

Ms. Elizabeth O'Donnell Executive Director Kentucky Public Service Commission 211 Sower Boulevard Frankfort, Kentucky 40602

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May 9, 2007

### PUBLIC SERVICE COMMISSION

### Re: <u>The Application of Kentucky Utilities Company for a Certificate of</u> <u>Public Convenience and Necessity to Construct Flue Gas Desulfurization</u> <u>Systems and Approval of Its 2004 Compliance Plan for Recovery by</u> <u>Environmental Surcharge – Case No. 2004-00426</u>

Dear Ms. O'Donnell:

Enclosed please find an original and ten (10) copies of Kentucky Utilities Company's Update to the 2004 SO<sub>2</sub> Compliance Strategy ("Update Strategy") and a presentation entitled "SO<sub>2</sub> Compliance Strategy – E.W. Brown FGD – Kentucky Public Service Commission Update." These two documents were presented by Company representatives at the April 26, 2007 meeting with the Commission Staff, the Attorney General, and the Kentucky Industrial Utility Customer's Inc., in the above-referenced matter. Also enclosed is the attendee listing for that meeting. This information is being filed pursuant to the direction of the Commission Staff following the meeting.

Also enclosed are an original and ten copies of a Motion for Confidential Treatment regarding certain information provided in the *Update Strategy*.

Should you have any questions concerning the enclosed, please do not hesitate to contact me.

Sincerely,

Kut Blake

Kent Blake

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Update to the 2004 SO<sub>2</sub> Compliance Strategy For



Subsidiaries Kentucky Utilities and Louisville Gas and Electric

April 2007



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### **Executive Summary**

The purpose of this document is to update the 2004 SO<sub>2</sub> Compliance strategy including the cost estimates of the flue gas desulfurization ("FGD" or "scrubber") systems being built at Kentucky Utilities' ("KU's") Ghent and E.W. Brown stations, along with both quantitative and qualitative explanations that support the changes in cost. A Certificate of Public Convenience and Necessity ("CCN") was granted and environmental cost recovery ("ECR") treatment approved by the Kentucky Public Service Commission ("KPSC") on June 20, 2005 as Project KU-21 in Case No. 2004-00426. However, since KPSC approval, and despite the efforts of KU to control capital costs, the cost estimate of the E.W. Brown ("Brown") FGD project has increased from \$234.2 million to \$358.6 million, an increase of 53%, primarily driven by market prices for materials, equipment, labor and a significant scope increase for the ductwork routing of units 1 and 2.

The changes in capital cost, combined with the changes in the forecasted prices of  $SO_2$  allowances and fuel necessitate a re-evaluation of the Companies' 2004 least-cost  $SO_2$  compliance plan. On December 22, 2006, the KPSC approved as Case No. 2006-00493 an application for changes to the Ghent FGD CCNs which also included an update on the Ghent FGD project<sup>1</sup> in general and demonstrated that the addition of FGDs at Ghent continues to be the least-cost next step in environmental compliance. This evaluation focuses on whether or not the plan to construct an FGD on Brown Units 1, 2 and 3 continues to be economical.

Continued construction of wet FGD systems on Ghent Units 1, 3 and 4 and Brown Units 1, 2 and 3 and the simultaneous switching of these units to high sulfur coal is the leastcost plan for continued environmental compliance. While the addition of the FGD systems do not eliminate the need to purchase  $SO_2$  allowances, the installation of environmental controls reduces the purchase of  $SO_2$  allowances and are required for continued economical compliance with the  $SO_2$  emission reduction requirements of the Clean Air Act Amendments of 1990.

Following the scrubbing and fuel switching of the remaining units at Ghent, construction of FGD systems at Brown and the simultaneous conversion of the Brown Units 1-3 to high sulfur coal in conjunction with purchasing  $SO_2$  allowances on an as-needed basis, is the least-cost  $SO_2$  compliance plan. Compared to only completing the scrubbers at Ghent and purchasing allowances, completing the FGD at Brown has the following benefits over the 20 year analysis period:

- 1. Decreases the cost of SO<sub>2</sub> compliance by approximately \$93.6 million in present value revenue requirements.
- 2. Significantly limits exposure to the volatile SO<sub>2</sub> allowance market by reducing the anticipated allowance shortfall to approximately 298,000 tons

<sup>&</sup>lt;sup>1</sup> In the Matter of: Application of Kentucky Utilities Company to modify certain Certificates of of Public Convenience and Necessity to construct ductwork for two flue gas desulfurization units at the Ghent power station, Order dated December 22, 2006, finding 4 at Page 4 - "KU's updated PVRR analysis demonstrates that constructing three new FGDs at the Ghent Station continues to be the most cost-effective means for KU to comply with the relevant emission limits imposed by the CAIR."



- 3. Increases fuel procurement flexibility
- 4. Positions the Companies for the SO<sub>2</sub> reduction requirements associated with the Clean Air Interstate Rule and future regulations targeting fine particulates and mercury
- 5. Delays the depletion of the Companies' SO<sub>2</sub> allowance bank.

Therefore, the Companies will continue with the implementation of the Base Case – construct an FGD for Brown 1, 2 and 3 in 2009, purchase allowances on an as-needed basis and continue the practice of environmental dispatching. Additionally, the Companies will evaluate additional environmental technologies for existing generating assets.



## **Background**

The Clean Air Act Amendments ("CAAA") of 1990 sought to reduce the effects of acid deposition through a phased reduction in SO<sub>2</sub> and NOx emissions from 1980 levels in the 48 contiguous states. Subsequently, the Clean Air Interstate Rule ("CAIR") was finalized by the Environmental Protection Agency in March 2005. This regulation requires significant additional reductions/limits in phases for NO<sub>x</sub> and SO<sub>2</sub>. With regard to SO<sub>2</sub>, CAIR will reduce the allowable SO<sub>2</sub> emissions of Kentucky Utilities ("KU") and Louisville Gas & Electric ("LG&E"), collectively "the Companies" by around 50% in 2010 and 65% in 2015.

In order to comply with these regulations, the Companies have constructed Flue gas desulfurization ("FGD") systems on many of the fleet's coal-fired units (Ghent 1, Trimble County 1, Mill Creek 1-4 and Cane Run 4-6). By increasing the FGDs' SO<sub>2</sub> removal efficiency where economically feasible, LG&E is expected to meet CAAA Phase II requirements and provide a bank of SO<sub>2</sub> allowances. The Companies' joint planning process assumes that allowances banked by either utility can be utilized by either Company, thereby mitigating the combined Companies' exposure to the volatile SO<sub>2</sub> allowance market.

On December 20, 2004, the Companies filed with the Kentucky Public Service Commission ("KPSC") for a Certificate of Public Convenience and Necessity ("CCN") and environmental cost recovery ("ECR") treatment for additional wet FGD systems on E.W. Brown ("Brown") units 1, 2 and 3 and the remaining un-scrubbed units at Ghent. On June 20, 2005, the KPSC approved these projects under Project KU-21 in Case No. 2004-00426. Since that time, the Companies have proceeded with the construction of these projects. On November 16, 2006, the Companies filed an application for changes to the Ghent FGD CCNs. That application, which also included an update on the Ghent FGD project in general, was approved as Case No. 2006-00493 on December 22, 2006. The purpose of this document is to provide a similar update on the Brown FGD project.

To date, \$63.8 million in capital costs have been spent or committed on the construction of the FGD planned at the Brown station. Recent photographs of this construction can be found in **Appendix 1**. Since 2004, several factors impacting the cost of the Brown FGD project have changed, as discussed in the following section. The goal of this revised evaluation was to identify the current least-cost plan, given the impact of these new factors.

### **Significant Changes since 2004 Filing**

Since Case No. 2004-00426 was completed in 2004, significant changes have occurred in the marketplace that have impacted three key drivers to least-cost environmental evaluations. Those changes are the  $SO_2$  allowance market, fuel price forecasts and FGD capital costs.



# SO<sub>2</sub> Allowance Prices

Previous testimony<sup>2</sup> has documented the increase in the SO<sub>2</sub> allowance price forecast since the 2004 ECR. An increase in the SO<sub>2</sub> allowance price makes constructing a FGD more favorable than purchasing allowances from the allowance market.

The following graph indicates that the  $SO_2$  allowance market price forecast has seen a significant increase since 2004. The primary factors that have placed upward pressure on the  $SO_2$  allowance market are:

- Increasing construction cost for building FGDs (materials, labor, contractor availability)
- Higher natural gas prices resulting in greater reliance on coal-fired generation
- Overall industry stronger coal build-out compared to earlier views
- Increased difference between low and high sulfur coal prices
- Current SO<sub>2</sub> market forecasts considers the impact the CAIR would have on the SO<sub>2</sub> allowance market in 2014 and beyond.



## Forecasted SO<sub>2</sub> Allowance Market Cost

## High and Low Sulfur Coal Prices

The near-term forecasted price has increased for Eastern Kentucky low sulfur coal, which is currently burned at Brown. A significant <u>increase in savings</u>, on the order of 10-20 cents/mmBtu, when switching from low sulfur fuel to high sulfur fuel is also forecasted

<sup>&</sup>lt;sup>2</sup> See Case No. 2006-00493, Testimony of John P. Malloy (page 11, beginning line 6)



at Brown for 2009-2012. The savings in 2012 and beyond, in general, remain consistent with the 2004 expectations. The forecasted increase in savings is demonstrated in the following graph.



The primary driver behind the increasing gap between high and low sulfur fuels is a result of upward pressure on the near-term low sulfur fuel price attributed to utilities switching to low sulfur fuel until FGD construction is completed. Projections reflect the expectation that once FGDs are constructed, the upward pressure on low sulfur coal will be relaxed and the fuel gap will re-align itself with the long term gap anticipated by the 2004 forecast.

### **Capital Costs**

In 2004, the estimated capital cost associated with constructing the single-module, wet FGD at Brown for Units 1, 2 and 3 was \$234.2 million. Testimony in Case No. 2006-00493 documents the fact that the earliest completed FGD at Ghent (on Unit 3) is less than the cost of the remaining FGDs to be constructed at Ghent. FGDs constructed on subsequent units are subject to the change in commodity prices, vendor availabilities and increasing labor prices.<sup>3</sup> The companies, have been proactively managing the costs associated with the FGD project and will continue to do so. However, even with the Companies' best efforts to manage costs, the capital cost of the Brown FGD has increased by \$124.4 million. The following table identifies the impacts to various areas of the project.

<sup>&</sup>lt;sup>3</sup> Case No. 2006-00493, Testimony of John P. Malloy (page 12, beginning line 11)



Item	Cost (M\$)
FGD Island and Foundation	60.4
Reactant Prep	18.0
Limestone Unloading	-10.0
Gypsum Dewatering	6.0
Combustion Modification	-13.0
Byproduct Pumping	-3.0
BOP Utilities	5.4
Ductwork	70.4
Stack	10.3
Fans	11.6
Auxiliary Power	10.1
Wet ESP Shell	-11.0
Spare Parts	0.0
Plant Labor	1.5
Escalation*	-21.9
A&G	7.5
AFUDC	3.4
Contingency	-21.3
	124.4

### **Brown FGD Capital Cost Impacts**

\*Fluor Target Estimates include 5% escalation on labor and varying escalation on material/commodities.

The estimate for Brown's FGD project has increased from \$234.2 million in November of 2004 to \$358.6 million in March 2007. The cost has been driven primarily by market prices for materials, equipment, labor and a significant scope increase for the ductwork routing of units 1 and 2.

### **Economic Analysis**

The June 2005 order issued by KPSC approving both the CCN and ECR treatment of the proposed FGD projects at the Companies' Ghent and Brown stations was based on supporting analytics that the FGDs represented the most reasonable least-cost plan for continued environmental compliance. A revised present value revenue requirements ("PVRR") evaluation of the economics of constructing an FGD at Brown has been completed with the previously mentioned market changes regarding SO<sub>2</sub> allowance prices, fuel prices and capital costs. The purpose of this "revised" evaluation was to identify the current least-cost plan, given these revised forecasts.



### **Cases Evaluated**

In order to identity the least-cost compliance strategy, individual alternatives were evaluated based on varying the number of units scrubbed at the Brown station and the inservice date of the FGD system. The Base Case represents the Companies' current plan as approved by the KPSC in 2005, which is to construct three FGDs at the remaining unscrubbed units at Ghent and build one FGD for all three Brown units (in-service in 2009). In order to determine if delaying the Brown FGD may be economical, several one-year and two-year delay scenarios were evaluated. In addition, a "Walk-Away" Case (Case09) was included in which no FGD would be completed at the Brown station and no further construction would take place while satisfying current contractual commitments at an estimated cost of \$63.8 million. The Ghent scrubbers are assumed to be completed in all cases. The table below summarizes the SO<sub>2</sub> compliance strategies that were evaluated in this update. Only a wet FGD with a 98% SO<sub>2</sub> removal efficiency is considered.

			<b>Total FGD</b>	
		In- Service	Capital	Ash Pond
Case	Construct FGD at	Date	<u>Cost<sup>1</sup> (\$M)</u>	$\underline{Cost}^1$ (\$M)
Base Case	Brown Units 1,2,3	2009	\$358.6	\$150.3
Case01	Brown Units 2,3	2009	\$337.8	\$155.4
Case02	Brown Units 3	2009	\$304.1	\$130.2
Case03	Brown Units 1,2,3	2010	\$395.5	\$150.3
Case04	Brown Units 2,3	2010	\$374.9	\$155.4
Case05	Brown Units 3	2010	\$339.2	\$130.2
Case06	Brown Units 1,2,3	2011	\$456.7	\$179.4
Case07	Brown Units 2,3	2011	\$430.5	\$159.0
Case08	Brown Units 3	2011	\$387.9	\$133.4
Case09	None (Purch. Allowances)	n/a	\$63.8	\$120.6

### SO<sub>2</sub> Compliance Strategies Evaluated

<sup>1</sup> Total FGD Capital Costs and Ash Pond Costs are the sum of annual (nominal dollars) construction expenditures.

Using the same analysis methods that were used in the original evaluation, the Cases were evaluated using the PROSYM<sup>TM</sup> detailed hourly production costing computer model and the Strategist Capital Expenditure and Recovery module. Used together, these tools have the capability of simulating the hourly production costs (fuel, fixed and variable operation and maintenance, emissions, etc) and quantifying the revenue requirements impact associated with each capital project. **Appendix 2** contains economic and forward looking assumptions used in this analysis. Each alternative was independently evaluated within PROSYM<sup>TM</sup> using the Companies' base price forecasts for fuel and SO<sub>2</sub> and NO<sub>x</sub> allowances and the estimates for capital construction costs in the table above.

Shortfalls in  $SO_2$  or  $NO_x$  allowances are made up by purchasing the required number of allowances from the allowance market on an as-needed basis. The first year that the Companies would purchase  $SO_2$  allowances and the volume of purchased allowances over the period can also be observed. In some Cases, the Companies rely heavily on  $SO_2$  allowance purchases for compliance and it is assumed that an unlimited number of



allowances are available at the projected allowance price. The total PVRR for each Case has been categorized into four areas:

- 1. <u>*Production Costs:*</u> represent the revenue requirements associated with fuel, fixed and variable operation and maintenance expenses and purchased power expenses.
- 2. <u>NO<sub>x</sub> Allowance Costs</u>: represent the revenue requirements associated with the purchasing of any NO<sub>x</sub> allowances. Note that NO<sub>x</sub> emission levels are quantified because the retrofitting of an SO<sub>2</sub> control technology impacts how that unit is dispatched, which in turn, affect NO<sub>x</sub> tonnage emissions.
- 3. <u>SO<sub>2</sub> Allowance Costs</u>: represent the revenue requirements associated with the purchasing of any SO<sub>2</sub> allowances.
- 4. <u>*Capital Costs:*</u> represent the revenue requirements associated with any capital expenditures for the Case.

The Case Summary table below summarizes these categories and compares the resulting PVRR of each Case to that of the Base Case, with the Cases listed in order of increasing PVRR. The table is a summary of the annual data contained in **Appendices 3 and 4**. **Appendix 3** presents the annual results of each Case compared to the Base Case while **Appendix 4** details the SO<sub>2</sub> emissions associated with each Case.

Case Summary	(Producti	on and A	Allowan	ces Co	sts estin	nated th	ru 2027	)
(Assu	ming: Base Cap	oital Costs, B	ase NOx & S	02 Emissio	ns Price Fored	casts)		
	Construction P	All Costs I	D for 2007 PVH	R \$1000)				<u></u>
ALL CASES COMPARED TO Base Case-	Constructing B	123 FG	D for 2009 in	Service			Elizab Vice and	
Case	Production Cost	NOx Allowance Cost	SO2 Allowance Cost	Capital Cost	Total PVRR	Incremental Cost over Base	First Year of SO <sub>2</sub> Allowance Purchase	Total SO2 Allowances Purchased
Base Case- BR123 WFGD 2009	14,800,304	75,816	114,287	576,240	15,566,648	Base	2018	298,138
Case01- BR23 WFGD 2009	14,796,732	70,884	161,527	561,487	15,590,630	(23,982)	2016	414,006
Case02- BR3 WFGD 2009	14,791,936	70,053	253,703	509,542	15,625,235	58,587	2014	640,107
Case03- BR123 WFGD 2010	14,802,114	75,331	140,589	611,761	15,629,795	63,147	2016	359,122
Case04- BR23 WFGD 2010	14,800,106	70,615	184,540	599,491	15,654,752	88,104	2014	467,100
Case09- Walk Away (with Env Dispatch)	14,845,387	73,303	523,155	218,376	15,660,222	93,574	2011	1,299,119
Case05- BR3 WFGD 2010	14,796,247	69,784	270,095	548,302	15,684,428	117,780	2013	678,411
Case06- BR123 WFGD 2011	14,802,973	74,416	166,035	670,020	15,713,444	146,796	2012	417,959
Case07- BR23 WFGD 2011	14,801,427	70,053	207,009	638,234	15,716,723	150,075	2012	518,880
Case08- BR3 WFGD 2011	14,798,973	69,197	287,087	582,204	15,737,461	170,813	2011	716,517

## **Discussion of Base Results**

As can be observed in the table above, the approved current plan (Base Case) to build an FGD on Brown units 1, 2 and 3 for an in-service date of 2009 is the least-cost option and results in a PVRR that is \$23.9 million lower than the second least-cost option (Case01) of completing an FGD on only Brown units 2 and 3 in 2009. The Walk-Away Case (Case09) is \$93.6 million higher in PVRR than the Base Case. While the Cases with fewer or no units scrubbed require less capital, the savings are not sufficient to offset the resulting increased production and SO<sub>2</sub> allowance purchase costs.

Each of the FGD build alternatives allows the postponement of the Companies' initial  $SO_2$  allowance purchases. However, no alternatives allow for all of the  $SO_2$  allowances required to comply over the twenty-year study period to be provided without purchasing



allowances from the SO<sub>2</sub> allowance market. With the Base Case, exposure to the volatile SO<sub>2</sub> market is mitigated, but the market is still relied upon to provide 298,000 allowances over the period. The figure below illustrates the difference between the Companies' projected annual Base Case SO<sub>2</sub> emissions and the Companies' anticipated annual allowance allocations. The difference between SO<sub>2</sub> emissions and allowance allocations is currently being covered by banked allowances. The implementation of Phase I and Phase II of CAIR significantly widens the gap between the number of allowances allocated and the number of allowances needed.



Beginning in 2000, it became necessary for the Companies to begin using banked  $SO_2$  allowances for compliance. As the figure below shows, the Companies' banked  $SO_2$  allowances, once in excess of 297,000 tons (during 1999) was over 156,000 allowances by year end 2006. Base Case projections are that even with the reduced emissions resulting from the new wet FGDs currently under construction at Ghent; the number of banked credits will be fully depleted before the end of 2018. The Base Case delays the need to purchase  $SO_2$  allowances by two years compared to the second least-cost Case (Case01 –BR23 WFGD 2009) which requires an additional 116,000 allowances over the study period. The Walk-Away option (Case09) necessitates purchasing  $SO_2$  allowances starting in 2011 and significantly increases  $SO_2$  allowance market exposure by requiring 1.3 million  $SO_2$  allowances be purchased over the next twenty years.





Because of the wide variance in forecasted  $SO_2$  prices, a sensitivity analysis was conducted regarding  $SO_2$  allowance prices as well as capital costs.

### **Sensitivities**

### **Sensitivity:** Market Price of SO<sub>2</sub>

Due to the volatility of the historic allowance market, it is prudent to evaluate the sensitivity of the rank of the Base Case as the least-cost alternative to changes in the  $SO_2$  allowance price forecast. To do so, the PVRR of each Case was quantified, assuming that the  $SO_2$  allowance price forecast was a multiple of the base price projection. This multiplier was applied to each year of the  $SO_2$  allowance market price curve to determine the price at which  $SO_2$  allowances would be purchased if required by the Case. This sensitivity includes the simplifying assumption that the new  $SO_2$  market prices would not make significant changes to the dispatch of the Companies' generating units.

The following graph depicts the relative rank of each alternative's PVRR for multiples of the base  $SO_2$  allowance price curve. The lowest ranked Case at each particular price curve multiple represents the least-cost alternative.



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Multiple of Base SO<sub>2</sub> Allowance Price Forecast

The SO<sub>2</sub> market price sensitivity analysis indicates that the Walk-Away Case with no FGD at Brown (Case09) would be preferred if, in each year of the study period, the SO<sub>2</sub> allowance market fell to or below 0.75x the base SO<sub>2</sub> allowance price projections. For all multiples above 0.75x the base SO<sub>2</sub> allowance price projections, the Base Case is least-cost.

### **Sensitivity: Capital Cost**

Similar in method to the  $SO_2$  price sensitivity analysis, a capital cost sensitivity analysis was also conducted in order to quantify the sensitivity of the Base Case to a range of capital costs. The graphical results of that sensitivity are shown below.





As with the  $SO_2$  allowance market price sensitivity, the capital cost sensitivity confirms the preference of the Base Case. The 2009 construction of an FGD for Brown units 1, 2 and 3 is the least-cost alternative over a range of capital costs up to and including a multiplier of 1.25x the base capital costs. At capital costs above 1.25x the base costs, the Walk-Away Case (Case09) is least-cost, but involves a significant exposure to the  $SO_2$ allowance market.

### Least-Cost Plan and SO<sub>2</sub> Compliance Strategy

As was the case in the 2004 filing with the KPSC, building a wet FGD system for Brown 1, 2 and 3 for service starting in 2009 continues to be the least-cost Case. This is the least-cost SO<sub>2</sub> compliance plan under the current base forecasts for fuel and SO<sub>2</sub> allowance prices. The project is currently underway and is on schedule for completion in May 2009 as was stated in the original filing for Case No. 2004-00426. Since the original filing, significant increases in the project's capital costs have been partially offset by increases in SO<sub>2</sub> allowance price forecasts and the near-term price gap between high and low sulfur coal.

Without scrubbing at Brown, the Companies face a significant  $SO_2$  allowance shortfall of over 1.3 million tons through 2027. While the Base Case allows a shortfall of 1 million tons of allowances to be economically mitigated, future allowance purchases of 298,000 tons are still expected.

Following the scrubbing and fuel switching of the remaining units at Ghent, construction of an FGD system at Brown and the simultaneous conversion of Brown units 1-3 to high sulfur coal in conjunction with purchasing  $SO_2$  allowances on an as-needed basis, is the least-cost  $SO_2$  compliance plan. Compared to completing the scrubbers at Ghent and purchasing allowances, completing the FGD at Brown has the following benefits over the 20 year analysis period:

- (1) Decreases the cost of  $SO_2$  compliance by approximately \$93.6 million in PVRR
- (2) Significantly limits exposure to the volatile SO<sub>2</sub> allowance market by reducing the anticipated allowance shortfall to approximately 298,000 tons
- (3) Increases fuel procurement flexibility

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- (4) Positions the Companies for the SO<sub>2</sub> reduction requirements associated with the CAIR and future regulations targeting fine particulates and mercury
- (5) Delays the depletion of the Companies'  $SO_2$  allowance bank.

Therefore, the Companies will continue with the implementation of the Base Case – construct an FGD for Brown 1, 2 and 3 in 2009, purchase allowances on an as-needed basis and continue the practice of environmental dispatching. Additionally, the Companies will evaluate additional environmental technologies for existing generating assets.



Appendix 1





The picture above (dated 4/11/2007) shows the main FGD foundation where the recycle pumps will sit next to the absorber that will sit on the pedestal foundation in the upper left corner with the rebar protruding vertically. The absorber area sump is located in the photo immediately to the left of the absorber. The anchor bolts in the main FGD foundation, where the structure's columns will be located, will provide support and access for the piping that will be installed in the area above the recycle pumps. The chimney foundation will be built in the circular excavation seen in the upper center of the photo and the limestone preparation building will be built in the rectangular excavation that you see in the upper right of the photo.





The picture above (dated 4/11/2007) shows a closer view of the main FGD foundation and absorber foundation from a different angle. The edge of the excavated area indicates the amount of soil that was removed and the amount of rock that was blasted and excavated to prepare the site for the FGD construction.





The picture above (dated 4/16/2007) shows the fire protection tank being built on its foundation. The tank will be a dual purpose tank that will hold and supply water for the fire protection system for the new items being installed as part of the FGD Project and will supply water for the quench water system that will quench the flue gas in case of a process upset where recycle pump flow is lost. Without quenching of the flue gas, the FRP mist eliminator panels would be overheated and damaged.





The above photo (dated 4/11/2007) shows balance-of-plant work that is being done to install new electrical manholes and underground ductbanks for the conduits to contain power, controls and communications cables between the existing plant and the new FGD items in addition to new fire hydrants and new underground fire protection piping that have been installed.





The above photo (dated 4/16/2007) shows construction of the new warehouse.



Appendix 2



- Base Case: Scrub Ghent and Brown consistent with the KPSC order in Case No. 2004-00426.
- Study Period: 20-year period for Production Cost impacts (2007-2027) 30-year period for Capital Costs impacts (2007-through book life of project).

