SOx emissions in the APEP reports were calculated using MDP for Compliance Year 2015. Table 5-1 compares the impact of MDP on reported annual emissions for the last few compliance years to the second compliance year, 1995 (MDP was not fully implemented during Compliance Year 1994).

[1] Based on uncontrolled emission factor at maximum rated capacity of the source and 24 hours per day.

[2] Based on averaged emissions during periods before and after the period for which data is not available.

Table 5-1
MDP Impact on Annual Emissions

Year	Percent of Reported Emissions Using Substitute Data*	
	NOx	SOx
1995	23.0% (65 / 6,070)	40.0% (12 / 3,403)
2009	7.8% (103 / 554)	13.8% (15 / 403)
2010	7.0% (93 / 488)	6.1% (23 / 168)
2011	6.2% (94 / 435)	12.4% (19 / 328)
2012	7.5% (95 / 560)	4.5% (13 / 114)
2013	3.9% (107 / 287)	5.6% (15 / 113)
2014	3.3% (97 / 247)	3.0% (13 / 66)
2015	6.9% (98 / 502)	10.9% (14 / 229)

* Numbers in parenthesis that are separated by a slash represent the number of facilities that reported use of MDP in each compliance year and tons of emissions based on MDP.

Most of the issues associated with CEMS certifications were resolved prior to Compliance Year 1999. Since then, very few facilities have had to submit emissions reports based on the worst case scenario under MDP, which may considerably overstate the actual emissions from major sources. As an example, most facilities that reported emissions using MDP in 1995 did so because they did not have their CEMS certified in time to report actual emissions. Since their CEMS had no prior data, MDP called for an application of the most conservative procedure to calculate substitute data by assuming continuous uncontrolled operation at the maximum rated capacity of the facility's equipment, regardless of the actual operational level during the missing data periods. As a result, the calculations yielded substitute data that may have been much higher than the actual emissions. In comparison to the 65 NOx facilities implementing MDP in Compliance Year 1995, 98 facilities reported NOx emissions using MDP in Compliance Year 2015. Even though the number of facilities is higher than in 1995, the percentage of emissions reported using MDP during Compliance Year 2015 is much lower than it was in 1995 (6.9% compared to 23%). Additionally, in terms of quantity, NOx emissions determined by the use of MDP in Compliance Year 2015 were about 8% of those in Compliance Year 1995 (502 tons compared to 6,070 tons). Since most CEMS were certified and had been reporting actual emissions by the beginning of Compliance Year 2000, facilities that had to calculate substitute data were able to apply less conservative methods of calculating MDP for systems with high availability and shorter duration missing data periods. Therefore, the substitute data they calculated for

their missing data periods were more likely to be representative of the actual emissions.

It is important to note that portions of annual emissions attributed to MDP include actual emissions from the sources as well as the possibility of overestimated emissions. As shown in Table 5-1, approximately 7% of reported NOx annual emissions were calculated using MDP in Compliance Year 2015. MDP may significantly overestimate emissions from some of the sources that operate intermittently and have low monitoring system availability, and/or lengthy missing data periods. Even though a portion of the 7% may be overestimated emissions due to conservative MDP, a significant portion (or possibly all) of it could have also been actual emissions from the sources. Unfortunately, the portion that represents the actual emissions cannot be readily estimated because the extent of this effect varies widely, depending on source categories and operating parameters, as well as the tier of MDP applied. For Compliance Year 2015, a significant portion of NOx MDP emissions data (74%) and majority of SOx MDP emissions data (96%) were reported by refineries, which tend to operate near maximum capacity for 24 hours per day and seven days per week, except for scheduled shutdowns for maintenance and barring major breakdowns or other unforeseeable circumstances. Missing data emissions calculated using the lower tiers of MDP (*i.e.*, 1N Procedure or 30-day maximum value) for facilities such as refineries that have relatively constant operation near their maximum operation are generally reflective of actual emissions because peak values are close to average values for these operations.

Emissions Monitoring

Overview

The reproducibility of reported RECLAIM facility emissions (and the underlying calculations)—and thereby the enforceability of the RECLAIM program—is assured through a tiered hierarchy of MRR requirements. A facility's equipment falls into an MRR category based on the kind of equipment it is and on the level of emissions produced or potentially produced by the equipment. RECLAIM divides all NOx sources into major sources, large sources, process units, and equipment exempt from obtaining a written permit pursuant to Rule 219. All SOx sources are divided into major sources, process units, and equipment exempt from obtaining a written permit pursuant to Rule 219. Table 5-2 shows the monitoring requirements applicable to each of these categories.

Table 5-2
Monitoring Requirements for RECLAIM Sources

Source Category	Major Sources (NOx and SOx)	Large Sources (NOx only)	Process Units and Rule 219 Equipment (NOx and SOx)
Monitoring Method	Continuous Emissions Monitoring System (CEMS) or Alternative CEMS (ACEMS)	Fuel Meter or Continuous Process Monitoring System (CPMS)	Fuel Meter, Timer, or CPMS
Reporting Frequency	Daily	Monthly	Quarterly

Continuous Emissions Monitoring System (CEMS)

Requirements

CEMS represent both the most accurate and the most reliable method of calculating emissions because they continuously monitor all of the parameters necessary to directly determine mass emissions of NOx and SOx. They are also the most costly method. These attributes make CEMS the most appropriate method for the largest emission-potential equipment in the RECLAIM universe, major sources.

Alternative Continuous Emissions Monitoring Systems (ACEMS) are alternatives to CEMS that are allowed under the RECLAIM regulation. These are devices that do not directly monitor NOx or SOx mass emissions; instead, they correlate multiple process parameters to arrive at mass emissions. To be approved for RECLAIM MRR purposes, ACEMS must be determined by SCAQMD to be equivalent to CEMS in relative accuracy, reliability, reproducibility, and timeliness

Even though the number of major sources monitored by either CEMS or ACEMS represent 19% and 61% of all permitted RECLAIM NOx and SOx sources during Compliance Year 2015, respectively, reported emissions for Compliance Year 2015 revealed that 78% of all RECLAIM NOx emissions and 99% of all RECLAIM SOx emissions were determined by CEMS or ACEMS.

Compliance Status

By the end of calendar year 1999, almost all facilities that were required to have CEMS had their CEMS certified or provisionally approved. The only remaining uncertified CEMS are for sources that recently became subject to major source reporting requirements and sources that modified their CEMS. Typically, there will be a few new major sources each year. Therefore, there will continue to be a small number of CEMS in the certification process at any time.

Semiannual and Annual Assessments of CEMS

RECLAIM facilities conduct their Relative Accuracy Test Audit (RATA) of certified CEMS using private sector testing laboratories approved under SCAQMD's Laboratory Approval Program (LAP). These tests are conducted either

semiannually or annually, depending on the most recent relative accuracy value (the sum of the average differences and the confidence coefficient) for each source. The interval is annual only when all required relative accuracies obtained during an audit are 7.5% or less (*i.e.*, more accurate).

To verify the quality of CEMS, the RATA report compares the CEMS data to data taken simultaneously, according to approved testing methods (also known as reference methods), by a LAP-approved source testing contractor. In order to have a passing RATA, each of the following relative accuracy performance criteria must be met: The relative accuracy of the CEMS results relative to the reference method results must be within ±20% for pollutant concentration, ±15% for stack flow rate, and ±20% for pollutant mass emission rate. The RATAs also determine whether CEMS data must be adjusted for low readings compared to the reference method (bias adjustment factor), and by how much. The RATA presents two pieces of data, the CEMS bias (how much it differs from the reference method on the average) and the CEMS confidence coefficient (how variable that bias or average difference is).

Tables 5-3 and 5-4, respectively, summarize the 2015 and 2016 calendar years' passing rates for submitted RATAs of certified CEMS for NOx and SOx concentration, total sulfur in fuel gas concentrations, stack flow rate (in-stack monitors and F-factor based calculations), and NOx and SOx mass emissions. However, the tables do not include SOx mass emissions calculated from total sulfur analyzer systems because such systems serve numerous devices, and therefore are not suitable for mass emissions-based RATA testing. As noted in the footnotes for each table, the calendar year 2015 and 2016 passing rates are calculated from RATA data submitted before January 14, 2016 and January 5, 2017, respectively, and may exclude some RATA data from the fourth quarter of each year.

Table 5-3
Passing Rates Based on RATAs of Certified CEMS in 2015[1]

Concentration						Stack Flow Rate				Mass Emissions			
NOx		SO_2		Total[2] Sulfur		In-Stack Monitor		F-Factor Based Calc.		NOx		SOx[3]	
No.	% Pass	No.	% Pass	No.	% Pass	No.	% Pass	No.	% Pass	No.	% Pass	No.	% Pass
373	100	93	100	13	100	42	100	379	100	373	100	80	100

[1] The calculation of passing rates includes all RATAs submitted by January 13, 2016. Ninety-nine percent of these RATAs were submitted electronically.

[2] Includes Cylinder Gas Audit (CGA) tests.

[3] Does not include SOx emissions calculated from total sulfur analyzers.

Table 5-4
Passing Rates Based on RATAs of Certified CEMS in 2016[1]

Concentration						Stack Flow Rate				Mass Emissions			
NOx		SO_2		Total[2] Sulfur		In-Stack Monitor		F-Factor Based Calc.		NOx		SOx[3]	
No.	% Pass	No.	% Pass	No.	% Pass	No.	% Pass	No.	% Pass	No.	% Pass	No.	% Pass
366	100	101	100	15	100	50	100	361	100	366	99.7	93	100

[1] The calculation of passing includes all RATAs submitted by January 4, 2017. Ninety-nine percent of these RATAs were submitted electronically.

[2] Includes Cylinder Gas Audit (CGA) tests.

[3] Does not include SOx emissions calculated from total sulfur analyzers.

As indicated in Tables 5-3 and 5-4, the passing rates for NOx/SO_2 concentration, stack flow rate, and mass emissions were at or near 100%. Since the inception of RECLAIM there have been significant improvements with respect to the availability of reliable calibration gas, the reliability of the reference method, and an understanding of the factors that influence valid total sulfur analyzer data.

Electronic Data Reporting of RATA Results

Facilities operating CEMS under RECLAIM are required to submit RATA results to SCAQMD. An electronic reporting system, known as Electronic Data Reporting (EDR), was set up to allow RATA results to be submitted electronically using a standardized format in lieu of the traditional formal source test reports in paper form. This system minimizes the amount of material the facility must submit to SCAQMD and also expedites reviews. All RATA results for calendar year 2016 were submitted via EDR.

