ENGINEERING EVALUATION
Banking Application No. 24230, Plant No. 3246 (GWF Power Systems, L.P., Site 5)
Banking Application No. 24231, Plant No. 3981 (GWF Power Systems, L.P., Site 4)
Banking Application No. 24232, Plant No. 3245 (GWF Power Systems, L.P., Site 3)
Banking Application No. 24233, Plant No. 3244 (GWF Power Systems, L.P., Site 2)
Banking Application No. 24234, Plant No. 3243 (GWF Power Systems, L.P., Site 1)

BACKGROUND

GWF Power Systems, L.P. (GWF) has applied for emission reduction credits (ERCs) corresponding to the permanent shutdown of the following equipment:

Under Application No. 24230, at Plant No. 3246 (GWF, Site 5):
- **S-1 Circulating Fluidized Bed Combustor with Integral Cyclones**
- **S-2 Fluidized Bed Preheat Burner**

Under Application No. 24231, at Plant No. 3981 (GWF, Site 4):
- **S-1 Circulating Fluidized Bed Combustor with Integral Dryers**
- **S-2 Fluidized Bed Preheat Burner**

Under Application No. 24232, at Plant No. 3245 (GWF, Site 3):
- **S-1 Circulating Fluidized Bed Combustor with Integral Cyclones**
- **S-2 Fluidized Bed Preheat Burner**

Under Application No. 24233, at Plant No. 3244 (GWF, Site 2):
- **S-1 Circulating Fluidized Bed Combustor with Integral Cyclones**
- **S-2 Fluidized Bed Preheat Burner**

Under Application No. 24234, at Plant No. 3243 (GWF, Site 1):
- **S-1 Fluidized Bed Combustor with Integral Cyclones**
- **S-2 Fluidized Bed Preheat Burner**

GWF operated five alternative fuel power plants that used petroleum coke, a by-product of the petroleum refining industry, to generate power. GWF ceased the operations of its five petroleum coke fired power plants on 2/16/2012.

The criteria pollutants for which GWF has requested ERCs are nitrogen oxides (NOx), carbon monoxide (CO), precursor organic compounds (POC), sulfur dioxide (SO_2), and particulate matter (PM_{10}). All of these pollutants are briefly discussed on the District's web site at www.baaqmd.gov.

This evaluation report will estimate the ERCs associated with the permanent shutdown of S-1 and S-2 at each GWF plant and will discuss the compliance of the five projects with applicable rules and regulations.

EMISSIONS REDUCTION CREDITS SUMMARY

The District's ERC banking rule is Regulation 2, Rule 4. The emission calculation procedure in Section 2-4-601 refers to the emission calculation procedures in the New Source Review Rule, which is Regulation 2, Rule 2. For ERCs, the calculation procedure is described in Section 2-2-605.

These banking applications were deemed complete on March 28, 2012. However, because the data provided by GWF to calculate the ERCs are on a monthly basis, it is appropriate to start the baseline period from the beginning of April 2009. The baseline period for these applications is April 1, 2009 through March 31, 2012.

For purposes of ERC calculation:

- For each application, GWF has provided monthly mass emissions of NOx, CO, and SO_2. These monthly data are based on Continuous Emissions Monitoring System (CEMS) and are as reported in the monthly compliance reports that GWF submitted to the District during the time the sources were still in active operation. Appendix A tabulates these data. District staff audited these data by reviewing raw data (i.e., daily mass emissions) for select months (i.e., August 2009, March 2010, July 2010, February 2011, June 2011, and January 2012) during the baseline period.
- For each application, GWF has also provided monthly operation hours of S-1 and S-2, to calculate POC and PM_{10} ERCs. Appendix B tabulates these monthly operation hours. District staff audited these data by reviewing raw data (i.e., daily operation hours) for each month during the baseline period. The monthly operation hours will be multiplied by the source test results conducted for POC and PM_{10} emissions from the sources when they were still in active operation. Appendix C tabulates these source test results.

The annual average mass emissions of NOx, CO, and SO_2 at five GWF petroleum coke fired power plants in Appendix A are summarized in Table 1.

