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Project Title:	Palmdale Energy Project (Formerly Palmdale Hybrid Power Plant) - Compliance
TN #:	211479-1
Document Title:	Preliminary ERC RACT Review for the Palmdale Energy Project
Description:	N/A
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ATMOSPHERIC DYNAMICS, INC
Meteorological & Air Quality Modeling

April 21, 2016

Mr. Chris Anderson
Antelope Valley Air Quality Management District
43301 Division Street, Suite 206
Lancaster, CA. 93535

Re: Proposed Offsets for the Palmdale Energy Project and Removal of Confidentiality Requirements

Dear Mr. Anderson:

Included with this cover letter is the Palmdale Energy Project (PEP) offset summary tables that are currently being reviewed for use on the project. Specifically, we have included detailed information with regards to the proposed use of emission reduction credits (ERCs) for both NO_x and VOCs. The details include the dates of the offset creation, approval dates, and SIP approved RACT rules and adjustments that apply or would apply to the offset at the time of use for both NO_x and VOCs. This information is included as an attachment to this cover letter.

With this submittal, we are *removing the confidentiality designation* of the ERCs. As such, the applicant will no longer request that this information be treated as confidential data. Additionally, PEP will no longer propose to use NO_x ERCs from the San Joaquin Valley Air Basin nor will they utilize inter-pollutant trades for ozone precursors of NO_x and VOCs per AVAQMD Rule 1309(g). The applicant, under the California Environmental Quality Act (CEQA), will however, propose mitigating emissions of SO_2 through PM10 offsets.

The submittal of the detailed ERC information should allow both the AVAQMD to independently verify that the issuance of emission reduction credits by SJVAPCD and the Mojave Desert Air Quality Management District (MDAQMD) meets USEPA criteria of being real, quantifiable, permanent, surplus and federally enforceable. The proposed VOC ERCs have already been RACT adjusted pursuant to SIP approved rules. AVAQMD may further adjust the VOCs at the time of use. The NO_x ERCs will also be RACT adjusted as required by AVAQMD rules and regulations. Even with the additional RACT adjustment, as applicable, there remains sufficient ERCs to cover the requirements of PEP. Table 1 lists the amounts of ERCs, based on the appropriate offset ratio, for both NO_x and VOCs.

TABLE 1 OFFSETS/MITIGATION PROPOSED FOR PEP
Emission Reduction Credits - TPY

	PM_{10}	VOC	NO_x	SO_2	CO
AVAQMD Offset Trigger Thresholds	15	25	25	25	NA
Facility PTE[1]	81.01	51.64	139.99	11.39	351.09
AVAQMD Offset Ratio	1:1	1.3:1	1.3:1	1:1	1:1
Total Offsets Required	81.01	67.13	181.99	0	0

Total Mitigation Required at 1.5:1 Ratio from ERC Transfers > 15 Miles from AVAQMD Boundary	0	77.46	209.99	0	0

[1] Values derived from Section 2 in the PSD application.
[2] Although the proposed facility is being permitted for full operations, the facility will be operated such that the current level of mitigation credits are not exceeded. As additional mitigation credits are obtained the facility will increase operations to comply with the new level of credits (on an annual basis).

With the data included with this cover letter, the project owner hopes to demonstrate to the satisfaction of the EPA, AVAQMD and the CEC and that adequate emission reduction credits are available for sale and can be purchased prior to start of construction of the project. Specific to the EPA comments on the PDOC, the project emissions of 139.99 and 51.64 tons per year of NO_x and VOC, respectively, shall be offset at a ratio of 1.3 to one for ERC's within the MDAB or areas in the SJVAB that are within 15 miles of the AVAQMD western boundary. If ERCs are obtained from locations greater than 15 miles from the western portion of the AVAQMD, an offset ratio of 1.5 to one shall be utilized for those offsets.

We look forward to working with you. If you have any questions, please do not hesitate to call me at (831) 620-0481. Thank you for your attention in this matter.

Sincerely,

Atmospheric Dynamics, Inc.

Gregory S. Darvin

cc:
Tom Cameron, Palmdale Energy, LLC
Thomas Johns, Palmdale Energy, LLC
Docketts (CEC)

Attachment

Attachment

VOC and NO_x Emission Reduction Credits

Palmdale Energy Project VOC Emissions Reduction Credit Information Summary

Table 1 – VOC ERC Certificate/Facility Key **(San Joaquin Valley APCD)**

Current Owner	Current ERC Certificate	APCD Reduction Project ID	How Were ERCs Generated	Approximate Date ERCs Approved
Vector Environmental	S-4039-1	S-1100008	Approved equipment shutdown	Dec 2010
Crimson Resource Management	S-3387-1	S-1052797	Approved equipment shutdown/replacement	NA/2005
Calpine	S-3261-1	S-1045045	Approved equipment shutdown	Feb 2006
Dart Container Corporation	C-555-1	C-1010009	Approved equipment shutdown	Jan 2001
Martin Anderson	C-1051-1	C-1074595	Approved equipment shutdown	Feb 2010
Anderson Rack Systems - Hannibal Industries	N-950-1	N-1062909	Approved equipment shutdown	Mar 2011
Heck Cellars	S-3442	S-1075911	Over control	Sept 2010
Creations Mfg., Inc.	C-1686	1031718	Approved shutdown	Jan 2004
Silgan Container Corp.	C-1208-1	C-1123501	Approved shutdown	Mar 2013
Silgan Container Corp.	N-431-1	N-1040409	Approved shutdown	Nov 2008
BlueScope BNA, Inc.	1094294-71-1	N-1094249	Approved shutdown	Mar 2010
Malibu Boats	N-942-1	1101305	Approved shutdown	Jan 2012

Table 2 – District Analysis Determinations

ERC Certificate	Timely Filing	Emissions Reductions Approved as Bankable ERCs				
		Real	Quantifiable	Enforceable	Permanent	Surplus
S-4039-1	Yes	Yes	Yes	Yes	Yes	Yes
S-3387-1	Yes	Yes	Yes	Yes	Yes	Yes
S-3261-1	Yes	Yes	Yes	Yes	Yes	Yes
C-555-1	Yes	Yes	Yes	Yes	Yes	Yes
C-1051-1	Yes	Yes	Yes	Yes	Yes	Yes
N-950-1	Yes	Yes	Yes	Yes	Yes	Yes
S-3442	Yes	Yes	Yes	Yes	Yes	Yes
C-1686	Yes	Yes	Yes	Yes	Yes	Yes
C-1208-1	Yes	Yes	Yes	Yes	Yes	Yes
N-431-1	Yes	Yes	Yes	Yes	Yes	Yes
1094294-71-1	Yes	Yes	Yes	Yes	Yes	Yes
N-942-1	Yes	Yes	Yes	Yes	Yes	Yes

The SJVAPCD (District's) strategy for attaining the 2008 8-hour ozone standard builds upon adopted strategies from previous District plans and strategies implemented by the California Air Resources Board (ARB). The District strategy is a multi-faceted approach that uses a combination of conventional and innovative control strategies. This comprehensive strategy includes regulatory actions; incentive programs; technology advancement programs; policy and legislative activities; public outreach, participation, and communication; and other innovative strategies. As supported by extensive photochemical modeling conducted by ARB, the significant emissions reductions achieved by this comprehensive strategy in the coming years are projected to bring the Valley into attainment of the 2008 8-hour ozone standard by the 2032 deadline.

The SJVAPCD current rules and regulations reflect technologies and methods that are far beyond minimum required control levels. The aggressive regulations already adopted under previous District attainment plans (*2007 Ozone Plan, 2008 PM2.5 Plan, 2012 PM2.5 Plan, 2013 Plan for the Revoked 1-hour Ozone Standard, 2015 Plan for the 1997 PM2.5 Standard*) serve as the basis for this *2016 Ozone Plan*. These adopted regulations will reduce

emissions of oxides of volatile organic compounds (VOCs) as they are fully implemented over the upcoming years, contributing to the Valley's progress toward attainment of the 2008 8-hour ozone standard.

EPA prefers reliance on control measures that have already been adopted over ones that have yet to be approved. EPA has gone so far as to disapprove attainment plans that demonstrated an over-reliance on unapproved measures. As such, the recognition of recently adopted and implemented District and ARB control measures is an important component of this plan and is listed as a SIP approved control plan in the table below.

The following Table 3 identifies the adopted District rules for source categories that would be used for VOC offsets for achieving new emissions reductions in and after 2009. However, even pre-2012 emissions reductions are contributing and will continue to contribute to the Valley's progress toward attainment.

Table 3 – ERC Quantification Determinations

ERC Certificate	District Approved Emissions Factors Used	District Approved Quantification Methods Used	Approximate Date ERCs Approved	RACT Adjustment Potentially Required*	Adopted/Amended Date SIP Approval Date
S-4039-1	Yes	Yes	Dec 2010	VOC – Rule 4682* Yes	12/15/11 9/20/12
S-3387-1	Yes	Yes	NA/2005	VOC – none	NA
S-3261-1	Yes	Yes	Feb 2006	VOC – Rule 4606* Yes	10/16/08 1/10/12
C-555-1	Yes	Yes	Jan 2001	VOC – Rule 4691 No	12/17/1992 1/10/12
C-1051-1	Yes	Yes	Feb 2010	VOC – Rule 4682* Yes	12/15/11 9/20/12
N-950-1	Yes	Yes	Mar 2011	VOC – Rule 4603 No	9/17/09 1/10/12
S-3442	Yes	Yes	Sept 2010	VOC – Rule 4695 No	9/17/09 1/10/12

C-1686	Yes	Yes	Jan 2004	VOC – Rule 4606 Yes	10/16/08 1/10/12
C-1208-1	Yes	Yes	Mar 2013	VOC – Rule 4604 No	9/20/07 1/10/12
N-431-1	Yes	Yes	Nov 2008	VOC - none	-
1094294-71-1	Yes	Yes	Mar 2010	VOC – Rule 4603 No	9/17/09 1/10/12
N-942-1	Yes	Yes	Jan 2012	VOC – Rule 4684 No Rule 4653 No Rule 4663 No	8/18/11 2/6/12 9/16/10 2/13/12 9/20/07 1/10/12
Pursuant to the "Surplus" analysis in these district files, the ERCs were RACT adjusted at the time of banking. The column above indicates if any further RACT adjustments may be required due to rule adoptions or amendments since the time of issuance. The previous and current RACT rule is cited for reference as well as the last amendment date and SIP approval date.					

Rule 4603 Surface Coating of Metal Parts and Products, Plastic Parts and Products, and Pleasure Crafts
Rule 4604 Can and Coil Coating Operations
Rule 4606 Wood Products and Flat Wood Paneling Products Coating Operations
Rule 4653 Adhesives and Sealants
Rule 4663 Organic Solvent Cleaning, Storage, and Disposal
Rule 4682 Polystyrene, Polyethylene, and Polypropylene Products and Manufacturing
Rule 4684 Polyester Resin Operations
Rule 4691 Vegetable Oil Processing Operations
Rule 4695 Brandy and Wine Aging Operations

Table 4 – VOC ERC Amounts Generated from Identified Projects

ERC Project ID	ERC Pollutant	1st Qtr, lbs	2nd Qtr, lbs	3rd Qtr, lbs	4th Qtr, lbs
S-4039-1	VOC	71,653	86,926	80,406	9,672
S-3387-1	VOC	23,063	20,161	19,126	13,979
S-3261-1	VOC	5,294	5,812	4,730	4,995
C-555-1	VOC	112,929	104,976	40,935	69,030
C-1051-1	VOC	8,699	12,348	6,585	90
N-950-1	VOC	7,335	7,335	7,335	7,335
S-3442	VOC	10,000	10,000	10,000	10,000
C-1686	VOC	9,986	9,206	9,494	9,041
C-1208-1	VOC	4,279	3,921	3,042	3,166
N-431-1	VOC	5,103	3,464	3,573	3,865
1094294-71-1	VOC	5,404	6,473	10,921	8,632
N-942-1	VOC	13,753	22,879	14,803	14,093
Quarterly Totals, tons		*138.75*	*146.75*	*105.48*	*76.95*
Annual Totals, tpy			***497.9***		

See the attached district analysis files for more detailed data.