The production costs include items such as fuel, O&M and purchase power and are estimated using the PROSYM production model. This model was run for the 2007-2027 time period.

The revenue requirements associated with capital costs are determined via the Capital Expenditure and Recovery module of the Strategist production and capital costing software. Capital projects with a 20 year book/tax life and an in service date after 2007 would have the last years of their life excluded from the revenue requirement calculation if capital costs impacts were halted at 2027. Doing so would have the affect of underestimating the capital cost of alternatives and would favor construction of new projects. Therefore, to completely account for capital projects were extended through the end of their book life.

- KU/LGE continues as a regulated entity subject to the oversight of the Kentucky Public Service Commission and that the Commission continues the requirement of the Companies implementing the least-cost strategy to the benefit of the native load customers.
- The capital costs, O&M costs and the costs of increased emissions (both NO<sub>x</sub> and SO<sub>2</sub>) associated with the addition of new environmental projects will be subject to recovery through the Environmental Cost Recovery mechanism.

### • Financial Data

Discount Rate (%):	7.85 %
Federal Income Tax Rate (%)	39.55 %
AFUDC Rate (%):	7.85 %
Insurance Rate (%):	0.07 %
Property Tax Rate (%):	0.15 %
Percentage of Debt in Capital Structure (%):	43.94 %
Debt Interest Rate/Weighted Cost of Debt (%):	4.48%
Desired Return on Rate base (%):	7.85
Capitalized Interest Debt Rate (%):	4.48 %
Environmental Projects Book Life (years):	20 years
Environmental Projects Tax Life (years):	20 years
Annual Fixed O&M escalation rate (%):	1.6% (prorated for mid-year installs)
Annual Variable O&M escalation rate (%):	1.6%
	Discount Rate (%): Federal Income Tax Rate (%) AFUDC Rate (%): Insurance Rate (%): Property Tax Rate (%): Percentage of Debt in Capital Structure (%): Debt Interest Rate/Weighted Cost of Debt (%): Desired Return on Rate base (%): Capitalized Interest Debt Rate (%): Environmental Projects Book Life (years): Environmental Projects Tax Life (years): Annual Fixed O&M escalation rate (%): Annual Variable O&M escalation rate (%):

• No unit retirements occur on the Companies' generating system within the study period.



• SO<sub>2</sub> Emission Costs (Base Assumption) Note that the effects of CAIR are reflected in the forecasted price of SO<sub>2</sub>.



- Fuel Forecast (Base Assumptions)
  - Fuel cost savings associated with serving native load will be returned to the ratepayer though the Fuel Adjustment Clause mechanism.





Appendix 3

**Compliance Strategy Update to the 2004 SO<sub>2</sub> Compliance Strategy U.S.** Appendix 3- Comparison of Various SO<sub>2</sub> Compliance Plans (Base Capital Costs, Base SO<sub>2</sub> Market Prices) **Confidential Information Redacted** 

				Cost	t Compa	Irison of A All Costs	lternativ in 2007 PV	e SO <sub>2</sub> /RR \$ x	Complia	nce Pla	us				
Case01- B	3R23 WFGD 2009						Base Case- B	IR123 WF	GD 2009					Price Curve M	uttinilers
		Fuel Forecast:	Base	Cap Cosi	t Sensitivity %:				Fuel Forecast: B	ase	Cap Cos	t Sensitivity %:		so <sub>2</sub>	1.00
	S	Load Forecast: 32 Price Forecast: 3X Price Forecast:	Base Base X 1 None X 1	:				SO2 F NOX F	-oad Forecast: B Price Forecast: B Price Forecast: B	ase ase X 1 ase X 1	ļ			NOX	001
Envir	( ronmental Controls:	Other Description:	Brown 23 FGD in 0	60, 1				Environme	er Description: B 0 ental Controls:	rown 123 FGD ir	60, L				
M-700	Unit         SO2. Rem &           Brown t         0%           Brown 2         98%           Brown 3         98%           Ghent 1         95%	SO2 Tech n/a FS HS+Wet FGD FS HS+Wet FGD Existing FGD	<u>SO2 In-Serv</u> 0 2009 1992	NOX Tech LNB (1993) LNCFS I (1994) LNCFS III (1992) LNCFS II	SCR In-Serv 0 2015 2003	NOX Tech Cost (MS)	ō	<mark>02. Rem %</mark> 98% 98% 98% 95%	SO2.Tech Si FS HS+Wet FGD FS HS+Wet FGD FS HS+Wet FGD FS HS+Wet FGD Existing FGD	<mark>22 In-Serv</mark> 2009 2009 1992	NOX Tech LNB (1993) LNCFS I (1994) LNCFS III (1992) LNCFS II	<u>SCR In-Serv</u> 0 2015 2003	NOX Tech Cost (MS)		
_	Ghent 2 98%	FS HS+Wet FGD	2009	LNCFS III (2000)/SCR (2009)	2009	\$95.00		98%	FS HS+Wet FGD	2009	LNCFS III (2000)/SCR (2009)	2009	\$95		
- C	Ghent 3 98% Ghent 4 98%	FS HS+Wet FGD FS HS+Wet FGD H- 414 006	2007 2008	LNB & OFA (1998) LNB & OFA (1999) SO	2003 2003 1. Tons Emitted•	1 930 610		98% 98% SO- Alfowan	FS HS+Wet FGD FS HS+Wet FGD	2007 [ 2008 [	LNB & OFA (1998) LNB & OFA (1999) Sr	2003 2003 D. Tons Fmitted	1 814 742		
	2 Some NO Allow Durry	h. 63.917	st Annual SO <sub>2</sub> Pur	rchase (as a % of l Ann+07 Seas	EPA Allocation): NO Tons Emit:	739.744	Anr	N+O7 Spas N	Large	st Annual SO <sub>2</sub> Pu 68.367	Irchase (as a % of Ann+Oz Seas	EPA Allocation): NO. Toos Emit-	745.948	DIFFERE	INCE
	Emission Price Nominal S/ton emit)		Combined Allow. Pu	Company Irchases	×	PVRR	Emission P (Nominal \$/tor	rice n emit)		Combined ( Allow. Pur	Company rchases	- T	PVRR		Sumulative
Year N	VOX SO2	Production S	NOX S	S02 \$	Capital S	Total \$	XON	502	Production S	NOX \$	S02 \$	Capital S	Total S	Total S	Total S
2007	900 45	39	,	• •	23,414		900 850	489		, ,	, ,	22,477		937	937
2009	645 48	30	1,532	,	58,792		645	480		1,603	,	60,445		(2,736)	(2,061)
2010	2366	66	3,633	,	56,952		2366	599		4,008	,	58,714		(3,816)	(5,877)
2011	2369 62	24:	3,218	,	50,515		2369	624		3,515	,	52,078		(3,430)	(3,307)
2012	2372 64	19	1,958	3	44,785		2372	649		2,209	'	46,171		(3,108)	(12,415)
2013	2274 67	73	4,827	1	39,682		2274	673		5,051	'	40,911		(2,748)	(15,163)
2014	2250 7:	33	2,557	I	35,136		2250	704		2,/04	,	36,225		(2,364)	(17,526)
2016	3092 85	55	3,158	8,111	27,457		3092	855		3,312		28,312		6,245	(13,315)
2017	3086 91	16	4,112	15,877	24,202		3086	916		4,296	,	24,958		14,330	1,015
2018	3122 97	77	3,864	15,744	21,276		3122	977		4,039	11,907	21,943		2,366	3,381
2019	3149 105	38	5,185	15,280	18,647		3149	1038		5,445	12,636	19,234		1,681	5,063
2020	3177 3177	66	4,624	14,823	16,288		3177	1099		4,987	12,497	16,803		2,078	7,140
2021	3250 11t 3282 122	31	4,981 5.010	15,059	14,174 12.281		3250 3282	1221		5,311	12,826	14,624 12,674		1,925	9,066
2023	3281 126	32	4,679	13,444	10,589		3281	1282		5,079	11,253	10,930		2,671	14,493
2024	3123 134	13	4,862	14,097	9,078		3123	1343		5,222	11,928	9,372		2,678	12,171
2025	2970 140	14	4,244	13,835	7,731		2970	1404		4,578	11,732	7,984		2,596	19,767
2026	3018 142	26	3,340	11,321	6,532		3018	1426		3,612	9,494	6,748		2,356	22,123
2027	3066 144	19	2,771	9,875	5.318		3066	1449		2,945	8,248	5,511		2,121	24,244
2028			1	,	3,585					,	,	3,806		(221)	24,023
2029			•	•	661					,	1	702		(41)	23,982
2030			•	1						•	•	·			23,982
2031 2032			• •												23,982
Totals		14 796 732	70.884	161.527	561.487	15.590.630			14.800.304	75.816	114.287	576.240	15.566.648	23.982	-
-	7		1.202	1			Delta (P)	VRR \$000)	(3,573)	(4,932)	47,240	(14,753)	23,982		

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Confidential Information of Various SO<sub>2</sub> Compliance Plans (Base Capital Costs, Base SO<sub>2</sub> Market Prices) Confidential Information Redacted

(4,096) (12,832) (49,545) 15,363 33,939 (44,211) 20 20,972 27,324 40,822 47,779 53,988 58,694 58,587 (138) (23,501) (32,912) (41,691) (30,671) (16,414) 4,992 9,947 59,271 58,587 58,587 58,587 Cumulative Total S Price Curve Multipiters SO<sub>2</sub> <u>1.00</u> NO<sub>X</sub> <u>1.00</u> DIFFERENCE (8,736) (9,412) (8,779) (7,854) 5,335 13,540 14,257 4,955 5,416 5,609 6,883 6,957 6,209 (3,958) (10,669) 16,435 6,615 5,283 (577) (138) 4,972 6,352 (107) 58,587 Total S 15,566,648 58,587 1,814,742 71% 745,948 NOX Tech Cost (MS) PVRR Total S **S95** Cap Cost Sensitivity %: SO<sub>2</sub> Tons Emitted: 6,748 576,240 (66,698) 
 FED
 2007
 LNB & OFA (1999)
 2003

 FED
 2008
 LNB & OFA (1999)
 2003

 FED
 2008
 LNB & OFA (1999)
 2003

 201
 2018
 LNB & OFA (1994)
 2003

 202
 2008
 LNB & OFA (1994)
 2003

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 LAB & OFA (1994)
 2003
 2003

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 LAB & OFA (1994)
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 LAB & OFA (1994)
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 LAB & OFA (1994)
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 LAB & OFA (1994)
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 2004

 203
 LAB & OFA (1994)
 2004
 2004
 60,445 58,714 52,078 46,171 40,911 36,225 32,044 28,312 24,958 21,943 19,234 16,803 14,624 12,674 10,930 5,511 3,806 702 22,477 43,574 9,372 7,984 Ann+Oz Seas NO, Tons Emit . . SCR In-Serv Capital S 0 2015 2003 2009 11,732 114,287 139,416 LNCFS I (1994) LNCFS III (1992) LNCFS II 12,636 12,826 11,928 9,494 LNCFS III (2000)/SCR (2009) 11,907 12,497 11,765 11,253 8,248 . . . NOX Tech LNB (1993) 68.367 Ann+0 Combined Company Allow. Purchases NOx \$ SO2 \$ Cost Comparison of Alternative SO<sub>2</sub> Compliance Plans Other Description: Brown 123 FGD in '09 75,816 (5,763) 5,418 3,515 2,479 4,039 5,445 5,079 5,222 4,578 3,612 2,945 ,603 4,008 2,209 5,051 2,704 3,312 4,296 4,987 5,311 . SO2 In-Serv 2009 2009 2009 2009 1992 2009 SO2 Price Forecast: Base X 1 NOX Price Forecast: Base X 1 Fuel Forecast: Base Load Forecast: Base c 14,800,304 (8,368) SO2 Tech FS HS+Wet FGD FS HS+Wet FGD FS HS+Wet FGD Existing FGD Environmental Controls: SO<sub>2</sub> Allowances Purchased: FS HS+Wet FGD FS HS+Wet FGD FS HS+Wet FGD Ann+Oz Seas NO<sub>x</sub> Allow Purch Production \$ Base Case- BR123 WFGD 2009 All Costs in 2007 PVRR \$ x1000 SO2 Rem % 98% 98% 98% 95% 489 485 480 599 624 649 673 733 733 733 733 733 794 855 916 977 038 660 1160 1221 1282 1282 1343 1404 1404 449 Delta (PVRR \$000) Emission Price (Nominal S/ton emit) NOx | SO2 98% 38% 98% 2366 2369 2372 2274 2250 3098 3092 3092 3086 3149 3177 3250 3282 3281 3281 3123 3123 3123 900 850 645 3018 3066 2,156,711 110% 738,043 15,625,235 NOX Tech Cost (MS) PVRR Total S \$95.00 Cap Cost Sensitivity %: SO<sub>2</sub> Tons Emitted: Annual SO<sub>2</sub> Purchase (as a % of EPA Allocation): 22,339 39,616 53,214 51,526 45,702 40,517 35,900 31,787 28,117 24,839 21,894 19,246 16,868 14,734 12,821 11,108 509,542 9,577 8,210 6,991 5,906 4,806 3,229 595 Ann+Oz Seas NO<sub>x</sub> Tons Emit . . SCR In-Serv Capital S 0 2015 2003 2009 2003 2003 12,011 19,345 18,484 18,155 LNCFS I (1994) LNCFS III (1992) LNCFS II LNCFS III (2000)/SCR (2009) LNB & OFA (1998) LNB & OFA (1999) 19,470 20,898 19,844 17,923 15,184 13,108 253,703 21,041 20,358 19,581 18,301 LNB (1993) Combined Company Allow. Purchases NOX S SO2 S Other Description: Brown 3 FGD in '09 70,053 2,600 2,386 3,209 4,536 4,702 ,538 3,613 3,252 1,996 4,907 4,112 3,878 5,102 4,856 4,855 4,548 3,212 2,674 SO2 In-Serv 2009 SO2 Price Forecast: Base X 1 NOX Price Forecast: Base X 1 2009 1992 2007 Fuel Forecast: Base Load Forecast: Base c .0/ Largest / 62,869 n/a n/a FS HS+Wet FGD Existing FGD FS HS+Wet FGD FS HS+Wet FGD 640,107 FS HS+Wet FGD 14,791,936 <sup>a</sup>roduction \$ SO2 Tech SO<sub>2</sub> Allowances Purchased: 489 485 599 624 624 673 673 7794 7794 855 916 916 917 038 815 01038 1160 1221 1282 1343 1404 1426 1426 Ann+Oz Seas NO<sub>x</sub> Allow Purch: Emission Price (Nominal S/ton emit) NOx | SO2 Case02- BR3 WFGD 2009 S02 Rem % Environmental Controls: 0% 38% 35% 98%8 98% 98% Ghent 3 Ghent 4 Brown 3 Ghent 1 645 3149 3123 3018 Brown 1 Brown 2 Ghent 2 850 2372 2274 2250 3098 3092 3250 3282 2970 3066 906 2366 2369 3086 3122 3177 3281 nut Totals Үеаг

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Update to the 2004 SO<sub>2</sub> Compliance Strategy Confidential Information of Various SO<sub>2</sub> Compliance Plans (Base Capital Costs, Base SO<sub>2</sub> Market Prices) Confidential Information Redacted

(21,188) (20,118) 42,773 51,740 54,875 56,178 (13,459) (7,544) (2,288) 22,108 38,573 45,412 47,769 57,329 58,342 62,428 63,147 (8,181) 2,382 6,532 49,871 53,401 59,231 63,147 63,147 Cumulative Total S Price Curve Multipiters SO<sub>2</sub> NO<sub>X</sub> <u>1.00</u> DIFFERENCE (8,181) (13,007) 4,150 15,576 16,465 2,640 2,357 2,102 1,870 1,661 1,474 1,304 1,151 1,013 3,197 719 1,070 6,660 5,915 5,255 4,670 4,200 889 Total S 1,814,742 71% 745,948 NOX Tech Cost (MS) PVRR Total S \$95 Cap Cost Sensitivity %: 60,445 58,714 52,078 36,225 28,312 21,943 16,803 14,624 12,674 10,930 
 CD
 2007
 LNB & OFA (1998)
 2003

 FCD
 2008
 LNB & OFA (1998)
 2003

 Rest
 2283,138
 S0, Tons Emitted:

 Largest Amnual SO2, Purchase (as a % of EPA Allocation):
 Largest Amnual SO2
 Purchase (as a % of EPA Allocation):
 43,574 40,911 32,044 24,958 19,234 9,372 7,984 6,748 3,806 702 22,477 46,171 5,511 Ann+Oz Seas NO<sub>x</sub> Tons Emit . . SCR In-Serv Capital S 0 2015 2003 2009 <u>NOX Tech</u> LNB (1993) LNCFS I (1994) LNCFS III (1992) LNCFS II LNCFS III (2000)/SCR (2009) 11,907 12,636 12,497 12,826 11,765 11,253 11,928 11,732 9,494 8,248 68.367 Ann+0 Combined Company Allow. Purchases NOx S SO2 S Cost Comparison of Alternative SO<sub>2</sub> Compliance Plans Other Description: Brown 123 FGD in '09 5,418 ,603 4,008 3,515 2,209 2,704 2,479 3,312 4,296 4,039 5,445 4,987 5,311 5,079 5,222 4,578 3,612 2,945 5,051 SO2 In-Serv 2009 2009 2009 2009 1992 SO2 Price Forecast: Base X 1 NOX Price Forecast: Base X 1 Fuel Forecast: Base Load Forecast: Base ¢ SO2 Tech FS HS+Wet FGD FS HS+Wet FGD FS HS+Wet FGD FS HS+Wet FGD Existing FGD Environmental Controls: FS HS+Wet FGD FS HS+Wet FGD SO<sub>2</sub> Allowances Purchased: FS HS+Wet FGD Ann+Oz Seas NO<sub>x</sub> Allow Purch Production \$ Base Case- BR123 WFGD 2009 All Costs in 2007 PVRR \$ x1000 599 624 649 673 733 794 855 855 916 977 1038 1099 1160 1221 1282 1343 1404 1426 1429 **502 Hem %** 98% 98% 489 480 485 Emission Price (Nominal S/ton emit) NOx | SO2 98% 98% 95% 98% 18% 2366 2372 2274 2274 3098 3098 3122 3149 3122 3149 3177 3250 3281 3123 2970 3018 900 850 645 3066 1,875,726 71% 745,352 NOX Tech Cost (MS) PVRR Total \$ S95.00 Cap Cost Sensitivity %: SO<sub>2</sub> Tons Emitted: Annuai SO<sub>2</sub> Purchase (as a % of EPA Allocation): 46,165 21,873 19,159 16,725 14,543 12,590 10,845 4,695 3,899 719 22,477 35,393 60,350 58,736 52,085 40,894 36,193 31,998 28,257 24,895 6,524 45,561 9,287 7,898 Ann+Oz Seas NO, Tons Emil i. SCR In-Serv Capital S 2015 2003 2009 2003 2003 LNB & OFA (1998) LNB & OFA (1999) LNCFS III (1992) LNCFS II LNCFS III (2000)/SCR (2009) 11,889 13,165 13,155 12,636 12,497 12,826 11,765 11,253 11,928 11,732 9,494 8,248 LNCFS I (1994) NOX Tech LNB (1993) Combined Company Allow. Purchases NOX \$ SO2 \$ Other Description: Brown 123 FGD in '10 2,704 2,479 3,312 5,445 4,987 5,222 4,578 1,445 3,515 2,209 4,296 4,039 5,311 5,418 5,079 3,612 2,945 3,682 5,051 SO2 In-Serv 2007 2008 2010 1992 2009 SO2 Price Forecast: Base X 1 NOX Price Forecast: Base X 1 Fuel Forecast: Base Load Forecast: Base FS HS+Wet FGD FS HS+Wet FGD 359.122 Largest / 67,908 c SO2 Tech FS HS+Wet FGD FS HS+Wet FGD FS HS+Wet FGD FS HS+Wet FGD Existing FGD FS HS+Wet FGD Production \$ Case03- BR123 WFGD 2010 SO<sub>2</sub> Allowances Purchased: 1221 1282 1343 1404 1426 1426 Ann+Oz Seas NOs Allow Purch: Emission Price (Nominal S/ton emit) NOx | SO2 502 Rem % Environmental Controls: 98% 98% 95% 98% 98% Ghent 2 Ghent 3 Ghent 4 900 850 645 2366 Brown 2 Brown 3 Ghent 1 3018 2250 3092 3149 3177 3250 3282 3123 2970 3066 2369 2372 2274 3098 3086 3122 3281 ŧ Year

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63,147

15,566,648 63,147

576,240 35,521

114,287 26,302

75,816 485)

1,810

Delta (PVRR \$000)

15,629,795

611,761

140,589

75,331

14,802,114

Totals

14,800,304

Confidential Information of Various SO<sub>2</sub> Compliance Plans (Base Capital Costs, Base SO<sub>2</sub> Market Prices) Confidential Information Redacted

(6,379) (14,912) 42,340 73,316 77,188 83,780 (18,987) (17,653) (12,465) 24,753 47,620 56,303 60,296 64,892 69,194 80,669 87,422 88,104 937 (20,810) (8,434) 8,449 51,904 84,427 88,104 88,104 Cumulative Total S Price Curve Multipliers SO<sub>2</sub> 1.00 NO<sub>x</sub> 1.00 1.00 DIFFERENCE (7,316) (12,608) 2,447 4,031 16,882 17,587 5,280 4,284 4,122 3,873 3,481 3,111 647 (1,822) 3,156 88,104 16,304 4,399 3,993 4,596 4,302 2,995 937 2,741 682 Total S 1,814,742 71% 745,948 NOX Tech Cost (MS) 15,566,648 PVRR Total \$ **S95** Cap Cost Sensitivity %: 
 FED
 2007
 LNB & OFA (1998)
 2003

 EED
 2008
 LNB & OFA (1998)
 2003

 Seet:
 298;138
 SO<sub>2</sub> Tons Emitted:

 Largest Annual SO<sub>2</sub> Purchase (as a % of FPA Allocation):
 Largest Annual SO<sub>2</sub>
 Purchase (as a % of FPA Allocation):
 5,511 3,806 576,240 23,251 43,574 60,445 58,714 52,078 46,171 40,911 36,225 32,044 28,312 24,958 21,943 19,234 16,803 14,624 12,674 10,930 22,477 9,372 7,984 6,748 702 Ann+Oz Seas NO<sub>x</sub> Tons Emit . . SCR In-Serv Capital S 2015 2009 LNCFS III (2000)/SCR (2009) 9,494 8,248 114,287 70,253 LNCFS III (1992) LNCFS II 11,732 NOX Tech LNB (1993) LNCFS I (1994) 11,907 12,636 12,497 12,826 11,765 11,253 11,928 . . . 68.367 Ann+0. Combined Company Allow. Purchases NOx S S02 S Cost Comparison of Alternative SO<sub>2</sub> Compliance Plans Other Description: Brown 123 FGD in '09 75,816 (5,201) 5,418 3,515 2,479 3,312 4,296 4,039 5,445 5,079 5,222 4,578 3,612 2,945 ,603 4,008 2,209 5,051 2,704 4,987 5,311 502 In-Serv 2009 2009 2009 1992 2009 SO2 Price Forecast: Base X 1 NOX Price Forecast: Base X 1 Fuel Forecast: Base Load Forecast: Base 0 <u>\$02 Tech</u> FS HS+Wet FGD FS HS+Wet FGD FS HS+Wet FGD Environmental Controls: Ann+Oz Seas NO<sub>x</sub> Allow Purch: 14,800,304 98% FS HS+Wet FGD 98% FS HS+Wet FGD SO<sub>2</sub> Aliowances Purchased FS HS+Wet FGD Production \$ Existing FGD Base Case- BR123 WFGD 2009 All Costs in 2007 PVRR \$ x1000 489 485 480 599 624 649 673 733 734 794 855 916 916 977 038 099 1160 1221 1282 1343 404 426 449 SO2 Rem % Emission Price (Nominal S/ton emit) NOx | SO2 98% 98% 95% 98% 2369 2372 2274 2250 3098 3092 3092 3122 3122 3177 3250 3282 3281 3123 2970 3018 3066 900 850 645 2366 1,983,704 84% 739,419 15,654,752 NOX Tech Cost (MS) PVRR Total S \$95.00 Cap Cost Sensitivity %: SO, Tons Emitted: 23,414 36,258 45,960 58,810 57,100 50,633 44,876 39,751 35,179 31,099 27,459 24,189 21,249 18,609 16,241 14,119 12,220 10,522 Annual SO<sub>2</sub> Purchase (as a % of EPA Allocation): 9,007 7,657 6,307 4,453 3,697 682 Ann+Oz Seas NO<sub>x</sub> Tons Emit 599,491 SCR In-Serv 0 0 . Capital S 2015 2009 2003 LNCFS III (2000)/SCR (2009) LNB & OFA (1998) LNB & OFA (1999) 14,817 15,744 15,280 14,823 15,060 14,060 13,444 13,835 LNCFS III (1992) LNCFS II 1,779 14,527 15,877 14,097 11,321 9,875 184,540 LNCFS | (1994) NOX Tech LNB (1993) Allow. Purchases NOX S SO2 S Combined Company Other Description: Brown 23 FGD in '10 70,615 2,557 2,329 3,864 3,340 2,771 1,445 3,451 3,218 1,957 4,827 3,158 4,112 5,185 4,624 4,980 5,010 4,679 4,862 4,244 SO2 In-Serv 2010 2010 2007 SO2 Price Forecast: Base X 1 NOX Price Forecast: Base X 1 1992 2009 Fuel Forecast: Base Load Forecast: Base FS HS+Wet FGD FS HS+Wet FGD 467,100 Largest / 63,663 n/a FS HS+Wet FGD FS HS+Wet FGD Existing FGD 14,800,106 FS HS+Wet FGD Production S SO2 Tech SO<sub>2</sub> Allowances Purchased: 1160 1221 1282 1343 1343 1404 1426 Ann+Oz Seas NO<sub>x</sub> Allow Purch: 038 660 Case04- BR23 WFGD 2010 SO2 Rem % Environmental Controls: (Nominal S/ton emit) NOx 1 SO2 0% 98% 98% 988% 38% 98% Emission Price <u>Unlt</u> Brown 1 Brown 2 Brown 3 Ghent 1 Ghent 3 Ghent 4 645 3149 3123 3018 3066 Ghent 2 850 2366 2369 2372 2250 3098 3092 3122 3177 3250 3282 2970 006 2274 3086 3281 2008 2032 Totals 2007 Year