Table 1. NOx, CO, and SO_2 ERCs at five GWF petroleum coke fired power plants

Plant	NOx (TPY)	SO_2 (TPY)	CO (TPY)
Plant No. 3243 (GWF, Site 1)	46.337	66.351	14.402
Plant No. 3244 (GWF, Site 2)	50.399	66.835	26.698
Plant No. 3245 (GWF, Site 3)	50.907	73.660	16.063
Plant No. 3981 (GWF, Site 4)	51.464	64.356	26.156
Plant No. 3246 (GWF, Site 5)	48.017	68.305	21.315

Results of the source tests in Appendix C are used to calculate POC emissions beginning from the month of the source test date to the month prior to the next source test date. For purposes of these calculations, the operation hours in Appendix B have been summarized in Table 2.

Table 2. Operation hours for S-1 and S-2 at five GWF petroleum coke fired power plants

Period	Hours at Plant No. 3243 (GWF, Site 1)	Hours at Plant No. 3244 (GWF, Site 2)	Hours at Plant No. 3245 (GWF, Site 3)	Hours at Plant No. 3981 (GWF, Site 4)	Hours at Plant No. 3246 (GWF, Site 5)
Apr 09 - Aug 09	3,585.9	3,523.6	3,364.5	3,511.9	3,203.0
Sep 09 - Aug 10	7,490.8	8,388.7	7,851.0	8,107.8	8,532.3
Sep 10 - Aug 11	7,575.0	8,552.0	8,058.5	8,467.0	8,514.5
Sep 11 - Mar 12	3,136.5	3,805.0	3,628.5	3,592.5	3,647.5

Table 3 calculates and tabulates the POC emissions at five GWF petroleum coke fired power plants using the data from Table 2 and Appendix C.

Table 3. POC ERCs at five GWF petroleum coke fired power plants

Period	POC Emissions (lbs) at Plant No. 3243 (GWF, Site 1)	POC Emissions (lbs) at Plant No. 3244 (GWF, Site 2)	POC Emissions (lbs) at Plant No. 3245 (GWF, Site 3)	POC Emissions (lbs) at Plant No. 3981 (GWF, Site 4)	POC Emissions (lbs) at Plant No. 3246 (GWF, Site 5)
Apr 09 - Aug 09[1]	167	190	151	227	165
Sep 09 - Aug 10[2]	382	449	373	422	474
Sep 10 - Aug 11[3]	227	787	266	1,668	434
Sep 11 - Mar 12[4]	110	167	149	212	150
Annual Average (TPY)	**0.148**	**0.266**	**0.157**	**0.421**	**0.204**

Notes:
1. POC Emissions = Operation Hours from Table 2 * 2008 Source Test Results from Appendix C
2. POC Emissions = Operation Hours from Table 2 * 2009 Source Test Results from Appendix C
3. POC Emissions = Operation Hours from Table 2 * 2010 Source Test Results from Appendix C
4. POC Emissions = Operation Hours from Table 2 * 2011 Source Test Results from Appendix C

Prior to 2011, the permit limitation for PM emissions was in TSP (Total Suspended Particles); the source test method did not measure or calculate PM_{10}. The 2011 source tests, which are tabulated in Appendix C, were the only source tests performed for PM_{10}. Therefore, the PM_{10} data for 2011 will be used to calculate PM_{10} ERCs during the whole baseline period for these applications. The annual average mass emissions of PM_{10} and $PM_{2.5}$ at five GWF petroleum coke fired power plants are calculated using the data from Appendices B and C and are summarized in Table 4.

Table 4. PM_{10} and $PM_{2.5}$ ERCs at five GWF petroleum coke fired power plants

Pollutant	PM Emissions at Plant No. 3243 (GWF, Site 1)	PM Emissions at Plant No. 3244 (GWF, Site 2)	PM Emissions at Plant No. 3245 (GWF, Site 3)	PM Emissions at Plant No. 3981 (GWF, Site 4)	PM Emissions at Plant No. 3246 (GWF, Site 5)
PM-10 (lb/yr)	7,190	7,928	10,001	5,920	10,355
PM-2.5[1] (lb/yr)	2,696	2,973	3,750	2,220	3,883
PM-10 (TPY)	**3.595**	**3.964**	**5.000**	**2.960**	**5.178**
PM-2.5[1] (TPY)	**1.348**	**1.486**	**1.875**	**1.110**	**1.942**

Note: 1. Per updated CEIDARS List with PM-2.5 Fractions, PM-2.5 fraction of PM-10 for coal or coke-fired external combustion equipment is 0.375.