Non-Major Source Monitoring, Reporting, and Recordkeeping

Emissions quantified for large sources are primarily based on concentration limits or emission rates specified in the Facility Permit. Other variables used in the calculation of large source emissions are dependent on the specific process of the equipment, but generally include fuel usage, applicable dry F-factor, and the higher heating value of the fuel used, which are collectively used to calculate stack flow rate. RECLAIM requires large sources to be source tested within defined three-year windows in order to validate fuel meter accuracy and the equipment's concentration limit or emission rate. Since emissions quantification is fuel-based, the monitoring equipment required to quantify emissions is a non-resettable fuel meter that must be corrected to standard temperature and pressure. Large source emission data must be submitted electronically on a monthly basis.

Process unit emission calculations are similar to those of large sources in that emissions are quantified using the fuel-based calculations for either a concentration limit or an emission factor specified in the Facility Permit. Similar to large sources, variables used in emission calculations for process units are dependent on the equipment's specific process, but generally include fuel usage, applicable dry F-factor, and the higher heating value of the fuel used. Process units that are permitted with concentration limits are also required to be source-tested, but within specified five-year windows rather than three-year windows.

Emissions for equipment exempt from obtaining a written permit pursuant to Rule 219 are quantified using emission factors and fuel usage. No source testing is required for such exempt equipment. Since emissions calculations are fuel-based for both process units and exempt equipment, the monitoring equipment required to quantify emissions is a non-resettable fuel meter, corrected to standard temperature and pressure. Alternately, a timer may be used to record operational time. In such cases, fuel usage is determined based on maximum rated capacity of the source. Process units and exempt equipment must submit emission reports electronically on a quarterly basis.

Emissions Reporting

Requirements

RECLAIM uses electronic reporting technology to streamline reporting requirements for both facilities and SCAQMD, and to help automate compliance tracking. Under RECLAIM, facilities report their emissions electronically on a per device basis to SCAQMD's Central Station computer as follows:

- Major sources must use a Remote Terminal Unit (RTU) to telecommunicate emission data to SCAQMD's Central Station. The RTU collects data, performs calculations, generates the appropriate data files, and transmits the data to the Central Station. This entire process is required to be performed by the RTU on a daily basis without human intervention.
- Emission data for all equipment other than major sources may be transmitted via RTU or compiled manually and transmitted to the Central Station via modem. Alternatively, operators of non-major sources may use SCAQMD's internet based application, Web Access To Electronic Reporting System (WATERS) to transmit emission data for non-major sources via internet connection. The data may be transmitted directly by the facility or through a third party.

Compliance Status

The main concern for emission reporting is the timely submittal of accurate daily emissions reports from major sources. If daily reports are not submitted by the specified deadlines, RECLAIM rules may require that emissions from CEMS be ignored and the emissions be calculated using MDP. Daily emission reports are submitted by the RTU of the CEMS to SCAQMD's Central Station via telephone lines. Often communication errors between the two points are not readily detectable by facility operators. Undetected errors can cause facility operators to believe that daily reports were submitted when they were not received by the Central Station. In addition to providing operators a means to confirm the receipt of their reports, the WATERS application can also display electronic reports that were submitted to, and received by, the Central Station. This system helps reduce instances where MDP must be used for late or missing daily reports, because the operators can verify that the Central Station received their daily reports, and can resubmit them if there were communication errors.

Protocol Review

Even though review of MRR protocols was only required by Rule 2015(b)(1) for the first three compliance years of the RECLAIM program, staff continues to review the effectiveness of enforcement and MRR protocols. Based on such review, occasional revisions to the protocols may be needed to achieve improved measurement and enforcement of RECLAIM emission reductions, while minimizing administrative costs to RECLAIM facilities and SCAQMD.

Since the RECLAIM program was adopted, staff has produced rule interpretations and implementation guidance documents to clarify and resolve specific concerns about the protocols raised by RECLAIM participants or observed by SCAQMD staff. In situations where staff could not interpret existing rule requirements to adequately address the issues at hand, the protocols and/or rules have been amended.

When the RECLAIM program first began, the ability to electronically transmit emissions data to SCAQMD's Central Station via modem was considered state-of-the-art technology. However, that technology is now antiquated and finding replacement components (*e.g.,* slower baud-rate modems) is becoming increasingly difficult. As such, SCAQMD is evaluating options to either upgrade or replace the current Central Station. SCAQMD plans to initiate a Working Group during 2017. Key factors that need to be considered include ease of implementation and cost impacts on RECLAIM facilities and SCAQMD. Any proposed alternative must be broadly applicable, be capable to support automatic daily transmission of reports without any human intervention, and allow adequate time for testing and implementation. Progress on this effort will be presented in future annual program audit reports.

CHAPTER 6
REPORTED JOB IMPACTS

Summary

*This chapter compiles data as reported by RECLAIM facilities in their Annual Permit Emissions Program (APEP) reports. The analysis focuses exclusively on job impacts at RECLAIM facilities and determination if those job impacts were directly attributable to RECLAIM as reported by those facilities. Additional benefits to the local economy (*e.g.*, generating jobs for consulting firms, source testing firms and CEMS vendors) attributable to the RECLAIM program, as well as factors outside of RECLAIM (*e.g.*, the prevailing economic climate), impact the job market. However, these factors are not evaluated in this report. Also, job losses and job gains are strictly based on RECLAIM facilities' reported information. SCAQMD staff is not able to independently verify the accuracy of the reported job impact information.*

According to the Compliance Year 2015 employment survey data gathered from APEP reports, RECLAIM facilities reported a net gain of 1,329 jobs, representing 1.21% of their total employment. One of the five RECLAIM facilities that shut down during Compliance Year 2015 cited RECLAIM as a factor contributing to the decision to shutdown. No other facilities reported any gain or loss of jobs due to RECLAIM.

Background

The APEP reports submitted by RECLAIM facilities include survey forms that are used to evaluate the socioeconomic impacts of the program. Facilities were asked to indicate the number of jobs at the beginning of Compliance Year 2015 and any changes in the number of jobs that took place during the compliance year in each of three categories: manufacturing, sale of products, and non-manufacturing. The numbers of jobs gained and lost reported by facilities in each category during the compliance year were tabulated.

Additionally, APEP reports ask facilities that shut down during Compliance Year 2015 to provide the reasons for their closure. APEP reports also allow facilities to indicate whether the RECLAIM program led to the creation or elimination of jobs during Compliance Year 2015.

Since data regarding job impacts and facility shutdowns are derived from the APEP reports, the submittal of these reports is essential to assessing the influence that the RECLAIM program has on these issues. The following discussion represents data obtained from APEP reports submitted to SCAQMD for Compliance Year 2015 and clarifying information collected by SCAQMD staff. SCAQMD staff is not able to verify the accuracy of the reported job impact information.

Job Impacts

Table 6-1 summarizes job impact data gathered from Compliance Year 2015 APEP reports and follow-up contacts with facilities. A total of 122 facilities reported 9,756 job gains, while 131 facilities reported a total of 8,427 job losses.

Net job losses were reported in two of the three categories: sales of products (57), and manufacturing (1,642), whereas net job gains were reported in the remaining category: non-manufacturing (3,028). Table 6-1 shows a total net gain of 1,329 jobs, which represents a net jobs increase of 1.21% at RECLAIM facilities during Compliance Year 2015.

Table 6-1
Job Impacts at RECLAIM Facilities for Compliance Year 2015

Description	Manufacture	Sales of Products	Non-Manufacture	Total[1]
Initial Jobs	40,454	1,011	68,521	109,986
Overall Job Gain	2,250	68	7,438	9,756
Overall Job Loss	3,892	125	4,410	8,427
Final Jobs	38,812	954	71,549	111,315
Net Job Change	-1,642	-57	3,028	1,329
Percent (%) Job Change	-4.06%	-5.64%	4.42%	1.21%
Facilities Reporting Job Gains	87	26	70	122
Facilities Reporting Job Losses	103	28	80	131

[1] The total number of facilities reporting job gains or losses does not equal the sum of the number of facilities reporting job changes in each category (*i.e.*, the manufacture, sales of products, and non-manufacture categories) due to the fact that some facilities may report changes under more than one of these categories.

Data in Table 6-1 include five RECLAIM facilities that were reported to have shut down or ceased operations in Compliance Year 2015 as listed in Appendix C. One facility was demolished after its brand had been sold to a third party. Staff attempted to contact the owners, but were unable to obtain further clarification regarding the reason for shutdown. Two other facilities consolidated their operations into other company-owned RECLAIM facilities. The fourth facility cited more attractive utility of land and resources, cost of meeting air pollution regulations, including RECLAIM, Rule 1156 and the SCAQMD compliance burden, and an unfriendly business environment as the reasons for shutdown. The fifth facility sold all equipment and property to a third party. RECLAIM staff attempted to contact the parent company for a more descriptive reason for the shutdown, but received no response.

These shutdowns led to a total loss of 201 jobs (139 manufacturing jobs, 42 sales jobs, and 20 non-manufacturing jobs, according to the submitted APEP reports. Of the five shutdown facilities, one facility claimed 30 job lost to RECLAIM and its compliance burden (refer to Appendix E). No other RECLAIM facilities attributed job gains or losses to RECLAIM for Compliance Year 2015.

The analysis in this report only considers job gains and losses at RECLAIM facilities. It should be noted that this analysis of socioeconomic impacts based on APEP reports and follow-up interviews is focused exclusively on changes in employment that occurred at RECLAIM facilities. The effect of the program on the local economy outside of RECLAIM facilities, including consulting and source testing jobs, is not considered.

It is not possible to compare the impact of the RECLAIM program on the job market *vis-à-vis* a scenario without RECLAIM. This is because factors other than RECLAIM (*e.g.*, the prevailing economic climate), also impact the job market. Furthermore, there is no way to directly compare job impacts attributed to RECLAIM to job impacts attributed to command-and-control rules that would have been adopted in RECLAIM's absence, because these command-and-control rules do not exist for these facilities. As mentioned previously, the effect of the RECLAIM program on the local economy outside of RECLAIM facilities (*e.g.*, generating jobs for consulting firms, source testing firms and CEMS vendors) is also not considered in this report.

CHAPTER 7
AIR QUALITY AND PUBLIC HEALTH IMPACTS

Summary

Audited RECLAIM emissions have been in an overall downward trend since the program's inception. Compliance Year 2015 NOx emissions decreased 2.7% relative to Compliance Year 2014, and Compliance Year 2015 SOx emissions were 3.7% less than the previous year. Quarterly calendar year 2015 NOx emissions fluctuated within 10% of the mean NOx emissions for the year. Quarterly calendar year 2015 SOx emissions fluctuated within seven percent of the year's mean SOx emissions. There was no significant shift in seasonal emissions from the winter season to the summer season for either pollutant.

