Review of the San Joaquin Valley Air Pollution Control District Emission Reduction Credit System

June 2020

Enforcement Division
California Air Resources Board

Executive Summary

On January 24th, 2019, the California Air Resources Board (CARB) directed staff to conduct a review of the San Joaquin Valley Air Pollution Control District (SJVAPCD or District) Emission Reduction Credit (ERC) program. This report provides our analysis, results, findings, and recommendations. The goal of this project was to review the SJVAPCD ERC system, including the equivalency determination, and explain it in the context of the broader District program for reducing emissions from stationary sources including New Source Review (NSR), permitting, and regulatory requirements.

CARB staff has shared the findings of its review with the District management and discussed with the District leadership the need to update the Districts ERC program and processes to address the following overarching findings.

- The program needs to be more transparent to the public and industry and more rigorous.
- Implementation procedures and policies need to be upgraded.
- Assumptions in the equivalency demonstration need to be reviewed and revised as needed.

In response to these overarching findings, the District has committed to take the following specific steps.

- Develop a new equivalency tracking database, including associated documentation.
- Conduct a public workshop each year, beginning with the 2020 equivalency demonstration, to present the results of the annual equivalency demonstration prior to taking the report to the District's Governing Board.
- Enhance the annual demonstration report to make the report more understandable beginning with the 2020 equivalency demonstration, including more fully characterizing adjustments made to year-to-year carry-overs to ensure the public can better understand all adjustments effective in a tracking year.
- Convene a public advisory working group consisting of affected stakeholders, including regulated Valley businesses, Valley residents, and federal, state, and local public agencies, to assist in developing solutions related to the District's offset equivalency system, as needed to maintain an effective permitting system that allows for strong economic growth and protection of public health.
- Adjust calculated emission reductions from all affected AG-ICE projects to reflect the appropriate load-factor, and incorporate these adjustments into the 2020 equivalency demonstration. The District will include a discussion of the analysis and adjustments in the 2020 report.

- Analyze the orphan shutdowns projects identified by CARB, and make adjustments, as appropriate, for inclusion in the 2020 equivalency demonstration. The District will include a discussion of the analysis and adjustments in the 2020 report.
- Update the District's policies that pertain to the quantification of emissions reductions from orphan shutdowns, and ensure procedures and associated staff training maintain consistency with District NSR criteria for creditability of emissions reductions.

CARB staff plans to work with the district as it implements the above commitments as well as periodically update its Board on progress.

The SJVAPCD was formed in 1992 by the unification of eight individual county districts. Prior to unification, each county had independent rules and requirements, and made their own permitting decisions. With unification, the District developed a single set of rules and regulations, including those governing its NSR and ERC programs. While new ERCs issued after unification were developed in a consistent manner, older ERCs generated prior to unification needed to be carried over. These ERCs exist today and may be available to offset new emissions. About half of all NOx and VOC ERCs were generated prior to unification.

The District adopted its NSR rule in 1991. The rule established BACT requirements, offset thresholds, and offset requirements that when originally put in place applied to more sources, and applied a much greater level of stringency to those sources than required under federal and state law. The rule also diverged from federal requirements in one important respect: under the District rules, the value of an ERC is calculated when the ERC is issued and retains this value over the life of the ERC. This is referred to as "time of issuance" value, and was supported by CARB at the time.

Federal law requires an ERC to be valued at time-of-use, meaning that if a regulation would have reduced emissions from a source granted an ERC, that ERC must be discounted when used as an offset to reflect emissions after required controls from the regulation. The value of an ERC will always be the same or lower at time-of-use than time of issuance. The federal Clean Air Act allows local NSR programs to differ from federal NSR so long as the local program is at least as stringent as federal NSR. In order to demonstrate that the District's NSR program is at least as stringent as federal NSR, in 1999 U.S. EPA and SJVAPCD entered into an agreement requiring the District to implement an annual federal offset equivalency tracking system. U.S. EPA required this agreement as a condition of approving the District's amended NSR rule for incorporation into the State Implementation Plan.

From the time the tracking system was adopted in August 2001 until present, SJVAPCD has never failed to show equivalency based on its annual demonstration to U.S. EPA. However, in 2010, the San Joaquin Valley's federal non-attainment ozone

classification was bumped up from severe to extreme. As a result, the federal major source and major modification thresholds for ozone precursors dropped to levels that were equivalent to emissions thresholds established in the District's NSR rule. This effectively eliminated the primary advantage SJVAPCD's NSR program had in offset stringency over the federal NSR program for NOx, VOC, and CO. Once the District's offset threshold was no longer lower than the federally required threshold, in most cases more offsets are required for major sources under federal requirements than under District rules.

The current SJVAPCD ERC bank contains nearly 11 million pounds per year of NOx ERCs when valued at time of issuance, more than 80% of which were generated more than 20 years ago. However, over the years, the District's regulatory program has become more stringent, and the District estimated in 2016 that these NOx ERCs, when valued at time-of-use, were worth about 18% of the time of issuance value. This reduction in time of issuance value is directly related to the stringency of the District's regulatory program. In effect, as the District increases the stringency in its regulatory program, it also reduces the time-of-use value in its ERC bank, which makes achieving equivalency more difficult.

To demonstrate equivalency, the District has been increasingly relying on the carry-over of past mitigations and reductions, including past unbanked reductions from orphan shutdowns and electrification projects. These emission reductions are not generated as part of the ERC system, but are used to demonstrate offset equivalency between the District program and federal requirements. Between 2010 and 2018, half of all VOC reductions, and 75% of all NOx reductions included in the District's equivalency demonstrations were provided by orphan shutdowns and electrification projects, with the remaining value provided by ERCs.

CARB's review identifies three areas of findings. First, many of the District's engineering evaluations of ERC and permit applications, and the District's equivalency database system, can both be more transparent, and rigorous. These documents could be improved by including supporting explanation or documentation. Without this information, the public and industry cannot verify or fully review the District's actions. Staff also identified calculation discrepancies in electrification projects and orphan[1] shutdowns used for offset equivalency. These issues could be avoided through stronger review procedures.

Second, the District should make adjustments to how it implements its rule for the timeliness of ERC application submittals, and could be more rigorous in its determination of surplus reductions in individual ERCs. For example, in 15 of the 52 ERC projects reviewed, the District granted ERCs, generated by facility shutdowns, in

[1] Orphan shutdowns are unclaimed emission reductions from a facility surrendering all their operating permits.

which emissions ceased more than 180 days before submission of the ERC application. This is consistent with the District's long-standing policy, CARB staff interpret the District's rule as requiring an ERC application to be submitted within 180 days of the shutdown, and that it defines shutdown as the earlier of the permanent cessation of emissions, or the surrender of the operating permit. In addition, in four of the 52 ERC projects reviewed, CARB determined that it is unclear whether the emission reductions were surplus of every federal, State, or district law, rule, order, permit, or regulation. This benefitted the applicant by providing a greater face value to the ERC. But, as a result, the District had to find additional reductions to cover the non-surplus ERCs.

In the third set of findings, staff identified issues in the District's equivalency demonstration. The District relies on electrification projects, generated through the Agricultural Internal Combustion Engine (AG-ICE) incentive program, to demonstrate NOx equivalency with federal requirements. In calculating and claiming credit for these projects, the District used an incorrect load factor, resulting in an overvaluing of reductions in the equivalency demonstration. While the reductions are real, they were not sufficiently documented to have resulted from a permitting action nor could CARB staff identify documentation showing that they were permanent and enforceable. CARB staff also concluded that potentially half of the credited projects appeared to be funded in part through the Carl Moyer program.

The issues identified in this report are substantial and complex, potentially impacting a wide array of stakeholders in the San Joaquin Valley including residents of the Valley, industries that rely on offsets and ERCs in order to expand or build new business, environmental organizations who advocate for cleaner air, and community groups representing those living near stationary and mobile sources who are impacted the most by emissions at the local level.

The Valley has always faced substantial air quality challenges due to its geography, meteorology, and climate. The SJVAPCD has over 150 rules applicable to specific types of equipment (e.g., turbines, internal combustion engines, boilers), to specific industries (e.g., confined animal facilities, oil production, composting), and to all sources (e.g., nuisance, visible emissions). As technologies have improved, the District has continued to improve the stringency of its regulations. The Valley's stationary source emissions have been reduced because of source-specific regulations and now represent 15% of total NOx emissions in the Valley. Despite these successes, the San Joaquin Valley continues to face major air quality challenges. Air pollution concentrations of ozone and particulate are often above standards, and the District continues to experience some of the worst air quality in the United States. Further improvements in air quality will require both stationary and mobile source emissions to be minimized.

Many of the findings in this report - regarding the issuance of individual ERCs, the time of issuance valuation of ERCs, the use of electrification projects from the AG-ICE program, and others - relate to decisions made decades ago. Since these decisions were made, conditions have changed. Air quality has improved substantially, but ambient air quality standards have increased in stringency. Even though these decisions were made decades ago, they generate implications for air quality today. Consistent with the staff recommendations as well as the District commitments the primary focus of this report is on improvements to the district's ERC program moving forward. This report identifies potential improvements in the District's ERC program, which will help in ensuring an effective permitting program that protects public health and supports economic growth and development, which in turn strengthens the District's overall regulatory program.

San Joaquin Valley
AIR POLLUTION CONTROL DISTRICT

HEALTHY AIR LIVING™

June 4, 2020

Richard Corey, Executive Officer
California Air Resources Board
P.O. Box 2815
Sacramento, California 95812

Re: California Air Resource Board's Review of San Joaquin Valley Air Pollution Control District Emission Reduction Credit System

Dear Mr. Corey,

The San Joaquin Valley Air Pollution Control District (District) has received the California Air Resources Board's (CARB) report titled *Review of San Joaquin Valley Air Pollution Control District Emission Reduction Credit System.* The District staff would like to thank CARB for the opportunity to review and comment on the recommendations of this review. District staff and CARB have worked cooperatively over the past year-and-a-half during this review to evaluate the District's Emission Reduction Credit (ERC) program and identify opportunities to enhance the District's ERC program moving forward in a manner that will help to ensure an effective permitting program that protects public health and supports economic growth and development in the Valley. Furthermore, the District is committed to working closely and collaboratively with CARB and Valley stakeholders to address the recommendations in the report and implement the District's commitments contained in this letter. Additionally, the District is appreciative of CARB's general recognition of the stringency of the District's air quality control program and of the success in reducing stationary source emissions in the Valley.

Both federal and state law mandate New and Modified Stationary Source Review (NSR) permitting programs that contain offsetting and ERC banking provisions. ERCs are intended by both federal and state law to be only one part of a comprehensive NSR permitting program that has been specifically designed by Congress and the state legislature to allow for industrial growth while tightly regulating any emissions increases. Additionally, any emission increases due to growth are accounted for in State Implementation Plans that demonstrate how the District's overall air quality control program will require sufficient emissions reductions to attain national ambient air quality standards, despite that growth.

While it is mentioned in the report, the District feels that it is important to reiterate that, despite a seemingly common misconception, ERCs cannot be used in lieu of meeting

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other air pollution control requirements, such as through market-based systems that other agencies may have in place. Instead, ERCs are required in addition to, and only after, establishing that the new emissions are controlled with the best available control technology (BACT) and will not cause a health risk to surrounding communities. The San Joaquin Valley's NSR permitting program, including the accompanying ERC program, ensures that new emissions are controlled with the best technologies, prevents the permitting of any operation that will cause a significant health impact, demonstrates on a project-by-project basis and in each attainment plan that attainment is not endangered, and has historically been found by the state and federal governments to comply with state and federal laws governing NSR/ERC programs.

Businesses can only generate ERCs by voluntarily reducing emissions to levels below those required by any rule or regulation, and then applying to the District to have those reductions recognized in the form of an ERC banking certificate. Because the District's air quality regulations are among the most stringent requirements in the nation, it is exceedingly difficult and expensive for businesses to reduce emissions beyond rule requirements to generate ERCs. In fact, as more effective controls are developed, they are generally required through regulatory action by the District, limiting the time that new and innovative techniques can be used to generate ERCs. Reductions beyond the level required by those regulations generally involve innovative or untested control techniques, which entail considerable financial risk to develop and implement. The opportunity to bank ERCs for reductions that result from these types of extraordinary and voluntary efforts, and then to be able to sell them on the open market, encourages innovation in emissions control technologies.

The difficulty in the ability to generate and rely on new ERCs for future permitting projects underscores the challenges faced by businesses, especially in extreme ozone non-attainment areas, which even after installing the best available control technology must still provide ERCs to offset emission increases. Without sufficient ERCs, new and modifying businesses and essential public services including, but not limited to, hospitals, waste-water treatment facilities, and composting facilities may not be able to obtain necessary operating permits to serve Valley communities.

While the District and CARB agree on many of the areas identified in the report and on a general path moving forward, there are areas where the District and CARB have differing opinions, especially as it relates to the interpretation and application of certain provisions of District rules and regulations as they pertain to the ERC program. This is not uncommon in a review of this complexity and scale, and the District does not believe that these points of contention undermine the overall cooperative process and ultimate agreement by CARB and the District on a path to move forward relying on the recommendations of CARB and commitments by the District.

In completing this comprehensive review, CARB reached three overarching findings to which the District will respond in turn. The findings as detailed in the report are as follows:

- *The [ERC] program needs to be more transparent to the public and industry and more rigorous.*
- *Implementation procedures and policies need to be upgraded.*
- *Assumptions in the equivalency demonstration need to be reviewed and revised as needed.*

The program needs to be more transparent to the public and industry and more rigorous

Consistent with the District's core values of continuous improvement and open and transparent public processes, the District respects CARB's recommendations which identify opportunities to enhance transparency as it relates to the District's equivalency database system and specific engineering evaluations of ERC and permit applications. It is important, however, to consider these opportunities in the larger context of the existing transparency measures that the District employs in its permitting program.

For years, the District has provided bilingual notice of all significant proposed permitting projects and ERC transactions on our public website. The complete engineering and compliance evaluations are posted with the associated public notice documentation. Furthermore, any interested parties are provided the opportunity to receive, by email, this same set of documents. They can sign up to receive notices for all projects issued by the District, they can sign up to receive notices for all projects in a specific region of the Valley, or they can sign up to receive all notices associated with an individual facility. Through this process, the public receives direct access to the same exact documents that we send to CARB and EPA for their review. All comments received on the District's preliminary analyses are addressed and responded to in writing before finalizing any ERC issuance or permitting project, and all associated documents, including the District's final analysis and final public notice, are also posted to the District website. Similarly, the District's written analyses and preliminary and final public notices of permitting projects that are required to surrender ERCs to obtain a permit are posted to the District's public website for the same review and comment process.

Specific permitting and ERC projects that have been reviewed contemporaneously by CARB, EPA, and the public without comment on the lack of transparency, are now being highlighted when reviewed under this review. While the District believes that CARB's recommendations highlight opportunities to further enhance transparency, we believe it is important to view the recommendations in a larger context so it is clear they should be interpreted through the lens of continuous improvement.

Regarding the District's equivalency database system and annual offset equivalency report, each year the District makes publicly available the equivalency report and accepts comments on the report and its findings up through the public hearing by the District's Governing Board. Additionally, this report is also sent to U.S. EPA and CARB every year. While we believe that the database and report contain the information necessary to demonstrate that the District's ERC system is equivalent to the federal system, we agree that the database system could benefit from modernization and the annual report could be made more consumable to a reviewer that may not possess a comprehensive understanding of complex NSR and offset equivalency concepts.

Implementation procedures and policies need to be upgraded

As recognized in the report, the rules and regulations that implement NSR and ERC banking programs are very complex and require a deep understanding of policy, regulations, and decisions that have been made at the federal, state, and local level over the past 40 years. As a best practice, the District believes that it is prudent to revisit and update, as necessary, policies and procedures that implement District rules and regulations. In the review, CARB questions the District's interpretation of rule provisions relating to the timeliness of ERC applications and the determination of what are considered surplus emission reductions at the time of ERC banking. While the District recognizes the complexity associated with these issues identified in the review, it is important to note that the District has adopted and follows policies and procedures to ensure consistent, fair, and reasonable application of its rules. Furthermore, the areas in question are local requirements of the District's NSR and ERC banking programs, and are beyond any requirements in state or federal law relating to ERCs.

Assumptions in the equivalency demonstration need to be reviewed and revised as needed

Consistent with the District's offset equivalency agreement with the federal EPA and with the provisions of the District's NSR rule, the District utilizes the surplus value of emission reductions across various categories to demonstrate equivalency with federal offsetting requirements on an annual basis. As detailed in the report, there was an inconsistency in the District's methodology for calculating emission reductions from agricultural engine electrification projects associated with the AG-ICE program relative to the Moyer methodology. The District is committed to adjusting the calculated emission reductions from all affected AG-ICE projects to reflect the appropriate emission reductions, and incorporate these adjustments into the 2020 equivalency demonstration.

Another category of emission reductions used in equivalency are those from unbanked facility shutdowns ("orphan shutdowns"). Each orphan shutdown

presents a unique set of circumstances that determines the amount of credit that can be claimed. CARB's review identified some inconsistency in the crediting of emission reductions from certain orphan shutdown projects. The District is committed to analyzing the orphan shutdowns projects identified by CARB, and making adjustments, as appropriate, for inclusion in the 2020 equivalency demonstration. Furthermore, District staff intends to review and update as necessary the policies that pertain to the quantification of emissions reductions from orphan shutdowns.

In response to CARB's overarching findings, the District is committed to taking the following specific steps to enhance the ERC program as needed to maintain an effective permitting system that allows for strong economic growth and protection of public health:

- Develop a new equivalency tracking database, including associated documentation.
- Conduct a public workshop each year, beginning with the 2020 equivalency demonstration, to present the results of the annual equivalency demonstration prior to taking the report to the District's Governing Board.
- Enhance the annual demonstration report to make the report more understandable beginning with the 2020 equivalency demonstration, including more fully characterizing adjustments made to year-to-year carry-overs to ensure the public can better understand all adjustments effective in a tracking year.
- Convene a public advisory working group consisting of affected stakeholders, including regulated Valley businesses, Valley residents, and federal, state, and local public agencies, to assist in developing solutions related to the District's offset equivalency system, as needed to maintain an effective permitting system that allows for strong economic growth and protection of public health.
- Adjust calculated emission reductions from all affected AG-ICE projects to reflect the appropriate load-factor, and incorporate these adjustments into the 2020 equivalency demonstration. The District will include a discussion of the analysis and adjustments in the 2020 report.
- Analyze the orphan shutdowns projects identified by CARB, and make adjustments, as appropriate, for inclusion in the 2020 equivalency demonstration. The District will include a discussion of the analysis and adjustments in the 2020 report.
- Update the District's policies that pertain to the quantification of emissions reductions from orphan shutdowns, and ensure procedures and associated staff training maintain consistency with District NSR criteria for creditability of emissions reductions.

As I stated earlier, the District staff is committed to working closely with CARB and Valley stakeholders to address the recommendations collaboratively to ensure an ERC program that serves our shared goals of public health protection and economic viability in the Valley. Please contact me if you have any questions or wish to discuss any of our comments. I can be reached at 559-230-6036 or via email at samir.sheikh@valleyair.org.

Sincerely,

Samir Sheikh
Executive Director/APCO

List of Acronyms

AG-ICE – Agricultural Internal Combustion Engine incentive program
AIPE – Adjusted Increase in Permitted Emissions
APCO – Air Pollution Control Officer at an Air District
AQMD – Air Quality Management District
ATC – Authority to Construct
BACT – Best Available Control Technology
CAAQS – California Ambient Air Quality Standards
CARB – California Air Resources Board
CARL – Carl Moyer emissions database
CEMS – Continuous Emissions Monitoring System
CNG – Compressed Natural Gas
CO – Carbon Monoxide
DCF – Discounted Cash Flow
DOQ – District Offset Quantity
EACM – Equivalent Annual Cost Method
ERC – Emission Reduction Credit
FCAA – Federal Clean Air Act
FMM – Federal Major Modification
FOQ – Federal Offset Quantity
GHG – Greenhouse Gas
HAP – Hazardous Air Pollutant
HC – Hydrocarbon
hr – Hour
HSC – California Health and Safety Code
lb – Pounds
MMBTU – Million Metric British Thermal Units
MST – Major Source Threshold
NAAQS – National Ambient Air Quality Standard
NMS – New Major Source
NOx – Nitrogen Oxides
NSR – New Source Review
PAS – San Joaquin Valley's Permit Administration System
PG&E – Pacific Gas and Electric Company

PM10 – Particulate Matter 10 microns in size or smaller
PM2.5 – Particulate Matter 2.5 microns in size or smaller
ppm – Parts per Million
ppmv – Parts per Million by Volume
PTE – Potential to Emit
RACT – Reasonably Available Control Technology
SB 288 – Protect California Air Act of 2003, "NSR anti-backsliding"
SCE – Southern California Edison
SIP – State Implementation Plan
SJVAPCD – San Joaquin Valley Air Pollution Control District
SOx – Sulfur Oxides
t/y – tons per year
U.S. EPA – United States Environmental Protection Agency
VOC – Volatile Organic Compound
yr – Year

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I. Review Process

CARB conducted this review consistent with State law, including as defined in sections 41500 et seq. of the California Health and Safety Code (HSC). State law defines CARB's important role in reviewing district attainment plans, rules, regulations, and enforcement practices. CARB's role includes programmatic reviews, such as this one, and day-to-day review of individual district actions, such as permits for major sources and major modifications, issuance of ERCs, adoption of rules, and granting of variances.