Anticipated Emissions Reductions Due to Changes in RACT Rules

1. For the ERC certificates subject to changes in Rule 4682 (S-4039-1, and C-1051-1), the anticipated changes to banked emissions would be insignificant. Pursuant to the Fact Sheet for the proposed 2011 amendments, the District stated that "the proposed amendments will not result in any significant additional emissions reductions and the costs of the proposed amendments are anticipated to be minimal with little or no socioeconomic impacts." Therefore, at this time, no additional RACT reductions in banked VOC emissions per Rule 4682 are anticipated.
2. For certificate S-3261-1, note the following:
   a. The surplus analysis for this certificate does not state that Rule 4606 is an applicable rule, but rather that historical actual emissions were derived from approved historical data, compliance with the permit conditions, and compliance with Rule 4606.

b. At the time of adoption and the last amendment to Rule 4606, the District had no facilities subject to Rule 4606, and the rule adoption and amendments were undertaken so that if such a facility were to propose operations within the District, the rule would then apply, and control VOC emissions to RACT levels at a minimum.
c. Rule 4606 apparently contained coating VOC limits and requirements that were thought to be similar to the operations conducted at the facility in question.
d. The District states in the analysis that the coating operations are in compliance with the rule (see item "e" below).
e. The permits to operate for the various coating and solvent operations have VOC limits established via Rule 2201 (NSR), not Rule 4606. The only permit conditions that contain a Rule 4606 VOC limit are those which address the use of clean up and surface preparation solvents. Therefore, the primary VOC limits were established under Rule 2201, not Rule 4606, and as such, we would not expect that the current banked emissions under this certificate would experience any reductions due to changes in Rule 4606 that occurred after the emissions certificate was issued. Based on our review, the only emissions reductions or adjustments would be from the lowering of the VOC content limits for cleanup and surface preparation solvent use. Per the District analysis, butyl-cellosolve is the only solvent used for cleanup and surface prep, and the VOC emissions from this solvent represented approximately 2.2% of the average monthly VOC emissions. The latest version of Rule 4606 requires a 50% reduction in VOC content from the cleanup and surface prep solvents. This reduction would lessen the solvent emissions contributions on a average monthly basis to 1.1%. This approximate reduction is insignificant as applied to the current ERC certificate. Total VOC ERCs for this certificate are 20831 lbs, and a reduction of 1.1% would result in an adjusted value of 20602 lbs.

3. Certificate C-1686 may need to be re-evaluated for any changes that have occurred to Rule 4606 after the date of the creation of the ERCs, i.e., specifically the latest version of the rule dated 10/16/08. See item 2(e) above.

Palmdale Energy Project NO_x Emissions Reduction Credit Information Summary

Table 1 – NOx ERC Certificate/Facility Key **(Mohave Desert AQMD)**

Current Owner	Current ERC Certificate	APCD Reduction Project ID	How Were ERCs Generated	Approximate Date ERCs Approved
NRG California South LP	0102	Coolwater Gen Station	Approved Shutdown	6/29/15
CalPortland Cement	0103	Kiln	Approved Shutdown	2/1/08

Table 2 – District Analysis Determinations

ERC Certificate	Timely Filing	Emissions Reductions Approved as Bankable ERCs				
		Real	**Quantifiable**	**Enforceable**	**Permanent**	**Surplus**
0102	Yes	Yes	Yes	Yes	Yes	Yes
0103	Yes	Yes	Yes	Yes	Yes	Yes

Table 3 – ERC Quantification Determinations

ERC Certificate	District Approved Emissions Factors Used	District Approved Quantification Methods Used	Approximate Date ERCs Approved	RACT Adjustment Potentially Required	Adopted/Amended Date SIP Approval Date
0102	Yes	Yes	June 2015	NO_x -	See note
0103	Yes	Yes	Feb 2008	NO_x – Rule 1161	3/2002 (*)

Note: AQMD prohibitory rules such as Rules 406, 407, 409, 474, 475, and 476 were adopted or last amended in the 1977 to 1997 timeframe.

Source specific rules such as Rules 1157 and 1158 were last amended in 1997.

Rule 1159 (Combustion Turbines) was last amended in Sept 2009, but it is unlikely that this rule applied to the cement kiln at the time of shutdown.

Rule 1404 indicates that adjustments to proposed ERCs, i.e., RACT, shall be made by the AQMD as part of its ERC application review.

Rule 1402 states that "Subsequent changes in District Rules or Regulations to require a type of emission reduction which has previously been banked shall not reduce or eliminate such ERC."

Table 4 – NOx ERC Amounts Generated from Identified Projects

ERC ID	ERC Pollutant	TPY
0102	NO_x	240
0103	NO_x	854
Annual Totals, tons		***1094***

Revised 04-28-15

MOJAVE DESERT
AIR QUALITY MANAGEMENT DISTRICT

Emission Reduction Credit Preliminary Evaluation

for
the Shutdown of

Coolwater Generating Station
37000 Santa Fe Street
Daggett, CA 92327

Submittal Date to CARB/USEPA review: May 1, 2015
30-day Public Comment Period begins (Public Notice Published): May 5, 2015

Processing Engineer:

Sheri Haggard

14306 PARK AVENUE, VICTORVILLE, CALIFORNIA 92392
PHONE (760) 245-1661
FAX (760) 245-2022

A. FACILITY IDENTIFYING INFORMATION:

Owner/Company Name:	NRG California South, LP
Owner Mailing Address:	P.O. Box 337 Daggett, CA 92397
Facility Name:	Coolwater Generating Station
Facility Location:	37000 Santa Fe Street Daggett, CA 92327
MDAQMD Federal Operating Permit Number:	104801880
MDAQMD Company Number:	1048
MDAQMD Facility Number:	1880
Responsible Official: Title: Phone Number:	Mr. Patrick Kossman Interim Plant Manager 760-254-5242
Facility "Site" Contact: Title: Phone Number:	Ms. Apeetha Jain Environmental Supervisor, West Region 909-899-7209
Facility "Site" Contact: Title: Phone Number:	Mr. Pierce Harvey Environmental Specialist 760-254-5205
Nature of Business: SIC Code: Facility Location:	Electric Power Generation 4911 – Electric Power Generation UTM (km) 3858 N / 514 E

B. BACKGROUND:

Coolwater Generating Station (Coolwater) is an electric power generating facility located in Daggett, California with a net power production capacity of approximately 658 MW(e) from four power generating units and two boilers. In September of 2014, Unit 3 &4 cooling tower failed, and a portion of it collapsed. After detailed evaluation, the refurbishment of the cooling towers at Coolwater, and continued operation of the units, was determined to be economically infeasible. Coolwater decided to permanently retire all six generating units effective January 1, 2015.

C. ACTIONS:

On March 13, 2015, the MDAQMD received Notice of Change in Long-Term Status of Generating Units and Filing of Emission Reduction Credit Application. This notice included prior correspondence, dated December 23, 2014, to the California Public Utilities Commission and to the California Independent System Operator which indicates Coolwater will be permanently retiring the generating units. This notice included the request to cancel the MDAQMD permits listed below in Table 1. This notice also included the filing of an Emission Reduction Credit (ERC) application for the shutdown of the equipment listed in Table 1.

Table 1 – List of Equipment to be Shutdown

Permit No.	Description
B001077	Steam Boiler - Unit No. 1
B001078	Steam Boiler - Unit No. 2
B001079	Combustion Turbine Generator - Unit No. 31
B001080	Combustion Turbine Generator - Unit No. 32
B001081	Combustion Turbine Generator - Unit No. 41
B001082	Combustion Turbine Generator - Unit No. 42
B010617	Cooling Tower - Unit 1
B010618	Cooling Tower - Unit 2
B010619	Cooling Tower - Units 3 & 4

On March 31, 2015, the MDAQMD permits listed in Table 1 were officially cancelled by the MDAQMD.

On April 9, 2015, the MDAQMD was copied on a Notice of Change in Long-Term Status of Generating Units sent to USEPA. The MDAQMD considers this notice as documentation to cease the renewal of Coolwater's Federal Operating Permit, inclusive of the Title IV and V. Coolwater's Federal Operating Permit expired on June 28, 2014 and was currently under District review for renewal.

D. TIMELINESS OF ERC APPLICATION:

Coolwater submitted an application (with the appropriate fee) requesting the formal issuance of ERCs for the shutdown equipment on March 13, 2015. The District has determined that the ERC application was submitted in a timely manner as required by District Rule 1402(B)(1)(d)(ii)e. since the application was submitted within six months of the shutdown (January 1, 2015).

E. DETERMINATION OF COMPLETENESS:

The District determined the ERC application to be complete on April 28, 2015. Initially, the District requested additional information pertaining to the proposed application on April 3, 2015. This information was provided on April 21, 2015.

F. CALCULATION OF ERCS:

Coolwater is requesting ERCs for NO_X, CO, ROG, SO_2, PM_{10}, and $PM_{2.5}$. While the District has not traditionally addressed ERCs for $PM_{2.5}$, the District agrees with Coolwater's proposal, in that the shutdown of the power generating equipment does constitute reductions in $PM_{2.5}$ as a quantifiable portion of the reductions in PM_{10}. The District has quantified $PM_{2.5}$ reductions and is proposing to issue $PM_{2.5}$ ERCs; as the District is in attainment for $PM_{2.5}$, the proposed $PM_{2.5}$ ERCs cannot be used for offsets at this time, but may be used at a future date. As the $PM_{2.5}$ reductions are a portion of the PM_{10} emissions, they cannot be separated from the PM_{10} ERCs. At some future date of $PM_{2.5}$ ERC use, at the proposed ratio of 44,292 pounds of PM_{10} and 28,404 pounds of $PM_{2.5}$ ERCs, each pound of PM_{10} ERC consumed also consumes 0.64 pounds of $PM_{2.5}$, and conversely each pound of $PM_{2.5}$ consumed also consumes 1.56 pounds of PM_{10}.

Emission reductions associated with the equipment shown in Table 1 have been quantified in accordance with District Rule 1404 – *Emission Reduction Credit Calculations*. Rule 1404 specifies that ERCs shall be Actual Emission Reductions (AERs) as defined in District Rule 1401 – *Definitions*. AERs shall be real, enforceable, quantifiable, surplus and permanent.

Pursuant to Rule 1404(A)(2)(a), for the shutdown of an emission unit, AERs are equal to the Historic Actual Emissions (HAE). Coolwater has proposed using the 24 month period from August 2012 through July 2014 as the most representative data of facility operations in the past five year period to represent HAE pursuant to Section (N) of Rule 1401. The District accepts Coolwater's proposal for the selected 24 month period (August 2012 through July 2014) to be the most representative data of facility operations, as the cooling tower collapsed in September of 2014.

Furthermore, pursuant to Rule 1404, Section (A)(3), AERs must be adjusted to reflect emission reductions which are otherwise required by Federal, State, or District law, rule, order, permit or regulation. These adjustments reflect only the excess reductions beyond those: 1) already achieved by, or achievable by, the emissions unit using RACT; 2) required by applicable District

Rules and Regulations; 3) required by any applicable proposed District Rules and Regulations which have been take to a public workshop; and 4) required by any control measures identified in the District's Air Quality Attainment Plan or contained in the State Implementation Plan which have not yet been implemented in the form of District Rules and/or Regulations.

