

**ENGINEERING EVALUATION REPORT  
SHELL OIL PRODUCTS  
PLANT NO. 11  
APPLICATION NO. 25198**

**INTRODUCTION**

This application is to bank Interchangeable Emission Reduction Credits (IERCs), in accordance with District Regulation 2, Rule 9, from the sources listed below at the Shell Martinez Refinery in Martinez, CA.

S-1507	CO Boiler #1
S-1509	CO Boiler #2
S-1512	CO Boiler #3

The emission reductions are the result of combustion modifications to CO Boilers No. 1, No. 2, and No. 3 that occurred on June 8, 1999, April 29, 1999, and October 28, 1998, respectively. Shell has already banked IERCs from these sources for the initial credit generation periods (CGP<sub>1</sub>) immediately following the combustion modifications to each source. IERCs from CO Boilers 1, 2, and 3 have previously been banked under application numbers 27765, 439, 1820, 6979, 10368, 14858, 16772, 21415, and 25198.

This application is to bank IERCs from all three CO Boilers for the following credit generation periods:

July 1, 2012 through June 30, 2013 (365 days)  
July 1, 2013 through June 30, 2014 (365 days)  
July 1, 2014 through June 30, 2015 (365 days)

IERCs for this application are calculated using the same baseline periods that were used in the previous IERC banking applications.

**IERC CALCULATIONS**

The procedure for calculating IERCs is described in Regulation 2, Rule 9, Sections 602 and 603. The IERC calculations to follow are based on daily NO<sub>x</sub> CEM concentrations, NO<sub>x</sub> emissions, and steam production rates provided by Shell. Baseline data used in this application is the same data used in previous IERC applications from Shell. The data for each CGP was provided by Shell in this banking application. District staff audited this data by comparing it with data previously submitted by Shell as part of monthly emission reports for the CO Boilers, as required by the Clean Fuels Project permit conditions, for select months during the credit generation periods.

***Determine Baseline Period:***

The baseline periods were already determined in the original IERC banking applications for the CO Boilers. The baseline periods and credit generation periods (CGPs) for the CO Boilers are summarized in Table 1. ***The credit generation periods for this current IERC banking application are highlighted in bold italics print.***

**Table 1 – CO Boilers Baseline and Credit Generation Periods**

	<b>COB 1</b>	<b>COB 2</b>	<b>COB 3</b>
<b>Baseline</b>	6/8/94 – 6/7/99	4/29/94 – 4/28/99	11/7/93 – 11/6/98
<b>CGP<sub>1</sub></b>	6/8/99 – 9/26/99	4/29/99 – 9/26/99	11/7/98 – 4/30/99
<b>CGP<sub>2</sub></b>	9/27/99 – 8/27/00	9/27/99 – 8/27/00	5/1/99 – 4/30/00
<b>CGP<sub>3</sub></b>	8/28/00 – 6/30/01	8/28/00 – 6/30/01	5/1/00 – 8/27/00
<b>CGP<sub>4</sub></b>	7/1/01 – 6/30/02	7/1/01 – 6/30/02	8/28/00 – 6/30/01
<b>CGP<sub>5</sub></b>	7/1/02 – 6/30/03	7/1/02 – 6/30/03	7/1/01 – 6/30/02
<b>CGP<sub>6</sub></b>	7/1/03 – 3/31/04	7/1/03 – 3/31/04	7/1/02 – 6/30/03
<b>CGP<sub>7</sub></b>	4/1/04 – 6/30/04	4/1/04 – 6/30/04	7/1/03 – 3/31/04
<b>CGP<sub>8</sub></b>	7/1/04 – 6/30/05	7/1/04 – 6/30/05	4/1/04 – 6/30/04
<b>CGP<sub>9</sub></b>	7/1/05 – 6/30/06	7/1/05 – 6/30/06	7/1/04 – 6/30/05
<b>CGP<sub>10</sub></b>	7/1/06 – 6/30/07	7/1/06 – 6/30/07	7/1/05 – 6/30/06
<b>CGP<sub>11</sub></b>	7/1/07 – 6/30/08	7/1/07 – 6/30/08	7/1/06 – 6/30/07
<b>CGP<sub>12</sub></b>	7/1/08 – 6/30/09	7/1/08 – 6/30/09	7/1/07 – 6/30/08
<b>CGP<sub>13</sub></b>	7/1/09 – 6/30/10	7/1/09 – 6/30/10	7/1/08 – 6/30/09
<b>CGP<sub>14</sub></b>	7/1/10 – 6/30/11	7/1/10 – 6/30/11	7/1/09 – 6/30/10
<b>CGP<sub>15</sub></b>	7/1/11 – 6/30/12	7/1/11 – 6/30/12	7/1/10 – 6/30/11
<b>CGP<sub>16</sub></b>	<b>7/1/12 – 6/30/13</b>	<b>7/1/12 – 6/30/13</b>	7/1/11 – 6/30/12
<b>CGP<sub>17</sub></b>	<b>7/1/13 – 6/30/14</b>	<b>7/1/13 – 6/30/14</b>	<b>7/1/12 – 6/30/13</b>
<b>CGP<sub>18</sub></b>	<b>7/1/14 – 6/30/15</b>	<b>7/1/14 – 6/30/15</b>	<b>7/1/13 – 6/30/14</b>
<b>CGP<sub>19</sub></b>			<b>7/1/14 – 6/30/15</b>