For the past decade, CARB has reduced its focus on air district stationary source permitting programs due to demands associated with developing, implementing, and enforcing an unprecedented number of mobile source related regulations, many of which focus on reducing emission of diesel particulate matter. As we have implemented these regulations we have also sought to analyze and improve them, including programmatic improvements, regulatory updates, and in some cases new laws to support implementation and enforcement. This iterative approach has generated improvements in both the regulations and implementation. CARB staff is taking a similar approach with stationary sources, re-engaging in district permitting programs and working as a constructive partner with the districts and federal government to ensure existing programs are as successful as possible. In doing so, as evidenced in this review, CARB hopes to provide answers to questions posed by stakeholders and provide assurance that District programs are effective and consistent with underlying regulations.

CARB staff has worked extensively with SJVAPCD staff and executive management to conduct this review. Through data and information requests from CARB, the District provided electronic copies of hundreds of documents related to over 50 ERC projects, 30 Authority to Construct permits, and the federal offset equivalency tracking system. The documents include SJVAPCD and Kern County Air Pollution Control District NSR and banking rules, SJVAPCD policies and guidance documents related to ERC banking, ERC applications and supporting documents related to CARB-selected ERC projects, SJVAPCD engineering evaluations supporting the decision to issue the ERC certificates, and SJVAPCD engineering evaluations and supporting documents related to CARB-selected NSR actions. Information related to Kern County APCD was needed because prior to unification of the San Joaquin Valley Air District in 1991, Kern County had an independent permitting program, which banked a large number of ERCs that were moved over to the unified air district upon unification.

In addition, SJVAPCD provided CARB staff with electronic access to the SJVAPCD Permits Administration System (PAS). PAS is a comprehensive database where all permitting and ERC related actions are recorded and related documents are stored. From PAS, CARB staff retrieved hundreds of documents including permit applications,

engineering evaluations, ERC transaction histories, emission inventories, source test records, and inspection reports related to the original ERC projects under review.

SJVAPCD also provided CARB staff with access to the federal offset equivalency tracking system at District offices. SJVAPCD shared information about the tracking system, access to database files, and tracking system output.

1. *Public Participation*

In November 2018, Earthworks released the report that helped initiate this review -- *Undeserved Credit: Why emissions banking in California's San Joaquin Valley puts air quality at risk*. The Earthworks report made the following findings and conclusions, among others: "a significant proportion of ERCs in the San Joaquin Valley Air Pollution Control District's bank appear to be invalid"; "CARB should audit the San Joaquin Valley Air District ERC system"; "equivalency should be questioned"; and "CARB should not allow ERCs to last forever."

Further, in a January 9, 2019 letter to Mary Nichols, Chairman of the Board, and in testimony at the January 24, 2019 Board Meeting, a coalition of environmental and health advocacy groups representing the Southern San Joaquin Valley requested that CARB "…conduct a thorough review of the Emission Reduction Credit (ERC) banks administered by the San Joaquin Valley Air Pollution Control District…."

CARB staff has considered input from these and other stakeholders in planning and executing this review. CARB staff has also taken steps to ensure this review is an open, public process. Staff held three workshops: in April and September 2019, and in June 2020. During these workshops, staff presented material and solicited comments. These workshops were hosted at the Bakersfield District office, which was linked to the Fresno and Modesto offices by the District's video teleconference system. The workshops were also webcast through CARB's web site, and translation services were made available at all three District office locations.

CARB staff has also had numerous in person meetings and conference calls with stakeholders regarding this project. Staff maintains a website[2] specifically for this project and an email address (valleyERCs@arb.ca.gov) for project questions. The website includes posting of documents related to the current ERC review, past CARB reviews of the District ERC banking program, and ERC banking in general.

2. *Public Stakeholder Concerns*

Stakeholders have identified a number of issues of potential relevance to CARB's review, including the following concerns:

[2]San Joaquin Valley Emission Reduction Credit Program Review, https://ww2.arb.ca.gov/our-work/programs/san-joaquin-valley-emission-reduction-credit-program-review.

- Validity of Older ERCs

Stakeholders have questioned whether certain ERCs were banked in conformance with legal requirements. Some stakeholders believe that the use of older, improperly issued ERCs could result in a large amount of new emissions in the Valley, which could impact local air quality and regional attainment demonstrations. Other stakeholders are concerned the ERCs they hold may be devalued.

- Impacts on Equivalency

Stakeholders have expressed concerns regarding the District's ability to continually identify additional offsets beyond ERCs to account for the difference between time of issuance valuation (as under the District's NSR program) and time-of-use valuation (as under federal NSR) in order to demonstrate equivalency with the federal program. Additional offsets are needed to demonstrate equivalency because the vast majority of ERCs currently in the bank in the San Joaquin Valley appear to have relatively little value at time-of-use. Many times, the value of an ERC has degraded by the time it is used due to more stringent regulations that are adopted or proposed between the time of issuance and time-of-use.

Stakeholders have expressed concern that the use of a large number of older ERCs could result in a failure to demonstrate federal equivalency. At the same time, some stakeholders believe that the use of a large number of older ERCs could result in a large amount of new emissions in the Valley, which could impact local air quality and regional attainment demonstrations.

- No Net-Increase

Under the District program, offsets are required above certain thresholds, but not below those thresholds. Stakeholders have asked whether this maintains the general goal of no-net-increase in emissions from stationary sources.

- Local Air Quality

Under State and federal law, ERCs are a tradeable commodity, and as such allow emissions to increase at one location while decreasing at another location. Some stakeholders have questioned whether emissions trading is appropriate. Further, while districts have rule provisions intended to protect the public from local increases of criteria pollutant and toxics emissions; such as emissions modeling, health risk assessments, and application of BACT; some stakeholders have questioned the effectiveness of these approaches.

- Transparency

NSR programs are quite complicated. While public documents regarding the SJVAPCD NSR program are available upon request, stakeholders have expressed difficulty in accessing relevant information necessary to understand the program. Stakeholders have expressed difficulty in understanding how to formulate and submit

requests for information to meet the District's requirements. This difficulty may be a result of stakeholders not knowing exactly how to specifically identify or describe the information they need to understand the program, or not being able to ascertain the connections and relevance of the provided information in the larger context of the District's NSR program. There appears to be a desire for stakeholders to understand how permitting and NSR works, and the District has indicated it is willing to offer training to stakeholders upon request.

3. Industry Stakeholder Concerns

- Availability of ERCs and Economic Growth

Some stakeholders expressed concern over possible "invalidation" of some ERCs, which could have an effect on ERC availability and pricing. Because ERCs are the currency of offsets, and offsets are often needed in order to modify or build a new emissions source, ERCs are critical to on-going economic development in the San Joaquin Valley.

Additionally, stakeholders have expressed concern with the permitting impacts associated with a failure to demonstrate equivalency. More specifically, concerns have been expressed regarding the unavailability of surplus at time-of-use ERCs required under permitting actions for federal new major sources and major modifications, particularly given the low major source thresholds in the San Joaquin Valley and large number of major sources across all sectors.

II. Part 1: Explaining the Emission Reduction Credit System

A. Overview of Emission Reduction Credits

The federal Clean Air Act establishes requirements for the permitting of stationary sources. Generally, states have the direct responsibility to meet requirements of the federal Clean Air Act and corresponding federal regulations with respect to permitting. California law, however, allows for delegation of permitting activities to the local and regional air districts. All thirty-five California air districts have taken advantage of the opportunity to implement their own permitting program for stationary sources. In California, maintaining a structure of air districts performing permitting with CARB review has been largely successful. Individual air districts are generally well suited to maintain localized regulations, which has led to improved air quality across the State. CARB has central oversight authority to monitor the performance of district programs and to conduct district functions if the district fails to meet certain responsibilities.

In accordance with the federal Clean Air Act, U.S. EPA sets ambient air quality standards for criteria pollutants. A geographic area that does not meet these standards is called a non-attainment area. The San Joaquin Valley is classified as extreme non-attainment for 8-hour ozone and serious non-attainment for PM2.5. Non-attainment areas must develop State Implementation Plans (SIPs) that either include, or commit to adopt, emission control measures to attain and maintain ambient air quality standards. The local air districts develop and implement portions of the SIP that cover stationary sources through rulemaking, permitting, and enforcement.

Generally, any stationary source that emits or has the potential to emit air pollution is subject to local air district permitting requirements. New or modified sources of air pollution must obtain approval from the local air district in the form of an Authority-to-Construct (ATC) permit. Most ATC permit applications are subject to NSR, and in California NSR is implemented at the district level. The federal Clean Air Act, implementing regulations, and State law establish the minimum requirements for non-attainment NSR permitting programs. U.S. EPA allows implementing authorities to tailor their NSR requirements to address local air quality conditions, provided the local NSR program is at least as stringent as federal standards. Generally speaking, NSR programs require sources exceeding a defined emissions threshold to install best available control technology (BACT) and to offset emission increases which occur after the installation of BACT with emissions reductions. These requirements for mitigating emissions reductions are generally referred to as offsets. NSR programs generally require offsets so that there is no net increase in emissions, on a regional basis, of nonattainment pollutants and their precursors.

NSR rules require either past or contemporaneous emission reductions to be used to counter-balance newly permitted emission increases. Emission reductions above and beyond what is required by rules and regulations, and not immediately used to counter balance new emission increases, can be stored in the form of ERCs. ERCs are the currency of offsets, and are a way of "banking" emission reductions for future use, either at the site they were generated or elsewhere within the air basin (or, in limited circumstances, in a downwind air basin).

Due to the emission-offsetting requirement of NSR, both the federal Clean Air Act and State law require non-attainment areas to have an ERC banking system. To qualify for banking as an ERC, an emission reduction must meet the following criteria:

- Real – the reduction must be in actual emissions not potential, allowed or permitted emissions.
- Quantifiable – the reduction must be calculable based on actual verifiable operational data and the best available emission factors and source test data.
- Surplus – the reduction must go beyond what is required by law, regulation, or SIP commitment at the time the ERC was originally banked.
- Permanent and Enforceable – the reduction must be legally and practically enforceable and permanent through permit conditions and limits, or surrender of the operating permit.

These ERC criteria help ensure the integrity of an ERC program. These criteria are also universal to programs across the United States, and provide the framework CARB staff used in the review of SJVAPCD ERC projects and the equivalency demonstration.

B. Demonstrating Equivalency

The offsetting requirements of the District's NSR rule are different from the offsetting requirements under federal NSR. For example, federal NSR requires offsets from major sources but not from minor sources, whereas the District's NSR rule requires offsets from both major and minor sources if the emissions are calculated to exceed specified offset thresholds. The federal Clean Air Act allows local NSR programs to differ from federal NSR so long as the local program is at least as stringent as federal NSR.

An important caveat to bear in mind when interpreting District and federal offset thresholds is that the District and federal calculation methods that determine "when" offsets are required and "how much" offsets are required are different, especially for modified sources. Thus, even where the pollutant thresholds are the same, the same project will produce different offset quantities for the same pollutant when evaluated under District versus federal NSR.

Other differences exist, which, depending on the facts of a given ATC project, may make either federal NSR or SJVAPCD NSR more stringent regarding offset requirements for a particular project (though the local NSR *program* must remain more stringent overall). Among the most significant difference in offsetting requirements is when the "surplus" value of an ERC is determined. SJVACPD values ERCs at the "time of issuance" whereas federal NSR values ERCs at the "time-of-use."

Specifically, under the SJVAPCD NSR rule, the value of an ERC is calculated when the ERC is issued, and the ERC retains that value throughout its life until it is used. In contrast, under the federal NSR rules, the value of an ERC is calculated first when it is created, and again when it is used. In a 1993 memorandum, entitled "Use of Shutdown Credits for Offsets," U.S. EPA stated that this approach is designed to avoid double counting emission reductions in a SIP. Under the federal approach, each ERC must be re-evaluated based on the rules, regulations, and SIP commitments that apply at the time-of-use. Because many years often elapse between when an ERC is created and when it is used, the adoption of progressively stricter emissions standards can cause the surplus value of an ERC to drop significantly.

For example, if a boiler in compliance with all applicable requirements has actual NOx emissions of 30 ppmv and 1.0 ton per year and ceases operation permanently, the operator could apply to bank the resulting NOx emission reductions as an ERC. Following receipt of an application, the air district verifies the reductions are timely, real, surplus, enforceable, permanent, and quantifiable and issues the operator an ERC with a time of issuance or face value of 1.0 tons per year NOx.[3] Suppose 10 years later the owner of this ERC wishes to use it to offset a new permitted emission increase of NOx, and, in the intervening 10 years, the air district has amended its boiler rule to require a NOx standard of 15 ppmv. Under a surplus-at-time-of-use offset system, the portion of the ERC representing a reduction in NOx from 30 to 15 ppmv is no longer surplus, which leaves the portion from 15 to 0 ppmv as the surplus-at-time-of-use value. Thus, the offset value of the ERC is reduced to 0.5 tons per year NOx[4] because half of the NOx emission reductions represented by the ERC are required by the amended boiler rule. However, under a surplus-at-time-of-issuance offset system, the ERC holds it value of 1.0 tons per year in perpetuity even if new rules are subsequently adopted that require stricter emission standards.

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[3] SJVAPCD would deduct 10% for an air quality improvement deduction (AQID); however, the AQID is omitted in this example for demonstration purposes.

[4] Discount Percentage = [(EF1 – Rule EF) ÷ (EF1 – EF2)] = [(30 – 15) ÷ (15 – 0)] = 0.50
ERC Surplus Value = (Current ERC Value) x (1 – Discount Percentage) = 1 tons per year x (1.0 – 0.50) = 0.5 tons per year
Where: EF1 = Pre-project emission factor used to calculate AER from the original banking action
EF2 = Post project emission factor used to calculate AER from the original banking action
EF Rule = Current emission factor required by a rule or regulation
Source: SJVAPCD Draft Staff Report Annual Offset Equivalency Demonstration (April 19, 2016).

Due to the differences between the federal and District NSR programs, in 1999 U.S. EPA and SJVAPCD entered into an agreement requiring SJVAPCD to implement an annual federal offset equivalency tracking system. U.S. EPA required this agreement as a condition of approving SJVAPCD's amended NSR rule for incorporation into the SIP. The purpose of the equivalency tracking system is to show, on a program-wide basis, that SJVAPCD's NSR rule requires an equal or greater amount of offsets than would be required under the terms of federal NSR. Equivalency is tracked on a pollutant-by-pollutant basis for each of the District's non-attainment pollutants. The District issues an annual offset equivalency report to U.S. EPA. The report is based on the outputs from the District's internal equivalency system.

From the time the tracking system was adopted in August 2001 until present, SJVAPCD has never failed to show equivalency in its annual demonstration report submitted to U.S. EPA. As a result, SJVAPCD has been able to maintain its offsetting system instead of adopting federal offset requirements for new major sources (NMS) and federal major modifications (FMM) to existing major sources. If SJVAPCD were to fail to show equivalency, they would be required, by their existing NSR rule and the agreement with U.S. EPA, to follow federal offsetting standards, including valuing ERCs at time-of-use rather than at time-of-issuance.

C. Role of ERCs under the Federal Clean Air Act

The federal Clean Air Act (FCAA) forms the basis for the national air pollution control effort, including among other elements, national ambient air quality standards for major air pollutants, hazardous air pollutants standards, state attainment plans, stationary source emissions standards and permits, and enforcement provisions. Both the federal government (under the FCAA) and California (under the California Clean Air Act) set air quality standards for clean air. An air quality standard defines the maximum amount of a pollutant averaged over a specified period of time that can be present in outdoor air without harming public health.

The FCAA requires U.S. EPA to set primary National Ambient Air Quality Standards (NAAQS) to protect public health, and secondary NAAQS to protect plants, forests, crops, and materials from damage due to exposure to six air pollutants that are harmful to public health and to the environment. These pollutants include particulate matter (PM 10 and PM 2.5), ozone (O3), nitrogen oxides (NOx), sulfur oxides (SOx), carbon monoxide (CO), and lead (Pb).

Federal law requires that all states attain the NAAQS. Geographic areas within each state that do not meet a standard are called non-attainment for that air pollutant. The designation of an area as non-attainment is also important because it triggers the regulatory requirements for banking and use of emission reductions credits. The San Joaquin Valley is one of the non-attainment areas in the State. U.S. EPA classified the San Joaquin Valley as extreme non-attainment for ozone and serious non-attainment

for PM2.5. Non-attainment areas must develop plans, called State Implementation Plans (SIPs), to attain the NAAQS. SIPs are comprehensive plans that describe how an area will attain, or maintain, NAAQS.

The SIPs' main purposes are to demonstrate that the State has the basic air quality management program components in place to implement a new or revised NAAQS, to identify the emissions control requirements the State will rely upon to attain and/or maintain the primary and secondary NAAQS, to prevent air quality deterioration for areas that are in attainment with the NAAQS, and to reduce criteria pollutants emitted in nonattainment areas.

The FCAA Amendments of 1970 also authorize California to set its own separate and stricter-than-federal emissions standards to address California's extraordinary circumstances of population, climate, and topography that pose serious air quality challenges. CARB focuses on California's unique air quality challenges by setting the State's own stricter emissions standards for a range of statewide pollution sources including vehicles, fuels, and consumer products.

The FCAA sets deadlines for attainment based on the severity of an area's air pollution problem. Failure of a state to reach attainment of the NAAQS by the target date can trigger a change in attainment status, new planning, and possibly penalties, including withholding of federal highway funds.

State law makes CARB the lead agency for all purposes related to the California SIP. CARB and local air pollution control districts work together in developing clean air plans to demonstrate how and when California will attain, or maintain, air quality standards established under both the FCAA and the California Clean Air Act. Local air pollution control districts, such as the SJVAPCD, develop plans that describe how the districts will reduce emissions to meet air quality standards by the deadlines, and implement control measures in their areas. These controls primarily affect stationary sources, such as manufacturing and goods processing facilities.

As part of the control strategy at the local level, districts regulate stationary emission sources by adopting control strategies such as district permitting rules and prohibitory rules (prohibitory rules are rules that apply to specific types of equipment or industries). The rules achieve emissions reductions by setting limits and by requiring controls, certifications, or work practices that minimize emissions. Many of these rules have been made stricter over time. The permitting process is the vehicle by which the District implements and enforces rule requirements. An operating permit contains clear, enforceable conditions that spell out each of the rule requirements, and includes associated recordkeeping, monitoring, or testing requirements to ensure that it can be demonstrated that the conditions are being adhered to.

D. Permitting – Federal Requirements

There are two layers of permitting for major sources: 1) federal process and standards; and 2) district process and standards. In many cases, the district will perform both reviews if the district has a SIP-approved program or is delegated authority to implement the federal permitting program. If a district is not delegated such authority, then U.S. EPA will perform the federal permitting and the district will perform its own permitting. Many of the terms used in both federal and local permitting are the same or similar, however some are different, so it is important to distinguish between them.

Major sources of emissions are subject to Title V (of the FCAA), which establishes a federal operating permit program designed to standardize air quality permits and the permitting process for major sources of emissions across the country. Title V only applies to "major sources." U.S. EPA defines a major source as a facility that emits, or has the potential to emit (PTE) any criteria pollutant or hazardous air pollutant (HAP) at levels equal to or greater than federal Major Source Thresholds (MST). The MST for criteria pollutants varies depending on the pollutant and attainment status (e.g., marginal or moderate, serious, severe, and extreme) of the geographic area in which the facility is located.

The FCAA[5] requires NMSs and FMMs to existing major sources of criteria pollutants to undergo a preconstruction review and permitting process conforming to federal law and regulations. In nonattainment areas, the process is called federal "non-attainment new source review" ("NNSR" or simply "NSR"). Existing "major sources" must comply with certain minimum emission reduction requirements and obtain a Title V operating permit. Federal new source review and District new source review differ in several ways, as discussed further below.

E. Permitting – Local Requirements

Air districts issue permits and monitor new and modified sources of air pollutants in accordance with national, State, and local emission standards. A primary purpose of permitting is to ensure that emissions from such sources will not interfere with the attainment and maintenance of ambient air quality standards adopted by CARB and U.S. EPA. Permit requirements apply to individual processes and devices at major sources and to individual processes and devices at facilities that fall below major source thresholds. Local air district permitting activity falls into two broad categories. The districts must approve any new or modified source that has the potential to emit air pollution before it is constructed. This is called an ATC permit for the source. Most ATC permit approvals are subject to NSR. Once a district inspects a source and

[5] CAA 172(c)(5).

finds that the source complies with its ATC permit, the district will issue a permit to operate (PTO). The operating permits of major facilities must include federal Title V requirements in addition to local district requirements.