The sources covered under these banking applications were subject to the following permit conditions:

- Permit Condition No. 20551, for S-1 and S-2 at Plant No. 3246 (GWF, Site 5)
- Permit Condition No. 20550, for S-1 and S-2 at Plant No. 3981 (GWF, Site 4)
- Permit Condition No. 20552, for S-1 and S-2 at Plant No. 3245 (GWF, Site 3)
- Permit Condition No. 20554, for S-1 and S-2 at Plant No. 3244 (GWF, Site 2)
- Permit Condition No. 20555, for S-1 and S-2 at Plant No. 3243 (GWF, Site 1)

Each of the above conditions limits the total combined daily and annual emissions from S-1 and S-2 at each plant to no greater than 360 lb/day and 63 TPY of NOx, 528 lb/day and 83 TPY of SO_2, 521 lb/day and 95 TPY of CO, 130 lb/day and 24 TPY of POC. District's databank shows that none of the five GWF plants were issued any Notices of Violation (NOVs) between April 1, 2009 and March 31, 2012. This means the plants were in compliance with their permit limits during the baseline period of these banking applications.

As part of evaluation of a banking application, for purposes of verifying the data used to calculate ERCs, the District normally compares the data with those reported during annual updates. However, for these banking applications, because the data (i.e., CEMS emissions and operation hours data) used to calculate ERCs are different from the data (i.e., coke throughput data) reported during annual updates, the District cannot and will not compare the data with those reported during annual updates.

Regulation 2-2-605.5 requires adjustment of the baseline emission rate to comply with the most stringent of RACT, BARCT, and District rules and regulations in effect or contained in the most recently adopted Clean Air Plan (CAP). There are 18 stationary source control measures (SSMs) contained in the 2010 CAP, adopted on September 15, 2010. SSM 6 (General Particulate Matter Emission Limitation) recommends a reduced PM allowable emissions rate lower than that set forth in the current Regulation 6-1. The S-1 at each GWF plant had A-4, a pulsejet baghouse, to abate PM emissions with 0.0040-gr./dscf grain loading, which is already lower than the limit (0.15 gr./dscf) in the current Regulation 6-1. Therefore, there is no need for emission factor adjustments for these banking applications.

Additionally, the emission rates used in these banking applications need no RACT adjustments either because the Circulating Fluidized Bed Combustors (CFBCs) at GWF represent current BACT technology for burning solid coal or petroleum coke. Table 5 compares the existing GWF permit limits with the BACT limits of CFBC at Northern Michigan University (NMU) reported in the EPA 2009 BACT Clearinghouse. The NMU's CFBC is representative of the modern CFBC technology for burning solid fuels including coal or wood. Table 5 shows that the CFBCs at GWF had emission control technologies that are still current, and their regulated emission limits were at least as stringent as the BACT limits of CFBC at NMU. Because S-1 at each GWF plant satisfied the current BACT standards and because BACT is at least as stringent as RACT, no RACT adjustments to the baseline emission rates are required.

Table 5. Comparison of CFBC emission limits at GWF with modern CFBC BACT emission limit at NMU

Pollutant	GWF's 245-MMBtu/hr Petroleum Coke or Coal Fired CFBCs Limits[1]	GWF Control Technology	NMU's 185-MMBtu/hr (2009 EPA BACT Clearing house) Coal Fired CFBC Limits	NMU Control Technology
NOx	0.07 lb/MMBtu (48 ppmvd @ 3% O_2, corresponding to hourly limit)	Selective Non-Catalytic Reduction (Ammonia Injection)	0.1 lb/MMBtu	Selective Non-Catalytic Reduction (Ammonia Injection)
CO	0.097 lb/MMBtu (110 ppmvd @ 3% O_2, corresponding to daily limit)	Good Combustion Practice	0.17 lb/MMBtu	Good Combustion Practice
NMHC	0.024 lb/MMBtu (42 ppmvd @ 3% O_2, corresponding to daily limit)	Good Combustion Practice	--	Good Combustion Practice
SO_2	0.10 lb/MMBtu (50 ppmvd @ 3% O_2, corresponding to hourly limit)	Limestone Injection with Fabric Filter	0.2 lb/MMBtu	Limestone Injection with Fabric Filter
PM_{10}	0.01 lb/MMBtu (0.004 gr/dscf, baghouse limit)	Fabric Filter	0.03 lb/MMBtu	Fabric Filter

Note: 1. From BAAQMD Synthetic Minor Permit Application Nos. 15601 – 15605.

