



# South Coast Air Quality Management District

21865 Copley Drive, Diamond Bar, CA 91765-4178  
(909) 396-2000 • www.aqmd.gov

BOARD MEETING DATE: January 19, 2001

AGENDA NO. 23

**PROPOSAL:** Report on Potential Backstop Measures to Stabilize NO<sub>x</sub> RECLAIM Trading Credits Prices

**SYNOPSIS:** During the year 2000, the price of NO<sub>x</sub> RECLAIM Trading Credits (RTCs) traded in the RECLAIM market increased sharply from the previous years. The average price of 1999 and 2000 NO<sub>x</sub> RTCs increased above the backstop level of \$15,000 per ton specified in Rule 2015 – Backstop Provisions. Rule 2015, Sub-division (d) requires the Executive Officer, upon discovery, propose that the Governing Board amend the program to address any specific problems. This report examines the issues associated with the recent increase in NO<sub>x</sub> RTC prices and makes recommendations for program improvements that may reduce and stabilize NO<sub>x</sub> RTC prices.

**COMMITTEE:** Stationary Source, December 1, 2000, Reviewed

**RECOMMENDED ACTION:**

1. Direct the staff to proceed with developing proposed rule amendments to the RECLAIM program pursuant to general Board direction received at the meeting.

Barry R. Wallerstein, D.Env.  
Executive Officer

BB:CC:CM:DL:DN:scs

---

## Background

The RECLAIM program was implemented in 1994. Facilities within the RECLAIM program have the option of complying with their allocation allowance by either installing control equipment or purchasing RTCs from other facilities. From the start of the program, the price of NO<sub>x</sub> RTCs remained relatively stable until summer 2000, at which time an increased demand for power generation resulted in the electric power industry purchasing a large quantity of RTCs. This action resulted in the depletion of available RTCs and caused the price of NO<sub>x</sub> RTCs for Compliance Year 2000 to increase from approximately \$4,284 per ton traded in 1999 to approximately \$39,000 per ton traded during the first ten months of 2000.

The District recognized this change in activity, and, at its October 20, 2000 meeting, the Governing Board directed staff to examine the issues affecting the high price of NOx RTC prices and recommend actions that can be taken to stabilize NOx RTC prices. Additionally, the Governing Board directed the Executive Officer to form an advisory committee to provide input on this issue as well. Staff has prepared the attached White Paper outlining recommendations made by all committee members, including a staff analysis and recommendations.

In developing proposals for the Governing Board's consideration, staff's first priority is to protect public health and ensure adequate progress toward meeting clean air mandates. At the same time, it is vital to ensure that air pollution regulations do not inadvertently hinder the State's efforts to ensure adequate power supplies. Staff believes that stabilizing RTC prices will contribute significantly to both those goals.

A review of recent data indicates that increased demand for RTCs by power producers has played a significant role in the current situation. Power producers have purchased 67 percent of the NOx RTCs that were traded with price and that expired in December 2000. In contrast, power producers only account for approximately 14 percent of total RECLAIM allocations for Compliance Year 2000. Continued high demand from power producers would likely make it more difficult for other RECLAIM facilities to purchase needed RTCs and would increase pressure on RTC prices. At the same time, many RECLAIM facilities, relying on previous low RTC prices, did not begin installing controls until after RTC prices climbed dramatically. As a result, the RECLAIM program predictably reached the "cross-over point" where emissions equal allocations. This also has an effect of increasing prices.

The RECLAIM market has already started to respond to increased prices. A number of facilities, including power producers, have filed permit applications to install controls that will significantly reduce emissions and associated the demand for RTCs. This will ultimately cause RTC prices to drop. However, there is a lag time between the decision to install controls and actually operating the controls with associated reduced emissions. Unless refinements are made to the RECLAIM program, prices are likely to remain high until controls become operational.

Therefore, to provide needed RTC price stability in the short term, staff recommends convening a working group to develop rule amendments that will implement realistic, effective solutions. The working group will include power producers, other RECLAIM facilities, environmental groups, EPA, ARB, CEC, and interested legislative representatives. These rule amendments will be developed as quickly as possible to provide a fast-track response to the current situation, with Board hearings tentatively scheduled for May 2001.

## **Attachment**

### **White Paper on Stabilization of NOx RTC Prices**

**SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT**

**White Paper on Stabilization of NOx RTC Prices**

**January 11, 2001**

**Executive Officer**

Barry Wallerstein, D.Env.

**Deputy Executive Officer**

**Engineering and Compliance**

Carol Coy

**Assistant Deputy Executive Officer**

**Engineering and Compliance**

Mohsen Nazemi, P.E.

**Senior Manager**

**Refinery, Energy, and RECLAIM Administration**

Pang Mueller, P.E.

---

**Authors:** Carol Coy, Deputy Executive Officer  
Pang Mueller, P.E., Senior Manager  
Danny Luong, P.E., Senior Air Quality Engineer  
Susan Tsai, Air Quality Engineer II  
Don Nguyen, Air Quality Engineer I  
Fortune Chen, Air Quality Engineer I

**Reviewed by:** Barbara Baird, District Counsel

**SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT  
GOVERNING BOARD**

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

Vice Chair: NORMA J. GLOVER  
Councilmember, City of Newport Beach  
Cities Representative, Orange County

**MEMBERS:**

MICHAEL D. ANTONOVICH  
Supervisor, Fifth District  
Los Angeles County Representative

HAL BERNSON  
Councilmember, City of Los Angeles  
Cities Representative, Los Angeles County/Western Region

CYNTHIA VERDUGO-PERALTA  
Governor's Appointee

JANE W. CARNEY  
Senate Rules Committee Appointee

RONALD O. LOVERIDGE  
Mayor, City of Riverside  
Cities Representative, Riverside County

JON D. MIKELS  
Supervisor, Second District  
San Bernardino County Representative

LEONARD PAULITZ  
Mayor Pro Tem, City of Montclair  
Cities Representative, San Bernardino County

CYNTHIA P. COAD, Ed.D.  
Supervisor, Fourth District  
Orange County Representative

BEATRICE J. S. LaPISTO-KIRTLEY  
Mayor Pro Tem, City of Bradbury  
Cities Representative, Los Angeles County/Eastern Region

S. ROY WILSON, Ed.D.  
Supervisor, Fourth District  
Riverside County Representative

**EXECUTIVE OFFICER**

BARRY R. WALLERSTEIN, D. Env.

## Acknowledgements

The following are the Members of the Advisory Committee who provided valuable input and their assistance is greatly appreciated.

Charles Barlow; NP Cogen Inc	Nick Drakos; Custom Alloy Light Metals	Gary Jorown; Tri-Alloy Inc
Guruzaran Bawa; WSPA	Greg Emanuelson; Vista Metals	Mike Justice; Justice & Associates
Dennis Becvar; PES	Tony Endres; Energy Services Corp	Jim Karalus; NRG Power Marketing Inc
Dennis Brimhall; LA Dye & Print Works	Karen England; Artesia Sawdust Products	Ken Kloster; Kloster Environmental
Jack Brunton; Sempra Energy	Richard Friedman; EES	John Koenig; Metal Coaters of Calif
Mike Buckantz; Justice & Associates	Joseph Garcia; Quemetco Inc	Karl Kottman; Pacific Clay Products
Jay Burack; Boldwater Brokers	Chris Gemgnani; RR Donnelley & Sons	Naro Kuch; Sierra Aluminum Co
Mike Buxton; Press Forge	Julie Gilbert; Sup Mikel	Gene Kulesza; Riverside Cement
Charles Byron; City of Anaheim	Carlos Gonzalez Jr; Vertis Advertising	Chuck La Piana; Broadway Entr
Tom Canaday; US EPA	Jay Grady; California Portland Cement Co	Cliff Lotzenhiser; TST Inc
Terry Carberry; Carberry & Associates	Michael Grubbs; Davis Wire Company	Al Maclean; Deleo Clay Tile
Tim Carmichael; Coalition for Clean Air	John Gustafson; Equilon Enterprises LLC	Grace Madden; Kimberly Clark
Ashok Chaurushia; Boeing	Ricardo Gutierrez; Hayes-Lemmerz Intl Inc	James Malek; City of Burbank
R Cimbals; Edgington Oil Company	Matt Haber; US EPA	Josh Margolis; Cantor Fitzgerald
John Clarke; CENCO Refining Company	Deanna Haines; Sempra Energy	Armando Martinez; Boeing
Curtis Coleman; Cal Mfrs Assn So Calif AQ Alliance	George Hall; Mountainview Power Co	James Marzolino; Exide Technologies
John Crews; Canners Steam Co	Jim Harley; Chroma Systems	Scott McArthur; Tosco Refining Co
Rich Crews; Canners Steam Co	Julia Ince-Scott; Hayes-Lemmerz Intl Inc	Tom McCabe; Edison Mission Energy
Richard Davis; Goal Line	Jeffrey Johnson; Johnson & Tekosky, LLP	Mike Miclette; Oglebay Norton
Brigitte De Laura; Artesia Sawdust Products, Inc.		

Josh Miller; BP Carson	Anne Sholtz; Automated Credit Exchange	Bob Wyman; Latham & Watkins
Bruce Moore; LADWP	Rene Silva; Schlosser Forge	Brian Yates; West Coast Environmental
Peter Nash; Schultz Steel	Ron Sneddon; Angelica Textiles	Allan Zabel; US EPA
Lyle Nelson; SCE	Kimba Spencer; Justice & Associates	Maria Zdunkiewicz; ARE
Bob Nicksin; Sempra Energy	Charles St John; Quemetco	
Steve Odabashian; NRG	Susan Stark; BP	
Jim Olivier; PQ Corp	Milan Steube; Aera Energy LLC	
David Oppenheimer; Natsource	Jennifer Stone; Nelco Products Inc	
Jon Owyang; Market- Based Solutions	Ivan Tether; Smiland & Khalhigian	
Suma Peesapati; CBE	Glenn Thomas; Mountainview Power Co	
David Pikelney; A&N Technical Services	Gary Thornberry; California Portland Cement Co	
Robert Poitras; Generation Equipment Services Co	Mike Tollstrup; California Air Resources Board	
Cynthia Praul; California Energy Commission	Lucille van Ommering; California Air Resources Board	
David Price; Ultramar Inc	G E Vaughn; Angelica Textiles	
Bill Quinn; CCEEB	Lee Wallace; Sempra Energy	
Vikram Reddy; B Braun Medical Inc	Lin Wang; City of LA, Airports	
Ryan Rietzel; BP	Steve Ward; Weyerhaeuser	
Leonard Robinson; TAMCO	Peter Whittingham; EMI	
Gail Ruderman Feuer; NRDC	Ron Wilkniss; WSPA	
Viji Sadasivan; Advanced Environmental Controls(AEC)	Suzanne Wilson; City of Anaheim	
Mike Scheible; California Air Resources Board	Rodney Wirtz; Kaiser Aluminum	
Shayne Seever; Sierra Aluminum Co		
Tom Shaffer; Schlosser Forge		
Mike Shaffer; Entrix Inc		
Jon Shepardson; 3M		

The following staff assisted with the preparation of this report and their assistance is greatly appreciated:

Barbara Baird, District Counsel

Peter Mieras, District Prosecutor

Elaine Chang, Assistant Deputy Executive Officer, Planning, Rule Dev. & Area Sources

William Wong, Senior Deputy District Counsel

Nancy Feldman, Senior Deputy District Prosecutor

Sue Lieu, Program Supervisor, Modeling Inventory Development

## **TABLE OF CONTENTS**

Chapter 1: Introduction.....	1
Chapter 2: RTC Market .....	8
Chapter 3: RTC Supply and Demand Analysis .....	17
Chapter 4: Near-Term and Long-Term Options To Stabilize NO <sub>x</sub> RTC Prices .....	27
Chapter 5: Staff Recommendations.....	54

## **LIST OF TABLES**

Table 2.1: Comparison of Required Emission Reductions for Various Industries.....	10
Table 2.2: RTCs Converted from Mobile and Area Source Credits.....	15
Table 3.1: Changes to RTC Supply After RECLAIM Program Adoption .....	18
Table 3.2: Emission Reductions to be Achieved to Comply with 2003 RTC Holdings at 1999 Production Level .....	20
Table 3.3: Emission Reductions from Proposed Projects .....	21
Table 3.4: Comparison of emissions based on 1999 production levels to RTC holdings (tons per year) and percent reduction required in each year. ....	23
Table 3.5: Possible Reductions in Emissions (Preliminary Estimates Using Known Technologies) .....	24
Table 3.6: Further Control Opportunities .....	25
Table 3.7: Achievable NO <sub>x</sub> Emissions Reductions and Annualized Cost Equipment Type .....	26
Table 4.1: Summary of Suggested Near-Term and Long-Term Options .....	28
Table 4.2: Additional RTC Supply.....	43

## **LIST OF FIGURES**

Figure 1.1: Structure of RECLAIM Trading Cycles .....	3
Figure 1.2: RECLAIM NOx Emissions and RTC Supply (tons/year) .....	4
Figure 1.3: RECLAIM SOx Emissions and RTC Supply (tons/year).....	4
Figure 1.4: Average NOx RTC Prices.....	5
Figure 1.5: Average SOx RTC Prices.....	6
Figure 2.1: Annual NOx RTC Trade Volumes and Prices .....	9
Figure 2.2: Annual SOx RTC Trade Volumes and Prices .....	9
Figure 2.3: Initial Allocation of NOx RTCs .....	11
Figure 2.4: Comparisons Between RTCs Initially Allocated and RTCs Currently Held...	13
Figure 2.5: Buyers and Sellers of RTCs in the Year 2000 .....	14
Figure 3.1: Emission Trends Reported by Operating RECLAIM Facilities.....	19
Figure 3.2: 1999 NOx Emissions and 2003 NOx Allocations .....	20
Figure 3.3: Comparison of 1999 Emissions to Current Holdings by Industry .....	22
Figure 4.1: Proposed Reduction in RTC Supply .....	42

---

## EXECUTIVE SUMMARY

**Purpose** The purpose of this White Paper is to present the issues associated with the recent increases in RECLAIM Trading Credit (RTC) prices for Oxides of Nitrogen (NOx) and to discuss possible approaches to stabilize RTC prices while continuing to meet air quality objectives.

---

**Background** On October 15, 1993, the Governing Board adopted a new approach to reduce NOx emissions in the South Coast Air Basin by approving the Regional Clean Air Incentives Market (RECLAIM) program. It was expected that the program would provide additional incentives for industry to reduce emissions and develop better pollution control technologies. In addition, the program was designed to give facilities added flexibility in meeting emission reduction requirements.

Initially, there were 353 facilities placed in the RECLAIM program. The universe of facilities participating in the program has grown to 364, from a wide variety of industries. The program was design to reduce NOx emissions from 105 tons per day to 27 tons per day, at a lesser cost than the equivalent emissions under command-and-control rules.

---

**RECLAIM NOx Emissions Approach Allocations** Between compliance year 1994 and compliance year 1999, NOx emissions at RECLAIM facilities, in aggregate, were below allocations, and the price of NOx RTCs remained relatively stable ranging from \$1,500 to \$3,000 per ton. However, AQMD observed increased emissions during Compliance Year 2000. This was mainly due to the increased generation rates at local power plants in response to the deregulated market. During this past summer, older, uncontrolled utility boilers that were placed in operation resulted in significant increases in NOx emissions. This increased power demand and increased production rates at other RECLAIM facilities may result in emissions of NOx above the levels targeted under RECLAIM. For the program to remain in compliance, it is necessary for RECLAIM facilities to install control equipment to reduce NOx emissions expeditiously.

---

**Recent High Demand for NOx RTCs Caused Sharp Increase in NOx RTC Prices** Beginning June 2000, RECLAIM program participants experienced a sharp and sudden increase in NOx RTC prices for both 1999 and 2000 compliance years. The average price of 1999 NOx RTCs traded in 2000 was \$15,377 per ton, which was almost ten times higher than the average price of \$1,827 per ton of NOx RTCs traded in 1999 for the same compliance year. More significantly, the average price of NOx RTCs for compliance year 2000, traded in the year 2000 increased sharply to over \$45,000 per ton compared to the average price of \$4,284 per ton traded in 1999.

---

**Public Input** At the direction of the Governing Board, The Executive Officer formed an Advisory Committee to provide input to staff regarding possible approaches to stabilize NOx RTC prices. The Committee membership was open to all individuals who wished to attend. As a result, the Committee represented a diverse group of organizations and consisted of representatives of several RECLAIM facilities, trade organizations, market commodities trading organizations, environmental groups, California Air Resources Board (CARB), U.S. Environmental Protection Agency (EPA), California Energy Commission (CEC), AQMD, and any other individuals who expressed interest in participating in the committee. The input from this Committee was very important in the preparation of staff analysis and recommendations presented in this report. The suggestions made by committee members and staff are summarized in the different options below.

---

- Near-Term and Long-Term Options**
- Mobile Source and Area Source Credits.
  - Stipulated Order for Abatement Guidelines.
  - Accelerated Permit Processing for Air Pollution Control Projects.
  - Waive Monetary Penalties for Facilities that Exceeded Annual Allocations by Less Than Five Percent.
  - Emergency Price Caps for NOx RTCs.
  - EPA-Approved/Project-Specific Air Quality Investment Program (AQIP).
  - ERC Conversion.
  - High Employment/Low Emissions (HILO) Designation.
  - Phase III Clean Fuels Credits.