F. New Source Review

New Source Review (NSR) is the title applied to programs regulating the new construction of, and/or modifications to, industrial sources, that have the potential to emit, or will emit, air pollutants. NSR programs establish standards for the construction of new stationary sources and the modification of existing stationary sources such as power plants, refineries, and incinerators. State and federal law mandate requirements for NSR, including offset requirements for new and expanding stationary sources. There are two types of NSR in California: federal and local.

The requirements of NSR must be met before a district will issue an ATC. The minimum requirements of NSR are specified in federal and State laws, but in California NSR is implemented at the local level. The local air districts incorporate the applicable state and federal requirements in their own local NSR rule(s). In addition, the districts may include more stringent requirements in their NSR rule(s). Emissions offsetting and ERCs are required components of NSR in non-attainment areas, such as the San Joaquin Valley.

The California Clean Air Act sets basic requirements for NSR programs in the State. Specific to NSR, each district is to include in its attainment plan, a stationary source control program designed to achieve no net increase in emissions of nonattainment pollutants or their precursors for all new or modified sources that exceed particular emission thresholds.[6]

Each of the 35 districts in California has its own NSR program and issues its own ATCs and PTOs. Each district has adopted its own NSR rules and regulations to comply with state and federal laws. These regulations usually incorporate both the California and federal regulations into one or more rules. Two of the key components of NSR in each of the districts are Best Available Control Technology (BACT) and offsets.

1. Best Available Control Technology

Depending on the type and quantity of emissions of air pollutants that will be emitted from the source and the area designation for that pollutant, the new or modified source may be required to install BACT. In general terms, BACT means an emission limitation based on the maximum degree of reduction of each pollutant subject to regulation, emitted from, or which results from any major emitting facility. The SJVAPCD defines BACT as follows:

[6] HSC 40918 – 40920.5.

> [T]he most stringent emission limitation or control technique of the following:
>
> Achieved in practice for such category and class of source;
>
> Contained in any State Implementation Plan approved by the Environmental Protection Agency for such category and class of source. A specific limitation or control technique shall not apply if the owner of the proposed emissions unit demonstrates to the satisfaction of the APCO that such a limitation or control technique is not presently achievable; or
>
> Contained in an applicable federal New Source Performance Standard; or
>
> Any other emission limitation or control technique, including process and equipment changes of basic or control equipment, found by the APCO to be cost effective and technologically feasible for such class or category of sources or for a specific source.

At a minimum, a specific limitation or control technique must be proposed as BACT if it has been achieved in practice on the same type of equipment, anywhere. Even more stringent emission limitation or control techniques are required, including alternative basic equipment or process or changes of control equipment, if found by the APCO to be technologically feasible for such class or category of sources or for a specific source, and cost effective, even if such a control has never been achieved before.

2. *Offsets*

The California and federal Clean Air Acts each require offsets as an element of air quality attainment plans. State law specifies that each non-attainment area's attainment plan contain a stationary source control program designed to achieve no net increase in emissions of non-attainment pollutants from all new or modified stationary sources. Under California law, a new or modified facility at, or above, a certain threshold must mitigate all emission increases so that the result is no net increase in emissions.

Therefore, new and/or modified sources in California may be required, depending on the type and quantity of pollutants emitted, to mitigate or "offset" the increases in emissions that result from the project, even after installation of BACT. The concept behind offsets is that new and expanding stationary sources of air pollution mitigate, or "offset," new emissions with reductions in air pollution at existing sources. The system is designed to accommodate new emissions so that industrial growth can continue in areas not meeting NAAQS (or CAAQS) while not undermining progress toward achieving clean air mandates.

An offset threshold refers to the level of emissions from a new or modified stationary source above which the source is required to provide offsets to mitigate a new emissions increase. Offset requirements are triggered on a pollutant-by-pollutant basis. For example if the offset threshold for VOC in a given district is 10 tons per year, and a new or modified source is projected to emit 8 tons per year, then the source would not be required to provide offsets to mitigate the 8 ton emission increase. However, if the source is projected to emit 12 tons of VOC, then the source would be required to provide offsets.

Once offsets are triggered, a source must provide ERCs to offset either all or a portion of the permitted emissions. Each district's NSR program differs in whether a source must offset the entire permitted amount of emissions, or only down to the offset threshold. Meaning, in the case described above, where the source is permitted to emit 12 tons of VOC, some districts require the source to offset 12 tons of VOC, where others only require the source to offset 2 tons of VOC down to the 10 ton offset threshold. SJVAPCD requires offsetting down to the offset threshold.

G. The San Joaquin Valley Air Pollution Control District ERC System

This section provides an overview of how the SJVAPCD implements the ERC element of its NSR program.

The history of the SJVAPCD is important for understanding the current ERC program. The SJVAPCD was formed in 1992 by the unification of eight individual county districts. Prior to unification of the District, the eight counties each had independent air quality management programs. Each county had its own set of rules and requirements and thus each county made its own permitting decisions. While each county was subject to essentially the same State and federal requirements pertaining to air quality, there were differences in the way counties made permitting and ERC approval decisions.

The unification of these county programs through the formation of the SJVAPCD created a consistent air quality program Valley-wide. Prior to unification, some counties, such as Kern, had fully developed rules for granting ERCs while other counties had more informal procedures for recognizing ERCs. While permits issued under the new unified District were consistent, it was recognized that the ERCs generated by the individual counties before unification needed to be carried over to the unified District. The SJVAPCD NSR and ERC rules facilitated this by creating procedures and timelines for recognizing and carrying over ERCs created in the individual counties. Thus old ERCs generated by county air districts prior to unification became unified District recognized ERCs. These ERCs still exist today, comprise roughly half of available NOx and VOC ERCs, and may be available to offset new emissions.

Following unification, the District established its own requirements for ERC banking, as further detailed below.

1. The SJVAPCD New Source Review Program

The SJVAPCD operates its NSR program to meet federal and State legal requirements. Elements of the program have been approved by CARB and U.S. EPA through the SIP approval process.

Rule 2201 is the District's NSR rule. First adopted in 1991, the District has updated and amended the rule sixteen times, most recently in August 2019. The rule establishes BACT requirements, offset thresholds, and offset requirements. Key elements of the rule include:

- BACT Requirements

BACT requirements are triggered on a pollutant-by-pollutant basis and on an emissions unit-by-emissions unit basis. Under Rule 2201, a BACT analysis is required (unless exempted) on (a) any new emissions unit or relocation from one Stationary Source to another of an existing emissions unit with a Potential to Emit exceeding 2.0 pounds in any one day; (b) modifications to an existing emissions unit with a valid Permit to Operate resulting in an Adjusted Increase in Permitted Emissions (AIPE) exceeding 2.0 pounds in any one day; and (c) any new or modified emissions unit, in a stationary source project, which results in an SB 288 Major Modification[7] or a FMM.

- Emissions Offset Threshold

Offset requirements are triggered on a pollutant-by-pollutant basis. Unless exempted, offsets are required if the post-project Stationary Source Potential to Emit (SSPE2) equals or exceeds the following offset threshold levels: VOC and NOx – 20,000 pounds per year; CO – 200,000 pounds per year; SOx – 54,750 pounds per year; PM10 – 29,200 pounds per year. SJVAPCD requires offsets down to the offset threshold.

- Offset Ratios

Rule 2201 establishes distance offsets designed to require additional offsets where the original location of emissions offsets is 15 miles or more away from the source under review. For NMSs and FMMs involving VOC or NOx, and for sources more than 15 miles away from the offset source, the ratio is 1.5. This means that every 1 pound of emissions increase must be offset by 1.5 pounds of emission decrease.

[7] The SB 288 Major Modification calculation procedure is included in Rule 2201 to comply with the requirements of California SB288 which prohibited air district's from relaxing requirements for Federal new source review (as they existed on 12/19/02) as a result of Federal NSR reform.

- Air Quality Improvement Deduction Requirements

New ERCs are discounted by 10% prior to banking, which is called an air quality improvement deduction. For example, if an emission reduction of 10 TPY qualifies for ERCs, then a certificate would be issued to the applicant for 9 TPY, and 1 TPY would be permanently retired by the District. This requirement is designed to help ensure that the implementation of the ERC program results in an overall air quality benefit within the boundaries of the air district.

- Calculation Requirements

Rule 2201 defines calculation methods for applying the NSR rule, including for baseline periods, daily emissions limits, historical actual emissions, and potential to emit. These definitions and requirements apply to both permit engineering review calculations, and to the equivalency demonstration. There are several important calculation differences between the SJVAPCD's rule and the federal program.

The most important distinction for purposes of this review concerns whether ERCs are discounted when they are used. Under federal NSR rules, the value of an ERC is discounted at the time-of-use. Under this approach, each ERC must be re-evaluated based on the rules, regulations, and SIP commitments that apply at the time-of-use. Because many years often elapse between when an ERC is created and when it is used, the adoption of progressively stricter emissions standards can cause the surplus value of an ERC to drop significantly.

Under the SJVAPCD rules, the value of an ERC is calculated when the ERC is issued, and the ERC retains this value for the life of the ERC. This is referred to as "time-of-issuance" value. This means the District grants ERCs based on the "surplus" (in excess of any rules, requirements or plans on the books) value at the time of banking. If at some point in the future a rule is adopted that would have reduced emissions from the banked source, the rule has no effect on the ERC. CARB supported this approach at the time it was originally adopted. In a 1993 letter to U.S. EPA, CARB expressed its view that this approach created incentives for companies to produce and use ERCs, "no company exercising good business judgment would ever purchase ERCs which could become worthless within an unforeseeable future time. This would also tend to discourage modernization, since a valuable ERC would be rendered useless on the open market."

A second calculation difference between SJVAPCD NSR and federal NSR is how an emissions increase is calculated to determine the offset quantity for FMMs. For modified sources that qualify as "clean emissions units,"[8] the emissions increase under SJVAPCD NSR is calculated as the difference between the pre-project PTE and the post-project PTE, i.e. a potential-to-potential basis (for all sources). In contrast, under

[8] Clean emissions units are emissions units equipped with emissions controls 95% efficient or meeting achieved-in-practice Best Available Control Technology requirements in the previous 5 years.

federal NSR (for new major sources and federal major modifications), the emission increase is calculated as the difference between the pre-project actual emissions and the post-project PTE, i.e. an actual-to-potential basis. An actual-to-potential basis (as under federal NSR) will always produce an emissions increase that is equal to or greater than an emission increase determined on a potential-to-potential basis (as under SJVAPCD NSR). Thus, the actual-to-potential calculation is more stringent. Districts differ in terms of the emissions increase calculation for their particular NSR rule. Some, including SJVAPCD, use a potential to potential calculation, while others use an actual to potential calculation, which results in a larger number of offsets required.

Due to the differences between the federal and District NSR programs, in 1999 U.S. EPA and SJVAPCD entered into an agreement requiring SJVAPCD to implement an annual federal offset equivalency tracking system. U.S. EPA required this agreement as a condition of approving SJVAPCD's amended NSR rule for incorporation into the SIP. The purpose of the tracking system is to show, on a program-wide basis, that SJVAPCD's NSR rule requires an equal or greater amount of offsets than would be required under the terms of federal NSR. This is the "equivalency determination" that a major section of this review discusses below.

The District's NSR Rule contains language that describes how the district would modify its program if it were to fail to show equivalency. From the time the tracking system was adopted in August 2001 until present, SJVAPCD has never failed to show equivalency based on its annual demonstration to U.S. EPA. As a result, SJVAPCD has been able to maintain its offsetting system instead of adopting federal offset requirements for NMSs and FMMs to existing major sources. If SJVAPCD were to fail to show equivalency, they would be required, by their existing NSR rule and the agreement with U.S. EPA, to follow federal offsetting standards.

2. The SJVAPCD ERC Bank

The District publishes on its website[9] a daily summary of the available (or currently valid) ERCs. Table 1 provides an example of the daily summary from August 1, 2019. The summary reports the ERCs by the region in which the ERCs were banked, however an ERC from one region may be used (retired) to mitigate emission increases in any other region. In 2016, the District estimated[10] that approximately 18% of its NOx ERCs were surplus as of that the time, if evaluated and discounted under a "surplus-at-time-of use" assumption.

[9] http://www.valleyair.org/busind/pto/erc.htm

[10] http://www.valleyair.org/Workshops/postings/2016/05-11-16_OEI/DRAFT-Staff-Report.pdf

Table 1. Available Annual ERCs in the San Joaquin Valley by Region (August 2019)

Pollutant (lbs/yr)	Northern Region	Central Region	Southern Region	Total District
VOC	748,373	589,690	8,847,980	10,186,043
NOx	2,005,863	740,185	8,242,410	10,988,458
CO	1,691,911	1,011,453	51,328,838	54,032,202
PM10	739,839	980,277	962,531	2,681,897
SOx	1,654,602	664,580	3,914,109	6,233,291
Acetone	71,826	2,695	None	74,521
Ethane	None	14,134	1,879,617	1,893,751
Hydrogen Sulfide	None	107	45,005	45,112
PM2.5	None	None	3,218	3,218
Sulfate Particulate	None	None	191,193	191,193
-	-	-	-	-
CO2E (MMT/yr)	2,444	259,575	636,315	636,315

Figures 1 and 2 below show the percentage of available VOC and NOx ERCs in the bank according to the age (grouped by decade) of the emission reductions that created them. The charts show that the majority of VOC (89%) and NOx (85%) ERCs remaining in the bank unused are based on emission reductions that occurred more than 20 years ago.[11]

[11] Note that the ERC totals (lb/yr) for VOC and NOx in the charts below will not equal the VOC and NOx totals in Table 1 above because the charts only represent banking actions through 2018, whereas Table 1 is current as of August 1, 2019.

Figure 1. Age of VOC ERCs Available in the SJVAPCD Bank

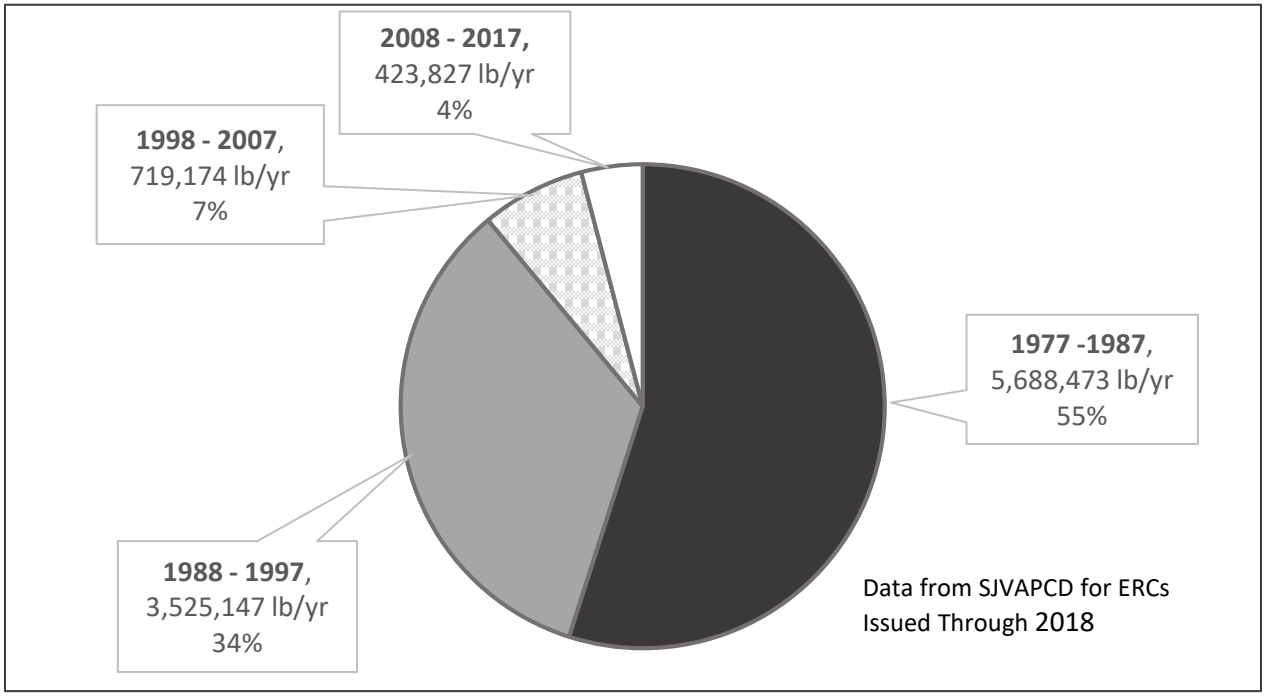
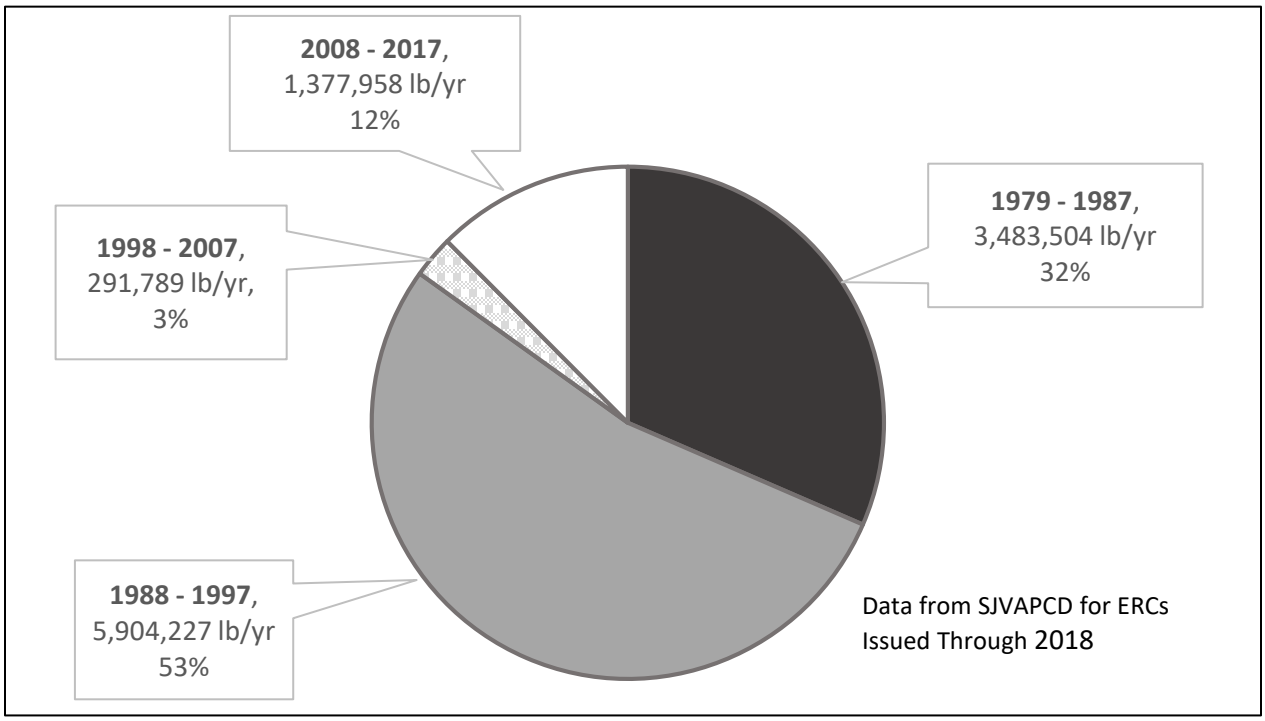


Figure 2. Age of NOx ERCs Available in the SJVAPCD Bank



3. Demonstrating Equivalency

When originally established, the District's NSR program required more offsets than the federal NSR program, primarily because District emissions offset thresholds and offset ratios were more stringent compared to federal NSR. However, in 2010, the San Joaquin Valley's federal non-attainment ozone classification was bumped up from severe to extreme. As a result, the federal major source and major modification thresholds for ozone precursors dropped to levels that eliminated the primary advantage SJVAPCD's NSR program had in offset stringency over the federal NSR program for NOx, VOC, and CO.

Since the reclassification to extreme non-attainment for ozone in 2010, SJVAPCD's tracking system frequently relies on the carry-over of past mitigations and reductions. To demonstrate equivalency for NOx and VOC the District has relied heavily on past, unbanked reductions from orphan shutdowns and electrification projects (i.e., reductions not used for ATC projects). For example, between 2010 and 2018, half of all VOC reductions, and 75% of all NOx reductions included in the District's equivalency demonstrations were provided by orphan shutdowns and electrification projects, with the remaining value provided by ERCs.

Figures 3 and 4 below display the emissions reductions claimed by source type by the District to demonstrate federal offset equivalency between 2010 and 2018. For NOx, electrification projects comprised the majority of offsets used to demonstrate equivalency, and for VOC both ERCs and orphan shutdowns were used to demonstrate equivalency.

Part 3 of this report provides further discussion and analysis of the District's equivalency program.