Per Regulation 2, Rule 9, Section 602 (Reg. 2-9-602), the baseline period for a source is the 5-year period immediately preceding the initial credit generation period. The initial credit generation period is determined by the completion date of the *first* IERC banking application. IERC banking applications 439 (CO Boilers 1 and 2) and 27765 (CO Boiler 3) were deemed complete on October 20, 1999, and September 3, 1999, respectively. Per Reg. 2-9-204, the initial credit generation period “shall not be more than 30 months prior to the submittal of the first complete IERC banking application for a particular emission reduction activity”. The baseline and initial credit generation periods in Table 1 satisfy the requirements of Section 2-9-204.

**Baseline Information:**

The original baseline data is summarized in Table 2. This is the same baseline data that was used for all previous IERC banking applications for the CO Boilers.

**Table 2 – Original IERC 5-Year Baseline Data**

		<b>CO Boiler 1</b>	<b>CO Boiler 2</b>	<b>CO Boiler 3</b>
		<b>6/8/94 – 6/7/99</b>	<b>4/29/94 – 4/28/99</b>	<b>11/7/93 – 1/6/98</b>
<b>Ave. NOx Emissions</b>	<b>lb/hr</b>	84.96	84.31	80.46
<b>Ave. Steam Production</b>	<b>klb/hr</b>	122.88	124.11	126.37
<b>NOx/Steam ratio</b>	<b>lb/klb</b>	0.691	0.679	0.637

**Determine Baseline Throughputs:**

Baseline throughput is the lesser of actual throughput or permitted throughput during the baseline period. Since none of the CO Boilers has a permit condition that limits throughput, the actual throughput is used. Average NOx emissions and throughput rates are summarized for the baselines in Table 2 above.

**Determine Baseline Emissions:**

From Table 2, the average hourly NOx emission rates over the respective baseline periods are:

CO Boiler 1	84.96 lb/hr
CO Boiler 2	84.31 lb/hr
CO Boiler 3	80.46 lb/hr

Baseline emissions are calculated by multiplying the hourly NOx emission rate by 8,760 hr/year.

CO Boiler 1	$(84.96 \text{ lb/hr}) (8,760 \text{ hr/yr}) / (2,000 \text{ lb/ton}) = 372.1 \text{ tons/yr}$
CO Boiler 2	$(84.31 \text{ lb/hr}) (8,760 \text{ hr/yr}) / (2,000 \text{ lb/ton}) = 369.3 \text{ tons/yr}$
CO Boiler 3	$(80.46 \text{ lb/hr}) (8,760 \text{ hr/yr}) / (2,000 \text{ lb/ton}) = 352.4 \text{ tons/yr}$

These are the baseline emissions used for previous IERC banking applications. However, these emissions must be reduced for this banking application, as discussed below.

**Determine the Baseline-Adjusted Emissions (A):**

The District cannot approve IERCs for an emission reduction that is required by a District rule, RACT, BARCT, etc. during a given credit generation period. To prevent this, the baseline emission rate must be adjusted (reduced) to reflect any rule or provision that is in effect during the credit generation period. Since requirements may change over time, it is possible to have different baseline adjusted emission rates for different credit generation periods.

The following rules and provisions that were established after the CO Boilers were originally permitted. All three sources were subject to these for the entirety of each credit generation period (CGP):

- Regulation 9-10-304 became effective on July 1, 2002. This Section limits NOx from CO Boilers to 150 ppm (at 3% O<sub>2</sub>).
- Permit condition (ID# 12271, Part 85) which limits total NOx emissions from all three boilers to 5,452 lb/day, annual average in order to meet Regulation 9-10-304. This condition limit is equivalent to 75.72 lb NOx/hr for each boiler  $[(5,452 \text{ lbNOx/day} / 24 \text{ hr/day})/3]$ .
- The Shell EPA Consent decree which became effective May 22, 2012. These limits are listed in Tables 5 and 6.

The baseline data will be adjusted to account for each of these limitations. The lowest adjusted emission rate will be used to calculate the Baseline-Adjusted Emissions (A).

**Adjusting the baseline data to account for the 150 ppm NOx Standard:**

This adjustment was established in Application 10368 covering credit generation periods 5, 6, and 7. To make the adjustment, the original CO Boiler baseline data was reviewed. For any day during the 5-year period baseline period when the average NOx concentration was greater than 150 ppm, staff adjusted (reduced) the daily NOx emissions. This was done by multiplying the actual emissions (lb/hr) by the ratio of the NOx concentrations. For example, if the actual daily NOx concentration was 185 ppm and the daily NOx emissions were 90 lb/hr, the adjusted NOx emissions were calculated as follows:

$$\text{Example NOx adjustment to 150 ppm: } (150 \text{ ppm}/185 \text{ ppm}) (90 \text{ lb/hr}) = 73.0 \text{ lb/hr}$$

This calculation was performed for each day during the baseline period that has a concentration greater than 150 ppm. Table 3 summarizes the results of this adjustment.