The specifics of these above listed ERC calculation requirements are broken down by equipment type and by pollutant and are discussed below:

F.1 Steam Boilers (units 1 and 2): Two steam boilers with both natural gas and oil burners (MDAQMD permits B001077 and B001078).

To determine the AERs (AERs=HAE) for the steam boilers, the 2 year average of the 24 month HAE (August 2012 through July 2014) were calculated for each pollutant using the sources specified in Table 2.

Table 2 – Steam Boiler AER Sources

Pollutant	Source of AERs
NO_X	CEMS
CO	Calculated using Ap-42, Section 1.4 - *External Natural Gas Combustion* emission factors and fuel throughputs from certified Station orifice fuel meters
ROG	
SO_2	
PM_{10}	Calculated using fuel throughputs and emission factors from source tests*
$PM_{2.5}$	Calculated assuming all condensable and filterable PM resulting from natural combustion is less than 1 micrometer in diameter; therefore total PM is equal to PM_{10} and $PM_{2.5}$ emissions as documented in EPA AP-42, Section 1.4 – *Natural Gas Combustion*, Table 1.4-2, Footnote C

*Source Test conducted on Unit 2 in August of 2013 was used to calculate the HAE from August 2013 to July 2014. Source Test conducted on Unit 1 in May of 2009 was used to calculate the HAE from August 2012 through July 2013. Only one unit is required to be tested every four years. The results of one unit are considered to be representative of both units.

The resulting AER associated with the shutdown of the two steam boilers is summarized in Table 3. The District has approved the proposed AER sources and calculations resulting in the AERs listed in Table 3. The CEMS data and calculation summaries for these totals are in Appendix B.

Table 3 – AERs Associated with Steam Boilers (lb/yr)

Unit	NO_X	CO	ROG	SO_2	PM_{10}	$PM_{2.5}$
Steam Boiler Unit 1	5,600	6,144	402	44	178	178
Steam Boiler Unit 2	9,000	8,735	572	62	255	255
Total	14,600	14,880	974	106	432	432

The AERs associated with the shutdown of the two steam boilers, as summarized in Table 3, was reviewed to evaluate whether adjustments were required pursuant to Rule 1404, Section (A)(3). District Rule 1158 – *Electric Power Generating Facilities* limits NOx emissions from electrical generating steam boilers and combined-cycle turbine units. Section C of Rule 1158 specifies

RACT NO_X limits for boilers. A comparison of the MDAQMD RACT limits for NO_X and the Coolwater steam boiler permit limits are summarized in Table 4 below.

Table 4 – Rule 1158 NO_X RACT Limits for Boilers

Equipment	RACT Limits			Permit Limits			Complies with RACT?
	Baseline Unit (ppmvd)	*Cycling Unit (ppmvd)*	*Peaking Unit (ppmvd)*	*Baseline Unit (ppmvd)*	*Cycling Unit (ppmvd)*	*Peaking Unit (ppmvd)*	
Natural Gas Burner	70	100	125	70	100	125	Yes
Oil Burner	115	115	225	115	115	225	Yes

As shown in Table 4, the steam boilers satisfy RACT for NOx. Additionally, the actual CO, ROG, SO2, and PM10 emissions are below the permit limits for the steam boilers specified in District permits B001077 and B001078. There are no other MDAQMD applicable current or proposed Rules; and there are no control measures identified in the MDAQMD's Air Quality Attainment Plan or contained in the SIP for the MDAQMD which have yet to be implemented in the form of District Rules. The MDAQMD Draft Staff Report for Proposed Adoption of the 2015 8 - Hour Reasonably Available Control Technology - State Implementation Plan Analysis RACT SIP Analysis) on February 23, 2015 was reviewed. The Report included discussion that the NOx RACT limits in MDAQMD Rule 1158 – *Electric Power Generating Facilities* may be adjusted; however, revised RACT limits to Rule 1158 have not yet been proposed. Therefore, no adjustments have been made to the values provided in Table 3, and the actual emission reductions shown in Table 3 due to the shutdown of the steam boilers are permanent, enforceable, surplus, quantifiable, and real.

F.2 Combustion Turbine Generators (units 31, 32, 41 and 42): Four combustion turbines that can fire on natural gas or liquid fuel (MDAQMD permits B001079, B001080, B001081, and B001082).

To determine the AERs (AERs=HAE) for the combustion turbines, the 2 year average of the 24 month HAE (August 2012 through July 2014) were calculated for each pollutant using the sources specified in Table 5.

Table 5 – Combustion Turbine AER Sources

Pollutant	Source of AERs
NO_X	CEMS
CO	Calculated using Ap-42, Section 3.1 – *Stationary Gas Turbines* emission factors and fuel throughputs from certified Station orifice fuel meters
ROG	
SO_2	
PM_{10}	Calculated using fuel throughputs and emission factors from source tests*
$PM_{2.5}$	Calculated assuming all condensable and filterable PM resulting from natural combustion is less than 1 micrometer in diameter; therefore total PM is equal to PM_{10} and $PM_{2.5}$ emissions as documented in EPA AP-42, Section 1.4 – *Natural Gas Combustion*, Table 1.4-2, Footnote C

*Source Test conducted on Unit 32 in August of 2013 was used to calculate the HAE from August 2013 to July 2014. Source Test conducted on Unit 42 in August of 2008 was used to calculate the HAE from August 2012 through July 2013. Only one unit is required to be tested every four years. The results of one unit are considered to be representative of both units.

The resulting AER associated with the shutdown of the four combustion turbines is summarized in Table 6. The District has approved the proposed AER sources and calculations resulting in the AERs listed in Table 6. The CEMS data and calculation summaries for these totals are in Appendix B.

Table 6 – AERs Associated with Combustion Turbines (lb/yr)

Unit	NO_X	CO	ROG	SO_2	PM_{10}	$PM_{2.5}$
Combustion Turbine Unit 31	90,880	27,731	1,903	544	5,358	5,358
Combustion Turbine Unit 32	86,610	26,871	1,844	527	5,315	5,315
Combustion Turbine Unit 41	132,930	38,273	2,627	750	8,000	8,000
Combustion Turbine Unit 42	154,960	44,087	3,026	864	9,245	9,245
Total	465,380	136,961	9,399	2,686	27,917	27,917

The AERs associated with the shutdown of the four combustion turbines, as summarized in Table 6, was reviewed to evaluate whether adjustments were required pursuant to District Rule 1404, Section (A)(3). District Rule 1158 – *Electric Power Generating Facilities* limits NOx emissions from electrical combined-cycle turbine units. Section C of Rule 1158 specifies RACT NO_X limits for combustion turbines. A comparison of the MDAQMD RACT limits for NO_X and the Coolwater combustion turbine generator permit limits are summarized in Table 7 below.

Table 7 – Rule 1158 NO_X RACT Limits for Combustion Turbines

Equipment	RACT Limits		Permit Limits		Complies with RACT?
	Natural Gas (ppmvd)	*Liquid Fuel (ppmvd)*	*Baseline Unit (ppmvd)*	*Cycling Unit (ppmvd)*	
Dual Fuel Combustion Turbine	42	65	42	65	Yes

As shown in Table 7, the combustion turbine generators satisfy RACT for NO_X. Additionally, the actual CO, ROG, SO_2, and PM_{10} emissions are below the permit limits for the combustion

turbine generators specified in District permits B001079, B001080, B001081, and B001082. There are no other MDAQMD applicable current or proposed Rules; and there are no control measures identified in the MDAQMD's Air Quality Attainment Plan or contained in the SIP for the MDAQMD which have not yet been implemented in the form of District Rules. The MDAQMD Draft Staff Report for Proposed Adoption of the 2015 8 - Hour Reasonably Available Control Technology - State Implementation Plan Analysis (RACT SIP Analysis) on February 23, 2015 was reviewed. The Report included discussion that the NOx RACT limits in MDAQMD Rule 1158 – *Electric Power Generating Facilities* may be adjusted; however, revised RACT limits to Rule 1158 have not yet been proposed. Therefore, no adjustments have been made to the values provided in Table 6, and the actual emission reductions shown in Table 6 due to the shutdown of the combustion turbine generators are permanent, enforceable, surplus, quantifiable, and real.

F.3 Cooling Towers (units 1, 2, 3 and 4): Four cooling towers equipped with a drift eliminator with control efficiency of 99.98% (MDAQMD permits B010617, B010618, and B010619).

To determine the AERs (AERs=HAE) for the cooling towers, the 2 year average of the 24 month HAE (August 2012 through July 2014) were calculated for PM10 based on permitted circulation rates, the drift eliminator control efficiency, and actual total dissolved solids (TDS) measurements. $PM_{2.5}$ AERs were calculated based on a representative drift droplet size distribution and Total Dissolved Solids (TDS) in the water. For a given initial droplet size, assuming that the mass of dissolved solids condenses to a spherical particle after all the water evaporates, and assuming the density of the TDS is equivalent to a representative salt (e.g., sodium chloride), the diameter of the final solid particle is calculated. Thus, using the drift droplet size distribution, the percentage of drift mass containing particles small enough to produce PM2.5 is calculated. This method is conservative as the final particle is assumed to be perfectly spherical; hence as small a particle as can exist. The equation can be found in Reisman and Frisbie's (2002) paper, *Calculating Realistic PM10 Emissions from Cooling Towers*.

The resulting AER associated with the shutdown of the four cooling towers is summarized in Table 8. The District has approved the proposed AER sources and calculations resulting in the AERs listed in Table 8. The data and calculation summaries for these totals are in Appendix B.

Table 8 – AERs Associated with Cooling Towers (lb/yr)

Unit	PM_{10}	$PM_{2.5}$
Cooling Tower Unit 1	1,735	7
Cooling Tower Unit 2	2,165	8
Cooling Towers Units 3 and 4	12,043	38
Total	15,943	53

There are no MDAQMD applicable current or proposed Rules; and there are no control measures identified in the MDAQMD's Air Quality Attainment Plan or contained in the SIP for the MDAQMD which have not yet been implemented in the form of District Rules. Therefore, no

adjustments have been made to the values provided in Table 8, and the actual emission reductions shown in Table 8 due to the shutdown of the cooling towers are permanent, enforceable, surplus, quantifiable, and real.

G. SUMMARY OF PROPOSED ERCS:

ERCs generated by the shutdown of permitted equipment at Coolwater meet the MDAQMD criteria of being permanent, enforceable, real, quantifiable, and surplus.

The proposed ERCs are permanent in that they are generated from equipment shutdowns (the relevant permits have been surrendered and were cancelled on March 31, 2015). Any replacement equipment would require New Source Review. The proposed ERCs are enforceable in that they are verified and legally binding. The proposed ERCs are real in that they have been occurring, implemented and not artificially devised. The proposed ERCs are quantifiable in that they were quantified using the methodology required by Rule 1404(A)(2)(a). The proposed ERCs are surplus in that they are in excess of emission reductions which are otherwise required by Federal, State, or District law, rule, order, permit or regulation. No adjustments were necessary pursuant to Rule 1404, Section (A)(3)

Table 9 summarizes the proposed facility-wide emission reductions. Since the values in Table 9 exceed the thresholds in Section (B)(4)(a)(ii) of District Rule 1402 – *ERC Reduction Credit Registry* for NO_X and PM_{10}, the MDAQMD will transmit this application to the California Air Resources Board (CARB) and the United States Environmental Protection Agency (USEPA) no later than the date of public notice.