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88,104

(198)

Delta (PVRR \$000)

Compliance Strategy Update to the 2004 SO<sub>2</sub> Compliance Strategy Update to the 2004 SO<sub>2</sub> Compliance Strategy U.S. Appendix 3- Comparison of Various SO<sub>2</sub> Compliance Plans (Base Capital Costs. Base SO<sub>2</sub> Market Prices) **Confidential Information Redacted** 

					Cost	: Compa	Irison of A All Costs	Iternati in 2007	ive SO <sub>2</sub> PVRR \$	Complix X1000	ance Pla	ns				
ase05	- BR3 WFG	D 2010						Base Case	- BR123 W	FGD 2009					Princ Curro	
			Fuel Forecast: E Load Forecast: E	Base Base	Cap Cos	t Sensitivity %:			COS 1	Fuel Forecast: Load Forecast: Price Forecast:	Base Base Asse X 1	Cap Cos	t Sensitivity %:		so <sub>2</sub> NO <sub>X</sub>	00.1
			Price Forecast: I Price Forecast: E ler Description: E	aase X 1 3ase X 1 3rown 3 FGD in '	10				XON	Price Forecast: her Description:	Base X 1 Brown 123 FGD I	60, u				
m)	nvironmental (	Controls:	-	-					Environn	nental Controls:	5					
	Unit Brown 1 Brown 2 Brown 3 Ghent 1	<mark>502 Rem %</mark> 0% 0% 98%	<u>SO2 Tech</u> n/a n/a FS HS+Wet FGD Existing FGD	<mark>SO2 In-Serv</mark> 0 2010 1992	NOX TECH LNB (1993) LNCFS I (1994) LNCFS II (1992) LNCFS II	<u>SCR In-Serv</u> 0 2015 2003	NOX Tech Cost (MS)		<mark>SO2 Rem %</mark> 98% 98% 98% 95%	SO2.Tech FS HS+Wet FGD FS HS+Wet FGD FS HS+Wet FGD FS HS+Wet FGD Existing FGD	<mark>502 In-Serv</mark> 2009 2009 2009 1992	NOX TECH LNB (1993) LNCFS II (1994) LNCFS III (1992) LNCFS II	<u>SCR In-Serv</u> 0 2015 2003	NOX Tech Cost (MS)		ann an
	Ghent 2	98 <i>%</i>	FS HS+Wet FGD	2009	LNCFS III (2000)/SCR (2009)	2009	\$95.00		988%	FS HS+Wet FGD	2009	LNCFS III (2000)/SCR (2009)	2009	\$95		
	Ghent 3 Ghent 4 SO Atlowance	98% 98% e Durchsed	FS HS+Wet FGD FS HS+Wet FGD 678 411	2007 2008	LNB & OFA (1998) LNB & OFA (1999) Sr	2003 2003 0. Tons Emitted:	2.195.015		98% 98% SO, Allows	FS HS+Wet FGD FS HS+Wet FGD ances Purchased:	2007 2008 298.138	LNB & OFA (1998) LNB & OFA (1999) SC	2003 2003 D. Tons Emitted:	1.814.742		
An	01+Oz Seas NO.	Allow Purch:	Larges 62,607	tt Annual SO <sub>2</sub> Pu	rchase (as a % of Ann+Oz Seas	EPA Allocation): NO, Tons Emit:	737,706		Ann+Oz Seas	Larg	est Annual SO <sub>2</sub> Pu 68,367	irchase (as a % of Ann+Oz Seas	EPA Allocation): NO, Tons Emit:	745,948	DIFFERE CALCULA	NCE
Year	Emission (Nominal S/I NOx	t Price ton emit) S02	Production S	Combined Allow. Pt NOX S	l Company urchases SO2 S	Capital \$	PVRR Total S	Emissio (Nominal 3 NOx	on Price S/ton emit) SO2	Production S	Combined Allow. Pu NOX S	Company rchases SO2 S	Capital S	PVRR Total S	Total \$	tumulative Total S
2007	006	489		1		22,339		006	489		,	   ,	22,477		(138)	(138)
2008	850	485			•	34,899		850	485			,	43,574 E0 44E		(8,675)	(8,813)
20102	2366	460 599		3.437		53.436		2366	299		4,008		58,714		(8008)	(32,892)
2011	2369	624		3,252	•	51,862		2369	624		3,515		52,078		(3,252)	(36,144)
2012	2372	649		1,996		45,987		2372	649		2,209	•	46,171		(3,309)	(39,453)
2013	2274	673		4,907	15,374	40,757		2274	673		5,051	•	40,911		12,377	(27,076)
2014	2250	733		2,600	13,028	36,101 31 948		3098	794		2,/04		622,08 440,98		10,000	(15,410)
2016	3092	855		3,209	19,470	28,242		3092	855		3,312	•	28,312		17,660	18,620
2017	3086	916		4,112	21,041	24,936		3086	916		4,296	1	24,958		19,477	38,097
2018	3122	226		3,878	20,898	21,965		3122	226		4,039	11,907	21,943		7,691	45,787
2019	3149	1038		5,102	20,358	19,295		3149	1038		5,445	12,636	19,234 16 803		7,382	53,169 60 748
2021	3250	1160		4,856	19,844	14,746		3250	1160		5,311	12,826	14,624		7,534	68,282
2022	3282	1221		4,855	18,301	12,819		3282	1221		5,418	11,765	12,674		8,063	76,345
2023	3281	1282		4,548	17,923	11,094		3281	1282		5,079	11,253	10,930		8,132	84,477
2024	3123	1343		4,702	18,484	9,552		3123	1343		5,222	11,928	9,372		8,225	92,702
2025	2970	1404		4,077	18,155	8,176		2970	1404		4,578	11,732	7,984		8,142	100,845
2026	3018	1426		3,212	15,184	6,949		3018	1426		3,612	9,494	6,748		7,252	108,096
2027	3066	1449		2,674	13,108	5,722		3066	1449		2,945	8,248	5,511		6,199	114,295
2028					t	4,030					1	1	3,806		224	114,519
2029					•	3,346							102		Z,D44	11/,103
2030						19						1 1			- 10	117.780
2032					,							•	r		1	117,780
Totals			14.796.247	69.784	270.095	548.302	15,684,428			14,800,304	75,816	114,287	576,240	15,566,648	117,780	
	~							Delt	a (PVRR \$000)	(4,058)	(6,032)	155,808	(27,938)	117,780		

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**Confluence** *Compliance Strategy* **Update to the 2004 SO<sub>2</sub> Compliance Strategy U.S.** *Appendix 3- Comparison of Various SO<sub>2</sub> Compliance Plans (Base Capital Costs, Base SO<sub>2</sub> Market Prices)* 

**Confidential Information Redacted** 

Cost Comparison of Alternative SO <sub>2</sub> Compliance Plans           All costs in 2007 PVRB \$ x1000           All costs in 2007 PVRB \$ x1000           All costs in 2007 PVRB \$ x1000           Cost Comparison of Alternative SO <sub>2</sub> Compliance Plans           All costs in 2007 PVRB \$ x1000           Cost Comparison of Alternation of Al		Price Curve Multipliers SO <sub>2</sub> NO <sub>X</sub> 1.00	SCR In-Serv 0         NOX Tech Cast (MS)           201         0           2013         2013           2029         355           2020         355           2021         1314,742           2023         2023           2033         555           2033         555           2033         555           2033         555           2033         555           2033         555           2033         555           2033         555           2033         555           2033         555           2033         595           2033         595           2033         595           2033         595           2033         595           2033         595           2033         595           2033         595           2033         595           2035         595           2035         595           2035         595           2035         595           2035         595           2035         595           505	PVRR Capital S Total S Total S Total S	22,477 1,669 1,669	43,574 (16,004) (14,335) 60.445 (23.47) (37.747)	58,714 (13,471) (51,218)	52,078 (39,406)	46,171 (21,627) (21,627)	36,225 17,591 16,960	32,044 23,526 40,486	28,312 62,519	24,958 24,625 93,850 21,943 92,225 93,850	19,234	16,803 6,334 107,297	14,624 5,629 112,926 12,674 4 993 117,919	10,930 4,420 122,340	9,372 3,905 126,244	7,984 3,439 129,684	6,748 3,022 132,706	5,511 2,629 135,335	3,806 2,186 137,521 702 4,328 141,849	- 4,177 146,026	- 770 146.796 - 146.796	
Cost Comparison of Alternative SO <sub>2</sub> Complia           All Costs in 2007 PVRR \$ x1000           Cost Comparison of All Costs in 2007 PVRR \$ x1000           Cost Control in 2017 Contro in 2017 Control in 2017 Contro in 2017 Control in 2017 Control in 2017 Control in 2017	nce Plans	ase Cap C ase Cap C ase X 1 ase X 1 com 123 FGD in '09	22 In-Serv         NOX Tech           2009         LVCF51 (1934)           2009         LVDF51 (1934)           2009         LVD145 (1934)           2009         LVD145 (1934)           2001         LVD145 (1934)           2003         LVD145 (1934)           2004         LVD145 (1934)           2005         LVD145 (1934)           2007         LVD145 (1934)           2008         LVD145 (1934)           2009         LVD145 (1934)	Combined Company Allow. Purchases NOx S SO2 S	•		4,008	3,515 -	2,209	2.704	2,479	3,312	4.296 4.039 11.907	5,445 12,636	4,987 12,497	5,311 12,826 5,418 11 765	5,079 11,253	5,222 11,928	4,578 11,732	3,612 9,494	2,945 8,248		,	• •	
Cost Comparison of Alte All Costs in 3 all Costs in 3 all costs in 4 all cos	rnative SO <sub>2</sub> Complia :007 PVRR \$ x1000	<ul> <li>Case- BR123 WFGD 2009</li> <li>Fuel Forecast: BL Load Porecast: BL SO2 Price Forecast: BL NOX Price Forecast: BL Other Description: BL</li> </ul>	Amilian         Southernal Controls: Environmental Controls: Southern Stations Food Brass Fistavins Food Brass Fistavins Food Brass Fistavins Food Brass Fistavins Food Brass Fistavins Food Brass No, Allowances Purchased: Large Amn+Oz Seas No, Allow Purch:         O	Emission Price ominal \$/ton emit) Ox SO2 Production \$	900 489	850 485 645 480	2366 599	2369 624	2372 649 2071	2250 733	3098 794	3092 855	3086 916 3122 977	3149 1038	3177 1099	3250 1160 3282 1221	3281 1282	3123 1343	2970 1404	3018 1426	3066 1449				
BOL- BR123 WFGD 2011         Cost Compare           Pol- BR123 WFGD 2011         Lual Forecast: Base Load Forecast: Base Source Forecast: Source Forecast: Base Source Forecast: Source Forecast: Base Source Forecast Source Forecast: Base Source Forecast Source For	rison of Alter All Costs in 2	Base	NOA Tech Cost (MS) 595.00 1.934.563 744.733	PVRR (N Total S N																					
Bobe- BR123 WFGD 2011         South Fuel Forecast: Base Load Forecast: Base Load Forecast: Base Soc Price Forecast: Base Load Forecast: Base Soc Price Forecast: Base Norm 1 25%         South Fuel Forecast: Base Cap Cos Soc Price Forecast: Base Cap Cos Soc Price Forecast: Base Cap Cos Soc Allow mores Porent 3 95%         South Fuel Forecast: Base Cap Cos Soc Price Forecast: Base Cap Cos Soc Allow mores Cap Cos Soc Allow mores Cap Cos Soc Allow mores Cap Cos Soc Allow mores Cap Cos Cap Cos	t Compa	t Sensitivity %:	SCR In-Serv 0 2015 2003 2003 2003 2003 2003 2003 2003 200	Capital S	24,146	27,570 35.156	45,947	63,962	62,302	48.951	43,346	38,346	33,887 29.910	26,337	23,127	20,244	15.342	13,269	11,416	9,763	8,134	5,992 5,030	4,177	770	
Bit Process:         Base Soc Frice Forecast:         Base Soc Frice Fore	Cost	Cap Cos	NOXTECT INB (1992) INCF5 II (1994) INCF5 II (1994) INCF5 II (1992) INCF5 II (1992) INCF5 II (1992) UNB 4 OF4 (1999) INB 4 OF4 (1999) INB 4 OF4 (1999) INB 4 OF4 (1999) INB 4 OF4 (1999)	Company Jrchases SO2 \$	3		,	•	1,631	6,654 4,851	12,211	11,987	13,165	12,636	12,497	12,826	11.253	11,928	11,732	9,494	8,248		I	• •	
Britishing         Solution         Solution           Environmental Controls:         Load Forecast: Load Forecast: NOX Price For		Base Base Base X 1 Base X 1 Brown 123 FGD	0 S021h:Serv 2011 2011 1992 2009 2009 2009 2005 2008 34 Annual SO <sub>2</sub> Pu	Combined Allow. Pi NOX \$	•		2,993	3,289	2,209	2.704	2,479	3,312	4,296	5,445	4,987	5,311	5.079	5,222	4,578	3,612	2,945		,		-
Bill Solution         Solution           Environmental controls:         NOXI           Environmental controls:         NOXI           Milit         Solution           Environmental controls:         Solution           Movinial solution         Solution           Environmental controls:         Solution           Militial solution         Solution           Environmental controls:         Solution           Environmental controls:         Solution           Environmental solution         Solution           Environmental solutio		Fuel Forecast: Load Forecast: Price Forecast: Price Forecast: er Description: fer	SQ2Tech SQ2Tech FS HS-Wet FGD FS HS-WET FS HS-WE	Production S																					
e06- BR123 Environment Valit Fraining Brown 3 Greent 3 Greent 4 Greent 4 Green		WFGD 2011	I Controls:           502 Rem %           99%           90%           90%           90%           90%	ion Price \$/ton emit) SO2	489	485	599	624	649	673 733	794	855	916 977	1038	1099	1160	1282	1343	1404	1426	1449				
		e06- BR123 1	Environment Unit Brown 1 Brown 2 Brown 2 Brown 2 Brown 2 Grent 3 Grent 2 Grent 4 SO <sub>2</sub> Allowen	r (Nominal Nox 1	006 200	08 850 00 645	10 2366	11 2369	12 2372	14 2250	15 3098	16 3092	117 3086 18 3122	3149	3177	21 3250	23 3281	3123	25 2970	126 3018	3066	29	130	31	1 201

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Confidential Information of Various SO<sub>2</sub> Compliance Plans (Base Capital Costs, Base SO<sub>2</sub> Market Prices) Confidential Information Redacted

(15,255) (39,436) (55,680) (30,558) (10,905) 28,369 81,620 89,618 104,265 111,476 118,095 129,949 5,573 72,177 97,328 139,525 1,263 (48.699) 49,926 124,268 135,021 141,370 145,411 Cumulative Total S Price Curve Multipilers SO<sub>2</sub> NO<sub>X</sub> 1.00 DIFFERENCE (16,518) 6,981 18,141 19,653 16,478 22,796 21,557 22,251 7,709 6,937 5,073 (16,244) 6,619 6,173 5,681 1,263 (24,181) 9,442 7,999 7,211 4,504 1,845 4,041 3,938 Total S 1,814,742 71% 745,948 NOX Tech Cost (MS) PVRR Total S \$95 Cap Cost Sensitivity %: SO<sub>2</sub> Tons Emitted: 6,748 Largest Annual SO, Purchase (as a % of EPA Allocation): 88.367 Ann+O2 Seas NO, Tons Emit: Combined Company Allow. Purchases NOX \$ SO2 \$ Capital \$ 60,445 58,714 52,078 36,225 32,044 28,312 24,958 21,943 19,234 16,803 14,624 12,674 10,930 7,984 5,511 3,806 702 22,477 43,574 46,171 40,911 9,372 SCR In-Serv 0 2015 2003 2009 2003 2003 LNCFS I (1994) LNCFS III (1992) LNCFS II 11,928 11,732 12,636 12,826 11,765 11,253 LNCFS III (2000)/SCR (2009) LNB & OFA (1998) LNB & OFA (1999) 11,907 12,497 9,494 8,248 NOX Tech LNB (1993) . . . . Cost Comparison of Alternative SO<sub>2</sub> Compliance Plans Other Description: Brown 123 FGD in '09 2007 2008 298,138 5,418 4,578 3,515 2,479 3,312 5,445 5,311 5,079 5,222 3,612 2,945 1,603 4,008 2,209 2,704 4,296 4,039 4,987 5,051 . . . . SO2 In-Serv 2009 2009 2009 7992 2009 SO2 Price Forecast: Base X 1 NOX Price Forecast: Base X 1 Fuel Forecast: Base Load Forecast: Base 0 SO2 Tech FS HS+Wet FGD FS HS+Wet FGD FS HS+Wet FGD Existing FGD Environmental Controls: 98% FS HS+Wet FGD 98% FS HS+Wet FGD SO<sub>2</sub> Allowances Purchased: Ann+Oz Seas NO<sub>x</sub> Allow Purch FS HS+Wet FGD Production S Base Case- BR123 WFGD 2009 All Costs in 2007 PVRR \$ x1000 <mark>SO2 Rem %</mark> 98% 98% 95% 489 485 599 624 673 673 7734 673 794 855 916 916 977 916 0038 8252 1160 0038 8152 1160 1038 8153 3333 3333 1426 1449 Emission Price (Nominal S/ton emit) NOx | SO2 388% 2369 2372 2274 2250 3098 3092 3086 3122 3149 3177 3250 3123 900 850 645 2366 3282 3018 3066 3281 2,035,484 84% 739,046 NOx Tech Cost (MS) PVRR Total \$ \$95.00 Cap Cost Sensitivity %: SO<sub>2</sub> Tons Emitted: 23,740 27,056 34,387 43,889 60,674 59,066 52,368 46,407 41,092 36,351 32,122 28,351 24,963 21,919 19,185 16,734 14,537 12,572 10,815 Annual SO<sub>2</sub> Purchase (as a % of EPA Allocation): 9,248 7,700 5,651 4,743 3,938 Ann+Oz Seas NO, Tons Emit SCR In-Serv Capital S 2015 2009 2003 2003 LNB & OFA (1998) LNB & OFA (1999) LNCFS I (1994) LNCFS III (1992) LNCFS II LNCFS III (2000)/SCR (2009) 14,817 14,527 13,444 14,097 13,835 15,877 15,744 15,280 14,823 15,060 14,060 11,321 6,966 9,712 7,570 9,875 NOX Tech LNB (1993) Combined Company Allow. Purchases NOx \$ SO2 \$ Other Description: Brown 23 FGD in '11 3,115 4,827 2,557 2,329 3,158 4,112 4,624 5,010 t,679 4,244 3,340 1,445 2,993 ,957 3,864 5,185 4,862 2,771 SO2 In-Serv 1992 2009 2007 SO2 Price Forecast: Base X 1 NOX Price Forecast: Base X 1 2011 Fuel Forecast: Base Load Forecast: Base c Largest 63,361 FS HS+Wet FGD FS HS+Wet FGD 518,880 FS HS+Wet FGD FS HS+Wet FGD Existing FGD FS HS+Wet FGD Production \$ <u>SO2 Tech</u> r/0 Ann+Oz Seas NO, Allow Purch: Emission Price (Nominal S/ton emit) NOX | SO2 489 485 480 5399 624 649 649 649 673 7794 855 916 916 916 916 SO<sub>2</sub> Allowances Purchased: 1160 1221 1282 1282 1343 1404 1426 Case07- BR23 WFGD 2011 SO2 Rem % Environmental Controls: %98 38% 35% 98% 98% Ghent 3 Ghent 4 Brown 1 Brown 2 Brown 3 Ghent 1 Ghent 2 645 3149 3250 3282 3123 2970 3018 850 2366 2369 2372 2274 2250 3098 3092 3086 3122 3177 3281 3066 906 1 liii 2008 2007 Year

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150,075

726

.

149,349

50,075

150,075

15,566,648

576,240 61,994

114,287 92,722

75,816 (5,763)

1,123

Delta (PVRR \$000)

15,716,723

638,234

207,009

70,053

14,801,427

2031 2032 Totals

726

14,800,304

Confidential Information of Various SO<sub>2</sub> Compliance Plans (Base Capital Costs, Base SO<sub>2</sub> Market Prices) Confidential Information Redacted

(43,177) (61,253) (22,500) (5, 940)62,583 73,960 84,633 95,145 145,648 154,312 161,748 16,666 38,977 125,857 135,901 163,036 170,813 157 (17,757) (63,222) (41,680) 105,289 115,670 166,610 170,159 70,813 Cumulative Total S 1.00 Price Curve Muttipiters SO<sub>2</sub> NO<sub>X</sub> <u>1.00</u> DIFFERENCE (17,914) (25,420) (20,045) 19,574 22,607 22,311 23,606 11,378 10,673 10,512 10,144 10,381 10,043 9,747 8,665 3,574 3,549 654 170,813 19,180 16,560 10,187 1,968 7,436 1,288 157 Total S 1,814,742 71% 745,948 15,566,648 170,813 NOX Tech Cost (MS) PVRR Total S \$95 Cap Cost Sensitivity %: SO<sub>2</sub> Tons Emitted: 7,984 6,748 576,240 5,964 sed: 298,138 SO<sub>2</sub> Tons Emitted: Largest Annual SO<sub>2</sub> Purchase (as a % of EPA Allocation): 68.367 Ann+O2 Seas NO<sub>4</sub> Tons Emit: Combined Company Allow. Purchases NOX \$ SO2 \$ Capital \$ 60,445 58,714 52,078 36,225 32,044 28,312 24,958 21,943 19,234 16,803 14,624 12,674 10,930 3,806 22,477 43,574 46,171 40,911 9,372 5,511 702 . . SCR In-Serv 0 0 2015 2003 2009 2003 2003 NOX TECH LNB (1993) LNCFS I (1994) LNCFS III (1992) LNCFS II 9,494 114,287 LNCFS III (2000)/SCR (2009) 12,636 12,826 11,253 11,928 11,732 LNB & OFA (1998) LNB & OFA (1999) 11,907 12,497 11,765 8,248 . . . Cost Comparison of Alternative SO<sub>2</sub> Compliance Plans Other Description: Brown 123 FGD in '09 75,816 (6,619) 3,515 2,479 3,312 5,445 5,418 5,079 1,603 4,008 2,209 4,296 4,039 5,311 5,222 4,578 3,612 2,945 5,051 2,704 4,987 2009 2007 2008 2009 1992 SO2 In-Serv SO2 Price Forecast: Base X 1 NOX Price Forecast: Base X 1 Fuel Forecast: Base Load Forecast: Base 0 SO2 Tech FS HS+Wet FGD FS HS+Wet FGD FS HS+Wet FGD Environmental Controls: FS HS+Wet FGD FS HS+Wet FGD SO<sub>2</sub> Allowances Purchased: Ann+Oz Seas NO, Allow Purch: FS HS+Wet FGD 14,800,304 Production S Existing FGD Base Case- BR123 WFGD 2009 All Costs in 2007 PVRR \$ x1000 SO2 Rem % 98% 98% 98% 489 485 480 599 624 649 673 7733 7794 855 916 977 1038 1099 160 1221 1282 1343 1404 1426 1426 (Nominal S/ton emit) NOx | SO2 98% %86 98% Emission Price 2372 2274 2250 3098 3092 3086 3122 3129 3177 3282 3123 2970 3018 3066 900 850 645 2366 2369 3250 3281 2.233,120 110% 737,319 NOx Tech Cost (MS) 15,737,461 PVRR Total \$ \$95.00 Cap Cost Sensitivity %: SO<sub>2</sub> Tons Emitted: 25,660 33,148 40,088 54,935 53,455 47,392 41,995 37,184 32,893 29,065 25,652 22,586 19,830 17,356 15,137 13,149 11,370 582,204 Annual SO<sub>2</sub> Purchase (as a % of EPA Allocation): 22,634 9,781 8,362 6,959 5,094 4,276 3,549 654 Ann+Oz Seas NO<sub>x</sub> Tons Emit SCR In-Serv Canital S 2015 2003 2009 2003 2003 NOX Tech LNB (1993) LNCFS II (1994) LNCFS III (1992) LNCFS II LNCFS II (2000)/SCR (2009) 19,470 21,041 20,898 18,155 15,184 13,108 LNB & OFA (1998) LNB & OFA (1999) 15,414 15,542 13,028 19,345 20,358 19,844 17,923 18,484 287,087 1,410 19,581 18,301 Allow. Purchases NOX \$ \$02 \$ Combined Company Other Description: Brown 3 FGD in '11 69,197 3,110 4,907 2,600 2,386 3,209 3,878 1,445 2,993 966,1 4,112 5,102 4,536 4,856 4,855 4,548 4,702 4,077 3,212 2,674 <mark>502 In-Serv</mark> 0 0 1992 2009 2007 SO2 Price Forecast: Base X 1 NOX Price Forecast: Base X 1 Fuel Forecast: Base Load Forecast: Base Largest 62,290 FS HS+Wet FGD FS HS+Wet FGD FS HS+Wet FGD Existing FGD 716,517 FS HS+Wet FGD Production \$ 14,798,973 SO2 Tech n/a SO<sub>2</sub> Allowances Purchased: Ann+Oz Seas NO<sub>x</sub> Allow Purch: 160 221 282 1343 1404 1426 1426 1038 660 **SO2 Rem %** 0% 98% 95% Case08- BR3 WFGD 2011 (Nominal S/ton emit) NOX 1 SO2 Environmental Controls: 98% 98% 98% Emission Price Unit Brown 1 Brown 2 Brown 3 Ghent 1 Ghent 3 Ghent 4 Ghent 2 850 645 3122 3149 3282 3123 2970 3018 2366 2369 2372 2274 2250 3098 3092 3086 3177 3250 3066 80 3281 2008 2009 2010 2032 Totals 2007 Year