Therefore, the ERCs for Banking Application Nos. 24230 through 24234 are summarized below.

Table 6. Summary of ERCs for Banking Application Nos. 24230 through 24234

Pollutant	ERCs (TPY) at Plant No. 3243 (GWF, Site 1)	ERCs (TPY) at Plant No. 3244 (GWF, Site 2)	ERCs (TPY) at Plant No. 3245 (GWF, Site 3)	ERCs (TPY) at Plant No. 3981 (GWF, Site 4)	ERCs (TPY) at Plant No. 3246 (GWF, Site 5)
NOx	46.337	50.399	50.907	51.464	48.017
CO	14.402	26.698	16.063	26.156	21.315
POC	0.148	0.266	0.157	0.421	0.204
PM_{10}[1]	3.595	3.964	5.000	2.960	5.178
$PM_{2.5}$[1]	1.348	1.486	1.875	1.110	1.942
SO_2	66.351	66.835	73.66	64.356	68.305

Note: 1. GWF does not get both PM_{10} and $PM_{2.5}$ but it has the option of using either one for offsetting purposes, assuming District's Regulation 2-2 amendments are adopted in the summer of 2012.

SMALL FACILITY BANK AND BANKING ACCOUNT

The five GWF plants (Plant Nos. 3246, 3981, 3245 through 3243) had not been the recipients of any offsets from the Small Facility Banking Account (SFBA). Therefore, no such emission offsets are required to be repaid to the SFBA as per Regulation 2-4-303.5.

STATEMENT OF COMPLIANCE

For each of Banking Application Nos. 24230 through 24234:

The ERCs are subject to and expected to comply with the standards of Regulation 2-4-302 for Bankable Reductions for Closures. The ERCs from the shutdown or closure of S-1 and S-2 are bankable because the reduction is permanent. However, because it is unclear whether the reduction will be replaced by an emissions increase elsewhere within the District, pursuant to Regulation 2-4-302.1, the applicant must accept a condition restricting use of the ERCs to offsetting emission increases in the same or closely related industries. In this case, Condition 25268 to restrict use of the ERCs to offsetting emission increases from other power generation sources will be imposed on the to-be-issued Banking Certificate. Per Regulation 2-4-302.2, issuance of a Banking Certificate for emission reductions resulting from the closure of S-1 and S-2 cancels the permit to operate the sources.

The ERC calculations were performed in accordance with the methodology outlined in Regulation 2-2-605. ERCs from the shutdown of S-1 and S-2 are calculated based on the following data during the three-year baseline period from April 1, 2009 through March 31, 2012: (1) CEMS-based mass emissions of NOx, CO, and SO_2, (2) S-1 and S-2 operation hours, and (3) source test results conducted for POC and PM_{10} emissions from S-1 and S-2 when the sources were still in active operation. The bankable ERCs did not require adjustments because the pulsejet baghouse (A-4) that abated S-1 had a grain loading (0.0040 gr./dscf) that is already lower than the limit (0.15 gr./dscf) set forth in the current Regulation 6-1. This is consistent with the recommendation found in SSM 6 (General Particulate Matter Emission Limitation) in the District's 2010 CAP. In addition, because S-1 satisfied the current BACT standards and because BACT is at least as stringent as RACT, no RACT adjustments to the baseline emission rates are required.

Based on the data provided by GWF, the ERCs are real, quantifiable, enforceable, and permanent as required by the definition of Emission Reduction Credit in Regulation 2-2-201.

The ERCs from the shutdown of S-1 and S-2 exceed 40 tons/yr for NOx and SO_2, and the application is therefore subject to Publication, Public Comment and Inspection of Regulation 2-4-405.

The project is exempt from CEQA pursuant to Regulation 2-1-312.10. GWF has completed and signed a BAAQMD Appendix H Environmental Information Form to ensure that the project has no potential for causing a significant adverse impact on the environment.

A toxics risk screening analysis is not required since there is no emission increase associated with the project.

PSD, Offsets, NSPS, and NESHAPS do not apply.

CONDITION

The following condition will be imposed on all of the Banking Certificates to be issued under Banking Application Nos. 24230 through 24234:

Condition 25268 ----------

1. The emission reduction credits (ERCs) can only be used to offset emission increases from other power generation sources. (Basis: Regulation 2-4-302.1)

End of Condition

RECOMMENDATION

Staff recommends the District issue a 30-day public notice regarding the preliminary decision to approve the following ERCs for emission reductions that occurred at five GWF plants (Plant Nos. 3246, 3981, 3245 through 3243).