Table 9 – Facility-wide AERs and Proposed ERCs (lb/yr)

NO_X	CO	ROG	SO_2	PM_{10}	$PM_{2.5}$*
479,980	151,840	10,374	2,792	44,292	28,404

* As the $PM_{2.5}$ reductions are a portion of the PM_{10} emissions, they cannot be separated from the PM_{10} ERCs. At the future date of $PM_{2.5}$ ERC use, each pound of PM_{10} ERC consumed also consumes 0.64 pounds of $PM_{2.5}$, and conversely each pound of $PM_{2.5}$ consumed also consumes 1.56 pounds of PM_{10}.

H. CLASS OF ERCS:

The proposed ERCs are classified as Class "A" pursuant to District Rule 1402, Section (A)(5)(b)(ii), as the ERCs are a result of a shutdown where there will likely be no resulting emission increase by replacement emission unit(s). Coolwater decided to permanently retire all the power generating equipment (as listed in Table 1) effective January 1, 2015, as indicated in the ERC application.

H. PUBLIC NOTICE AND COMMENT:

Pursuant to District Rule 1402, Section (B)(5), the MDAQMD will publish a notice in at least one daily newspaper of general circulation within the District and shall send a copy of the notice to all persons who are included on a list of persons requesting notice, on file with the Clerk of the Board for the District. Please refer to Appendix A to see a copy of the Public Notice and details of its circulation.

I. CONCLUSION:

The District has determined that the proposed ERCs generated by the shutdown of permitted equipment at Coolwater meet the MDAQMD criteria of being permanent, enforceable, real, quantifiable, and surplus. The relevant permits have been surrendered and voided. The emission units for which the permits were surrendered will not be repermitted within the District, unless their emissions are completely offset pursuant to District Regulation XIII – *New Source Review*. The District; therefore, expects to issue the ERCs, in the amounts listed in Table 9, upon expiration of the public commenting period, unless comments require additional review/commenting periods. This review period includes comments received from the CARB and/or USEPA due to the proposed ERCs exceeding the thresholds in Section (B)(4)(a)(ii) of District Rule 1402 – *ERC Reduction Credit Registry* for NO_X and PM_{10}. The District will provide written notice of the final action to the applicant, the CARB, and USEPA upon expiration of the public commenting period.

APPENDIX A – PUBLIC NOTICE

Noticing Methods include the following, per District Rule 1402 (B)(5):

- Published in newspapers of general circulation - Riverside Press Enterprise (Riverside County) and the Daily Press (San Bernardino County) on Tuesday, May 5, 2015.
- Mailed and/or emailed to MDAQMD contact list of persons requesting notice of actions (see the contact list following the Public Notice in Appendix A).
- Posted on the MDAQMD Website at the following link: http://www.mdaqmd.ca.gov/index.aspx?page=416

Mojave Desert Air Quality Management District
14306 Park Avenue, Victorville, CA 92392-2310
760.245.1661 • fax 760.245.2699
Visit our web site: http://www.mdaqmd.ca.gov
Eldon Heaston, Executive Director

NOTICE OF PROPOSED ISSUANCE OF EMISSION REDUCTION CREDITS

NOTICE IS HEREBY GIVEN THAT the Mojave Desert Air Quality Management District (MDAQMD) is proposing to grant NRG California South, LP – Coolwater Generating Station Emission Reduction Credits (ERCs) for the shutdown of power generating equipment, specifically, two steam boilers, four combustion turbine generators, and 4 cooling towers. The Coolwater Generating Station is located at 37000 Santa Fe Street in Daggett, California. The amount of ERCs proposed to be issued are as follows: 479,980 pounds of NO_X, 151,840 pounds of CO, 10,374 pounds of ROG, 2,792 pounds of SO_2, and 44,292 pounds of PM_{10}. The shutdown action has also generated 28,404 pounds of $PM_{2.5}$ reductions as a portion of the PM_{10} reductions. The class of the proposed ERCs are designated as Class "A".

REQUEST FOR COMMENTS: Interested persons are invited to submit written comments and/or other documents regarding the terms and conditions of this proposed action. If you submit written comments, you may also request a public hearing on this proposed action. To be considered, comments, documents and requests for public hearing must be submitted no later than 5:00 P.M. on June 5, 2015, to the MDAQMD, at the address listed below.

AVAILABILITY OF DOCUMENTS: The preliminary evaluation on this proposed action, as well as the application and other supporting documentation are available for review at the MDAQMD offices, 14306 Park Avenue, Victorville, CA 92392. In addition, these documents are available on the MDAQMD website and can be viewed at following link: http://www.mdaqmd.ca.gov/index.aspx?page=416. Please contact Sheri Haggard, Air Quality Engineer at the address, above, or (760) 245-1661, extension 1864, or at shaggard@mdaqmd.ca.gov for additional questions pertaining to this action and/or corresponding documents.

CEQA: Pursuant to the California Environmental Quality Act, the MDAQMD has determined that a Categorical Exemption (Class 8; 14 Cal. Code Reg. §15308) applies to the proposed action, and the MDAQMD will prepare a Notice of Exemption for the proposed action.

Traducción en español esta disponible por solicitud. Por favor llame: (760) 245-1661 x1864

MICHELE BAIRD
Clerk of the Governing Board

Point of Contact	Organization	Street Address	City, State, Zip	Date and Reason for Deleting
Air Pollution Control Officer	Eastern Kern Air Pollution Control District	2700 M Street, Ste 302	Bakersfield, CA 93301-2370	
Air Quality Division Director	ADEQ (Mail Code 3415A-1)	1110 West Washington Street	Phoenix, AZ 85007-2952	
~~Alan Maler~~	~~Greenberg Traurig, LLP~~	~~2450 Colorado Avenue, Ste 400E~~	~~Santa Monica, CA 90404~~	1/12/15: "Return to Sender: Unable to Forward"
Allan Randle	AC Randle & Associates	2179 Wilbanks Circle	Henderson, NV 89102	
Anne McQueen, Ph.D., P.E.	AMEC	121 Innovation Drive, Ste 200	Irvine, CA 92617	
Bob Rogan, Air Quality Engineer	California Air Resources Board	P.O. Box 2815	Sacramento, CA 95812	
Brian Maguire	CalNev Pipeline	1100 Town & Country Road	Orange, CA 92868	
Carol Kaufman	Metropolitan Water District	700 N Alameda Street, 8th Floor, RM 106	Los Angeles, CA 90012	
Chief, Bureau of Air Pollution Control	Nevada Division of Environmental Protection (Air)	901 South Stewart Street, Ste 4001	Carson City, NV 89701-5249	
Chief, Planning Division	California Air Resources Board	P.O. Box 2815	Sacramento, CA 95812	
Chief, Stationary Source Division	California Air Resources Board	P.O. Box 2815	Sacramento, CA 95812	
City Manager	The City of Barstow	220 East Mountain View, Ste A	Barstow, CA 92311	
Clark County	Department of Air Quality	4701 Russell Rd, Ste 200	Las Vegas, NV 89118	
Commanding Officer, NAWS China Lake	Attn: Air Quality Program Manager	429 E Bowen Rd, Stop 4104	China Lake, CA 93555-6108	
Darlene Bray, Environmental Manager	CEMEX	16888 North E Street	Victorville, CA 92392	

~~David Bubenick~~	~~The AirBank~~	~~49 Junction Square Drive~~	~~Concord, MA 01742~~	09/19/2014: Return to Sender, Not deliverable, unable to forward
David Rib, Environmental Manager	Mitsubishi Cement Corporation	5808 State Highway 18	Lucerne Valley, CA 92356	
Deborah Barmack	San Bernardino Associated Governments	1170 W. Third Street, 2nd FL	San Bernardino, CA 92410	
Director, Air Division: AIR-3	United States EPA, Region IX	75 Hawthorne Street	San Francisco, CA 94105	
Division Chief	San Bernardino County EHS	385 North Arrowhead Avenue, 2nd FL	San Bernardino, CA 92415-0160	
Don Shepherd	National Park Service, Air Resources Division	12795 W Alameda Pkwy	Lakewood, CO 80228	
Douglas MacIver, Engineer	Doug MacIver Consulting	P.O. Box 120001	Big Bear Lake, CA 92315	
Environmental Affairs	Blythe Energy Project	P.O. Box 1210	Blythe, CA 92226	
Environmental Affairs	Southern California Gas Company	P.O. Box 2300, SC 9314	Chatsworth, CA 91313	
Environmental Contact	Air Force Research Laboratory	95 ABW/CEV-5 East Popson Avenue, Bldg 2650A	Edwards AFB, CA 93524-8060	
Environmental Contact	Commanding Officer, USMCLB (B-550)	Box 110500	Barstow, CA 92311-5013	
Environmental Contact	Continental Fiberglass	17031 Muskrat Avenue	Adelanto, CA 92301	
Environmental Contact	Duffy Boats	17260 Muskrat Avenue	Adelanto, CA 92301	
Environmental Contact	Fiber Care Baths, Inc.	9832 Yucca Road	Adelanto, CA 92301	
Environmental Contact	High Desert Power Project, LLC	19000 Perimeter Road	Victorville, CA 92394	
~~Environmental Contact~~	~~NASA Goldstone DSCC - ITT/Exelis~~	~~P.O. Box 11103~~	~~Goldstone, CA 92310~~	9/8/14: "Return to Sender: Not Deliverable as Addressed"

Environmental Contact	Northwest Pipe Company	12351 Rancho Road	Adelanto, CA 92301	
PG&E - Air Permits		PO Box 7640	San Francisco, CA 94120	
Environmental Health & Safety	Specialty Minerals Inc.	P.O. Box 558	Lucerne Valley, CA 92356-0558	
Environmental Manager	Molded Fiber Glass Companies West	9400 Holly Road	Adelanto, CA 92301	
Erin Adams, Air Quality	MAGTFTC/CAGCC/NREA	Box 788110, Building 1451	Twentynine Palms, CA 92278-8110	
Evolution Markets, LLC		10 Bank Street, Ste 410	White Plains, NY 10606	
Gary Rubenstein	Sierra Research	1801 J Street	Sacramento, CA 95814	
Gerardo Rios, Permits Chief	United States EPA, Region IX	75 Hawthorne Street	San Francisco, CA 94105	
Glen King, Environmental Manager	Luz Solar Partners	41100 Highway 395	Boron, CA 93516	
Glen King, Environmental Manager	Luz Solar Partners	43880 Harper Lake Road	Harper Lake, CA 92347	
Harold Alderson		1211 Flora Street	Barstow, CA 92311	
Janet Laurain	Adams Broadwell Joseph & Cardozo	601 Gateway Boulevard, Ste 1000	South San Francisco, CA 94080-7037	
John Billheimer		1332 Tiger Tail Drive	Riverside, CA 92506	
John Kessler	California Energy Commission	1516 Ninth Street	Sacramento, CA 95814-2950	
~~John Margolis, Managing Director~~	~~Cantor Fitzgerald Brokerage, LP~~	~~345 California Street, Ste 1260~~	~~San Francisco, CA 94104~~	9/8/14: "Return to Sender: VACANT, Unable to Forward"
John Parks, EHS Manager	Molycorp Minerals, LLC	HC1 Box 224	Mountain Pass, CA 92366	