**Table 3 – Baseline Data Adjusted for 150 ppm NOx Standard**

	Baseline Adjusted NOx Emissions (lb/hr average)					5-Yr Ave.
	Year 1	Year 2	Year 3	Year 4	Year 5	
<b>COB 1</b>	88.47	73.27	75.72	72.78	70.85	<b>76.22</b>
<b>COB 2</b>	86.79	76.69	74.75	64.62	77.21	<b>76.01</b>
<b>COB 3</b>	81.32	82.00	69.46	57.86	75.79	<b>73.29</b>
<b>Average</b>	<b>85.53</b>	<b>77.32</b>	<b>73.31</b>	<b>65.09</b>	<b>74.62</b>	

Adjusting the baseline data to account for the 5452 lb/day NOx limit in Permit Condition:

This adjustment was established in Application 10368 covering credit generation periods 5, 6, and 7. In Table 3, for any year in which the average emissions for all 3 boilers was greater than 75.72 lb/hr, staff substituted 75.72 lb/hr for each CO Boiler for that year. Years 1 and 2 were adjusted accordingly. Table 4 summarizes the results of this adjustment.

**Table 4 – Baseline Data Adjusted for 150 ppm NOx AND 5,452 lb/day NOx Limit**

	Baseline Adjusted NOx Emissions (lb/hr average)					5-Year Ave.
	Year 1	Year 2	Year 3	Year 4	Year 5	
<b>COB 1</b>	75.72	75.72	75.72	72.78	70.85	<b>74.16</b>
<b>COB 2</b>	75.72	75.72	74.75	64.62	77.21	<b>73.60</b>
<b>COB 3</b>	75.72	75.72	69.46	57.86	75.79	<b>70.91</b>
<b>Average</b>	<b>75.72</b>	<b>75.72</b>	<b>73.31</b>	<b>65.09</b>	<b>74.62</b>	

Adjusting the baseline data to account for the Shell EPA Consent Decree NOx limits:

This adjustment was established in Application 25198 covering credit generation periods 13, 14, 15, and 16. On May 22, 2012 the District approved Shell’s application (number 22287) to add NOx concentration limits on each CO Boiler as required by Shell’s EPA Consent Decree. The limits are specific to each CO Boiler, and there is a rolling 24 hour limit and a rolling 365 day limit on each boiler. The limits were approved as a minor revision to Shell’s Title V Permit effective May 22, 2012. The limits are expressed at 0% O<sub>2</sub> in the permit as shown in Table 5.

**Table 5 – EPA Consent Decree Limits on CO Boilers at 0% O<sub>2</sub>**

CO Boiler	Rolling 24 hour NOx Limit (ppm at 0% O <sub>2</sub> )	Rolling 365 day NOx Limit (ppm at 0% O <sub>2</sub> )
COB 1	168.4	130.6
COB 2	156.9	127.4
COB 3	142.7	113.1

To convert these limits to the same measurement as the District limits of ppm at 3% O<sub>2</sub>; multiply the concentration at 0% by (20.95-3)/20.95 = 0.857. The converted limits are shown in Table 6.

**Table 6 – EPA Consent Decree Limits Converted to 3% O<sub>2</sub>**

CO Boiler	Rolling 24 hour NOx Limit (ppm at 3% O <sub>2</sub> )	Rolling 365 day NOx Limit (ppm at 3% O <sub>2</sub> )
COB 1	144.3	111.9
COB 2	134.4	109.2
COB 3	122.3	96.9

The baseline data was reviewed on a daily basis and lowered for any day the actual emissions were greater than the new daily limits. The annual average NOx for each year during the baseline was also lowered to the new annual average NOx limit. Tables 7 and 8 summarize the results of this adjustment.

**Table 7 – Baseline Data Adjusted for Rolling 24 hour NOx Limits in Shell Consent Decree**

	Baseline Adjusted NOx Emissions (lb/hr average)					
	Year 1	Year 2	Year 3	Year 4	Year 5	5-Yr Ave.
<b>COB 1</b>	85.22	72.14	74.96	70.69	68.78	<b>74.36</b>
<b>COB 2</b>	78.04	71.93	71.01	59.92	70.50	<b>70.28</b>
<b>COB 3</b>	66.73	67.75	64.22	54.05	65.07	<b>63.56</b>
<b>Average</b>	<b>76.66</b>	<b>70.60</b>	<b>70.06</b>	<b>61.55</b>	<b>68.12</b>	