Under Application No. 24230, for Plant No. 3246 (GWF, Site 5):

Pollutant:	**ERC Amount (TPY):**
NOx	48.017
CO	21.315
POC	0.204
PM_{10} (see *Note below)	5.178
$PM_{2.5}$ (see *Note below)	1.942
SO_2	68.305

*Note: GWF does not get both PM_{10} and $PM_{2.5}$ but it has the option of using either one for offsetting purposes, assuming District's Regulation 2-2 amendments are adopted in the summer of 2012.

Under Application No. 24231, for Plant No. 3981 (GWF, Site 4):

Pollutant:	**ERC Amount (TPY):**
NOx	51.464
CO	26.156
POC	0.421
PM_{10} (see *Note below)	2.960
$PM_{2.5}$ (see *Note below)	1.110
SO_2	64.356

*Note: GWF does not get both PM_{10} and $PM_{2.5}$ but it has the option of using either one for offsetting purposes, assuming District's Regulation 2-2 amendments are adopted in the summer of 2012.

Under Application No. 24232, for Plant No. 3245 (GWF, Site 3):

Pollutant:	**ERC Amount (TPY):**
NOx	50.907
CO	16.063
POC	0.157
PM_{10} (see *Note below)	5.000
$PM_{2.5}$ (see *Note below)	1.875
SO_2	73.66

*Note: GWF does not get both PM_{10} and $PM_{2.5}$ but it has the option of using either one for offsetting purposes, assuming District's Regulation 2-2 amendments are adopted in the summer of 2012.

Under Application No. 24233, for Plant No. 3244 (GWF, Site 2):

Pollutant:	ERC Amount (TPY):
NOx	50.399
CO	26.698
POC	0.266
PM_{10} (see *Note below)	3.964
$PM_{2.5}$ (see *Note below)	1.486
SO_2	66.835

*Note: GWF does not get both PM_{10} and $PM_{2.5}$ but it has the option of using either one for offsetting purposes, assuming District's Regulation 2-2 amendments are adopted in the summer of 2012.

Under Application No. 24234, at Plant No. 3243 (GWF, Site 1):

Pollutant:	ERC Amount (TPY):
NOx	46.337
CO	14.402
POC	0.148
PM_{10} (see *Note below)	3.595
$PM_{2.5}$ (see *Note below)	1.348
SO_2	66.351

*Note: GWF does not get both PM_{10} and $PM_{2.5}$ but it has the option of using either one for offsetting purposes, assuming District's Regulation 2-2 amendments are adopted in the summer of 2012.

Mail the five Banking Certificates to the owner:

Douglas Wheeler
Vice President
GWF Power Systems, L.P.
4300 Railroad Avenue
Pittsburg, CA 94565

By: _____
Kevin Oei
Air Quality Engineer

Date: _____

Appendix A
Monthly Mass Emissions of NOx, CO, and SO_2

Table A1. Monthly mass emissions of NOx, CO, and SO_2 for S-1 and S-2 at Plant No. 3243 (GWF, Site 1)

Month	NOx (lb/mo)	SO_2 (lb/mo)	CO (lb/mo)
Apr-09	9,028	12,709	2,205
May-09	9,383	13,320	1,951
Jun-09	9,081	13,209	1,732
Jul-09	9,637	13,812	2,164
Aug-09	8,694	12,585	2,126
Sep-09	8,672	12,504	2,244
Oct-09	5,915	8,189	1,971
Nov-09	9,400	12,613	2,408
Dec-09	9,534	13,396	2,580
Jan-10	9,449	13,574	2,796
Feb-10	8,427	11,912	2,154
Mar-10	9,162	13,221	2,592
Apr-10	8,842	12,814	2,811
May-10	8,387	11,917	2,950
Jun-10	8,527	11,959	3,366
Jul-10	5,487	7,706	3,327
Aug-10	6,380	8,411	3,719
Sep-10	9,108	13,012	3,484
Oct-10	8,753	12,245	2,715
Nov-10	8,228	11,893	3,072
Dec-10	8,246	11,977	3,741
Jan-11	5,381	7,617	2,610
Feb-11	7,027	10,037	3,083
Mar-11	9,455	13,489	2,236
Apr-11	8,516	11,824	1,485
May-11	9,214	12,697	1,621
Jun-11	7,334	10,314	1,717
Jul-11	9,274	12,849	1,857
Aug-11	7,763	12,687	1,903
Sep-11	8,664	12,431	2,139
Oct-11	8,454	12,107	3,189
Nov-11	4,312	6,836	2,147
Dec-11	8,132	12,570	3,345
Jan-12	3,771	6,012	1,812
Feb-12	2,385	3,655	1,160
Mar-12	0	0	0
Apr-12	0	0	0
Total Lbs 3 year (lbs)	278,022	398,103	86,412
Annual Average (lb/yr)	**92,674**	**132,701**	**28,804**
Annual Average (TPY)	**46.337**	**66.351**	**14.402**