The California Clean Air Act (CCAA) required a 50% reduction in population exposure to ozone, relative to a baseline averaged over three years (1986 through 1988), by December 31, 2000. The Basin achieved the December 2000 target for ozone well before the deadline. In calendar year 2016, the per capita exposure to ozone (the average length of time each person is exposed) continued to be well below the target set for December 2000.

Air toxic health risk is primarily caused by emissions of certain volatile organic compounds (VOCs) and fine particulates, such as metals. RECLAIM facilities are subject to the same air toxic, VOC, and particulate matter regulations as other sources in the Basin. All sources are subject, where applicable, to the NSR rule for toxics (Rule 1401 and/or Rule 1401.1). In addition, new or modified sources with NOx or SOx emission increases are required to be equipped with BACT, which minimizes to the extent feasible the increase of NOx and SOx emissions. RECLAIM and non-RECLAIM facilities that emit toxic air contaminants are required to report those emissions to SCAQMD. Those emissions reports are used to identify candidates for the Toxics Hot Spots program (AB2588). This program requires emission inventories and, depending on the type and amount of emissions, facilities may be required to do public notice and/or prepare and implement a plan to reduce emissions. There is no evidence that RECLAIM has caused or allowed higher toxic risk in areas adjacent to RECLAIM facilities.

Background

RECLAIM is designed to achieve the same, or higher level of, air quality and public health benefits as would have been achieved from implementation of the control measures and command-and-control rules that RECLAIM subsumed. Therefore, as a part of each annual program audit, SCAQMD staff evaluates per capita exposure to air pollution, toxic risk reductions, emission trends, and seasonal fluctuations in emissions. SCAQMD staff also generates quarterly emissions maps depicting the geographic distribution of RECLAIM emissions. These maps are generated and posted quarterly on SCAQMD's website[1], and

[1] The quarterly emission maps can be found at: http://www.aqmd.gov/home/programs/business/about-reclaim/quarterly-emission-maps.

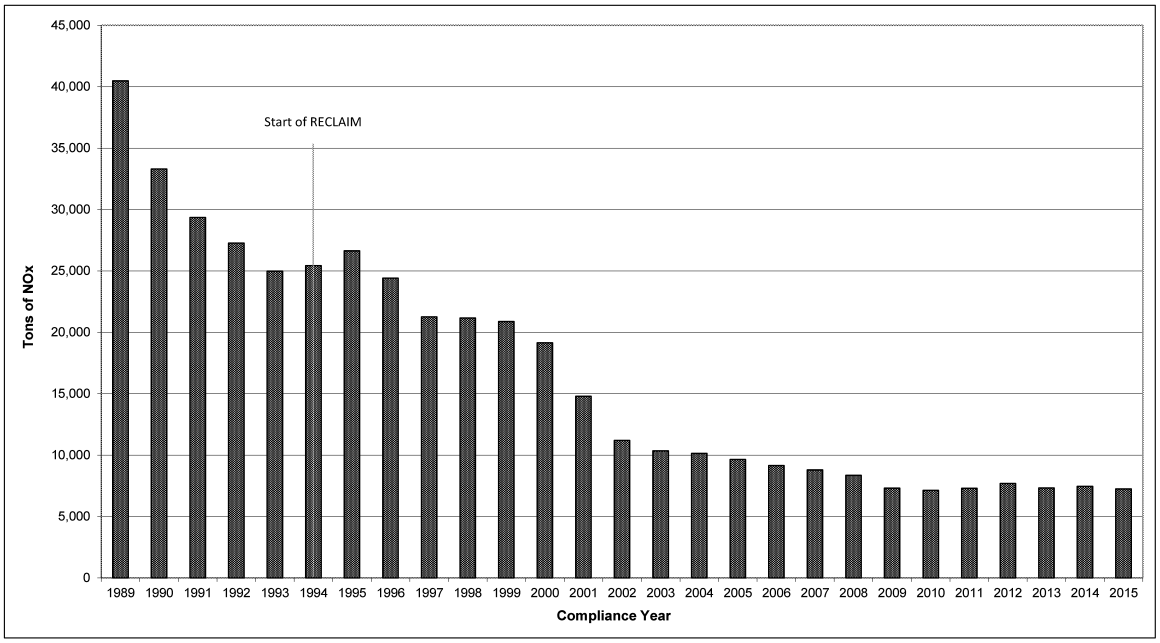
include all the quarterly emissions maps presented in previous annual program audit reports. This chapter addresses:

- Emission trends for RECLAIM facilities;
- Seasonal fluctuations in emissions;
- Per capita exposure to air pollution; and
- Toxics impacts.

Emission Trends for RECLAIM Sources

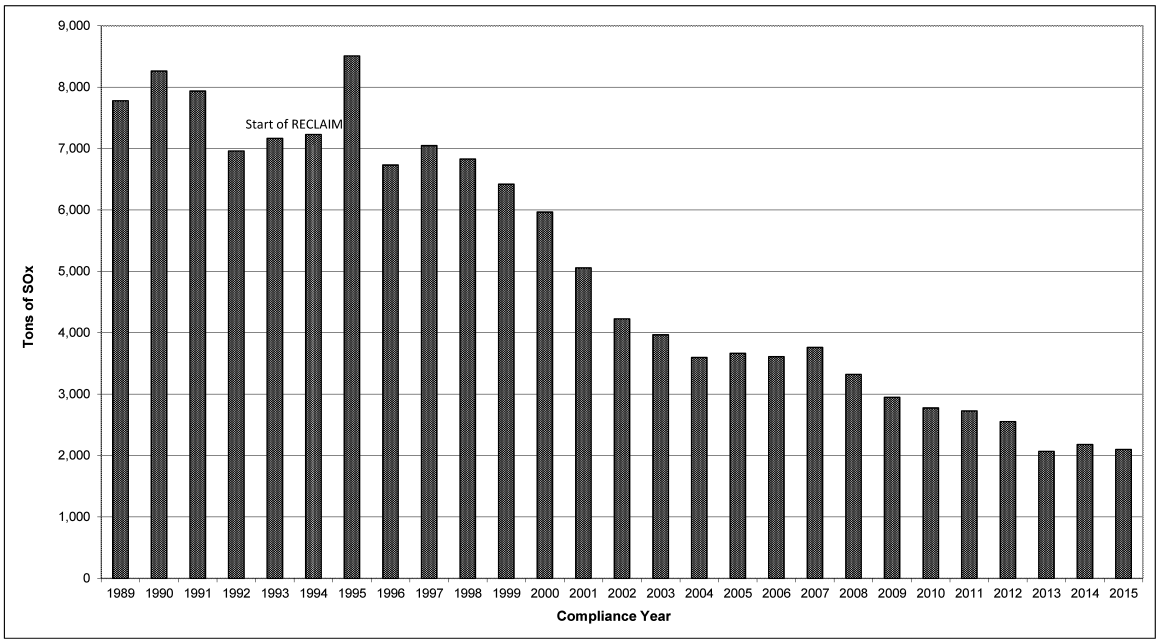
Concerns were expressed during program development that RECLAIM might cause sources to increase their aggregate emissions during the early years of the program due to perceived over-allocation of emissions. As depicted in Figures 7-1 and 7-2, which show NOx and SOx emissions from RECLAIM sources since 1989, the analysis of emissions from RECLAIM sources indicates that overall, RECLAIM emissions have been in a downward trend since program inception, and the emission increases during early years of RECLAIM that were anticipated by some did not materialize.

Figure 7-1
NOx Emission Trend for RECLAIM Sources



Note: 1989-1993 emissions presented in this figure are the emissions from the facilities in the 1994 NOx universe.

Figure 7-2
SOx Emission Trend for RECLAIM Sources



Note: 1989-1993 emissions presented in this figure are the emissions from the facilities in the 1994 SOx universe.

NOx emissions decreased every year from Compliance Year 1995 through Compliance Year 2009, and the emissions from Compliance Year 2009 to Compliance Year 2015 have fluctuated within a narrow range (7,121 – 7,691 ton/yr, or < ± 4% of the mid-point). As shown in Table 3-2 and Figure 3-1, these emission levels are much lower than the programmatic goals. Since Compliance Year 1995, annual SOx emissions have also followed a general downward trend, except for slight increases in Compliance Years 1997, 2005, 2007, and 2014 compared to each respective previous compliance year.

The increase in NOx and SOx emissions from Compliance Year 1994 to 1995 can be attributed to the application of MDP at the onset of RECLAIM implementation. RECLAIM provides for emissions from each major source's first year in the program to be quantified using an emission factor and fuel throughput (interim reporting) while they certify their CEMS. However, at the beginning of the program (Compliance Year 1994), many facilities had difficulties certifying their CEMS within this time frame, and consequently reported their Compliance Year 1995 emissions using MDP. As discussed in Chapter 5, since CEMS for these major sources had no prior data, MDP required the application of the most conservative procedure to calculate substitute data. As a result, the application of MDP during this time period yielded substitute data that may have been much higher than the actual emissions. In addition, emissions after Compliance Year 1995 decreased steadily through 2000. Thus, RECLAIM facilities did not increase their actual aggregate emissions during the early years of the program.

Seasonal Fluctuation in Emissions for RECLAIM Sources

Another concern during program development was that RECLAIM might cause facilities to shift emissions from the winter season into the summer ozone season and exacerbate poor summer air quality since RECLAIM emission goals are structured on an annual basis. To address this concern, "seasonal fluctuations" were added as part of the analysis required by Rule 2015. Accordingly, SCAQMD staff performed a two-part analysis of the quarterly variation in RECLAIM emissions:

1. In the first part, staff qualitatively compared the quarterly variation in Compliance Year 2015 RECLAIM emissions to the quarterly variation in emissions from the RECLAIM universe prior to the implementation of RECLAIM.
2. In the second part, staff analyzed quarterly audited emissions during calendar year 2015 and compared them with quarterly audited emissions for prior years to assess if there had been such a shift in emissions. This analysis is reflected in Figures 7-3 through 7-6.[2]

Quarterly emissions data from the facilities in RECLAIM before they were in the program is not available. Therefore, a quantitative comparison of the seasonal variation of emissions from these facilities while operating under RECLAIM with their seasonal emissions variation prior to RECLAIM is not feasible. However, a qualitative comparison has been conducted, as follows:

- NOx emissions from RECLAIM facilities are dominated by refineries and power plants.
- SOx emissions from RECLAIM facilities are especially dominated by refineries.
- Prior to RECLAIM, refinery production was generally highest in the summer months because more people travel during summer; thus, increasing demand for gasoline and other transportation fuels.
- Electricity generation prior to RECLAIM was generally highest in the summer months because of increased demand for electricity to drive air conditioning units.