- Utility Credits.
  - Incentive Program for NOx Control Projects.
  - Outreach Program to Encourage Installation of Air Pollution Control Equipment and Obtain More Accurate Emissions Reports.
  - Retroactive Use of New Concentration Limits From Source Tests
  - Extend Reconciliation Period for Determining Compliance With Allocations
  - Make RTCs Deducted Due to Violations of Annual Compliance Available
  - Extend the Reduction Required for the Period From Years 2000-2003 to 2000-2005.
  - Maintain Current RECLAIM Program Without Changes.
- 
- Adopt Universal Trading Credits (UTC) Program
  - Retrieve a Percentage of Allocation Issued to RECLAIM facilities to Fund a General RTC Auction
  - Isolate Power Plants from the RECLAIM Market:
    - *Create a Separate Trading Market with No Additional Requirements*
    - *Create a Separate Trading Market with Expedited Schedule to Install Air Pollution Control Systems*
    - *Keeping Power Plants in the RECLAIM Program with Expedited Schedule to Install Air Pollution Control Systems*
    - *Replace RECLAIM with the Command-and-Control Regulation*
  - Isolate Petroleum Refineries from the RECLAIM Market:
    - *Create a Separate Trading Market with No Additional Requirements*
    - *Create a Separate Trading Market with Expedited Schedule to Install Air Pollution Control Systems*
    - *Keeping Refineries in the RECLAIM Program with Expedited Schedule to Install Air Pollution Control System*
    - *Replace RECLAIM with the Command-and-Control Regulation*
  - Isolating Facilities Emitting Less Than 10 tons Per Year at the Start of RECLAIM from the program with or without additional requirements.
  - Reassess AQMP Tier 2 Reductions for Specific Industries
  - Reduce Future RECLAIM Allocations Based on Staff Assessment of Available Control Technology
  - Replace RECLAIM with Command-and-Control

---

**Staff** After careful consideration of the suggestions and concerns  
**Recommendations to** discussed, staff proposes a simple set of measures that are  
**Stabilize NOx RTC** expected to encourage expedited installation of emission  
**Prices** control equipment, directed to the exact problems at hand,  
while treating fairly the vast majority of facilities that remain  
in compliance with the program requirements. Staff  
recommendations include:

1. Obtain expedited CARB and EPA approval of Mobile Source and Area Source Credit generation rules.
2. Initiate rulemaking activities to:
  - (a) temporarily bifurcate large power plants from RECLAIM including a mitigation fee for emissions in excess of allocations.
  - (b) Initiate a temporary, and limited, pilot RECLAIM Air Quality Investment Program (AQIP).
  - (c) require RECLAIM facilities reporting 10 tons or more in 1999 to file a compliance plan to demonstrate compliance with NOx RTCs held by those facilities for Compliance Year 2001, 2002, and 2003.
  - (d) Improve registration and timely reporting of RTC trades.
  - (e) develop specific missing data protocol for missing and late electronic reports.
3. Continue to enter into stipulated orders for abatement with companies experiencing trouble complying with their current compliance year allocations.

# C HAPTER 1: INTRODUCTION

On October 15, 1993, the South Coast Air Quality Management District (AQMD) Governing Board adopted the Regional Clean Air Incentives Market (RECLAIM) program. This program was developed and adopted in consultation with representatives of a wide variety of interest groups including local, state, and federal agencies, regulated industry, environmental groups, academic institutions and the public.

## ***What is RECLAIM designed to achieve?***

Amidst the poor economic conditions at the time of program's adoption, RECLAIM sought to gain a greater certainty in meeting public health standards while providing industries with the flexibility to seek the most cost-effective solution to reduce their emissions. The RECLAIM program replaced some of the command-and-control rules and control measures specified in the 1991 Air Quality Management Plan (AQMP). RECLAIM is designed to achieve by year 2003 the same level of emissions reduction as would have been achieved in aggregate by implementing the replaced rules and control measures.

## ***How does RECLAIM work?***

Under RECLAIM, AQMD established annual oxides of nitrogen (NO<sub>x</sub>) and/or sulfur oxides (SO<sub>x</sub>) allocations for RECLAIM facilities for each compliance year from 1994 to 2010 and beyond based on historical reported actual emissions and the types of emission sources the facilities operated. The allocation is reduced for each year from 1994 to 2003, then remains stable. The NO<sub>x</sub> and SO<sub>x</sub> allocations are expressed as RECLAIM Trading Credits (RTC) where one pound of allocation for a specific compliance year is equal to one unit of RTC with expiration date at the end of the compliance year. RECLAIM requires facility owners to ensure that each year their facility-wide NO<sub>x</sub> and/or SO<sub>x</sub> emissions do not exceed the amount of RTCs available in their allocation account. Under this program, AQMD gives RECLAIM facilities the responsibility to decide which method of compliance is appropriate for meeting their facility-wide NO<sub>x</sub> and/or SO<sub>x</sub> emissions "budget." When the Governing Board (Board) adopted the RECLAIM program, the Board anticipated that the program would encourage RECLAIM facilities to embark upon innovative ideas in the areas of process change, adding new control equipment and replacing or refurbishing equipment with state-of-the-art technology to reduce emissions. Alternatively, RECLAIM facilities may purchase credits from other RECLAIM facilities that reduce emissions below their allocations.

***What are the main benefits of RECLAIM?***

RECLAIM allows each facility to determine for itself the most cost-effective approach to reduce emissions, including purchasing RTCs from other facilities. In a perfect scenario, RECLAIM facilities would target sources that are the most cost-effective to control, and introduce excess credits to the market at a reasonable price. This way, the cost of emissions control can be shared among facilities. Under this program, facilities have more flexibility in meeting emission reductions goals instead of following the prescribed reductions called for under the replaced rules and measures. RECLAIM also provides more certainty in emissions reductions in that for the first time facility mass emissions are capped.

***Who are the participants in RECLAIM?***

RECLAIM applies to facilities emitting 4 tons or more per year of NOx and/or SOx in the year 1990 or any other subsequent year. However, the program excludes certain essential public services that remain under command-and-control (e.g. landfills, public transit, restaurant, fire fighting facilities, etc.) In total, there are 364 facilities under the RECLAIM program today.

***Do RECLAIM facilities have to comply with the Best Available Control Technology (BACT) for new and modified equipment?***

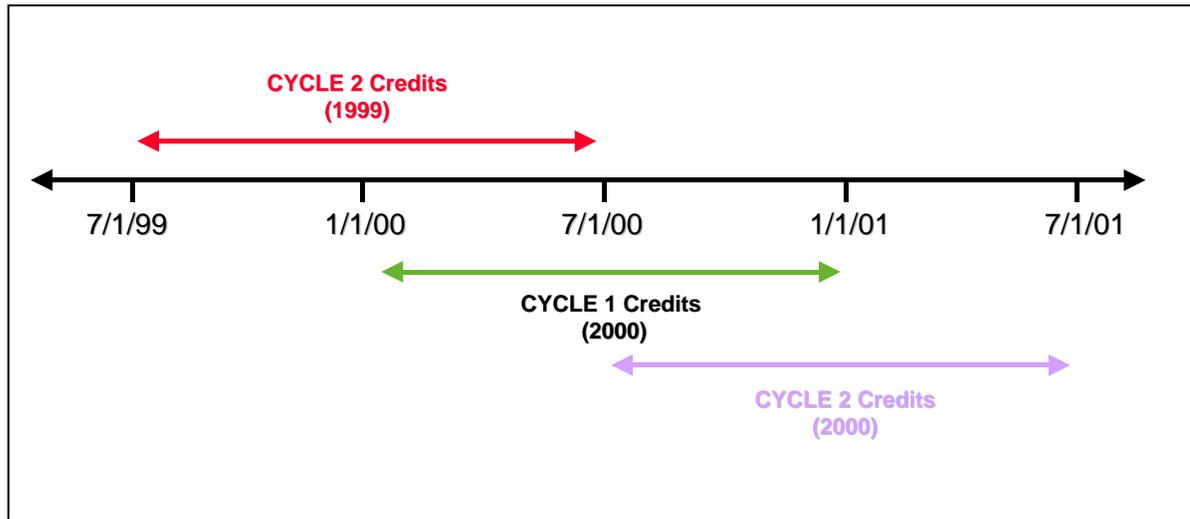
As required by the federal Clean Air Act, District rules required that installation of new equipment or modification of existing equipment that may cause an increase in emissions be installed with the BACT. BACT is determined on a case-by-case basis based on the lowest emission rates achieved in practice for the same type of equipment. Additionally, increased in emissions must be offset to the full extent. Under RECLAIM, new or modified equipment would only need to provide offsets at a 1:1 ratio prior to the start of operation. Under command-and-control, offsets must be provided at the 1.2 to 1 ratio prior to the issuance of the permit.

***How is the trading cycle structured?***

Facilities in RECLAIM are divided into two cycles. Cycle 1 facilities will have a compliance year of January 1 to December 31 of each year, and Cycle 2 facilities will have a compliance year of July 1 to June 30 of each year. Facilities are randomly assigned to each cycle to balance emissions. The program was designed with two trading cycles in order to create a liquid market in the RECLAIM system, as well protecting RECLAIM participants from price swings caused by the fact that all credits are expiring at the same time. Consequently, two types of credits are available within a compliance year. Each type expires at different time. Participants in both cycles can

freely exchange credits. Figure 1.1 illustrates how a Cycle 1 facility can purchase Cycle 2 Compliance Year 1999 RTCs to offset emissions during the first six months of year 2000.

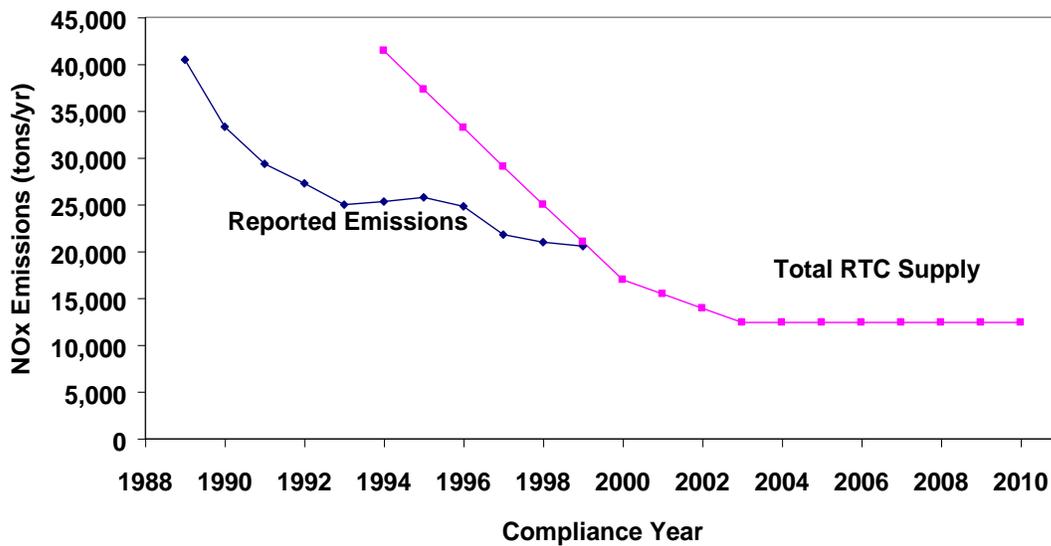
**Figure 1.1: Structure of RECLAIM Trading Cycles**



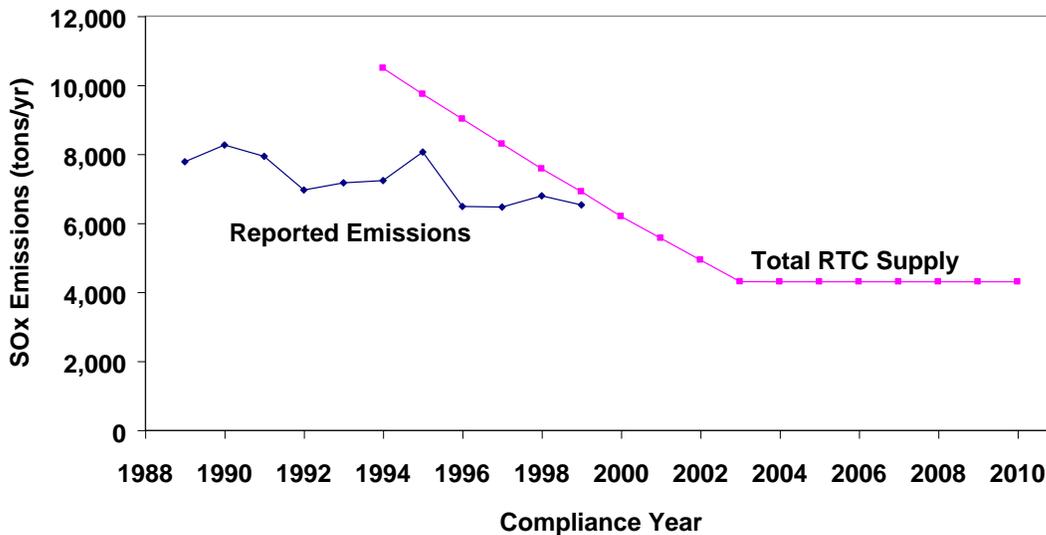
***Have emissions decreased under RECLAIM?***

Emissions under RECLAIM are presented in Figures 1.2 and 1.3 below. These figures show that emission goals for year 1994 through 1999 were met. Even though the region experienced economic growth, emissions have decreased and have not exceeded allocations. During the first five years of RECLAIM implementation (1994-1998), excess RTCs were available in the market through facility shutdown, relocation outside the AQMD jurisdiction, improved housekeeping, and improved process efficiency. These RTCs were available at a much lower cost than the installation cost of control equipment. However, the rate of actual reduction in emissions has not kept up with the rate of reduction in allocations. The imbalance of the two rates of reduction caused emissions to approach the level of allocation, especially for NOx emissions, in 1999. Figures 1.2 and 1.3 below show comparisons of actual emissions versus RECLAIM allocations for NOx and SOx respectively.

**Figure 1.2: RECLAIM NOx Emissions and RTC Supply (tons/year)**



**Figure 1.3: RECLAIM SOx Emissions and RTC Supply (tons/year)**

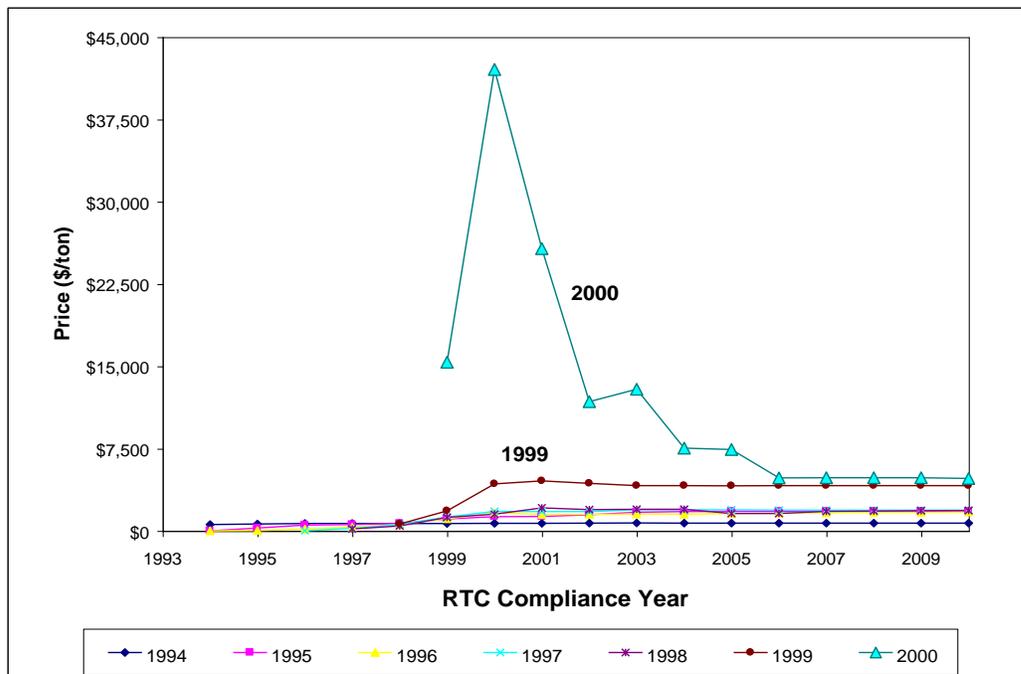


***What led to the development of this White Paper?***

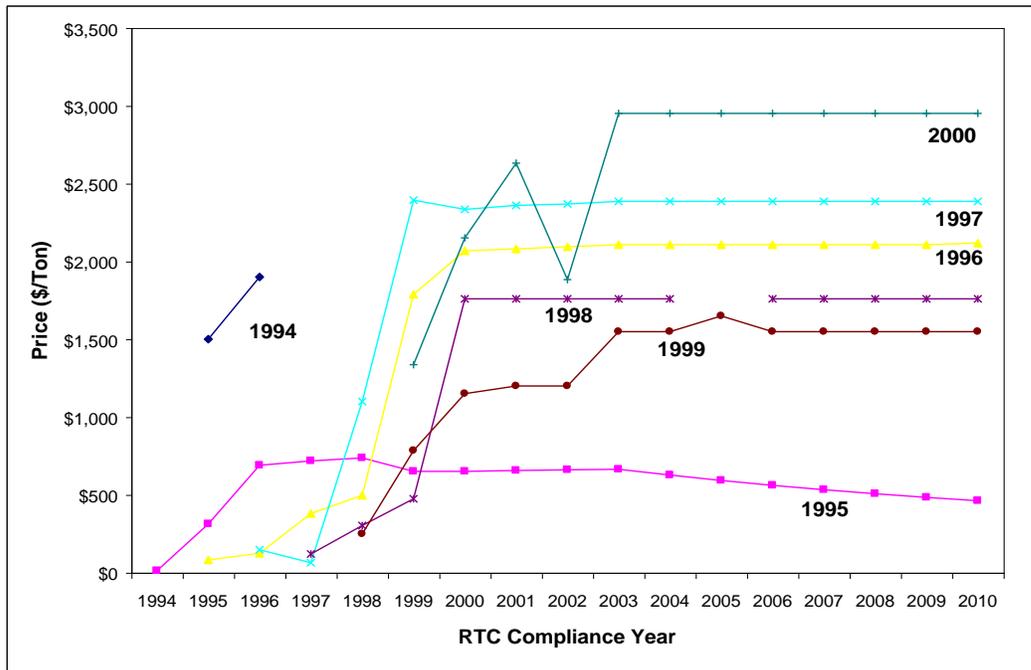
Since the adoption of RECLAIM, an active trading market has developed for both NOx and SOx RTCs. During the early years of the RECLAIM program, RTCs could be obtained at a very low price. Therefore, many RECLAIM operators relied on purchasing

credits rather than making investments in air pollution control equipment. The average price per ton of SOx RTCs from 1996 to 2000 remains relatively stable, ranging from \$1,500 to \$3,000. However, the price of NOx RTCs increased dramatically in 2000. Beginning in June 2000, RECLAIM program participants experienced a sharp and sudden increase in NOx RTC prices for both 1999 and 2000 compliance years sold during the second half of that year. The average price of 1999 NOx RTCs traded in 2000 was \$15,377 per ton, which was almost ten times higher than the average price of \$1,827 per ton of NOx RTCs traded in 1999 for the same compliance year. More significantly, the average price for NOx RTCs for compliance year 2000, traded during the first ten months in 2000, increased sharply to over \$45,000 per ton compared to the average price of \$4,284 per ton traded in 1999. Figures 1.4 and 1.5 show the RTC prices for NOx and SOx traded in 2000 relative to the earlier years in RECLAIM. The increase in RTC price for NOx parallels quite closely to the reaching of the crossover point where emissions equal allocations as shown in Figure 1.2.