Joseph Hower, Principal Air Sciences	ENVIRON International Corporation	707 Wilshire Boulevard, Ste 4950	Los Angeles, CA 90017
Kent Christensen	Ducommun Aerostructures	4001 El Mirage Road	Adelanto, CA 92301
Larry Carlson	Tenaska, Inc.	1044 North 115th Street, Ste 400	Omaha, CE 68154-446
Lisa Beckham	United States EPA, Region IX	75 Hawthorne Street	San Francisco, CA 94105
M. Talwar	OceanAir Environmental	4220 Donion Road	Somis, CA 93066
Michael Meinen, Environmental Manager	TXI Riverside Cement Company	P.O. Box 146	Oro Grande, CA 92368
Michael Taylor	Element Markets, LLC	3555 Timmons Lane, Ste 900	Houston, TX 77027
Mike Doman	Doman Auto Body	16718 Smoketree	Hesperia, CA 92345
Mobile Pipe Lining & Coating, Inc.		12776 Violet Road	Adelanto, Ca 92301
Nancy Jackson, Public Affairs Manager	Southern California Edison	12353 Hesperia Road	Victorville, CA 92395
Pierce Harvey, Environmental Specialist	NRG Coolwater Generating Station	P.O. Box 337	Daggett, CA 92327
Rick Cales		18314 Main Street	Hesperia, CA 92345
Ross May, Environmental Director	Searles Valley Minerals	P.O. Box 367	Trona, CA 93592-0367
San Bernardino County	Solid Waste Management Division	222 West Hospitality Lane, 2nd FL	San Bernardino, CA 92415-0017
Sara Head, QEP	AECOM	1220 Avenida Acaso	Camarillo, CA 93012
Steve Dobbs, Operations Manager	ACE Cogeneration Company	12801 South Mariposa Street	Trona, CA 93562

Unlimited Performance Products 8770 Caliente Road Hesperia, CA 92345

APPENDIX B – DATA AND CALCULATIONS

Table B.1 - Emission Reduction Credits

Permit Number	Equipment Description	Highest 24 Month Annual Emissions (lbs/yr)				
		NOx	SO_2	VOC	CO	PM10
B001077	Steam Boiler - Unit No. 1	5,600	44	402	6,144	178
B001078	Steam Boiler - Unit No. 2	9,000	62	572	8,735	255
	Sub-Total	**14,600**	**106**	**974**	**14,880**	**432**
B001079	Combustion Turbine Generator (Unit No. 31)	90,880	544	1,903	27,731	5,358
B001080	Combustion Turbine Generator (Unit No. 32)	86,610	527	1,844	26,871	5,315
B001081	Combustion Turbine Generator (Unit No. 41)	132,930	750	2,627	38,273	8,000
B001082	Combustion Turbine Generator (Unit No. 42)	154,960	864	3,026	44,087	9,245
	Sub-Total	**465,380**	**2,686**	**9,399**	**136,961**	**27,917**
B010617	Cooling Tower (Unit 1)	0	0	0	0	1,735
B010618	Cooling Tower (Unit 2)	0	0	0	0	2,165
B010619	Cooling Tower (Unit 3 and Unit 4)	0	0	0	0	12,043
	Sub-Total	**0**	**0**	**0**	**0**	**15,943**
	Total	**479,980**	**2,792**	**10,374**	**151,840**	**44,292**

B.2 Summary of 24 Month Emissions

Emission factors

Unit	Equipment Rating		Actual Operation		Emission Factors (lb/mmcf)					
					NOx^{1}	SO_2[2]	ROG[2]	CO[2]	PM_{10}[3]	PM_{10}[4]
Steam Boiler Unit #1	796.32	(MMBtu/hr)	73.15	mmcf		0.60	5.5	84	1.16	1.5
Steam Boiler Unit #2	856.8	(MMBtu/hr)	103.99	mmcf		0.60	5.5	84	1.16	1.5
Combustion Turbine Generator Unit #31	1,220	(MMBtu/hr)	906.23	mmcf		0.60	2.1	30.6	2.64	3.8
Combustion Turbine Generator Unit #32	1,220	(MMBtu/hr)	878.13	mmcf		0.60	2.1	30.6	2.64	3.8
Combustion Turbine Generator Unit #41	1,220	(MMBtu/hr)	1,250.74	mmcf		0.60	2.1	30.6	2.64	3.8
Combustion Turbine Generator Unit #42	1,220	(MMBtu/hr)	1,440.74	mmcf		0.60	2.1	30.6	2.64	3.8

	Facility Actual Emissions									
Unit	**Actual Emissions (lbs/yr)**					**Actual Emissions (TPY)**				
	NO_x	SO_2	ROG	CO	PM_{10}[5]	NO_x	SO_2	ROG	CO	PM_{10}
Steam Boiler Unit #1	5,600	43.89	402.32	6,144.47	177.63	2.80	0.02	0.20	3.07	0.09
Steam Boiler Unit #2	9,000	62.39	571.94	8,735.14	254.59	4.5	0.03	0.29	4.37	0.13
Combustion Turbine Generator Unit #31	90,880	543.74	1,903.09	27,730.75	5,357.68	45.44	0.27	0.95	13.87	2.68
Combustion Turbine Generator Unit #32	86,610	526.88	1,844.07	26,870.70	5,314.74	43.31	0.26	0.92	13.44	2.66
Combustion Turbine Generator Unit #41	132,930	750.44	2,626.55	38,272.60	8,000.01	66.47	0.38	1.31	19.14	4.00
Combustion Turbine Generator Unit #42	154,960	864.45	3,025.56	44,086.79	9,244.70	77.48	0.43	1.51	22.04	4.62
Cooling Tower #1	0	0	0	0	1,735.20	0	0	0	0	0.87
Cooling Tower #2	0	0	0	0	2,164.83	0	0	0	0	1.08
Cooling Tower #3&4	0	0	0	0	12,042.90	0	0	0	0	6.02
TOTAL	479,980	2,792	10,374	151,840	44,292	239.99	1.40	5.19	75.92	22.15

1. NOx emissions obtained from CEMS
2. AP-42 Section 1.4 External Natural Gas Combustion (July 1998) for Steam Boilers Unit 1 & 2; AP-42 Section 3.1 Stationary Gas Turbines (Apr 2000) for Combustion Turbine Generators
3. Source Test 2009 for Steam Boilers Unit 1 & 2; Source Test 2008 for Combustion Turbine Generators
4. Source Test 2013 for Steam Boilers Unit 1 & 2; Source Test 2013 for Combustion Turbine Generators
5. PM10 Calculations Based on Permitted Circulation Rates, Drift Eliminator Control Efficiency, and Actual TDS Samples

PM10 Emissions (lb/day) = water circ rate (lb/hr) * 24 hrs/day * TDS (ppm) / 1,000,000 * design drift rate (%)

Monthly Fuel Use

	Unit 1	Unit 2	CT31	CT32	CT41	CT 42
	HSCF	HSCF	HSCF	HSCF	HSCF	HSCF
Aug-12	813,472	932,239	3,045,759	2,404,312	2,658,565	2,876,057
Sep-12	687	2,761	2,847,779	2,636,417	3,218,131	3,363,957
Oct-12	178,402	246,651	1,308,871	1,134,617	1,681,099	1,716,122
Nov-12	107,601	45,986	1,103,491	982,802	1,669,426	2,200,322
Dec-12	0	0	738,944	739,336	948,495	602,745
Jan-13	0	0	260,889	443,207	583,111	854,650
Feb-13	0	397	353,706	187,544	418,872	664,190
Mar-13	0	163,047	1,061,890	1,104,099	0	0
Apr-13	0	94,159	1,246,719	1,009,396	191,197	296,199
May-13	0	0	310,671	257,065	729,970	1,109,426
Jun-13	1,503	1,557	575,406	520,103	575,832	595,335
Jul-13	128,212	200,692	332,944	296,870	304,640	418,951
Aug-13	0	104,753	1,554,648	1,656,145	1,497,583	1,698,906
Sep-13	161,045	231,977	826,995	965,165	1,298,613	1,440,364
Oct-13	0	0	1,240	928	5	953
Nov-13	0	0	0	0	0	0
Dec-13	72,047	0	0	0	1,002,728	1,135,851
Jan-14	0	0	0	0	3,069,670	3,124,936
Feb-14	0	0	0	0	2,504,222	2,037,665
Mar-14	0	0	471,954	1,488,605	598,818	2,684,445
Apr-14	0	55,578	1,405	74,064	35,422	51,541
May-14	0	0	826,635	616,589	740,669	543,719
Jun-14	0	0	0	53,200	67,277	298,243
Jul-14	0	0	1,254,729	992,087	1,220,431	1,100,324
TOTAL (2 Years)	**1,462,969**	**2,079,796**	**18,124,675**	**17,562,550**	**25,014,774**	**28,814,898**
2-Year Average	**731,484**	**1,039,898**	**9,062,337**	**8,781,275**	**12,507,387**	**14,407,449**

B.3 CEMS NOx Data for 24 Month Emissions

Month	Unit 1	Unit 2	CT31	CT32	CT41	CT 42
	ton/mo	ton/mo	ton/mo	ton/mo	ton/mo	ton/mo
Aug-12	3.1	4.2	14.37	10.45	12.34	13.75
Sep-12	0	0	13.49	11.87	15.44	16.48
Oct-12	0.7	1.2	6.35	5.06	8.23	8.35
Nov-12	0.4	0.2	6.06	5.25	8.91	11.72
Dec-12	0	0	3.86	3.86	4.86	3.09
Jan-13	0	0	1.58	2.68	3.46	5.16
Feb-13	0	0	2.06	1.03	2.44	3.95
Mar-13	0	0.5	5.42	5.77	0	0
Apr-13	0	0.3	7.58	5.85	1.1	1.77
May-13	0	0	1.76	1.44	4.15	6.5
Jun-13	0	0	2.53	2.36	2.82	2.82
Jul-13	0.5	0.9	1.6	1.39	1.5	2.12
Aug-13	0	0.5	6.78	7	6.62	7.7
Sep-13	0.6	1	4.34	4.04	5.63	6.57
Oct-13	0	0	0.01	0.01	0	0.01
Nov-13	0	0	0	0	0	0
Dec-13	0.3	0	0	0	5.51	6.1
Jan-14	0	0	0	0	19.31	19.06
Feb-14	0	0	0	0	15.94	12.52
Mar-14	0	0	2.91	9.51	3.66	16.49
Apr-14	0	0.2	0.01	0.49	0.23	0.35
May-14	0	0	4.26	3.45	4.24	2.99
Jun-14	0	0	0	0.32	0.4	1.93
Jul-14	0	0	5.91	4.78	6.14	5.53
Total (ton/2 yrs)	5.6	9.0	90.9	86.6	132.9	155.0
Total (ton/yr)	2.8	4.5	45.4	43.3	66.5	77.5

B.4 Cooling Tower PM10 Emission Calculations

Emissions lb/day = water circ rate (lb/hr) * 24 hrs/day * TDS (ppm) / 1,000,000 * design drift rate (

Emission Factor
lb PM10 / mmgal water
= lb PM10/day / (gpm water * 60 min/hr * 24 hrs/day * mmgal/1000(

UNIT 1:
Given:

Max water circulation rate	41,600	gpm
Water density	8.34	lb/gal
Max water circulation rate	20,809,651	lb/hr
Drift rate	0.02	% (from vendor)
Total number of cells	10	

Calculate:

Month	TDS (ppm)	PM10 Emissions (lb/day)	Date Sampled
Aug-12	1063	106	6/19/2012
Sep-12	1063	106	6/19/2012
Oct-12	1063	106	6/19/2012
Nov-12	1063	106	6/19/2012
Dec-12	1063	106	6/19/2012
Jan-13	1142	114	1/31/2013
Feb-13	1142	114	2/28/2013
Mar-13	1142	114	3/1/2013
Apr-13	1300	130	4/26/2013
May-13	1300	130	5/31/2013
Jun-13	960	96	6/1/2013
Jul-13	1700	170	7/2/2013
Aug-13	1800	180	8/14/2013
Sep-13	2100	210	9/5/2013
Oct-13	2100	210	10/31/2013
Nov-13	2100	210	11/30/2013
Dec-13	2200	220	12/3/2013
Jan-14	2200	220	12/3/2013
Feb-14	2200	220	12/3/2013
Mar-14	2200	220	12/3/2013
Apr-14	960	96	4/25/2014
May-14	960	96	4/25/2014
Jun-14	960	96	4/25/2014
Jul-14	960	96	4/25/2014
24-month Total		3,470	
2-year average		1,735	