Emissions from refineries (NOx and SOx) and from power plants (NOx) are typically higher in the summer months, which was the trend prior to implementation of RECLAIM for the reasons described above. Therefore, provided a year's summer quarter RECLAIM emissions do not exceed that year's quarterly average emissions by a substantial amount, it can be concluded that, for that year, RECLAIM has not resulted in a shift of emissions to the summer months relative to the pre-RECLAIM emission pattern.

Figure 7-3 shows the 2015 mean quarterly NOx emission level, which is the average of the aggregate audited emissions for each of the four quarters, and the 2015 audited quarterly emissions. Figure 7-4 compares the 2015 quarterly NOx emissions with the quarterly emissions from 2004 through 2014. During calendar year 2015, quarterly NOx emissions varied from six percent below the mean in

[2] Data used to generate these figures were derived from audited data. Similar figures for calendar years 1994 through 2007 in previous annual reports were generated from a combination of audited and reported data available at the time the reports were written.

the first quarter (January through March) to about ten percent above the mean in the third quarter (July through September). Figure 7-4 shows that the calendar year 2015 quarterly emissions profile is consistent with previous years under RECLAIM, with calendar year 2013 being the only notable exception. Figures 7-3 and 7-4, along with the qualitative analysis performed above, show that in calendar year 2015 there has not been a significant shift in NOx emissions from the winter months to the summer months.

Figure 7-3
Calendar Year 2015 NOx Quarterly Emissions

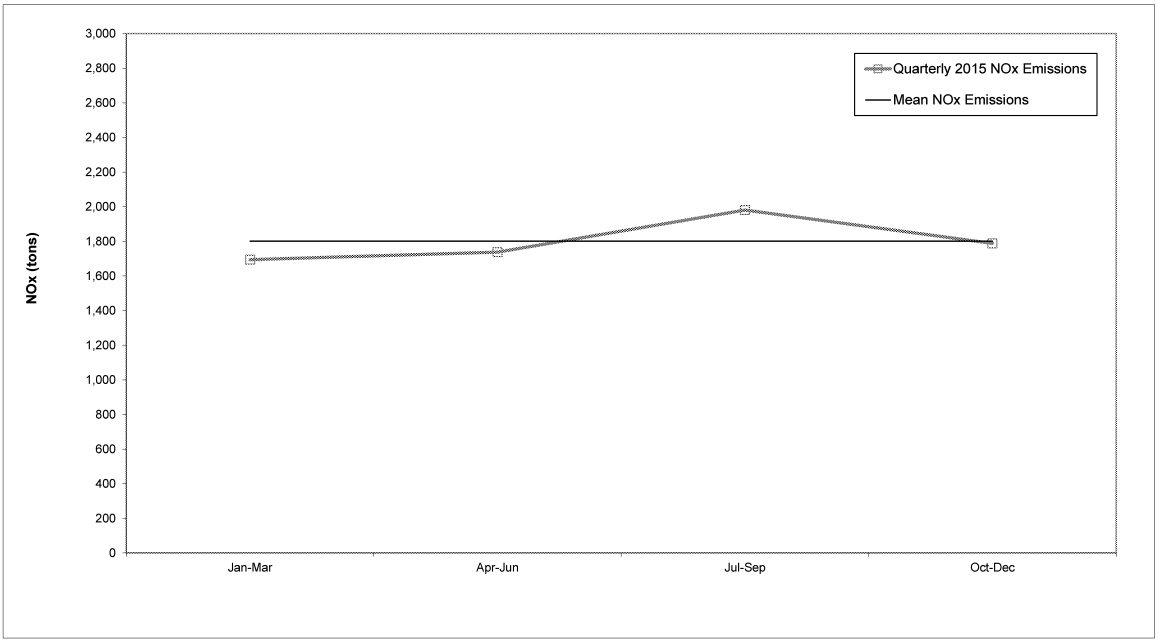
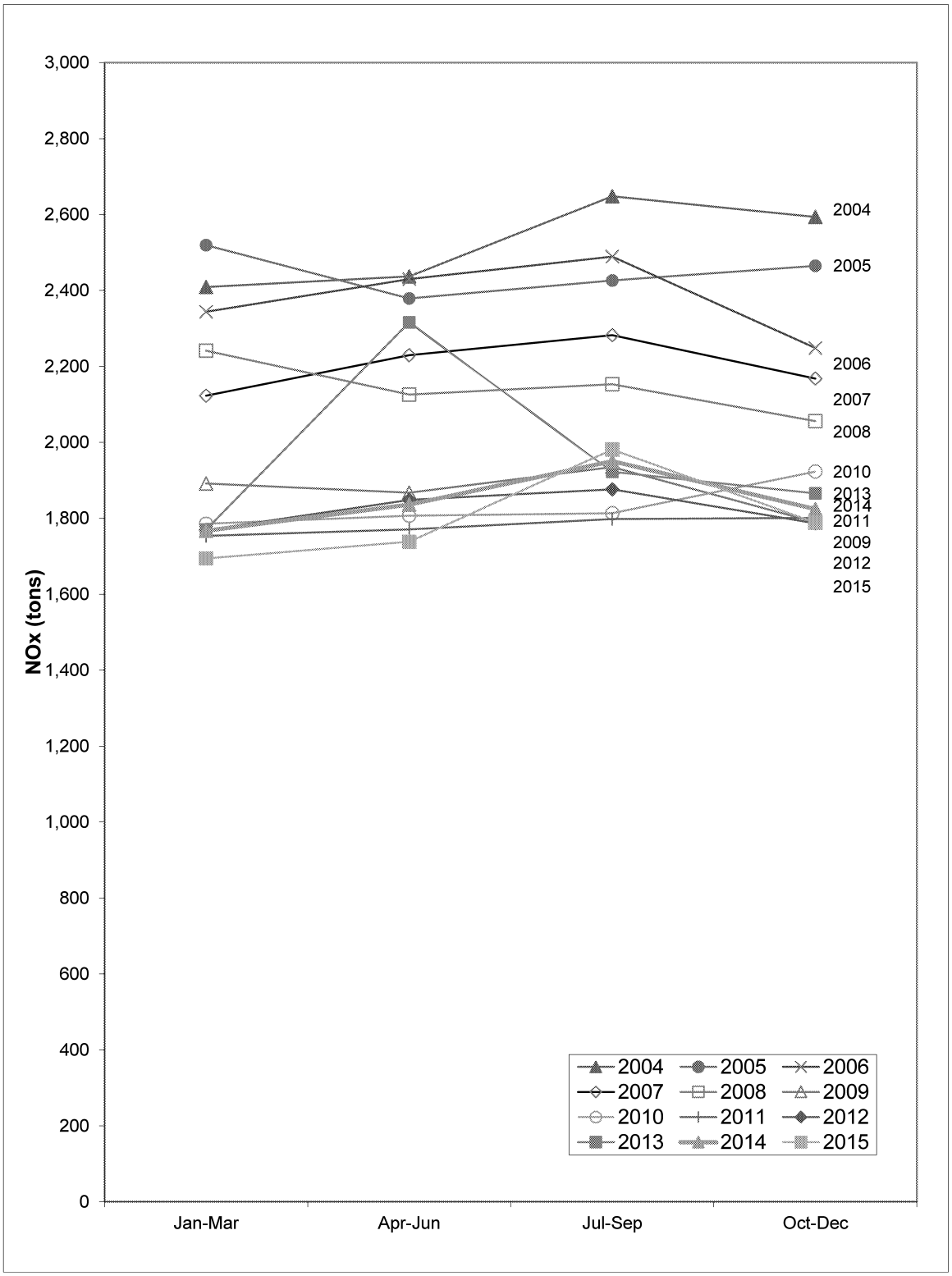


Figure 7-4
Quarterly NOx Emissions from Calendar Years 2004 through 2015



Similar to Figure 7-3 and 7-4 for NOx quarterly emissions, Figure 7-5 presents the 2015 mean quarterly SOx emissions and the 2015 audited quarterly emissions, while Figure 7-6 compares the 2015 quarterly SOx emissions with the quarterly emissions from 2004 through 2014. Figure 7-5 shows that quarterly SOx emissions during calendar year 2015 varied from about six percent above the mean in the fourth quarter (October to December) to seven percent below the mean in the first quarter (January to March). Figure 7-6 shows that the calendar year 2015 quarterly emissions profile is roughly consistent with previous years under RECLAIM. Both Figures 7-5 and 7-6, along with the qualitative analysis performed above, show that in calendar year 2015 there was not a significant shift in SOx emissions from the winter months to the summer months.