**Table 8 – Baseline Data Adjusted for Rolling 365 day NOx Limits in Shell Consent Decree**

	Baseline Adjusted NOx Emissions (lb/hr average)					
	Year 1	Year 2	Year 3	Year 4	Year 5	5-Yr Ave.
<b>COB 1</b>	66.17	62.89	64.69	61.61	59.65	<b>63.00</b>
<b>COB 2</b>	63.44	61.62	65.02	56.82	62.78	<b>61.93</b>
<b>COB 3</b>	56.58	53.94	54.10	53.36	54.38	<b>54.47</b>
<b>Average</b>	<b>62.06</b>	<b>59.48</b>	<b>61.27</b>	<b>57.26</b>	<b>58.93</b>	

The lowest adjusted NOx emission rate for each boiler is the adjusted emission rate that accounts for the Shell EPA Consent Decree rolling 365 day average NOx limits. Using these emission rates the Baseline-Adjusted Emissions for each CO Boiler are:

$$\begin{aligned} \text{COB 1} & \quad (63.00 \text{ lb/hr}) (8,760 \text{ hr/yr}) / (2,000 \text{ lb/ton}) = \mathbf{275.9 \text{ tons NOx/yr}} \\ \text{COB 2} & \quad (61.93 \text{ lb/hr}) (8,760 \text{ hr/yr}) / (2,000 \text{ lb/ton}) = \mathbf{271.3 \text{ tons NOx/yr}} \\ \text{COB 3} & \quad (54.47 \text{ lb/hr}) (8,760 \text{ hr/yr}) / (2,000 \text{ lb/ton}) = \mathbf{238.6 \text{ tons NOx/yr}} \end{aligned}$$

**Determine the Actual Emissions (B) During the Credit Generation Period:**

Actual emissions during each CGP are determined by multiplying the hourly average NOx emissions for the particular CGP by the duration of that CGP. Average NOx emission rates during each CGP were provided by Shell. Staff compared this data with Shell’s monthly reports required by the Clean Fuels Project permit conditions. The emissions in this application are consistent with the data previously

submitted by Shell. Tables 9, 10, and 11 summarize the CO Boiler data for the credit generations periods covered by this application.

**Table 9 - CO Boiler Data: (7/1/12 – 6/30/13)**

	CGP #	NOx Emissions lb/hr	Steam Production klb/hr	Em. rate (NOx/steam) lb/klb
COB 1	16	[REDACTED]	[REDACTED]	[REDACTED]
COB 2	16	[REDACTED]	[REDACTED]	[REDACTED]
COB 3	17	[REDACTED]	[REDACTED]	[REDACTED]

**Table 10 - CO Boiler Data: (7/1/13 – 6/30/14)**

	CGP #	NOx Emissions lb/hr	Steam Production klb/hr	Em. rate (NOx/steam) lb/klb
COB 1	17	[REDACTED]	[REDACTED]	[REDACTED]
COB 2	17	[REDACTED]	[REDACTED]	[REDACTED]
COB 3	18	[REDACTED]	[REDACTED]	[REDACTED]

**Table 11 - CO Boiler Data: (7/1/14 – 6/30/15)**

	CGP #	NOx Emissions lb/hr	Steam Production klb/hr	Em. rate (NOx/steam) lb/klb
COB 1	18	[REDACTED]	[REDACTED]	[REDACTED]
COB 2	18	[REDACTED]	[REDACTED]	[REDACTED]
COB 3	19	[REDACTED]	[REDACTED]	[REDACTED]

Actual emissions (B<sub>x</sub> where x represents the CGP number) are:

**7/1/12 – 6/30/13**

B<sub>16</sub> (COB 1) = [REDACTED] = 108.2 tons of NOx

B<sub>16</sub> (COB 2) = [REDACTED] = 113.4 tons of NOx

B<sub>17</sub> (COB 3) = [REDACTED] = 119.6 tons of NOx

**7/1/13 – 6/30/14**

B<sub>17</sub> (COB 1) = [REDACTED] = 136.7 tons of NOx

B<sub>17</sub> (COB 2) = [REDACTED] = 145.0 tons of NOx

B<sub>18</sub> (COB 3) = [REDACTED] = 148.9 tons of NOx

**7/1/14 – 6/30/15**

B<sub>18</sub> (COB 1) = [REDACTED] = 131.8 tons of NOx

B<sub>18</sub> (COB 2) = [REDACTED] = 127.9 tons of NOx

B<sub>19</sub> (COB 3) = [REDACTED] = 110.8 tons of NOx

**Determine Credit Generation Period Non-Curtailment Emissions (C):**

The non-curtailment emissions ( $C_x$  where  $x$  represents the CGP number) are calculated by multiplying the baseline throughput (steam production rate) by the emission rate (lb NO<sub>x</sub> / klb steam) for that CGP. Baseline throughputs are in Table 2, and CGP emission rates are in Tables 9, 10, and 11.