**Figure 1.4: Average NOx RTC Prices**



**Figure 1.5: Average SOx RTC Prices**



As part of the RECLAIM rules, backstop provisions were included into the program design under Rule 2015 – Backstop Provisions. Rule 2015 (b)(6) requires the Executive Officer to submit an evaluation and review of the compliance and enforcement aspects of the RECLAIM program to the California Air Resources Board (CARB) and the U.S. Environmental Protection Agency (EPA). This evaluation must be submitted within six months of the determination that the average RTC price has exceeded \$15,000 per ton. Additionally, Rule 2015 (d) requires the Executive Officer, upon discovery, to propose that the Governing Board amend the program as appropriate to address any specific problems.

One factor that appears to contribute significantly to the price increase is the high demand for NOx RTCs from the utility sector during the year 2000. During this period the utility sector purchased 60 percent of NOx RTCs which expired in June 2000 and 67 percent of NOx RTCs expiring in December 2000. Such high demand from the utility sector quickly depleted the supply of available NOx RTCs in the market, resulting in the sharp increase in the NOx RTC prices.

This White Paper presents the issues associated with the recent increases in NOx RTC prices and discusses possible approaches to stabilize RTC price and meet air quality objectives.

***Who provided input in the development of this White Paper?***

At the direction of the Governing Board, the Executive Officer formed an Advisory Committee to provide input to staff regarding possible approaches to stabilize NOx RTC prices. The Committee membership was open to all individuals who wished to attend. As a result, the committee represents a diverse group of organizations and consisted of representatives of several RECLAIM facilities, trade organizations, market commodities trading organizations, environmental groups, CARB, EPA, California Energy Commission (CEC), AQMD, and any other individuals who expressed interest in participating in the committee. The Committee met three times between November 2000 and January 2001 to discuss various options to stabilize NOx RTC prices while complying with the emissions reduction goals established under RECLAIM. The input from this committee was very important in the preparation of the staff's analysis and recommendations. However, the views expressed herein are strictly those of the AQMD staff.

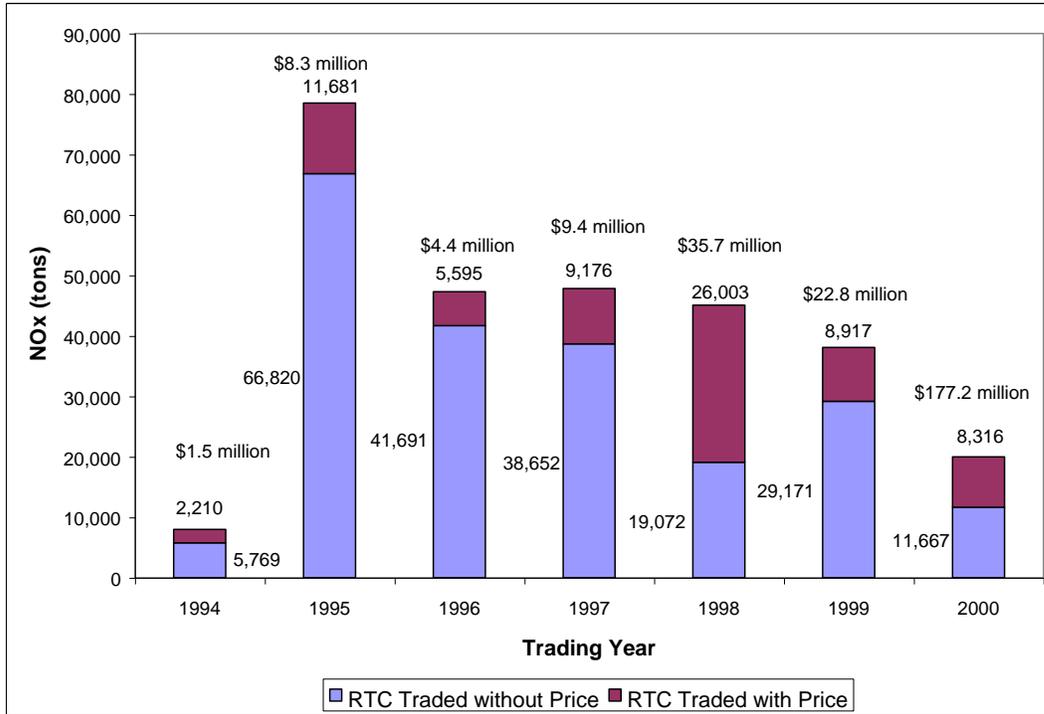
## **C** HAPTER 2: RTC MARKET

RECLAIM was developed under the premise that a market-based program can achieve equivalent or greater reductions in emissions at a lesser cost than the command-and-control approach. An effective market is an integral element for realizing the economic advantages of the trading system because it allows minimization of air pollution abatement costs to occur between various facilities. To facilitate trades and keep transaction costs low, the RECLAIM trading market was kept as simple as possible. During the development of the RECLAIM rules, there were debates over the role that government should or should not take in the marketplace. In the end, the program was kept simple, with the knowledge that if needed, the rules could be modified at a later date.

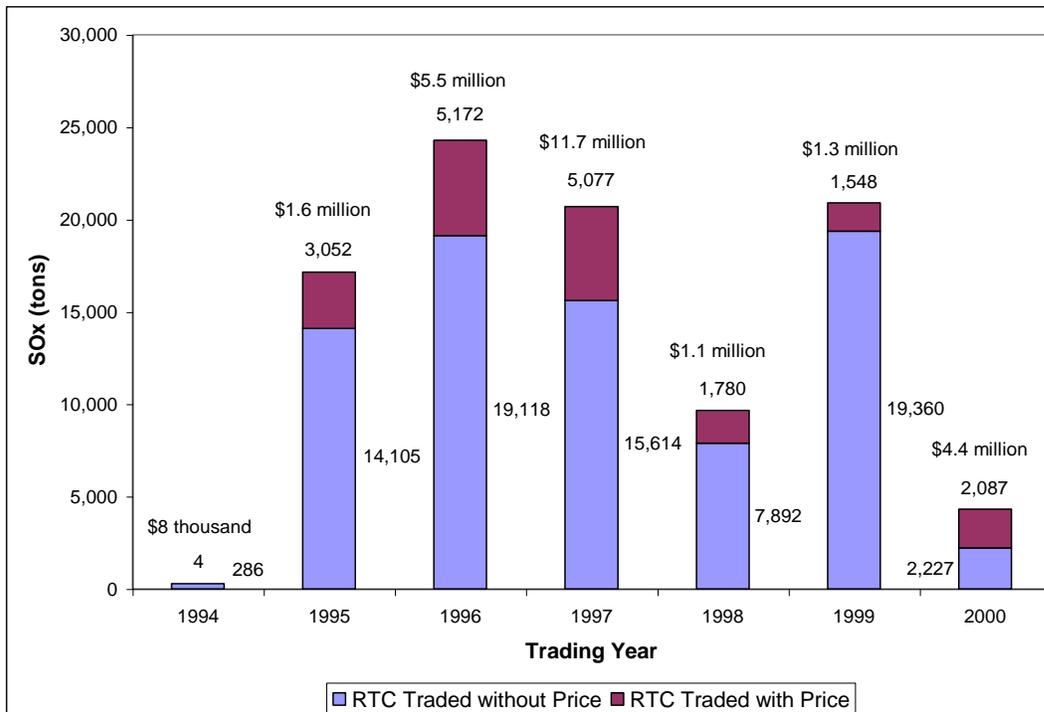
### ***Has the RTC market been active?***

An active credit trading market has developed since the adoption of RECLAIM. A large volume of NO<sub>x</sub> RTCs was traded each year since program adoption. Transactions occur both with and without price. Transactions without price generally reflect the movements of credits between various facilities within a company or the transfers of credits between sellers and brokers. Transactions with price usually reflect the cost of credits negotiated between various RECLAIM facilities. RECLAIM participants have utilized the RTC market as a means to comply with their allocations. This is evidenced by the fact that more than \$253 million of NO<sub>x</sub> RTCs and more than \$25 million of SO<sub>x</sub> RTCs have been traded in this market to date. Figures 2.1 and 2.2 show the annual NO<sub>x</sub> and SO<sub>x</sub> trade volumes since the start of RECLAIM.

**Figure 2.1: Annual NOx RTC Trade Volumes and Prices**



**Figure 2.2: Annual SOx RTC Trade Volumes and Prices**



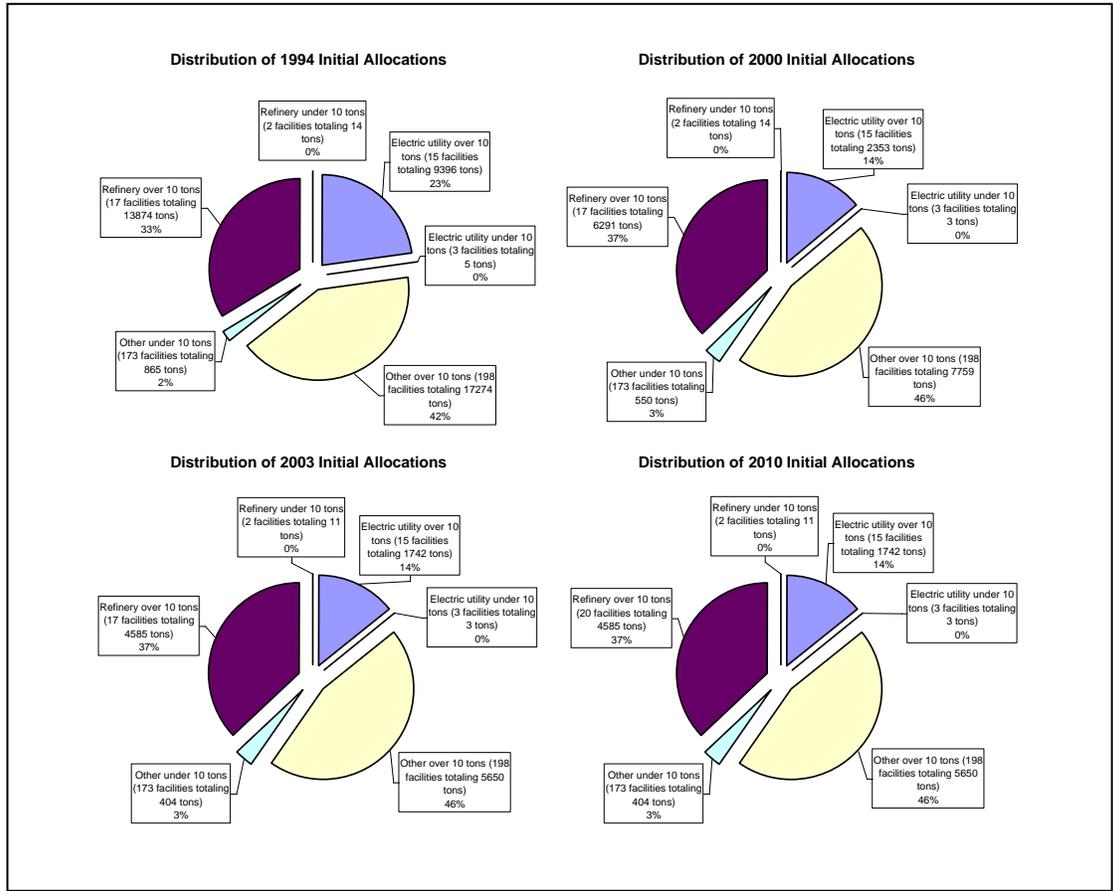
***How were NOx RTCs allocated at the start of RECLAIM?***

As illustrated in Table 2.1 and Figure 2.3, at the start of RECLAIM in 1994, facilities were given NOx allocations based on historic levels. Over time, allocations are reduced to 2003 AQMD control levels. Different industries have different rates of reduction, based on the rules and AQMP control measures for that industry that were replaced by RECLAIM. From the beginning, power plants and refineries have made up a significant share of the market. Refineries and power plants were given NOx allowances, based on historical emissions, totaling 23,289 tons. This amount of emission allowance represents more than 56 percent of overall RECLAIM NOx allocations. The NOx RTC allowance for power plants is reduced 81 percent by 2003, while the NOx RTC allowance for refineries is reduced 67 percent by 2003. The combined RTC allowance for these two industries in 2003 is 6,340 tons (1,744 tons for power plants and 4,596 tons for refineries) compared to 6,055 tons of NOx allowance provided for other industries. The rates of reduction for each industry correspond to the rates of reductions required by the subsumed command-and-control rules and 1991 AQMP control measures. However, it should be noted that, based on the actual emissions reported for 1994 from the power plants and refineries, they will need to reduce only 67 percent and 48 percent of their actual emissions, respectively, to comply with their 2003 allocations.

**Table 2.1: Comparison of Required Emission Reductions for Various Industries**

	Initial Allocations (tons)		Reduction in Allocations	Emissions in 1994 (tons)	Reduction based on Emission
	1994	2003			
Utility	9,401	1,744	81%	5,306	67%
Refinery	13,888	4,596	67%	8,914	48%
Other	18,139	6,055	67%	11,094	45%

**Figure 2.3: Initial Allocation of NOx RTCs**

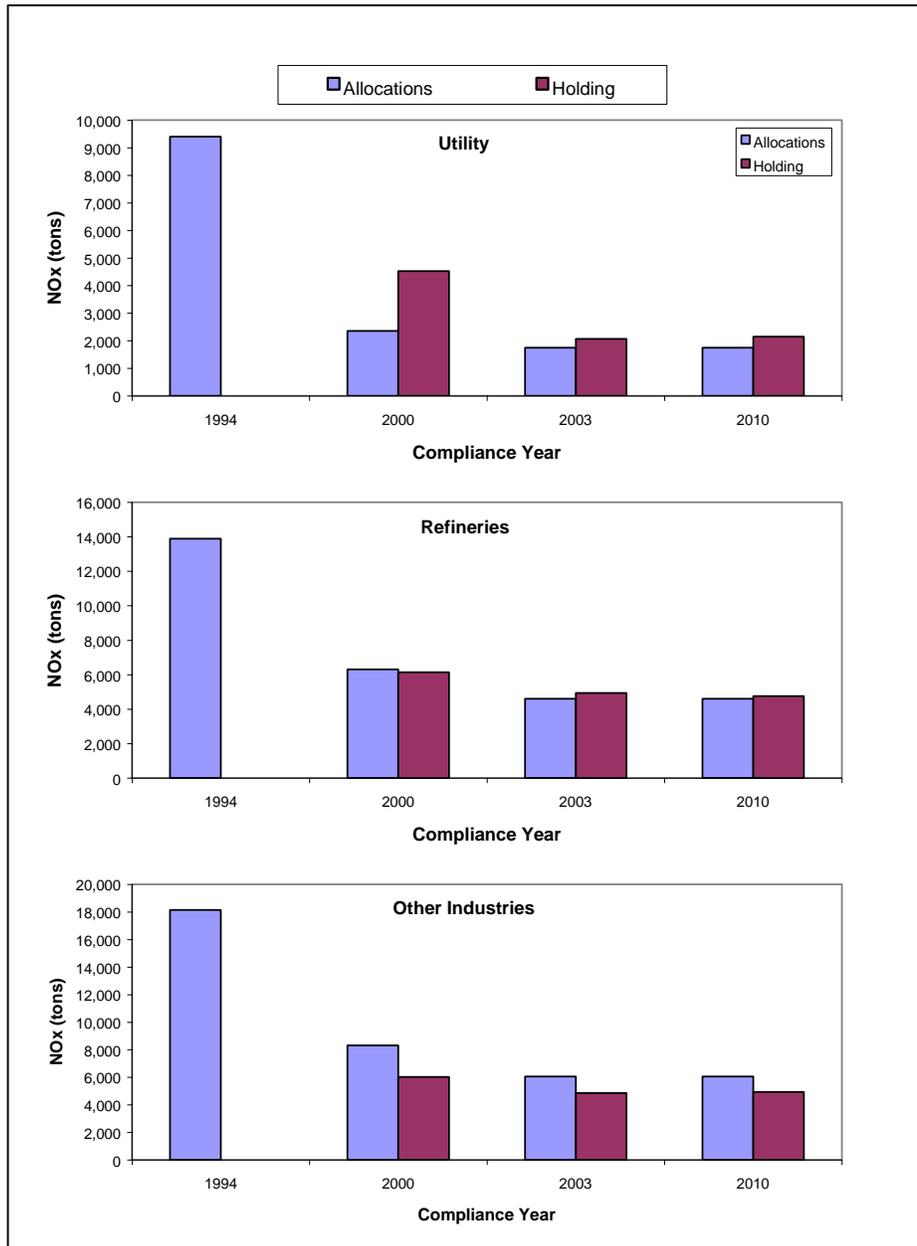


***How did RECLAIM facilities comply with allocations?***

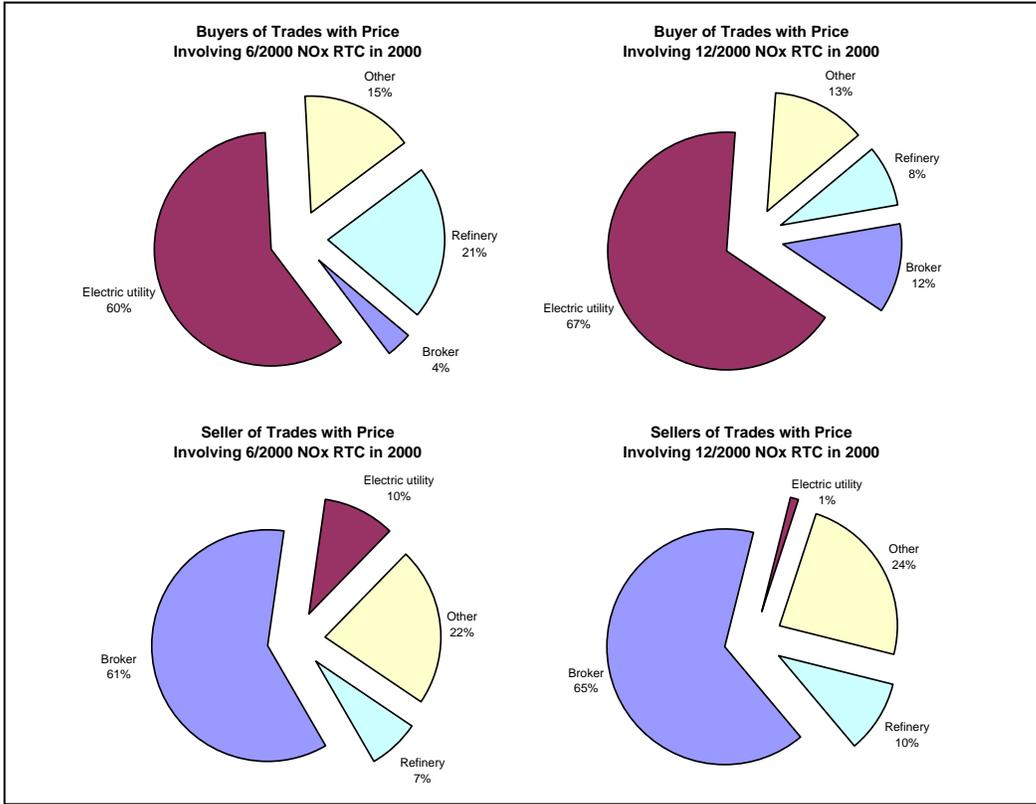
As discussed earlier, many RECLAIM facilities relied on the RTC trading market as a means to comply with NOx emission limits for their facilities. A large quantity of credits sold in the market in the earlier years involved shutdown of smaller refineries, oil fields and other industries. Some RTCs sold in the market were made available as a result of process change and installation of control equipment. Sellers of credits include small refineries, oil fields, glass manufacturing facilities, cement plants, etc. Buyers of credits are mainly power plants and refineries. However, due to the drastic increase in the price of NOx RTCs recently, a number of power plants, refineries and other industries have proposed to install air pollution control systems. The types of control equipment proposed include Selective Catalytic Reduction systems (SCR), Non-Selective Catalytic Reduction (NSCR), SCONOX, ultra low NOx burners, low NOx burners, steam injection and combustion modification.