UNIT 2:

Given:

Max water circulation rate	51,900	gpm
Water density	8.34	lb/gal
Max water circulation rate	25,962,041	lb/hr
Drift rate	0.02	% (from vendor)
Total number of cells	12	

Calculate:

Month	TDS (ppm)	PM10 Emissions (lb/day)	Date Sampled
Aug-12	1063	133	6/19/2012
Sep-12	1063	133	6/19/2012
Oct-12	1063	133	6/19/2012
Nov-12	1063	133	6/19/2012
Dec-12	1063	133	6/19/2012
Jan-13	1142	142	1/31/2013
Feb-13	1142	142	2/28/2013
Mar-13	1142	142	3/1/2013
Apr-13	1300	162	4/26/2013
May-13	1300	162	5/31/2013
Jun-13	960	120	6/1/2013
Jul-13	1700	212	7/2/2013
Aug-13	1800	224	8/14/2013
Sep-13	2100	262	9/5/2013
Oct-13	2100	262	10/31/2013
Nov-13	2100	262	11/30/2013
Dec-13	2200	274	12/3/2013
Jan-14	2200	274	12/3/2013
Feb-14	2200	274	12/3/2013
Mar-14	2200	274	12/3/2013
Apr-14	960	120	4/25/2014
May-14	960	120	4/25/2014
Jun-14	960	120	4/25/2014
Jul-14	960	120	4/25/2014
24-month Total		4,330	
2-year average		2,165	

UNIT 3&4:

Given:

Max water circulation rate	205,370	gpm
Water density	8.34	lb/gal
Max water circulation rate	102,732,646	lb/hr
Drift rate	0.02	% (from vendor)
Total number of cells	16	

Calculate:

Month	TDS (ppm)	PM10 Emissions (lb/day)	Date Sampled
Aug-12	741	365	8/3/2012
Sep-12	2586	1,275	9/5/2012
Oct-12	3022	1,490	10/1/2012
Nov-12	2036	1,004	11/1/2012
Dec-12	2393	1,180	12/4/2012
Jan-13	1900	937	1/2/2013
Feb-13	1765	871	2/2/2013
Mar-13	2200	1,085	3/8/2013
Apr-13	1700	838	4/2/2013
May-13	1500	740	5/7/2013
Jun-13	3100	1,529	6/30/2013
Jul-13	2900	1,430	7/1/2013
Aug-13	2400	1,183	8/15/2013
Sep-13	2600	1,282	9/3/2013
Oct-13	2600	1,282	10/31/2013
Nov-13	2600	1,282	11/30/2013
Dec-13	1500	740	12/5/2013
Jan-14	1200	592	1/7/2014
Feb-14	2500	1,233	2/3/2014
Mar-14	2200	1,085	3/4/2014
Apr-14	1600	789	4/3/2014
May-14	1200	592	5/5/2014
Jun-14	1300	641	6/4/2014
Jul-14	1300	641	7/1/2014
24-month Total		24,086	
2-year average		12,043	

Coolwater Generating Station
P.O. Box 337
37000 Santa Fe Street
Daggett, CA 92327
Phone: 760-254-5290
Fax: 760-254-5293

April 20, 2015

Mr. Eldon Heaston
Air Pollution Control Officer
Mojave Desert Air Quality Management District
14306 Park Ave.
Victorville, CA 92392

RE: Additional Information Related to
Emission Reduction Credit Banking Application Package
NRG California South LP – Coolwater Generating Station
Permit # 104801880

Dear Mr. Heaston,

As a follow-up to the Emission Reduction Credit (ERC) Banking Application Package provided by NRG California South LP – Coolwater Generating Station last month, we would like to provide additional information related to the particulate matter emissions. This letter presents PM2.5 emissions from the boilers, turbines, and cooling towers.

Boilers and Turbines

The Environmental Protection Agency (EPA) has assumed that all condensable and filterable PM resulting from natural gas combustion is less than 1 micrometer (µm) in diameter. Therefore, the total PM is equivalent to PM10 and PM2.5 emissions from natural gas combustion sources. This is documented in EPA AP-42 Chapter 1.4 "Natural Gas Combustion." Table 1.4-2 Footnote C.[1] The proposed PM10 and PM2.5 ERCs from the boilers and combustion turbines are shown in Table 1 below.

Table 1
Proposed PM10 andPM2.5 ERCs from Combustion Sources

Permit Number	Equipment Description	PM10 (lb/year)	PM2.5 (lb/year)
B001077	Steam Boiler - Unit No. 1	178	178
B001078	Steam Boiler - Unit No. 2	255	255
B001079	Combustion Turbine Generator (Unit No. 31)	5,358	5,358
B001080	Combustion Turbine Generator (Unit No. 32)	5,315	5,315

[1] For natural gas combustion, EPA assumes PM (Total) = PM (Condensable) + PM (Filterable) = PM10 = PM2.5 = PM1.0 taken from "Natural Gas Combustion", AP-42 Fifth Edition, Volume I, Chapter 1.4 Natural Gas Combustion, United States Environmental Protection Agency, July 1998.

Table 1 Proposed PM10 andPM2.5 ERCs from Combustion Sources			
Permit Number	**Equipment Description**	**PM10 (lb/year)**	**PM2.5 (lb/year)**
B001081	Combustion Turbine Generator (Unit No. 41)	8,000	8,000
B001082	Combustion Turbine Generator (Unit No. 42)	9,245	9,245
	Total	**28,351**	**28,351**

Therefore, in addition, to the ERCs requested in the ERC Application Banking Package previously submitted, NRG California South LP – Coolwater Generating Station also requests 28,351 pounds per year of PM2.5 ERCs from the shutdown of the boilers and turbines.

Cooling Towers

Emissions of PM2.5 from cooling towers may be calculated based on a representative drift droplet size distribution and Total Dissolved Solids (TDS) in the water. For a given initial droplet size, assuming that the mass of dissolved solids condenses to a spherical particle after all the water evaporates, and assuming the density of the TDS is equivalent to a representative salt (e.g., sodium chloride), the diameter of the final solid particle is calculated. Thus, using the drift droplet size distribution, the percentage of drift mass containing particles small enough to produce PM2.5 is calculated. This method is conservative as the final particle is assumed to be perfectly spherical; hence as small a particle as can exist.[2]

The equation to calculate PM2.5, as provided in the paper "Calculating Realistic PM10 Emissions from Cooling Towers", by Reisman and Frisbie is as follows:

PM2.5 Emission Rate (lb/day) = PM10 Emissions (lb/day) x (PM2.5 %Mass/100)

Values for the PM2.5 %Mass are based on the concentration of TDS. The concentrations of TDS ranged from 741 to 3100 ppm from August 2012 through July 2014 for the Coolwater Cooling Towers. The PM2.5 %Mass corresponding to the TDS values and used to calculate PM2.5 are shown in Table 2 below.[3]

[2] Methodology for calculating particle size was taken from "Calculating Realistic PM10 Emissions from Cooling Towers", Reisman and Frisbie, *Environmental Progress*, July 2002.
[3] Values for PM %Mass was taken from "Calculating TSP, PM10, and PM2.5 from Cooling Towers", New Mexico Environment Department, September 2013.

Table 2 TDS and PM2.5 %Mass Correlation	
TDS (ppm)	**PM2.5 %Mass**
1000	0.514
2000	0.226
3000	0.226

For example, for cooling tower (unit 1), the TDS value for August 2012 was 1063 ppm and the following equation was used to calculate PM2.5 emissions.

PM2.5 Emission Rate (lb/day) = 106 lb/day x (0.514/100) = 0.55 lb/day

The PM10 and PM2.5 emissions for a consecutive 24-month period starting in August 2012 were summed, and a 2-year average was calculated. The resulting PM10 and PM2.5 emissions from the cooling towers are shown in the Table 3 below.

Table 3 Proposed PM10 andPM2.5 ERCs from Cooling Towers			
Permit Number	**Equipment Description**	**PM10 (lb/year)**	**PM2.5 (lb/year)**
B010617	Cooling Tower (Unit 1)	1,735	7
B010618	Cooling Tower (Unit 2)	2,165	8
B010619	Cooling Tower (Unit 3 and Unit 4)	12,043	38
	Total	**15,943**	**53**

Therefore, in addition, to the ERCs requested in the ERC Application Banking Package previously submitted, NRG California South LP – Coolwater Generating Station also requests 53 pounds per year of PM2.5 ERCs from the shutdown of the cooling towers.

If you have any questions or require further information, please contact William Dusenbury, Plant Manager at 702-400-9765 or Apeetha Jain, Environmental Supervisor at 909-782-8834.

Best Regards,

George L. Piantka, PE
Director, Regulatory Environmental Services
NRG, West Region

Cooling Tower PM2.5 Emission Calculations

PM10 Emissions lb/day = water circ rate (lb/hr) * 24 hrs/day * TDS (ppm) / 1,000,000 * design
PM2.5 Emission Rate (lb/day) = PM10 (lb/day) x (PM2.5%)

TDS (ppm)	PM2.5 %Mass
1000	0.514
2000	0.226
3000	0.226

UNIT 1:

Max water circulation rate	41,600	gpm
Water density	8.34	lb/gal
Max water circulation rate	20,809,651	lb/hr
Drift rate	0.02	% (from vendor)
Total number of cells	10	

Month	TDS (ppm)	PM10 Emissions (lb/day)	Date Sampled	PM2.5 Emissions (lb/day)
Aug-12	1063	106	6/19/2012	0.55
Sep-12	1063	106	6/19/2012	0.55
Oct-12	1063	106	6/19/2012	0.55
Nov-12	1063	106	6/19/2012	0.55
Dec-12	1063	106	6/19/2012	0.55
Jan-13	1142	114	1/31/2013	0.59
Feb-13	1142	114	2/28/2013	0.59
Mar-13	1142	114	3/1/2013	0.59
Apr-13	1300	130	4/26/2013	0.67
May-13	1300	130	5/31/2013	0.67
Jun-13	960	96	6/1/2013	0.49
Jul-13	1700	170	7/2/2013	0.87
Aug-13	1800	180	8/14/2013	0.92
Sep-13	2100	210	9/5/2013	0.47
Oct-13	2100	210	10/31/2013	0.47
Nov-13	2100	210	11/30/2013	0.47
Dec-13	2200	220	12/3/2013	0.50
Jan-14	2200	220	12/3/2013	0.50
Feb-14	2200	220	12/3/2013	0.50
Mar-14	2200	220	12/3/2013	0.50
Apr-14	960	96	4/25/2014	0.49
May-14	960	96	4/25/2014	0.49
Jun-14	960	96	4/25/2014	0.49
Jul-14	960	96	4/25/2014	0.49
24-month Total		**3,470**		**13**
2-year average		**1,735**		**7**

UNIT 2:

Max water circulation rate	51,900	gpm
Water density	8.34	lb/gal
Max water circulation rate	25,962,041	lb/hr
Drift rate	0.02	% (from vendor)
Total number of cells	12	