Table A2. Monthly mass emissions of NOx, CO, and SO_2 for S-1 and S-2 at Plant No. 3244 (GWF, Site 2)

Month	NOx (lb/mo)	SO_2 (lb/mo)	CO (lb/mo)
Apr-09	9,324	12,045	3,690
May-09	8,890	11,408	2,152
Jun-09	9,654	11,581	5,491
Jul-09	9,971	11,693	5,150
Aug-09	9,025	11,112	3,631
Sep-09	8,226	10,829	2,738
Oct-09	9,565	11,845	3,674
Nov-09	9,472	11,186	3,654
Dec-09	9,845	12,154	3,789
Jan-10	7,339	9,743	3,692
Feb-10	8,750	11,194	3,852
Mar-10	9,732	12,414	5,872
Apr-10	9,123	12,371	5,655
May-10	9,670	13,091	3,649
Jun-10	9,164	11,544	5,688
Jul-10	8,893	12,083	6,166
Aug-10	8,615	12,015	7,243
Sep-10	9,240	12,331	5,884
Oct-10	9,611	12,725	5,421
Nov-10	9,096	12,479	5,365
Dec-10	9,341	12,265	5,955
Jan-11	9,607	12,446	6,347
Feb-11	8,549	10,817	7,197
Mar-11	3,377	11,592	4,787
Apr-11	8,508	9,774	2,931
May-11	8,592	9,886	3,623
Jun-11	9,024	12,487	3,615
Jul-11	9,158	12,406	3,067
Aug-11	9,417	12,689	4,141
Sep-11	9,138	12,567	3,958
Oct-11	8,690	12,568	4,949
Nov-11	7,856	11,088	5,603
Dec-11	5,898	7,736	4,159
Jan-12	8,139	11,302	5,271
Feb-12	3,895	5,546	2,126
Mar-12	0	0	0
Apr-12	0	0	0
Total Lbs 3 year (lbs)	302,394	401,012	160,185
Annual Average (lb/yr)	**100,798**	**133,671**	**53,395**
Annual Average (TPY)	**50.399**	**66.835**	**26.698**

Table A3. Monthly mass emissions of NOx, CO, and SO_2 for S-1 and S-2 at Plant No. 3245 (GWF, Site 3)

Month	NOx (lb/mo)	SO_2 (lb/mo)	CO (lb/mo)
Apr-09	6,460	9,114	1,701
May-09	9,838	14,151	2,044
Jun-09	9,633	13,986	2,128
Jul-09	10,071	14,682	2,227
Aug-09	9,073	13,143	1,741
Sep-09	9,508	13,489	1,978
Oct-09	9,967	14,218	1,883
Nov-09	9,483	13,152	2,178
Dec-09	9,730	13,890	2,075
Jan-10	9,432	13,556	2,466
Feb-10	8,805	12,466	1,880
Mar-10	9,800	13,969	2,175
Apr-10	7,699	10,838	1,542
May-10	8,719	11,966	3,061
Jun-10	8,332	11,368	2,772
Jul-10	6,458	8,734	2,863
Aug-10	6,810	9,087	3,717
Sep-10	9,941	14,028	3,216
Oct-10	9,146	13,034	2,834
Nov-10	10,036	14,345	3,215
Dec-10	10,152	14,576	3,546
Jan-11	6,584	9,386	3,089
Feb-11	5,086	7,452	3,035
Mar-11	9,909	14,777	3,050
Apr-11	9,552	13,545	1,740
May-11	10,057	14,726	3,074
Jun-11	9,619	14,358	3,307
Jul-11	9,946	14,859	3,022
Aug-11	9,637	14,470	3,300
Sep-11	9,605	14,266	3,605
Oct-11	8,965	13,754	4,708
Nov-11	7,070	9,796	3,679
Dec-11	9,009	14,424	3,914
Jan-12	7,077	11,629	3,393
Feb-12	4,231	6,727	2,220
Mar-12	0	0	0
Apr-12	0	0	0
Total Lbs 3 year (lbs)	305,440	441,961	96,378
Annual Average (lb/yr)	**101,813**	**147,320**	**32,126**
Annual Average (TPY)	**50.907**	**73.660**	**16.063**