**7/1/12 – 6/30/13 (365 days = 8,760 hrs)****C<sub>16</sub> (COB 1) =**

$$(122.88 \text{ klb steam/hr})(0.225 \text{ lb NO}_x/\text{klb steam})(8,760 \text{ hr}) / (2,000 \text{ lb/ton}) = \mathbf{121.1 \text{ tons of NO}_x}$$

**C<sub>16</sub> (COB 2) =**

$$(124.11 \text{ klb steam/hr})(0.242 \text{ lb NO}_x/\text{klb steam})(8,760 \text{ hr}) / (2,000 \text{ lb/ton}) = \mathbf{131.6 \text{ tons of NO}_x}$$

**C<sub>17</sub> (COB 3) =**

$$(126.37 \text{ klb steam/hr})(0.283 \text{ lb NO}_x/\text{klb steam})(8,760 \text{ hr}) / (2,000 \text{ lb/ton}) = \mathbf{156.6 \text{ tons of NO}_x}$$

**7/1/13 – 6/30/14 (365 days = 8,760 hrs)****C<sub>17</sub> (COB 1) =**

$$(122.88 \text{ klb steam/hr})(0.302 \text{ lb NO}_x/\text{klb steam})(8,760 \text{ hr}) / (2,000 \text{ lb/ton}) = \mathbf{162.5 \text{ tons of NO}_x}$$

**C<sub>17</sub> (COB 2) =**

$$(124.11 \text{ klb steam/hr})(0.291 \text{ lb NO}_x/\text{klb steam})(8,760 \text{ hr}) / (2,000 \text{ lb/ton}) = \mathbf{158.2 \text{ tons of NO}_x}$$

**C<sub>18</sub> (COB 3) =**

$$(126.37 \text{ klb steam/hr})(0.298 \text{ lb NO}_x/\text{klb steam})(8,760 \text{ hr}) / (2,000 \text{ lb/ton}) = \mathbf{164.9 \text{ tons of NO}_x}$$

**7/1/14 – 6/30/15 (365 days = 8,760 hrs)****C<sub>18</sub> (COB 1) =**

$$(122.88 \text{ klb steam/hr})(0.278 \text{ lb NO}_x/\text{klb steam})(8,784 \text{ hr}) / (2,000 \text{ lb/ton}) = \mathbf{149.6 \text{ tons of NO}_x}$$

**C<sub>18</sub> (COB 2) =**

$$(124.11 \text{ klb steam/hr})(0.280 \text{ lb NO}_x/\text{klb steam})(8,784 \text{ hr}) / (2,000 \text{ lb/ton}) = \mathbf{152.2 \text{ tons of NO}_x}$$

**C<sub>19</sub> (COB 3) =**

$$(126.37 \text{ klb steam/hr})(0.225 \text{ lb NO}_x/\text{klb steam})(8,784 \text{ hr}) / (2,000 \text{ lb/ton}) = \mathbf{124.5 \text{ tons of NO}_x}$$

**Calculate IERCs for the Credit Generation Period:**

For a given source and credit generation period, IERCs are calculated by subtracting the greater of either the actual emissions (B) or the non-curtailment emissions (C) from the baseline-adjusted emissions (A).

**7/1/12 – 6/30/13**

**COB 1 (CGP<sub>16</sub>):** IERCs =  $A_{16} - C_{16} = 275.9 \text{ tons} - 121.1 \text{ tons} = \mathbf{154.8 \text{ tons of NO}_x}$

**COB 2 (CGP<sub>16</sub>):** IERCs =  $A_{16} - C_{16} = 271.3 \text{ tons} - 131.6 \text{ tons} = \mathbf{139.7 \text{ tons of NO}_x}$

**COB 3 (CGP<sub>17</sub>):** IERCs =  $A_{17} - C_{17} = 238.6 \text{ tons} - 156.6 \text{ tons} = \mathbf{82.0 \text{ tons of NO}_x}$

**7/1/13 – 6/30/14**

**COB 1 (CGP<sub>17</sub>):** IERCs =  $A_{17} - C_{17} = 275.9 \text{ tons} - 162.5 \text{ tons} = \mathbf{113.4 \text{ tons NOx}}$

**COB 2 (CGP<sub>17</sub>):** IERCs =  $A_{17} - C_{17} = 271.3 \text{ tons} - 158.2 \text{ tons} = \mathbf{113.1 \text{ tons NOx}}$

**COB 3 (CGP<sub>18</sub>):** IERCs =  $A_{18} - C_{18} = 238.6 \text{ tons} - 164.9 \text{ tons} = \mathbf{73.7 \text{ tons NOx}}$

**7/1/14 – 6/30/15**

**COB 1 (CGP<sub>18</sub>):** IERCs =  $A_{18} - C_{18} = 275.9 \text{ tons} - 149.6 \text{ tons} = \mathbf{126.2 \text{ tons NOx}}$

**COB 2 (CGP<sub>18</sub>):** IERCs =  $A_{18} - C_{18} = 271.3 \text{ tons} - 152.2 \text{ tons} = \mathbf{119.1 \text{ tons NOx}}$

**COB 3 (CGP<sub>19</sub>):** IERCs =  $A_{19} - C_{19} = 238.6 \text{ tons} - 124.5 \text{ tons} = \mathbf{114.1 \text{ tons NOx}}$

***IERC Banking Certificate***

IERCs are valid for 5 years following the end of the credit generation period. In this banking application there are three time periods during which credit is generated. The IERCs generated in a given time period will be combined into a single IERC Banking Certificate.