Figure 7-5
Calendar Year 2015 SOx Quarterly Emissions

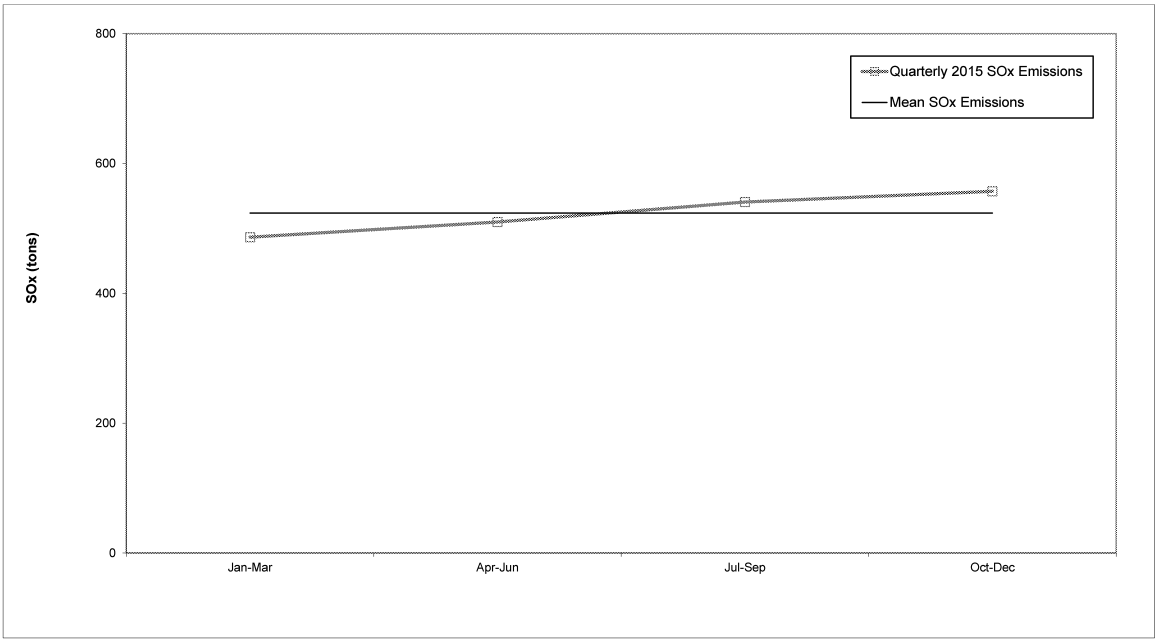
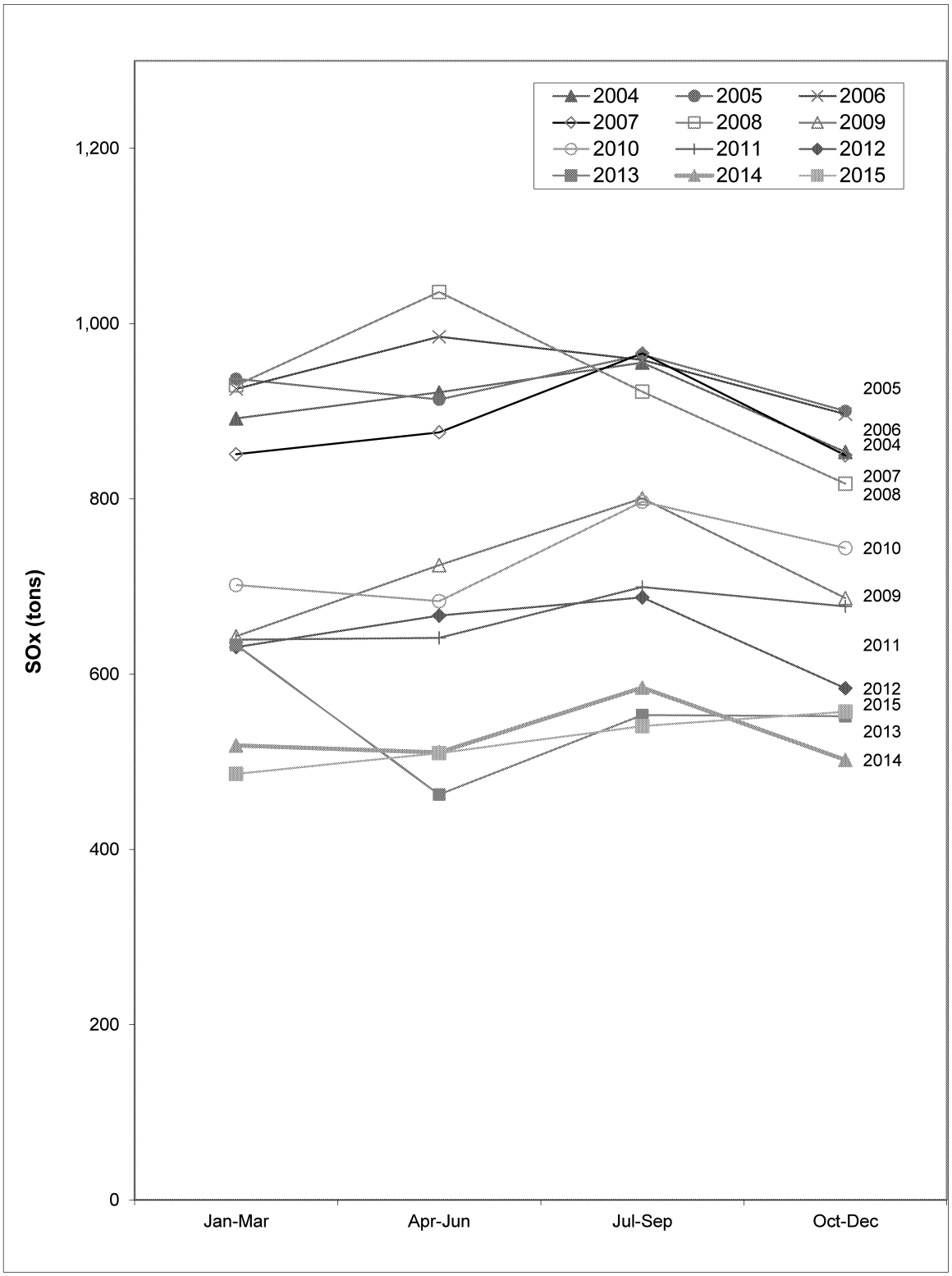


Figure 7-6
Quarterly SOx Emissions from Calendar Years 2004 through 2015



Per Capita Exposure to Pollution

The predicted effects of RECLAIM on air quality and public health were thoroughly analyzed through modeling during program development. The results were compared to the projected impacts from continuing traditional command-and-control regulations and to implementing control measures in the 1991 AQMP. One of the criteria examined in the analysis was per capita population exposure.

Per capita population exposure reflects the length of time each person is exposed to unhealthful air quality. The modeling performed in the program development analysis projected that the reductions in per capita exposure under RECLAIM in calendar year 1994 would be nearly identical to the reductions projected for implementation of the control measures in the 1991 AQMP, and the reductions resulting from RECLAIM would be greater in calendar years 1997 and 2000. As reported in previous annual reports, actual per capita exposures to ozone for 1994 and 1997 were below the projections.

As part of the Children's Environmental Health Protection Act that was passed in 1999, and in consultation with the OEHHA, CARB is to "review all existing health-based ambient air quality standards to determine whether these standards protect public health, including infants and children, with an adequate margin of safety." As a result of that requirement, CARB adopted a new 8-hour ozone standard (0.070 ppm), which became effective May 17, 2006, in addition to the 1-hour ozone standard (0.09 ppm) already in place. Table 7-1 shows the number of days that both the state 8-hour ozone standard of 0.070 ppm and the 1-hour standard of 0.09 ppm were exceeded.

In July 1997, the USEPA established an ozone National Ambient Air Quality Standard (NAAQS) of 0.085 ppm based on an 8-hour average measurement. As part of the Phase I implementation that was finalized in June 2004, the federal 1-hour ozone standard (0.12 ppm) was revoked effective June 2005. Effective May 27, 2008, the 8-hour NAAQS for ozone was reduced to 0.075 ppm. Table 7-1 shows monitoring results based on this 8-hour federal standard. Effective December 28, 2015, the 8-hour NAAQS for ozone was further reduced to 0.070 ppm, the level of the current California Ambient Air Quality Standard. Table 7-1 shows that the Basin exceeded both the newer 8-hour federal 0.07 ppm standard and the state 0.07 ppm standard by 132 days in 2016. Though the number of days in exceedance of the federal and state standards were the same this year, they were different in 2015. This difference could occur again in the future due to the differing language and methods for deriving exceedance days in the federal and state rules.

Table 7-1 summarizes ozone data for calendar years 2001 through 2016 in terms of the number of days that exceeded the state's 1-hour and 8-hour ozone standards, the 2008 and 2015 federal ambient 8-hour ozone standard, and both the Basin's maximum 1-hour and 8-hour ozone concentrations in each calendar year. This table shows that the number of days that exceeded the 1-hour state and the older 8-hour federal ambient ozone standards in calendar year 2016 were elevated from the previous two years, but still followed a persistent downward trajectory. The Basin's maximum ozone concentrations were very close to the lowest levels since 2001, based on the 8-hour averaging period.

Table 7-1
Summary of Ozone Data

Year	Days exceeding state 1-hour standard (0.09 ppm)	Days exceeding state 8-hour standard (0.07 ppm)	Days exceeding old federal 8-hour standard (0.075 ppm)	Days exceeding new federal 8-hour standard (0.07 ppm)	Basin Maximum 1-hour ozone concentration (ppm)	Basin Maximum 8-hour ozone concentration (ppm)
2001	121	156	132	N/A	0.191	0.146
2002	118	149	135	N/A	0.169	0.148
2003	133	161	141	N/A	0.216	0.200
2004	110	161	126	N/A	0.163	0.148
2005	111	142	116	N/A	0.163	0.145
2006	102	121	114	N/A	0.175	0.142
2007	99	128	108	N/A	0.171	0.137
2008	98	136	121	N/A	0.176	0.131
2009	100	131	113	N/A	0.176	0.128
2010	83	128	109	N/A	0.143	0.123
2011	94	127	107	N/A	0.160	0.136
2012	97	140	111	N/A	0.147	0.112
2013	92	123	106	N/A	0.151	0.122
2014	76	134	93	N/A	0.142	0.114
2015	72	116	83	113	0.144	0.127
2016	85	132	105	132	0.164	0.122

The CCAA, which was enacted in 1988, established targets for reducing overall population exposure to severe non-attainment pollutants in the Basin—a 25% reduction by December 31, 1994, a 40% reduction by December 31, 1997, and a 50% reduction by December 31, 2000 relative to a calendar years' 1986-88 baseline. These targets are based on the average number of hours a person is exposed ("per capita exposure"[3]) to ozone concentrations above the state 1-hour standard of 0.09 ppm. Table 7-2 shows the 1986-88 baseline per capita exposure, the actual per capita exposures each year since 1994 (RECLAIM's initial year), and the 1997 and 2000 targets set by the CCAA for each of the four counties in the district and the Basin overall. As shown in Table 7-2, the CCAA reduction targets were achieved as early as 1994 (actual 1994 Basin per capita exposure was 37.6 hours, which is below the 2000 target of 40.2 hours). The per capita exposure continues to remain much lower than the CCAA targets. For

[3] SCAQMD staff divides the air basin into a grid of square cells and interpolates recorded ozone data from ambient air quality monitors to determine ozone levels experienced in each of these cells. The total person-hours in a county experiencing ozone higher than the state ozone standard is determined by summing over the whole county the products of the number of hours exceeding the state ozone standard per grid cell with the number of residents in the corresponding cell. The per capita ozone exposures are then calculated by dividing the sum of person-hours by the total population within a county. Similar calculations are used to determine the Basin-wide per capita exposure by summing and dividing over the whole Basin.

calendar year 2016, the actual per capita exposure for the Basin was 2.64 hours, which represents a 96.7% reduction from the 1986-88 baseline level.