Figure 2.4 shows the amount of NOx RTCs held by various industries in 2000, 2003, and 2010 compared to the amount of credits initially allocated to these industries. The data show that utilities and refineries held more NOx credits in the future years due to purchases than the amount originally allocated. There are significant trade activities in the year 2000, 19,983 tons of NOx traded (8,316 tons were traded with transaction price) at the cost totaling \$177.2 million. Figure 2.5 shows the distribution of NOx credits purchased by various industries during this calendar year. Overall, power plants are the major purchaser of NOx credits, as a group they purchased 11.4 million pounds (8.9 million with transaction price) of credits presenting 62 percent of all NOx credits purchased. The total value of NOx credits purchased by power plants was \$111.7 million. Refineries are the other major buyers of NOx credits. In the year 2000, this industry purchased 8.8 million pounds (3.5 million with transaction price) of NOx credits at a total cost of \$22.2 million.

**Figure 2.4: Comparisons Between RTCs Initially Allocated and RTCs Currently Held**



**Figure 2.5: Buyers and Sellers of RTCs in the Year 2000**



***How will future growth be supported under RECLAIM?***

Similar to the command-and-control program, growth for facilities in the RECLAIM market is designed to be supported by RTCs made available through shutdown of facilities or equipment, installation of new control technologies, improved process efficiency, and mobile and area source emission reductions. Additionally, mobile source and area source credits are also designed to facilitate the increased demands for RTCs. AQMD is actively working with both CARB and EPA to obtain their approval for both mobile source and area source credits rules. NOx RTCs converted from mobile and area source credits to date are listed in Table 2.2.

**Table 2.2: RTCs Converted from Mobile and Area Source Credits**

Year	Amount (tons)	Source of Credits
1994	33	Mobile Source Credits (Rule 1610 - Old Vehicle Scrapping)
1995	36	Mobile Source Credits (Rule 1610 - Old Vehicle Scrapping)
1996	36	Mobile Source Credits (Rule 1610 - Old Vehicle Scrapping)
1997	4	Mobile Source Credits (Rule 1610 - Old Vehicle Scrapping)
1999	50	Mobile Source Credits (Rule 1612 - Credits for Clean On-Road Vehicles)
2000	150	Mobile Source Credits (Rule 1612 - Credits for Clean On-Road Vehicles)
2000	68	Area Source Credits (Rule 2506 - Area Source Credits for NOx and SOx)
2001	10	Mobile Source Credits (Rule 1612 - Credits for Clean On-Road Vehicles)
2001	68	Area Source Credits (Rule 2506 - Area Source Credits for NOx and SOx)
2002	68	Area Source Credits (Rule 2506 - Area Source Credits for NOx and SOx)

***Has the NOx RTC market behaved according to supply and demand?***

NOx RTC prices have responded according to supply and demand. As illustrated in Figure 1.2 in the previous chapter, RECLAIM NOx Emissions and RTC Supply, emissions (or demand on RTCs) were much lower than the available credits in the initial years of RECLAIM. Correspondingly, prices for current RTCs in years 1994 through 1997 stayed under \$500 per ton. Beginning in 1998, as emissions started to approach

the allocation line, the prices started to rise as the supply of excess RTCs dwindled. As illustrated by Figure 1.4, the rise in NOx RTC prices was even more noticeable in 1999. Therefore, the NOx RTC market has behaved as expected according to the laws of supply and demand (i.e. prices were low when supply exceeded demand and prices started to climb as demand increased).

A factor that appears to contribute significantly to the price increase in 2000 is the high demand for RTCs from the power plants. Figure 2.5 shows the amount of 1999 RTCs (Cycle 2) and 2000 RTCs (Cycle 1) purchased and sold in 2000 by the utility, refinery, and other manufacturing sectors. The demand exceeded the available supply of RTCs and resulted in the sharp price increase.

On the other hand, there was no such high demand in the SOx market from the utility sector since it is not a participant in the SOx market. The annual average price of SOx RTCs remained relatively stable as shown in Figure 1.5 and continued to remain well below the backstop threshold price of \$15,000 per ton established under Rule 2015.



## CHAPTER 3: RTC SUPPLY AND DEMAND ANALYSIS

An initial supply of NOx RTCs was allocated at the beginning of the RECLAIM program for all program participants at no cost. Each unit of RTC is equal to a pound of NOx emissions and is valid for one year. The amount of RTCs provided to each RECLAIM facility was determined based on historical production rates multiplied by applicable emission rates for the type of equipment at each specific RECLAIM facility. To prevent facilities from being locked into the generally lower production rates due to the severe economic recession facing Southern California at that time, the program design allowed the use of peak production rates before recession in determining allocations. This action provided industries an ability to grow back to the production level prior to the recession with corresponding decreases in emission rates at each facility. In determining future year allocations, AQMD had taken into account the existing regulations of the federal and California Clean Air Acts. To realize the emission reduction rates required by federal and state laws, RECLAIM followed the emission reduction targets contained in the 1991 Air Quality Management Plan (AQMP). To meet this goal, RECLAIM facilities must reduce their demand for credits by installing air pollution control equipment at their facilities to reduce emission rates. By allowing RECLAIM companies the flexibility to design their own emission control strategies, they were allowed to implement the most cost effective approach on their site-specific basis. This approach results in a lower overall compliance cost for facilities than implementing command-and-control regulations which, by their nature, cannot be tailored on a facility-specific basis.

### ***Has supply of RTCs increased since program adoption?***

Since the adoption of RECLAIM, the supply of NOx RTCs in the RECLAIM market has increased. The increase in NOx RTCs ranged from 7 percent of overall market supply for compliance year 1994 to 23 percent for compliance year 2000. The increase in NOx RTC supply is from the following activities:

- Conversion of NOx Emission Reduction Credits (ERCs) as allowed by program rules during the first six months of the program.
- Reevaluation of ending emission factors for certain industries as required under Rule 2015.
- Clean Fuel adjustments for the production of CARB Phase II Reformulated Gasoline at local refineries.
- Adjustments of allocations using more accurate information.
- Conversion of Mobile Source and Area Source Credits.

Table 3.1 shows the changes in the pool of RTC supply for years 1994, 2000, and 2003 in more detail.

**Table 3.1: Changes to RTC Supply After RECLAIM Program Adoption**

	1994 RTC (tons/yr)	2000 RTC (tons/yr)	2003 RTC (tons/yr)
Adjustment to Original Allocation with More Accurate Information	1683	310	263
Change of RECLAIM Universe (Inclusions and Exclusions)	-310	256	18
Conversion of Emission Reduction Credits (ERCs) During First Six Months of Program	1278	1278	913
Adjustment to Allocation due to Technology Review (Rule 2015)	0	1073	777
Clean Fuel Adjustment for Production of CARB Phase II Reformulated Gasoline	0	99	99
Conversion of Mobile Source (MSERCs) and Area Source Credits (ASCs)	33	219	0
<b>TOTAL</b>	<b>2683</b>	<b>3234</b>	<b>2070</b>
Percent Changes to Initial Allocation	7%	23%	20%

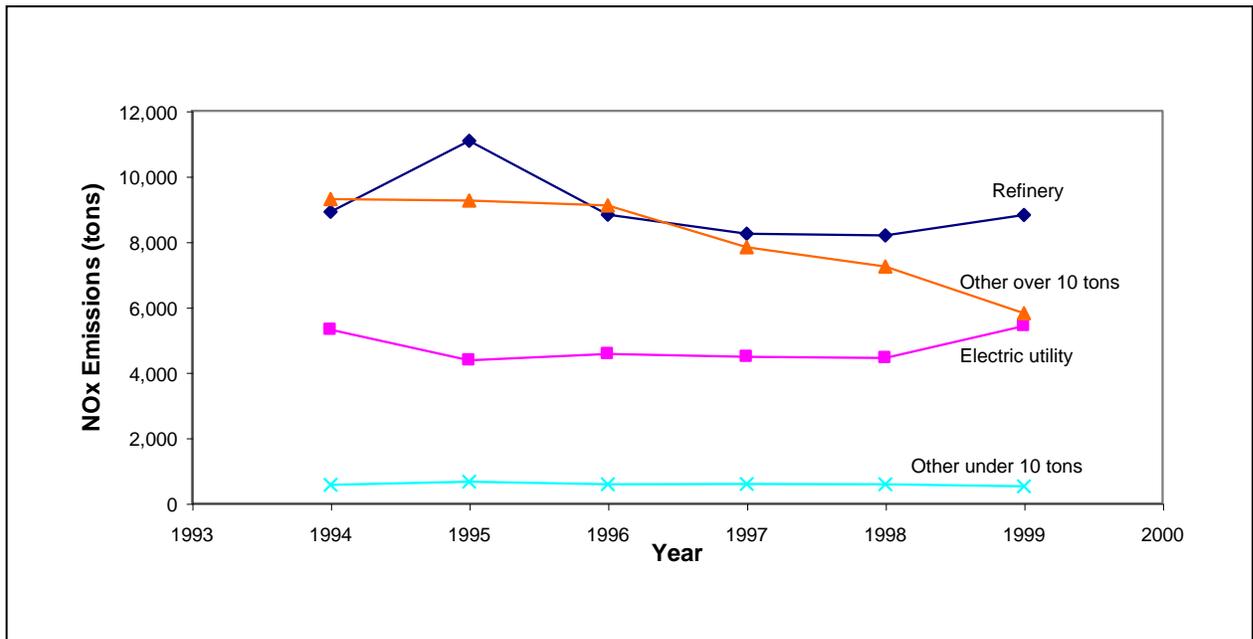
In addition to the credits listed in Table 3.1, the ERCs owned by RECLAIM facilities prior to the adoption of the RECLAIM program, were also allowed to be converted to RTC and added 1,183 tons to the allocation from 1994 to 2000. The amount of RTCs from this source gradually declined to 850 tons in 2003.

***What did RECLAIM facilities do to reduce demand for RTCs?***

As previously mentioned, the program was designed to comply with federal and state laws by reducing RTC supply over the years. Production rates prior to recession were used as the basis for determining initial allocations. Therefore, RECLAIM facilities can resume the pre-recession rates of production if they take the appropriate steps to reduce emissions. Many facilities have expanded and added new equipment. Although new

equipment is equipped with the Best Available Control Technologies (BACT) as required by AQMD rules, a large number of existing equipment units have not been retrofitted with reasonably available control equipment. Figure 3.1 shows emissions trends reported by various industries since program inception. By excluding facilities shutdown prior to 2000 from this evaluation, we see reductions occur only at facilities emitting 10 tons or more of NO<sub>x</sub> at the start of RECLAIM. In fact both refineries and utilities are showing an increased emission trend.

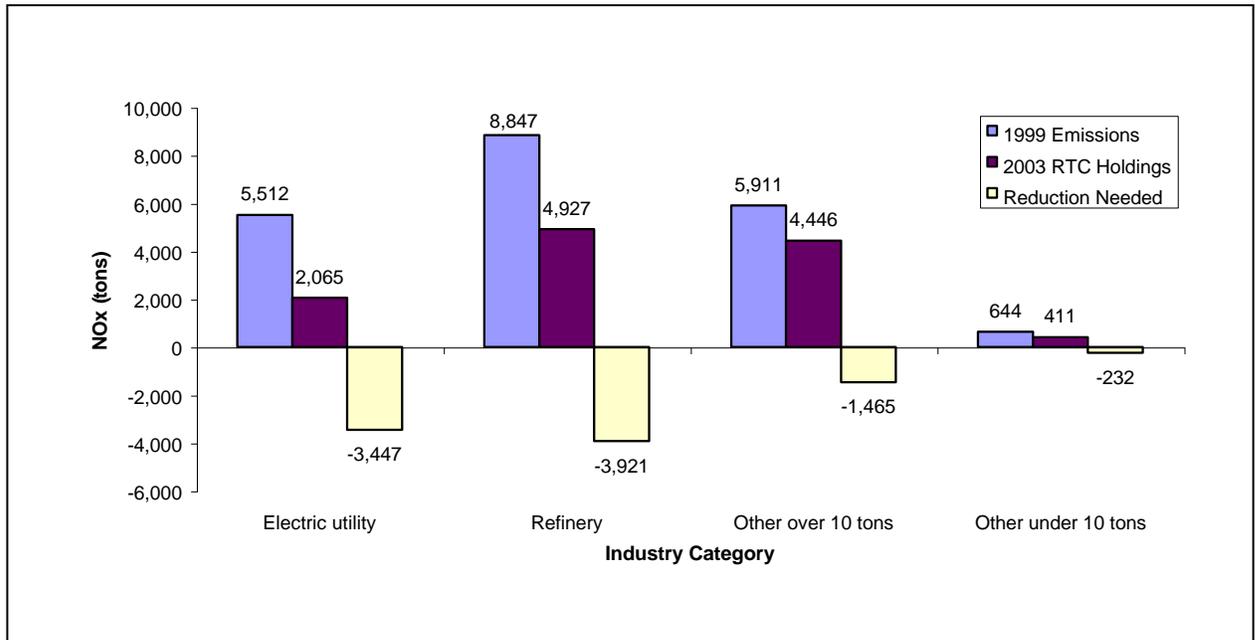
**Figure 3.1: Emission Trends Reported by Operating RECLAIM Facilities**



***How much emission reduction must be achieved to meet 2003 emission targets?***

To fully assess the RTC supply and demand, Figure 3.2 compares the reported emissions in Compliance Year 1999 to NO<sub>x</sub> RTCs held by RECLAIM facilities in Compliance Year 2003 by each industry category. If no additional RTC supply is added to the market, and the production level remains at the 1999 level, a 41 percent overall emissions reduction must be achieved by all RECLAIM facilities by 2003. Looking at each industrial sector, the NO<sub>x</sub> emission reductions that must be achieved by each type of industry ranged from 25 percent to 63 percent as shown in Table 3.2. Currently, non-RECLAIM entities (e.g. brokers, etc.) hold approximately 546 tons of NO<sub>x</sub> RTCs for Compliance Year 2003.

**Figure 3.2: 1999 NOx Emissions and 2003 NOx Allocations**



**Table 3.2: Emission Reductions to be Achieved to Comply with 2003 RTC Holdings at 1999 Production Level**

Industry	Emissions Based on 1999 Production Levels (tons)	2003 RTC Holdings (tons)	Reduction from 1999 Production to 2003 Holdings
Electric utility	5,512	2,065	63%
Refinery	8,847	4,927	44%
Other over 10 tons	5,911	4,446	25%
Other under 10 tons	644	411	36%
RTCs held by Non-RECLAIM facilities	NA	546	NA
All Categories	20,914	12,396	41%

***Have there been recent proposals for emission reduction projects?***

A number of air pollution control projects were proposed and some projects were permitted in 2000 as shown in the Table 3.3 below. Of the total proposed 66 projects, 37 projects were implemented in 2000 and the remaining 29 projects are expected to be

in operation in 2001. It is estimated that these projects will reduce NOx RTCs demands (assuming 1999 production level) by 1,100 tons in 2001 and 3,880 tons in 2002 and beyond.