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(1,331)

Delta (PVRR \$000)

**Confidential Contractions Solution of Various SO2 Compliance Plans (Base Capital Costs, Base SO2 Market Prices) Confidential Information Redacted** 

					Cost	Compe	irison of A	Iternati	ve SO <sub>2</sub>	Complis	ance Pla	su				
							All Costs	in 2007 F	VRR \$ >	(1000						
ase06	3- Walk A	\way (with E	nv Dispatch)					Base Case-	BR123 W	FGD 2009					Price Curve M	ultipliers
			Fuel Forecast:	Base	Cap Cos	t Sensitivity %:		:		Fuel Forecast: [	Jase	Cap Cos	st Sensitivity %:		so,	1.00
		SO2 NOX	Load Forecast: Price Forecast: (Price Forecast:	Base Base X 1 Base X 1	ł				S02 NOX	Load Forecast:   Price Forecast:   Price Forecast:	Base X 1 Base X 1 Base X 1	ç			NOX	1.00
	Environmer	Ur <u>ttal Controls:</u>	mer vescapuon:	No Brown 123 F	en				Environm	ental Controls:		80 E				
	Unit Brown 1 Brown 2 Brown 3 Ghent 1	<u>SO2 Rem %</u> 0% 0% 95%	<u>SO2 Tech</u> n/a n/a Existing FGD	SO2 In-Serv 0 1 1992	NOX Tech LNB (1993) LNCFS I (1994) LNCFS II (1992) LNCFS II	SCR In-Serv 0 2015 2003	NOX Tech Cost (MS)		SO2 Rem % 98% 98% 98% 95%	SO2 Tech FS HS+Wet FGD FS HS+Wet FGD FS HS+Wet FGD Existing FGD	502 In-Serv 2009 2009 2009 1992	NOX TECH LNB (1993) LNCFS I (1994) LNCFS II (1992) LNCFS I	SCH In-Serv 0 2015 2003	NOX Tech Cost (MS)		
	Ghent 2	98%	FS HS+Wet FGD	2009	LNCFS III (2000)/SCR (2009)	2009	\$95.00		98°,	FS HS+Wet FGD	2009	LNCFS III (2000)/SCR (2009)	2009	\$95		
	Ghent 3 Ghent 4	9686 9686	FS HS+Wet FGD FS HS+Wet FGD	2007 2008	LNB & OFA (1998) LNB & OFA (1999)	2003 2003			98% 98%	FS HS+Wet FGD FS HS+Wet FGD	2007 2008	LNB & OFA (1998) LNB & OFA (1999)	2003 2003			
Ā	SO <sub>2</sub> Allow:	ances Purchased: NO.: Allow Purch:	: 1,299,119 Large: 65.860	st Annual SO <sub>2</sub> Pu	S( irchase (as a % of Ann+Oz Seas	O <sub>2</sub> Tons Emitted. EPA Allocation: \$ NO. Tons Emit:	2,815,723 189% 742,158		SO <sub>2</sub> Allowal Ann+Oz Seas M	nces Purchased: Large 40, Allow Purch:	298,138 est Annual SO <sub>2</sub> Pt 68,367	S urchase (as a % of Ann+Oz Sea:	102 Tons Emitted: EPA Allocation): s NO, Tons Emit:	745,948	DIFFERE CALCULA	NCE
·	Emis (Nomine	sion Price al S/ton emit)		Combinec Allow. P	d Company urchases		PVRR	Emissio (Nominal Si NOV	n Price (ton emit) SO2	Production c	Combined Allow. Pu NOY S	Company Irchases	Canital C	PVRR Total S	Total s	tumulative Total S
Year 2007	006 006	502 489	Production \$	- NUX 3		Capital \$	¢ 10101	006	489	Production 5			22,477	10141 \$	639 639	639
2008	850	485		•	•	25,201		850	485		1	•	43,574		(18,373)	(17,734)
2009	645	480		1,445	ı	22,364		645	480		1,603	ı	60,445		(36,204)	(53,938)
2010	2366	599		2,993	12.953	19,838		2369	599 624		3.515		58,714 52.078		(22.580)	(94,233) (116,813)
2012	2372	649		1,614	29,862	15,583		2372	649		2,209		46,171		(2,365)	(119,178)
2013	2274	673		4,501	31,334	13,797		2274	673		5,051		40,911		3,442	(115,736)
2015	2250	733		3,293	27,612 35.003	12,205		2250 3098	733 794		2,704		36,225 32,044		3,213 13,432	(112,523) (99,091)
2016	3092	855		3,967	35,067	9,488		3092	855		3,312	ı	28,312		16,211	(82,880)
2017	3086	916		4,812	37,169	8,331		3086	916		4,296	•	24,958		21,468	(61,412)
2018	3122	226		4,479	36,670	7,292		3122	977		4,039	11,907	21,943		11,863	(49,549)
2019	3149	1038	2	5,507	33,958	5,526		3177	1039		c94,c	12,497	19,234		14,282	(38,377) (24,096)
2021	3250	1160		5,210	34,530	4,779		3250	1160		5,311	12,826	14,624		16,249	(7,846)
2022	3282	1221		5,133	32,312	4,112		3282	1221		5,418	11,765	12,674		18,154	10,308
2023	3281	1282		4,814	31,326	3,517		3281	1282		5,079	11,253	10,930		18,420	28,728
2024	3123	1343	3	4,906	31,612	2,986		3123	1343		5,222	11,928	9,372		19,156	47,884
2025	2970	1404	1	4,227	30,851	2,514		2970	1404		4,578	11,732	7,984		19,816	62,699
2026	3018	1426		3,381	25,307	2,048		3018	1426		3,612	9,494	6,748		15,552	83,252
1202	3066	1445		2,850	23,405	005		Danc	n++-		רי היים עיימי	0,240	3,806		(3 806)	30,002
2029												,	702		(702)	93,574
2030						•					,	,			'	93,574
2031				,	'						•	•			,	93,574
2032						, 010				¥00 000 ¥ ¥				15 555 640	03 674	1,0,02
Totals			14,845,387	13,303	001,626	218,370	10,000,222	Delta	(PVRR \$000)	45,083	(2,513)	408,868	(357,864)	93.574	L Infon	

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Appendix 4



# Base Case- BR123 WFGD 2009

0         0	FUEL S02 Content (#/MBTU)	wner 2006	2007	2008	2009	2010	2011 6.4	2012 5.4	SUMMAR'	Y BY YEAI 2014 5.4	ح 2015 6.4	2016 6.4	017 20 6.4 (	18 2019 5.4 6.4	2020 6.4	2021 6.4	2022 6.4	2023 6.4	<u></u>	2024 2 6.4
1         1	trown 1 K		255	25 25 26	35.3 39.0	ម ម ម ម ម ម	4 4 4	4 9 9 4 4 4 4	9 9 9 4 4 4	6.4 6.4 4	4 4 4 4 7	4 4 9 7 4 9	4 4 9	5.4 5.4 5.4 5.4 5.4 5.4	6.6 4.4	1 4 4 1 4 4		9 9 9 4 4 4	0.4 6.4 6.4 6.4	6,4 6,4 0,4 6,4 6,4 0,4
0         0	rown 3 Kurren 1 Kur		5 B S	5.9	5.8	‡ 0, 0 10	+ 6 5	4:B	ដ មេ ភ	615	6.5	6.5	t eq 5 un	55	5.9	6.9		5.9	5.9	200
0.1         0.1 <td>hent 2 K</td> <td>52</td> <td>1.1 16 R</td> <td>1.1</td> <td>16.7 5.9</td> <td>8 6 9 6</td> <td>8.2</td> <td>5.8 8.8</td> <td>5 5 5 6 5 7</td> <td>6 6 6 6 6 6</td> <td>6, 6, 5 6, 5</td> <td>6 6 6</td> <td>8 6 5</td> <td>8.6 8.6 8.6</td> <td>9.9 8.8</td> <td>5.8 2.8</td> <td></td> <td>5.8 5.8</td> <td>5.8 5.9 5.9</td> <td>5.8 5.9 5.8 5.8 5.9 5.8</td>	hent 2 K	52	1.1 16 R	1.1	16.7 5.9	8 6 9 6	8.2	5.8 8.8	5 5 5 6 5 7	6 6 6 6 6 6	6, 6, 5 6, 5	6 6 6	8 6 5	8.6 8.6 8.6	9.9 8.8	5.8 2.8		5.8 5.8	5.8 5.9 5.9	5.8 5.9 5.8 5.8 5.9 5.8
Mexima         O         C <td>hent 4</td> <td></td> <td>12</td> <td>14.8</td> <td>6.5</td> <td>5.8</td> <td>65</td> <td>5.9</td> <td>5.8</td> <td>5.8</td> <td>5.9</td> <td>5.8</td> <td>5.8</td> <td>5.9 5.9 5.1 5.9</td> <td>5.8</td> <td>5.9 4 1</td> <td></td> <td>5.9</td> <td>5.9 5.9 41 41</td> <td>5.9 5.9 5.9 41 41 41</td>	hent 4		12	14.8	6.5	5.8	65	5.9	5.8	5.8	5.9	5.8	5.8	5.9 5.9 5.1 5.9	5.8	5.9 4 1		5.9	5.9 5.9 41 41	5.9 5.9 5.9 41 41 41
01         01<	een Hiver 3 K.		4 <del>4</del>	4.1	4.1	14	14	4.4	1.4	1.4	4.1	4.1	4,1	4.1 4.1	4.1	4,1		4,1	4.1 4.1	4,1 4,1 4,1
0         0	rone 3 K	ر د	2.5	4,1 4 a	1.4	4, 1 4, a	4.1	2.1 8.2	5.9 5.9	1.5 8.5	4.1 8.5	5.9	5.B	1.4 5.8 5.9	5 5	5.8		5.9	1.5 1.5 5.9 5.8	1.5 1.5 1.5 5.9 5.8 5.9
0         0	100 HUN 5 EV	96	5 6	9.2	6'5	83	ព្	5.8	5.8	5.9	6.5	5.8	5.8	5.8	6.5	6'S		5.8	5.8 5.8	5.8 5.8 5.8
(50)         (60)         (61) <th< td=""><td>In the second second</td><td>99 H</td><td>80 K 19 19 19 19 19 19 19 19 19 19 19 19 19</td><td>89 G 19 G</td><td>89 G 70 G 70 G</td><td>e) e e</td><td>9 5 5</td><td>n o n u</td><td>9'G 6'S</td><td>טיט זיסי</td><td>ກຸຍວຸ ກໍາກັ</td><td>2 8 8</td><td>0 0 0 0</td><td>5.9</td><td>0 40</td><td>a 6's</td><td></td><td>n 10</td><td>5.8</td><td>5.8 5.8 5.8 5.8</td></th<>	In the second	99 H	80 K 19 19 19 19 19 19 19 19 19 19 19 19 19	89 G 19 G	89 G 70 G 70 G	e) e e	9 5 5	n o n u	9'G 6'S	טיט זיסי	ກຸຍວຸ ກໍາກັ	2 8 8	0 0 0 0	5.9	0 40	a 6's		n 10	5.8	5.8 5.8 5.8 5.8
Control         Control <t< td=""><td>in Creek 2</td><td>CE I</td><td>5</td><td>5.8</td><td>5.8</td><td>5.8</td><td>85</td><td>5.9</td><td>5.8 8.2</td><td>8.0 0</td><td>οη Vi v</td><td>5.9</td><td>5.8</td><td>5.8 5.9</td><td>0.2</td><td>8.0</td><td></td><td>80 8 80 8</td><td>5,8 5,8 8,5 8,5 8,5 8,5 8,5 8,5 8,5 8,5</td><td>5,8 5,9 5,9 2,8 5,9 2,8 5,9</td></t<>	in Creek 2	CE I	5	5.8	5.8	5.8	85	5.9	5.8 8.2	8.0 0	οη Vi v	5.9	5.8	5.8 5.9	0.2	8.0		80 8 80 8	5,8 5,8 8,5 8,5 8,5 8,5 8,5 8,5 8,5 8,5	5,8 5,9 5,9 2,8 5,9 2,8 5,9
Control         Cit	# Creek 3 L	GE	0,8 5,5 1,5 1,5 1,5 1,5 1,5 1,5 1,5 1,5 1,5	5.8	5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	ត្ត ភូទ័ទ	դ Ծլ Ռ տ	5.8	0 0 0	505	0 80 0 10	9 9	a 67	5.8	6 G	56	ວ່າທີ	<b>.</b>	8 5.8	8 5.8 5.9
0         0	timble County 1	GE	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	0.0	6.0	6.0	5.0 6.0	6.0	6.0	φu	0,0	.0 6.0	.0 6.0 6.0
Matrix for the first of the first	mble County 2 K		0.0	0.0	0.0	9.0 2	0, 0 0	0.0	0.6	0.05	0.5	0.5	5.0	5.0 5.0	20.0	2.0	i ui	, q	50	5.0 5.0
1         1	INDEER REMOVAL EFF.			2										ALL CONTRACTOR OF CONTRACTOR O	Contraction of the second s	DOV	G	28.122.00 •	. Cost	1. COSt COSt Cost Cost Cost Cost Cost Cost Cost Cos
1         1	own 1		30 20	360 360	98%	98% 98%	1,80	2007 2007	38%	38%	196	- 28.5	105 106	38° 38°	%86 98%	98%	86	5 28		
1         1	0WD 3		20	% 0	38.2	98%	98%	58%	38%	386 286	58%	98% 2021	98°" 9	8% 98%		98% ***	86	17 h	285 S	5. 98% 98%
0.1         0.1 <td>1ent 1</td> <td></td> <td>95% 25%</td> <td>95% 0%</td> <td>95% 98%</td> <td>38% 38%</td> <td>98% 98%</td> <td>95% 98%</td> <td>186 186</td> <td>%86</td> <td>**** %86</td> <td>**e5</td> <td>n on %80</td> <td>1966 × 196</td> <td>**** 86%</td> <td>28% 28%</td> <td>88</td> <td>9 x 9</td> <td>5 200 2 200 2 200</td> <td>500 500 500 500 500 500 500 500 500 500</td>	1ent 1		95% 25%	95% 0%	95% 98%	38% 38%	98% 98%	95% 98%	186 186	%86	**** %86	**e5	n on %80	1966 × 196	**** 86%	28% 28%	88	9 x 9	5 200 2 200 2 200	500 500 500 500 500 500 500 500 500 500
Intert         Inter         Inter         Inter <td>hent 3</td> <td></td> <td>38%</td> <td>38%</td> <td>38%</td> <td>98%</td> <td>38%</td> <td>98%</td> <td>38%</td> <td>38%</td> <td>38%</td> <td>98%</td> <td>58%</td> <td>386 %B</td> <td>28% 28%</td> <td>38% </td> <td>83</td> <td></td> <td>200</td> <td>% 98% 98%</td>	hent 3		38%	38%	38%	98%	38%	98%	38%	38%	38%	98%	58%	386 %B	28% 28%	38% 	83		200	% 98% 98%
Merici         Col         Col<	nent 4		%0 0%	38%	286 290	988 % 20	58% 20%	382 12	36%	596	29.0 20%	20% 20%	20% 0%	102 910 102 910	*00 	ar 02	è ô			00% 00%
0.1         0.1 <td>reen River 3 reen River 4</td> <td></td> <td>, <u>%</u></td> <td>200</td> <td>10</td> <td>20</td> <td>%0</td> <td>0%</td> <td>%0</td> <td>0.2</td> <td>°,</td> <td>920</td> <td>:00</td> <td>0% 0%</td> <td>%0</td> <td>075 201</td> <td>53</td> <td></td> <td>%0 0</td> <td>01% 01%</td>	reen River 3 reen River 4		, <u>%</u>	200	10	20	%0	0%	%0	0.2	°,	920	:00	0% 0%	%0	075 201	53		%0 0	01% 01%
0.0000         0.00000         0.00000         0.000	rone 3		260	50°	30 0	°20	%0 %0	0°°	°6	2°C	360 1	0%0 80ec	02°	0% 0%	0 <sup>22</sup>		58		80%	0%5 0%5 R2%5 82%5
meri         meri <th< td=""><td>ne Run 4 no Run 5</td><td></td><td>82% 84%</td><td>84% 84%</td><td>84%</td><td>84% 84%</td><td>84%</td><td>84%</td><td>97% 84%</td><td>84%</td><td>84%</td><td>84%</td><td>84% 8</td><td>4% 84%</td><td>84%</td><td>84%</td><td>84%</td><td></td><td>84%</td><td>84% 84%</td></th<>	ne Run 4 no Run 5		82% 84%	84% 84%	84%	84% 84%	84%	84%	97% 84%	84%	84%	84%	84% 8	4% 84%	84%	84%	84%		84%	84% 84%
Concit         Concit         Conc	ne Run 6		86%	86%	86%	86%	86%	86%	86%	86%	86%	86%	86% 8	5% 86%	86%	86% 02*	86%		86% 03%	86% 85% oge: 03%
0.0000         0.00000         0.0000         0.0000	I Creek 1		33% 56	93% 55	93%	93% 92%	93% 92%	93% 65%	326 356	92% 92%	%26 %26	92%	55 %25	2% 92%	92%	%26	875 675		92%	92% 92%
Contractione 1 and	Creek 3		868 89%	%68 %68	% <u>68</u>	89%	%68	89%	83%	89%	83%	89%	89% 81	9% 89%	89%	89%	89% 222		368	89% 89%
Common         Total         Total <t< td=""><td>Creek 4</td><td></td><td>91%</td><td>91%</td><td>91%</td><td>91%</td><td>91%</td><td>91% 2000</td><td>91% 00er</td><td>91% 00%</td><td>91%</td><td>91% oner</td><td>91% 9</td><td>1% 91%</td><td>91%</td><td>91% qq2</td><td>91% 90%</td><td></td><td>91% qqv,</td><td>91% 91% qq% dq%</td></t<>	Creek 4		91%	91%	91%	91%	91%	91% 2000	91% 00er	91% 00%	91%	91% oner	91% 9	1% 91%	91%	91% qq2	91% 90%		91% qqv,	91% 91% qq% dq%
Noncomp.         Op         Top	mble County 1		365	365 50	3865 U	3866 3866	- 655 666	586 586	3,80 3,80	2,20 2,80	*185 %86	-165 786	58% 58%	8% 38%	**** ****	***** *****	%86 %86		**86 1985	%86 %86
Net         Net <td>mble County 2</td> <td></td> <td></td> <td>50</td> <td>%0 1</td> <td>38%</td> <td>98%</td> <td>58%</td> <td>98% 28%</td> <td>98%</td> <td><u>98%</u></td> <td>98%</td> <td>38% G</td> <td>89% 98%</td> <td>38%</td> <td>38%</td> <td>98%</td> <td></td> <td>98%</td> <td>98% 98%</td>	mble County 2			50	%0 1	38%	98%	58%	98% 28%	98%	<u>98%</u>	98%	38% G	89% 98%	38%	38%	98%		98%	98% 98%
	DNS SO2 EMITTED		2007	2008	2009	2010	2011 394	2012 382	2013	2014 330	2015 304	2016 301	2017 21 327 3	352 352	358	346	383		388	388 387
	7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	9 2	15,089	0.403 13,808	4,589	785	414	765	766	705	562	612	645	54 665	649	673	624		678	678 697
Image: 1         0.0         0.00	K 000 3	2	34,743	35,261	10,817	1,986	1,934	1,670	1,905	1,710	1,871 5 265	1,841	,915 1.8 340 5	1702	5 344	1,941	1,970		1,931 1	5.373 5.419 5
(iii)         (i)         (i)<	ient 1 × X	3 2	4,548 18,089	16,037	4,753	2,006	2,006	1.798	2,000	1,981	1,979	1,983	982 1.2	385 1,780	1,994	1,992	1,998		1,987	1,967 2,001
Initiation         ND         1313         4.00         7.11         7.01	ent 3 k	2	5,768	2,202	2,231	1,999	2,224	2,229	2,213	2,175	2,145	2,143		149 2,167	2,161	2,172	2,184		2,164	2,184 1,968 2 2,163 2,157 2
memory memory	ient 4 h.	3 =	19,134 8 154	4,600 A.131	2,177	2,175 8.100	2,171	7.401	2,16/	6,710	6,028	5,248	121	106 6,045	5,081	5,655	4,802		4,118 4	4,118 4,834 4
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	een River 4 K		14,477	14,658	12,865	11,593	10,559	9,254	10,600	9,478	8,251	7,961	1,819 9,0	36 7,666	8,283	8,878	8,164		7,852 8	7,852 8,417 9
March         UL         Syste         Sy	rione 3	2	2,770	3,208	3,281	2,710	2,820	2,675	2,754 4 527	2,355	2,164 3.794	2,176 3,854	143 2.3	387 2,432 147 4,395	2,203	2,338	2,231		2,269 2	2,269 2,191 2 4.485 4.575 4
min in iter         (E)         (E) <th< td=""><td>ane Run 4 L</td><td>GE</td><td>5,191</td><td>4,475</td><td>5,922</td><td>4,547</td><td>4,261</td><td>4,243</td><td>4,326</td><td>3,862</td><td>3,137</td><td>3,626</td><td>1,894 3.5</td><td>385 4,056</td><td>4,023</td><td>4,198</td><td>3,785</td><td></td><td>4,093 4</td><td>4,093 4,352 4</td></th<>	ane Run 4 L	GE	5,191	4,475	5,922	4,547	4,261	4,243	4,326	3,862	3,137	3,626	1,894 3.5	385 4,056	4,023	4,198	3,785		4,093 4	4,093 4,352 4
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	ane Bun 6	GE	6,810	6,900	6,055	6,553	6,347	6,365	6,283	5,681	5,144	5,008	5,1882 5,1	777 6,117	5,955	6,103	6,325		5,582 6	5,582 6,516 6
consist         cical         gits         gits<	II Creek 1 L	3E 2F	4,214	3,971	4,197	3,253 4,476	4,569	4,821	4,475	3,004 4,610	2,005 4,018	4,139	1633 4,2	224 4,155	4,297	4,204	4,500		4,265	4,265 4,560 3
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Il Creek 3	GE	9,012	9,580	6,008	9,556	8,276	9,573	8,982	9,415	8,845	9,355	1865 9.1	340 B,166	9,402	8,865 0.470	9,447		8,900 9,450	8,900 9,487 8 0.450 9,487 8
mice Commiz         (U)         0         0         0         0         100         1,501	II Creek 4 L	10 10	9,744 843	9,208 929	9,692 779	9,129 926	850	929	850	6,14U 925	849 849	927 927	B12	325 845	876 6	850	926		850	850 929
mbc count 2         0         0         100	mble County 2 K	12	0	0	0	807	1,526	1,604	1,601	1,593	1,588	1.591	,588 1,5 220	1,595 1,592	1,597	1,599	1,594		1,601	1,601 1,606 1
Contraction         Total         T3,761         18,921         100,753         81,77         78,600         73,355         76,339         75,829         75,831         45,811         45,	mble County 2	GE	0	0	0	189	358	376	375	374	373	373	373	374 375	375	c/5	4/5		9/F	//F 9/F
LOWARDER         33,44         8,746         36,746         36,746         36,746         36,746         36,749         25,759<	Je terrissions ( 1 ons) Total		175,761	158,931	100,763	81,777	79,680	79,355	80,725	76,399	73,833	73,358 76	i,281 76,9	589 75,825	9 76,053	77,531	75,615	~	75,092 77	75,092 77,777 78
EFA Antonendo SCA Allowances ELSA 18,543 18,543 18,543 18,543 18,543 18,543 18,543 18,543 18,543 18,553 18,222 18,	LLOWANCES								26 446	26 740	001-00	10 034 30	20 25	750 25 750	25 750	26.750	25,759		24,740 24	24,740 24,754 25
Model         Excession         145,799         145,719         145,719         145,719         145,719         145,719         145,719         145,719         145,719         145,719         145,718 <t< td=""><td>J EPA Allocated SU2 Allowances iE EPA Allocated SO2 Allowances</td><td></td><td>52,456</td><td>62.456</td><td>62.455</td><td>28.420</td><td>28.420</td><td>28.420</td><td>28.420</td><td>28.420</td><td>19.922</td><td>18.922</td><td>19.</td><td>222 19.92</td><td>19.922</td><td>19.922</td><td>19.92</td><td>~</td><td>219-922</td><td>2 19.922 19.922 15</td></t<>	J EPA Allocated SU2 Allowances iE EPA Allocated SO2 Allowances		52,456	62.456	62.455	28.420	28.420	28.420	28.420	28.420	19.922	18.922	19.	222 19.92	19.922	19.922	19.92	~	219-922	2 19.922 19.922 15
US Proference Mark Mark Frank Edition (19) (19) (19) (19) (19) (19) (19) (19)	olal KU/LGE EPA Allocated SO2 Allo	wances	145,799	145,799 0	145,799 ñ	65,166 0	65,166 0	65,166 0	65,166 Q	65,166 0	42,001 0	190,04	0,054 0	0 0	0 0	100'24		~ 0	0 0	2t 00°Ct 00°Ct 0
Ombind Company Purchases         0 <td>U/LGE EXtension U's Portion of OMU Surplus/Shortfall</td> <td></td> <td>665</td> <td>2066</td> <td>656</td> <td>584</td> <td>, 0</td> <td>, 0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>•</td> <td></td> <td>0</td> <td>0</td> <td>0 0</td>	U/LGE EXtension U's Portion of OMU Surplus/Shortfall		665	2066	656	584	, 0	, 0	0	0	0	0	0	0	0	•		0	0	0 0
Image: State of the state o	ombined Company Purchases		00	00	00	00	0 0	00	00	0 0	00	00	0 273	386 30,148 0 (	30,372	31,850	56 87		84 29,411 32 0 0 0	4 29,411 32,096 32 0 0 0
ХПАКИЛСЕ АЛАКИХ УПАКИЛСЕ АЛАКИ 23.27 12.11 45.422 15.07 14.514 44.100 15.539 11.230 25.157 20.500 2.922 0 0 0 Посновае (-робелевае) Параки - 23.27 12.11 45.652 15.07 14.514 14.118 15.539 11.230 25.157 20.500 2.922 0 0 0 LOWANCE BANK				2000				22 100	Sauran Contraction		A5 681	45.681 4		567 75.824	76.053	77.531	75.61	2	5 75.092 77	5 77.77 77.77 78
	DTAL KU/LGE ALLOWANCES DY Increase (+)/Decrease in Bank		146,464	-12,141	45,692	-16,027	14,514	14,189	-15,559	-11,233	28,152	-27.677 -3	0,600 -2.	332 (	0	0	0	•	0	0
	LLOWANCE BANK								102.007		5									