Table 7-2
Per Capita Exposure to Ozone above the State One-Hour Standard of 0.09 ppm (hours)

Calendar Year	Basin	Los Angeles	Orange	Riverside	San Bernardino
1986-88 baseline[1]	80.5	75.8	27.2	94.1	192.6
1994 actual	37.6	26.5	9	71.1	124.9
1995 actual	27.7	20	5.7	48.8	91.9
1996 actual	20.3	13.2	4	42.8	70
1997 actual	5.9	3	0.6	13.9	24.5
1998 actual	12.1	7.9	3.1	25.2	40.2
2000 actual	3.8	2.6	0.7	8.5	11.4
2001 actual	1.73	0.88	0.15	6	5.68
2002 actual	3.87	2.16	0.13	11.12	12.59
2003 actual	10.92	6.3	0.88	20.98	40.21
2004 actual	3.68	2.26	0.50	6.82	12.34
2005 actual	3.11	1.43	0.03	6.06	12.54
2006 actual	4.56	3.08	0.68	8.02	13.30
2007 actual	2.90	1.50	0.35	4.65	10.53
2008 actual	4.14	2.04	0.26	7.50	14.71
2009 actual	2.87	1.54	0.08	3.88	10.54
2010 actual	1.18	0.38	0.11	2.45	4.48
2011 actual	2.10	0.85	0.02	3.46	8.13
2012 actual	2.37	1.05	0.05	2.59	9.78
2013 actual	1.31	0.52	0.07	1.61	5.50
2014 actual	1.84	1.26	0.29	1.47	6.02
2015 actual	1.96	0.76	0.10	2.14	8.47
2016 actual	2.64	1.14	0.07	2.19	11.56
1997 target[2]	48.3	45.5	16.3	56.5	115.6
2000 target[3]	40.2	37.9	13.6	47	96.3

[1] Average over three years, 1986 through 1988.

[2] 60% of the 1986-88 baseline exposures.

[3] 50% of the 1986-88 baseline exposures.

Table 7-2 shows that actual per capita exposures during all the years mentioned were well under the 1997 and 2000 target exposures limits. It should also be noted that air quality in the Basin is a complex function of meteorological conditions and an array of different emission sources, including mobile, area, RECLAIM stationary sources, and non-RECLAIM stationary sources. Therefore, the reduction of per capita exposure beyond the projected level is not necessarily wholly attributable to implementation of the RECLAIM program in lieu of the command-and-control regulations.

Toxic Impacts

Based on a comprehensive toxic impact analysis performed during program development, it was concluded that RECLAIM would not result in any significant impacts on air toxic emissions. Nevertheless, to ensure that the implementation of RECLAIM does not result in adverse toxic impacts, each annual program audit

is required to assess any increase in the public health exposure to air toxics potentially caused by RECLAIM.

One of the safeguards to ensure that the implementation of RECLAIM does not result in adverse air toxic health impacts is that RECLAIM sources are subject to the same air toxic statutes and regulations (*e.g.*, SCAQMD Regulation XIV, State AB 2588, State Air Toxics Control Measures, Federal National Emissions Standards for Hazardous Air Pollutants, etc.) as other sources in the Basin. Additionally, air toxic health risk is primarily caused by emissions of VOCs and fine particulates such as certain metals. VOC sources at RECLAIM facilities are subject to source-specific command-and-control rules the same way as are non-RECLAIM facilities, in addition to the toxics requirements described above. Sources of fine particulates and toxic metal emissions are also subject to the above-identified regulations pertaining to toxic emissions. Moreover, new or modified RECLAIM sources with NOx or SOx emission increases are also required to be equipped with BACT, which minimizes to the extent feasible NOx and SOx emissions, which are precursors to particulate matter.

There have been concerns raised that trading RTCs could allow for higher production at a RECLAIM facility, which may indirectly cause higher emissions of toxic air contaminants, and thereby make the health risk in the vicinity of the facility worse. Other SCAQMD rules and programs for toxic air contaminants apply to facilities regardless of them being in RECLAIM or under traditional command and control rules. Emission increases at permit units are subject to new source review. RECLAIM facilities must also comply with any applicable Regulation XIV rules for toxics. Permits generally include limiting throughput conditions for new source review or applicable source specific rules. AB2588 and Rule 1402 could also be triggered based on risk, which would require the facility to take appropriate risk reduction measures.

Under the AER program, facilities that emit either: 1) four tons per year or more of VOC, NOx, SOx, or PM, or 100 tons per year or more of CO; or 2) any one of 24 toxic air contaminants (TACs) and ozone depleting compounds (ODCs) emitted above specific thresholds (Rule 301 Table IV), are required to report their emissions annually to SCAQMD. Beginning with the FY 2000-01 reporting cycle, toxics emission reporting for the AB2588 Program was incorporated into SCAQMD's AER Program. The data collected in the AER program is used to determine which facilities will be required to take further actions under the AB2588 Hot Spots Program.

Facilities in the AB2588 Program are required to submit a comprehensive toxics inventory, which is then prioritized using Board-approved procedures[4] into one of three categories: low, intermediate, or high priority. Facilities ranked with low priority are exempt from future reporting. Facilities ranked with intermediate priority are classified as District tracking facilities, which are then required to submit a complete toxics inventory once every four years. In addition to reporting their toxic emissions quadrennially, facilities designated as high priority are required to submit a health risk assessment (HRA) to determine their impacts to the surrounding community.

According to SCAQMD's 2015 Annual Report on the AB2588 Air Toxics "Hot

[4] The toxics prioritization procedures can be found at: http://www.aqmd.gov/home/regulations/compliance/toxic-hot-spots-ab-2588

Spots" program[5], staff has reviewed and approved 339 facility HRAs as of the end calendar year 2015. About 95% of the facilities have cancer risks below 10 in a million and 97% of the facilities have acute and chronic non-cancer hazard indices less than 1. Facilities with cancer risks above 10 in a million or a non-cancer hazard index above 1 are required to issue public notices informing the community. A public meeting is held during which SCAQMD discusses the health risks from the facility. SCAQMD has conducted such public notification meetings for 53 facilities under the AB2588 Program.

The Board has also established the following action risk levels in Rule 1402 – Control of Toxic Air Contaminants from Existing Sources: a cancer burden of 0.5, a cancer risk of 25 in a million, and a hazard index of 3.0. Facilities above any of the action risk levels must reduce their risks below the action risk levels within three years. To date, 25 facilities have been required to reduce risks and all of these facilities have reduced risks well below the action risk levels mandated by Rule 1402.

The impact of the above rules and measures are analyzed in Multiple Air Toxic Exposure Studies (MATES), which SCAQMD staff conducts periodically to assess cumulative air toxic impacts to the residents and workers of southern California. The fourth version of MATES (*i.e.*, MATES IV) was conducted over a one year period from July 2012 to June 2013, and the final MATES IV report was released on May 1, 2015[6]. Monitoring conducted at that time indicated that the basin-wide population-weighted air toxics exposure was reduced by 57% since MATES III (conducted from April 2004 to March 2006). The results of these recent MATES studies continue to show that the region-wide cumulative air toxic impacts on residents and workers in southern California have been declining. Therefore, staff has not found any evidence that would suggest that the substitution of NOx and SOx RECLAIM for the command-and-control rules and the measures RECLAIM subsumes caused a significant increase in public exposure to air toxic emissions relative to what would have happened if the RECLAIM program was not implemented. Staff will continue to monitor and assess toxic impacts as part of future annual program audits.

[5] The 2015 AB2588 Annual Report can be found at: http://www.aqmd.gov/docs/default-source/planning/risk-assessment/ab2588_annual_report_2015.pdf?sfvrsn=6

[6] The Final MATES IV Report can be found at: http://www.aqmd.gov/docs/default-source/air-quality/air-toxic-studies/mates-iv/mates-iv-final-draft-report-4-1-15.pdf

APPENDIX A
RECLAIM UNIVERSE OF SOURCES

The RECLAIM universe of active sources as of the end of Compliance Year 2015 is provided below.

Facility ID	Cycle	Facility Name	Program
800088	2	3M COMPANY	NOx
23752	2	AEROCRAFT HEAT TREATING CO INC	NOx
115394	1	AES ALAMITOS, LLC	NOx
115389	2	AES HUNTINGTON BEACH, LLC	NOx/SOx
115536	1	AES REDONDO BEACH, LLC	NOx
148236	2	AIR LIQUIDE LARGE INDUSTRIES U.S., LP	NOx/SOx
3417	1	AIR PROD & CHEM INC	NOx
101656	2	AIR PRODUCTS AND CHEMICALS, INC.	NOx
5998	1	ALL AMERICAN ASPHALT	NOx
114264	1	ALL AMERICAN ASPHALT	NOx
3704	2	ALL AMERICAN ASPHALT, UNIT NO.01	NOx
181505	2	AMERICAN AIRLINES INC	NOx
800196	2	AMERICAN AIRLINES INC	NOx
156722	1	AMERICAN APPAREL KNIT AND DYE	NOx
21598	2	ANGELICA TEXTILE SERVICES	NOx
74424	2	ANGELICA TEXTILE SERVICES	NOx
16642	1	ANHEUSER-BUSCH LLC., (LA BREWERY)	NOx/SOx
117140	2	AOC, LLC	NOx
124619	1	ARDAGH METAL PACKAGING USA INC.	NOx
174406	1	ARLON GRAPHICS LLC	NOx
12155	1	ARMSTRONG WORLD INDUSTRIES INC	NOx
122666	2	A'S MATCH DYEING & FINISHING	NOx
117290	2	B BRAUN MEDICAL, INC	NOx
800016	2	BAKER COMMODITIES INC	NOx
800205	2	BANK OF AMERICA NT & SA, BREA CENTER	NOx
40034	1	BENTLEY PRINCE STREET INC	NOx
166073	1	BETA OFFSHORE	NOx
155474	2	BICENT (CALIFORNIA) MALBURG LLC	NOx
132068	1	BIMBO BAKERIES USA INC	NOx
1073	1	BORAL ROOFING LLC	NOx