Table A4. Monthly mass emissions of NOx, CO, and SO_2 for S-1 and S-2 at Plant No. 3981 (GWF, Site 4)

Month	NOx (lb/mo)	SO_2 (lb/mo)	CO (lb/mo)
Apr-09	9,067	11,406	3,973
May-09	7,880	2,478	3,976
Jun-09	9,148	11,354	3,145
Jul-09	9,787	12,523	3,850
Aug-09	8,439	11,347	3,094
Sep-09	7,871	10,108	2,705
Oct-09	9,400	11,142	5,397
Nov-09	9,728	11,859	4,278
Dec-09	9,170	11,688	4,619
Jan-10	6,876	9,917	4,972
Feb-10	8,478	11,825	3,933
Mar-10	7,849	11,100	3,145
Apr-10	9,291	13,080	3,727
May-10	9,334	12,107	3,164
Jun-10	9,537	11,036	5,157
Jul-10	9,908	11,553	5,753
Aug-10	9,923	11,854	6,847
Sep-10	8,950	10,877	6,442
Oct-10	9,940	13,737	4,673
Nov-10	9,785	13,191	4,563
Dec-10	10,129	13,036	6,128
Jan-11	8,774	10,940	4,991
Feb-11	8,757	10,212	6,887
Mar-11	9,885	12,031	6,210
Apr-11	9,036	8,593	4,238
May-11	9,652	10,873	4,055
Jun-11	9,135	12,403	3,673
Jul-11	9,587	12,139	3,855
Aug-11	9,537	11,827	4,837
Sep-11	7,999	11,509	3,688
Oct-11	9,506	13,135	4,126
Nov-11	8,969	12,675	4,069
Dec-11	4,867	5,689	4,300
Jan-12	8,472	11,567	6,067
Feb-12	4,117	5,322	2,396
Mar-12	0	0	0
Apr-12	0	0	0
Total Lbs 3 year (lbs)	308,783	386,133	156,933
Annual Average (lb/yr)	**102,928**	**128,711**	**52,311**
Annual Average (TPY)	**51.464**	**64.356**	**26.156**

Table A5. Monthly mass emissions of NOx, CO, and SO_2 for S-1 and S-2 at Plant No. 3246 (GWF, Site 5)

Month	NOx (lb/mo)	SO_2 (lb/mo)	CO (lb/mo)
Apr-09	8,605	12,121	3,767
May-09	4,915	7,038	1,530
Jun-09	9,529	12,933	3,888
Jul-09	9,724	13,089	4,383
Aug-09	8,246	11,671	2,469
Sep-09	9,242	13,225	1,927
Oct-09	8,838	12,436	3,799
Nov-09	9,031	12,473	2,651
Dec-09	9,017	13,122	3,418
Jan-10	9,240	13,119	3,198
Feb-10	8,319	11,769	3,016
Mar-10	9,101	13,153	3,177
Apr-10	9,041	13,113	3,623
May-10	7,329	10,174	2,868
Jun-10	8,504	11,290	4,875
Jul-10	8,767	12,255	3,836
Aug-10	8,988	12,390	4,352
Sep-10	8,576	12,201	4,340
Oct-10	9,389	13,112	3,974
Nov-10	9,276	13,265	3,946
Dec-10	8,788	12,194	4,696
Jan-11	8,603	12,128	4,973
Feb-11	8,237	10,435	6,483
Mar-11	8,175	12,036	4,509
Apr-11	8,008	7,884	3,259
May-11	9,023	12,013	3,940
Jun-11	8,728	12,585	3,666
Jul-11	5,826	13,648	2,556
Aug-11	8,148	13,240	3,225
Sep-11	9,169	13,146	3,539
Oct-11	9,000	13,159	3,817
Nov-11	7,863	11,302	3,387
Dec-11	4,134	5,843	2,947
Jan-12	7,177	10,211	5,886
Feb-12	3,546	6,056	1,970
Mar-12	0	0	0
Apr-12	0	0	0
Total for 3 years (lbs)	288,102	409,829	127,890
Annual Average (lb/yr)	**96,034**	**136,610**	**42,630**
Annual Average (TPY)	**48.017**	**68.305**	**21.315**