Figure 3. Surplus at Time-of-use Equivalency: NOx Mitigation by Source

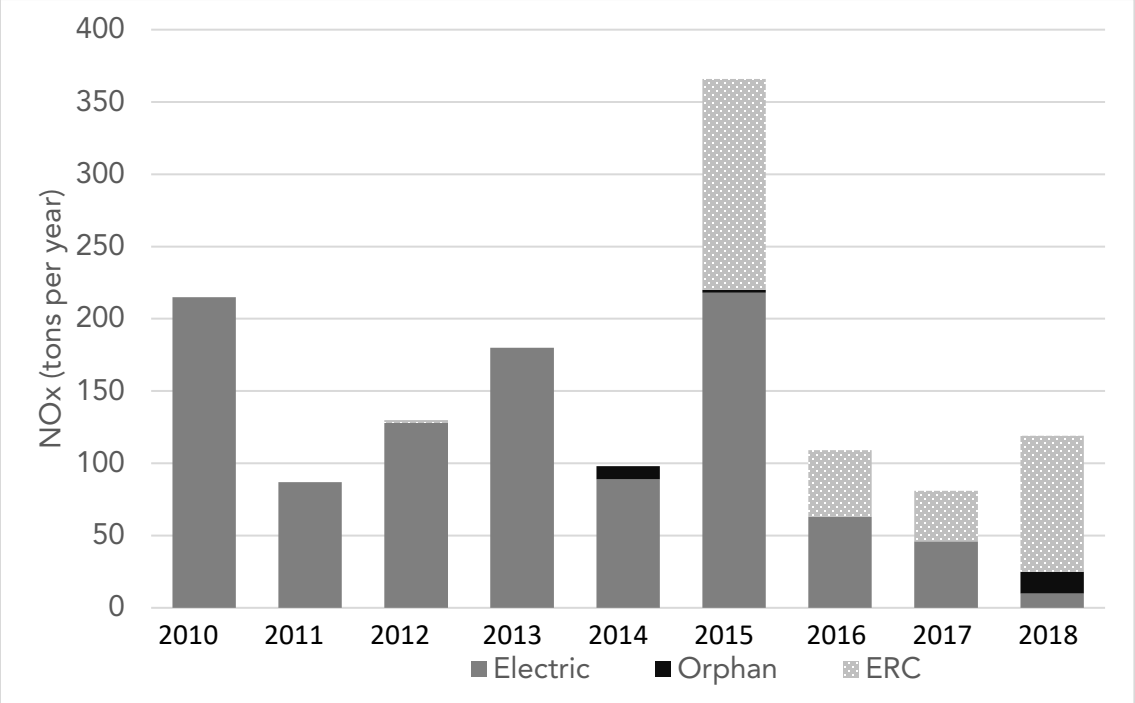
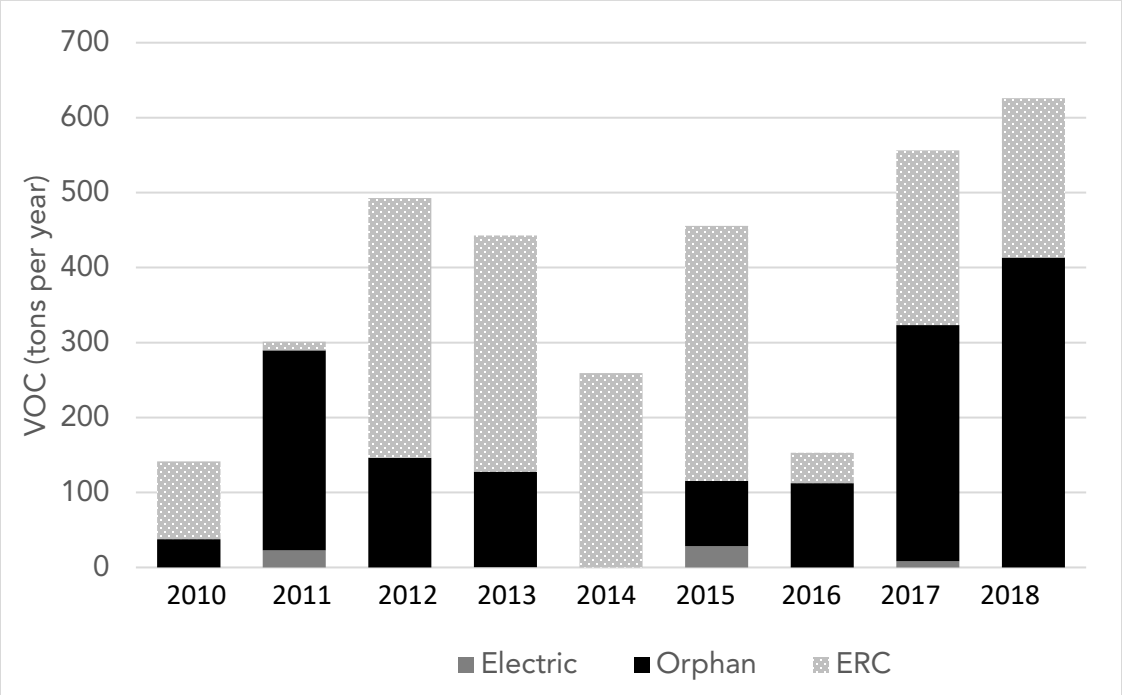


Figure 4. Surplus at Time-of-use Equivalency: VOC Mitigation by Source



H. Summary of Findings for Part 1

The current SJVAPCD ERC bank contains nearly 11 million pounds per year of NOx ERCs when valued at time-of-issuance, more than 80% of which were generated more than 20 years ago. However, over the years, the District's regulatory program has become more stringent, and the District estimated in 2016 that these NOx ERCs, when valued at time-of-use, were worth about 18% of the time-of-issuance value.[12] This reduction in time-of-issuance value is directly related to the stringency of the District's regulatory program. In effect, as the District increases the stringency in its regulatory program, it also reduces the time-of-use value in its ERC bank, which makes achieving equivalency more difficult. By way of example, when a business uses a 100 TPY ERC to offset a 100 TPY emissions increase, the business gets full use of the 100 TYP face value of the ERC. However, when the District accounts for the use of the same 100 TPY ERC in the context of the equivalency determination, its surplus-at-time-of-use value may be much less. In the case of NOx, on average, the 100 TPY NOx ERC would only be able to "offset" 18 TPY in the equivalency determination calculation.

At the same time, the District's NSR program, once significantly more stringent than federal requirements no longer is for NOx and VOC because of the District's reclassification to extreme non-attainment status for ozone in 2010. Prior to reclassification, the District's offsets thresholds for major sources were below the federal offset threshold and therefore the District required a greater use of offsets to mitigate emissions increases than what was federally required. However, upon reclassification, the District's offset threshold was no longer lower than the federally required threshold, which created a situation in which more offsets are generally required for major sources under federal requirements than under district rules. This change has been exacerbated by the fact that there generally are not sufficient reductions from the application of the NSR ERC program to offset the difference between time-of-issuance and time-of-use value of ERCs. The District uses orphan shutdowns and electrification projects to provide additional emissions reductions that are needed to demonstrate equivalency because the remaining portions of the program do not appear to provide sufficient additional offsets. These emission reductions are not generated as part of the ERC system, but are used to demonstrate offset equivalency between the District program and federal requirements. On the other hand, the District has not to date incorporated other eligible and more stringent requirements of their NSR rule into the offset equivalency demonstration, such as the application of BACT requirements to minor sources which is beyond federal requirements.

[12] SJVAPCD Draft Staff Report for Annual Offset Equivalency Determination, April 19, 2016, page 6

III. Part 2: Evaluating ERC Projects

This section discusses Part 2 of the review, in which staff evaluated 52 individual ERC projects, which represents 201 individual ERC banking certificates.[13] Staff's evaluation focused on whether the projects conformed to District rules, as well as federal and State requirements. Staff focused particularly on timeliness of applications; baseline determinations and calculations; and the evaluation criteria (real, quantifiable, surplus, permanent, and enforceable). In addition, staff reviewed emission calculations and engineering evaluations for accuracy and completeness of information. Because the Earthworks Report identified potential issues with specific ERCs, CARB staff included in this review all of the ERCs discussed in the Earthworks Report. To ensure the sample of ERCs in this review provides an adequate representation of the entire ERC program, CARB selected additional ERCs for evaluation using a random selection and representing the following criteria:

- A variety of locations, including varied regions of SJVAPCD;
- A variety of industries;
- A range of magnitude of emissions banked; and
- A range of dates in which the project took place.

To select ERCs for review, staff first identified the full population of projects and ERCs. Staff identified 1,358 projects and 2,101 ERC certificates listed in the District's ERC bank. From this population, staff selected 52 ERC projects representing 201 individual single pollutant ERC certificates, including those addressed in the Earthworks Report and additional projects chosen by CARB staff to provide a representative overview of the program.

Table 2 below lists the ERC project codes associated with the 52 ERC projects selected for review. District staff assign ERC project codes when an ERC application is submitted. The first letter of the project code indicates which region the reduction originated in (N for northern, C for central, and S for southern). The remaining numbers uniquely identify each project. Each ERC project code represents between one and five actual ERC certificates because a unique ERC certificate is issued for each pollutant banked, even if they result from the same project. For each of these projects, staff requested the contents of the project file from the District, and reviewed information available in the District's permitting database, PAS. Key publicly available information which staff used to review these projects can be found on CARB's website at the following address: https://ww2.arb.ca.gov/our-work/programs/san-joaquin-valley-emission-reduction-credit-program-review

[13] An ERC banking action, or "project", can involve a banking of multiple pollutants, and an individual ERC certificate is issued for each pollutant banked in an action or project.

Table 2. List of ERC Projects that CARB Reviewed

ERC Project Number	Date of Issuance	Number Certificates Issued	VOC (tpy)	NOx (tpy)	CO (tpy)	PM10 (tpy)	SOx (tpy)	CO2e (tpy) (metric)
S-851028	7/23/1987	2	2,202.3	-	11,459.8	-	-	-
S-870731	4/14/1988	5	261.3	509.4	4730.2	6.6	295.8	-
S-920255	9/27/1994	23	1,168.0[14]	-	-	-	-	-
S-910706	3/30/1992	5	-	58.7	8.1	20.8[15]	386.4	-
S-920024	12/17/1992	5		3.3	10.4	3.6[16]	126.5	-
S-930509	7/14/1994	4	-	110.9[17]	-	-	-	-
S-950784	12/6/1996	1	103.6	-	-	-	-	-
S-981134	4/12/1999	1	-	9.9	-	-	-	-
S-1010702	12/17/2001	1	-	13.1	-	-	-	-
S-1020219	4/28/2003	1	-	-	-	8.74	-	-
S-1052797	12/6/2006	4	38.2	7.1	20.2	2.6	-	-
S-1075362	5/15/2008	4	11.5	11.8	52.7	0.8	-	-
S-1080067	5/14/2008	4	0.1	0.7	1.3	0.1	-	-
S-1113860	1/19/2012	1	4.5	-	-	-	-	-
S-1120775	2/13/2014	2	-	-	-	-	-	70,788[18]
S-1122749	3/24/2015	1	-	-	-	-	-	12,003
S-1122845	7/14/2014	6	0.5	4.7	3.2	1.7	0.03	30,279
S-1123816	4/19/2017	1	-	-	-	-	-	257,426
C-1130364	10/7/2015	6	0.04	0.1	3.5	0.1	0.002	161
S-1141060	8/26/2015	4	-	42.0	99.6	13.9	9.2	-
S-1144501	7/12/2017	1	1.5	-	-	-	-	-
S-1154368	4/3/2017	3	-	0.1	1.9	0.6	-	-

[14] 1,168.0 tpy is the total of twelve separate VOC ERC certificates issued for this project. In addition, eleven ethane ERC certificates were issued.
[15] A separate ERC for 8.4 tpy sulfates was also issued.
[16] A separate ERC for 1.8 tpy sulfates was also issued.
[17] 110.9 tpy is the total of four separate NOx ERC certificates issued for this project.
[18] 70,788 is the total for two separate CO2e ERC certificates issued for this project.

ERC Project Number	Date of Issuance	Number Certificates Issued	VOC (tpy)	NOx (tpy)	CO (tpy)	PM10 (tpy)	SOx (tpy)	CO2e (tpy) (metric)
S-1171326	3/12/2018	4	-	19.8	6.1	7.8	0.2	-
S-1180895	8/21/2018	5	0.3	0.4	11.1	0.3	0.8	-
C-920318	9/13/1993	5	61.0	11.0	2.7	112.7	0.05	-
C-950579	6/12/1996	3	3.5	22.6	18.2	-	-	-
C-970158	1/7/1999	5	20.7	6.0	31.4	0.7	0.04	-
C-980294	8/18/2003	5	0.7	5.5	74.2	1.1	4.4	-
C-1010009	3/15/2001	5	163.9	1.5	1.4	39.5	0.02	-
C-1011235	7/16/2002	5	1.5	14.6	2.2	0.7	0.2	-
C-1032163	3/29/2004	5	0.01	0.2	0.2	9.9	0.006	-
C-1040561	10/6/2004	5	0.03	0.7	0.1	7.5	0.04	-
C-1063777	4/30/2007	5	0.02	0.4	0.1	9.5	0.003	-
C-1120248	7/9/2012	5	0.4	32.9	32.7	6.8	22.8	-
C-1162473	7/12/2017	5	0.009	0.2	0.03	8.0	0.03	-
C-1162737	1/30/2018	1	5.3	-	-	-	-	-
C-1171943	7/26/2018	6	0.003	0.1	0.01	3.9	0.01	79
C-1172943	7/8/2019	5	0.1	0.9	0.7	2.1	0.01	-
C-1173456	10/11/2018	5	0.003	0.05	0.01	5.5	-	56
N-930450	5/19/1995	4	0.1	45.5	-	1.6	17.5	-
N-950107	5/21/1996	1	-	-	37.9	-	-	-
N-950151	3/4/1996	1	-	163.5	-	-	-	-
N-950288	12/8/1998	5	68.3	79.0	69.3	12.7	6.4	-
N-960487	6/3/1997	5	1.0	36.0	10.8	8.1	0.7	-
N-970384	11/5/1998	5	1.7	243.6	42.1	49.8	341.3	-
N-980337	5/25/2000	5	107.5	14.1	9.4	3.0	0.2	-
N-1000509	10/29/2008	1	-	-	-	6.4	-	-
N-1001257	8/14/2002	5	0.5	55.9	40.7	9.5	28.1	-
N-1061341	2/20/2008	5	2.7	20.8	54.3	0.03	4.3	-

ERC Project Number	Date of Issuance	Number Certificates Issued	VOC (tpy)	NOx (tpy)	CO (tpy)	PM10 (tpy)	SOx (tpy)	CO2e (tpy) (metric)
N-1062909	5/26/2011	2	14.7	-	-	0.6	-	-
N-1101305	12/19/2012	1	32.8	-	-	-	-	-
N-1131840	2/21/2017	1	-	-	-	-	28.3	-

A. Findings

In reviewing the 52 ERC projects, staff identified four areas in which the District's program requires improvement:

1. Transparency
2. Timeliness of Application and Selection of Baseline Periods
3. Real and Permanent Reductions
4. Surplus Reductions

This section provides an overview of each of these areas of concern, with reference to the affected ERC projects.

1. Transparency

In about half of (27 of 52) ERC projects reviewed, the District's project files lacked sufficient supporting documentation that would be necessary to replicate or verify the information used in the District evaluation or provided in the facility application. The ERC projects were missing information such as emissions inventory submittals, choice of baseline period, Continuous Emission Monitoring (CEMS) data, source test data, and other information. The following ERCs lacked sufficient documentation: C-920318, C-920255, C-1010009, C-1032163, C-1130364, C-1162737, C-1172943, C-1173456, N-930450, N-950107, N-950288, N-960487, N-980337, N-1062909, N-1131840, S-851028, S-870731, S-910276, S-920024, S-1020209, S-1075362, S-1113860, S-1122749, S-1122845, S-1123816, S-1141060, and S-1144501.

The ERC process should ensure that the ERC file is complete and transparent, such that a reviewer, or member of the public, can readily replicate the decision made. Three examples of transparency issues found during the review are illustrative of ERCs with similar issues.

- S-1144501: The proposed reduction resulted from shutdown of two floating roof crude oil production tanks. The referenced ERC was issued in 2017. The District's files provide no discussion of the reason the District chose an alternative baseline period for the facility, rather than the two years immediately preceding the date of

application. There is no detail of the quarterly average production data calculations, and using the raw data, the District values cannot be duplicated. In addition, the District relied on the permit surrender date for justification of application timeliness, yet the letter from the applicant surrendering permits is not included in the District's files.

- N-960487: The proposed reduction resulted from the shutdown of a sugar manufacturing facility. The throughput and fuel usage were supplied by a consultant on behalf of the applicant, without any supporting documentation or records. The file did not include any emission inventory submittals, nor any evidence that the District verified the information in the application.
- N-1062909: The proposed reduction resulted from the shutdown of a steel storage system manufacturing facility. The District sent several letters requesting more information from the applicant regarding amount of paint used and VOC contents of paints, but the file contains no resolution of the requests. The project files do not contain final issuance letters. The District took over four years to determine the application was complete, but the file contains no explanation for this delay.

2. Timeliness of Application and Selection of Baseline Period

District's banking rule (Rule 2301) governs the timeline for applications for ERC banking. CARB staff interprets the rule as being clear that the application must be submitted within 180 days of when emission reductions occurred. To interpret Rule 2301, District follows Policy APR 1805 (4/9/1992)[19]. CARB staff believes that Rule 2301 and APR 1805 are inconsistent. The District maintains that the rule and policy are consistent but has committed to making adjustments to reduce the likelihood of future actual or perceived inconsistencies.

In the San Joaquin Valley, most ERCs are generated from the shutdown of a facility or process. In 15 of the 52 projects reviewed, the District granted ERCs for reductions generated by a facility shutdown that occurred more than 180 days before submission of the ERC application following Policy APR 1805. The 15 affected ERC projects are: S-1075362, C1010009, C-950579, C-970158, C-1032163, C-1063777, C-1130364, C-1162473, C-1172943, C-1173456, S-430424, N-1001257, S-870731, S-1080067, S-1122845. For many of these ERCs, the District also selected baseline periods reflecting operation of the facility even though the facility had not operated within 180 days of, and sometimes in years prior to, the ERC application.

District Rule 2301, Sections 4.2 and 4.2.3 states:

[19] https://www.valleyair.org/policies_per/Policies/APR%201805.pdf

4.2 Affected Pollutant Emissions Reductions Occurring After September 19, 1991

For emission reductions occurring after September 19, 1991, the following criteria must be met in order to deem such reductions eligible for banking: …

4.2.3 An application for ERC has been filed no later than 180 days after the emission reductions occurred.

The District does not define the date "emission reductions occurred," however, it is the District's position that the date the "emission reductions occurred" for facilities which are shutting down and applying for ERCs is the date of the "shutdown." The District defines "shutdown" in their regulations, although the term is not used in the timeliness language. Specifically, District regulations define shutdown as *the earlier* of the permanent cessation of emissions from an emitting unit or the surrender of that unit's operating permit. Rule 2301, Section 3.14, defines "shutdown" as:

Shutdown: shall mean either the earlier of the permanent cessation of emissions from an emitting unit or the surrender of that unit's operating permit. If, prior to the surrender of the operating permit, the APCO determines that:

the unit has been removed or fallen into inoperable and unmaintained condition such that startup would require an investment exceeding 50% of the current replacement cost; and

the owner cannot demonstrate to the satisfaction of the APCO that the owner intended to operate again, then the APCO may cancel the permit and deem the source shutdown as of the date of last emissions. Evidence of an intent to operate again may include valid production contracts, orders, other agreements, or any economically based reasons which would require the operation of the emitting unit after initial cessation of emissions.

District Policy APR 1805, Definition of a Shutdown defines shutdown as follows:

For permitted sources, the date of the shutdown shall be the date of the surrender of the operating permit, unless the Control Officer determines that: a) the unit has been removed or has fallen into an inoperable and unmaintained condition such that start-up would require an investment exceeding 50% of the current replacement cost; and, b) the owner cannot demonstrate to the satisfaction of the Control Officer that the owner intended to operate again. Evidence of "intent to operate again" may include valid production contracts, orders, other agreements, or any

economically based reasons which would require the operation of the emissions unit.

Should the Control Officer make determinations a) and b), the date of the shutdown shall be the date of the last emissions from the emissions unit.

District Policy APR 1805 further states "*We further recommend that the definition be changed, by rule amendment, at the first opportunity. The wording of the attached interpretation may be appropriate for such an amendment.*"

By following Policy APR 1805 in reviewing the timeliness of ERC projects, the District is accepting ERC applications submitted more than 180 days after the date emission reductions occurred, which CARB staff interprets as in conflict with the District's Rule. The acceptance of applications more than 180 days after cessation of emissions impacts the selection of the baseline period. District Rule 2201, Section 3.9, defines the baseline period as: "the two consecutive years of operation immediately prior to the submission date of the Complete Application" or "[a]t least two consecutive years within the five years immediately prior to the submission of the complete application if it is determined by the APCO as more representative of normal source operation."[20] In 14 of the 15 ERCs identified as being issued more than 180 days since cessation of emissions, the District defined a baseline period consisting of two years that were not immediately prior to the submission of the application.