Facility ID	Cycle	Facility Name	Program
150201	2	BREITBURN OPERATING LP	NOx
174544	2	BREITBURN OPERATING LP	NOx
25638	2	BURBANK CITY, BURBANK WATER & POWER	NOx
128243	1	BURBANK CITY,BURBANK WATER & POWER,SCPPA	NOx
179957	2	CA LOS ANGELES TIMES SQUARE LLC	NOx
800344	1	CALIFORNIA AIR NATIONAL GUARD, MARCH AFB	NOx
22607	2	CALIFORNIA DAIRIES, INC	NOx
138568	1	CALIFORNIA DROP FORGE, INC	NOx
800181	2	CALIFORNIA PORTLAND CEMENT CO	NOx/SOx
46268	1	CALIFORNIA STEEL INDUSTRIES INC	NOx
107653	2	CALMAT CO	NOx
107654	2	CALMAT CO	NOx
107655	2	CALMAT CO	NOx
107656	2	CALMAT CO	NOx
119104	1	CALMAT CO	NOx/SOx
153992	1	CANYON POWER PLANT	NOx
94930	1	CARGILL INC	NOx
22911	2	CARLTON FORGE WORKS	NOx
118406	1	CARSON COGENERATION COMPANY	NOx
141555	2	CASTAIC CLAY PRODUCTS, LLC	NOx
14944	1	CENTRAL WIRE, INC.	NOx/SOx
42676	2	CES PLACERITA INC	NOx
148925	1	CHERRY AEROSPACE	NOx
800030	2	CHEVRON PRODUCTS CO.	NOx/SOx
56940	1	CITY OF ANAHEIM/COMB TURBINE GEN STATION	NOx
172077	1	CITY OF COLTON	NOx
129810	1	CITY OF RIVERSIDE PUBLIC UTILITIES DEPT	NOx
139796	1	CITY OF RIVERSIDE PUBLIC UTILITIES DEPT	NOx
164204	2	CITY OF RIVERSIDE, PUBLIC UTILITIES DEPT	NOx
16978	2	CLOUGHERTY PACKING LLC/HORMEL FOODS CORP	NOx
38440	2	COOPER & BRAIN - BREA	NOx
68042	2	CORONA ENERGY PARTNERS, LTD	NOx
152707	1	SENTINEL ENERGY CENTER LLC	NOx
50098	1	D&D DISPOSAL INC,WEST COAST RENDERING CO	NOx
63180	1	DARLING INGREDIENTS INC.	NOx
3721	2	DART CONTAINER CORP OF CALIFORNIA	NOx

Facility ID	Cycle	Facility Name	Program
7411	2	DAVIS WIRE CORP	NOx
143738	2	DCOR LLC	NOx
143739	2	DCOR LLC	NOx
143740	2	DCOR LLC	NOx
143741	1	DCOR LLC	NOx
132071	1	DEAN FOODS CO. OF CALIFORNIA	NOx
47771	1	DELEO CLAY TILE CO INC	NOx
800037	2	DEMENNO/KERDOON	NOx
125579	1	DIRECTV	NOx
800189	1	DISNEYLAND RESORT	NOx
142536	2	DRS SENSORS & TARGETING SYSTEMS, INC	NOx
178639	1	ECO SERVICES OPERATIONS LLC	NOx/SOx
800264	2	EDGINGTON OIL COMPANY	NOx/SOx
115663	1	EL SEGUNDO POWER, LLC	NOx
800372	2	EQUILON ENTER. LLC, SHELL OIL PROD. US	NOx/SOx
124838	1	EXIDE TECHNOLOGIES	NOx/SOx
17344	1	EXXONMOBIL OIL CORP	NOx
25058	2	EXXONMOBIL OIL CORP	NOx
800089	1	EXXONMOBIL OIL CORPORATION	NOx/SOx
800094	1	EXXONMOBIL OIL CORPORATION	NOx
95212	1	FABRICA	NOx
11716	1	FONTANA PAPER MILLS INC	NOx
175154	2	FREEPORT-MCMORAN OIL & GAS	NOx
175191	1	FREEPORT-MCMORAN OIL & GAS	NOx
346	1	FRITO-LAY, INC.	NOx
2418	2	FRUIT GROWERS SUPPLY CO	NOx
142267	2	FS PRECISION TECH LLC	NOx
153033	2	GEORGIA-PACIFIC CORRUGATED LLC	NOx
176934	1	GI TC IMPERIAL HIGHWAY, LLC	NOx
124723	1	GREKA OIL & GAS, INC	NOx
137471	2	GRIFOLS BIOLOGICALS INC	NOx
156741	2	HARBOR COGENERATION CO, LLC	NOx
157359	1	HENKEL ELECTRONIC MATERIALS, LLC	NOx
123774	1	HERAEUS PRECIOUS METALS NO. AMERICA, LLC	NOx
113160	2	HILTON COSTA MESA	NOx
800066	1	HITCO CARBON COMPOSITES INC	NOx

Facility ID	Cycle	Facility Name	Program
2912	2	HOLLIDAY ROCK CO INC	NOx
800003	2	HONEYWELL INTERNATIONAL INC	NOx
124808	2	INEOS POLYPROPYLENE LLC	NOx/SOx
129816	2	INLAND EMPIRE ENERGY CENTER, LLC	NOx
157363	2	INTERNATIONAL PAPER CO	NOx
169678	1	ITT CANNON, LLC	NOx
16338	1	KAISER ALUMINUM FABRICATED PRODUCTS, LLC	NOx
21887	2	KIMBERLY-CLARK WORLDWIDE INC.-FULT. MILL	NOx/SOx
1744	2	KIRKHILL - TA COMPANY	NOx
36909	2	LA CITY, DEPARTMENT OF AIRPORTS	NOx
800335	2	LA CITY, DEPT OF AIRPORTS	NOx
800170	1	LA CITY, DWP HARBOR GENERATING STATION	NOx
800074	1	LA CITY, DWP HAYNES GENERATING STATION	NOx
800075	1	LA CITY, DWP SCATTERGOOD GENERATING STN	NOx
800193	2	LA CITY, DWP VALLEY GENERATING STATION	NOx
61962	1	LA CITY, HARBOR DEPT	NOx
550	1	LA CO., INTERNAL SERVICE DEPT	NOx
173904	2	LAPEYRE INDUSTRIAL SANDS, INC	NOx
141295	2	LEKOS DYE AND FINISHING, INC	NOx
144455	2	LIFOAM INDUSTRIES, LLC	NOx
83102	2	LIGHT METALS INC	NOx
151394	2	LINN OPERATING INC	NOx
151532	2	LINN OPERATING, INC	NOx
180367	1	LINN OPERATING, INC	NOx
152054	1	LINN WESTERN OPERATING INC	NOx
151415	2	LINN WESTERN OPERATING, INC	NOx
115314	2	LONG BEACH GENERATION, LLC	NOx
17623	2	LOS ANGELES ATHLETIC CLUB	NOx
58622	2	LOS ANGELES COLD STORAGE CO	NOx
800080	2	LUNDAY-THAGARD COMPANY	NOx/SOx
38872	1	MARS PETCARE U.S., INC.	NOx
14049	2	MARUCHAN INC	NOx
3029	2	MATCHMASTER DYEING & FINISHING INC	NOx
2825	1	MCP FOODS INC	NOx
173290	1	MEDICLEAN	NOx
176952	2	MERCEDES-BENZ WEST COAST CAMPUS	NOx

Facility ID	Cycle	Facility Name	Program
94872	2	METAL CONTAINER CORP	NOx
155877	1	MILLERCOORS, LLC	NOx
12372	1	MISSION CLAY PRODUCTS	NOx
11887	2	NASA JET PROPULSION LAB	NOx
115563	1	NCI GROUP INC., DBA, METAL COATERS OF CA	NOx
40483	2	NELCO PROD. INC	NOx
172005	2	NEW- INDY ONTARIO, LLC	NOx
12428	2	NEW NGC, INC.	NOx
131732	2	NEWPORT FAB, LLC	NOx
18294	1	NORTHROP GRUMMAN CORP, AIRCRAFT DIV	NOx
800408	1	NORTHROP GRUMMAN SYSTEMS	NOx
800409	2	NORTHROP GRUMMAN SYSTEMS CORPORATION	NOx
112853	2	NP COGEN INC	NOx
115315	1	NRG CALIFORNIA SOUTH LP, ETIWANDA GEN ST	NOx
89248	2	OLD COUNTRY MILLWORK INC	NOx
47781	1	OLS ENERGY-CHINO	NOx
35302	2	OWENS CORNING ROOFING AND ASPHALT, LLC	NOx/SOx
7427	1	OWENS-BROCKWAY GLASS CONTAINER INC	NOx/SOx
169754	1	SO CAL HOLDING, LLC	NOx
151594	1	OXY USA, INC	NOx
151601	1	CALIFORNIA RESOURCES PRODUCTION CORPORAT	NOx
45746	2	PABCO BLDG PRODUCTS LLC,PABCO PAPER, DBA	NOx/SOx
17953	1	PACIFIC CLAY PRODUCTS INC	NOx
59618	1	PACIFIC CONTINENTAL TEXTILES, INC.	NOx
2946	1	PACIFIC FORGE INC	NOx
130211	2	PAPER-PAK INDUSTRIES	NOx
800183	1	PARAMOUNT PETR CORP	NOx/SOx
800168	1	PASADENA CITY, DWP	NOx
168088	1	POLYNT COMPOSITES USA INC	NOx
171107	2	PHILLIPS 66 CO/LA REFINERY WILMINGTON PL	NOx/SOx
171109	1	PHILLIPS 66 COMPANY/LOS ANGELES REFINERY	NOx/SOx
137520	1	PLAINS WEST COAST TERMINALS LLC	NOx
800416	1	PLAINS WEST COAST TERMINALS LLC	NOx
800417	2	PLAINS WEST COAST TERMINALS LLC	NOx
800419	2	PLAINS WEST COAST TERMINALS LLC	NOx
800420	2	PLAINS WEST COAST TERMINALS LLC	NOx