**Table 3.3: Emission Reductions from Proposed Projects**

Number of Projects	Process Equipment	Control Technology	Expected Reductions (tons/yr) Based on 1999 Reported Emissions	Expected Year of Operation
3	Oven	Concentration Limit Change	1.7	2000
9	Kiln	Concentration Limit Change	4.7	2000
10	Heater	Low NOx Burner	260.3	2000
4	Furnace	Concentration Limit Change	0.9	2000
1	CO Boiler	Combustion Modification	386.0	2000
3	Boiler	Low NOx Burner	0.5	2000
1	Gas Turbine	Selective Catalytic Reduction	N/A	2000
1	I.C. Engines	Concentration Limit Change	N/A	2000
4	Furnace	Concentration Limit Change	N/A	2000
1	FCCU	Selective Catalytic Reduction	440	2000
17	Utility Boiler	Selective Catalytic Reduction	2,670	2001
1	Heater	Low NOx Burner	85.7	2001
3	IC Engine	Staged Combustion	28.8	2001
1	Heater	Low NOx Burner	N/A	2001
1	Heater	Selective Catalytic Reduction	N/A	2001
2	Heater	Steam Injection	N/A	2001
4	IC Engine	Non-selective Catalytic Reduction	N/A	2001

***Are there any proposed projects that may create significant demands for NOx RTC in the future?***

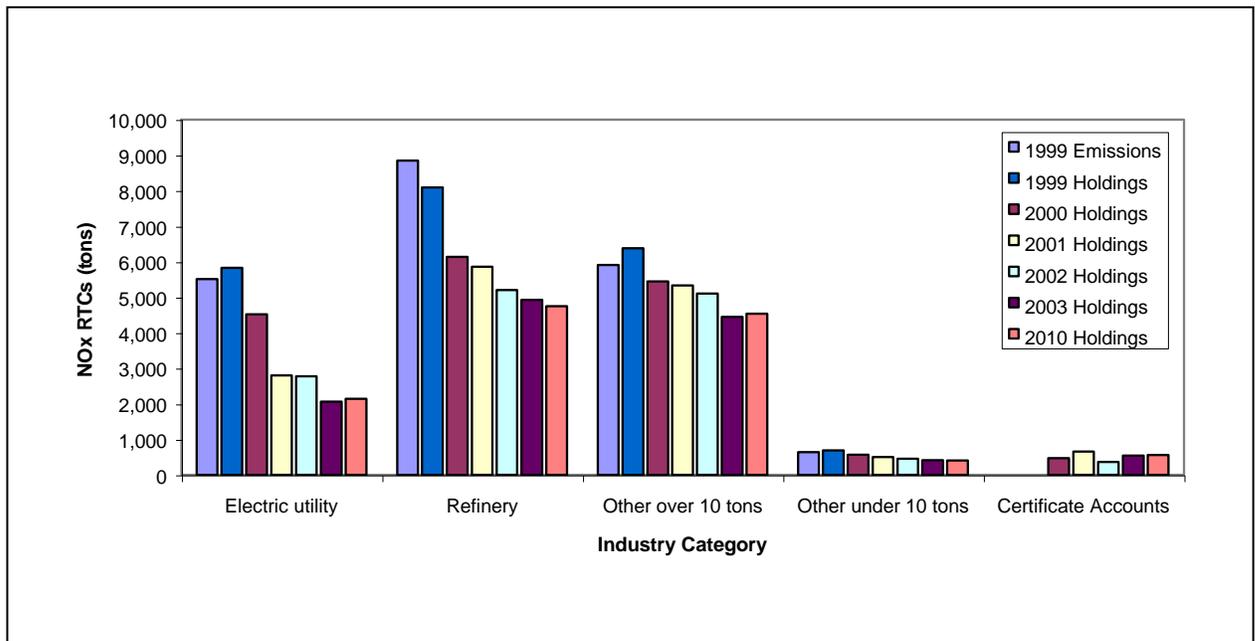
Currently there are two new proposed large power plant projects in the South Coast Air Basin. These projects are larger than 50 Megawatts. Staff anticipates that these units will generate additional electricity rather than replace the existing power generation of the current older high emission units. In addition, a power generation facility is proposing to retool two retired boilers and install BACT to generate more power to meet

the anticipated increase in power consumption. These projects, if operated at maximum capacity, may add approximately 520 tons per year of additional NOx RTC demand in the RECLAIM program starting in 2002. However, increased power production is influenced by many factors including increased consumption, reduction of imported power, siting of new power plants outside the South Coast Air Basin, and the economies of generating power for export out of state. Therefore, increases in NOx RTC demands cannot be predicted with certainty.

***What is the outlook for NOx RTC availability considering emission reduction projects known to AQMD?***

Figure 3.3 compares current RTC holdings for various industries with projected emissions assuming 1999 production rates. Table 3.4 also listed in more detail the needed NOx RTC reduction necessary to comply with allocation on a year-by-year basis. If we assume that the production rates remain at the 1999 emission level, NOx emissions must be reduced from the 1999 level by 28 percent, 34 percent, and 41 percent to maintain compliance with 2001, 2002 and 2003 allocations, respectively. If the emission reduction projects and new power generation facilities known to AQMD are taken into the account, the rates of reductions become 28 percent, 32 percent, and 29 percent for 2001, 2002, and 2003, respectively.

**Figure 3.3: Comparison of 1999 Emissions to Current Holdings by Industry**



**Table 3.4: Comparison of emissions based on 1999 production levels to RTC holdings (tons per year) and percent reduction required in each year.**

Industry Category	1999 Emissions	2001 RTC Holdings	2002 RTC Holdings	2003 RTC Holdings	Reduction in 2001	Reduction in 2002	Reduction in 2003
Electric utility	5,512	2,798	2,777	2,065	43%	50%	63%
Refinery	8,847	5,861	5,203	4,927	34%	41%	44%
Other over 10 tons	5,911	5,335	5,106	4,446	10%	14%	25%
Other under 10 tons	644	501	458	411	22%	29%	36%
RTCs held by non-RECLAIM facilities	NA	656	362	546			NA
Comparison of 1999 Emissions to RTC holdings	20,914	15,151	13,906	12,396	28%	34%	41%
Estimated NOx reduction from known projects		0	1,100	3,880			
Emissions from New electric facilities	0	0	520	520			
Expected emissions with known reductions incorporated	20,914	20,914	20,334	17,554	28%	32%	29%

It should be noted that the RTCs hold by RECLAIM entities for the year 2001 is more than sufficient to offset any emission shortfalls at facilities other than refineries and power plants.

***Are cost-effective emission control technologies available?***

When the Governing Board ratified findings required by Health and Safety Code Section 39616 (e) pertaining to the RECLAIM program on October 20, 2000, staff prepared a technical report addressing various issues regarding the program. One of the issues discussed in the report was the cost of installing air pollution control equipment, and staff concluded that there are several existing control technologies that can cost-effectively reduce NOx emissions. In addition, AQMD staff also identified emerging technologies that have been recently identified as BACT or Reasonably Available Control Technology (RACT). These technologies are listed in Table 3.5 and Table 3.6 below.

**Table 3.5: Possible Reductions in Emissions (Preliminary Estimates Using Known Technologies)**

Source Type	Achievable Technology	Achievable Level	Achievable Reductions (tons/day)
Utility Boilers	Selective catalytic reduction	0.01 lb/mmBtu (~ 8 ppm)	10.17
Boilers > 40 mmBtu (refineries)	Ultra Low NOx burners	9 ppm	2.19
Boilers >= 20 mmBtu (except refinery heaters > 40 mmBtu)	Ultra Low NOx burners	9 ppm	0.48
Boilers < 20 mmBtu	Ultra Low NOx burners	12 ppm	0.26
Process heaters > 40 mmBtu (refineries)	Low NOx burners	0.03 lb/mmBtu (~ 25 ppm)	5.68
Process heaters > 2 mmBtu (except refinery heaters > 40 mmBtu)	Low NOx burners	33 ppm	0.28
Gas turbines	Selective catalytic reduction	9 ppm	3.77
Diesel ICEs	Selective catalytic reduction	44 ppm	1.41
Natural gas ICEs	3-Way Catalyst	24-27 ppm	1.53
		Total:	25.77

**Table 3.6: Further Control Opportunities**

Source Type	Control Technology*	Control Emission Level
Utility Boiler	SCR	5 ppmv at 3% O <sub>2</sub>
Boilers > 20 mmBtu	SCR	7 ppmv at 3% O <sub>2</sub>
Boilers < 20 mmBtu	ULNB	9 ppmv at 3% O <sub>2</sub>
Boilers	SCONOX	2+ ppmv at 3% O <sub>2</sub>
Boilers	LTO	5-7 ppmv at 3% O <sub>2</sub>
Process Heaters > 40 mmBtu (refineries)	SCR	5 ppmv at 3% O <sub>2</sub>
Process Heaters > 40 mmBtu (refineries)	LNB	18 ppmv at 3% O <sub>2</sub>
Gas Turbines	SCONOX	1 ppmv at 15% O <sub>2</sub>
Gas Turbines	XONON	2.5 ppmv at 15% O <sub>2</sub>
Gas Turbines	SCR	3 ppmv at 15% O <sub>2</sub>
ICE, Diesel	NOx TEC	33 ppmv at 15% O <sub>2</sub>
ICE, Natural Gas	NSCR	11 ppmv at 15% O <sub>2</sub>
Dryer	ULNB	10 ppmv at 3% O <sub>2</sub>
Dryer	LNB	30 ppmv at 3% O <sub>2</sub>
Oven	LNB	30 ppmv at 3% O <sub>2</sub>
Furnace	LNB	40 ppmv at 3% O <sub>2</sub>
Furnace, metal melting	Oxy-fuel	9 ppmv at 3% O <sub>2</sub>
Afterburner	LNB	30 ppmv at 3% O <sub>2</sub>

\*SCR = Selective Catalytic Reduction

ULNB = ultra low NOx burner

LTO = low temperature oxidation

NSCR = non-selective catalytic reduction

Oxy-fuel = enriched oxygen fuel combustion

In the October 20, 2000 report, staff made an effort to determine the cost-effectiveness of installing control equipment at RECLAIM facilities. As a result, staff conducted a case study to determine how much it will cost to reduce NOx emissions by 12.5 tons per day (4562.5 tons per year) from year 2000 allocation level to year 2003 allocation level. The case study showed that control equipment will need to be installed on about 120 NOx emitting equipment units. The estimated annualized cost of control equipment is \$14.9 million. This study yielded an overall cost-effectiveness of \$3,300/ ton of NOx reduced. The report also indicated that if all NOx-emitting equipment in the categories identified can be controlled to a full extent, approximately 26 tons per day (9,490 tons per year) can be reduced. However, it is possible that when the NOx emitting equipment is examined on a case-by-case basis there will be some situations where installation of a control technology is not technically feasible. A general listing of the cost analysis under this case study is shown in Table 3.7. However, it should be noted that the 1999 emission level is higher than the year 2000 allocation. To comply with year 2003

allocation level, 23.3 tons/day (8,518 tons per year) of NOx emissions must be reduced from the 1999 emission level.

**Table 3.7: Achievable NOx Emissions Reductions and Annualized Cost Equipment Type**

Source Type	Achievable Reductions (tons/day)	Needed Reductions (tons/day)	Units Required	Total Annualized Cost
Utility Boilers	10.17	4.93	7	\$8,100,000
Boilers > 40 mmBtu/hr (refineries)	2.19	1.06	5	\$400,000
Boilers >= 20 mmBtu/hr (except refinery heaters > 40 mmBtu/hr)	0.48	0.23	23	\$1,400,000
Boilers < 20 mmBtu/hr	0.26	0.13	48	\$1,100,000
Process heaters > 40 mmBtu/hr (refineries)	5.68	2.76	12	\$900,000
Process heaters > 2 mmBtu/hr (except refinery heaters > 40 mmBtu/hr)	0.28	0.13	6	\$100,000
Gas turbines	3.77	1.83	5	\$2,400,000
Diesel ICEs	1.41	0.68	3	\$300,000
Natural gas ICEs	1.53	0.74	11	\$200,000
Total	25.77	12.49	120	\$14,900,000
Cost Effectiveness	$\$14,900,000 / (12.49 \text{ tons/day} \times 365 \text{ days/year})$ $= \$3,300 / \text{year}$			



## **HAPTER 4: NEAR-TERM AND LONG-TERM OPTIONS TO STABILIZE NO<sub>x</sub> RTC PRICES**

At the direction of the Governing Board on October 20, 2000, the AQMD's Executive Officer formed an Advisory Committee to discuss issues regarding the recent high cost of NO<sub>x</sub> RTCs. The Advisory Committee included more than 100 members representing RECLAIM facilities, various trade organizations, RTC brokers, three environmental organizations, and representatives from EPA, CARB, and CEC. The committee met three times between November 2000 and January 2001. Committee members made several suggestions on measures that AQMD can implement to stabilize NO<sub>x</sub> RTC prices. These suggestions include ideas to increase RTC supply as well as reduce the demand for RTCs. Implementation of some recommendations may have an impact on the program in the near term. Other recommendations have a delayed effect and will likely take a few years before the increase in RTC supply or the decrease in RTC demand would occur.

In addition to the discussions regarding RTC price stabilization, many committee members representing RECLAIM facilities expressed that they were most concerned regarding action that can be taken to resolve potential non-compliance issues facing them in 2000. A subcommittee of the group met twice and provided input on a number of options to be considered for short-term relief.

Near and long-term options suggested by any member of the committee or AQMD staff are summarized in this chapter in random order. Table 4.1 below lists these options.

**Table 4.1: Summary of Suggested Near-Term and Long-Term Options**

Option No.	Proposed Option
1	Obtain EPA and CARB Approval for Mobile Source and Area Source Credits.
2	Stipulated Order for Abatement
3	Accelerated Permit Processing for Air Pollution Control Projects
4	Waive Monetary Penalties for Facilities that Exceeded Annual Allocations by Less Than Five Percent
5	Implement Emergency RTC Price Caps
6	EPA-Approved/Project-Specific AQIP
7	ERC Conversion
8	High Employment/Low Emissions Designation (HILO)
9	Phase III Reformulated Gasoline credits
10	Issue Utility Credits as Per Rule 2015(c)(2)
11	Incentive Program for NOx Control Projects
12	Outreach Program to Encourage Installation of Air Pollution Control Equipment and Obtain More Accurate Emissions Reports
13	Allow the Use of New Concentration Limits from Source Tests Retroactively to Determine Emissions for the Past Compliance Year
14	Extend Reconciliation Period
15A	Make Available RTCs Deducted Due to Violations of Annual Compliance to Facilities that Meet Certain Criteria
15B	Modify Missing Data Provisions for Missing or Late Reports
16	Extend the Reduction Required for the Period from Years 2000-2003 to 2000-2005
17	Maintain Current RECLAIM program without changes
18	Adopt Universal Trading Credits (UTC) Program
19	Isolate Power Plants from the RECLAIM Market (A) Create a Separated Trading Market with No Additional Requirements (B) Create a Separate Trading Market with Expedited Schedule to Install Air Pollution Control Systems (C) Keeping Power Plants in the RECLAIM Program with Expedited Schedule to Install Air Pollution Control Systems (D) Replace RECLAIM with Command-and-Control Regulation
20	Isolating Petroleum Refineries from the RECLAIM Market (A) Create a Separate Trading Market With no Additional Requirement (B) Create a Separate Trading Market with Expeditious Schedule to Install Air Pollution Control Systems (C) Keeping Refineries in the RECLAIM Program with an Expeditious Schedule to Install Air Pollution Control Systems (D) Replace RECLAIM with Command-and-Control Regulation
21	Isolating Facilities Emitting Less Than 10 tons Per Year at the Start of RECLAIM from the program
22	Reassess AQMP Tier II Reductions for Specific Industries

Option No.	Proposed Option
23	Replace RECLAIM with Command-and-Control
24	Retrieve a Percentage of Allocation Issued to RECLAIM Facilities to Fund a General RTC Auction
25	Reduce Future RECLAIM Allocations Based on Staff Assessment of Available Control Technology

**1 – Obtain EPA and CARB Approval for Mobile Source and Area Source Credits**

Statement of Problem: Although the Mobile Source and Area Source Credits rules were adopted by the Governing Board several years ago, these rules have not yet been approved into the State Implementation Plan (SIP) by EPA. Therefore, the use of RTCs converted from these sources runs the risk of enforcement action by EPA and /or citizen suits despite the fact that the RECLAIM rules contain approved mechanisms for their conversion and use. As previously discussed in Chapter 2, there are 150 tons per year of 2000 RTCs converted from MSERCs, as well as 68 tons per year (for compliance years 2000 and 2001) of RTCs converted from ASCs. RECLAIM facilities have used some of the RTCs converted from MSERCs to reconcile with annual allocation caps. AQMD is not aware of any ASCs being utilized for RECLAIM compliance at this time. However, the use of these types of credits is not popular because EPA has not endorsed the use of MSERCs and ASCs in the form of RTCs.

Proposal: This proposal urges the AQMD, EPA and CARB to work together and with interested parties to expeditiously resolve concerns raised by EPA and CARB regarding these credits. It is also proposed that if discussions with EPA and CARB show positive results, the resolution can take the form of a letter of intent or understanding to allow immediate use of these credits while EPA proposes approval. If necessary, programmatic change can be formally adopted through rule amendments.

Staff Analysis: The amount of additional RTCs available from these sources is relatively small at this time. The majority of available RTCs from MSERCs have already been sold to RECLAIM facilities, and there are only 68 tons of RTCs converted from ASCs for each of the years 2001 and 2002. Nonetheless, MSERCs and ASCs represent a significant potential source of real, quantifiable, and surplus emission credits that could be converted to RTCs. Moreover, the future availability of such credits for RECLAIM compliance purposes was presumed at the time of program adoption.

With EPA's approval, the risk of legal action associated with the use of RTCs from MSERCs and ASCs would be eliminated. In addition, since the increase in RTC supply through the conversion of MSERCs and ASCs is already an available option in the existing rules, no rule amendment would be necessary.

Stakeholder Viewpoints: This option is proposed by industry and uniformly supported by all industry members. All three environmental organizations oppose this option, believing that cost-effective reductions can be achieved through installation of control equipment at RECLAIM facilities. EPA and CARB expressed a willingness to consider such credit generation mechanisms on a pilot basis.

## **2 – Stipulated Order for Abatement**

Background and Statement of Problem: The AQMD Hearing Board is authorized to hear variance petitions, permit appeals, and petitions for orders for abatement. Orders for abatement can be issued pursuant to California Health & Safety Code Section 42451. A stipulated order for abatement is a written agreement between the AQMD and a facility specifying the necessary actions to achieve compliance and the associated enforceable schedule to implement such actions. Under RECLAIM, it is not possible to obtain a variance from the requirement to hold sufficient RTCs to cover emissions. Therefore, an order for abatement does not serve as a variance, but it is a mechanism to achieve compliance. The AQMD and the affected facility must also agree on the amount of civil penalties that will be paid due to the violation. State law specifies the factors to be considered in assessing the penalty, including the extent of harm caused by the violation and the financial burden to the defendant.

A number of facility representatives who have deferred control equipment installation due to plentiful supply of low-cost RTCs say that they were caught by surprise by the quickly escalating NOx RTC prices. A number of these individuals represent that they cannot afford to purchase RTCs at the current high prices and that it will take some amount of time to install control equipment and realize the attendant reduction in their emissions levels. Others state that they will have inadequate funds to install control equipment. Yet, others claim they have no control options. Those who have cost-effective control options would prefer to invest their available funds in control technology rather than in the current high-priced RTCs for the current compliance year. Even though facilities are aware of the order for abatement option, they claim better information and specific guideline parameters would encourage their consideration of their use.

Proposal: Although orders for abatement have been offered (and used) as a compliance tool since May 2000 as facilities began to experience problems, this proposal suggests that AQMD prosecutors establish guidelines for stipulated orders for RECLAIM facilities. Several suggestions were made regarding potential components for such guidelines. It was also noted that guidelines might be useful for facilities to determine if participation is warranted.