While the District's reliance on District Policy APR 1805 with respect to application timeliness appears to have been consistent since 1992, CARB staff concludes that the policy and the rule are not aligned and should be modified accordingly. When coupled with the District's selection of baseline periods, the application of the policy has led to the issuance of ERCs for facility shutdowns that occurred more than 180 days prior to application, with credit for normal levels of activity prior to shutdown. The district has committed to a process to align the policy and the rule.

3. Source Shifting Considerations

In 10 projects (6 criteria pollutant and 4 GHG) of 52 ERC projects reviewed the reductions may not have been real and permanent as the pollution activity and emissions may have shifted to a different facility.[21]

In ERC projects for criteria pollutants, the District may consider the potential for the emissions reductions proposed for banking being shifted to another nearby source or

[20] Different baseline periods apply to sources that have been in operation for less than two years in total. These periods do not apply to the projects staff reviewed.

[21] CARB includes this review of GHG issues in part because non-profit groups raised concerns on this program as well. CARB recognizes that the GHG program is not directly linked to NOx offsets for ozone attainment, but GHG reductions, too, should be properly handled, given the significant public health implications of GHG emissions.

source within the air basin. This "source shifting" consideration is expressed implicitly in Rule 2301, Section 4.4.1 which bans certain source categories such as gasoline stations from banking emission reductions. The rationale for this exclusion is that the shutdown of a gasoline station will not result in any permanent or real emission reductions because the demand for gasoline will remain the same and the activity of refueling will be shifted to another nearby gasoline station. Thus, the air basin will see the same emissions as before the shutdown.

Where an emissions reduction creates a potential for source shifting, it is best practice for the ERC application to address this issue specifically by conducting an analysis to demonstrate source shifting is not occurring or that it is being compensated for in the amount of ERC being issued.

Staff observed that the issue of source-shifting was not explained adequately in some criteria pollutant banking actions where it could be an issue, in particular, in the banking of emissions from cotton gins in projects C-1032163, C-1040561, C-1063777, C-1162473, C-1171943, and C-1173456. While the District explained that cotton production was declining as an industry within the San Joaquin Valley, which CARB staff concurs, the District did not explain how this ensured that the production from one cotton gin shutting down was not being shifted to another nearby gin. In some cases, there was another nearby gin within a few miles. The District could improve its assessments by addressing source shifting more explicitly and comprehensively in its review of ERC applications.

The District considered the issue of source shifting when amending Rule 2301 to allow banking of GHG reductions. In presenting the Rule change, District staff noted certain reductions would be ineligible for banking –including shutdowns where "global demand for product/service does not decrease, product/service will be produced elsewhere (and result in GHG emissions)."[22] While this language was not directly incorporated into the Rule, the stated interpretation is consistent with the requirement that reductions be real and permanent.

Because the effects of GHGs are global, some account of global demand and therefore source shifting, on a global basis, is appropriate to ensure reductions are real and permanent. However, in the analysis of GHG banking projects (S-1122749, S-1123816, S-1122845, and C-1130364) for the shutdown of oil and gas production equipment (pre-Cap and Trade), the District did not apply this global level of scrutiny. The District assumed the GHG reductions would be real and permanent based on documentation of declining oil and gas production in California. However, a global boundary and demonstration of source shifting would have been more appropriate to

[22] http://www.valleyair.org/Board_meetings/GB/agenda_minutes/Agenda/2012/January/Item11-Rule2301011912presentation.pdf

show the reductions are real and permanent given that oil and gas are global commodities not on a downward trend, many producers are global, and the effects of GHGs are global.

Ultimately, the impact of these GHG ERCs is not clear, as there is no currently authorized use in an NSR context consistent with District rules or in the context of GHG Cap and Trade programs. To CARB's knowledge, none of these GHG ERCs have been used.

4. Surplus Reductions

In four of the 52 ERC applications reviewed (S-1075362; S-981134; S-851028; and C-1010009), it is unclear whether a portion of the reductions issued an ERC were not surplus. These issues are particularly complicated – influenced by federal, state, and local requirements.

For purposes of ERC banking, State law requires:[23]

> *(a) Every district board shall establish by regulation a system by which all reductions in the emission of air contaminants that are to be used to offset certain future increases in the emission of air contaminants shall be banked prior to use to offset future increases in emissions. The system shall provide that only those reductions in the emission of air contaminants that are not otherwise required by any federal, state, or district law, rule, order, permit, or regulation shall be registered, certified, or otherwise approved by the district air pollution control officer before they may be banked and used to offset future increases in the emission of air contaminants.*

Federal law requires:[24]

> *(c) Offsets (2) Emission reductions otherwise required by this chapter shall not be creditable as emissions reductions for purposes of any such offset requirement*

District rules require:[25]

> *3.2.2 To be considered surplus, [actual emissions reductions] shall be in excess, at the time the application for an Emission Reduction Credit or an Authority to Construct authorizing such reductions is deemed complete, of any emissions reduction which:*

[23] California Health and Safety Code 40709.
[24] Clean Air Act Section 173(c)(2).
[25] SJVAPCD Rule 2201, 3.2.2.

3.2.2.1 Is required or encumbered by any laws, rules, regulations, agreements, orders, or

3.2.2.2 Is attributed to a control measure noticed for workshop, or proposed or contained in a State Implementation Plan, or

3.2.2.3 Is proposed in the APCO's adopted air quality plan pursuant to the California Clean Air Act.

CARB recognizes that these rules and requirements are complex. However, all these requirements focus on a careful evaluation of whether an ERC is truly surplus relative to controlling law. This issue is particularly important to reevaluate, as a policy matter, because the time-of-issuance program in San Joaquin can mean ERCs issued under one legal regime are no longer truly surplus at use in light of changes in law since issuance. This becomes more important because the District, not the applicant, must identify sufficient time-of-use reductions in the context of the Equivalency Demonstration.

The four applications where it is unclear as to whether the full value of the ERCs were in fact surplus in light of changes in law.

- ERC S-981134 involved a refinery applying for ERCs for emissions reductions achieved from the required installation of BACT in 1998. The facility received an Authority to Construct (ATC) Permit # S-33-56-11 to increase the firing rate capacities of two heaters on a hydrocracking unit. This modification triggered BACT for NOx, and the District determined BACT for NOx to be a technology capable of meeting a NOx emission rate of 0.036 lb/MMBtu. The District granted an ERC for reductions achieved between the rule requirement and BACT.

  This approach was consistent with District Rule 2201 as adopted in 1995, which required emissions reductions selected for banking to be in excess of any emissions reduction required by any law, rules, regulations, agreements, or orders – except controls required by the District's NSR Rule. However, District Rule 2201 as adopted in 1995 was inconsistent with California Health and Safety Code section 40709 and federal Clean Air Act section 173(c)(2), discussed above, which require banked reductions to be surplus of all requirements including NSR requirements for BACT. The District subsequently amended Rule 2201 in 1998 to remove the language allowing banking of emissions reductions required by installation of BACT in NSR.

- ERC S-851028 involved benzene emissions reductions from the installation of a boiler on a fluid coker at a refinery in 1987. CARB and USEPA appeared to differ with the Kern County Air Pollution Control District on whether or not the reductions were surplus and therefore eligible for banking. EPA and CARB both commented that the reductions had occurred 10 years earlier and were already

accounted for in the non-attainment plan, and RACT at the time of banking was incineration. This ERC was discussed extensively in the Earthworks evaluation, and the record regarding this ERC is not clear. Ultimately, the Kern County Air Pollution Control District issued the ERCs, despite comments from CARB and U.S. EPA at the time which raised issues about the eligibility of the emissions reductions that the Kern County Air Pollution Control District did not fully address.

- ERC C-1010009 involved an ERC application in July 2000 for the shutdown of equipment at an oil mill used for seed processing. The facility continued to operate exclusively as a cottonseed receiving and storage facility. Prior to the ERC application, in May of 2000, the US EPA had published a notice to update a NESHAP (40 CFR Part 63 Subpart GGGG) applicable to the source. The District did not discount the ERC for the proposed NESHAP because it believed its rules did not require it to do so, and finalized the ERC in March 2001. However, US EPA finalized the NESHAP in April 2001, which reduced the time-of-use value of the ERC by 280,000 pounds of VOC per year, a reduction of roughly 80%, just weeks after the ERC was issued. This example highlights why time-of-issuance ERCs can be problematic as a policy matter, given this notable difference in reduction value.
- ERC S-1075362 involved the shutdown of six CNG engines. In this application, the applicant requested ERCs for reductions above the most stringent regulatory internal combustion emissions limit incorporated into a SIP in California – the 36 ppm NOx limit set forth in South Coast AQMD Rule 1110.2 (revised on June 3, 2005). The applicant used South Coast AQMD Rule 1110.2 for the Reasonably Available Control Technology (RACT) adjustment because the 36 ppm NOx limit was more stringent than the emissions limit under SJVAPCD Rule 4702. The application noted that SJVAPCD Rule 4702 had been identified as a further study measure, but no new draft potential emission limits had been published. As a result, the applicant calculated reductions using the 36 ppm NOx emissions limit.

  The District granted the ERC assuming an emissions limit of 65 ppm NOx, rather than the 36 ppm NOx emissions limit proposed by the applicant. This increased the value of the ERC. The District's evaluation did not include an explanation for the decision to use the 65 ppm limit. During this review process, however, the District explained that prior to the issuance of the ERC, the District had consulted with U.S. EPA in relation to a different banking action, and U.S. EPA had advised the District by letter "*actual emission reductions are required to be surplus of any other SIP requirement the source is subject to, not the requirement of other agencies SIPs which do not apply to the source.*"

IV. Part 3: Examining the District's Federal Offset Equivalency Demonstration

This section describes the District's federal offset equivalency demonstration and presents the analysis and findings of staff's review.

Summary of findings:

- The District's equivalency database is not a self-contained, relational database and lacks a complete data dictionary and technical documentation. CARB staff noted a number of stranded records, data-handling discrepancies, and transparency concerns related to these issues.
- The District over-credited the amount of emission reductions claimed for equivalency from PG&E's AG-ICE diesel-to-electric incentive program for agricultural irrigation pumps (Table 13). The over-credit is due to the use of a load factor of 1.0 instead of the Carl Moyer Guidelines' recommended load factor of 0.65 in the calculation of the amount of actual emission reductions creditable from these projects. (Table 11).
- Six of the ten AG-ICE projects reviewed received Carl Moyer co-funding, which, according to California Health and Safety Code section 44281(b) and Carl Moyer Guidelines, call into question their appropriateness for use in the equivalency demonstration. However, CARB staff found no evidence that the emission reductions from the AG-ICE projects were relied on in the California State Implementation Plan (SIP), which indicates the District's use of these reductions likely did not result in double-counting in both the SIP and equivalency demonstration, and found evidence that only a portion of the reductions, and not all of the reductions, were claimed for offset equivalency.
- AG-ICE projects were emission reductions from agricultural sources and not all agricultural sources were/are subject to permitting and NSR. Pursuant to SB 700 (2003, Florez), the District requires permits for agricultural sources (including spark- and compression-ignited irrigation pumps) if their emissions are greater than one-half of the major source emissions threshold. For agricultural sources with emissions less than one-half of the major source emissions threshold, the District issues registrations for spark- and compression-ignited irrigation pumps. It is unclear whether the emission reductions associated with the AG-ICE projects met the enforceability and permanence criteria under Rule 2201 Sections 7.2.2.2 and 7.1.5 in all cases.
- The District over-credited the amount of NOx and VOC emission reductions from some orphan shutdowns claimed for surplus-at-time-of-use equivalency for ten of the eleven projects reviewed (Table 14). Collectively, orphan shutdowns account for nearly 50 percent of the emission reductions the District used to

show surplus-at-time-of-use equivalency for VOC from 2001 – 2018 and over 60 percent of the excess VOC and NOx emission reductions available for use in future equivalency demonstrations at the end of the 2018 reporting period (Table 12).

A. Equivalency Overview

Since 2001, U.S. EPA has required the District to demonstrate program equivalency with federal NSR offset requirements by showing that the emissions reductions generated by SJVAPCD's NSR requirements as a whole are equal to or greater than the reductions that would have been required by federal NSR.[26] U.S. EPA and the District entered into an agreement on August 30, 1999 establishing the requirements for the equivalency demonstration. The District subsequently amended its NSR rule (District Rule 2201), to reflect the requirements of the agreement. The equivalency provisions in Rule 2201 have been incorporated into the SIP, and through that process were subject to CARB review and U.S. EPA approval. The District submits its federal offset equivalency report each November to U.S. EPA and CARB. The reports are available on the District's web site. The reports provide a summary of the reductions the District relies on to demonstrate equivalency, but the full data set underlying the equivalency demonstration is within the District's internal equivalency tracking system, which is not subject to regular review by U.S. EPA or CARB.

The federal offset equivalency demonstration consists of two distinct tests: Test 1 (offset requirement equivalency) and Test 2 (surplus-at-time-of-use equivalency).

Test 1 – offset requirement equivalency – compares the annual quantity of offsets that would have been required under the federal program (i.e., the "Federal offset quantity" or FOQ) to the annual quantity of offsets actually required by the District's program (i.e., the "District offset quantity" or DOQ).[27] This test requires the District to calculate and track the total FOQ and DOQ from all ATC projects it issues each period. To demonstrate equivalency under this test, the total DOQ must be equal to or greater than the total FOQ.

Although the District is required to report this demonstration annually, the report is best understood as an update because the District must demonstrate equivalency since August 20, 2001. In other words, when the District makes an equivalency

[26] Technical Support Document for EPA's Notice of Proposed Rulemaking for the California State Implementation Plan, San Joaquin Valley Unified Air Pollution Control District: Rule 2020, Exemptions Rule 2201, New And Modified Stationary Source Review Rule, p. 15 - 17 (8/30/1999); *see also* August 26, 1999 Letter from David Howekamp, U.S. EPA Region IX Director Air Division to Mark Boese, Deputy APCO, SJVAPCD, enclosing EPA-District NSR Offset Tracking Agreement.

[27] The abbreviations FOQ and DOQ will be used to represent the federal and district offset quantities both for individual ATC projects and the total for all ATC projects during a tracking period. The context will make clear which meaning is intended.

demonstration, it represents federal offset equivalency over the life of the NSR program since 2001. Thus, in Test 1 (the offset requirement equivalency test), any extra DOQ beyond what is needed to show equivalency with the FOQ in the current year's equivalency demonstration may be carried forward and used to show equivalency in future years if the ATC projects issued in that year show a shortfall in DOQ relative to the FOQ.

While Test 1 is focused on the amount of offsets required, Test 2 is focused on the emission reductions used to satisfy the offset requirements.

Test 2 – surplus-at-time-of-use equivalency – requires the District to reserve or retire sufficient surplus-at-time-of-use creditable emission reductions[28] to mitigate the current years' FOQ plus any unmitigated FOQ from prior years.[29] The creditable emission reductions the District uses to mitigate the FOQ can be drawn from any time from August 20, 2001, the start of the tracking system, to the end of the current tracking period. The creditable emission reductions used to satisfy the FOQ have come from three principle sources: (1) ERCs reserved or withdrawn for ATC projects, (2) orphan shutdowns, and (3) electrification of agricultural irrigation pump engines from 2005 – 2008.[30]

Each test has its own accounting rules and different remedies for a failure to demonstrate equivalency. The failure of one test would not necessarily entail failure of the other. Both tests are pollutant specific, meaning equivalency must demonstrated for every pollutant (i.e. NOx, VOC, PM10, PM2.5, CO, and SOx). Because the demonstration represents federal offset equivalency over the life of the program since 2001, both tests permit the District to carry forward any excess or shortfall in credit for use in a future year's equivalency demonstration. The District has an excess margin of credits to draw on to remedy future potential shortfalls for both tests. That substantial margin of excess credits, however, rests on the integrity of the prior credits used for equivalency.

Because almost all NMSs and FMMs in SJVAPCD involve NOx and VOC offsets, CARB's review of SJVAPCD's federal offset equivalency demonstration focused on NOx and VOC.

[28] A creditable emission reduction meets the same integrity criteria as ERCs, i.e. the emission reductions must be real, quantifiable, permanent, enforceable, and surplus.
[29] The District has never had a year where it did not fully mitigate the current tracking year's FOQ based on the data provided in the District's equivalency demonstration reports.
[30] PG&E's Ag-ICE program will be discussed in detail in Part III. C. 3. a. See Tables 13 and 14 for the total amount of reductions claimed for NOx and VOC equivalency by type.

B. Interpreting the District's Federal Offset Equivalency Report

The District must submit to U.S. EPA and CARB its annual federal offset equivalency report by November 20 every year.[31] The District publishes the equivalency reports on its web site.[32] Each report summarizes the offsetting and emissions reduction (i.e. mitigation) activity during the tracking period August 20 of the previous year to August 19 of the current year. The dates coincide with the effective date of the equivalency demonstration requirements in SJVAPCD's NSR Rule 2201 on August 20, 2001. The report summarizes the activity during the tracking period. The determination of equivalency in the report reflects not only that current year's activity, but also the entire history since the beginning of the tracking system in 2001. Table 3 is reproduced from SJVAPCD's 2019 Annual Offset Equivalency Report for the tracking period 8/20/2018 to 8/19/2019 and summarizes the demonstration of equivalency made for Test 1.

Table 3 : Test 1 – Offset Requirement Equivalency (from SJVAPCD 2019 Annual Offset Equivalency Report)

Pollutant	Number of New Federal Major Sources (NMS)	Number of Federal Major Modifications (FMM)	Offsets Required under Federal NSR (FOQ) (tons per year)	Offsets Required under District NSR (DOQ) (tons per year)	Excess or Shortfall This Year (tons per year)	Excess or Shortfall Previous Year (tons per year)	Total Excess or Shortfall (tons per year)
NOx	0	16	83.4	84.4	1.0	4,312.9	4,313.9
VOC	0	19	69.5	43.3	-26.2	733.4	707.2
PM10	0	0	0.0	3.2	3.2	837.5	840.7
PM2.5	0	0	0.0	0.0	0.0	377.7	377.7
CO	0	0	0.0	0.0	0.0	198.1	198.1
SOx	0	0	0.0	47.5	47.5	2,863.6	2,911.1

The equivalency test is performed pollutant-by-pollutant. In 2019, for NOx, there were 16 FMM, which required 83.4 tons per year of NOx reductions under federal requirements. Thus, 83.4 tons per year is the FOQ. The actual quantity of offsets or DOQ required by SJVAPCD for all ATC projects issued during the tracking period was 84.4 tons per year NOx. Therefore, SJVAPCD required 1.0 tons per year more NOx offsets under their NSR rule than they would have required if they were following federal NSR to determine the offset quantity. The extra 1.0 tons per year is added to the accumulated 4,312.9 tons per year of excess NOx accumulated from prior years, and is carried forward for use in future years. As long as the Total Excess (last column of Table 4) is equal to or greater than 0.0 tons per year, SJVAPCD has shown it meets

[31] Rule 2201, 7.3.2 (amended 8/15/19)
[32] http://www.valleyair.org/busind/pto/annual_offset_report/annual_offset_report.htm

Test 1 "offset requirement equivalency" for NOx as of the end of the tracking period. Moreover, the Total Excess NOx (4 313.9 tons per year) is available to use for future Test 1 equivalency demonstrations when the FOQ is larger than the DOQ in a future year.

Table 4 is reproduced from SJVAPCD's 2019 Annual Offset Equivalency Report for the tracking period 8/20/2018 to 8/19/2019 and summarizes the demonstration of equivalency made for Test 2.

Table 4: Test 2 – Surplus at the Time-of-Use Equivalency (from SJVAPCD 2019 Annual Offset Equivalency Report)

Pollutant	Number of New Federal Major Sources	Number of Federal Major Mods	Offsets Required under Federal NSR (FOQ) (tons per year)	Shortfall from previous year (tons per year)	Reduction (surplus at the time of use) used for equivalency this year (tons per year)	Shortfall this year (tons per year)	Reductions eliminated by discounting at the time of use (tons per year)	Unused Carry-over Creditable Reductions (tons per year)
NOx	0	16	83.4	0.0	83.4	0.0	5,559.8	408.0
VOC	0	19	69.5	0.0	69.5	0.0	2,300.3	1,428.0
PM10	0	0	0.0	0.0	0.0	0.0	135.0	1,898.0
PM2.5	0	0	0.0	0.0	0.0	0.0	8.4	1,020.0
CO	0	0	0.0	0.0	0.0	0.0	110.7	763.0
SOx	0	0	0.0	0.0	0.0	0.0	786.6	2,038.0

Similar to Test 1, Test 2 is performed on a pollutant-by-pollutant basis. The first three columns for Test 2 are the same as for Test 1. During the 2019 tracking period, the FOQ was 83.4 tons per year of NOx. The current years' FOQ is added to the shortfall from the previous year (in this case zero) to get the total amount of surplus-at-time-of-use emission reductions the District must reserve, withdraw, or retire to show equivalency. The District mitigated or matched the 83.4 tons per year NOx FOQ with 83.4 tons per year NOx worth of surplus-at-time-of-use reductions as indicated in the column "Reduction (surplus at the time-of-use) used for equivalency this year." The District identifies the amount and source of those reductions in an attachment to the report. The sources of the NOx reductions for 2019 are from ERCs and orphan shutdowns. Since the District was able to match the FOQ with enough surplus-at-time-of-use reductions based on its calculations, the District does not have any shortfall in 2019, which means it has passed Test 2. In the column "Reductions eliminated by discounting at time-of-use," the District presents the sum total since 2001 of reductions required by its NSR program that were not surplus and so were not counted as mitigation in Test 2. Finally, the last column, "Unused carry-over creditable reductions" are the excess reductions still available for use in next year's surplus-at-time-of-use demonstration.