Facility ID	Cycle	Facility Name	Program
176708	2	ALTAGAS POMONA ENERGY INC.	NOx
11435	2	PQ CORPORATION	NOx/SOx
7416	1	PRAXAIR INC	NOx
42630	1	PRAXAIR INC	NOx
152501	1	PRECISION SPECIALTY METALS, INC.	NOx
136	2	PRESS FORGE CO	NOx
105903	1	PRIME WHEEL	NOx
132191	1	PURENERGY OPERATING SERVICES, LLC	NOx
132192	1	PURENERGY OPERATING SERVICES, LLC	NOx
179137	1	QG PRINTING II CORP	NOx
8547	1	QUEMETCO INC	NOx/SOx
19167	2	R J. NOBLE COMPANY	NOx
3585	2	R. R. DONNELLEY & SONS CO, LA MFG DIV	NOx
20604	2	RALPHS GROCERY CO	NOx
114997	1	RAYTHEON COMPANY	NOx
115172	2	RAYTHEON COMPANY	NOx
800371	2	RAYTHEON SYSTEMS COMPANY - FULLERTON OPS	NOx
20203	2	RECONSERVE OF CALIFORNIA-LOS ANGELES INC	NOx
180410	2	REICHHOLD LLC 2	NOx
52517	1	REXAM BEVERAGE CAN COMPANY	NOx
61722	2	RICOH ELECTRONICS INC	NOx
800113	2	ROHR, INC.	NOx
18455	2	ROYALTY CARPET MILLS INC	NOx
4242	2	SAN DIEGO GAS & ELECTRIC	NOx
161300	2	SAPA EXTRUDER, INC	NOx
155221	2	SAVE THE QUEEN LLC (DBA QUEEN MARY)	NOx
15504	2	SCHLOSSER FORGE COMPANY	NOx
14926	1	SEMPRA ENERGY (THE GAS CO)	NOx
800129	1	SFPP, L.P.	NOx
37603	1	SGL TECHNIC INC, POLYCARBON DIVISION	NOx
131850	2	SHAW DIVERSIFIED SERVICES INC	NOx
117227	2	SHCI SM BCH HOTEL LLC, LOEWS SM BCH HOTE	NOx
16639	1	SHULTZ STEEL CO	NOx
54402	2	SIERRA ALUMINUM COMPANY	NOx
85943	2	SIERRA ALUMINUM COMPANY	NOx
101977	1	SIGNAL HILL PETROLEUM INC	NOx

Facility ID	Cycle	Facility Name	Program
119596	2	SNAK KING CORPORATION	NOx
43201	2	SNOW SUMMIT INC	NOx
4477	1	SO CAL EDISON CO	NOx
5973	1	SO CAL GAS CO	NOx
800127	1	SO CAL GAS CO	NOx
800128	1	SO CAL GAS CO	NOx
8582	1	SO CAL GAS CO/PLAYA DEL REY STORAGE FACI	NOx
14871	2	SONOCO PRODUCTS CO	NOx
160437	1	SOUTHERN CALIFORNIA EDISON	NOx
800338	2	SPECIALTY PAPER MILLS INC	NOx
1634	2	STEELCASE INC, WESTERN DIV	NOx
126498	2	STEELSCAPE, INC	NOx
105277	2	SULLY MILLER CONTRACTING CO	NOx
19390	1	SULLY-MILLER CONTRACTING CO.	NOx
2083	1	SUPERIOR INDUSTRIES INTERNATIONAL INC	NOx
3968	1	TABC, INC	NOx
18931	2	TAMCO	NOx/SOx
174591	1	TESORO REF & MKTG CO LLC,CALCINER	NOx/SOx
174655	2	TESORO REFINING & MARKETING CO, LLC	NOx/SOx
151798	1	TESORO REFINING AND MARKETING CO, LLC	NOx/SOx
800436	1	TESORO REFINING AND MARKETING CO, LLC	NOx/SOx
96587	1	TEXOLLINI INC	NOx
148340	2	THE BOEING COMPANY-BUILDING 800 COMPLEX	NOx
14736	2	THE BOEING COMPANY-SEAL BEACH COMPLEX	NOx
16660	2	THE BOEING COMPANY	NOx
115241	1	THE BOEING COMPANY	NOx
800067	1	THE BOEING COMPANY	NOx
800038	2	THE BOEING COMPANY - C17 PROGRAM	NOx
11119	1	THE GAS CO./ SEMPRA ENERGY	NOx
153199	1	THE KROGER CO/RALPHS GROCERY CO	NOx
97081	1	THE TERMO COMPANY	NOx
109914	1	THERMAL REMEDIATION SOLUTIONS, LLC	NOx
800330	1	THUMS LONG BEACH	NOx
129497	1	THUMS LONG BEACH CO	NOx
800325	2	TIDELANDS OIL PRODUCTION CO	NOx
68118	2	TIDELANDS OIL PRODUCTION COMPANY ETAL	NOx

Facility ID	Cycle	Facility Name	Program
171960	2	TIN, INC. DBA INTERNATIONAL PAPER	NOx
137508	2	TONOGA INC, TACONIC DBA	NOx
53729	1	TREND OFFSET PRINTING SERVICES, INC	NOx
165192	2	TRIUMPH AEROSTRUCTURES, LLC	NOx
43436	1	TST, INC.	NOx
800026	1	ULTRAMAR INC	NOx/SOx
9755	2	UNITED AIRLINES INC	NOx
800149	2	US BORAX INC	NOx
800150	1	US GOVT, AF DEPT, MARCH AIR RESERVE BASE	NOx
800393	1	VALERO WILMINGTON ASPHALT PLANT	NOx
9053	1	VEOLIA ENERGY LOS ANGELES, INC	NOx
11034	2	VEOLIA ENERGY LOS ANGELES, INC	NOx
14502	2	CITY OF VERNON, VERNON GAS & ELECTRIC	NOx
148896	2	CALIFORNIA RESOURCES PRODUCTION CORP	NOx
148897	2	CALIFORNIA RESOURCES PRODUCTION CORP	NOx
151899	2	CALIFORNIA RESOURCES PRODUCTION CORP	NOx
14495	2	VISTA METALS CORPORATION	NOx
146536	1	WALNUT CREEK ENERGY, LLC	NOx/SOx
42775	1	WEST NEWPORT OIL CO	NOx/SOx
17956	1	WESTERN METAL DECORATING CO	NOx
51620	1	WHEELABRATOR NORWALK ENERGY CO INC	NOx
127299	2	WILDFLOWER ENERGY LP/INDIGO GEN., LLC	NOx

APPENDIX B
FACILITY INCLUSIONS

As discussed in Chapter 1, one facility was added to the RECLAIM universe in Compliance Year 2015. The included facility is identified below, and the reason for inclusion is also provided.

Facility ID	Cycle	Facility Name	Market	Date	Reason
150201	2	BREITBURN OPERATING LP	NOx	7/7/2015	Reported emissions from permitted sources exceeded four tons NOx in a year

APPENDIX C
RECLAIM FACILITIES CEASING OPERATION OR EXCLUDED

SCAQMD staff is aware of the following RECLAIM facilities that permanently shut down all operations, inactivated all their RECLAIM permits, or were excluded from the RECLAIM universe during Compliance Year 2015. The reasons for shutdowns and exclusions cited below are based on the information provided by the facilities and other information available to SCAQMD staff.

Facility ID	5814
Facility Name	Gainey Ceramics, Inc.
City and County	La Verne, Los Angeles County
SIC	3260
Pollutant(s)	NOx
1994 Allocation	26,626
Reason for Shutdown	Facility was demolished after the "Gainey" brand was bought by a 3rd party. Staff was unable to obtain further clarification regarding the facility shutdown.

Facility ID	145836
Facility Name	American Apparel Dyeing & Finishing, Inc.
City and County	Hawthorne, Los Angeles County
SIC	2299
Pollutant(s)	NOx
1994 Allocation	0
Reason for Shutdown	The company consolidated operations at another company-owned RECLAIM facility.

Facility ID	167066
Facility Name	Arlon Graphics L.L.C.
City and County	Santa Ana, Orange County
SIC	2672
Pollutant(s)	NOx
1994 Allocation	7,423
Reason for Shutdown	The company consolidated operations at another company-owned RECLAIM facility.

Facility ID	800182
Facility Name	Riverside Cement Co.
City and County	Riverside, Riverside County
SIC	3241
Pollutant(s)	NOx, SOx
1994 Allocation	NOx = 240,204; SOx = 122,284
Reason for Shutdown	The facility cited more attractive utility of land and resources, cost of meeting air pollution regulations, including RECLAIM, Rule 1156 and the SCAQMD compliance burden, and an unfriendly business environment as reasons for shutdown.

Facility ID	115041
Facility Name	Raytheon Company
City and County	El Segundo, Los Angeles County
SIC	3761
Pollutant(s)	NOx
1994 Allocation	32,796
Reason for Shutdown	Facility sold both their equipment and property. RECLAIM staff attempted to contact the parent company for a more descriptive reason for the shutdown, but received no response.

APPENDIX D
FACILITIES THAT EXCEEDED THEIR ANNUAL ALLOCATION FOR COMPLIANCE YEAR 2015

The following is a list of facilities that did not have enough RTCs to cover their NOx and/or SOx emissions in Compliance Year 2015 based on the results of audits conducted by SCAQMD staff.

Facility ID	Facility Name	Compliance Year	Emittant
15504	SCHLOSSER FORGE COMPANY	2015	NOx
18931	TAMCO	2015	NOx
19390	SULLY-MILLER CONTRACTING CO.	2015	NOx
20203	RECONSERVE OF CALIFORNIA-LOS ANGELES INC	2015	NOx
22911	CARLTON FORGE WORKS	2015	NOx
68118	TIDELANDS OIL PRODUCTION COMPANY ETAL	2015	NOx
114997	RAYTHEON COMPANY	2015	NOx
122666	A'S MATCH DYEING & FINISHING	2015	NOx
124723	GREKA OIL & GAS, INC	2015	NOx
131732	NEWPORT FAB, LLC	2015	NOx
138568	CALIFORNIA DROP FORGE, INC	2015	NOx
144455	LIFOAM INDUSTRIES, LLC	2015	NOx
153199	THE KROGER CO/RALPHS GROCERY CO	2015	NOx
172005	NEW-INDY ONTARIO, LLC	2015	NOx
173290	MEDICLEAN	2015	NOx
179137	QG PRINTING II CORP	2015	NOx
180367	LINN OPERATING, INC.	2015	NOx
800181	CALIFORNIA PORTLAND CEMENT CO	2015	SOx

APPENDIX E
REPORTED JOB IMPACTS ATTRIBUTED TO RECLAIM

Each year, RECLAIM facility operators are asked to provide employment data in their APEP reports. The report asks company representatives to quantify job increases and/or decreases, and to report the positive and/or negative impacts of the RECLAIM program on employment at their facilities. This appendix is included in each Annual RECLAIM Audit Report to provide detailed information for facilities reporting that RECLAIM contributed to job gains or losses.

Facilities with reported job gains or losses attributed to RECLAIM:

Facility ID:	800182
Facility Name:	Riverside Cement Co.
City and County:	Riverside, Riverside County
SIC:	3241
Pollutant(s):	NOx, SOx
Cycle:	1
Job Gain:	0
Job Loss:	30
Comments:	Facility shut down on 12-28-2015. The facility claims job losses due to RECLAIM as “part of cost of doing business”, and cited more attractive utility of land and resources, cost of meeting air pollution regulations including Rule 1156 and the SCAQMD compliance burden, and an unfriendly business environment as reasons for shutdown.