Month	TDS (ppm)	PM Emissions (lb/day)	Date Sampled	PM2.5 Emissions (lb/day)
Aug-12	1063	133	6/19/2012	0.68
Sep-12	1063	133	6/19/2012	0.68
Oct-12	1063	133	6/19/2012	0.68
Nov-12	1063	133	6/19/2012	0.68
Dec-12	1063	133	6/19/2012	0.68
Jan-13	1142	142	1/31/2013	0.73
Feb-13	1142	142	2/28/2013	0.73
Mar-13	1142	142	3/1/2013	0.73
Apr-13	1300	162	4/26/2013	0.83
May-13	1300	162	5/31/2013	0.83
Jun-13	960	120	6/1/2013	0.61
Jul-13	1700	212	7/2/2013	1.09
Aug-13	1800	224	8/14/2013	1.15
Sep-13	2100	262	9/5/2013	0.59
Oct-13	2100	262	10/31/2013	0.59
Nov-13	2100	262	11/30/2013	0.59
Dec-13	2200	274	12/3/2013	0.62
Jan-14	2200	274	12/3/2013	0.62
Feb-14	2200	274	12/3/2013	0.62
Mar-14	2200	274	12/3/2013	0.62
Apr-14	960	120	4/25/2014	0.61
May-14	960	120	4/25/2014	0.61
Jun-14	960	120	4/25/2014	0.61
Jul-14	960	120	4/25/2014	0.61
24-month Total		**4,330**		**17**
2-year average		**2,165**		**8**

UNIT 3&4:

Max water circulation rate	205,370	gpm
Water density	8.34	lb/gal
Max water circulation rate	102,732,646	lb/hr
Drift rate	0.02	% (from vendor)
Total number of cells	16	

Month	TDS (ppm)	PM Emissions (lb/day)	Date Sampled	PM2.5 Emissions (lb/day)
Aug-12	741	365	8/3/2012	1.88
Sep-12	2586	1,275	9/5/2012	2.88
Oct-12	3022	1,490	10/1/2012	3.37
Nov-12	2036	1,004	11/1/2012	2.27
Dec-12	2393	1,180	12/4/2012	2.67
Jan-13	1900	937	1/2/2013	4.82
Feb-13	1765	871	2/2/2013	4.47
Mar-13	2200	1,085	3/8/2013	2.45
Apr-13	1700	838	4/2/2013	4.31
May-13	1500	740	5/7/2013	3.80
Jun-13	3100	1,529	6/30/2013	3.45
Jul-13	2900	1,430	7/1/2013	3.23
Aug-13	2400	1,183	8/15/2013	2.67
Sep-13	2600	1,282	9/3/2013	2.90
Oct-13	2600	1,282	10/31/2013	2.90
Nov-13	2600	1,282	11/30/2013	2.90
Dec-13	1500	740	12/5/2013	3.80
Jan-14	1200	592	1/7/2014	3.04
Feb-14	2500	1,233	2/3/2014	2.79
Mar-14	2200	1,085	3/4/2014	2.45
Apr-14	1600	789	4/3/2014	4.06
May-14	1200	592	5/5/2014	3.04
Jun-14	1300	641	6/4/2014	3.30
Jul-14	1300	641	7/1/2014	3.30
24-month Total		**24,086**		**77**
2-year average		**12,043**		**38**

Revised ERC Engineering Evaluation (November 2009)
Prepared by Alan De Salvio

Shutdown of Seven Kilns and Two Boilers in Oro Grande, California

TXI – Riverside Cement Company Facility (County of San Bernardino)
Oro Grande, California 92368
Applicant Contact: Jean Brewster (760) 245-5321 x335
Applicant Consultant: Eric Walther, Sierra Research (916) 273-5134
ERC Certificate MD0078
Date Received: November 12, 2008
Date Complete: December 11, 2008[1]

HISTORY

TXI – Riverside Cement Company (RCC) is seeking to obtain Emission Reduction Credits (ERCs) for the oxides of nitrogen (NO_x) emission reductions generated by the shutdown of an existing cement kiln and boiler complex and surplus to the subsequent construction of a new cement kiln combustion source at the same facility. The Mojave Desert Air Quality Management District (District) released a proposed issuance of 1,814,593 pounds per year of Class A NOx ERCs on January 8, 2009, with a public comment period ending on February 20, 2009.

REASONS FOR REVISIONS TO INITIAL ISSUANCE

Subsequent to a February 20, 2009 request for extension of review deadline,[2] USEPA staff expressed concerns on the validity of the proposed ERC issuance. After several telephone and electronic conversations, including the provision of substantial additional supporting information to USEPA staff, USEPA provided comments in a June 3, 2009 letter.[3] The District has revised the ERC engineering evaluation in response to those comments. The comments concerned: (1) representativeness of facility operation during 2006 and 2007; (2) justification of kiln recovery factors used in ERC quantification; (3) use of higher heating value of fuel fired for ERC quantification; (4) verification that emission reductions were surplus to District Rule 1161; and (5) use of USEPA requested ERC package format.

I. SUMMARY:

TXI – Riverside Cement Company (RCC) has completely shut down nine existing combustion sources at their facility in Victorville. The nine combustion sources were shutdown on May 16, 2008; the nine permits have been canceled, the replacement equipment has been permitted and constructed (and was offset) in compliance with the District's New Source Review rules.[4] Actual emission reductions in the amounts shown below were shown to qualify for emission

[1] A. De Salvio (District) to D. Salzborn (RCC), dated December 11, 2008
[2] G. Rios (USEPA) to A. De Salvio (District), dated February 20, 2009
[3] G. Rios (USEPA) to A. De Salvio (District), dated June 3, 2009
[4] Application Package, D. Salzborn (RCC) to A. De Salvio (District), received November 13, 2008.

reduction banking.

Certificate	Pollutant	Emissions
MD0078	NOx	1,710,793 pounds per year

II. APPLICABLE RULES:

Rule 1161: Portland Cement Kilns (March 25, 2002)
Rule 1400: General (June 28, 1995)
Rule 1401: Definitions (June 28, 1995)
Rule 1402: Emission Reduction Credit Registry (May 19, 1997)
Rule 1404: Emission Reduction Credit Calculations (June 28, 1995)

III. PROJECT LOCATION:

RCC is located at 19409 National Trails Highway in Oro Grande, California.

IV. EQUIPMENT LISTING:

B000167 - KILN AND CLINKER SYSTEM NO. 1 (110)
Kiln (Long Kiln 1), 130 MMBTUH
B000169 - KILN AND CLINKER SYSTEM NO. 2 (120)
Kiln No. 2 (130 MMBTUH)
B000171 - KILN AND CLINKER SYSTEM NO. 3 (130)
Kiln No. 3 , 130 MMBTUH
B000173 - KILN AND CLINKER SYSTEM NO. 4 (140)
Kiln No. 4, 130 MMBTUH
B000175 - KILN AND CLINKER SYSTEM NO. 5 (150)
Kiln No. 5 , 130 MMBTUH
B000179 - KILN AND CLINKER COOLER SYSTEM NO. 6 (160)
No. 6 kiln drive, 120 MMBTUH
B000184 - KILN AND CLINKER COOLER SYSTEM NO. 7 (170)
Kiln #7 Drive - Input of 120 MMBTUH
B000165 - BOILER NO. 6
Natural gas fired, 2 Drum, Bent Tube Waterwall Design w/Pendent-Type, Welded Joint Superheater, Tubular-Type Preheater, and Induced Draft Fans - 48 MMBtu/h input. This fuel-fired boiler provides additional steam for power house electricity production in the event waste heat steam from the kiln system is not adequate to provide enough power house electricity to operate plant equipment. Normal seven kiln operation provides sufficient waste heat steam to preclude any other steam requirements. This boiler and Boiler No. 7 (District permit No. B000166) serve as supplemental steam generators for a cogeneration system, consisting of:
Waste Heat Boilers 1 through 7, 52.8 MMBtu each
Steam Turbine Generators 1 and 2, 12,000 kW each
B000166 - BOILER NO. 7
Natural gas fired, Two Drum, Bent Tube Waterwall Design w/Pendent-Type, Welded

Joint Superheater, Tubular-Type Prehater, and Induced Draft Fans - 48 MMBtu/h input. This fuel-fired boiler provides additional steam for power house electricity production in the event waste heat steam from the kiln system is not adequate to provide enough power house electricity to operate plant equipment. Normal seven kiln operation provides sufficient waste heat steam to preclude any other steam requirements. This boiler and Boiler No. 6 (District permit No. B000165) serve as supplemental steam generators for a cogeneration system, consisting of:
Waste Heat Boilers 1 through 7, 52.8 MMBtu each
Steam Turbine Generators 1 and 2, 12,000 kW each

See permits in Appendix B

V. METHOD OF GENERATING REDUCTIONS:

The nine permit units collectively allowed a seven cement kiln production complex with connected kiln waste heat and supplemental natural gas combustion electrical generation boilers to operate in Oro Grande. The complex was replaced as part of a substantial facility modernization that displaced cement clinker production to a completely new pre-heater/pre-calciner cement kiln (and which has no non-emergency indigenous electrical generation). The new cement kiln was permitted through New Source Review and was limited with permit conditions reflecting Best Available Control Technology and emission limits representing no net increase, after the use of simultaneous emission reductions derived from the shutdown of the previously existing seven kilns. The NOx emissions from the facility have been reduced due to the shutdown of equipment. The nine District permits were cancelled on July 28, 2008. RCC submitted an application requesting formal issuance of ERCs for the equipment shutdown on November 13, 2008.[5]

VI. CALCULATIONS:

A summary of the calculations is presented as Attachment A. The complete set of calculations is presented as Attachment B.

A. Assumptions

- 2006 and 2007 are representative years
- Historical Actual Emissions were calculated using Continuous Emissions Monitoring System or equivalent
- Missing NOx CEMS data for Kilns 6 and 7 during 2006 are due to reported equipment problems and replaced through data substitution via 40 CFR 75 Appendix A
- RCC Short Dry Kilns operated under Rule 1161 NOx emission limit as a kiln system that recovers waste heat and converts it into electricity and an alternative compliance strategy employing aggregation of emissions (in accordance with 1161(C)(2)(b) and 1161(D)(1))
- Historical Actual Emissions are surplus to Rule 1161 - Portland Cement Kilns

[5] Application Package, ibid

B. Representative Years

Rule 1401 allows the use of averaged emissions from any two years of the five year period which immediately precedes the date of application which the APCO has determined is representative of facility operations. As is shown below, 2006 and 2007 are representative of the five year period 2003-2007.

	2003	2004	2005	2006	2007
	NOx Emissions in tons per year				
Kiln 1	746.3	661.9	614.5	549.6	450.2
Kiln 2	564.0	714.8	607.0	813.7	654.6
Kiln 3	631.1	616.5	490.4	428.1	277.5
Kiln 4	523.4	666.9	588.2	706.2	527.3
Kiln 5	341.7	446.8	452.8	475.7	595.6
Kiln 6	714.4	382.0	403.4	603.2	524.3
Kiln 7	372.2	283.9	384.1	429.6	764.3
Total Kilns:	*3893.1*	*3772.8*	*3540.4*	*4006.2*	*3793.8*
Average:	3801.3				

C. CEMS Data Substitution

RCC experienced Kiln 6 and 7 CEMS equipment failures during 2006 (missing 108 total days for Kiln 6 and 174 total days for Kiln 7), and obtained a local variance to perform repairs. The applicant has requested the use of 40 CFR 75 Appendix A data substitution methods, specifically Option 4 (the 720 previous hour arithmetic mean method). The District deems this method reasonable and acceptable (as did the Hearing Board for each variance). Supporting data has been provided by the applicant through a technical consultant for each day involving data substitution,[6] and is enclosed in Attachment B.