C. Equivalency Review Approach

The District's offset equivalency demonstration is complex and involves large and diverse data sets, covering a nearly 20-year period. CARB staff evaluated the data system functionality, approaches, and calculations in order to evaluate the equivalency determination. Staff reviewed both the data system as a whole and individual projects, selected at random, which were part of the equivalency demonstration. To conduct the evaluation, staff reviewed the District's equivalency database and associated documentation including individual tables, inputs to the database, and outputs from the database. Staff reviewed select reduction types and the underlying source data to determine whether it was correct and accurately input to the database system. The purpose of the evaluation was to determine whether the equivalency database is accurately reporting information and calculating equivalency.

1. Findings Regarding the Equivalency Database

The equivalency database is a system written in Microsoft Access, and originally developed in the mid-2000s. Overall, the database's lack of documentation limits the ability to determine if the system is functioning properly. In addition, the database is not self-contained, meaning that many calculations are conducted external to the database system (e.g., input from spreadsheet files), and not adequately documented in the database. This impedes the ability to assure the quality of the calculations in the demonstration.

To facilitate the review, District staff provided CARB staff with access to the database in the District's Fresno office, along with a manual describing how to operate the system, including copying and clearing data tables, renaming the tables, performing analyses in Microsoft Excel, and inputting data from Excel to Microsoft Access. District staff also provided a partial data dictionary based on specific CARB requests. CARB staff created copies of two summary tables in the database (Track_Master and Track_Allocate). These tables represent the results of core calculations and information tracked and used in the database system. District staff could not provide a complete data dictionary or technical documentation describing the calculations within the system.

The Track_Master table is the parent table for the Track_Allocate table. They are connected through the TrackNum field in each table. Each time a portion of an ERC is allocated (used), a record is put in the Track_Allocate table and the quantity of the ERC used is in the quantity column of the Track_Allocate table. Based on this understanding, there should never be a record in the Track_Allocate table that does not have a parent record in the Track_Master table. Otherwise, referential integrity is not enforced in the database. CARB staff's analysis identified what appear to be orphan records, including 194 NOx and 98 VOC records in Track_Allocate that did not have a record in Track_Master.

The used_NOx and used_VOC fields in Track_Master represent the amount of NOx and VOC used from an ERC (or other creditable reduction) in the surplus-at-time-of-use equivalency demonstration. This amount should always be less than or equal to the total value of the Actual Emission Reductions (AER), which is shown in the aer_NOx and aer_VOC fields. As a result, the used_NOx and used_VOC fields should always be less than or equal to the aer_NOx and aer_VOC fields. CARB's analysis identified 6 records where the used_VOC exceeded the aer_VOC, although the difference was negligible (0.122 t/y VOC).

District staff has investigated and identified the source of most of the discrepancies identified by CARB staff and have committed to making the appropriate corrections immediately. District staff has also conveyed their assurance that none of the orphan records identified above had any effect on the equivalency demonstration. Finally, District staff has indicated a willingness to explore the development of a new database with documentation to reduce the types of issues noted above and improve transparency.

2. Findings Regarding Test 1 – Offset Requirement Equivalency

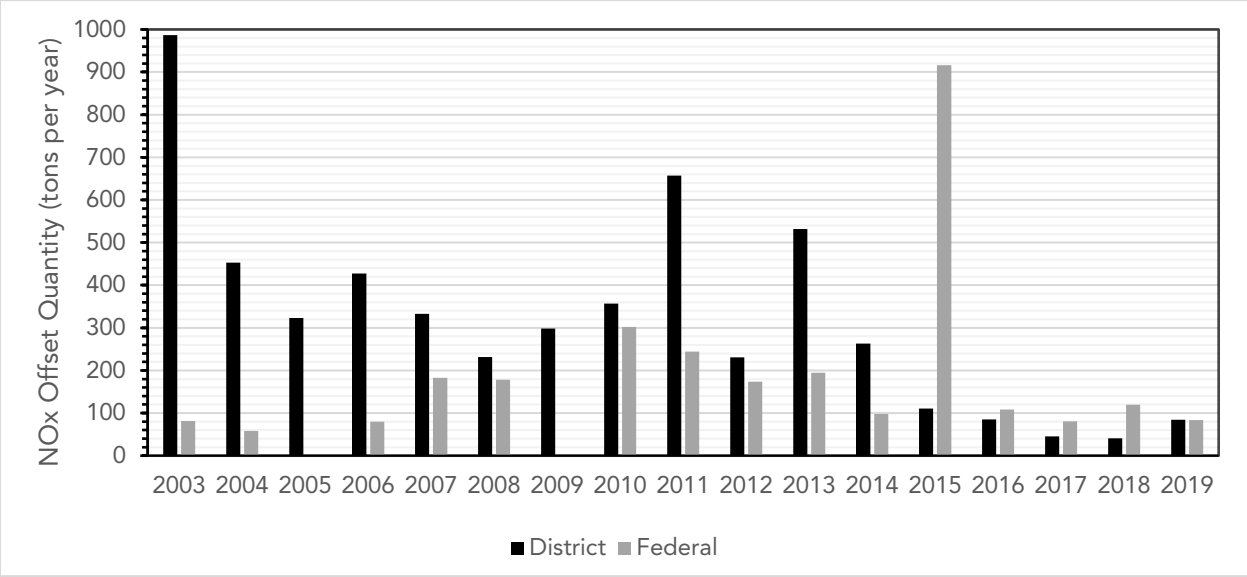
Figures 5 and 6 compare the DOQ to the FOQ for all ATCs issued by tracking year.[33] Between 2001 and 2010, the District's NSR program required more offsets for NOx and VOC than what would have been required by the federal NSR program, primarily because the District required offsets at a lower emissions threshold than federal NSR during that time. However, after the bump-up to extreme non-attainment for ozone in 2010, the FOQ usually tends to be greater than the DOQ for NOx and VOC for the ATCs issued in a given year.

Overall, the database indicates the District has accumulated a significant excess DOQ for every pollutant from previous years' equivalency demonstrations. The most current statement of the amount of excess credits the District has for Test 1 is from the District's 2019 equivalency report, presented in Table 3 in the last column labeled "Total Excess or Shortfall". A positive number indicates an excess, a negative number, a shortfall. The Total Excess DOQ for NOx is 4,313.9 tons per year, for VOC 707.2 tons per year. This will be the starting point for the District's equivalency demonstration in 2020.

CARB identified a transparency issue associated with the equivalency demonstrations each year. In essence, the carryover from year-to-year relies on adjustment terms that are not clearly provided in the tables, and which are difficult to check.

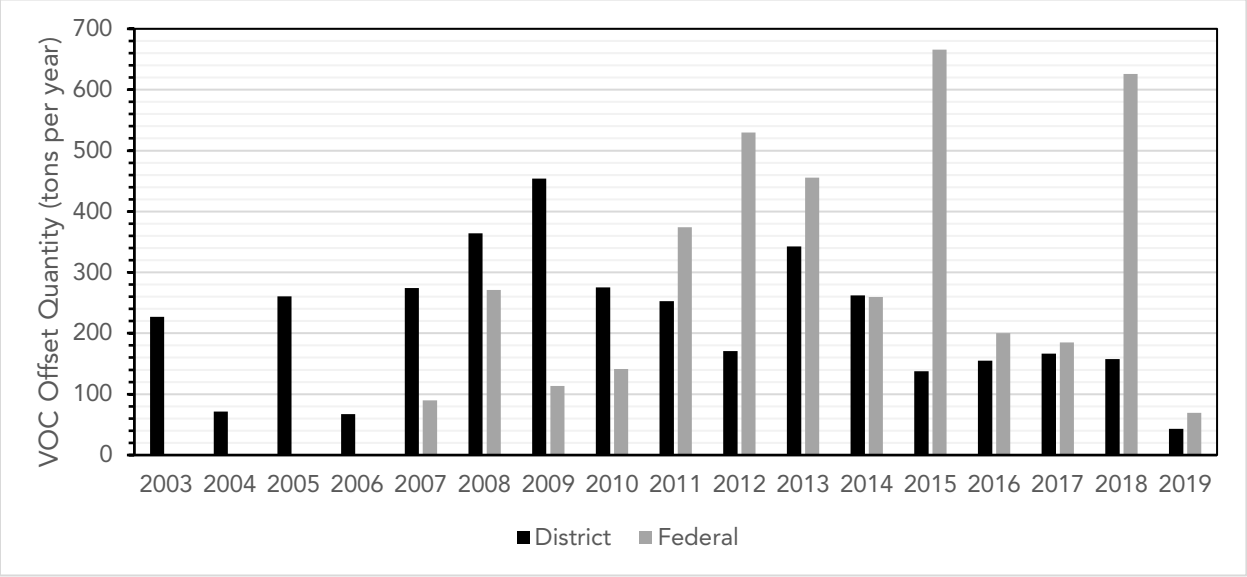
[33] A given tracking period runs from August 20 of one year to August 19 of the following year. The tracking year is the later year in this period. For example, for the tracking period running from August 20, 2015 to August 19, 2016, the tracking year is 2016.

Figure 5. NOx District Offset Quantity and Federal Offset Quantity by Tracking Year



Source: SJVAPCD Equivalency Reports Published on http://www.valleyair.org/busind/pto/annual_offset_report/annual_offset_report.htm

Figure 6. VOC District Offset Quantity and Federal Offset Quantity by Tracking Year



Source: SJVAPCD Equivalency Reports Published on http://www.valleyair.org/busind/pto/annual_offset_report/annual_offset_report.htm

The quantities displayed in Figures 5 and 6 are taken from each individual annual equivalency demonstration. The Total Excess or Shortfall values in the 2019 Report (Table 3) consists of the sum of the DOQs and FOQs from all previous equivalency reports plus adjustments for any projects removed (or sometimes added to) the tracking system each year. Simply adding quantities displayed in Figures 5 and 6 will not equal the Total Excess DOQ, which takes into consideration the annual adjustments related to projects being removed or added to the tracking system. The necessary adjustment is not explicitly stated in the tables but its cumulative effect over all the years is significant.

These adjustments come from ATC projects that previously were included in the tracking system in one year, but for various reasons (usually the ATCs have been cancelled or expired unimplemented), it becomes necessary to remove them. In the annual equivalency reports published by the District since 2011, the District lists the ATC projects that are being removed from the current year's demonstration and provides a reason for the removal. For example, the adjustment taken in the 2019 Equivalency Report is summarized in Table 5.

CARB staff attempted to verify the net adjustment in Table 4 above by summing the net effect from the three ATC projects removed from the 2019 Equivalency Demonstration (Table 5). In Table 5, removal of a project from the tracking system is accompanied by a negative sign in the corresponding DOQ and/or FOQ value. CARB staff found the DOQ and the FOQ from the ATC application reviews of the three projects on the District's public notification web site. The ATC application reviews are the source documents for the DOQ and FOQ that are used for the equivalency demonstration. CARB staff calculated a net adjustment of +0.5 tons per year for NOx and +22.3 tons per year for VOC, compared to the District's adjustment of +35.4 tons per year for NOx and +77.3 tons per year for VOC.

Table 5. Adjustment to Excess DOQ Credit Implied in SJVAPCD 2019 Equivalency Report

	NOx DOQ (tons per year)	**VOC DOQ (tons per year)**
Total Excess from 2018 Report (ending)	4,277.5	656.1
Total Excess from 2019 Report (beginning)	4,312.9	733.4
Net Adjustment	+35.4	+77.3

Table 6. CARB Calculated Adjustment to Excess DOQ Credit from 2019 Project Removed List

Project Number removed	NOx DOQ (tons per year)	NOx FOQ (tons per year)	VOC DOQ (tons per year)	VOC FOQ (tons per year)
C-1133313	0	0	-13.7	-13.7
C-1161110	0	-0.5	0	0
N-1133659	0	0	-41.5	-63.8
Total Adjustments	0	-0.5	-55.2	-77.5
CARB Net Adjustment	+0.5		+22.3	
District Net Adjustment	+35.4		+77.3	
Discrepancy	+34.9		+55.0	

District staff has explained that the source of the NOx difference was related to ATC project N-1161175 from the 2017 – 2018 tracking period, which had a DOQ of 35.0 tons per year NOx. According to District staff, the District included the FOQ for this project during the 2017 – 2018 tracking period, but not the DOQ because the facility had not specifically identified which ERC certificates it was going to use to satisfy the DOQ. The facility did identify which specific NOx ERCs it would use as offsets during the 2018 – 2019 tracking period, at which point the District added the DOQ amount as a 35.0 tons per year NOx adjustment. District staff has indicated verbally a similar explanation for the VOC difference noted in Table 6 above.

In effect, the District delayed counting the DOQ, is conservative and understandable under the circumstances, and had no impact to the outcome of equivalency demonstration. However, this explanation should have been included in the list of projects accounting for the adjustment in the 2018 – 2019 report – so that the report and calculations are more clear to the interested public, CARB, and U.S. EPA.

CARB staff also checked the District's calculations of the DOQ and FOQ by examining the ATC application reviews for the 2016 - 2017 tracking period. The ATC application reviews are the building blocks for the equivalency demonstration. The FOQ and DOQ values provided in the equivalency reports -- on which the determination of equivalency rests -- should be traceable back to the ATC application reviews. CARB staff obtained from the District and the District's web site the application reviews for the ATC projects from the 2017 tracking year (8/20/2016 – 8/19/2017) that were identified as NMS (1 ATC project) or FMM (32 ATC projects). Most ATC projects that had a FOQ also had a DOQ. For example, of the 14 ATC projects that were FMM for NOx, 11 also had a DOQ associated with the project.

Staff spot-checked the emissions increase calculations used to determine the FOQ and the DOQ in the ATC application reviews for all the NMS (1) and FMM (32) projects identified by the District for the 2017 tracking year. All reviewed calculations appeared to have been completed correctly. Staff then summed the FOQ and DOQ from all the ATC application reviews in order to compare to values reported by the District in the 2017 report. These results are summarized in Tables 9 and 10 below.

Table 7 shows a minor discrepancy discovered between the calculated and reported FOQ for VOC. The source of this discrepancy is ATC projects S-1151973 and S-1152366, which were associated with a FOQ of 7.9 tons per year VOC. However, the District entered the FOQ as 5.3 tons per year VOC for these projects (in the ini_i_VOC field of the Track_Master table). This results in a difference in the FOQ of 2.6 tons per year VOC. Thus, CARB staff calculated a FOQ of 187.6 tons per year VOC, while the district reported a FOQ of 185.0 tons per year VOC.

Table 7. Comparison Between CARB Calculated and SJVAPCD Reported Federal Offset Quantities for One New Major Source and 32 FMMs Reported in the 2017 Equivalency Demonstration.

FOQ Calculation Method	NOx (tons per year)	VOC (tons per year)
FOQ calculated using CARB reviews of each NMS and FMM	80.5	187.6
FOQ reported in the 2017 Equivalency Report	80.5	185.0
FOQ calculated in the Equivalency Database Track_Master table.	80.5	185.0

Verification of the DOQ for Test 1 must take account of a different subset of ATC projects because the District can require offsets (DOQ) both from projects that are NMS or FMM and from new minor sources or minor modifications. CARB staff reviewed ATC application reviews for all the NMS (1) and FMM (32) identified by the District for the 2017 tracking year to identify the DOQ. However, staff did not request the ATC application reviews for those projects that had a DOQ but were not NMS or FMM. The DOQ from those projects was taken at face value from Track_Master.

Staff added up the DOQ from FMM, NMS, and minor projects. Table 8 shows the results of this analysis, by comparing differences between the CARB calculated DOQ and District reported DOQ for NOx and VOC from the 2017 Report. CARB staff identified 75.9 tons per year NOx DOQ from FMM and NMS, and 0.8 tons per year from minor projects, for a total of 76.7 tons per year NOx DOQ. However, the District in its 2017 Equivalency Demonstration, presented a DOQ of 45.6 tons per year NOx – a difference of 31.1 tons per year NOx from the CARB value.

CARB staff identified 100.2 tons per year VOC DOQ from FMM and NMS, and 119.2 tons per year VOC DOQ from minor projects for a total of 219.4 tons per year VOC DOQ. However, the District in its 2017 Equivalency Demonstration, presented a DOQ of 166.8 tons per year VOC DOQ – a difference of 52.6 tons per year VOC from the CARB value.

Table 8. Comparison between CARB Calculated and SJVAPCD Reported District Offset Quantities in the 2017 Equivalency Demonstration

DOQ Calculation Method	NOx (tons per year)	VOC (tons per year)
DOQ calculated using CARB reviews of each NMS and FMM	75.9	100.2
DOQ from minor projects in Track_Master	0.8	119.2
Total DOQ	76.7	219.4
DOQ reported in the 2017 Equivalency Report*	45.6	166.8
Possible under-credit of DOQ	31.1	52.6

*The source of the DOQ in the equivalency report is sum of erc_pollutant fields in Track_Master.

CARB staff identified ATC projects whose application reviews identified a DOQ, but had a different value noted in the erc_NOx field in Track_Master (Table 9). The erc_NOx field in Track_Master is the source for the DOQ in the equivalency reports.

Table 9. List of ATC Projects from 2017 Report with a District Offset Quantity for NOx in the Authority to Construct Application Review Different from what is Recorded in the Equivalency Database (as erc_nox)

ATC Project Number	DOQ for NOx (tons per year) in ATC Application Review	erc_NOx (tons per year) from Track_Master*
S-1143503	1.1	0
S-1144548	32.6	33.2**
S-1151973 (and S-1152366)	18.4	0.0000001
S-1162420	8.5	0.0000001
S-1162746	0.3	0.2
S-1170679	0.3	0.2
S-1171052	0.9	0.1
S-1171635	6.9	4.1
Net Difference	+31.2	

* Each ERC certificate reserved or withdrawn for a given ATC project will have its own separate entry (erc_NOx) in the District's Track_Master equivalency database under erc_NOx (or erc_pollutant more generally). The DOQ for each ATC project in Table 9 could represent more than one ERC certificate.

** Both District and CARB staff agree that the erc_nox value for project S-1144548 should be 32.6 tons per year. 33.2 tons per year is the total face value of the NOx ERCs proposed for use as offsets in project S-1144548, not the DOQ.

Finally, CARB staff noted three examples where the DOQ for individual ATC projects appeared to be over-credited because the face value of the ERCs reserved for an ATC project were counted (in erc_nox field of Track_Master) instead of the actual DOQ calculated in the application review. This is shown in Table 10. District staff has acknowledged these issues and assured CARB staff that they would be corrected.

Table 10: ATC projects where the DOQ was Over-credited in the Report Because the Face Value of the ERCs Instead of the DOQ from the ATC Application review was Transferred to erc_nox in Track_Master*

Report year	ATC project	erc_nox from Track_Master (tons per year)	ERC # from ATC application review	Face value of ERC (tons per year)	Amount of NOx offset required in ATC project (tons per year)	Over-credit to DOQ in Test 1 Demonstration [sum of erc_nox – amount of offset required in ATC project]
2017	S-1144548	33.2	S-3208-2	33.2	32.6	0.6
-	-	-	-	-	-	-
2016	S-1151996	5.7	S-4515-2	5.7	7.4	7.6
2016	S-1151996	1.4	S-4514-2	5.8		
2016	S-1151996	0.5	S-4516-2	0.5		
2016	S-1151996	3.7	S-4530-2	3.7		
2016	S-1151996	1.5	N-1302-2	1.5		
2016	S-1151996	2.2	N-1332-2	2.2		
-	-	-	-	-	-	-
2016	S-1153671	0.4	S-3326-2 (?)	0.4	6.8	6.6
2016	S-1153671	1.2	S-3625-2	1.2		
2016	S-1153671	0.7	N-1327-2	0.7		
2016	S-1153671	0.4	N-1329-2 (?)	0.4		
2016	S-1153671	10.7	C-1059-2	4.1 (?)		