**IERC Banking Certificate #8-T (effective 7/1/13, expires 6/30/18)**

**367.5 Tons of NOx**

**IERC Banking Certificate #8-U (effective 7/1/14, expires 6/30/19)**

**300.2 Tons of NOx**

**IERC Banking Certificate #8-V (effective 7/1/15, expires 6/30/20)**

**359.4 Tons of NOx**

**STATEMENT OF COMPLIANCE**

For an emission reduction to be banked as an IERC, the reduction must be real, permanent, quantifiable, enforceable and surplus (Section 2-1-301.2).

**Real:** The emission reductions evaluated in this application are real. There was an actual decrease in emissions to the atmosphere, as is evident from continuous emission monitoring (CEM) data.

**Permanent:** As defined in Section 2-9-213, permanent means that the emission reduction exists for the duration of the credit generation period (CGP). Since the CGP in this application has already ended, the emission reductions have already occurred, and therefore, are permanent.

**Quantifiable:** These emission reductions are quantifiable. The emission calculations were performed using NOx CEM and emission data, and steam production data.

**Enforceable:** As defined in Section 2-9-209, enforceable means that there is credible evidence during the credit generation periods to verify compliance with Regulation 2, Rule 9. The evaluation of this banking application is based on actual steam production data and NOx CEM and emission data.

**Surplus:** As defined in Section 2-9-218, surplus means that the emission reductions are not required by Reasonably Available Control Technology (RACT), Best Available Retrofit Control Technology (BARCT), or any other rule in effect during the credit generation period. In addition, emissions reductions must exceed any reduction required by the most recent Clean Air Plan or Air Quality Management Plan.

The District is not aware of any EPA guidance on RACT for CO Boilers. In the absence of such guidance, the District considers the 150 ppm NOx limit in Regulation 9, Rule 10, Section 304 to constitute RACT/BARCT for CO Boilers. However, On May 22, 2012 the District approved Shell's application (number 22287) to add NOx concentration limits on each CO Boiler as required by Shell's EPA Consent Decree. These limits are more stringent than the 150 ppm NOx limit in Regulation 9, Rule 10, Section 304 and are specific to each CO Boiler. During the entirety of the three credit generation periods in this application, the Shell EPA Consent Decree annual limits were the most stringent limits in effect. Emissions during the baseline period were reduced to reflect the Consent Decree limits for all credit generation periods.

The amount of IERCs generated in each calendar year from 2009 through 2015 exceeds the amount of IERCs used in each respective year. In 2015, the sum amount of IERCs in emission inventories exceeds the sum of actual emissions, the IERCs used, and the IERCs generated. Therefore, the IERCs requested in this application are surplus. The details are tabulated in Appendix A of this evaluation report.

## **PUBLIC COMMENT**

The amount of IERCs exceeds 40 tons for each of the credit generation periods in this application. Therefore, this application is subject to the public comment provisions of Section 2-9-405. Before approving this banking application, the District must publish a notification of our preliminary decision to approve the IERCs. Following publication, there will be a 30-day public comment period, during which the District will accept written comments.

## **CEQA**

The District will issue a Notice of Exemption for this application. Pursuant to Regulation 2-1-312.10, review of this application to bank emission reductions pursuant to Regulation 2, Rule 9 is exempt from CEQA review because it can be seen with clarity that review and approval of such applications have no potential for causing a significant environmental impact.

**RECOMENDATION**

Staff recommends the District issue a Notice of Exemption and a public notice for our preliminary decision to approve the following IERCs for emission reductions that occurred at Shell.

<b>IERC Banking Certificate #8-T 367.5 Tons of Nitrogen Oxides</b>		
<u>Source #</u>	<u>Baseline Period</u>	<u>Credit Generation Period</u>
S-1507 CO Boiler #1	6/8/94 – 6/7/99	7/1/12 – 6/30/13
S-1509 CO Boiler #2	4/29/94 – 4/28/99	7/1/12 – 6/30/13
S-1512 CO Boiler #3	11/7/93 – 11/6/98	7/1/12 – 6/30/13
<b>Effective Date:</b>	<b>July 1, 2013</b>	
<b>Expiration Date:</b>	<b>June 30, 2018</b>	

<b>IERC Banking Certificate #8-U 300.2 Tons of Nitrogen Oxides</b>		
<u>Source #</u>	<u>Baseline Period</u>	<u>Credit Generation Period</u>
S-1507 CO Boiler #1	6/8/94 – 6/7/99	7/1/13 – 6/30/14
S-1509 CO Boiler #2	4/29/94 – 4/28/99	7/1/13 – 6/30/14
S-1512 CO Boiler #3	11/7/93 – 11/6/98	7/1/13 – 6/30/14
<b>Effective Date:</b>	<b>July 1, 2014</b>	
<b>Expiration Date:</b>	<b>June 30, 2019</b>	