Staff Analysis: There are legal and procedural impediments to a “group” stipulated order for abatement, as suggested in the proposal. However, an order for abatement for an individual facility is a currently available enforcement tool and thus no rule amendment is required to institute this option. Under existing policy, stipulated orders have been offered to individual facilities as an alternative to complying with RECLAIM through the purchase of RTCs, provided (1) the facility installs air pollution control equipment on an accelerated schedule (or purchases a future stream of credits if controls are not feasible), (2) the excess NOx emissions are deducted from the facility’s subsequent year allocation, and (3) a civil penalty is paid. The availability of this enforcement option to non-utility RECLAIM participants is dependent on the facility’s demonstration that it cannot afford to purchase RTCs at the current market price. The civil penalty is based upon a baseline amount representing the RTC price that was reasonably foreseeable, provided that this amount is not so low as to confer an unjust economic benefit on the facility nor too high as to impose an undue economic hardship. For this reason, the baseline amount may be adjusted appropriately on a case by case basis. Staff proposes to adhere to this existing policy in utilizing stipulated orders for abatement. Regarding the use of penalty monies, some portion of the civil penalty may be used for air pollution improvement projects under the AQMD’s existing policy on Supplemental Environmental Projects. Under this arrangement, the facility directly funds the project in question.

Stakeholder Viewpoints: All parties support the use of Stipulated Abatement Orders. Environmental organizations suggest that penalty funds be used to reduce emissions in the short term (e.g., by funding MSERCs or other programs in the short term), but not to fund creation of additional credits. An attorney representing a few companies in the metal melting industry suggested a group Stipulated Order for Abatement approach.

### **3 – Accelerated Permit Processing for Air Pollution Control Projects**

Statement of Problem: Installation of air pollution controls will result in emissions reductions that would likely lessen the demand for NOx RTCs. Generally, there is a lead-time to obtain necessary permits to install and operate this equipment. In addition, some projects may also require the preparation of CEQA documents that will add to the project lead-time.

Proposal: One of the proposals to minimize the time for permit issuance is the implementation of a programmatic CEQA analysis for power plants with submitted applications to install selective catalytic reduction (SCR) or other controls. By performing a general CEQA analysis based on the type of control equipment and regional needs, this general analysis could serve as the overall Environmental Impact Report in lieu of project-specific documents. In addition, the use of a template CEQA analysis for electric utility SCRs or other equipment could reduce document preparation time. Also, a pre-approved template would provide increased assurance for project proponents. Another proposal is to implement additional permit streamlining efforts for control equipment applications. The third proposal is increasing permitting staff to help expedite application processing.

Staff Analysis: Efforts have been made to accelerate processing permit applications for installation of air pollution control equipment. Recent applications for installation of SCRs submitted by electric utilities were processed expeditiously and CEQA documents have been completed within six months from first meeting to project certification. The proposed programmatic CEQA analysis option is not appropriate since site-specific impacts, including environmental justice concerns, may not be adequately analyzed. Relative to template CEQA analysis, current evaluations use previous work to the degree feasible. The current permit streamlining process, along with the implementation of express permit processing under AQMD Rule 301(y) - Optional Express Permit Processing Fee, have greatly expedited the permit issuance process. Adding CEQA and/or permit processing staff is another possible approach to further accelerate permit processing. However, additional time and resources would likely be required to train new staff.

Stakeholder Viewpoints: This option is proposed and widely supported by industry . Advisory committee members agreed that power plant air pollution control applications and CEQA analysis have been processed expeditiously in recent months. The environmental community supports AQMD's efforts to expedite permit review to the extent that it does not sacrifice legal requirements and the public's right to participate in the process. However, the groups oppose programmatic CEQA for power plants due to concerns regarding likely adequacy of the evaluation.

#### **4 – Waive Monetary Penalties for Facilities that Exceeded Annual Allocations by Less Than Five Percent**

Statement of Problem: Some RECLAIM facilities retain a certain amount of RTCs above and beyond the level of their facility annual emissions as a compliance safety margin. These credits are saved as insurance against reporting or recordkeeping errors that

might be revealed when emissions reports are audited by the AQMD in the future. These credit reserves could be tapped to meet the tight demand for RTCs.

Proposal: The AQMD can adopt a policy of not pursuing monetary penalties for facilities that exceeded annual allocations by less than five percent. Removing such penalties may entice facilities to release credits they would otherwise reserve as a compliance safety margin.

Staff Analysis: The AQMD is required to enforce violations of air quality rules and regulations. Enforcement is achieved by returning the violator to compliance and assessing a civil penalty, which is necessary to deter future violations. Blanket waivers of the type proposed here are disfavored by this agency and EPA and CARB because the lack of credible deterrence may actually induce willful violations.

Stakeholder Viewpoints: A credit broker suggested this proposal. Environmental representatives stated that the compliance margin was considered to be one of the positive contributing factors for some environmental community representatives to support the RECLAIM program. It was further stated that they will oppose any effort to implement this proposal. EPA representatives also raised the same objection.

## **5 – Implement Emergency RTC Price Caps**

Statement of Problem: The price of near-term RTCs has increased dramatically resulting in escalated cost for facilities to comply with RECLAIM requirements.

Proposal: This proposal is to establish a temporary upper price limit to immediately cap the rise in the RTC price. An upper price cap not only prevents unreasonable escalation in prices, but also minimizes the instances of “panic purchasing.”

Staff Analysis: Establishing a price cap requires rule amendments and detailed economic and technical analysis to determine an appropriate value. Additionally, unless it is carefully established, a price cap could reduce incentive for installation of air pollution control equipment. Furthermore, artificial price caps could potentially undermine the current free market structure. Lastly, a price cap would be difficult to enforce.

Stakeholder Viewpoints: This option is proposed by industry. EPA, CARB and the environmental groups did not provide specific comments on this issue.

## **6 – EPA-Approved/Project-Specific AQIP**

Statement of Problem: Some companies do not readily have control options available to them to reduce emissions to their RECLAIM allocation level.

Proposal: The Air Quality Investment Program (AQIP) is a voluntary emissions reduction compliance option program in lieu of employer rideshare programs, adopted by the AQMD Governing Board. Under this program, monies that are paid by sources needing emission reductions are used to fund emission reduction strategies. At present, this rule has not been approved by EPA into the SIP. This proposal urges EPA and CARB to work with AQMD to approve specific projects for non-RECLAIM sources under an AQIP program that will provide additional RTCs. The projects may be selected in a manner which promotes advancement of control technologies. Prefunding could be supplied by AQMD and subsequently reimbursed.

Staff Analysis: The AQIP approach has successfully been utilized for emissions equivalency in lieu of employer rideshare plans. The approach could be tested for RECLAIM compliance purposes. However, issues concerning timing of emission reductions, shifting of compliance responsibility, proper integration with the RTC market, and CARB/EPA approval would have to be addressed.

Stakeholder Viewpoints: This option is proposed by industry. Environmental organizations, EPA, and CARB expressed that the focus of enhancement efforts should be on reducing emissions at RECLAIM facilities through cost-effective measures. An AQIP is not consistent with such approach. Moreover, the environmental organizations expressed opposition to all supply-side options.

## **7 – ERC Conversion**

Statement of Problem: The escalated RTC prices may be stabilized through increasing RTC supply. A potential source of increased RTC supply is conversion of ERCs. However, such emission credit/offset conversions were only available during the first six months of the program. ERCs of other pollutants, such as VOC and PM are also possible sources of RTC supply through inter-pollutant conversions. Such conversions are also prohibited at this time.

Proposal: This proposal is to allow conversion of additional NO<sub>x</sub> ERCs to RTCs and to allow conversion of VOC emissions to NO<sub>x</sub> RTCs. The only VOC ERCs proposed for conversion are those generated through voluntary VOC emissions reduction projects at a facility. These inter-pollutant conversions would be based on a specific, scientifically-determined ratio. At current prices for NO<sub>x</sub> RTCs, facilities would have the incentive to reduce these non-RECLAIM pollutant emissions. Both NO<sub>x</sub> and VOC ERC conversions will provide additional supply to the RTC market.

Staff Analysis: Currently, the NO<sub>x</sub> ERC supply is very limited, since the only NO<sub>x</sub> ERC generators are non-RECLAIM facilities. Allowing conversion of additional NO<sub>x</sub> ERCs will

place further strain on the availability of emission offsets needed by facilities outside the RECLAIM program. Conversion of VOC ERCs to NOx RTCs may reduce the supply of VOC ERCs that may be needed to support paint- and solvent-related activities. In addition, implementation of this option would require adoption of rule amendments. Furthermore, issues related to determining the inter-pollutant conversion ratio would require extensive modeling analysis. EPA and CARB approval may be difficult to obtain.

Stakeholder Viewpoints: This option was proposed by a member of the Advisory Committee. There was no significant support for this option among the industry representatives. Environmental organizations expressed opposition.

## **8 – High Employment/Low Emissions Designation (HILO)**

Statement of Problem: In order to help stabilize rising NOx RTC prices, either the supply of credits available to the market must increase or the demand for such credits must diminish. Rule 2001(e) provides for a bank of 91 tons per year of each RECLAIM pollutant that can be issued to new facilities (after January 1, 1997) with high employment and low emissions designation relative to other facilities within the same industry. Credits issued to facilities through HILO designation are considered non-tradeable and can only be used to offset emissions at the facility. Since the quantification standards to determine eligibility have yet to be determined, this provision to reduce demand has not been used.

Proposal: AQMD should quickly develop eligibility guidelines including any necessary job/emissions thresholds that must be met. Once this information is available, it should be widely advertised and the approval process for HILO RTCs streamlined.

Staff Analysis: Since this source of additional non-tradeable credits is already available in the rules, no rule amendment is needed to implement this option. However, even though the current rule provides the general eligibility requirement, determination of HILO-specific values for various industries will be resource intensive. Moreover, no facilities have yet applied for HILO designation. Additionally, a facility must be relatively new and must meet the quantification standards for each of the four pollutant categories in order to obtain the HILO designation. With such stringent requirements, it is unlikely that many facilities can qualify for HILO designation and therefore, the impact of reduced demand from this option is minimal.

Stakeholder Viewpoints: Since this option is an existing component of the current RECLAIM program and the possible effect of introducing these non-tradeable credits is to lower demand, industry uniformly supports this option.

## **9 – Phase III Reformulated Gasoline credits**

Statement of Problem: In Rule 2002(c)(12), allocation adjustments are available to refiners for actual emissions increases due to the production of Phase II reformulated gasoline. However, no such provision exists for the production of Phase III reformulated gasoline, which is on the horizon and could create additional demand for RTCs that was not anticipated at the start of the program. Petroleum refineries are required under state law to produce Phase III reformulated gasoline by the end of 2001. The production of reformulated gasoline is typically more energy intensive than previous varieties of gasoline, and therefore could result in more pollutant emissions during the manufacturing process. However, these emissions increases are more than offset by mobile source reductions from the use of the cleaner fuels.

Proposal: This proposal seeks to provide refineries with allocation adjustments, similar to Phase II allocation adjustments provided under Rule 2002(c)(12) for actual emissions increases from modifications solely to comply with Phase III reformulated gasoline requirements.

Staff Analysis: With an increase in allocations, the demand for RTCs from refineries would be reduced. However, since these additional credits have to be used to offset the actual emissions increases, this option will not create a net increase in RTC supply that could be available to the RTC market. As well, since similar provisions as Rule 2012(c)(12) need to be adopted, this option would require additional time for rule amendment. At this time, staff understands that there will be a minimum increase in energy consumption due to Phase III reformulated gasoline regulations. There should be a sufficient supply of RTCs available to the refineries if they expeditiously install air pollution control equipment to reduce emissions.

Stakeholder Viewpoints: No comments were received on this proposal.

## **10 – Issue Utility Credits as Per Rule 2015(c)(2)**

Statement of Problem: Allocations for existing electricity generating facilities are not adequate to cover current needs. Power plant demand for RTCs has significantly increased market prices in the year 2000 and will likely be a major factor for the next several years. Existing power plants will be “working overtime” until additional generating capacity is created in the Western United States.

Proposal: Issue additional allocations to electric generating facilities to offset the emissions from the increased electric generation by modifying Rule 2015(c).

Staff Analysis: Rule 2015(c)(2) requires the Executive Officer to quantify additional energy demand and the potential need for increased Allocations to electric generating and natural gas distribution facilities resulting from implementation of the AQMP. The recent increased production at local power generating facilities was not a result of increased energy demand from the implementation of AQMP measures. In addition, no AQMP measures were adopted that would have caused an appreciable increase in electric energy demand. Therefore, Rule 2015(c)(2) is not applicable to the present situation. Moreover, the proposed approach would have both short- and, possibly, long-term consequences relative to meeting AQMD's emission reduction targets.

Stakeholder Viewpoints: Industry representatives proposed the AQMD conduct the analysis and determine the additional allocation, if any, to be issued under Rule 2015(c)(2).

## **11 – Incentive Program for NOx Control Projects**

Statement of Problem: As mentioned earlier, a number of facility representatives who have deferred control equipment installation say that they were caught by surprise by the quickly escalating NOx RTC prices. These representatives state that they cannot afford to install NOx air pollution control equipment while purchasing RTCs at the current high prices.

Proposal: Under this proposal, a facility that reduces emissions through the addition of air pollution control equipment is credited with non-transferable RTCs equal to the amount of actual reductions. This is in addition to RTCs freed up as a result of the reductions achieved. This credit applies only during the initial year of installation. To qualify, the facility must not have sold credits for the subject year and may not otherwise be in violation of its annual allocation. Qualifying facilities have the option of reducing emissions by a lower amount initially and are provided an added incentive to install pollution control equipment.

Staff Analysis: This incentive option proposes crediting qualifying facilities with RTCs. Because there is a finite supply of RTCs under the RECLAIM program to meet emission reduction goals, additional RTCs, beyond those assumed in the AQMP, must be provided. Such action is inconsistent with air quality improvement principles established at the beginning of the program and would significantly undermine confidence in RECLAIM by the general public and oversight agencies. With this option, other concerns arise such as how to address previous trades and guarding against facilities claiming artificial reductions, such as with applications for lower concentration values for large and process units.

Stakeholder Viewpoints: The proposal is supported by industry. Environmental organizations oppose all supply-side options.

## **12 – Outreach Program to Encourage Installation of Air Pollution Control Equipment and Obtain More Accurate Emissions Reports**

Statement of Problem: Facility operators may not be fully aware of all the opportunities for further emissions reductions or improving the accuracy of emissions reports through source testing. Cost-effective control might be missed due to the fact that facilities may lack the knowledge of current technology levels or the provisions of the RECLAIM rules.

Proposal: The AQMD should actively contact operators of facilities with sources that have been identified by the AQMD as potential sources for emissions reductions. The AQMD should contact these operators through an enhanced outreach program to encourage early installation of air pollution control equipment or to obtain improved emissions reporting through testing the sources so that more accurate emissions factors can be developed. The latter action could result in increased RTC supply through lower RTC demand for annual compliance.

Staff Analysis: This proposal will provide facility operators with useful information to reduce emissions. Even though the facility that owns the source may have adequate RTCs and may not need to realize the emissions reductions, the source may benefit economically by installing further controls and selling the excess RTCs. In the past, staff conducted meetings and workshops to explain options available under the RECLAIM rules to improve the accuracy of emissions reports and to resolve compliance issues. Staff will continue to enhance its outreach efforts, including conducting additional workshops to assist facility operators.

Stakeholder Viewpoints: This proposal is generally supported by all parties.

## **13 – Allow the Use of New Concentration Limits from Source Tests Retroactively to Determine Emissions for the Past Compliance Year**

Statement of Problem: Small sources known as process units within the RECLAIM program are allowed to report emissions based on either a default factor or a concentration limit that is expressed as an enforceable permit condition. The facility operator may opt for a concentration limit at any time by submitting an application to amend the permit to reflect such a condition. The facility is then allowed to use the concentration to determine emissions after the permit is issued. The permit condition is enforced by testing the source any time.

In the past, the emissions from these sources were too low to justify the added source test expenditures to obtain an actual emissions profile to establish concentration limits. The recent RTC price hike has made testing such sources a possible approach. However, RECLAIM prohibits use of concentration limits prior to permit issuance.

Proposal: Allow the use of new concentration limits obtained from source tests retroactively to determine emissions for the past compliance year. The operator will have to prove that emissions from the sources have not been altered.

Staff Analysis: Most of the process units are combustion sources. The emissions profiles of such a source can be altered by simple tuning of the burners. Therefore, the past condition of such a source is difficult to determine. The accuracy of the emissions reports cannot be ascertained without an enforceable condition. Allowing retroactive recalculation of emissions reports based on a later source test would undermine the integrity and accuracy of the emissions reports of the program. In addition, the emissions from these sources are relatively small and the resultant reduction in reported emissions is likely insignificant and will not result in an impact on RTC prices.

Stakeholder Viewpoints: An industrial representative made this suggestion. Environmental representatives questioned the approach of allowing emissions reports for the same piece of equipment to be based on an emissions factor different from the one used to establish allocations.

#### **14 – Extend Reconciliation Period**

Statement of Problem: RECLAIM facilities are required to reconcile facility emissions every quarter as well as annually. During the meetings of the Advisory Committee, a number of facility representatives stated that they were unable to foresee the rapid escalation of RTC prices. Moreover, these facilities are faced with lead-time requirements for construction and permitting which are longer than the current one-year reconciliation period. Therefore, these facilities are still faced with purchasing RTCs at high prices in order to reconcile current emissions while waiting for the controls to come online.

Proposal: Increasing the reconciliation period from its current basis to a longer period of two to three years would allow facilities more time to react to a rapid rise in RTC prices. For example, following a rise in price at the beginning of the reconciliation period, a number of facilities could install control equipment to reduce emissions during the reconciliation period. The result would be a reduction in price because of the greater supply of RTCs during the same reconciliation period.

Staff Analysis: Facility operators may face a false sense of security that credits will be available at the end of this extended reconciliation period under this proposal. This has already happened, to a certain extent, with the current RECLAIM system. Because many facility operators used only the current price of RTCs for decision-making, low RTC prices have resulted in delayed installation of some air pollution control equipment. Therefore, prolonging the time period for reconciliation may induce further delay in installing the necessary air pollution control equipment. In addition, a longer reconciliation period may delay trading activity until the end of the period, which could cause greater market uncertainty. Therefore, accurate price information will only be known as the reconciliation period deadline approaches, which may further exacerbate price hikes. Most importantly, this option could delay compliance with the California Clean Air Act because there are no assurances that facilities will be able to meet the emissions goals at the later date.