Overall, CARB staffs' review of federal offset equivalency identifies issues with the accuracy and transparency of the equivalency demonstration because of the data handling system, which, for reasons noted in the findings on the equivalency database, makes it difficult to ensure the accuracy of the demonstration. The current data handling system may have been adequate when the District began the tracking system in 2001 until 2010 -- when the number of NMS and FMM projects in a tracking period

was between zero to four for every pollutant. However, after the bump-up to extreme non-attainment for ozone in 2010, the number NMS and FMM projects for NOx and VOC together has ranged from 35 to 90 every tracking period, creating a quality assurance challenge in an already complex system. The data handling issues point to a clear need for better quality control and transparency.

3. Findings Regarding Test 2 – Surplus at Time-of-Use Equivalency

The second federal offset equivalency test requires the District to reserve or retire sufficient surplus-at-time-of-use creditable emission reductions to mitigate the current years' FOQ. In other words, the District must demonstrate that it has retired sufficient reductions valued as surplus-at-time-of-use to match the number of reductions that would have been required under federal NSR. The emission reductions used as mitigation may come from any year since the start of the equivalency tracking system in 2001, and, as such, each annual report represents a running-total demonstration of equivalency.

The "surplus-at-time-of-use" federal requirement is based in the Clean Air Act requirements that all creditable emission reductions be surplus to all requirements under the Act. Further, this valuation is necessary to avoid double counting of reductions claimed in the SIP.[34] As U.S. EPA has explained ". . . the State cannot rely on emission reduction credits in its overall attainment plan and rely on the same credits in the issuance of an NSR permit (i.e., no 'double counting')."[35] U.S. EPA requires Test 2 as part of the equivalency demonstration because SJVAPCD relies on surplus-at-time-of-issuance valuation and does not discount the value of ERCs at time-of-use based on additional requirements that have been imposed between issuance and use.[36]

Performing a surplus-at-time-of-use determination for an ERC requires looking back at the original emission reduction, but applying the strictest applicable law or emission standard in effect at the time the ERC is used as an offset for NSR (i.e., at time of ATC issuance). As the emission standards become more stringent, the amount of the

[34] See footnotes 9 and 10.

[35] July 21, 1993 U.S. EPA Memorandum from John Seitz, Director, Office of Air Quality Planning and Standards to Air Branch Chiefs, Regions I-X, et al., "Use of Shutdown Credits for Offsets."; *see also* August 26, 1994 U.S. EPA Memorandum from John Seitz, Director, Office of Air Quality Planning and Standards, to David Howekamp, Director Region IX, Air and Toxics Division: "Response to Request for Guidance on Use of Pre-1990 ERC's and Adjusting for RACT at Time-of-use."

[36] Bay Area AQMD and Ventura County APCD are required to perform similar surplus-at-time-of-use equivalency demonstrations by U.S. EPA because they likewise only require emission reductions banked as ERCs to be surplus-at time-of-issuance. South Coast AQMD also does not discount ERCs for their time-of-use; however, South AQMD discounts emission reductions banked as ERCs to applicable Best Available Control Technology (BACT) levels at time-of-issuance. South Coast AQMD is required by U.S. EPA to make an annual demonstration of federal offset equivalency for emission reductions held in its internal bank per Rule 1315, Federal New Source Review Tracking System.

original emission reduction that is still surplus will be reduced. In aggregate, the requirement that ERC value be determined at time-of-use has a deflationary effect on the offset value of an ERC bank.[37] This is discussed in Part 1, which illustrates that the District's estimate that its NOx ERC bank's time-of-use value (as of 2016) is on average about 18 percent of its time-of-issuance value.

Test 2 requires the District to match or mitigate the federal offset quantity (FOQ) from the current tracking period with an equal amount of surplus-at-time-of-use emission reductions drawn from an "equivalency bank" of creditable emission reductions. These reductions are not formally banked, but rather tracked by the District internally through its equivalency-tracking database. To be "creditable" means an emission reduction is real, surplus,[38] quantifiable, enforceable, and permanent.[39] Rule 2201 further defines the eligibility criteria for use of such reductions in the equivalency demonstration.[40]

In practice, the District has used the following types of creditable emission reductions in its "equivalency bank" for use in the surplus-at-time-of-use equivalency demonstration:

- ERCs reserved or withdrawn for ATC projects,
- Unclaimed reductions from orphan shutdowns (i.e. closed facilities), [41]
- Electrification projects from PG&E's AG-ICE program,
- 10 percent air quality improvement deduction (AQID) from newly banked ERCs, returned credits from unimplemented NMS and FMS,
- ERCs surrendered for non-NSR actions (e.g. CEQA, variance, consent decree),

As with Test 1, Test 2 allows any excess in the amount of surplus-at-time-of-use creditable emission reductions to remain in the equivalency bank and be carried forward to future years for equivalency purposes.

To evaluate Test 2, CARB staff began by spot-checking the emission reduction calculations for the types of reductions that have been the most significant for the surplus-at-time-of-use equivalency demonstration. Table 11 compares the amount of NOx reductions used, and the amount remaining for future use in equivalency demonstrations, over the period 2001-2018. Table 11 shows that electrification

[37] The surplus value of the ERC at time-of-use could vary from 0 to 100 percent of its face value. In a April 19, 2016 draft staff report on its equivalency system, SJVAPCD estimated that approximately 18 percent of its banked NOx ERCs were currently surplus (ref. http://www.valleyair.org/Workshops/postings/2016/05-11-16_OEI/DRAFT-Staff-Report.pdf)
[38] For purposes of Test 2, surplus is understood to mean "at time-of-use," i.e. when the creditable reduction is used for a mitigation.
[39] Rule 2201, section 7.1.5.
[40] Rule 2201, section 7.2.2.2.
[41] The electrification projects discussed later in this review could be classified as a type of orphan reduction that the generator of the reduction did not claim or ceded to the District.

projects have accounted for more than 50 percent of the mitigations used to show surplus-at-time-of-use equivalency for NOx from 2001 to 2018, and were completely used by the end of the 2017 to 2018 tracking period. Table 12 shows orphan shutdowns have accounted for nearly 50 percent of the mitigations used to show surplus-at-time-of-use equivalency for VOC from 2001 to 2018 and comprise over 60 percent of the excess VOC and NOx mitigations available for use at the end of the 2018 reporting period.

Table 11: NOx Reductions Used and Remaining by Type for Surplus-at-Time-of-Use Equivalency 2001 – 2018. (All values are tons per year from Track_Master Table.)

Type of Reduction	Amount Used as Mitigation (used_nox)	Remaining Reductions Available for Future Equivalency Demonstrations (r_nox)
Emission Reduction Credits	720.7	160.6
Electrification Projects	1,210.7	0
Orphan Shutdowns	122.5	273.8
Totals	2,053.9	*434.4

*Unused Carry-Over Reductions in 2018 Report = 434.0 tons per year NOx

Table 12: VOC Reductions Used and Remaining by Type for Surplus-at-Time-of-Use Equivalency 2001 – 2018. (All values are tons per year from Track_Master Table.)

Type of Reduction	Amount Used as Mitigation (used_voc)	Remaining Reductions Available for Future Equivalency Demonstrations (r_voc)
Emission Reduction Credits	1,752.4	466.2
Electrification Projects	61.2	0
Orphan Shutdowns	1,720.4	819.2
Totals	3,534.0	*1,285.4

*Unused Carry-Over Reductions in 2018 Report = 1,286.0 tons per year VOC

The source of the creditable reductions from electrification projects is the Agricultural Internal Combustion Engine or AG-ICE program, which funded replacements of diesel internal combustion engines with utility electricity to power agricultural irrigation pumps from approximately 2005 - 2008. The District's equivalency database shows that 1,210.7 tons per year of surplus NOx reductions from 919 engines were claimed from AG-ICE. The electrification projects comprise 77 percent of the mitigations used to show surplus-at-time-of-use equivalency for NOx from 2008 to 2018.

CARB reviewed data and other background information to determine the amount of creditable emission reductions from a randomly selected sample of 10 electrification projects that were listed in the 2017 Equivalency Report. The diesel internal combustion engines replaced were all Tier 0, Tier 1, or Tier 2.

Because the District claimed the reductions from all 919 diesel-to-electric projects at the same time for use in the equivalency demonstration in 2008, and all the reductions were generated by replacing diesel internal combustion engines with electric motors, the sample of 10 projects appears representative of the emission reduction calculations from all 919 projects.

a. Electrification Projects

There are multiple issues with the use of the electrification projects for equivalency.

- *Issues Regarding Whether Reductions Were Real, Due to Load-Factor Discrepancies*

Emission reductions from the AG-ICE electrification projects involved the replacement of Tier 0, 1, or 2 diesel IC engines with electric motor power. The reductions from AG-ICE were divided into two parts: (a) the replacement of Tier 0, 1, 2 diesel emissions to the equivalent activity with Tier 3 levels of emissions, and (b) the replacement of Tier 3 level of emissions to zero (i.e. the electric motor emissions being counted as zero).

The District used the reductions from Tier 3 emissions to zero for the equivalency demonstration. The District did not use the emissions reduction benefit from the replacement of Tier 0, 1, 2 diesel emissions to the equivalent activity with Tier 3 levels of emissions. That reduction benefit was not utilized for equivalency. To be eligible for the equivalency demonstration, an emission reduction must be creditable meaning, among other criteria, that it must be based on real or actual emissions.[42] A portion of the reductions claimed by the District from AG-ICE do not qualify as real because the calculation methodology used by the District assumed the replaced engines' operated with a load factor of 1.0 rather than the actual load or the default load factor provided by the Carl Moyer Program Guidelines.

The Carl Moyer Program ensures reductions it funds are real (and thus SIP creditable) by using calculation methods that represent real emissions. For emission reductions based on the AG-ICE program, the Carl Moyer Program Guidelines in Appendix C prescribe the following method when the engine activity level is based on annual hours of operation:[43]

[42] District Rule 2201, Section 7.1.5 (amended 8/15/19)
[43] The Carl Moyer Program Guidelines Part IV, Appendix C, 1. Calculating Annual Emissions Based on Hours of Operation, C-3 (November 17, 2005)

Formula C-4: Estimated Annual Emissions based on hours of Operation (tons/yr):

*Emission Factor or Converted Emission Standard (g/bhp-hr) * Horsepower * **Load Factor** * Activity (hr/yr) * Percent Operation in CA * ton/907,200g*

The engine load factor is an indicator of the nominal amount of work done by the engine for a particular application. It is given as a fraction of the rated horsepower of the engine and varies with engine application. For projects in which the horsepower of the baseline technology and reduced technology are different by more than 25 percent, the load factor must be adjusted following formula C-5 below. It is important to understand the replacement load factor must never exceed 100 percent in cases where the reduced technology engine is significantly smaller than the baseline technology engine.

Formula C-5:

*Replacement Load Factor = Default Load Factor $_{baseline}$ * hp $_{baseline}$/hp $_{reduced}$*

Moyer uses a default load factor for agricultural irrigation pumps of 0.65 as determined from historical emissions inventory.[44] The default load factors for dozens of types of off-road heavy-duty diesel engines are given in Table B-13 of the Guidelines, and those range from 0.30 to 0.78.

Following the above Appendix C method, the CARL database uses the horsepower of the electric motor in the formula C-4 above and bases the Tier 3 emission factor on the horsepower rating of the electric motor. The CARL database uses the electric motor horsepower only in conjunction with the replacement load factor in the calculation of emissions. This ensures the activity used to calculate the reduction, measured as horsepower-hours, does not increase beyond the baseline of the replaced diesel IC engine.

However, in Appendix D of the same Carl Moyer Program Guidelines, an example calculation for an AG-ICE project is given where no adjustment to the default load factor (0.65) is made although the electric motor that replaced the diesel IC engine has a horsepower that is more than 25 percent different.[45] The example calculation uses the horsepower rating of the replaced diesel IC engine in the formula C-4 above and bases the Tier 3 emission factor on the rated horsepower of the IC engine. This method likewise ensures that the activity used to calculate the reduction equals the baseline of the replaced diesel IC engine.

[44] Carl Moyer Program Guidelines, Part IV, Appendix B, Table B-13 (November 17, 2005)
[45] The Carl Moyer Program Guidelines Part IV, Appendix D, XII. Zero-Emission Technologies, Example 2, D-64 (November 17, 2005)

CARB staff believe that either of the two methods (Appendix C or Appendix D of the Carl Moyer Guidelines Part IV) is an acceptable calculation for determining the amount of actual emission reductions from an AG-ICE project. The District used the Appendix D method with one significant deviation -- the District used a load factor of 1.0 rather than the default load factor of 0.65.

Staff reviewed District calculations from the 10 sample electrification projects. Table 13 lists the variables used and the results of the calculated amount of creditable emission reductions by the District compared to the Carl Moyer Program Guidelines Appendix D and CARL (Appendix C) described above. The District calculation for the amount of creditable NOx reductions that can be claimed for these projects is higher for all 10 projects compared to either Carl Moyer method. CARB staff believes the District over-credited these 10 electrification projects by 35 percent or more because of the use of a load factor of 1.0 tied to the horsepower of the diesel engine being replaced.

Table 13: Creditable Emission Reduction Calculations from 10 Electrification Projects[46]

Tracking ID	Model Year	Tier	IC Engine Horsepower	Operating Hours (hr/year)	Carl Moyer Tier 3 NOx EF (g/bhp-hr)[47]	District Calculated Reduction NOx (t/yr)[48]	Moyer Appendix D Calculated Reduction NOx (t/yr)[49]	CARL Calculated Reduction NOx (t/yr)[50]
2008-S-8881142-3089-1	1979	0	125	6,800	2.32	2.2	1.4	0.8
2008-S-8881145-3090-1	1996	0	150	6,739	2.32	2.6	1.7	Not in CARL
2008-S-8881262-3137-1	2003	2	152	4,000	2.32	1.6	1.0	0.9
2008-C-8881814-3634-1	2003	2	125	3,000	2.32	1.0	0.6	0.5
2008-C-8881829-3637-1	2004	2	113	2,500	2.74	0.9	0.6	0.6
2008-C-8881878-3659-1	2004	2	139	4,000	2.32	1.4	0.9	0.9
2008-C-8881896-2980-1	2001	1	105	2,500	2.74	0.8	0.5	Not in CARL
2008-C-8881901-2908-1	1992	0	76	1,600	2.74	0.4	0.2	Not in CARL
2008-C-8881971-2996-1	2001	1	230	2,200	2.32	1.3	0.8	0.9
2008-C-8881972-3000-1	2002	1	230	2,200	2.32	1.3	0.8	Not in CARL
					Sum	13.5	8.5	N/A

[46] Supplemental calculations and tables related to the electrification projects will be included in a document on the San Joaquin Valley ERC Program Review Public Documents web page.

[47] Tier 3 Emission Factors from 2008 Carl Moyer Program Guidelines Part IV, Appendix B, Tables for Emission Reduction and Cost Effectiveness Calculations, Table B-13. The emissions factor from the 2005 and 2008 guidelines differ for some horsepower ranges. CARB staff used the guideline the District proposed.

[48] District calculation: NOx (t/yr) = BHP × **Load Factor (1.0)** × Operating Hours (hr/yr) × EF (g-NOx/bhp-hr) × 1 lb/453.6 g × 1 ton/2,000 lb

[49] CARB staff calculation following Carl Moyer Guidelines Appendix D:
NOx (tons per year) = BHP × **Load Factor (0.65)** × Operating Hours (hr/yr) × EF (g-NOx/bhp-hr) × 1 lb/ 453.6 g × 1 ton/ 2,000 lb [equation from 2005 Carl Moyer Program Guidelines Part IV, Appendix D, Examples Calculations, XII. Zero Emission Technologies. Also 2008 Carl Moyer Program Guidelines Part IV, Appendix E, Examples Calculations, VII. Agricultural Sources]

[50] CARL calculation following Carl Moyer Guidelines Appendix C:
NOx (tons per year) = BHP (ICE) × Default Load Factor (0.65) × (BHP (ICE)/HP electric motor) × Operating Hours (hr/yr) × EF (g-NOx/bhp-hr) × 1 lb/ 453.6 g × 1 ton/ 2,000 lb [modified load factor equation from 2005 Carl Moyer Program Guidelines Part IV, Appendix C.

- *Issues Regarding Permitted Sources*

To be eligible for use in the surplus-at-time-of-use demonstration an unbanked reduction must have been generated as a result of a permitting action:

> *For purposes of the demonstration described in Section 7.2.2, the comparison may also include the surplus value of additional creditable emission reductions that have not been used as offsets and have been banked or have been generated as a result of permitting actions. [Rule 2201, section 7.2.2.2]*

According to the District, none of the replaced engines from the sample of 10 projects had a permit prior to removal, nor was a permit issued for the electrified pump that replaced it. Thus, the reductions associated with the replacement engines were not generated as a result of a permitting action.

- *Issues Regarding Crediting of State-Funded Projects*

Some of the AG-ICE projects received co-funding from the Carl Moyer Program. California law prohibits the use of any project funded by Carl Moyer from being used as an emissions offset. While the District recognizes that some of the projects were co-funded by Moyer and the utilities, the District believes that because they are using only the portion of the total emission reductions generated equal to the replacement of a Tier 3 engine with an electric motor the requirements of State law are met. Aside from the funding issue, it is important to note that there does not appear to have been any double counting of emissions reductions, meaning the emissions the District claimed for use in equivalency were not counted in any other way for SIP purposes.

California Health and Safety Code, section 44281 (b) states:

> *No project funded by the [Carl Moyer] program shall be used for credit under any state or federal emissions averaging, banking, or trading program. No covered emission reduction generated by the program shall be used as marketable emission reduction credits or to offset any emission reduction obligation of any person or entity.*

The 2005 Moyer Guidelines, which are incorporated by reference under the Health & Safety code and implemented the Moyer statute at the time when the AG-ICE program was implemented, also specifically provided that the reductions from AG-ICE funded project belonged to the Carl Moyer Program if the project also received Moyer funds:

> *Carl Moyer Program applicants using the PG&E and SCE incentive programs will also have to make adjustments to the emission reduction calculations. Because to date virtually no electric agricultural pump projects have been funded through Carl Moyer Program grants, the PG&E and SCE incentive programs take credit for the emission reduction*

between a Tier 3 engine and an electric motor. ***As a condition of the PG&E and SCE incentive programs, these emission reductions must be donated to the Carl Moyer Program for clean air.*** *The emission reduction benefit between the replaced engine and a Tier 3 engine, may be included in the cost-effectiveness calculation to determine the grant amount. An example of this calculation is provided in Appendix D. (ref. 2005 Carl Moyer Program Guidelines, Part II, Project Criteria, Chapter XII, Zero Emission Technologies, XII-p. 5)*

The AG-ICE program operated with both funding between public utilities, and the State of California in part through the Carl Moyer program. Specifically, the Carl Moyer program funded conversion to electric pumps, and the public utilities provided line extensions and rate incentives. Joint funding was necessary because funding levels from the Carl Moyer program alone were not sufficient to entice a transition from diesel to electric agricultural pumps.

A joint settlement between the California Public Utilities Commission, Pacific Gas and Electric Company (PG&E), Southern California Edison Company (SCE), the Office of Ratepayer Advocates, the Utility Reform Network, Agricultural Energy Consumers Association, the California Farm Bureau Federation, and the California Air Resources Board[51] in March 2005 established favorable electric rates which helped encourage the transition from diesel to electric pumps.

The District believes the record of the CPUC proceedings show that the agreement apportioned emission reductions between the utilities, the State, and the District. The District believes that under the agreement the State would retain criteria pollutant emission reductions generated by the transition between the engine being replaced and a Tier 3 engine, and the District (through the utilities) would retain criteria pollutant emission reductions from a Tier 3 engine to zero emissions. The District relied on their understanding of this agreement when deciding to use the AG-ICE emission reductions from Tier 3 to zero emissions for demonstrating offset equivalency. CARB staff does not concur with this assessment.

CARB staff has not determined the exact number of electrification projects that received Carl Moyer funding. In the sample of ten AG-ICE electrification projects using serial numbers for the replaced diesel engines along with other project specific information[52] CARB staff noted that six of the ten engines matched engine records in CARB's Clean Air Reporting Log (CARL) database strongly indicating these six projects received Moyer funding or co-funding.

[51] http://docs.cpuc.ca.gov/publishedDocs/published/Graphics/47069.PDF

[52] CARB staff does not have the serial number for all 919 diesel engines replaced as this information is not part of the District's equivalency tracking database that CARB staff has access to.

A preliminary review of the 919 electrification projects suggests that a large number of those could have also received Carol Moyer funding.

Issues Regarding Permanency of Reductions

Another of the criteria for claiming a reduction in the surplus-at-time-of-use demonstration is that the reductions be permanent.