Appendix B
Monthly Operation Hours

Table B1. Monthly operation hours for S-1 and S-2 at five GWF petroleum coke fired power plants

Month	Hours/month at Plant No. 3243 (GWF, Site 1)	Hours/month at Plant No. 3244 (GWF, Site 2)	Hours/month at Plant No. 3245 (GWF, Site 3)	Hours/month at Plant No. 3981 (GWF, Site 4)	Hours/month at Plant No. 3246 (GWF, Site 5)
Apr-09	718.5	719.5	487	671	684.5
May-09	735.9	686.5	742.5	736.5	415.5
Jun-09	719.5	707.6	720	696.4	720
Jul-09	744	739.5	744	737	744
Aug-09	668	670.5	671	671	639
Sep-09	657.5	662	701.5	715.5	720
Oct-09	428	717.5	744	681.5	741.5
Nov-09	716.5	713.5	714.5	719	721
Dec-09	744	742.5	744	714	730.3
Jan-10	744	534.5	744	525	744
Feb-10	648	664	668	640	667
Mar-10	694.2	738.7	737.5	570.8	729
Apr-10	673.5	705.5	582	677.5	719.5
May-10	619.5	739	653.5	668	555
Jun-10	666	716	611	718.5	717
Jul-10	420	743.5	463.5	743	744
Aug-10	479.6	712	487.5	735	744
Sep-10	719	686	713.5	639.5	660
Oct-10	647	743	660.5	722.5	728.5
Nov-10	589.5	720	718	718.5	711.5
Dec-10	613.5	736.5	728.5	738	739.5
Jan-11	375	742	470	626.5	714
Feb-11	508.5	672	371	625.5	653.5
Mar-11	680.5	740.5	743	743	739
Apr-11	634	690.5	719	720	684.5
May-11	742.5	642	735	742.5	736.5
Jun-11	577.5	715	712	720	681.5
Jul-11	744	720.5	744	728.5	736.5
Aug-11	744	744	744	742.5	729.5
Sep-11	717	717.5	717	675.5	713.5
Oct-11	698	741.5	665.5	744	744
Nov-11	389.5	705	561.5	692.5	692
Dec-11	744	529	742.5	383	379.5
Jan-12	362.5	744	590.5	732	744
Feb-12	225.5	368	351.5	365.5	374.5
Mar-12	0	0	0	0	0
Annual Average (hr/yr)	**7,262.7**	**8,089.8**	**7,634.2**	**7,893.1**	**7,965.8**

Appendix C
Source Test Results for POC and PM_{10}

Table C1. Source Test Results for S-1 and S-2 at five GWF petroleum coke fired power plants

Pollutant	Plant No. 3243 (GWF, Site 1)		Plant No. 3244 (GWF, Site 2)		Plant No. 3245 (GWF, Site 3)		Plant No. 3981 (GWF, Site 4)		Plant No. 3246 (GWF, Site 5)	
	(lb/hr)	Source Test Date	(lb/hr)	Source Test Date	(lb/hr)	Source Test Date	(lb/hr)	Source Test Date	(lb/hr)	Source Test Date
PM, Front Half	0.50	9/13/2011	0.43	9/14/2011	0.26	9/16/2011	0.41	9/15/2011	0.38	9/12/2011
PM, Back Half	0.49	9/13/2011	0.55	9/14/2011	1.05	9/16/2011	0.34	9/15/2011	0.92	9/12/2011
PM-10	0.99	9/13/2011	0.98	9/14/2011	1.31	9/16/2011	0.75	9/15/2011	1.30	9/12/2011
POC	0.047	8/26/2008	0.054	8/25/2008	0.045	8/28/2008	0.065	9/26/2008	0.052	8/27/2008
	0.051	9/3/2009	0.054	9/17/2009	0.048	9/4/2009	0.052	9/18/2009	0.056	9/2/2009
	0.030	9/14/2010	0.092	9/17/2010	0.033	9/15/2010	0.197	9/16/2010	0.051	9/13/2010
	0.035	9/13/2011	0.044	9/14/2011	0.041	9/16/2011	0.059	9/15/2011	0.041	9/12/2011