Stakeholder Viewpoints: This option is proposed by a credit broker and is supported by some members of the Industry. Environmental organizations strongly oppose this option.

### **15A – Make Available RTCs Deducted Due to Violations of Annual Compliance to Facilities that Meet Certain Criteria**

Statement of Problem: If a facility is found to have exceeded its allocations in a compliance year, RECLAIM requires that an equivalent amount of RTCs be deducted from the facility's allocations in a subsequent year. Current enforcement guidelines call for deducting a facility's allocation the year after discovery of violation of annual allocation. This includes reporting failure violations, either electronic or paper. Some facility representatives have argued that any deduction of RTCs, while meant to penalize the facility in violation, also penalizes the entire RECLAIM universe because these RTCs are no longer available. They further argue that this unduly affects their planning ability because they cannot anticipate future deductions.

Proposal: This option proposes that RTCs deducted due to this provision be re-introduced into the market at a fixed price or in an auction to facilities that meet certain criteria. This would allow the use of credits for actual emissions and has the potential to generate additional revenue from the sale of these RTCs. The proceeds may be used to fund further air pollution reduction projects.

Staff Analysis: RECLAIM requires any allocation exceedances to be deducted from the future years to ensure that the environment is benefited from the past violations. Actions to release those credits for use by RECLAIM facilities would require rule amendments. The proponent of this option implied that the exceedances were mainly caused by the

conservative missing data provisions. The impact of missing data may be limited because most continuous emission monitoring system (CEMS) have been certified and placed in operation for several years. Data substituted for missing data generally reflect actual emissions for the past 24 hours or the past 30 days. Furthermore, exceedances of allocations at RECLAIM facilities may also result in exceedance of RECLAIM program allocations under that situation.

Stakeholder Viewpoints: This option is supported by certain industries. The environmental organizations strongly opposed this option.

### **15B – Modify Missing Data Provisions for Missing or Late Reports**

Statement of Problem: Occasionally, some RECLAIM facilities experience technical difficulties in data reporting. On the days that data were not received by the District, RECLAIM facilities are required to use substituted data that causes an artificial increase in the reported NOx emissions.

Proposal: Modify the missing data protocol for missing or late reports.

Staff Analysis: At the onset of the program, many facilities had periods of missing data as they proceeded with new continuous emissions monitoring systems (CEMS). RECLAIM calls for the use of worst-case assumptions for "missing data." Consequently, much of the RTC use in earlier years was due mainly to failures in monitoring or reporting. These issues have largely been resolved through time due to the increased reliability of CEMS data.

In the 1999 year, for example, deductions accounted for only 40 tons of NOx, which is less than 0.2 percent of the total reported emissions. This proportion would have little impact upon the price of RTCs. Furthermore, not all of these 40 tons of NOx were results of missing data substitution.

However, additional adjustment to the protocol to ensure that real emissions are reported will alleviate problems raised by facility operators.

Stakeholder Viewpoints: This proposal is widely supported by industry. There is no input from the environmental organizations regarding this proposal at this time.

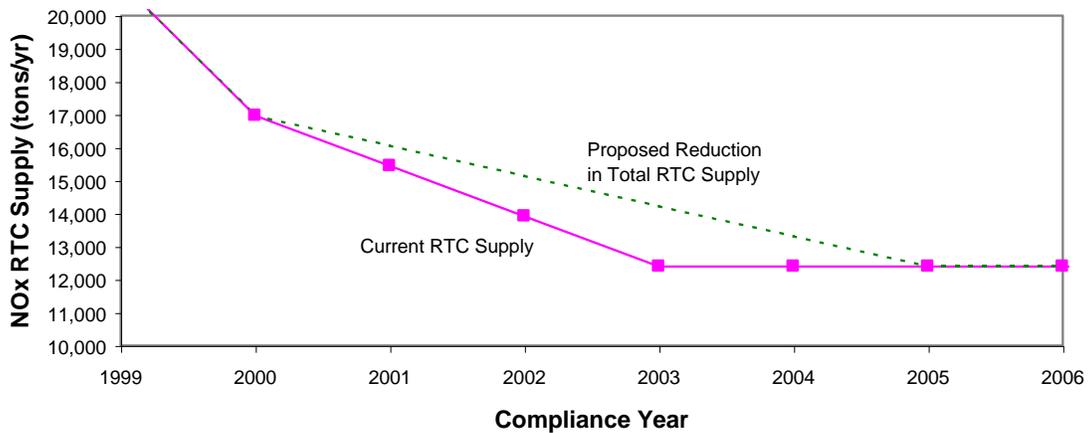
### **16 – Extend the Reduction Required for the Period from Years 2000-2003 to 2000-2005**

Statement of Problem: It was anticipated at program inception that nearly all sources would be required to install stringent levels of control in order to meet the ending

allocation level in the year 2003. Under the current design of the RECLAIM program, a second tier of reduction is required from 2000 through 2003. Given that many facilities have not begun to control emissions to the level required, it may not be feasible to expect that the required emissions reductions will occur over this time period.

Proposal: Under this proposal, the overall reduction remains the same but the years during which the reduction take place occur over a longer period of time from years 2000 to 2005 (see Figure 4.1). Therefore, the amount of reduction which would be required from year to year from 2000 to 2005 if this proposal were adopted is less than that from 2000 to 2003 under the current approach. As seen in Table 4.2 below, this would effectively increase the supply of RTCs for years 2001 through 2004 as compared to the current system.

**Figure 4.1: Proposed Reduction in RTC Supply**



**Table 4.2: Additional RTC Supply**

Year	Current RTC Supply	Proposed RTC Supply	Additional RTC From Proposal
2000	16,970	16,970	0
2001	15,444	16,055	612
2002	13,919	15,140	1,221
2003	12,395	14,225	1,830
2004	12,395	13,310	915
2005	12,395	12,395	0

Staff Analysis: This proposal would allow companies additional time to install controls since the rate of reduction is reduced. As discussed earlier, the amount of reductions anticipated from the permit applications for NOx control known to the AQMD will not be sufficient to meet the level of demand estimated from 1999 production levels. Therefore, more air pollution control projects are required. Assuming that production levels remain constant, there may be a violation of the statutory requirements for RECLAIM program emission reduction equivalency compared to command-and-control regulations. In addition, there may also be delayed compliance with California Clean Air Act requirements that AQMD implement an expeditious adoption schedule.

Stakeholder Viewpoints: No specific positions were expressed by industry. Environmental organizations strongly oppose any delay in meeting RECLAIM emission targets.

### **17 – Maintain Current RECLAIM program without changes**

Statement of Problem: Current issues concerning RECLAIM are short-term. Broad changes to the program are unnecessary and could undermine air quality goals or market confidence.

Proposal: This proposal is to simply take no action at all, and maintain the current RECLAIM program without any changes. This proposal assumes that RECLAIM, in its present form, is functioning correctly according to the laws of supply and demand.

Staff Analysis: When the Governing Board adopted the RECLAIM program, the program was anticipated to encourage RECLAIM facilities to embark upon process changes, adding new control equipment and replacing or refurbishing equipment with state-of-the-art technology to reduce emissions. As an alternative, RECLAIM facilities could also enter the RTC market to purchase credits from other RECLAIM facilities that reduced emissions below their allocations. With annual average NOx prices at less than \$2,000 per ton during the early years of the RECLAIM program, RTCs could be obtained at a very reasonable price, and it appears that facility operators relied on the ability to purchase RTCs at these prices. Thus, many RECLAIM operators relied on purchasing these credits rather than making investments in air pollution control equipment to achieve compliance with their annual allocation caps.

Nonetheless, a status quo option does not address the present high prices of RTCs which, in some cases, greatly exceed levels anticipated during the design of the program or that are otherwise considered unreasonable in an AQMP context. Thus, staff cannot support a strictly status quo approach.

Stakeholder Viewpoints: All industry members believe there should be adjustments to the RECLAIM program. An environmental organization suggested that industry should be held accountable for emissions targeted under RECLAIM.

## **18 – Adopt Universal Trading Credits (UTC) Program**

Statement of Problem: A recent increase in production rates at RECLAIM facilities created increased demand for NOx RTCs. Additionally, there has not been sufficient installation of control equipment at RECLAIM facilities to reduce demand for credits consistent with future year RECLAIM allocations. To allow RECLAIM facilities to grow and reduce Basin-wide emissions in the most cost-effective manner, a mechanism is needed to allow RECLAIM facilities to purchase emission reduction credits from sources outside the RECLAIM universe.

Proposal: Proceed with AQMD's proposal to develop the UTC program and allow for all types of credits such as mobile source, area source, emission reductions credits (ERCs) and others to be used interchangeably.

Staff Analysis: AQMD staff remains strongly supportive of UTC program development. EPA, CARB and the environmental organizations have expressed some concerns over several issues related to the UTC program in the past. Some of these issues are complex, and will likely take significant time to resolve. Nonetheless, the pending adoption of AQMD Rule 1612.1- Mobile Source Credits Generation Pilot Program, could provide progress in this regard.

Stakeholder Viewpoints: In recent meetings, industry representatives continue to support this option. Environmental organizations are opposed to this option at this time.

## **19 – Isolate Power Plants from the RECLAIM Market**

Statement of Problem: A high demand for electricity this past summer caused the power plants to purchase large quantities of NOx RTC. Power plant RTC purchases appear to have driven the sudden increase in NOx RTC prices. Thus, the increased production rates coupled with the delay in installation of air pollution control equipment at power plants placed a major constraint on the NOx RECLAIM market.

Proposal: Isolate power plants into a separate trading market or separate regulatory requirements outside RECLAIM. This option will help stabilize NOx RTC prices by reducing the demand for NOx RTCs from this industry which can pay high prices for RTC while still making large profits.

Staff Analysis: Prior to RECLAIM, large electric utilities in the South Coast Air Basin were subject to a command-and-control rule (Rule 1135 – Emissions of Oxides of Nitrogen From Electric Power Generating Systems) that mandated emission reductions for five electric generation entities. This rule required gradual reduction of NOx emissions with the final emission rate set at 0.15 lb. NOx/Net Megawatt Hour for the two largest utilities, and 0.20 lb. NOx/Net Megawatt Hour for smaller utilities. Three smaller utilities were not included in the RECLAIM program initially. However, two of these facilities chose to opt-in to the program in the late 1990's. Once these facilities joined the RECLAIM program, they were no longer subject to command-and-control rules, and were able to choose the most cost-effective means to comply, including purchasing RTCs.

During the 1990's, utility companies chose to defer any major capital investment in control equipment and elected to comply by purchasing NOx RTCs from other RECLAIM facilities. The preference for purchasing credits instead of installing control equipment is evidenced by the amount of credits purchased by this industry. Power plants were initially allocated 2,357 tons of NOx RTCs, however, they have obtained an additional 1,896 tons of NOx RTCs in Compliance Year 2000. During the year 2000, the amount of RTCs purchased by power plants accounts for more than 60 percent of NOx RTCs traded in year 2000 totaling 5,715 tons, with an overall price tag of \$111.7 million. This high demand, especially during the second half of the year 2000, has caused RECLAIM participants to unexpectedly experience a sharp increase in NOx RTC prices for Compliance Years 1999 and 2000. There are several strategies for isolating power plants from the RECLAIM market. Possible scenarios are identified below.

**19(A) – Create a Separated Trading Market with No Additional Requirements:** This option will only allow power plants to trade among themselves to meet the required allocation target for each year. If there are insufficient allocations within this group, control equipment will need to be installed expeditiously. Based on the analysis of supply and demand for this industry as discussed in Chapter 3, power plants as a group are already expected to have a shortfall of RTCs. Although some air pollution control projects have been proposed, there will not be sufficient reductions to comply with future year allocations without additional controls on all major electric generation units. A total of seventeen emission reduction projects are expected to be in full operation during the second half of year 2001. Of these projects, fourteen involve the installation of selective catalytic reduction systems and the remaining four are for flue gas recirculation systems. If these projects proceed on schedule, it is estimated that NOx emissions will be reduced by 2,670 tons of emissions. If the projects begin operation on schedule, there will still be a shortfall of 424 tons of NOx RTCs in 2001, 445 tons in 2002, and 1157 tons in 2003.

**19(B) – Create a Separate Trading Market with Expedited Schedule to Install Air Pollution Control Systems:** This proposal is similar to the previous scenario. However, instead of leaving the choice of installing air pollution control equipment to the power plants, AQMD would set a schedule for installation of control equipment. This schedule can be set either through the rulemaking process or with a compliance plan. A compliance plan would allow each facility to tailor its schedule to fit the specific needs of that facility. The added element of mandating installation of control equipment will prevent delays in meeting the emission reduction targets. Compliance schedules would have to be closely coordinated with the Independent System Operator (ISO) to ensure adequate generating capacity at any given time (i.e., not too many units off line at the same time for installation of controls).

Preliminary analysis indicates that it is possible to reduce emissions to the level of the year 2003 NOx RTCs currently held by this industry. However, feasible control technologies would have to be installed to reduce the industry-wide emission rate to 0.014 pounds of NOx per million BTU of fuel burned. Further reductions may be possible depending upon repowering projects, or implementing emission controls on peaking units.

**19(C) – Keeping Power Plants in the RECLAIM Program with Expedited Schedule to Install Air Pollution Control Systems:** This is a variation of the previous scenario without the element of isolation. The additional requirements for air pollution equipment will ensure that the emissions will be reduced expeditiously. However, there is a likelihood power plants will continue to place high demands on the RECLAIM market on a near-term basis until control equipment is installed and operating at all power

generation units. One advantage of keeping power plants under RECLAIM is that excess NOx RTCs may be available once power plants are controlled to the full extent, or the existing older power generation units are replaced with more efficient, new generation gas turbines that are equipped with SCR. However, the disadvantage of this approach is that the program cannot protect the other RECLAIM participants against the electricity market fluctuations.

**19(D) – Replace RECLAIM with Command-and-Control Regulation:** Imposing a command-and-control requirement is a possible way of ensuring that control equipment is installed at all power generation units and that the power shortage wouldn't have any further effects on RTC prices. However, growth issues will need to be addressed. First, there are currently only 1000 pounds per day of ERCs available outside of RECLAIM. Any new power plants will need to purchase sufficient ERCs to offset maximum potential emissions from that facility. On the other hand, a new power plant under the RECLAIM program can be permitted without first obtaining all future year RTCs. They are only required to purchase one year of RTCs prior to the start of operation. Therefore, it may be difficult to site new power plants under the command-and-control system without making additional changes to the Air Quality Management Plan (AQMP). Secondly, there are concerns regarding emissions growth at the existing power plants. Currently power plants can grow only to the extent that their emissions will not exceed RECLAIM allocations unless additional credits are purchased. Under command-and-control, power plants are permitted to operate at maximum capacity. Therefore, it is most likely that NOx emissions will increase unless each facility is subject to an overall mass emissions limitation.

Discussion: Placing an industry into an isolated market with a limited RTC supply could create added incentives to reduce emissions through the installation of air pollution control systems if RTCs cannot be obtained cost-effectively. If this industry is placed into a separate market without additional requirements to install control equipment, then emissions reductions would again depend upon market conditions, such as in the current RECLAIM market. However, the RECLAIM market should be protected from significant price fluctuations caused by sudden swings in demand for NOx RTCs by this industry. Another benefit of this type of action is to shield smaller facilities from direct competition with the larger counterparts.

Implementing any of these isolation strategies may also lead to problems. For example, industry groups such as electric utilities and petroleum refineries are subject to the same market forces. Isolating an industry may lead to simultaneous demand or lack of demand for RTCs within the group. If there is any demand for RTCs in a separate market comprising the same industry, it will likely be simultaneous and unilateral among companies. If no additional command-and-control rules are implemented, it is possible

that there will be insufficient RTCs in the isolated market, which would again lead to high-priced RTCs within that market.

Additional issues will need to be addressed such as:

*Should participants in the new market take all their allocated and purchased credits?*

*Should newly sited power plants be able to opt-in to any market?*

*Which market is appropriate for small power plants with less than 50 Net Megawatt-Hours of electrical generating capacity?*

*Should power plants be allowed to sell excess credits to the RECLAIM market if excess credits are available in the future due to reduction in electricity demands?*

*Should separate market be temporary or permanent?*

## **20 – Isolating Petroleum Refineries from the RECLAIM Market**

Statement of Problem: Similar to the strategies previously described for power plants, several scenarios for isolating the refineries. These options are intended to prevent the refineries from impacting the market in the future in the same manner as the power plant situation today. Although refineries have not impacted the RECLAIM market as significantly as the power plants, they are also a major buyer in the RECLAIM market. Last year, refineries purchased more than 16 percent of the market share, totaling 4,401 tons of NO<sub>x</sub> RTCs at \$22.2 million. Staff has conducted an analysis to determine if the refineries will be able to comply with their NO<sub>x</sub> allocations in the future years. In examining the amount of NO<sub>x</sub> RTCs currently held by the refineries, staff estimates that, at current production rates, emissions at the refineries will exceed available RTCs unless there are significant additional reductions in emission rates. Readily available controls would substantially reduce emissions, but in order to reach RECLAIM goals it will be necessary to install advanced controls. However, such advanced controls offer the potential for attaining emission reductions even beyond RECLAIM goals.

Proposal: Isolate refineries into a separate trading market or separate regulatory requirements outside RECLAIM. This proposal will ensure that any business decisions made by the refineries regarding investments in air pollution control systems versus purchasing credits will not adversely impact other industries in the RECLAIM market. There are several possible ways of implementing the proposals discussed below.

Staff Analysis: Similar to the power plants, prior to RECLAIM, the refineries were subject to a command-and-control rule that mandated emissions to a certain rate of emissions for certain types of equipment. Rule 1109 – Emissions of Oxides of Nitrogen from

Boilers and Process Heaters in Petroleum Refineries, required that by December 31, 1995, all boilers and heaters must reduce emissions to the rate of less than or equal to 0.03 pound per million BTU or less. This rate of reductions has not been achieved by the refineries. However, implementation of more advanced controls offers the potential to obtain emission reductions beyond RECLAIM goals.