The AG-ICE Program had a limited life, as explained in a July 27, 2005 document titled *Agricultural Internal Combustion (IC) Engine Conversion Incentive Program Questions and Answers*, published by PG&E, California Farm Bureau Federation, and Agricultural Energy Users Association[53]

> *Q7. Do I have to stay on the AG-ICE rate for the whole 10 years?*
>
> *A. No. You will only be required to stay on the AG-ICE rate for 12 months under Electric Rule 12. However, if you elect to leave the AG-ICE rate for a different PG&E electric tariff, you may not return to the AG-ICE rate.*
>
> *After the program expires on December 31, 2015, nothing in the AG-ICE program precludes a grower from leaving PG&E to disconnect or choose an alternative power source such as an IC engine, although there is no certainty as to the air quality regulations that will be in place at that time. The customer would still be responsible for non-passable charges if going to an alternate electrical source provided those charges are in existence at the time of departure.*

With the Carl Moyer Program, to ensure satisfaction of the permanence requirement, SIP creditability of reductions ends with the contract expiration. Similarly, with the AG-ICE program, reductions from the electrification projects may not be enforceable after the expiration of the contract, meaning, after the contract expires, they may not meet the criterion for permanence under Rule 2201, section 7.1.5 to be used in the equivalency demonstration.

b. Orphan Shutdowns

Orphan shutdowns are unclaimed emission reductions from facilities that have shut down and surrendered their air permits, but did not claim the actual emission reductions, if any, from the cessation of emissions. The District collects the actual emission reductions from orphan shutdowns and retires them for use in the equivalency demonstration. The District never uses emission reductions from orphan shut downs to directly offset emission increases from ATC projects.

[53] Ref. Agricultural Internal Combustion (IC) Engine Conversion Incentive Program Questions and Answers from July 27, 2005, Published by PG&E, California Farm Bureau Federation, and Agricultural Energy Users Association.

Although orphan emission reductions are not formally banked as ERCs, Rule 2201 does require them to meet the same evaluation criteria as ERCs.[54] The reductions must be real, surplus, permanent, quantifiable, and enforceable.

According to the District's internal guideline document "Offset Equivalency Step-by-Step Instructions," actual emissions reductions from orphan shutdowns are calculated using the following method:[55]

> *The database will calculate the emissions for units at the deleted facilities using the following protocol:*
>
> - *use the two most recent [Emissions Inventory] years from the past 5 years.*
> - *if both years are available, average the two*
> - *if only one year is available, use that year (no average)*
> - *if both years are blank[56], use 1/2 of the PE [potential to emit]*

The District's method for crediting emission reductions from orphan shutdowns is an attempt to treat orphan shutdowns in a manner similar to ERC banking applications by applying the concepts "baseline period" and "actual emission reductions" from Rule 2201.[57] That is, the District bases the amount of creditable emissions reductions on actual operating data from the most recent two-year period from the past five years preceding shutdown. The period immediately preceding shutdown is usually the lowest emitting period in the life of a facility. Rule 2201 and federal NSR allow a different 24-month period from the past five years if the permitting authority determines that a different 24-month period is more representative of normal operation. Therefore, in this respect, by using the most recent time period instead of the most representative operating period, the District's method for crediting orphan shutdowns is more conservative than Rule 2201 or federal NSR for crediting emission reductions.

However, the District's orphan credit procedure is less stringent than its normal ERC banking procedure or federal NSR for establishing real emissions in that it allows for use of one years' worth of data, or the use of half of the potential to emit, if no emissions inventory record is available from the previous five years. For facilities where the record on actual emissions is absent or missing, relying on some fraction of the permitted or potential to emit of a source as a way of representing actual emissions may be a reasonable practical accommodation. Unlike with ERC applications, where the applicant has an active interest in providing operating data,

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[54] District Rule 2201, section 7.1.5 (8/15/19)
[55] SJVAPCD *Offset Equivalency Step-by-Step Instructions*, III.C. Entering Deleted Facilities (C.III.6)
[56] The word "blank" implies missing or absent data. However, CARB staff would note that in practice "blank" appears to include instances of zero emissions, i.e. zero actual emissions is taken to be the same as missing data, justifying the use of ½ of the potential to emit.
[57] District Rule 2201, sections 3.2 and 3.9 (8/15/19)

the District is forced to rely on its own records of operating history to discern the actual emissions from the operation, which may be incomplete for older shutdowns. The question of whether the multiplier of half of the permitted emissions is appropriate here would require further research beyond the scope of this review. For purposes of this review, CARB staff assumed, consistent with District practice, half of the potential or permitted emissions where no emissions inventory or operating record was available.

The District does not discount or surplus the orphan shutdowns when they are added to the federal offset equivalency tracking system. This practice is indicated in their internal guidance document Offset Equivalency Step-by-Step Instructions*:* [58]

> *For deleted facilities, the District does not discount the emissions reductions. Therefore, enter "0" for:*
>
> - *"Permitted Potential to Emit after the initial action (t/y)",*
> - *"Discount quantity for federal rules in place at the time of initial action (t/y)"*
> - *"Discount quantity for federal rules SINCE the time of initial action (t/y)".*

CARB staff would agree that for most orphan shutdowns, the permit at the time of surrender should reflect all the applicable emission standards. Therefore, any actual emission reductions generated in conformity with the permit should be surplus at the time of permit surrender. However, CARB staff would note several examples discovered in this review where this assumption turned out to be unwarranted, e.g. permits representing "non-compliant dormant emissions units" or "fee-paying units," which contain emission limits that are not reflective of the applicable rule standards. Nevertheless, this by itself should not cause any inaccuracies in the equivalency demonstration provided the surplus value of the reductions is determined at the time the reductions are used as mitigation.

CARB staff has determined that the District's procedure above for assessing actual emissions reductions from orphan shutdown is reasonable and appropriate, with four clarifications. First, in step 4 of the procedure for determining the amount of emission reduction, the word "blanks" should be understood to refer to an absence of data, not actual zeros, i.e., where the record clearly indicates zero emissions or non-operation. Second, orphan reductions should be subject to the surplus-at-time-of-use requirement as required by Rule 2201. Third, when a shutdown involves multiple emissions units, only one consecutive 24-month period (or 12-month period per the District's procedure referenced above) should be used to determine the actual emissions. This stipulation should be observed for determining the amount of creditable reductions from orphan shutdowns because it prevents double counting of emissions that are merely shifting from unit to unit over time (i.e., shifting to a similar

[58] SJVAPCD Offset Equivalency Step-by-Step Instructions, III.C. Bullet point i (C.III.24).

source within a facility or counting emissions that were relied on in an internal offset or netting action). Thus, to use a specific period of emissions inventory for one unit, but not for other units, (and instead using, for example, ½ PE) is inconsistent with this stipulation and inconsistent with how the District would normally bank these reductions were they to go through a formal banking process. Fourth, related to the previous point, the District should not credit emission reductions related to older cancelled permits that could not legally operate or emit at the claimed levels within the five-year look-back period to determine the actual emissions.

CARB staff reviewed a random sample of 11 orphan shutdowns used as mitigation in the 2018 tracking period (Table 14).[59] CARB staff determined a lower value for the reductions than the District had for most of the orphan shutdowns. The differences between CARB's determination and the District's determination appear to result mainly from (1) the District not following the procedure in Steps 1 – 4 noted above, or (2) the District not appropriately discounting the emission reductions to reflect their surplus value.

In orphan reduction 2011-S-9990046-4884, the District did not use the available emission inventory record, the compliance record, correspondence from the operator, or the PE value as indicated on the permit to determine the amount of creditable emission reductions. This shutdown consisted of six petroleum storage tanks and one wastewater storage tank. The District received a letter from the operator requesting cancellation of the permits on November 29, 2010. In the letter, the operator noted the tanks had not operated since summer of 2001. The District's June 29, 2010 inspection report also stated the facility had been out of service since 2001. In June of 2011, the facility submitted a 2010 emission inventory report indicating no throughput for any of the equipment in 2010.

The District claimed 525.8 tons per year of VOC creditable reductions for the surplus-at-time-of-use equivalency in 2011 as indicated by the equivalency database entries showing ini_r_voc and aer_voc = 528.8 tons per year. As of the 2018 equivalency report, 320.1 tons per year VOC had been used in the equivalency demonstrations since 2011 (used_voc) with 205.7 tons per year remaining (r_voc).

CARB staff found that the record demonstrated that actual emissions were zero for this facility since summer of 2001. Following the District's rules for crediting reductions from deleted facilities, the amount of creditable VOC reductions available from the shutdown should have been 0 tons per year. If one allows that the District system tracked these zeros as "blanks" or missing data, then ½ PE would be used. The facility-wide Title V permit S-46-0-2 renewed for this facility in 2009 had a facility-wide cap on

[59] All orphan reductions can be identified in the tracking system and annual reports by the "999----" in their tracking number. The tracking number also reveals the facility identification number associated with the permits and when the District claimed the emission reductions for the tracking system. For example, orphan reduction 2011-S-9990046-4884-1 was from the shutdown of facility S-46, and the District claimed those reductions for the equivalency demonstration in 2011.

VOC emissions of 50 tons per year. Using the District rule that would credit ½ PE for a shutdown facility in the absence of any emission inventory data from the previous five years. At most, the District could claim 25 tons per year of VOC for use in the equivalency demonstration. CARB staff believes the permissible creditable reductions for the shutdown of this facility in 2011 should be 0 tons per year VOC; however, in no case should the amount of creditable reductions be greater than 25 tons per year VOC. The District acknowledged and indicated they would address this issue.

The results from CARB staff's review of the sample of 11 emission reductions from orphan shutdowns used in whole or in part in the 2018 Equivalency Report is presented in Table 14. For each of these shutdowns, CARB staff calculated the amount of orphan actual emission reductions (AER) that could be claimed or used and compared to the amount of credit taken in the District Track_Master and Track_Allocate databases. CARB's results were consistently lower than District's recorded values. These results may or may not be representative of other orphan shutdowns, because each orphan shutdown presents a unique set of circumstances that determines the amount of credit that can be claimed. Detailed explanations and reference documents for all the orphan shutdowns indicated in Table 14 will be included on the San Joaquin Valley ERC Program Review Public Documents web page.

Table 14. Orphan Credit Comparison between CARB and District Staff for Mitigations Used in the 2018 Report[60]

Track Number	NOx (tons per year) District Database	NOx (tons per year) CARB Calculated	VOC (tons per year) District Database	VOC (tons per year) CARB Calculated
2011-S-9990046-4884	-	-	525.8	0
2013-C-9990512-5391	0.59	0.28	7.14	3.14
2013-S-9990204-5386	2.63	0.83	0.17	0.05
2010-C-9990263-4278	1.0	0.3	0	0
2010-C-9990583-4282	1.2	0.04 or 0.09	1.3	0.08
2004-S-9990252-1439	0.6	0.07 or 0.21	0.11	0.003 or 0.11
2015-N-9990290-6076	0.75	0.70	0.15	0.15
2015-S-9990494-6077	0.63	*	0.14	*
2017-C-9990646-6593	9.74	1.36	2.29	1.28
2018-C-9990445-6878	1.93	0	0.41	0
2018-C-9990547-6880	4.03	0	0.37	0

*CARB staff did not have the information to verify the District's value.

[60] The District values in the table below are found in Track_Master under one or more fields aer_pollutant ini-r_pollutant, and used_pollutant.

V. Part 4: Application of Offset Requirements to Permitting

The District's ERC system works as part of a larger NSR program to accomplish the air quality goals in the San Joaquin Valley. ERCs are the currency of offsets, and offsets are a NSR requirement. In most cases, BACT is triggered and evaluated prior to offsets being required. As a result, BACT has a direct relation to whether offsets are triggered and how many are required as part of NSR. Therefore, the final portion of the review focused on how the District calculated and used offsets in the permitting process.

Based on the limited analysis we have conducted, we found the District generally appears to apply its NSR program consistent with its rules and policies. In addition, we found no difference in the application of the District's NSR program between ATCs selected from the community list, and those selected at random.

CARB staff selected 30 ATC projects for this portion of the review. Most of the projects were drawn from a list generated by District staff of approximately 7,200 ATC projects issued by the District from 2016 to 2018. A few projects outside this window were chosen when staff could not locate a project within the 2016 - 2018 window that met the other selection criteria. Half (15 of the ATCs) were selected from random facilities, and the other half (15 of the ATCs) were selected from a list of facilities raised by community groups: Rio Bravo Fresno, Vitro, San Fe Petroleum Terminal, MB Technology, Chevron USA Inc, Aera Energy LLC, Kern Oil and Refining, Alon Bakersfield Refining, and Gallo Glass Company. It should be noted that for the 15 facilities from the list, there were hundreds of individual ATCs from which one was selected at random, from each facility.

CARB selected projects based on several criteria. The main criterion was that the projects had to illustrate some facet of the offsetting requirements, offset exemptions, or calculation methods that feed offset determinations in District Rule 2201. Other aspects of the projects, e.g., BACT, risk assessments, application of prohibitory rules, were also reviewed, however, as they were integral to the ATC project approval. Table 15 lists the projects selected for analysis:

Table 15. Authority-to-Construct Applications Selected for Review

Project ID	Project ID	Project ID	Project ID
S-1171639^	S-1182997^	S-1182363	N-1153167
S-1170151^	S-1173785^	S-1150871	N-1172193
S-1160023^	C-1172937^	S-1153552	N-1162806
S-1173694^	N-1182628^	S-1153263	C-1141302
S-1153809^	C-1182872^	N-1162235	C-1181525
S-1183520^	C-1051325^	N-1152244	N-115001
S-1182998^	C-1181006^	N-1153643	
S-1163220^	S-1183515	N-1183369	

^ Project selected at random from one of 9 facilities requested by community stakeholders.

Consistent with CARB staff's evaluation of ERCs in Part 2 of this report, CARB staff's analysis identified transparency and record gaps as an issue. In a majority (21 of 30) of projects reviewed, the evaluation did not provide enough information to replicate or verify the information used in the District evaluation or provided in the facility application, or did not clearly document calculations. In some cases, citations were not provided for assumptions or the evaluation lacked explanation for determinations. The following ATCs were impacted by lack of information: S-1150871, S-1153263, S-1153552, S-1153809, S-1160023, S-1163220, S-1170151, S-1171639, S-1173694, S-1173785, S-1182363, S-1182997, S-1182998, S-1183515, S-1183520, N-1152244, N-1183369, C-1172937, C-1181006, C-1181525, and C-1182872.

Examples of transparency issues found include:

- S-1183520: The engineering evaluation did not include emission factors or emission calculations used to determine the potential to emit. There was no explanation for the ranking of control technologies in the BACT analysis. The PE and BE calculations were not clear, which affects the quantity of offsets required.
- S-1173694: There were no emission calculations provided, so it was not possible to verify if the District's conclusion that there would be no change in emissions. This affects applicability of BACT, Offsets, and public notice.
- S-1153552: The project was for a relaxation in monitoring requirements, but was classified as a Title V minor modification without a justification in the evaluation. Calculation issues in the PE1 and PE2 tables make the values difficult to follow.

Finally, CARB staff conducted a cursory review of the SJVAPCD and other district's offset thresholds, BACT trigger levels, BACT cost-effectiveness thresholds, and BACT cost-effectiveness assumptions. There are clear differences between the District's BACT trigger and threshold levels compared to other districts. There are also clear differences in these factors among all the districts. While all air district NSR programs have the same basic structure, they vary in their detail. As a result, staff's review of offset thresholds, BACT trigger levels, BACT cost-effectiveness thresholds, and BACT cost-effectiveness assumptions was not sufficient to make specific conclusions about the overall stringency of the District's NSR program. Such an assessment of the district's NSR program is beyond the scope this report.

California air quality policy and management is increasingly focused on addressing community scale impacts along with the long-standing focus on regional attainment of air quality standards governed by both the Clean Air Act and State law. As a result, there is a growing need to understand how existing NSR programs address both regional and community scale needs. The review necessary to develop a sufficient understanding of NSR programs and how they are applied must be broader than an evaluation of a single district's program. As noted NSR programs can vary in complex and nuanced ways. Understanding how they work and what the opportunities are to optimize the systems to ensure they meet current and future needs will require the focused efforts of staff from multiple air districts as well as CARB staff. CARB staff proposes to begin a discussion with the air districts as well as stakeholders concerning the approach for conducting such a review.

VI. Summary and Recommendations for Future Action

The current SJVAPCD ERC bank contains nearly 11 million pounds of NOx ERCs when valued at time-of-issuance. While the bank is large, 80% of the ERCs it contains were issued more than 20 years ago. As the District's programs have become more stringent, the time-of-use value of these ERCs has declined. The District estimated in 2016 that these ERCs, when valued using time-of-use assumptions, are worth about 18% of the time-of-issuance value. This decline has no immediate impact on the holders of the ERCs, because the value of these ERCs under the District's NSR program is based on time-of-issuance. However, this decline is the reason why EPA requires the equivalency determination – to ensure that the difference between time-of-issuance and time-of-use ERC value is accounted for through sufficient offsets generated by the overall increased stringency of the District's program relative to federal requirements.

The equivalency demonstration was designed to allow the District to take credit for other reductions that are generated through their NSR program, such as the application of NSR to non-major sources, and other areas where the District's program is more stringent than federal requirements. However, when the District was reclassified to extreme non-attainment, the major source emission thresholds were reduced, which substantially reduced the advantage between the District's and federal NSR requirements. For the past decade, the District has heavily relied on orphan shutdowns and electrification projects to demonstrate equivalency. It should be noted that these projects are not related to the stringency of the District's NSR rules.

This review identified three groups of findings which, when viewed together, indicate that the District should strengthen its ERC system, to ensure the program will result in no net increase emissions across the basin, while also providing the ERCs industry needs in the San Joaquin Valley. In reviewing ERC banking actions, ATC evaluations, and the District's equivalency database, staff identified general findings in three areas:

A. Transparency and Rigor of Analysis

- In many of the ERC and ATC projects reviewed, the evaluations lacked supporting documentation that is necessary to replicate, verify or fully review the District's actions. ERC banking actions were missing information such as emissions inventory submittals, choice of baseline period, Continuous Emissions Monitoring data, source test data, and other information. ATCs in some cases were missing citations for assumptions, and some evaluations lacked explanation for determinations.
- The District's equivalency system database is lacking technical documentation, and is not self-contained, meaning that many calculations are conducted external to the database system, performed by input from or output to spreadsheet files for additional analysis. As a result, the calculations are not fully trackable within the

database system. Staff's analysis identified orphan records in the system and calculation discrepancies in the District's offset requirement equivalency demonstration (i.e., Test 1), caused in part by issues in data entry and data processing procedures before data is entered into the database. Overall, these issues highlight areas for improvement, both in District's staff's analysis, and in the database environment where staff perform calculations and engineering analyses. After the bump-up to extreme non-attainment in 2010, the number of projects has increased, creating a quality assurance challenge in an already complex system.

- Staff's analysis identified several calculation issues relating to orphan shutdowns and electrification projects affecting the surplus-at-time-of-use equivalency demonstration (i.e., Test 2). Electrification projects and orphan shutdowns both appear to be overestimated. In particular, the emission reductions from electrification projects appear overestimated by at least 35 percent. These issues need to be addressed going forward to provide confidence in the surplus-at-time-of-use equivalency demonstration to be submitted in 2020.

B. Rule Implementation

In the second set of findings, staff identified rule implementation issues:

- ERC Timeliness

In 15 of the 52 ERC projects reviewed, the District granted ERCs, generated by facility shutdowns, in which emissions ceased more than 180 days before submission of the ERC application. The District followed its long-standing policy defining shutdown as the surrender of the operating permit, when deciding to grant these ERCs. However, the District's policy conflicts with its Rule, which requires the application to be submitted no later than 180 days after the emission reductions occurred. The District should follow its Rule as written and make adjustments so that both the policy and rule are consistent.

- ERC Surplus Reductions

In four of the 52 ERC projects reviewed, the District granted ERCs even though they appeared to not be surplus of every federal, State, or district law, rule, order, permit, or regulation. This increased the value of the ERC to the applicant, and decreased the value of the ERC in the equivalency demonstration when the ERCs are used. Over time these types of decisions may put the District's offset equivalency demonstration at risk.

C. Offset Equivalency

In the third set of findings, staff identified several issues in the District's equivalency demonstration.

- ERC Electrification Project Eligibility and Calculations

The District relies on electrification projects, generated through the Agricultural Internal Combustion Engine (AG-ICE) incentive program, to demonstrate NOx equivalency with federal requirements. In calculating and claiming credit for these projects, the District used an incorrect load factor, resulting in a significant overvaluing of reductions in the equivalency demonstration. In addition, these reductions were not documented to have resulted from a permitting action, were not documented to be permanently enforceable, and potentially half of the credited projects appeared to be funded in part through the Carl Moyer program. These issues affect the magnitude and eligibility of electrification projects that are the primary basis for NOx equivalency over the past ten years. The District should address these issues in its 2020 Equivalency Demonstration.

Recommendations for Future Action

The issues identified in this report are complex, and impact a wide array of stakeholders in the San Joaquin Valley including residents of the Valley, industries that rely on offsets and ERCs in order to expand or build new business, environmental organizations who advocate for cleaner air, and community groups representing those living near stationary and mobile sources who are impacted the most by emissions at the local level.

As a result of the findings highlighted in this report, CARB staff recommends that the District take specific action to address the following overarching findings as detailed in this evaluation.

- Revise the program to make it more transparent to the public and industry and more rigorous.
- Upgrade the District's Implementation procedures and policies.
- Review and revise assumptions in the equivalency demonstration as identified.