D. Rule 1161 Compliance

RCC complied with applicable NOx RACT by aggregating all seven kilns and using a heat recovery factor, as allowed by Rule 1161. Note that the higher heating value of coal is used for all coal firing calculations (by rule - the District rates equipment by gross heating value, equivalent to higher heating value). During each day, the ratio of the waste heat recovered from each kiln over the heat input to each kiln modified the base 7.2 pound per ton of clinker produced NOx limit. The limit is further modified by a 30-day averaging requirement (by rule), and a ten percent reduction due to the use of multiple kiln aggregation (by rule). The applicant has provided recovery factors for each kiln for each operating day in 2006 and 2007[7] - this electronic file will be provided to USEPA Region IX and is available on request.

The District determines compliance with Rule 1161 to two digits as specified in the limit (7.2 pounds per ton of clinker). At the request of USEPA Region IX, compliance was calculated to the pound (six digits), which resulted in four days in 2007 with 7,857 pounds of NOx not surplus

[6] E. Walther (Sierra Research) to A. De Salvio (District), dated November 12, 2009
[7] Ibid

to Rule 1161. These emissions are being subtracted from the Historical Actual Emissions calculation.

E. Emission Factors

Boiler emissions are calculated using emission factors from annual source tests during each year (2006 and 2007), as these units were not equipped with CEMS.

Source Test Results		
	Boiler 6	Boiler 7
	NOx lb/MMBtu	
2006	0.0645	0.0645
2007	0.0705	0.0660

Kiln emissions are calculated using daily average NOx concentrations and daily average kiln flow rates from each kiln's CEMS. Kiln daily average clinker production rates are recorded for each kiln for 2006 and 2007.

F. Calculation of Historical Actual Emissions

Shown below is a sample calculation of HAE for Boiler 6 2006 annual emissions:

$$HAE\,(lb/yr) = 324{,}261 Mscf \times \frac{1008\,Btu}{scf} \times 0.0645 lb/MMBtu = 21{,}082\ lb\ NOx$$

Historical Actual Emissions (HAE) from the two boilers:

	Boiler Natural Gas Usage (10^3cf)				Boiler Heat Input	Boiler NOx Emission Factor	Boiler NOx Annual Emissions	Baseline Period Average Boiler NOx Emissions
					MMBtu/yr	lb/MMBtu	lb/yr	lb/yr
	12/31/2005	5/31/2006	12/31/2006	**Total 2006**				
Boiler 6	156,060	270,711	209,610	324,261	326,855	0.0645	21,082	
Boiler 7	135,336	240,709	230,434	335,807	338,493	0.0645	21,833	
Both	291,396	511,420	440,044	660,068	665,349		42,915	
	12/31/2006	5/31/2007	12/31/2007	**Total 2007**				
Boiler 6	209,610	352,034	194,418	336,842	339,537	0.0705	23,937	22,510
Boiler 7	230,434	390,884	238,216	398,666	401,855	0.0660	26,522	24,178
Both	440,044	742,918	432,634	735,508	741,392		50,460	46,687
Natural gas heat content (Btu/cf, HHV) =				1,008				

Shown below is a sample calculation of emissions for one day of Kiln 1:

$$NO_x\,(lb/day) = 2246051 dscfh \times 768 ppmvd \times 24hr \times 46 \frac{lb}{lb-mol} \times 2.5973 x 10^{-9} \frac{1}{mv\ \ factor} = 4948$$

Historical Actual Emissions (HAE) from the seven kilns:

Kiln NOx Emissions

	2006	2007
	pounds per year	
Kiln 1	1,099,287	900,398
Kiln 2	1,627,407	1,309,162
Kiln 3	856,182	555,028
Kiln 4	1,412,485	1,054,630
Kiln 5	951,327	1,191,173
Kiln 6	1,206,440	1,048,678
Kiln 7	859,292	1,528,579
Total Kilns:	8,012,419	7,587,649
		7,800,034

Kiln HAE must be adjusted to be surplus to Rule 1161 as previously discussed, and when added to boiler HAE quantifies facility HAE for 2006 and 2007:

	2006	2007
	pounds per year	
Total Kilns:	8,012,419	7,587,649
Adjustment for Surplus	0	-7,857
Total Kilns (Surplus):	8,012,419	7,579,792
Total Boilers:	42,915	50,460
Total Facility:	8,055,334	7,630,252
NOx Facility Average (HAE):		**7,842,793**

G. Calculation of Actual Emission Reductions (AER)

Pursuant to Rule 1404(A)(2)(c) AER shall be calculated as follows:

$$AER = HAE - proposed\ PTE$$

The replacement equipment for the nine combustion units in question was permitted under B007435 with a NOx limit of 16,800 pounds per day, which is equivalent to 6,132,000 pounds per year. HAE reductions in excess of this PTE are creditable:

	pounds per year	*tons per year*
NOx HAE:	7,842,793	3,921
NOx PTE:	6,132,000	3,066
Net NOx Emission Reductions (AER):	**1,710,793**	**855**

This AER is creditable.

VII. COMPLIANCE:

To be eligible for banking, Emission Reduction Credits (ERCs) must be verified as being real, enforceable, quantifiable, permanent, and surplus pursuant to District Regulation XIV. In addition,

A. Real

The AERs quantified in this project were based on actual, historical emissions from combustion units operating during the baseline period (as measured by CEMS or source test and actual fuel use). The NOx emissions have been reduced by shutdown.

Therefore, the emission reductions are real.

B. Enforceable

The AERs are enforceable in that the combustion units have been shutdown and are no longer permitted; RCC has permitted the replacement equipment. The replacement equipment has NOx emission limits verified with CEMS.

Therefore, the emission reductions are enforceable.

C. Quantifiable

The AERs were calculated using actual emissions as measured by CEMS or by using the actual quantities of fuel burned during the baseline period and emission factors determined by source compliance test.

Therefore, the emission reductions are quantifiable.

D. Permanent

The combustion units have been shutdown. Replacement equipment has been permitted and fully offset, with NOx emission limits verified with CEMS.

Therefore, the emission reductions are permanent.

E. Surplus

The combustion units were subject to the applicable District NO_x RACT rule, Rule 1161 – *Portland Cement Kilns*. Adjustments to the AERs have been made to ensure only reductions surplus to Rule 1161 are creditable. A substantial portion of the historic actual emission reduction was used as simultaneous emission reduction offsets for the replacement kiln (B007435), the remaining reduction represents the actual emission reduction.

The District has no other plan, rule or regulation that would require further reductions of the combustion unit NOx. There is no law, agreement or order which would require further reductions of the combustion unit NOx, or which affects the issuance of ERCs for this action.

Therefore, the emission reductions as quantified in this project are surplus.

F. Timeliness

An ERC application must be submitted with appropriate application fees and within six months of the District permit cancellation in accordance with Rule 1402(B)(1)(c) and (d). The combustion units were shut down on May 16, 2008; the District permits for the combustion units were cancelled on July 28, 2008, and the application was received on November 12, 2008. The Emission Reduction Credit Application Fee required by District Rule 313(C)(2) was received on November 13, 2008.

Therefore, the application is timely.

G. Class of ERC

The emissions reduction satisfies District Rule 1402(A)(5)(b)(ii)(c) as the result of a shutdown where the replacement emission units were offset under new source review. Accordingly the emissions reductions generate Class "A" ERCs.

VII. COMPLIANCE:

After public notice, review by the EPA and ARB, and after addressing any comments received during the noticing period, issue an ERC banking certificate to TXI Riverside Cement in the amount shown in Section I of this evaluation.

Attachment A
NOx Emissions and Reductions Calculations

Parameter		Year 2006	Year 2007
Boiler No. 6	EFs (lbs NOx/MMBtu)	0.0645	0.0705
	Fuel (Mcf)	324,261	336,842
	Fuel (MMBtu)	326,855	339,537
	NOx Emissions (pounds per year)	21,082	23,937
Boiler No. 7	EFs (lbs NOx/MMBtu)	0.0645	0.0660
	Fuel (Mcf)	335,807	398,666
	Fuel (MMBtu)	338,493	401,855
	NOx Emissions (pounds per year)	21,833	26,522
Boilers:	NOx Emissions (pounds per year)	**42,915**	**50,460**

	Year				
	2003	2004	2005	2006	2007
	NOx in pounds per year				
Kiln 1	1,492,600	1,323,800	1,229,000	1,099,287	900,398
Kiln 2	1,128,000	1,429,600	1,214,000	1,627,407	1,309,162
Kiln 3	1,262,200	1,233,000	980,800	856,182	555,028
Kiln 4	1,046,800	1,333,800	1,176,400	1,412,485	1,054,630
Kiln 5	683,400	893,600	905,600	951,327	1,191,173
Kiln 6	1,428,800	764,000	806,800	1,206,440	1,048,678
Kiln 7	744,400	567,800	768,200	859,292	1,528,579
Total Kilns:	7,786,200	7,545,600	7,080,800	8,012,419	7,587,649
			Total Facility:	**8,055,334**	**7,630,252**
Average of 2006 and 2007:					**7,800,034**
Adjustment for Surplus				0	-7,857
Total Facility (Surplus):				8,055,334	7,622,395
NOx Emission Average of 06 and 07 (HAE):					**7,842,793**
Current Facility NOx PTE (pounds per year):					6,132,000
Current Facility NOx PTE (tons per year):					3,066
Net NOx Emission Reduction in pounds (AER):					**1,710,793**
Net NOx Emission Reduction in tons (AER):					855

Attachment B
November 12, 2009 submission from
Sierra Research on behalf of TXI Riverside Cement

Air District	Air Basin	Current Owner	ERC Certificate	NOx	VOC	PM10
MDAQMD	Mojave Desert	NRG - California South,	102	240		
MDAQMD	Mojave Desert	CalPortland Cement Co.	103	854		
SJVAPCD	San Joaquin	Vector Environmental	S-4039-1		124	
SJVAPCD	San Joaquin	Crimson Resource Management	S-3387-1		38	
SJVAPCD	San Joaquin	Calpine	S-3261-1		10	
SJVAPCD	San Joaquin	Dart Container Corporation	C-555-1		164	
SJVAPCD	San Joaquin	Martin Anderson	C-1051-1		14	
SJVAPCD	San Joaquin	Anderson Rack Systems- Hannibal Industrie	N-950-1		15	
SJVAPCD	San Joaquin	Heck Cellars	S-3442		20	
SJVAPCD	San Joaquin	Creations Mfg., Inc.	C-1686		19	
SJVAPCD	San Joaquin	Silgan Container Corp.	C-1208-1		7	
SJVAPCD	San Joaquin	Silgan Container Corp.	N-431-1		8	
SJVAPCD	San Joaquin	BlueScope BNA, Inc.	1094294-71-1		16	
SJVAPCD	San Joaquin	Malibu Boats	N-942-1		33	
AVAQMD	Mojave Desert	Road Paving	TBD			>81
		Total ERC's Potentially Identified :		**1094**	**468**	**>81**

SJVAPCD credit conversion- pounds/quarter to tons/year

				total lbs	total tons
71,653	86,926	80,406	9,672	248,657	124
23,063	20,161	19,126	13,979	76,329	38
5,294	5,812	4,730	4,995	20,831	10
112,929	104,976	40,935	69,030	327,870	164
8,699	12,348	6,585	90	27,722	14
7,335	7,335	7,335	7,335	29,340	15
10,000	10,000	10,000	10,000	40,000	20
9,986	9,206	9,494	9,041	37,727	19
4,279	3,921	3,042	3,166	14,408	7
5,103	3,464	3,573	3,865	16,005	8
5,404	6,473	10,921	8,632	31,430	16
13,753	22,879	14,803	14,093	65,528	33
138.75	*146.75*	*105.48*	*76.95*	468	