In addition to the typical combustion equipment described in the October 2000 RECLAIM report, there are also opportunities to reduce refinery emissions in the areas that have not been previously identified in the AQMP. For example, one large refinery recently installed a SCR on its Fluid Catalytic Reduction Unit (FCCU) that is estimated to reduce emissions by approximately 440 tons per year. If this technology is installed at the remaining six refineries, significant emission reductions can be realized. In addition to the SCR technology, another large refinery has recently obtained an experimental permit to test the DeNOx Catalyst System on its FCCU unit. This technology is estimated to reduce NOx emissions by 50 percent. If appropriate control equipment can be installed and placed in operations at the refineries over the next two years, it is possible that excess NOx RTCs can be generated by this sector to supplement the RECLAIM market. Most of the refineries in AQMD's jurisdiction are operating at full capacity; therefore, it is unlikely that major fluctuations in the NOx demand will occur. If NOx emissions at the refineries are fully controlled, it is possible that 3,373 tons of excess NOx RTCs will be available to the market. Removal of this industry from RECLAIM could also result in removal of the current mass emissions limitations.

Isolating refineries into a separate trading market has the advantage of protecting other RECLAIM participants from price swings due to high demands from this industry. In addition, the limited market may provide greater incentives for the refineries to install air pollution control equipment. Analysis of technologies as discussed, indicates that there are opportunities to reduce NOx emissions beyond the current level of NOx RTCs currently held by this industry. Therefore, isolating this industry will reduce the opportunities for making excess credits available to the rest of the market participants.

Possible scenarios for isolating refineries from the RECLAIM market are listed below.

**20(A) – Create a Separate Trading Market With no Additional Requirement:** Based on trade activities in the year 2000, the refinery industry is the second largest buyer of credits in the RECLAIM market. If this trend continued without the corresponding reductions in emission rates at the refineries, the demand from this industry will certainly place additional pressures on the market. One option is to isolate refineries into a separate market without additional requirements.

**20(B) – Create a Separate Trading Market with Expedious Schedule to Install Air Pollution Control Systems:** Again, this scenario is just an extension of the previous

scenario by adding the command-and-control element to the design. Emissions data and technology analysis show that cost-effective reductions are possible at the refineries.

**20(C) – Keeping Refineries in the RECLAIM Program with an Expeditious Schedule to Install Air Pollution Control Systems:** This option would allow refineries to continue to trade in the RECLAIM markets. At the same time it would maximize opportunity for the creation of RTCs, given the fact that the refineries have the potential to reduce emissions beyond the level required by RECLAIM.

**20(D) – Replace RECLAIM with Command-and-Control Regulation:** Similar issues arise for this industry as with the power plants. All NO<sub>x</sub> ERCs, originally held by RECLAIM facilities, were converted to RTCs and built in to the original allocation for these facilities. To return this industry to command-and-control will require analysis on whether RTCs should be converted into ERCs. Furthermore, removing the mass cap will likely result in a significant increase in emissions if all equipment are placed in operation at maximum capacity.

## **21 – Isolating Facilities Emitting Less Than 10 tons Per Year at the Start of RECLAIM from the program.**

Statement of Problem: Currently there are 153 facilities in the RECLAIM universe that, since the beginning of the program, have been emitting less than 10 tons per year. Many of these facilities are small businesses and do not have extensive environmental staff as many of the larger businesses. As a group, these facilities only represent two (2) percent of overall NO<sub>x</sub> allocations. To meet the year 2003 allocations, these facilities must reduce emissions by 232 tons per year. Staff has conducted a review of equipment at these facilities, and by assuming year 1999 production level and readily available control technologies, we estimated that emissions from this sector can be reduced by 122 tons for the year 2003. The additional 110 tons of emissions may need to be purchased from other RECLAIM facilities that can reduce emissions more cost-effectively.

Proposal: There are various options for isolating smaller facilities. One option would be to remove them from RECLAIM entirely, replacing the market-based regulation with command-and-control. Other options would create a separate trading market for smaller facilities, either with or without an expedited schedule to install controls.

Staff Analysis: It is not likely that this group of industry can create sufficient credits to trade amongst themselves. This group will need to purchase additional credits from

other RECLAIM facilities to comply with RECLAIM. Therefore, any option which provides an isolated RECLAIM market does not appear to be a viable option for this group.

Replacing RECLAIM with Command-and-Control regulations would have different effects. If this group of facilities is removed from RECLAIM, it will only impact the market by reducing the demand. Currently, this group is only 3% of the total 1999 RECLAIM allocations, so it will not greatly reduce demand. However, despite command-and-control regulation, potential increases in emissions will likely occur without emission caps. Although limited availability of ERCs in the command-and-control market may limit growth, many facilities with potential to emit less than 4 tons will be eligible for the existing Regulation XIII exemption from offsets. This action may require adjustments to the AQMP to address the potential increase in emissions, which would require yet greater reductions to come from other sources.

Stakeholder Viewpoints: This option was proposed by some of the facilities emitting less than 10 tons per year. No input from the environmental groups or other industry.

## **22 – Reassess AQMP Tier II Reductions for Specific Industries**

Statement of Problem: Tier II reductions were shared between industries at a flat rate of 28 percent reduction over the period between 2000 and 2003. Some industry representatives felt that technologies do not exist for their facilities to reduce emissions beyond the level allocated for the year 2000.

Proposal: Instead of applying the average rate of reduction for every RECLAIM facility, develop Tier II emission reduction rates based on the specific equipment and industry types.

Staff Analysis: At the time of RECLAIM development, Tier II control technologies were largely unknown. The program was designed for all participants to share the emissions reductions cost. It was understood at that time that some participants will be the seller and some participants will be the buyers. In the October 20, 2000 technical report prepared by staff, we noted that RECLAIM facilities can apply existing control technologies to reduce emissions to the year 2003 level cost-effectively. Therefore, staff believes it is unnecessary to reassess Tier II emission reduction rates for specific industry.

Stakeholder Viewpoints: This option was proposed by representatives of metal melting facilities. It is not supported by all industries. No specific comments from the environmental groups.

### **23 – Replace RECLAIM with Command-and-Control**

Statement of Problem: NOx RTC prices have increased sharply over the past year due to increased demand and the delays in installation of control equipment. Businesses cannot sustain profits if they continue to have to purchase NOx RTCs at higher prices.

Proposal: Adopt command-and-control regulations to replace RECLAIM.

Staff Analysis: As previously discussed, replacing RECLAIM with command-and-control rules can present the following challenges:

1. Potential increases in NOx emissions at existing RECLAIM facilities to the maximum permitted level, which is significantly higher than the current RECLAIM allocation.
2. Availability of ERCs for new and expansion of existing facilities. Currently, new growth will only need to be offset at the ratio of 1:1 under RECLAIM. However, under command-and-control new source emissions must be offset at the ratio of 1.2:1. Furthermore, RECLAIM facilities receive full credits for emission reductions, while emission reductions at command-and-control facilities must be discounted to the BACT level.
3. Complex analysis to account for the RTCs purchased by RECLAIM facilities and ERCs previously converted to RTCs.
4. The length of time and resources required to develop command-and-control rules for all types of equipment and industries.

### **24 – Retrieve a Percentage of Allocation Issued to RECLAIM Facilities to Fund a General RTC Auction**

Statement of Problem: Increased production within some industrial sectors in the RECLAIM program without adequate pollution controls caused the price of NOx RTC to rapidly escalate in year 2000.

Proposal: Under the federal Acid Rain Allocation Trading Program, a small percentage of allocations are withheld and made available either at a fixed price or at auction. The intent is to moderate prices in the trading market. One proposal is to provide a similar process in the RECLAIM market.

Staff Analysis: Making a small percentage of RTC available through an auction would likely protect small facilities from some of the impacts of the high RTC prices. Pursuant to RECLAIM rules, RTCs are not property within the meaning of the state and federal constitutions. The District reserves the right to limit, suspend or terminate any RTCs.

For those facilities losing a percentage of RTCs to the auction, reduction of a percentage of future allocations could provide added incentive for facilities to control emissions. However, this approach might place certain businesses that cannot further reduce through available control technologies in a disadvantaged position.

Stakeholder Position: Industry uniformly opposes this option. The environmental organizations support this option with a recommendation that AQMD consider controlling the price on these shares rather than leaving the auction open to the highest bidder.

## **25 – Reduce Future RECLAIM Allocations Based on Staff Assessment of Available Control Technology**

Statement of Problem: AQMD must be in attainment of the federal ambient air quality standard for ozone by 2010. To reduce ozone levels, both NOx and Volatile Organic Compounds emissions must be reduced by mobile and stationary sources. Staff's technical report presented to the Governing Board in October 2000 indicated that there may be opportunities to reduce emissions further using available air pollution control equipment.

Proposal: Direct staff to conduct additional technology assessment to determine whether it is feasible to control additional NOx emissions at RECLAIM facilities.

Staff Analysis: In the October, 2000 Technical Report, staff concluded, based on a case study that emissions can be reduced by 12.5 tons per year from the year 2000 allocation level to the year 2003 allocation level cost-effectively. The report also concluded if available control technologies are fully utilized, it may be possible to reduce a greater amount of pollution. However, staff did not conduct a cost-effectiveness review relative to these emission reduction estimates.

Stake Holder Position: This option is proposed by the environmental organizations and is opposed by industry.

## **C** HAPTER 5: STAFF RECOMMENDATIONS

Over the last several months, staff has been involved in fact finding discussions with a wide variety of individuals interested in the RECLAIM program. These discussions, along with Advisory Committee meetings, included representatives of facilities in varying compliance status with RECLAIM, RTC brokers, EPA, CARB, CEC, and environmental groups. After careful consideration of the suggestions and concerns discussed, staff is proposing an integrated group of recommendations to improve the RECLAIM program. These recommendations are expected to encourage expedited installation of the emissions control equipment contemplated during initial RECLAIM program design while reducing impacts of California's electricity crisis on the RECLAIM market. Staff recommends the Governing Board direct implementation of a set of measures that are simple, directed to the exact problems at hand, and treat fairly the vast majority of facilities that remain in compliance with program requirements. To that end, staff recommends that the Governing Board:

### **1. SIP Approval of Mobile and Area Source Credits**

Request expedited SIP approval by ARB and EPA of Mobile Source and Area Source Credit generation rules.

This recommendation will provide alternate credit streams to help moderate RTC costs and ensure adequate supply for future growth, including new power plants. Governor Davis has also proposed the use of mobile source credits for power plant siting.<sup>1</sup>

### **2. Rule Development**

Direct staff to immediately initiate rulemaking activities to develop a package of amendments to the RECLAIM rules that will work together to lower and stabilize RTC prices by increasing supply, reducing demand, and increasing RTC trading information availability and accuracy. The rule amendments are proposed to include the following elements:

#### **A. Temporarily Bifurcate Existing Large Power Plants from other RECLAIM Sources**

---

<sup>1</sup> Letter from Governor Davis to James Hoecker, Chairman of Federal Energy Regulatory Commission, dated December 1, 2000.

Isolate the largest existing electrical generation facilities (those producing 50 MW or more) from the remainder of the RECLAIM universe for the 2001 through 2003 compliance years. Require these facilities not rejoin the full RECLAIM universe until the Governing Board finds evidence in a public hearing that their reentry for the 2004 compliance year will not result in any negative impact on the remainder of the RECLAIM universe or California's energy security needs. Freeze the number of RTCs available for these facilities' use at their original allocation plus any purchases made through January 11, 2001. Any emissions in excess of these available RTCs are proposed to be offset by the payment of \$7.50 per pound (\$15,000 per ton) be used to obtain NOx emission reductions from mobile, stationary or area sources to mitigate any air pollution effects. Evaluation of whether these excess emissions over RTC holdings should also be debited from the facility's next compliance year allocation per existing RECLAIM rules, and/or environmental dispatch of units, is proposed for study and comment during the rule development process. In addition, as in Section 2 (C) below, it is proposed to require all such facilities to file a compliance plan for incorporation into their permit. This compliance plan must present an expedited schedule for control equipment installation and/or repowering to clean generation equipment to produce the maximum feasible emissions reduction (such as a specified emission rate per megawatt hour generated, or other factor as worked out during the rule development process). Current Abatement Orders and Settlement Agreements would constitute compliance with the compliance plan submittal requirement. In addition, while the initial staff recommendation is to place all facilities over the California Energy Commission threshold of 50 MW in this "sub-universe," public input will be solicited in the rulemaking process to refine this proposal.

Implementation of this recommendation will increase the supply of RTCs available for the remainder of the RECLAIM universe by reducing utility sector demand. It is also designed to limit the influence of NOx RTC prices on the electricity market while State of California officials grapple with overhaul of the deregulation statutes. The proposal also provides reasonable protection of public health.

#### **B. Temporary RECLAIM Air Quality Investment Program (AQIP)**

Some facilities in the RECLAIM market are totally dependent on credit purchases by program design (e.g., so called "structural buyers" and new power plants). Therefore, an additional means of compliance needs to be available for these facilities. To meet this need, staff is proposing a temporary pilot effort for an AQIP for the 2001-2003 compliance years while the recommendations contained

herein become fully effective and help stabilize RTC prices to reasonable levels. Participants would be limited to facilities which have BACT or Best Available Retrofit Control Technology (BARCT) on their equipment. Participants could be further limited to sources below 10 tons that have not installed additional production capacity and have not sold allocations for the compliance year of concern.

Under the AQIP, facilities will pay into a fund for every ton of emissions in excess of the amount covered by usable RTCs. The fee will initially be set at \$7.50 per pound (a level above the marginal costs of controls). AQMD will use the funds paid into the AQIP to obtain NO<sub>x</sub> emission reductions from stationary, area and mobile sources.

The AQMD Board may also consider prefunding the AQIP with a loan to obtain actual emission reductions during Compliance Year 2001. Funds will be replenished by payments of \$7.50 per pound for emissions exceeding usable RTCs. AQMD staff believes that cost-effective reductions will be available at less than \$15,000 per ton (\$7.50 per pound), since staff estimated in the October 2000 RECLAIM report that there are additional NO<sub>x</sub> reductions available within the RECLAIM universe at under such cost. In addition, the Carl Moyer Program for Mobile Source NO<sub>x</sub> Reductions has a cost-effectiveness cutoff of \$13,000 per ton, so monies used in this program will obtain cost-effective reductions. Consequently the suggested initial amount is currently above the marginal cost of compliance and is adequate to obtain emissions reductions. It is proposed that the Governing Board evaluate the appropriate funding amount each year during review of the annual RECLAIM Compliance Report to the Board.

By establishing the AQIP program, AQMD would be assuming some of the responsibility for achieving necessary NO<sub>x</sub> emission reductions that would otherwise be the responsibility of RECLAIM facilities. For this reason, AQMD proposes the AQIP initially as a 3-year pilot program, subject to full reevaluation by the Board on an annual basis. In addition, the pilot program would be limited in number of tons per year available to be made up through AQIP. Staff proposes that the initial limit be determined during rule development. Should demand for the AQIP program exceed that limit a method would need to be established for allocating access to the AQIP, and any exceedances not covered by the AQIP would constitute rule violations.

Implementing the temporary AQIP proposal will ensure that emission reductions are available for a limited number of RECLAIM participants that have special needs.

### **C. Compliance Plan Filing**

Require the largest emitting RECLAIM facilities to file a compliance plan demonstrating the steps they will take to come into compliance with their Compliance Year 2001, 2002, and 2003 NOx RTC holdings at the time of compliance plan submittal. These plans are proposed to be filed in two phases with facilities emitting 25 tons or more of NOx in Compliance Year 1999 first, followed by those reporting 10 to 25 tons in Phase 2. Criteria for compliance plan approval will be specified during rule development.

Implementation of this proposal will address the lag time between control equipment installation and the realization of the attendant emission reductions to better forecast market supply and demand. It will also assure all major RECLAIM companies devote immediate attention to their emission reduction planning effort and commit to an enforceable plan to ensure the required emission reductions occur. It encourages commitment to install the required air pollution control technologies without layering new command and control requirements on top of the market-based program.

### **D. RTC Trade Registration Improvements**

Specify additional RTC Trade Registration reporting requirements, including at least (1) broker disclosure of actual RTC seller, (2) enforceable certification of trading transaction date, and (3) timely filing of trade registrations with AQMD within fourteen (14) calendar days of transaction date.

Implementation of this recommendation will increase information availability and accuracy of trade data available to the public through the AQMD.

### **E. Missing Data Protocol Revision**

Develop a specific missing data protocol for missing and late electronic reports.

Implementation of this recommendation will reduce the impact of missing data for reporting errors.

### **3. Air Quality Investment Program (AQIP)**

Authorize the Executive Officer to pre-fund the pilot RECLAIM Air Quality Investment Program (AQIP) via a loan. The amount of said loan and a specific proposal is to be provided at the Board's February meeting.

Pre-funding of this account will expedite obtaining actual NOx emission reductions for Compliance Year 2001.

### **4. Stipulated Order for Abatement**

Consistent with existing policy on the use of stipulated orders for abatement, it is recommended that facilities that can demonstrate an inability to comply with their current compliance year allocations be offered such an order, provided (1) control equipment is installed on an expedited basis (or, if controls are not feasible, an alternative such as purchasing a future stream of credits is required); (2) a penalty is paid depending on their individual circumstances that could include a component established at a benchmark amount that would go into the pilot RECLAIM AQIP fund; and (3) any emissions exceedance is deducted from their next compliance year's allocation, as required by the RECLAIM rules.

Implementation of this recommendation will help moderate RTC prices at a level reasonably above the marginal cost of control, by continuing to provide non-compliant companies an alternative to buying RTCs being offered at extraordinarily high prices.

### **5. Peer Review of Market Structure Amendments**

Initiate outside peer review of market structure amendments prior to presentation to the Governing Board for adoption.

### **6. Maximize Public Participation in Rule Development**

Direct the Executive Officer to create a RECLAIM Rule Development Working Group with broad-based participation.

In summary, bifurcation of the program as proposed by staff is a response to the need to remove power plant demand from dominating the RECLAIM market and causing RTC prices to skyrocket. Yet, if existing power plants do not have some remaining constraint on their emissions, there could be a large increase in generation and associated power plant emissions within the AQMD. The proposal contain herein attempts to maintain appropriate limits on power plant emissions while removing their influence from the RECLAIM market. Further, the proposal attempts to maintain incentives for power generation to be as clean as possible, while making the environment whole for any exceedances. Through the recommended actions, it is hoped that equivalent or close to equivalent emission reductions will occur in each year as would have occurred under RECLAIM. Thus the proposal attempts to maintain expeditious progress toward air quality goals while allowing necessary electricity generation to occur and separating the RECLAIM and electrical markets from negatively influencing each other.