# Case01- BR23 WFGD 2009



# Case02- BR3 WFGD 2009

	FUEL SO2 Content (#MBTU)	Brown 1	Brown 2	Ghent 1	Ghent 2	Ghent 4	Green River 3 Green Biver 4	Tyrone 3	Cane Run 4	Cane Hun 5 Cane Run 6	Mil Creek 1	Mill Creek 2 Mill Creek 2	Mill Croek 4	Trimble County 1	Trimble County 2 Trimble County 2	SCRUBBER REMOVAL EFF.	Brown 1	Brown 2	Ghent 1	Ghent 2	Ghent 3	Ghent 4	Green Hiver 3 Green River 4	Tvrone 3	Cane Run 4	Cane Run 5	Cane Run 6	Mill Creek 1	Mill Creek 2	Mill Crook 4	Trim No County 1	Trimble County 2	Trimble County 2	TONS SO2 EMITTED	Brown 1	Brown 2	Ghent 1	Ghent 2	Ghent 3	Ghent 4 Green Birer 3	Green River 4	Tyrone 3	Cane Run 4	Cane Run 5	Mill Creek 1	Mill Creek 2	Mill Creek 3 Mill Creek 4	Trimble County 1	Trimble County 2	SO2 EMISSIONS (TONS)		ALLOWANCES KU EPA Allocated SO2 Allowant	LGE EPA Allocated SO2 Allowa	KU/LGE Extension	KU's Portion of OMU Surplus/Si	Combined Company Purchases Seli	TOTAL KIN GE ALLOWANCE	EOY Increase (+)/Decrease In	ALLOWANCE BANK
	Owner	ŔŨ	S 3	Š	KU	222	N KU	5 Q	LGE	LGE CE	LGE	LGE	105	LGE	191																				2 I	22	ĸu	Ϋ́	2 S	Ŋ,	Ŋ	KU	101	191	LGE	щ Ц	LGE	LGE	D, 22	101	Total	Ces	nces		horitali	_	v	Bank	End of Vest 16
	2006																																			. ()			•		-										11	u							SE 628 17
	2007	52	25 25	5.8	1.1 16.8	1.1	4,1 1,4	15	6.6	5.8	5.8	6,9 9,8	5.8	6.0	0.0		2°2		95%	0%	38%	20 C	°,0	0%	82%	84%	86%	0.77 	0.75	21%	99°%	0.0	%0	2007	15,089	34,743	4,548	18,089	84/10	8,154	14,477	2.770	5,146	6,810	4,214	4,733	9,744	843	0 0	5	75,761	33,343	62.456	0	665			29,297	7.331
	2008	52	2.5 2.5	5.9	5	14.8	4 1 4	4	8 Q 0	5 8 5	5.9	5.8 8.2 8	5.8	6.0	0.0		°°°	, o 0	95%	0%	58°°	2.90		0.0	82%	84%	86%	1000	30.05 2005	91%	39%	0.20	0%	2005	6,2U3	35,261	5,586	18,037	7027	8.131	14,658	3,208	5,119	6,900	3,971	5,050	9,208	526	0 0	2	158,931	83,343	62.456 • • 5 700	0	66	00	146.789	-12,141	115,190
	2009	52	25 36.3	5.9	16.7 5.8	5.9	144	5	6 G G	5 8 S	5.9	9.9 9.5	5.9	6.0	0.0		30 d	200	35%	98%	386 	2020	~~0%	9%D	82%	84%	86% 02%	1900	36 %	91%	93°,°	°.0	%0	2003	13.514	10,861	5,461	4,753	1527	2,177	13,597	3,338	5,067 5 020	6,073	4,196	4,665	9,689	5/1		5	115,427	83,343	62.456 • 45 700	0	656	00	146.455	31,028	146.21R
	2010	2.7	27	5.9	9.2 8.4	53	14 14	1.4	6 5 5 5 5	9 6 6	5.8	10 10 10 10	5.8	6.0	20		°°°	286 186	35%	98%	38%	-10C	200	0.4	82%	84%	80%9	2.00 0	50 ac	91%	%65	38%	98%	2010	14.352	2,039	5,446	2,005	866'I	8.043	12,412	2,821	4 746	6,599	3,559	4,4/5 0 551	9,126	926	807	9	103,312	36,746	28.420 65 166	•	584		65.750	-37,562	108.656
	2011	2.7	27 F 4	5.8	5.8	8	4.4 1.4	1.5	ត ភូម	9 5 5	קי טיי	8.5	5.9	6.0	5.0		0% 0%	~~86 ~~86	95%	38%	38°	100	200	%0	82%	84%	80.00	1.00	83°	91%	99%	38%	38%	1002	13,488	2,001	5,441	2,006	2171	7,270	11,678	2.953	5G2 4	6,417	4,072	5/2,4 5 774	9,676	850	1,526		100,469	36,746	28.420		00	00	65,166	-35,303	73.353
	2012	22	27 64	5.9	9.2	0.0	4,4	15	8,0 4,1	5.8	8.2	5.8 2.2	5.8	6.0	5.0		50	286	95%	::86	888°	20.2	50	%0	82%	84%	8000 1900		30 20 20 20 20 20 20 20 20 20 20 20 20 20	91%	366	38%	38%	2012	13.298	1,733	5,454	1,798 1000	2 175	59E'2	10,254	2,786	4,810	6,452	3,867	9 570	9,114	526	1,604	5	99,822	36,746	28.420	0		0	65.166	-34,656	38.697
so <sub>2</sub> sum	201	C4 C	NI 40	ι.	տտ		ৰ ব	-	un u	5 10	ນາເ	n n	ŝ	ωv	i lin		20	86	<b>3</b> 6	86		ņ Ċ	0	•	82	4B 2	85	88	1 65	91	66	98	85		4.0	1,96	¥ i	5, č	10	4.7	11,8	80 f	- ŭ	6,3	4	τα τα	96	80 0	ā M		101,5	36,7	E 28.4	_			65,1	.36.3	2,35
MARY B	13 201	eo; 1	P. 4	8	տ տ օր օր	ίού. 		-	10 a 10 a	jecj ov o		10 aq	5	0 C	19		2 G	- 66 - 88		86	25	9 C		% O		e e			58	<sup>5,6</sup> 91	56 53	5° 98	% •	50 50 26 50	21 12.5	5.4 1.7	12,4,2		10	05 6,7	48 10,3	58 2.4	9 F	77 5.7	3,6	0, 10 10 10	10 8,1	000	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	2	08 95,3	46 36,7	20 20 20 20 20 20 20 20 20 20 20 20 20 2	0	0 77.8	, o	66 92,9	+2 -2.3	5
Y YEAR	14 201	сч с	20 47	с г	o, aq	ież.		4	un ur	i oui v nu	ທ ເ ຄຸ ເ	n n n n	8	0 c	1 12		2 C	86	% 35	26 26	96 96	e 25		% ۵	85 82		20 00 00			% 91	% 66	86 %	86 •	3 u 4 u	6.01	50 1,8	55 5,2	6'L 62			54 9,2	80	0,4,6	70 5,2	79 3,6	0,4,4,00	30 2'5	52	45 FZ		33 90,2	46 25,7	20 21 22 23 23	0	11 445	. 0	77 90,2	55	•
	5		4	80	ο, eq	2 00 -		5.	ω, σ. α, σ	, aq	ο, α ο, ι	ים וי וי ני	8,		. 9		2 U	86	26 BE	26 G			1.2	54 C				1	1	-6 <sup>52</sup>	۲. 29	36 %	2°		2,11	75 1,8	48 5,2	5' 5' 5'	10	27 5,1	9,0 8,8	58 2,2	19.60	50 5,0	BB 3.4	- + 6 + 6 + 6	41 8.7	64 IS	2 6	,	78 90,6	59 25,7	22 147 85 145	0	0 97 44.5	0	78 90,6	0	'
	16 201	ni e	5 K	5 5	ui ui eg eg	чл - ед -	44	5	uni uni on ec	i uni a ong	ui u on o	ո՝ տ՝ դոլ	ທີ່ ຄູ	9 v 0 0	.0		56	586 686	56 92°	-86			5°	3% Q	2% 82		55 55		3% 89	% 31,	3% 23	3% 38	3% 98		75 11,88	49 1,92	36 5,33	282 28	24	99 6,11	49 9,83	24 2,22	34 4.12	52 5,92	61 3.75	51 8.85	36,9	27	21 10 10 10 10 10 10 10 10 10 10 10 10 10		37 94,58	59 25,75	22 19.45 81.65	0 (	U 56 48.9(	0	37 94,58	0	,
	2018	2.8 2.8 2.8	6 6	5.8	5.8	5.8	1.4.4	15	5.8	5.8	85	50 50 50	3 5.B	50	5.0		56	98%	55%	385	1000			ة 0%	82%	94%	- 60 - 60 - 5	326	, 89%	\$ 91%	93%	ه»: 98%	38%	5843	5 11,862	2 1,905	5,324	1,985	5 2.118	6,264	4 9,933	4 2,478	192.0 0	8 5,818	3 3.201	9.334	8,743	8 925	9251 D		8 94,799	9 25,759	2 19.922 1 45.681	0	7 49.118	0	8 94,799	0	,
	2019	1.2	6.4 6.4	5.8	6, 6, 5, 6, 5,	8.5	1.4 1.4	1.5	6, 6 5	5'6	8.5	7 0,5 0	5.9	6.0 5.0	5.0		58	98%	95%	98% 98%	200	%0 7	020	0%	82%	6,450 900	1200	92%	89%	91%	%66	98 <i>%</i>	98%	5 928	12,233	117.1	5,320	1,/80	2,131	6,010	8,557	2,542	4,222	6,147	3,811	8.163	9,396	849	375		94,252	25,759	193224	0	48.571	0	94,252	0	,
	2020	2.7	6.4	5.8	5.8	85	44	4.1	5.9	5.8	ոս	0 0 0 0	5.9	6.0 5.0	5.0		° 0	38%	95%	1.86	- 07	30 20	50	0%	82%	0,450 0,000		92%	89%	91%	335%	38%	38%	5 763	11,591	1,889	5,339	522,1	2.145	4,976	8,910	2,258	4.200	5,972	3,562	665.6	8,823	928	375		93,268	25,759	19.922 45.681	0 0	47.587	0	93,268	0	,
	2021	7.2	64	6.5	6 6 S	65		1.5	5,0	5.8	6.6	5 6 6 7	5.9	0.9	5.0		%0 50	98%	95%	186	- 00 - 00	°0	°:50	0%	82%	64,49 90%	9312	92%	83%	91%	33%	58%	98%	5 499	12,046	1,949	4,810	2661	2.145	5,569	9,530	2,437	4.337	6,133	3,864	8.861	9,423	850	375 375		34,960	25,759	45,681	0 0	49.279	0	94,960	0	,
	2022	27	6.4	5,5	6.6	5.8	144	4.1	5.8	5.8	899	2.9 2.9	5.9	6.0 5.0	5.0		°20	38%	353%	38%	4 D2 -		0%	0%	82%	64% DCsr	5250	32%	89%	91%	33%	38%	98%	5 750 5	11 010.11	1 1.22,1	5,385 5	- 955'C	1.925	4,749 4	8 906'8	2,314 2	3.859	6,331 5	3,686 3	9,440	8,198 9	926	374		32,247 92	25,759 25	45.681 45	0 0	46.566 46	0	92,247 92	0	,
	023 20	8216	6.4	5.9	5.8	6.5	14	1.5	5 0 5 0	53	8 9 9 8 9	0.0	5.8	5.0	5.0		58	36% 36	95% 95	38% 38			0%	0%	82%	04/9 02	53%	92%	89% 83	91% 9	66 %66	98%	96% R	782 5.6	,857 12,0	935 1,9	370 5,4	0'7 005'	152 2.1	016 4.7	,524 9,2	363 2,2	260 4.4	,581 6,5	7.6 006	76 006	437 8.5	850 . 5	375		,524 95,4	,759 25,7	1322 132 1681 45,6	0 0	.843 49.7	0	524 95,4	0	,
	24 202	80 e N 6	0 4 0 4	8.0	5 G G G G G G G G G G G G G G G G G G G	5.8	1.4 1.4 4 4	1.5	ດ ທ ດ ຫ	8.9	ເດັນ ເດັນ	1 K0	5,9 5,	5.0 5.0	5.0 5		0.0 01:	3% 38	5% 35	85°, 98			0, 0,	0% 0	2%	420 04	3% 93	2%	9% 89	1% 91	9% 99	8% 98	85 97 97	5 B.2	12,21	351 1,91	116 5,4	200 1,91	156 2.1	754 4,8	243 9,71	277 2.5	139	505 6,61	722 4,0	282 282	948 9,4	329 1 - 1 2 - 1	67 EF		115 96,0	759 25,7	122 17 T	0 0	734 50.3	0	415 96,0	0	•
	5 2026	7 2.5	4 6.4	6.5.9	8 5.9	8 5.8	1.4.4	5 1.4	5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	5.8	8 2.8	5°C 6	8 5.9	0 6.0	0 5.0		56	% 38%	% 352%	38°	1000		50°	% 0%	24 82%	50 0450		32%	% 89%	% 91%	% 66%	% 98%	382	5 590	8 11,585	8 1,613	H 5,289	26/1 p	2.133	4,459	0 6,250	1 2,125	0 4.272	04 6,100	3,294	5 9,333	8,694	18 926 10 1 EDG	1,230 15 375		7 90,423	39 25,759	22 13-3424 31 45,681	00	742 A	0	77 90,423	0	
	2027	12	6.4	6°S	5.9 9.2	9.5	4 4 1 4	4.1	5 G 6 G	6 9 9	8.2	n 19 n 19	មា ភ្	5.0	5.0		56	98%	95%	866 1980	1000	5	0%0	50	88 88	04.40	800 13%	°26	89%	91%	365%	%B6	2005	5.027	10,288	1,744	5,226	360.0	2.102	3,140	6,708	1,935	3,851	5,813	3,693	8.033	6.079	848	374		86,687	25,759	32,581	00	41.000	0	86,681	0	•



# Case03- BR123 WFGD 2010

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FUEL SO2 Content (#/MBTU) Owner	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018 2	<b>119 20</b>	202	1 2022	2023	2024	2025	2026	2027
		0 4	0 u 0 u	0 U C	0.00 23 B	4 U	4 ×	4 U	4 4 4	4 4 4 4	4 y	4.4	4.0 4 4	4.0	4		6.4	6.4	6.4	6.4	6.4
Brown 3 KU		25	25	2.0	46.0	19	1 1	44	1	1 4	4.0	1 1	* *	1 1		# . 6 u	4.0	4 U	4 V	4.	¢ .
Ghent 1 KU		5.8	6.5	5.8	5.9	55	5.8	58	, 01	5	5	1 40	50	5	5 v 1		t o o u	t o v	* # 5	та 6 и	† 8 0 4
Ghont 2 KU		171	7	16.7	5.8	5.8	5.9	5.8	6,2	5.9	63	5.8	5.5	10.0	1 49	55	182	ן מי קייים	5,65		5 6
Ghent 3 KU		16.8	5.8	5.9	5.3	5.9	5.8	5,9	5.9	5.9	5.9	5.9	5.8	5.8	8.5.8	5.8	5.9	5.8	5.8	5.8	5.8
Ghent 4 KU		2	14.8	5.9	5.8	5.9	5.9	5.8	5.8	5.9	5.8	5.8	קינ	5.8	.a 5.5	5.9	5.9	5.9	5.9	5.8	5.8
Green Hiver J		4	1.4	4.4	4.4	1	4.4	4.4	1.4	14	4:	4.4	1.4	1.4	4	1.4	4	4.1	4	4.1	7
Twone 3 KU		- u f -	- 4 -	- 4		t d	- u f +	77	- u † -	- 4	- v f -	÷.			- u	- u	4,	4	4	4,1	4.1
Cano Bun 4 1.6F		10	8.5	t d		0	0 8 - 4	, o		t o	t 0 - u	ta - u	* 0	- 4 - 4		<u>-</u>		– n Ú C	4 C	n (	4
Cane Run 5 LGE		99	ງ ຫຼື ທີ່ທີ່	, u	, m	, n	8.5	1 4	0.0	89	5 G	0.0	o a		ņ tr n	5 a		ה ע היי	ο α α	, n 1 1	יים מית
Cane Run 6 LGE		5.8	5.8	5	5.B	5.9	65	5.8	8	5	0	9 6	5.B		10			o a n v	0 0 0 4	n u n u	n a n u
Mill Creak 1 LGE		5.8	5,9	5.9	5.8	5.9	5.9	63	65	5.8	8 5	5	5.8	יינ	1.0		ņ at ņ	οα	, <b>0</b>	o a n u	o a
Mill Creek 2 LGE		5.9	5.8	5.8	5.3	5.8	5.5	5.8	5.8	5.8	65	5.8	5.8	8.6	1 5			0	8.5	a d b v	n a
Mill Creek 3 LGE		5.9	5.8	5.8	5.8	5.9	5.9	5.8	5	5.8	8,5	5.8	50	65	1	5.8			, <b>0</b>	0 0 1 1	
Mill Creek 4 LGE		5.8	5.8	5,8	5.8	6 S	5.8	615	5	8.5	8 5	65	8.5		100		i a	a a	n o v	n a b u	0 0 1 4
Timble County I LGE		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	0.9	6.0	6.0	0.0	60.9	n U Y		2		n c
Trimble County 2 KU		0.0	0.0	0.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	20	0.2	200	200	20	5.0	0.0	0.0
Trimble County 2 LGE		0.0	0.0	0.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	202	0.4	05	202	0.5	20	201	2 C
SCRUBBER REMOVAL EFF.																					3
Brown 1		%0	°0	:0	98%	28%	28%	58°'a	98%	98%	58%	98%	98% 9	8% 98	1983	98%	98%	98%	98% "	98%	98%
Brown 2		ŝ	50		585	%96	3° 87	595	382	385	385	38%	38%	8% 98	100 B	38%	38%	38%	98%	58%	98%
Brown J		200	10	0% 20%	525	98%	3885	98% 255	198	385	38%	98%	38%	8% 38		38%	98%	38%	98%	98%	98%
Great 2		91.05	8,07 180	2000	207	90.CA	0,00 100	2,05	100	925B	30% 20%	92.55	50 U	5% 35	366 86	95%	35%	35%	92%	95%	35%
Ghont 3		2.00	1980	1-200	0.00	1990	1000	9,00 1,000	0.00	100	000 000	200	200	01/9 06/ 70		2020	2965 2002	196	38% 2000	385%	%86
Gheat A		- 00 - 00	1.90	100	60 DE	a/ 05	200	e' 05	2.00		100	5.00			205	90%	2,85	285 199	595	38.96	28%
Green Bluer 3		20	2.00	5.00		1.00	907 100	202		a 00	0.05	*.oh	2. DD	010 AC	107	202	107	585	96.56	512	38%
Green Piver 3		9 0	1.0	0.0		9 D	°.5	e è	20	2,00	50					5	5	s i	6	2.0	6
Tumpe 3		3/0	2.0	200	200	200	50	a, p	e	a' o		e	200			58		50	% 0	50	ŝ
		8.0 10.0	200	200	8.0°	200	2 o 2	* D	500 A	200	500		5 C 2		58	50	5	50	5	50	5
Care Bun 5		Rde's	SAP.	207D	34%	BA <sup>6</sup> 2	BAC'S	20/20	0, 10	07 V0	or 70	07.70	0 0,70	10,00	10 0C1		100	0,70	222	222	22P
		2 A B	1.18	1.40		1000	97 HO	e' + 0	1000	0110	0.40	04/10	e. 40			04%	845°	84.99	642	84%	84%
			100		0,000	* 00	100	200 200	60 Ja	000 1800	00.00	a. 00		00 00 00 00 00 00 00 00 00 00 00 00 00	200	200	302	80.2	80%	86.5	86%
Mail Crock 3		500 A	2.00 5	0.00	2000	a, on	1000	0102 1000	500 1000	20 <sup>20</sup>	500	23%		25 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1	205 8	93%	3°26	93%	33%	93%	93%
Mill Crock 2 Mill Crock 2		2675	0.75	2676	2000	-1200 2000	91.7F	275 1001	975	97% 202	226	926		2.5	25	%26 .	32%	92%	35%	92%	92%
		07.50	2.00	0.50		1.00	ar 20	*150 1010	e	- AD	0,55	67.FD	2	59 975	- <b>B</b>	63%	%68	%68	83%	89%	89%
Trim Oreck 4		0,000	200	a' + C	0/16 /000	a' 10	0/1/0 DO01	* - h	8 1 <b>7</b>	200	212	21.7e	200		3.60	216 o	2.17	16	81.6	816 8	91%
		0.00	2.00	5 hh	0, nn	-, nn	2,000	*. <b>7</b> 7	200	8, DD	27.75	1.55		25 C	3.65 	2.66	265 1	33%	366	366	26.66
Trimble County 2		e j		° .	000°	0.00	0000	20.00	200 100	1000	2020	2014		02.0 00.0	205 of	205 o	%B5	385	5,85 2000	186	38%
TONS SO2 EMITTED		2007	2008	2009	2010	2011	2012	2013	2012	2015	2016	2017	20 20 20 20 20 20 20 20 20 20 20 20 20 2	10 30 30		ecore i	ecuc	er 05	2010	94.95 9000	5.9A
Brown 1 KU		7.298	6.209	7.580	3.070	394	382	382	330	304	305	775	324	52	100	383	280	287	201	200	100
Brown 2 KU		15,089	13,808	14,425	6,494	774	765	766	705	562	612	645	654	14	56	500 500	2000	202		192	
Brown 3 KU		34.743	35,261	33.912	13.715	1934	1.620	1.905	1 710	1.871	1 841	1915 1	892	1 1 1 1	1941	1 970	1031	1045	1 078	100	
Ghent 1 KU		4.548	5,586	5.461	5,446	5.441	5.455	5,442	4.738	5.255	5.240	5.340 5	325	16.5 16.5	4 814	282.2	575.2	015	356.3	00001	101
Ghent 2 KU		18,089	18,037	4,753	2,006	2,006	1,798	2,000	1,981	6/6'1	1,983	1.982	985	1.90	1 1 992	1 998	1.987	2004	1.996	1 752	3
Ghent 3 KU		5,768	2,202	2,231	1,999	2,224	2.229	2,213	2,175	2,145	2,143	1,917 2	149 2	67 2.10	2.17	2.184	2.184	1 968	2 195	2141	100
Ghent 4 KU		19,134	4,600	2,177	2,175	2,171	2,177	2,167	2.146	1.903	2.125	2.137 2	120	33 2.1	214	1 925	2 153	2 157	2 157	1210	5
Green River 3 KU		8,154	8,131	7,896	8,104	7,325	7,401	7,386	6,710	6,028	5.248	6,157 6	306 6.1	145 5.08	1 5,65	4.802	4.518	4 834	4 884	1445	800
Green River 4 KU		14,477	14,658	14,293	12,112	10,559	9.254	10,600	9,478	8.251	7,961	8,819 9	036 7.1	66 8.28	3 8.876	8.164	7.852	B.417	9.042	5 803	121
Tyrone 3 KU		2,770	3,208	3,472	2,756	2,820	2,675	2,754	2,355	2,164	2,176	2,143 2	387 2,	32 2,20	3 2.336	2,231	2.269	2,191	2,401	2.045	847
Cane Run 4 LGE		5,146	5,119	5,131	4,871	4,069	4,651	4,527	4,294	3,794	3,854	4,143 3	647 4.	95 4,32	9 4,446	4,429	4,485	4,575	4,194	4,370	658
Cane Run 5 LGE		5,191	4,475	5,058	4,721	4,261	4,243	4,326	3,862	3,137	3,626	3,894 3	,985 4,0	56 4,02	3 4,198	3,785	4,093	4,352	4,487	4,239	,829
Cane Run 6 LGE		6,810	6,900	6,098	6,591	6,347	6,365	6.283	5,680	5,144	5,008	5,882 5	777 6.	17 5,95	5 6,103	6,325	5,582	6.516	6,604	6,111 5	818,
Will Creek 1 Let		4 1 7 4	1/2/0	051.4	2002'5	9/0' <del>4</del>	2,202	4,0/4	3,664	2502	3,460	5,756	201 31	13 3,56	3,866	3,699	3,904	3,729	4,008	3,298	.702
Mill Crock 3 EGE		010 6	9 580	9006	9 556	B 276	9 573	C BO B	0 415 0 415	5768	10.150	1 0 0000	r a 195		107'1 0		C07"#	1000'4	01000	010,4	105
Mil Crock 4 LGE		9.744	9,208	9,688	9,128	9.681	9.120	9.619	B.140	9.348	8 789	8 895.4	750 9.	58 8 58 8	0070	1108	0050	050 8	01500	000 EUL 8	500
Trimble County 1 LGE		843	929	6/1	926	850	929	850	925	849	927	778	925	49 90	850	926	850	626	8/2	926	848
Trimble County 2 KU		0	0	0	807	1.526	1.604	1,601	1,593	1,588	1,591	1,588 1	595 1,	98 1,55	7 1,595	1,594	1.601	1.606	1.598	1.598	593
Trimble County 2 LGE		0	0	0	189	358	376	375	374	373	373	373	374 3	175 37	5 375	374	376	377	375	375	374
SO2 EMISSIONS (TONS)		100	100 011	000000	202 202	200		2000 000	1000						l						
		10/10/1	106'001	140,020	507,201	nea's/	CCD,E1	90'/79	655,01	13,633	1 365,51	o,261 /0	1'91 55c	53 120	4 77,531	75,676	75,092	<i>m,</i> m	78,248	3,656 71	479
KU EPA Allocated SO2 Allowances		83,343	83,343	83,343	36,746	36.746	36,745	36,746	36.746	25,759	25.759 2	5.759 25	759 25.7	59 25.75	9 25.759	25.759	25.769	25.759	26.759	5 759 25	759
LGE EPA Allocated SO2 Allowances		62.456	62.456	62.456	28.420	28.420	2B.420	28.420	28.420	19.922	1 226.01	<u> 1922 19</u>	19.22	22 19.92	2 19.922	19.922	19.922	19.922	19.922	91 226-6	322
Total KU/LGE EPA Allocated SO2 Allowances		145,799	145,799	145,799	65.166 °	65,166 2	65,166	65,166 â	65,166	45,681	45,681 4	5,681 45	681 45,6	81 45,65	1 45,681	45,681	45,681	45,581	45,681	5,681 45	,681
KU/LGE Extension		0 100	0 00		0	0 0	0 0	• •	0 (	0 0	0 (	0 (	0	0		•	o	0	0	0	0
AUS POTION OF OWN SUIPLINS SUOTIER Combined Company Purchases		500 00	0.05	000	+ oc	5 C	- c	- c		- c	0 27.452 3	0 30	0 0 te 30 -	0 30 31	1 2 C	- 00 00 - 00 00	0 11 02	20000	0	0 220 22	0 6
Sell		. 0	0	0	0	0	• •	• •	0	00	0	0	· · · ·	0	0	0		050,20	100'20		02.7
														******			_				
101AL KUILGE ALLOWANCES EQY Increase (+)/Decrease in Bank		146,464 -29,297	146,789 -12,141	146,455 5,635	<b>65,750</b> -36,952	65,166 -14,514	-14,165	65,166 -15,559	65,166 -11,233	45,681 -28,152	73,133 7	5,281 76 0	,599 75,1 0	29 76,05 0	4 77,531 0 0	75,616	75,092	0 0	78,248	3,656 71 0	479 0
ALL DIVENUE DAVIS																					
ALLOWANCE HANN Total KU/LGE Allowance Bank (End of Year)	156,628	27,331	115,190	120,825	83,873	69,358	55,169	39,610	28,377	226	,				,		,			,	