<b>IERC Banking Certificate #8-V 359.4 Tons of Nitrogen Oxides</b>		
<u>Source #</u>	<u>Baseline Period</u>	<u>Credit Generation Period</u>
S-1507 CO Boiler #1	6/8/94 – 6/7/99	7/1/14 – 6/30/15
S-1509 CO Boiler #2	4/29/94 – 4/28/99	7/1/14 – 6/30/15
S-1512 CO Boiler #3	11/7/93 – 11/6/98	7/1/14 – 6/30/15
<b>Effective Date:</b>	<b>July 1, 2015</b>	
<b>Expiration Date:</b>	<b>June 30, 2020</b>	

By: (Signed by Anne Werth)  
 Air Quality Engineer

Date: October 28, 2016

Appendix - IERC Surplus Determination

PN	Name	S-#	2000				2001				2002				2003			
			NOx Emission Inventory (Tons)	Actual Emissions (Tons)	IERCs Generated (Tons)	IERCs Used (Tons)	"Adjusted" Inventory (Tons)	Actual Emissions (Tons)	IERCs Generated (Tons)	IERCs Used (Tons)	NOx Emission Inventory (Tons)	Actual Emissions (Tons)	IERCs Generated (Tons)	IERCs Used (Tons)	"Adjusted" Inventory (Tons)	Actual Emissions (Tons)	IERCs Generated (Tons)	IERCs Used (Tons)
12626	Valero	S-3 S-4	1152.7 646.7	1749.4	554.1	26.5	948.2 532.0	1019.3	1284.2	43.8	587.3 286.3	916.5	950.2	266.9	512.2 249.7	923.1	483.8	421.3
11	Shell	S-1507 S-1508 S-1512	193.5 207.3 214.0	622.9	408.1	56.3	159.2 170.5 176.1	626.1	364.9	44.5	229.4 210.1 237.8	654.6	354.8	290.1	200.1 183.2 74.2	712.1	189.5	368.5
26	Mirant Potrero	S-1	454.1	399.3	70.9	0.0	494.2	447.1	94.2	0.0	142.2	94.8	34.3	0.0	81.9	199.3	0.0	0.0
24	PG&E Hunters Pt.	S-3 S-4 S-5 S-6 S-7	46.4 38.4 49.7 44.4 129.1	272.2	125.2	0.0	50.5 42.9 54.0 48.4 140.5	170.0	124.5	0.0	0.0 0.0 0.0 0.0 99.5	99.5	0.0	0.0	0.0 0.0 0.0 0.0 67.3	107.9	0.0	0.0
16	ConocoPhillips	S-438																
<b>Totals:</b>			<b>3177.5</b>	<b>3043.7</b>	<b>1158.3</b>	<b>82.8</b>	<b>2816.5</b>	<b>2252.4</b>	<b>1887.8</b>	<b>88.4</b>	<b>1792.6</b>	<b>1765.4</b>	<b>1339.3</b>	<b>557.0</b>	<b>1356.6</b>	<b>1942.4</b>	<b>673.3</b>	<b>769.8</b>

PN	Name	S-#	2004				2005				2006				2007			
			"Adjusted" Inventory (Tons)	Actual Emissions (Tons)	IERCs Generated (Tons)	IERCs Used (Tons)	"Adjusted" Inventory (Tons)	Actual Emissions (Tons)	IERCs Generated (Tons)	IERCs Used (Tons)	"Adjusted" Inventory (Tons)	Actual Emissions (Tons)	IERCs Generated (Tons)	IERCs Used (Tons)	"Adjusted" Inventory (Tons)	Actual Emissions (Tons)	IERCs Generated (Tons)	IERCs Used (Tons)
12626	Valero	S-3 S-4	512.2 249.7	649.9	589.4	507.5	434.5 211.8	770.6	537.2	495.6	434.6 211.8	752	556	507.1	434.6 211.8	688.3	608.7	453.2
11	Shell	S-1507 S-1508 S-1512	200.1 183.2 207.4	739.5	180.9	157.2	169.7 155.5 176.0	686.6	129.0	157.3	169.7 155.5 176	546	316.2	132.3	169.7 155.5 176	618	320.6	27.9
26	Mirant Potrero	S-1	81.9	204.7	0.0	12.8	81.9	43.4	0.0	15.5	no credits used	no credits used	no credits used	no credits used	no credits used	no credits used	no credits used	no credits used
24	PG&E Hunters Pt.	S-3 S-4 S-5 S-6 S-7	0.0 0.0 0.0 0.0 57.3	0.0	0.0	1.1	0.0 0.0 0.0 0.0 57.3	61.7	0.0	62.3	Shut down 5/15/06	Shut down 5/15/06	Shut down 5/15/06	Shut down 5/15/06	Shut down 5/15/06	Shut down 5/15/06	Shut down 5/15/06	Shut down 5/15/06
16	ConocoPhillips	S-438	49.9	14.1	2.2	0.0	42.4	15.3	6.3	0.0	42.4	15.3	7.3	0.0	42.4	15.4	6.2	4.6
<b>Totals:</b>			<b>1541.7</b>	<b>1905.8</b>	<b>772.5</b>	<b>676.6</b>	<b>1329.3</b>	<b>1559.8</b>	<b>1572.5</b>	<b>730.6</b>	<b>1190</b>	<b>1313.3</b>	<b>879.5</b>	<b>639.4</b>	<b>1190</b>	<b>1391.7</b>	<b>944.5</b>	<b>486.7</b>