# Case04- BR23 WFGD 2010



# Case05- BR3 WFGD 2010

							S	<sup>2</sup> SUMMAF	<b>17 BY YE</b>	AR											
FUEL SO2 Content (#MBTU) Owner	2006	2007	2008	2009	2010	2011	2012	2013 Č	2014	2015	2016 20	2017	808		202 202	202	F202	2024	202	9702	202
Brown 1 KU		10 L	20.0	2 2	1.1	1.2	1.0	0 1 0	0.2	0 1 0	0.0	10		30	10		2.7	2.8	22	27	12
		2.5	52	55	45.2	6.4	6.4	9	6.4	6.4	6.4	6.4	6.4	6.4	6.4	4 6.4	6.4	6.4	6.4	6.4	6.4
Gheat 1 KU		84	5.9	8.5	5.9	5.8	5.9	5.8	5.9	5.8	5.9	5.8	5.8	5.8	5.8 5.	9 5.5	5.9	5.8	5.9	5.8	5.9
Ghent 2 KU		11	1.1	16.7	5.9	5.8	5.9	5.9	61 51	6.9	5.8	5.9	5.8	6.2	5.8	5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	5.8	8.0 1	8 G 1	6'5'	8, 6 8, 6
Ghent 3 KU		16.8	5.8	6'S 1	ο i i	8.G	6, C	קיני	10 U	12 a 1	η η η	Ω α	n n n	, a u u	n'u na nu	, o , o		η α ο τ		ה מ מ	ה היי
Ghent 4 KU		23	9.4	י ה ה	0 • Q	o • •	7 n 1	5.5 1 4	0.0 1 1	0.4	9 1	14	5 F	, 1,4	4.1 4.4	1	14	4.4	4.1	1.4	34
Green River J K()		14	1 4	ŦŦ	4	14	14	1	1.4	4	4,1	4,1	4.4	4,1	4.1 4	4.	4.1	4.1	4.1	4.1	4.1
Tvrone 3 KU		1.5	4.1	1.4	1.4	1.5	1.5	1.5	4.1	1.5	1.5	1,4	1.5	1.5	1.4	ت. ۲.	51	1,5	1.5 2	1.4	4,1
Cane Run 4 LGE		5.9	5.8	5.8	5.8	5,9	5.8	5.8	8'S	8.5	6) U	6, 6 6	8.2	5.9	տ՝ ւ ու	סיני מיני	ດ ທີ່ ຫ	0,0	0 6 7	0, 0 0, 0	տես
Cane Run 5 LGE		ۍ د 1	6.5	5.8	en ci en ci	10 U	on a ki k	8) G 10	5.8	n a vi u	10, U 10, U	51 D 27 U	τ α α	0 0 0 1			, o 4	n u n u	7 C	ກ ແ ດ່າ	0 0 0 0
Cane Run 6 LGE		200	0 0 0	η ο v	ກຸດ ກັບ	η σ ń w		0.0	6 H	50	5 0	1 01	, eq	. 8	0 47 0 67	10	2.9	99	5.8	8.5	5.8
		0 0	n, an n, un	n a	a a	) 60 ) 47		85	89	65	6,5	6'5	8 5	5.9	5.8	5	5.8	6'S	5.9	<del>و</del> ک	5,9
		n 0	n a n a	n er	9 <b>0</b>	5.5	р о и	9 9 9	89	6.0	6.9	5.8	5.9	5.9	5.9 5.9	8	5.9	5.8	5.9	5.9	5.8
		i a i v	e e	85	0.4	5	8.5	55	5,8	5.8	5.9	5.8	5.8	5.9	5.9 5.	9 5.5	5.8	5.9	5.8	5.9	5.9
Tumbo Countu 2 COL		50	6.0	90	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0 6	0.6.0	6.0	6.0	6.0	6.0	6.0
Trimition County 7 Kill		0.0	0.0	90	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0 5	.0 5.(	5.0	5.0	5.0	5.0	5.0
Trimble County 2 LGE		0'0	0.0	0.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0 5	0.5.0	5.0	5.0	5.0	5.0	2.0
SCRUBBER REMOVAL EFF.											and a second										
Brown 1		" <u></u> "0	°°0	%0	%0	%0	%0 *0	%D	5	5	20	5 b			50	58	50	5	* 0	200	56
Brown 2		20	%0	0.2	%D	20	50 C	0.0		e 5	e 0	200	2.0	0.00	200			080	2.80	080	0.80
Brown 3		20	0°2	202		9105 1010	2020	20.0	2070	20.0	1000	0, DC	1.00	02°2	26° 30		500		200	1950	1956
Ghent 1		55% 26	5075 100	97.05 900	2010 1010	307.e	1.60	1.00	1.80	1.00	1985	98.6	38%	100 100	96 %8			38°	286 386	385	38%
		0.0	2,940	205 786	200	98%	28%		38%	98%	38%	38%	98%	98%	8% 98	% 98°	. 98%	38%	98%	98%	98%
		100	1000	1.00	280	980 1980	98%	198%	386	98%	38%	38%	38.5	98%	85% 38	% 98°	° 98%	98%	98%	98°%	98%
Greent 4				****	50	200	2.00	0		%0	10	%0	°°0	°"	0.2%	6	.0%	0%	0%	0%	0%
		0.°	200	50	0	.0	0%	0%	3%D	0",0	°%	%0	500	0%0	0% 0	% 03	°, 0%	%0	%0	0 <sup>5</sup> ,	%0
Timore 3			10	0	9%0	0%	0%	052	0%	0%	%0	05%	0%	0%0	0.% 0	20 %		°50	%D	°,"0	0%
		82%	82%	82%	82%	82%	82%	82%	82%	82%	82%	82%	82%	82% 8	2% 82	% 82%	6 82%	82%	82%	82%	82%
		84%	84%	84%	84%	84%	84%	84%	84%	84%	84%	84%	84%	84% 8	4% 84	545 845	6 84%	84%	84%	84%	84%
		86%	86%	86%	86%	86%	86%	85%	86%	86%	86%	86%	86%	86% 8	6% 86	% 86%	° 86%	86%	86%	86%	86%
		2.00	1.50	2950	1.26	555	93%	93%	93%	93%	93%	93%5	93%	B3% B	3% 33	% 93°	93%	93%	93%	93%	93%
		200	200	100	125	92%	92%	92%	92%	92%	92%	92%	92%	92% 9	2% 92	5° 92°	\$ 92%	92%	92%	92%	32%
Mill Creek 2		Rq.	10%	89%	268		89%	89% 89%	89%	89%	89%	8975	89%	89% 8	9% 89	% 89°	°, 89%	89%	89%	89%	89%
		91%	.16	91%	91%	91%	91%	91%	91%	91%	91%	91%	91%	91% 9	1% 91	% 915	6 91%	91%	91%	91%	91%
Trimbo Country		1.00	4.66	266	98%	93%	39°''	33%	33%	99%	33%	99°%	3 <del>3</del> %	5 %65	9% BB	% 99°	° 39%	%65	39%	99% <sup>6</sup>	93%
Trimble County ? Trimble County ?			0%	%0	386	38%	58°%	98%	38%	38%	38%	38%	98%a	98% 5	8% 38	% 98°	s 98%	98%	38%	38°%	98%
Trimble County 2		0%	°.0	0%	38%	98°%	58%	38%	98%	38%	38%	98%	98%	38% 5	8% 98	% 98°	5 98%	38%	38%	38%	38%
TONS SOZ EMITTED		2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019 24	020 20	202	2 2023	2024	2025	2026	2027
Brown 1 KU		7,298	8,209	7,580	7,283	6,733	6,659	6,526	5,918	5,550	5,550	5,887	5,843	5,928 5,	763 5,45	39 5,75	5,782	5,677	5,840	5,590	5,027
Brown 2 KU		15,089	13,808	14,425	14,965	13,488	13,298	13,421	12,548	10,307	11,275	11,886	11,862 11	2,233 11.	591 12,0	11,01	0 11,857	12,098	12,208	11.585	10.288
Brown 3 KU		34,743	35,261	33,912	13,754	2,001	1,733	1,964	1,760	1,875	1,849	1,922	1.905	1,711	1°-1 1'-1	26° 6	1935	135,1	2965,1	1,513	4, j
Ghent 1 KU		4,548	5,586	5,461	5,446	5,441	5,454	5,439	4,765	5,248	5,235	5,336	5,324		10.4 10.4 10.0	92'5 01	U/E'S 5	014°C	404'0 +	697'C	077'0
Ghent 2 KU		18,089	18,037	4,753	2,005	2,006	1,798	1,999	6/6'1	5/6'C	295.1	2021	C07'1		17. T T T T T T T T T T T T T T T T T T T	160° - 21		10012		0010	2000
Ghent 3 KU		5,768	2,202	2.231	1,999	2,223	2,228	11272	2,1/4	2,14/	2,144	1251					1017	105°-	5	100	00010
Ghent 4 KU		19,134	4,600	2,177	2,174	2,171	2,176	2,165	2,145	1,902	2,124	2,136	PLL'2	2 1917			757.2	120	1017	2217	201.2
Green River 3 KU		8,154	8,131	2,896	8,057	7,270	7,389	7,405	6/29	277	271.2	0,110	0,204 0,007	0,U1U 4.			010'* 5	10/1	1004 a		0+1 m
Green River 4 KU		14,477	14,658	14,293	12,681	11,678	10,254	11,848	10,354	002'6	6,645	458,8		10010 011	0.0	15'0 DS	+70'0 0	2425	3,100	2110	0010
Tyrone 3 KU		2,770	3,208	3,472	2,840	2,953	2,786	898'Z	094'7	8577	47777	477'7	· · · · · · · · · · · · · · · · · · ·	2 240		10.7 10.0		4 647	310.7	5 5 V	
Cane Run 4 LGE		5,146	5,119	5,131	278,4	4 503	4,010	4,610	1080	540'H	000't	4 120	4 197 4	1 P C C C 1	000	1986 1986	4.260	4,439	4.560	4.272	3.851
				1000	5615	6.417	5.452	6 377	5 770	5.250	5.052	5.928	5.818 6	147 5.	972 6.1	33 6,33	5,581	6,505	6,604	6,100	5,813
Lang Hun 6 Lac		4.214	120 5	195	9.554	4.072	3.867	4.068	3.679	3,688	3.461	3,753	3.201	3,811 3,	562 3,86	54 3,68	3,900	3.722	4,004	3,294	3,693
Mill Creat 2 1GF		4.733	5.050	4,666	4,475	4,572	4,822	4,495	4,611	4,018	4.177	3,621	4,226 4	1,170 4,	327 4.2(	02 4,49	0 4,271	4,549	3,906	4,319	3,961
Mill Creek 3 LGE		9,012	9,580	900'6	9,551	8,274	9,570	8,979	9,407	8.833	9,351	8,859	9,334 8	3,163 9.	339 8,8	51 9,44	0 8,900	9,482	8,915	9,333	8,033
Mill Creek 4 LGE		9,744	9,208	9,688	9,126	9,676	9,114	9,610	8,130	9,341	8,776	9,361	8,743	9,396 8,	823 9,4	23 8,19	9,437	8,948	9,498	B,694	9,079
Trimble County 1 LGE		843	929	6//	326	850	929	850	925	848	927	178	925	849	878 872 872 872 872 872 872 872 872 872	26 09	850	67 F	8//	975	8
Trimble County 2 KU		0	0	0	807	1,526	1,604	1,600	1.594	1,587	1,590	1,590	1,594	1.599 1.	597 1,5		109'1	909'L	255,1	955"	5.2C,1
Trimble County 2 LGE		0	0	0	189	358	376	375	374	372	373	373	374	3/5	9/5 3/5	5	()F	311	G/F	C/F	4/5
SO2 EMISSIONS (TONS)	;		150 001	008.011	APC 211	100.460	00 877	101 508	05 333	90 27B	90 637	94.588 0	14.799 94	1.252 93.	268 94.9	50 92.24	7 92.524	95.415	96.077	90.423	36.681
	-	10/'01	105'001	070'041	577'D1 1	cotion:	Tanteo														
KU EPA Allocated SO2 Allowances	,	83,343	83,343	83,343	36,746	36,746	36.745	36,746	36,746	25,759	25,759	25,759 2	25,759 21	5,759 25,	759 25,7	59 25,75	9 25,759	25,759	25,759	25,759	25,759
LGE EPA Allocated SO2 Allowances		62.456	62.456	<u>62.456</u>	28.420	28.420	28.420	28.420	28.420	19.922	19.922	19.922	19.922	다. 1757 1757	19-22 19-22 19-22	19.92	22661	19.922	26.61	19.922	225'E
Total KU/LGE EPA Allocated SO2 Allowances	-	45,799	145,799	145,799	65,166 6	65,165 0	65.166	00,100 0	00,100 0	100,04	100,04	+ C	* 00°C	100'0 U	D'Ft 100	00'6# 0	100'04 0	- C	00,04		0
KU/LGE Extension		200	000	223	1925		• c			0	0	. 0	. 0	. 0	0	0	0	0	0	0	0
Combined Company Purchases		0	20	0	0	0	• •	35,949	30,167	44,597	44,956	48,907	19,118 48	3,571 47.	587 49,2	79 46,56	6 46,843	49.734	50,396	44,742	41,000
Sell		0	0	0	0	0	0	0	0	0	0	0	0	•	0	0	0	0	0	0	0
							22 120	101 115	a 101 10	00 778	00 K17	04 588 0	14 700 04	1 252 93	268 949	60 q2 24	7 97.574	95.415	- 220 B	90.423	86.681
TOTAL KU/LGE ALLOWANCES EOY Increase (+)/Decrease in Bank	- '	29,297	-12.141	5,635	-50,474	-35,303	34,656	-393	0	0	0	•	0	0	0	0	0	0	0	0	0
ALLOWANCE DAWN Total KU/LGE Allowance Bank (End of Year)	156,628 12	122,331	115,190	120,825	70,351	35,048	393		,	·			,	•	•	•			,	,	



# Case06- BR123 WFGD 2011

							S	2 SUMMAR	1Y BY YE⊅ 2011	R 2007			6		, UL			FLOC	actor -	2000	
FUEL SO2 Content (#/MBTU) Owner	2005	2002	2008 2 5	2002	280	2011 46.4	<b>2012</b> 6.4	64 64	<b>6</b> 4	6 4 6 4	6.4	6.4	8.4 6.4	6.4	54 6	4 6.	4 6.4	6.4 6.4	6.4 6.4	6.4 6.4	545 6.4
Brown 2 KU		25	3 43	រ	2.7	52.2	6.4	6.4	6.4	6.4	6,4	6.4	6,4	6.4	6	4	4 6.4	6.4	6.4	6.4	6.4
Brown 3 KU		2.5	2.5	2.5	2.8	44.8	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	5.4	4	4 6.4	6.4	6.4	6.4	6.4
Ghent 1 KU		5.8	5.9	5.8	0,0	6'S	89 1	5.8	0, 0 10	o, i	5, C	5.8	ດ ເ	- - 	נחי היי		6.5 6	n n n	8.3	8.0	89 G
Ghent 2 KU			23	16.7	וס סיני סיני	8.5 8 5	5,6	8.5		5	ק היי	8 C	ק היי	10 a 10 a	, n 10 10 10 10 10	, n 1 1 1 1	ກ ຄິດ ຄິດ ຄິດ	יי מיני מיני	יי טע	0 0 0 4	10 0 17 4
Great 3 NU		10.8	0.0	n u	00	o a n u	0 0 1 4	η n u	n a n u	n a n u	6, C	ηα			, u , u	5 v		o a o u	ים פ ייי	o e	0 a 7 u
George Diver 1 KU		4 1	14	1.4	14	14	4	41	4.1	1.4	4.1	1.4	4.1	14	1.4	14	14	4.1	14	14	4
Green River 4 KU		4	4.1	4	4.1	4,1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	14	4.1 4	.1 .4	1 4.1	4.1	4.1	4.1	4.1
Tyrone 3 KU		1.5	1,4	4,1	1.5	<u>1</u> .5	1.5	4.1	1.5	4.1	4,1	4,1	1,4	1.4	1.5	5	5 1.5	1,5	4.1	1.5	4.1
Cane Run 4 LGE		5.9	5.8	5.8	5.8	5.8	5.8	5.9	5.9	5.9	6,6	5.8	5.8	5.9	5.0	8.	9 5.8	5.9	5.8	5.9	5.9
Cane Run 5 LGE		5.9	5.9	5.8	5.8	5,9	5.8	5.8	5.5	8.5	8.5	ο G	5.8	n u	5 U	ທັນ ຫຼ	10 10 10 10 10 10	5.8	80 G	5°5	8. G
Cane Run 6		5,8	5.8	6 G G	5.8	80 4 V) 1	8.5 9.5		5.8	5,9	5 c	5.8	10 10 10 10 10	50,00	ກ ເ ກັບ	n'ı nı	0 0 0 0 0	2 C	10 C	ກ ດີ ເ	n n n
Mill Creak 1 LGE		5.8	וימ	2 2 1 2	20 U	י היק	ה ה ה	ה היו	n i n	ρ. 	0 C	η n	0,0	n u n	0 C	កំ ។ ភ្ន	0 a 6 u 8 u		n a 6 u	00	0 0
Mill Creek 2 LGE		619	8, G	nç c un i	8.5	2,0	ה ה ה ו	5 G	12 C	n n	ה היו	0.G	5 C L	200	ηu	n'u no c	0 0 0 0 0 0 0	יי היי	0 G 0 4	חית הים	200
Mill Greek 3 Loc		5 G	ם מי מי	י ה ה	n c	n c	ກະເ	00	η c n u	0 0		0 0	n 0		n u n d	ni u nj a			n c n u		0 0
Mill Creek 4 LGE		20	5 C	2 0 0	5 C U	n u		n c	n C n 4	9 U 9						ņ⊂ ņ¢		5 G G		0.04	
		0.0	0.0	0.00	0.0	0.0		200	0.0	0.5	200		0.0	0.0		s ur p⊂		0.0	0.5	0.0	200
Timute County a NO				8	200		0	202	0.0	50	0.5	50	202	5.0	0.5	9 G	0 20	202	0.5	205	05
							TANK NACIONAL	THE REPORT OF A DESCRIPTION OF A DESCRIP	Service Statistical Statistics	STATES CONTRACTOR (STATES)	descention of the second		Sector Solution								
Brown 1		°:0	%0	0%	%0	<u>9876</u>	98%	98%	58%	98%	98%	98%	38% 5	8% 3	3% 98	% 98°	÷ 98%	58%	98% 98%	98% 28%	98%
Brown 2		0::0	0%	0%	%0	38%	98%	58%	38%	98%	38%	98%	98% 5	8% 3	3% 38	% 98°	° 98%	38%	98%	98%	38%
Brown 3		0%	%0	%0	%0	98%	38%	38%	38%	38%	38%	38%	38%	8% 6	3% 38	% <u>98</u> .	. 28%	38%	382	38%	38%
Ghent 1		35%	95%	32%	35%	95%	95% 5511	92% 55%	95%	95%	32%	95%	522°	52% 51	25 C	100	105 e	395 5	325	32.5	32%
Ghent 2			°:0	382	3995	206	200	2,05	96.96	100	20%	40.%	200		010 AG		1000	0.07 9.00	202	1000	0.00
Gnents		202	0.07	100	a 00	1900	100	20.00	000	2000	1,00	2000	1.40			200		1.40	1940	000 1.000	1.80
Ghent 4		°.0	- 07 707	207 100	100	200	5 D7	0 0 C	- DC	5 OC	* <u>2</u>	5.0	100	10.0	- C	. č		8,00 190	500	100	
Green Hiver 3		0.19 0			8°0	a 5	50	e de			°.,	°°0	°,0	50				50	200	2.0	
Green Hiver 4			ar0 780	°'''	e i	50	5°5	50		2°0		0%	2.0	100				o	o	20	
		B202	200	82%	82%	82°	82%	128	82%	82%	82%	82%	82%	12%	235	828	82%	82%	82%	82%	82%
		84°2	2028	BA02	Adv.	84°5	B4%5	84%	84%	84%	84%	84%	84%	34%	4% 84	84	84%	84%	84%	84%	84%
			0.40	o' t D	ŝ	100	1000	are o	BGe.	86°.	BG%	BG°'	ate:	,	194 194		BG <sup>1</sup>	BR.	BRE	BG".	86.
		0100		e 00	e no	100	1.00	200 200	0.200	1000	100	200			200			1.00	Jab D	2360	100
Mill Creek 1		81.05 1000	87.0A	0.00 1000	0,00	1000	0, 0C	1000	2000	1000	1400	200	200	100		1000	1000	100	1000	1000	0.00
Mill Creek 2		%75	3226	35.0	250	247.5	97.75	1000	1000	0/7D	0/.75	e' 75	9770	10 10 10 10 10 10 10 10 10 10 10 10 10 1	00 00	100		or 70		0/ 7C	a' 10
Mill Creek 3		63%	88	268	%.59 %	2750	1.62	2,70	e 50	200	0,70	0,70			*C		- 10 C	2. RO	a7.50		0.60
Mill Creek 4		91%	91%	316	316	515	315 1900	3/16 3000	515	212	47.70 1970		2000			- a - a - a - a - a - a - a - a - a - a		200	91-17	a. ( D	9110 9110
Trimble County 1		366 1	36.65	3325	2,55 1000	**AA	2,55 1997	0.55	200	ממניים	2,222	0.00	2.77	0,00		- nn		* nn	1000	1,000	200
I nmble County 2		5	-1-e	e'.0	0.00	2.0D	°.00	a' 00		1000	1000	1000	50567	1.00		e. 90	2000	1.80	1000	20 m	000
Inmole County 2		2006		eco	ad to c	50 DE	500C	30.02 500 500 500 500 500 500 500 500 500 5	20.00 2014 CONTRACTOR	20%	2016	2017	018 S	019 20	20. 20.	202 12	2023	PCAL	2005	2026	Lauc
		7 208	2007 B	7 580	7 795	2 72E	382	382	UEE	304	301	327	324	352	3.8	46 38	388	387	401	366	307
		0021.1	0,203	14 425	15 851	6 105	765	766	205	542	612	645	654	660	19	12	4 677	697	112	661	065
		500'CI	13,000	010 25	100,01	10 800	1 670	1 905	1 710	1871	1841	915	1 200	203	19	197	0 1.931	1.945	825.1	1.600	252.1
		82.57	2 585	5 461	5 445	5 440	5.455	5 442	4 738	5.255	5,240	340	325	323 5.	44 4.8	14 5.38	2 5.373	5.419	5.435	5.290	5.228
Ghont 2 KU		080.81	18.037	4 753	2005	2 006	1.798	2.000	1.981	1.979	1.983	982 1	985	780 1.5	94 1.9	266-1 26	1,987	2,001	1,996	1.752	1.952
Ghant 3 Ki i		5 768	202.2	162 6	1,998	2.223	2.229	2.213	2.175	2.145	2.143	917 2	149 2	167 2.	61 2.1	72 2.18	4 2,184	1,968	2,195	2,141	2,097
		10124	1011	2 177	W21 C	2 171	2 177	2 167	2 146	1 903	1212	137	120	133	47 2.1	192	5 2.153	2.157	2,157	2,134	2,101
		101 n	1000't	2,11,2	B 067	7 348	7 403	7 286	6 710	R 028	5 248		306	145 50	81 5.6	4 BD	4118	4 834	4 884	4.445	3 298
			10.10	200 / 1	12 432	11 158	0.254	10,600	8 47B	8.251	7 96.1	810	7 200	999	B.B. B.B.	28 B 16	4 7 R52	B 417	C 147	5 803	6 931
		14.4		0474	1000	00000	2,675	2 754	2,755	1540	176	641	187 2. c	10 CL4	5 C C C C C C C C C C C C C C C C C C C	2 C C C	10000	101.0	2 401	2045	1 847
		0//17	2112	1110	1005	20217	4 653	4 527	A 294	1794	1 854	54		395	4 4 6 0	28 A 47	9 485	4 575	4 194	4 370	3,840
		101 1	4.475	101.0	000	4551	4 243	4 326	3 862	2137	3626	894	985	056 4.0	123	3.78	5 4.093	4.352	4.487	4,239	3.829
		010		5 09B	6.662	6 407	6.365	6.283	5,680	5.144	2008	882 5	9	117 5.9	6.10	03 6.32	5 5.582	6.516	6.604	6.111	5.818
Mill Crock 1 DGF		4 214	3.971	4.195	3.558	4.072	3,868	4.074	3,684	3,689	3,460	756 3	201	813 3.	67 3.8	3,69	3,904	3,729	4,008	3,298	3,702
Mil Creek 2 LGE		4.733	5,050	4,666	4,478	4,568	4,821	4,475	4,610	4,018	4,139 3	,633 4	,224 4,	155 4,2	24 28	04 4,50	0 4,265	4,560	3,915	4,318	3.964
Mil Creek 3 LGE		9.012	9,580	9006	9,551	8,275	9,573	8,982	9,415	8,845	9,355 8	,865 9	,341 8,	166 9,	102 8,81	35 9,44	7 8,900	9,487	8,916	9,336	8,036
Mil Creek 4 LGE		9,744	9,208	9,688	9,125	9,676	9,120	9.619	8,140	9,348	8,789 5	.368 8	,750 9,	404 8,8	139 9,4;	29 8,21	1 9,450	8,959	9,504	8,703	9,094
Trimble County 1 LGE		843	929	677	926	850	626	850	925	849	927	8/1	925	849	928 BI	50 92	6 850	929	778	926	848
Trimble County 2 KU		0	0	0	807	1,526	1,604	1,601	1,593	1,588	1,591 1	,588 1	,595 1,	598 1,5	51 1,5i	99 1,59	4 1,601	1,606	1,598	1,598	1,593
Trimble County 2 LGE		0	0	0	189	358	376	375	374	373	373	373	374	375	375 31	75 37	4 376	377	375	375	374
SO2 EMISSIONS (TONS)						1			000 02			100			F	1	000 11 0	ļ	000 U.		
Total		175,761	158,931	140,620	141,718	99,501	79,355	80,725	76,399	13,833	73,355 74	B/ 182'	",") 68c,	1°1 678	(1) bci	10'C/ 15	750'57 9	11111	18,248	969,67	1,479
ALLOWANCES		645 58	575 58	ይንይ ይሄ	16 746	36 746	36 746	36 746	36.746	25.759	25,759 25	759 25	759 25.	759 25.7	59 25.7	59 25.75	9 25,759	25.759	25.759	25.759	25.759
I GE EPA Allocated SO2 Allowances		62.456	62.456	62.456	28.420	28.420	28,420	28.420	28.420	19.922	19.922	922	922 19	922 19.9	19.9	22 19.92	2 19.922	19.922	19.922	19.922	19.922
Total KU/LGE EPA Allocated SO2 Allowances		145,799	145,799	145,799	65,166	65,166	65,166	65,166	65,166	45,681	45,681 45	,681 45	,681 45,	681 45,6	581 45,61	31 45,68	1 45,681	45,681	45,681	45,681	45,681
KU/LGE Extension		0	0	0	0	0	0	D	0	0	0	0	0	0	0	0	0	0	0	0	0
KU's Portion of OMU Surplus/Shortfall		665	066	656	584	0	0	0	0	0	0	•	•	0	0	0	0	0	0	•	0
Combined Company Purchases		0	0	0	0 1	0 0	3,667	15,559	11,233	28,152 î	27,677 30	,600 ,000	918 30.	148 30.	31,8 21,8	50 29,93	5 29,411	32,096	32,567	27,975	25,798
Sell		0	0	0	0	0	0	•	•	•	0	0		- -	-						
TOTAL KUALGE ALLOWANCES	1	146,464	146,789	146,455	65,750	65,166	68,633	80,725	76,399	73,833	73,358 76	,281 76	,599 75,	829 76,1	17,5	31 75,61	6 75,092	тт,тт °	78,248	73,656	71,479
EOY Increase (+)/Decrease in Bank		167.62-	12,141	5,635	205'0'-	CCC.40-	779'01-	-	þ	5	5	-	5	-	5	5	2	0	5	5	>
ALLOWANCE BANK	146,628	127,331	115,190	120.825	44,857	10.522			,					,	'	,	,		,		
ו טומן צחורתב אותאמורה ממווצ ובזא אי ייאאי	20,000		22.62.																		



# Case07- BR23 WFGD 2011

						Ţ	s	<sup>2</sup> SUMMAF	Y BY YEA	\R 2007					1000					1000
UEL SOZ Content (#/MBTU) Owner	r 2006	2007	2008	5002	0102	2011	2002	2013	2014 20	2015	4102	2102	21 27		1202 0	2722			2024	2023 2024 2025 7.7 7.8 7.8 7.8
IOWN 1 KU		25	6 V 1	0.0	2.7	52.2	6.4	6.4	6.4 6	5.4	6.4	5.5 5.4	6.4	24	5 57	5.4	Ni UC	- 4	4 64	4 2.8 2.8 6.4 6.4
OWN 3 KU		25	2.5	25	2.8	44.7	6.4	6.4	6.4	6.4	6.4	6.4	6.4	5,4 6.4	1 6.4	6.4	ů		6.4	4 6.4 6.4
tent 1 KU		5.8	5.9	5.8	5.9	5.8	5.9	5.8	5.8	5.8	5.8	5.8	5.9	2'B 2'F	3 5.9	5.8	5.5	~	5.9	5.9 5.9
hent 2 KU		11	2	16.7	5.9	5.3	5.9	5.8	5.9	5.8	5.8	5.8	5.8	5.8 5.4	3 5.8	5.8	5.1	~	5.8	3 5.8 5.8
tent3 KU		16.8	5.8	ស ហ	8 G 10	89 G 10 I	5.8	8.5 1	6.5 1	5.9	65	1 1 1 1 1 1	5.8	5.8	5.9	6.5	ທ່າ		5.8	8 5.8 5.8
Tent 4 NU		3	0.4	n •	, r , r	n -	0.0	,	0 F	0.0	0.0	1. F	0.0	n .		n n	77.	_	הית היי	9'C 7'C 1'
Pon River 4			4	1	4	4	41	4	4	4	4	4	4		74	74	1 4			14 14
rone 3 KU		1.5	4.1	4	1.5	4.1	1.4	1.5	4.1	1,4	4.1	1.4	1.4	1,4 1,4	1.4	1.4	-	S	5 1.5	5 1.5 1.5
Ine Run 4 LGE		5.9	5.8	5.8	5.8	5.3	5.9	5.9	5.8	5.8	5.8	5.8	5.8	5.9 5.5	3 5.8	5.8	ŝ	8	6.5.9	5.9 5.9
ane Run 5 LGE		5.9	5.9	5.8	5.8	5.9	5.8	5.8	5.8	5.9	5.9	5.9	5.8	5.9 5.1	3 5.8	5.8	ŝ	~	9 5.8	9 5.8 5.9
ane Run 6 LGE		5.8	5.8	5.9	5.8	5.9	5.9	5.8	5.B	5.9	5.8	5.8	5.8	5.8 5.4	5.9	5.9	5.5	_	53	5.9 5.8
III Creek 1 LGE		5.8	5.9	5.9	5.8	5.9	5.8	5.9	5.9	5.8	5.8	5,9	5.8	5.8 5.4	5.8	5.8	5.6	~	5.8	3 5.8 5.9
III Creek 2 LGE		5.9	5.8	5.8	5.8	5.9	5.0	5.9	5.9	5.8	5.9	5.8	5.8	5.9 5.	5.9	5,9	5.9		5.8	5.8 5.8
all Creek 3 LGE		5.9	5.8	5.8	5.9	5.9	5.9	5.9	5.3	5.8	5.9	5.8	5.9	5.8 5.8	5.8	5.8	5.8		5.8	5.8 5.9
THI Crock 4		5.8	5.8	5.8	5.9	5.5	5.3	51	5.6	5.8	2	8.0	5.6	5.8	2.9	5.8	5.9		5.9	5.9 5.9
nmble County 1 LGE		6.0	6.0	3	20	23	0.9	9	3	0.9	0.0	0.0	6.0		6.0	D G	0.9		6.0	6.0 6.0
		200		2	5	2 0	o c		5			9 0				0.0	0.0		2 0	0.0
		20	namenterationalitates		2.0	ALC CONTRACTOR OF CONTRACTOR O			N.C.	and and a function of the	or a construction of the c		<b>3.0</b>			20			<b>8.6</b>	ne ne
		0	0°1.	ATTACK AND A TO A T	7-0	net.	0.50	0.5	0*1	nanan 2000. PSA	0.5	0°.	0%5	her Andreas Anna Anna Anna	191	ne: De:	U∎5.		780	0°C. 0°C
			2.0	100		1980	1.080	1900	OR%	1980	OBer.	280	080.	200	C. C. D.	0.0	100			
		20		100	7.00	08%	1.00	280	080	08%	7.60	OBe'.	000	2ac 08a	1.000	1.00	100		100	
boot 1		1.20	1.420	1.00	1050	1050	1.50	74 DD	200	2020	1250	250	0 Table	100 000	100	1.50	1,120		8 DC	
		0.50	10.5	000 086	C C C C C C C C C C C C C C C C C C C	280	280	280	186	986	98%	GRev.		76% GR	980	1.00	1.80		1.40	
cont 3		1.000	1980		0B°	dRe.	<b>QR</b> <sup>1</sup>	QR <sup>e</sup>	da.	GRe.	dR°'	CR <sup>1</sup>	08°'	10° 00°	- Bo	0.00	1.00		0.00	
		1.0	08°	CR <sup>0</sup>	0Re	280	CIR**	ORe.	280	GR?	0,8°	QRe.	98°.	24. 080	QR <sup>e</sup>	CIR-S	80		0 der	GRef. ORef.
ann River 1		0.0	5.0	, °0	1.0	200	0%		2 <sup>2</sup>	2		0.2		20 20		50	çč		200	
oon River 4			100	50	ŝ	0°,	ŝ	i de	5.0	je Je	÷.0	0.0	0°,	7e, 0e		5	ŝ			500 Tot
		1.0	1	j è	i i	-0°	i l	20		ž	0.57	10,	0.7				58		1	
		200					1000		200	1000	200		0 0/0			5	òŝ	ο.		
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Inc Run 5		814P	24 P	954D	84%	8476	9.5-D	64%	84%	97.4A	04.40	6479	84%	4.50 84.1	84%	84.2	84.2		84.49	6 84% 84%
ne Run 6		86%	86%	86%	86%	86%	86%	86%	86%	86%	86%	85%	86% 8	5% 86%	° 86%	86%	398		. 86%	. 86% 86%
Creek 1		93%	33%	33%	33%	93%	93%	93%	93%	93%	93%	93%	93% 6	3% 93%	93%	93%	93%		93%	93% 93%
L Creek 2		92%	92%	92%	92%	92%	92%	92%	92%	92%	92%	92%	92% 9	2% 92%	.25" 5	92%	92%		92%	92% 92%
I Creek 3		83%	9368	89%	89%	89%	89%	89%	89%	89%	89%	89%	89% 8	3% 83%	; 89%	89%	89%		89%	89% 89%
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mNa County 1			49.00	500 S	1°bb	200	3.99	1999	1000	dda	1995	"abb	6 200	abb sat		des	"abb		64%	5abb
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NS SO2 ENITED		2002	2008	buuc	2010	1100	2012	2013	2014	2015	2016	2017	2018	10 202	1000	2022	LCUC		FCUC	202 202
		B0C 2	B 200	7 580	7 7.05	E ODR	E EDB	6.466	5 REG	5 50B	statement and a state of the	2 844	700 51	60 E 71	E AAD	680	5 7 2 3		2615	5 615 5 78+
		15,080	13 808	14.475	15,853	6 195	764	766	2052	563	613	544	654 654	68 64	F75	600	674		505	505 708
		CAT 40	100 00	010 00	100,00	21801	• 676		1 745	020				52.0 · · · ·	000	100	100 +			
				21000	20,000	10.2	0.01		01.1	0.01	040'-		100			202,-	075.1			
ent 1 KU		4,548	2,586	5,461	5,446	5,440	5,455	144.0	4,738	562.6	662.6	0,340		5.34	4,813	5,386	5,373		5,418	5,418 5,435
1ent 2 KU		18,089	18,037	4,753	2,005	2,006	1,798	2,000	1,980	6/6'1	1,983	1,983	2962 - 11	80 1,99.	3 1,992	1,998	1,985		2,001	2,001 1,996
ent3 KU		5,768	2,202	2,231	1,998	2,223	2,229	2,212	2,175	2,145	2,143	1,917	149 2,1	67 2,16	2,171	2,183	2,183		1,967	1 1,967 2,194
ent 4 KU		19.134	4.600	2.177	2.174	2,171	2.177	2.167	2.146	1.902	2.125	2.137	120 2.1	32 2.14	7 2.145	1.925	2.152		2.157	2.157 2.157
aon Biver 3 KII		8.154	R 131	7,896	8.067	7.331	7.418	7.426	6.778	6.003	5,259	6.132	282 6(	33 4.95	5 590	4.784	4.019		4 826	4 826 4 862
		14 477	14 660	14 203	CEV 61	11 815	0 057	115 470	10.056	8008	8 603	1 2 2 2	£70	an 201	0 346	0.715	100 0		0.007	0.007 0.604
		11111	000'*1	007142	204/01			0/4/0	ano'n:	0100	0000			n/0 00	010'E	C1 / 0	100,0		100'5	+nc's (101's
Vrore 3 KU		2,770	3,208	3,472	2,956	11672	2,747	2,619	2,415	212/2	2,183	2,135	458 2.	31 2,24	9 2,427	5,329	2,329		2,243	2,243 2,473
ane Bun 4 LGE		5,146	5,119	5,131	4,995	4,229	4,678	4,576	4,313	3,835	3,848	4,152	1,655 4.2	93 4,31.	4 4,443	4,412	4.483		4,543	4,543 4,189
ane Run 5 LGE		5,191	4,475	5,058	4,889	4,562	4,278	4,369	3,886	3,150	3,632	3,908	.006 4,0	64 4,01	3 4,201	3,767	4,081		4,337	4,337 4,478
ane Run 6 LGE		6,810	6,900	6,098	6,662	6,409	6,372	6,286	5,681	5,141	5,003	5,886 5	,778 6,1	09 5.93-	4 6.086	6,305	5,565		6,500	6,500 6,597
II Creek 1 LGE		4,214	3,971	4,195	3,558	4,071	3,868	4.071	3,684	3,687	3,458	3,756	202 3.6	08 3,55.	7 3,861	3,690	3,897		3,723	3,723 4,002
ill Creek 2 LGE		4,733	5,050	4,666	4,478	4,567	4,821	4,473	4,610	4,014	4,157	3,624 4	224 4.1	57 4,32.	3 4,200	4,487	4,259		4,542	4,542 3,904
III Creek 3 LGE		9,012	9,580	9,006	9,551	8,275	9,573	8,982	9,415	8,841	9,356	9,865 5	,341 8,1	65 9,40.	3, 8,863	9,445	8,900		9,485	9,485 8,914
ill Creek 4 LGE		9,744	9,208	9,688	9,125	9,675	9.120	9,618	8,139	9,344	8,787	9.370 8	,750 9,2	97 8,830	7 9,425	8,203	9,443		8,952	8,952 9,496
mble County 1 LGE		843	929	517	926	850	929	850	925	849	927	778	925	149 926	1 850	926	850		626	929 778
timble County 2 KU		G	c	0	807	1.526	1.604	1.601	1.593	1.588	1.591	1.589	1.1 295	1.59,	1.599	1.594	1.601		1.606	1.606 1.598
					189	358	376	375	374	525	125	EZE	476	75	375	726	375		175	377 375
		-	>	5	601	000	010	5.5	* 50	200	0.0	0.0			0	10	D10		110	C/C //C
Terrisonori Jenoti enoiseines ar		175 761	168 071	140 820	141 718	104 404	RE AAR	87 877	82 603	018 02	3 VCC DL	2 686 83	585 821	38 B1 706	83.078	81 455	50 817		61 610	25 C 23 C 23 C 25 C 25 C 25 C 25 C 25 C
			(notion)			101100		100100									1000		71000	
11 FPA Allocated SO2 Allowances		83.343	83.343	83.343	36.746	36.746	36.745	36.746	36.746	25,759	25,759 2.	5 759 25	759 25.7	59 25.75	1 25.759	25.759	25.759		25.759	25.759 25.769
CE FPA Allocated SO2 Allowances		62.456	62.455	62.456	28.420	28.420	28.420	28.420	28,420	19.922	19.922	9.922	61 246	19.92	19.922	19.922	19.922		19.922	19.922 19.927
otal KU/LGE EPA Allocated SO2 Allowance	50	145.799	145.799	145,799	65,166	65,166	65.166	65.166	65.166	45,681	45,681 4	5,681 45	681 45.6	81 45,68	45,681	45,681	45.681		45.681	45.681 45.681
11/1 GF Extension		Ċ	C	Ö	0	c	0	0	0	0	0	0	0	0	0	0	o		0	0
				2	2															
(U's Portion of OMU Surplus/Shortfall		665	665	656	584	0	0	0	0	0	0	0	0	0	0	0	0		0	0
Combined Company Purchases		0	0	0	0	0	15,662	22,711	17,527	34,158	33,543 3	5,905 37	,004 36,4	\57 36,02;	792,397	35,775	35,136		37,931	37,931 38,404
ei .		0	0	0	0	o	0	0	0	0	0	0	0	0	0	0		0	0	0 0 0
		Anna -												-						
IT AL KULGE ALLOWANCES		146,464	146,789	146,455	65,750	65,166	80,828	87,877	82,693	79,839	79,224 8.	2,586 82	,685 82,1	38 81,70	5 83,078	81,456	80,817	~	7 83,612	7 83,612 84,085
Y Increase (+)/Decrease in Bank		-29,297	-12,141	5,635	-75,968	-39.238	-5,619	0	0	0	0	0	0	0	0	0	0		0	0
LOWANCE BANK In KI IR GE Allowance Bank (End of Year)	156.628	127,331	115,190	120.825	44,857	5,619								•						,
at the contract of the second se	analas:																			