## Appendix - IERC Surplus Determination

- Notes:**
- (1) 2000 NOx inventory from 2001 Ozone Attainment Plan (OAP) inventory; 2002 NOx inventory from 2005 Ozone Strategy
  - (2) Actual emissions from the following references for each facility  
 Valero: IERC Banking AN 4398 (00-01); AN 11890 (02-03); AN 15662 (04-06); AN 18880 (07); AN 19792 (08); Data Bank (09-11)  
 Shell: monthly reports based on CEM data; Data Bank (2004-05)  
 Mirant Portero: IERC Banking App. No. 6473 (2000-02); Data Bank (2003-04)  
 PG&E Hunters Pl.: IERC Banking App. No. 7376 (2000-02); Data Bank (2003-04); 88,546,938 therm/yr x 0.018 lb/MM BTU (2006)  
 ConocoPhillips: Data Bank (2004-12)

Year	ERC ton/day	IERC ton/day	Totals Ton/year
2000	7.6	0	2774
2001	7.6	7.4	5475
2002	8.1	3.5	4234
2003	8.1	3.5	4234
2004	8.1	5.3	4891
2005	8.1	7.2	5584.5
2006	8.1	7.2	5584.5
2007	8.1	7.2	5584.5
2008	8.1	7.2	5584.5
2009	8.1	7.2	5584.5
2010	8.1	4.3	4526
2011	7.2	4.9	4416.5
2012	7.2	4.9	4416.5

### NOx ERC Use by Year

Year	ERCs Used (Tons/Year)	Running Total (Tons/Year)
2000	252.5	252.5
2001	278.7	531.2
2002	462.3	993.5
2003	252.7	1246.2
2004	118.0	1364.2
2005	322.0	1686.2
2006	123.0	1809.2
2007	245.9	2055.1
2008	207.2	2262.3
2009	5.0	2267.3
2010	37.9	2305.2
2011	57.4	2362.6
2012	0.3	2362.9

- (3) Adjusted NOx inventories based ratios in subsequent years of respective "Plans"  
 2001 Shell & Valero: ratio = 20.4/24.8 for refinery ext. combustion  
 PGE/Mirant: ratio = 18.5/17.0 for power plants  
 2002 No adjustment, because emissions are based on the 2002 base year for the 2005 Ozone Strategy  
 2003-04 Shell, Conoco-Phillips & Valero:  
 ratio = (16.5/18.52 for refinery ext. combustion) x (2002 Em. Inventory) / PGE/Mirant:  
 ratio = (2.8/4.86 for power plants) x (2002 Em. Inventory)  
 2005-09 Shell, Conoco-Phillips & Valero:  
 ratio = (14.0/18.52 for refinery ext. combustion) x (2002 Em. Inventory) / PGE/Mirant:  
 ratio = (2.8/4.86 for power plants) x (2002 Em. Inventory)  
 2010 Shell, Conoco-Phillips & Valero:  
 ratio = (14.8/18.02 for refinery ext. combustion) x (2002 Em. Inventory)  
 Subsequent calculations based on 2010 CAP inventory, w/2005 Base-Year  
 2011 Shell, Conoco-Phillips & Valero  
 ratio = (14.2/13.7 for refinery ext. combustion) x (2005 Em. Inventory)  
 2012 Shell, Conoco-Phillips & Valero  
 ratio = (14.7/13.7 for refinery ext. combustion) x (2005 Em. Inventory)

### SURPLUS CALCULATIONS

Year 2000-02, 2004, 2006-11: IERCs generated exceed IERCs used. Therefore, IERCs generated are surplus.

Surplus Test: IERCs used exceeds IERCs generated (subject to change, based on future IERC banking applications)  
 (Plan Emission Inventory + Banking Allowance in Emission Inventory) - (Actual Emissions + ERCs Used + IERCs Generated) >= 0

Year 2003: (1358.6 + 4234 tons) - (1942.4 + 1246.2 + 673.3 tons) >= 0 ? True. Therefore, IERCs are surplus.

Year 2005: (1329.3 + 5584.5 tons) - (1589.8 + 1686.2 + 672.5 tons) >= 0 ? True. Therefore, IERCs are surplus.

Year 2012: (1405.3 + 4416.5 tons) - (353.6 + 2362.9 + 253.3 tons) >= 0 ? True. Therefore, IERCs are surplus.

Last revision: 3/13