# Case08- BR3 WFGD 2011

	FUEL SO2 Content (#/MBTU) Owner 2006	Brown 1 KU		Gharl 1 KU	Ghent 2 KU	Ghent 3 KU	Ghent 4 KU	Green River 3 kU	Green River 4 KU	Tyrone 3 KU	Cane Run 4 LGE	Cane Run 5 LGE	Cane Run 6 LGE	Mail Creek 1 LGE	Mill Creek 2 LGE		Wai Creek 4 Lot	Trimeted County 5 Kit Kit	Trimitia Countu 2 (GE	SCRUBBER REMOVAL EFF.	Brown 1	Grown 2		Gilers r	Chant 3	Ghant 4	Green Biner 1	Green River 4	Turne 3	Cane Bun 4	Cane Blue 5	Cane Run 6	Mill Creek 1	Mill Creek 2	Mil Creek 3	Mill Creek 4	Trimble County t	Trimble County 2	Trimble County 2	TONS SO2 EMITTED	Brown 1 KU	Brown 2 KU		Grent P KII	Ghent 3 KU	Ghent 4 KU	Green River 3 KU	Green River 4 KU	Tvrone 3 KU	Cane Run 4 LGE	Cane Run 5 LGE	Lane Hun b Lott Mail Crock 1 I GF	Mill Creek 2 LGE	Mill Croek 3 LGE	Mill Crock 4 LGE	Trimble County 1 LGE		SO2 EMISSIONS (TONS)	Total	ALLOWANCES	KU EPA Allocated SO2 Allowances 1 G# EPA Allocated SO2 Allowances	Total KU/LGE EPA Allocated SO2 Allowances	KU/LGE Extension	KU's Portion of OMU Surplus/Shortfall	Combined Company Purchases		TOTAL VILL OF ALL OWANDES
	2007	2.5	0,5	9 6	1.1	16.8	11	4.1	4.1	1.5	5.9	6.5	5.8	5.8	5 G	р 6	200		00		220	-20 	200	2.00 1.00	0.00	200°	2.0	0%	0.5	82%	84%	86%	33%	92%	89%	91%	39%	0%	20	2007	7,298	15,089	04/40	18.080	5.768	19,134	8,154	14,477	2,770	5,146	5,191	4 214	4,733	9,012	9,744	599		>	175,761	010 00	63,243 62,456	145,799	0	665 2	00		146.464
	2008	2.5	0 U 0 U	3 5	57	5.8	14.8	4.1	4.1	1.4	5.8	5.3	5.8	5.5	8, S	2 G	5 C		00		0%	50			C.B.C.	2,00			5	82%	84%	86%	5365	92%	89%	91%	36%	%0	0.0	2008	8,209	13,808	107'55	000°C	2.202	4,600	B,131	14,658	3.208	5,119	4,475	145.6	5,050	9,580	9,208	ξ, c		>	158,931		62,456	145,799	0	066	0 0	-	146,789
	2009	2.5	0 F	93	16.7	6.5	5.9	4.1	4.1	4.1	5.8	5.8	5.9	5,5	10 U	ອ ຄ	n u	88	00	Sector Manual Control	°%0	5		1.680	2940	1.000		0%	-0 	82%	84%	86°.	2365	92%	89%	91%	26%	%0	%0	2009	7,580	14,425	21200	10410	2.231	2.177	7,896	14,293	3,472	5,131	5,058	0,030 4,195	4,666	9,006	9,688	<i>E</i> //		>	140,820	070 00	63,243 62 456	145,799	0	656	00		146,455
	2010	2.8	1.2	0.5		8	5.9	4.1	4.1	1.5	5.8	5.8	8.2	5.8	19 (C	ה ת ה	, u 1 1	0.0	6.5		%0	°.5	°:0	0.05 0.05	2000	2001 000	2.00	0.5	0.5	82%	84%	86%	93%	92%	89%	91%	5355	98%	98%	2010	7,725	15,851	200'00	2005	1.998	2,174	8,067	13,432	2,958	4,995	4,889	3,558	4,478	9,551	9,125	476 208		50	141,718	26.745	28.420	65,166	0	584	00	-	65.750
	2011	28	0.7			8.5	5.9	4.1	4.1	1.4	5.8	5.8	5.9	8.0	n n	ייי	0,0		C,		°0	*10 C	, au	7.80	000 1080			0%0	50	82%	84%	86%	33%	92%	89%	91%	565	98%	98%	2011	6,953	14,419	CC0'71	900 C	2,222	2.171	7,322	11,984	3,004	4.318	4,624	4.070	4,569	8,274	9,673	1 575	02C,1	0000	113,080	27 1 20	28,420	65,166	0	0	3,057 0	-	68.223
	2012	2.7	1.2		, 0 , 0	1 0	5.3	4.1	4.1	1.5	5.8	5.2	8.2	5.8	10 C	ה ה ה	000		U V		\$50	50	207	1.40	2940	2000 1980		50	5.U	82%	84%	999	200	92.	89%	91%	366	%85	98%	2012	6,659	13,298	507'''	H04 1	2.228	2.176	585.7	10,254	2,786	4,810	4,502	3,867	4,822	9,570	9,114	25	1,504	0/0	99,822	24 - 26	28,420	65,166	•	0.11	34,656		CC8 00
SO <sub>2</sub> SUM	201		ง่น	ó ư	i u	i uni		4.	4	-	ŝ	ŝ	uñ I	i î	d i	กับ	'nu	d v	ſ		0	58	507		ο α 1 σ	20	ç ĉ	0	ĉ	58	849	A6°	69	626	89%	919		986	585	201	6,52	13,42		7 0 7 0	2.21	191	104,7	11,84	2,86	4,71	63°4	4.05	4,49	8,97	9,61		100,1		101,50	4F 10	1.1.02 1.4.92	65, 16	-		36,34		101 ED1
MARY BY	3 201	8			1 ŭ		6 2'	4	4	2	8	5.1										->		• • •			, -		0.0	82.	84.	. RG	100	923	.88	919	-666 ;	, 28°	. 98	3 201	5,918	1 12,54	10/1 1		2.17	2,14	5 6,729	B 10,35-	8 2,48(	3 4,420	4,080	3670	4,61	9,40	a,130		1,22 I		85,333		1, 00 1, 00	65,166			30,167		100 100
YEAR	1 2015	50					3.5.6	4.1	1.4.1		5.6	5.5	5.6	22							10 10	5							6	82%	84%	86%	55	92%	89%	91%	366	385	386°	2015	3 5,550	10,307	2/0'1 I	525 F	2.147	1.902	5,927	9,200	0 2,258	4,045	3,316	3689	4,018	9,833	9,341	049 4	/90'1		1 90,278		co//c7 0	45,681	0	0 12	44,597		0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
	2016	2.8	Ňŭ			2.0	5.8	4.1	4.1		, S	5.8	5	u)		, i i	, u , u				50°	5	100	100		1980		20	20	82%	144 174	86°	69	92%	89%	91%	366	38%	386	2016	5,550	11,275	549,1	00210	2.142	2.124	5,199	8,849	2.224	4,065	3,834	3.461	4.17	9.351	8,776	126	022,1	510	90,637	016 16	ee /'ez	45,681	0	0.2	44,956	-	
	2017	2.7	N U		0.0	2.8	5.8	4.1	4.1	1.4	- 27	5.9	5.9	65	5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	200	200		50		%0	50 C		1,00	1.80	1,40			, Second	82%	84°	Rev.	366	92%	935%	91%	%66	98%	98%	2017	+ 5,887	11,886	226,1	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1.921	2.136	6,116	9,834	2,224	4,344	4,120	5753	3,621	8.859	9,361	R//	UK5'I	5,5	94,588	01.200	19.927	45,681	0	0	48,907		001 00
	2018	2.8		t at or		, 10 10	5.8	4.1	4.1	1.5	5.8	5.8	5.8	5.8	aç u	n i	000	0.0	05	<b>.</b>	0 <sup>%</sup>	5	207	00.02	280	1.00	2.00	0.57	0.5	82%	84%	R6%	2365	92%	89%	91%	33%	98% 98%	38%	2018	5,843	11,862	505'I	1084	2.147	2.118	6.264	9,933	2,478	3,927	4,197	010/0 10/0	4,226	9,334	8,743	925	455,F	470	94,799	011-10	CCD 01	45,681	0	0	49,118		002.00
	2019	2.7	n N N	4 5 8 5		9 9	5.8	4.1	4.1	1.5	5,9	5.8	5.9	5.8	הי הי	6 G	ה ה ה	0.0	Ū		°%D	* D	202	*.nn	200	2,90	1.00	2.0	50	82°"	84%	HG°,	63%	92%	89%	91%	93%	38%	585	2019	5,928	12,233	11/1	020'0	2.165	2.131	6,010	8,557	2,542	4,515	4,222	3,811	4,170	8,163	962'6	849 1 EDD	1,255	C/D	94,252	014 10	20,102	45,681	0	i °	48,571		0.000
	2020	2.7	0.0	t ad D ur		, e,	5.8	4.1	4.1	1,4	Ω Ω	5,9	5.8	ο Ω	a) u M	n ( 1	2 G	204	0.5		0%?	5		1,000	1.80	1.90		200		82%	R4%	R6°	1.25	92%	89%	91%	93%	98°,	38%	2020	5,763	11,591 1	1,003	500°	2.158	2,145	4,976	8,910	2,258	4,427	4,200	2,2,2	4,327	9.399	8,823	826	185,1	6/6	93,268 9		2 Kc/,c2 10 Q22	45,681 4	0	0	47,587 4		
	2021 2	2.7		t o		99	5.9	4.1	4.1	1.5	5.9	5.9	5.8	5.9	5,0	2.0	קינ				0%	5			1.000	2000	201	35	ŝ		Bd%	BFer	225	92%	89%	91%	33%	98%	38%	2021 2	5.499 5.	2,046 11.		4,810 0.84	02120	2,145	5,569 4	9,530 8.	2,437 2.	4,528 4.	4,337 3,	0,13d 0, 3,864 3	4,202 4	8,861 9,	9,423 8,	, 850 ,	1 225	6/6	4,960 92,		5,755 Eq.	5,681 45	0	0	9,279 46, 0 46,	,	
	022 20:	27		: 0 : 0	6 9 6 9 6 9	28.2	5.8	4.1	4.1 4	4.1	5.8 5.8	5.8	5.8	8.9	8 G	5.0	5 C			, 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997	02%		10% 20 20	00 00 00 00 00 00 00 00 00 00 00 00 00	10,00	28°.				22°	10 X 10	Res. RE	13% 93	32% 92	68 %58	91% 91	33%° 33	38% 38	38%	022 20:	750 5,78	010 11,8	211 1/2 200	5°5 505	182 2.1	925 2.1	749 4.0	906 8,52	314 2,30	501 4,5	859 4,26	331 2,21 686 2,31	490 4.27	440 8,90	198 9,4	3729	10,1 dec		247 92,52		759 107 20°C	681 45,61	0	0	566 46.8 <sup>,</sup>		
	23 202	18		, o	6 v		5	4	4	-1 -1	-5 -5	15 15	5	8		5 i 5 i	20				% 03		286 g	105	- 000			55	5.6			are are			,68 3	°,	% 86°	." 98°	.86 .86	23 202	32 5,67	12,09	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	1400	1961	2.151	4.75	24 9,24	53 2,27	26 4,64	E4.4 00	104'9 15 162'E UV	454	00 9,48	37 8.94	0.00	1,601 76	5	24 95,411	-	10 22 25 CO	31 45,68	0	0	13 49,73		
	4 2025	8 2.7		+ 0 0 4	n a n a n a		5.8	4.1	1 4.1	1.5	9 5.9	5,5,5,9	5.8	9 5.8	6,5 6,5 6,5	6, c					°.0		5,9,5 ,	5,050 v		000				82%	1.448	BRE	132	92%				98%		\$ 2025	7 5,840	3 12,208	1,988		194	2157	4.844	3 9,780	7 2,511	7 4,216	9 4,560	6,6U4	3,906	2 8,915	9,498 19,498	8/1 ,	555° 1.559	6/6	5 96,077		500 bl 0	45,681	0	0	4 50,396 0		
	2026	2.8		† 8 0 v	o a n u	6.5	5,8	4.1	4,1	1.4	6.3	5.9	5.8	5.8	6,3	5.9	6 S	0.0			0°°	0.25	195	20,02	a, 015	100	ŝ	2 2 2		1.008	07 70 B 49.7	BR°.	1.00	126	89%	216	39%	1.186	98 <sup>°</sup> .	2026	5,590	11,585	1,613	287.c	2140	2133	4,459	6.250	2,125	4,432	4,272	3 204	4.319	9,333	8,694	926	1,598	5/5	90,423		407,62 70 PT	45,681	0	0	44,742		
	202	2.7	N C	4 0 0 4	η α n ư		6.5	4.1	4.1	1.4	5.9	5.8	5.9	5.8	6 G G	2.9	0,0 0,0			<b>}</b>	0°,	6.0	5.96 1	20.05	000 N	* on	20.0	2.0	2	200	1978	1628	1.000	126	8 <u>9</u> %		39%	98%	386	2027	5,027	10,288	4.5	077.9	300.0	2 102	3,140	6.708	1,935	3,968	3,851	5,813	3,961	8.033	9,079	848	1,593	4/5	86,681		40/'SZ	45,681	0	0	41,000	, 	86.681



# Case09- Walk Away (with Env Dispatch)

FUEL SO2 Content (#MBTU) Owner	2006	2007	2003	2009	2010	2011	SO 2012		3Υ ΒΥ ΥΕ 2014	AR 2015	2016	2017	2018	2019 20	20 202	1 2022	2023	2024	2025	2026	
Rown 1 Kill	somered i canonaria	25	2.5	25	2.8	2.8	27	2.8	2.8	28	2.7	2.8	2.8	2.8	27 2.	58	3 2.8	2.7	2.7	2	~
Brown 2 Kil		1	25	25	2.7	27	58	2.7	2.8	2.7	2.8	2.8	2.7	2.8	2.8 2.	8 2.7	7 2.7	2.7	2.8	2.8	
Brown 2 KU		55	25	25	2.8	27	28	2.8	2.7	2.8	2.8	2.7	2.7	2.8	27 22	2.8	3 2.7	28	2.8	ស៊ីរ	~
Ghent 1 KU		5.8	5.9	5.8	9.5	8.5	5.8	5.9	5.8	5.8	ត ភូមិ ភូមិ	en o La la	oj u N	۵. ۵.	añ v an c	ດ ທີ່ ຄ	8.5	5, c	8 G	กัน	<b>m</b> c
Ghent 2 KU		1.1	21	16.7	6.5	n, i	80 G	8.0 8.0	ק הי	5	n c n i	0 0 0	2.0	ក្ដ	5 v 5 v	n u n u	0,00	0 a	n u n	n u	n a
Ghent3 KU		16.8	5.5 8 4 4	ο Γ	α n u	n a n v	0 0 0 0	, u 1 1 1	h ci	8.5	u u U ad	5	o G	50	՝ տ՝ Դոր	9.6	, 10 10 10	5.8	293	່ທ່	0
Green 4 NU		2	14	14	1.4	4.1	14	4.1	4	1.4	1.4	4	4.1	4,1	4.1	4.1	4.1	4.1	4.1	4	-
Green River 4 KU		4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1 4.	1 4.1	1 4.1	4.1	4.1	4	-
Tyrone 3 KU		t.5	1.4	1.4	1.5	1.5	1.4	15	1.5	1.5	4	51	4	4		4	4 I	r, r	4 1 1	- 1	च र
Cane Run 4 LGE		5.9	5.8	5.8	5.8	5.9 1	th d La i	5.8	ອ ທີ່ເ	<i>n</i> 0	n c n c	n n n	19 C	0 0	កំ។ ភ្ល		0 0 0 4	n u		ń v	n n
Cane Run 5 LGE		5.5	יי מיל	10 C	n n n	0 0 ñ v	n a n	n a n v		0 10	n a h ut	5	2.0	50	5 ¥1 5 40		1 80	5 0	5.8	5.0	
		9 K	20	20	8.5	9 K	6.5	5.8	5.9	5.9	5,5	5.8	5.9	5.8	5.9 5.	B 5.B	5.8	5.9	5.8	5.8	
Mill Cross 2 FGE			5.8	5.8	5.8	0,2	5.8	5.9	5.8	5.9	5.8	5.8	5.8	5.9	5.8 5.	8 5.8	в 5.8	5.9	5.9	5.8	
Mill Cronk 3 LGE		6.5	5.8	5.8	5.9	5.8	5.8	5.9	5.9	5.8	5.8	5.9	5.8	5.8	5.8	8 5.9	9 5.8	5.8	5.8	5.8	
Mit Creak 4 LGE		8.5	8,5	5,8	5.9	5,9	5.9	5.8	5.8	5.8	5.9	5.9	5,9	5.8	5.9 5.	9 5.9	9 5.8	5.8	5.8	5.8	
Timble County 1 LGE		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0 6.	0 6.0	0 6.0	6.0	6.0	6.0	
Trimble County 2 IOU		0.0	0.0	0.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	50	220	0 5.0	5.0	5.0	2.0	
Trimble County 2 LGE		0.0	0.0	0.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	0.5.0	0.5.0	0.0	0.5	D.C	. 1
SCRUBBER REMOVAL EFF.																					
Brown 1		0%	%0	%0	%0	50	5	0%	%0 0	°°	%0	50	%0	50	5			5	5	5 è	
Brown 2		0%	%D	%D	%0	°.0	°.0	°,0	°,0	51	s 1		2.0	200		• ·		2	5	òò	
Brown 3		%0	°°	3°,	%0	%0	0°%	0%	6	20	30 G	200			Ter Orio	• • • •	• <u>•</u> ••••••••••••••••••••••••••••••••••	1000	250	ů	
Ghent 1		35%	15%	95%	295 65	%55 5	2, C2	4.07 100	810D	4, D.D.	97.CG		a/ CC			100	0000	1.020	10,00	200	
Ghent 2		676 2000	1000		0,000	200	8° 00	200	100	1.00	1980	GR.	29,80	d He'	8%, OR	280	280	28%	08%	986	
Ghent 3		2G 22	1.05	1000	0.00	0.00	e, 00	2000	200	OBar.	100	190	0.00	2.40	200 708	en p	1.80	08%	CAR"	0Be	
Ghent 4		5	100	- 05 -	20.00	e, DD	e' 00	200	ŝ,	200	200		1.00			6	0.5	50	0	.0	
Green River 3		5	5		e 10	5	200	e è	e , e	e e		200	2.0					50	0.5	20	
Green River 4		50	5	5	5	5	ŝ	0.00	200	ŝè	ŝ	202	2	2.5				250	2°0	9	
Tyrone 3		2.0	5	-	1000		0 - C	2.0 2.0	, or o	1.000	0 %	10°C	20CB	8.2°2	2.6	200		82%	R2°,	82%	
Cane Run 4		97.79	95.29	279	200	170	4.70	0, 00	07.70	5	0.420	1040	0.20	7.478	40° 84°	Seden 2	JAVE J	A SA	PAPE	84%	
Cane Run 5		84%	8475	84.5	e: #0	0.450	o: +0		e. + 0	e, to	200	200	0.00					ae.		REP	
Cane Run 6		86%	86%	86%	80.00	80%°	00.00	00.50	200		00.00	e, D0	100						100		
Mil Creek 1		93%	33%	33%	33%	°'£5	93%	93.56	9105	200	202	500	0.00	e. 26	0.0			2.20	0.00	38	ε.
Mill Creek 2		92%	92%	92%	92%	92%	92%	92%	32%	526	32%	92%	92%	85.0	26 82	25	9.7E	275	8-2F	j,	e,
Mill Creek 3		89%	89%	89%	89%	568	89%	89%	89%	89%	% <b>5</b> 8	86%	83%	83%	9.2	60	a 89°a	5, FB	63.49	201	.e.
Mill Crook 4		91%	91%	91%	91%	91%	61%	91%	91%	91%	91%	91%	91%	91% 9	12 91	10	91%	91%	91%	6	2
Timble Courts 1		100	1900	100	566	a, 66	56°5°	99%	93%	33%	33%	39%	%65	6 %66	926 932	366	° 66.	:'66	%66	6	۶¢
		1.00	10.5		9.95	1.986	38%	38%	38%	98%	98%	98%	98%	98% 9	8% 38		á 98%	58%	98%	98,	
					38%	38%	<u>9</u> 8%	98%	98%	98%	38%	98%	98%	98% 9	8% 38	is 987	á 98%	98%	38%	386	
		2002	2008	PNAC	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019 24	120 202	1 202	2 2023	2024	2025	2026	
<ol> <li>Control and the second state of t</li></ol>		7 208	R 209	7 530	7.725	7.384	7.241	7.184	6.388	5,661	5,668	6,056	6.025 6	.088 5.1	391 5,62	1 5,885	8 5,921	5,849	6,066	5,775	
		15 080	13 808	14 425	15,851	15.457	14.955	15.256	13,962	10,939	12,053	12,815	12,806 12	12.1	229 12,74	8 11,675	5 12,549	12,847	13,047	12,259	
Brown 2 KII		34.743	35,261	33.912	36,882	35,080	30,477	34,928	32,045	35,690	35,573	36,762	36,512 32	1330 35,1	376 36,45	2 35,915	5 35,065	35,444	35,354	29,746	
		4548	5 5.86	5.461	5.445	5.439	5.453	5.436	4.759	5,267	5.213	5,349	5.314 5	321 5,	340 4,80	4 5,378	8 5,364	5,409	5,434	5,282	
Chost 2 KII		PRO RI	18.037	4.753	2,005	2.005	767.1	1,998	1,979	1,977	1,979	1,971	1,981	.778 1.1	39.3 1,95	0 1,996	6 1,984	1,999	1,995	1,750	
Chant 2 Mil		5 768	202	166 6	1.998	1222	2.227	2.211	2,173	2.144	2,139	1,920	2.140	2,165 2,	149 2,16	8 2,185	5 2,177	1,965	2,191	2,138	
		194	4600	2177	2.174	2 170	2.175	2,164	2.144	1.899	2.125	2,133	2,119	2,130 2,	143 2,14	3 1,920	3 2,149	2,154	2,154	2,132	
		101,01	1000,4	7 806	R 067	7 345	7.388	7.405	6.683	5,855	5,196	6.106	6.263	.006 4.	356 5.55	4,740	0 4.066	4,750	4,839	4,459	
		14 477	14 658	502 11	13 432	10 01	11.226	12.791	11.306	9,699	9.334	10.550	10.567 8	.979 9.	10.01 10.01	6 9,275	9 9,022	9,731	10,278	6,707	
				0000	000 0	9108	0 0 1 0	2 008	2 602	2 335	2 281	2,305	2541	625 2	232 2.55	1 2.39	1 2.430	2.363	2.620	2.223	
Lyrone 3 AU		5110	5 110	5 121	4 995	4439	4.946	4.876	4.669	4.395	4.370	4.584	4,129	1,717 4,1	60 4,75	6 4,700	3 4,717	4,816	4,292	4,635	
		101.7	4475	5.058	4,689	4.759	4.725	4,778	4,355	3,707	4.211	4,399	4,486	467 4,	122 4,56	3 4.02	7 4,484	4,631	4,681	4,393	
		6 810	6 900	6.098	6.662	6.485	6.511	6,447	5,862	5,534	5,215	6,097	5,966 6	i,208 6.(	389 6.26	6 6,419	9 5,678	6,518	6,637	6,094	
		4 214	3.971	4,195	3.558	4.063	3.861	4,067	3,676	3,709	3,475	3,765	3,191 3	1,817 3,1	571 3,87	5 3,69,	4 3,882	3.718	3,994	3,296	
Mill Croek 2 LGE		4,733	5,050	4,666	4,478	4,568	4,836	4,497	4,614	4,060	4,242	3,725	4,325	1,201 4,	349 4,15	3 4,52(	0 4,274	4,554	3,923	4,326	
Mill Crook 3 (GE		9.012	9.580	9.006	9.551	8.268	9,563	8.976	9.391	8,813	9,331	8,843	9,281 6	3,154 9,	387 8,85	0 9,42	4 8,869	9.475	8,907	9,323	
		9 7 44	9.208	9.688	9.125	9.664	9.104	9,602	8,117	9,315	8,761	9,348	8,736	,386 8,	310 9,41	2 8,19(	0 9,427	8,934	9,488	8,681	
Trimba Country 1		843	626	677	926	850	928	850	925	848	925	111	925	849	328 85	0 926	6 850	929	11	926	
Trimble County -			0	c	807	1.525	1.603	1,599	1,593	1,586	1,589	1,588	1,593	1,11,11,11,11,11,11,11,11,11,11,11,11,1	501 1,55	8 1,59	5 1,600	1,606	1,599	1,597	
Tembo County 2					189	358	376	375	374	372	373	373	374	375	376 37	5 37.	4 375	377	375	375	
		•	,	,	1																
Total		175.761	158,931	140,820	141,718	138,108	132,305	138,435	129,100	126,377	126,648	132,075 1	31,867 126	5,701 128,	514 131,42	9 127,89	5 127,553	130,740	131,319	120,251	
ALL DWANCES																					
KU EPA Allocated SO2 Allowances		83,343	83,343	83,343	36,746	36,746	36,746	36,746	36,746	25,759	25,759	25,759	26,759 25	5,759 25,	759 25,75	9 25,75	9 25,759	25,759	25,759	25,759	
LGE EPA Allocated SO2 Allowances		62.456	62.456	62.456	28.420	28.420	28.420	28.420	28.420	19.922	19.922	19.922	1 225 61	T 2251	FFT 228	28.81	22561 2	726'61	19.92	19.92	
Total KU/LGE EPA Allocated SO2 Allowances		145,799	145,799	145,799	65,166	65,166	65,166	65,166	65,166	45,681	45,681	45,681	45,681 45	5,681 45,	581 45,62	11 45,68	45,681	45,681	45.681	45,681	
KU/LGE Extension		0	0	0	0	0	0	•	0	0	0	0	0	0	0	0	0	0	0	0	
KI Pe Dortion of OMU Sumbre/Shortfall		565	066	656	584	0	0	0	0	0	0	0	0	0	0	0	0	0	0	•	
Combined Company Burchases		2	0	0	•	28.085	67,139	73,269	63,934	80,696	80,967	86,394	86,186 81	1,020 82,	933 85.74	82.21	4 81,872	85,059	85,638	74,570	
Collionico Collipariy Fulcitadea					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
TOTAL KURGE ALLOWANCES		146,464	146,789	146,455	65,750	93,251	132,305	138,435	129,100	126,377	126,648	132,075 1	31,867 126	5,701 128,	514 131,45 °	127,89	5 127,553	130,740	131,319	120,251	
EOY Increase (+)/Decrease in Bank		-29,297	-12,141	5,635	-75,968	-44,857	0	•	0	5	>	0	5	>	0	5	2	>	>	•	
ALLOWANCE BANK Total KUN GE Allowance Bank (End of Year)	156.628	127,331	115,190	120,825	44,857				,	,	,	,			•	'	,	•			



SO<sub>2</sub> Compliance Strategy

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E. W. Brown FGD









 Higher SO, market prices make physical compliance (FGDs) more favorable than financial compliance (purchasing allowances)

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# Significant Changes: Near-Term Increase in Fuel Price Gap

Fuel Price Gap Between Low and High Sulfur Coal at Brown (2004 ECR Filing vs. Current Forecast)

- ... Fuel Cost Gap (cents/MBtu) 60 50 10 C through 2012 for low sulfur Price increase forecasted coal (currently burned at utilities construct FGDs increased demand as E.W. Brown) with
  - High sulfur coal becomes more attractive
- **SZ0**Z \$202 £202 Increased savings of 10-20 cents/mmBtu as FGD allows E.W. Brown to 7707 1707 0202 6107 8107 *L*107 9107 \$107 \$107 £10Z 2102 1107 0107 6007 8007 2007

switch from low to high sulfur coal



# Significant Changes: Increase in Capital Costs Increase in estimates for E.W. Brown FGD

\$234.2 M	<u>358.6</u>	124.4
2004 Filing	Current Estimate	Capital Increase

# Most significant changes

\$70M	11	her 13
Ductwork & Fans	Market Impacts	Scope Refinements & Ot

# • Key drivers

- Market prices for materials, equipment, labor
- Scope increase for ductwork routing



# Increase in Capital Costs: Ductwork & Fans – Units 1 & 2



						the		h h i h	
Least-Cost Pla	1	ıtinu	les t(	0 inc			scrul		Q Q M
E.W. Brown U	Jnits 1	P P	200						
<ul> <li>\$23.9M (PVRR) Is</li> </ul>	ess than	the ne	ext bes	t alter	native	(physic	sal con	nplianc	(əc
<ul> <li>\$93.6M less than</li> </ul>	i the "W	alk-Aw	'ay″ Ca.	se (fin	ancial	compli	ance)		
Case Summ	ary (Prodi (Assuming: Ba:	uction a se Capital Co	orthe Allov	Vances X & SO2 Em	Costs e	<b>stimatec</b> Forecasts)	d thru 2	027)	
ALL CASES COMPARED TO Base Case-	Constructing Bi	rown 123 FG	D for 2009 In-	Service	1000				
		NOX Allowance	SO2 Allowance			Incremental Cost over	First Year of SO <sub>2</sub> Allowance	First Year of NO <sub>x</sub> Allowance	Total SO2 Allowances
Case	Production Cost	Cost	Cost	Capital Cost	Total PVRR	Base	Purchase	Purchase	Purchased
Base Case- BR123 WFGD 2009	14,800,304	75,816	114,287	576,240	15,566,648	Base	2018	2009	298,138
Case01- BR23 WFGD 2009	14,796,732	70,884	161,527	561,487	15,590,630	23,982	2016	2009	414,006
Case02- BR3 WFGD 2009	14,791,936	70,053	253,703	509,542	15,625,235	58,587	2014	2009	640,107
Case03- BR123 WFGD 2010	14,802,114	75,331	140,589	611,761 500,404	15,629,795 15,629,795	63,147	5010	6002	359,122
Case04- BR23 WFGD 2010 Case00- Walk Away (with Eny Dispatch)	14,800,106 14,845.387	73.303	523.155	218.376	15,650,752 15,660,222	88,104 93,574	2014	2009	1,299,119
Case05- BR3 WFGD 2010	14,796,247	69,784	270,095	548,302	15,684,428	117,780	2013	2009	678,411
Case06- BR123 WFGD 2011	14,802,973	74,416	166,035	670,020	15,713,444	146,796	2012	2009	417,959
Case07- BR23 WFGD 2011	14,801,427	70,053	207,009	638,234	15,716,723	150,075	2012	2009	518,880
Case08- BR3 WFGD 2011	14,798,973	69,197	287,087	582,204	15,737,461	170,813	2011	2009	716,517



# Least-Cost Plan:

# Delays exposure to S0<sub>2</sub> allowance market

Compared to 2<sup>nd</sup> Least-Cost Plan:

- Delays bank depletion 2 years
  - Requires purchase of 116,000 fewer allowances

Compared to Walk-Away:

- Delays bank depletion 7 years
- Requires purchase of 1.0 million fewer allowances





 Increase typical residential customers' bills (1000 kwh/month) by \$0.91/month with a 1.51% increase in ECR factor at the time of in-service



# Combined Company SO<sub>2</sub> Compliance Strategy

- Continue with the construction of a single FGD for E.W. Brown 1, 2 and 3 in 2009
- Purchase SO<sub>2</sub> allowances on an as-needed basis
- Continue the practice of environmental dispatching
- Evaluate additional environmental technologies for existing generating assets

# COMMONWEALTH OF KENTUCKY PUBLIC SERVICE COMMISSION

April 26, 2007

# 10: 00 a.m. Commission Offices

Commission Staff Meeting with LG&E to hear its update on Brown flue gas desulfurization.

Name	Company
ISAAC SCOTT	PSC - Financial Analysis
ANITA Mutchell	PSC-Legal
Lawy Coote	AG
David Samford	PSC-Legal
Kulil R Mini	SKO LUTT (KU
JOHN P. Malley	KU
KENI BLAKE	KU
Fereydoon Gorjian	PSC-Electric Branch
Mike Kurtz	KIUC
andrea Schoeder	PSC-Commission Operations