

## **Appendix A – CORMIX Modeling Results**

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Table A-1. Summary of CORMIX Model Results

Plant	Case	Month	Ambient River Conditions		Blowdown Conditions		Conditions at Edge of Mixing Zone			
			Flow	Temp	Discharge	Temp	Temp	Temp Rise	Plume Width	Plume Thickness
			(cfs)	(°F)	(cfs)	(°F)	(°F)	(°F)	(feet)	(feet)
<b>36-inch Diameter, 45-foot Long Diffuser Pipe</b>										
B&W	1	March	3130	41.0	50	86.4	43.2	2.2	246	8
B&W	2	April	190	52.0	50	90.4	53.9	1.9	249	8
B&W	3	July	3760	89.5	50	97.7	89.9	0.4	193	10
B&W	4	March	-9160 <sup>(1)</sup>	41.0	50	86.4	44.4	3.4	343	9
AP 1000	1	March	3130	41.0	18	86.4	43.1	2.1	444	4
AP 1000	2	April	190	52.0	18	90.4	53.9	1.9	424	5
AP 1000	3	July	3760	89.5	18	97.7	89.9	0.4	337	5
AP 1000	4	March	-9160 <sup>(1)</sup>	41.0	18	86.4	42.4	1.4	348	7
<b>42-inch Diameter, 75-foot Long Diffuser Pipe</b>										
B&W	1	March	3130	41.0	50	86.4	43.6	2.6	368	6
B&W	2	April	190	52.0	50	90.4	54.3	2.3	356	7
B&W	3	July	3760	89.5	50	97.7	90.0	0.5	286	8
B&W	4	March	-9160 <sup>(1)</sup>	41.0	50	86.4	43.3	2.3	442	10
AP 1000	1	March <sup>(2)</sup>	3130	41.0	18	86.4	43.5	2.5	758	3
AP 1000	2	April	190	52.0	18	90.4	54.3	2.3	625	4
AP 1000	3	July	3760	89.5	18	97.7	89.8	0.3	632	7
AP 1000	4	March	-9160 <sup>(1)</sup>	41.0	18	86.4	42.0	1.0	375	10

Notes: (1) Reverse river flow with diffuser ports pointing vertically upward

**Table A-2. Summary of 1999 Guntersville Reservoir Model Results<sup>1</sup>**

Parameter (Units)	Upstream of Widow's Creek Intake TRM 409.5 - 410.7			Upstream of Bellefonte Intake TRM 393.0 - 393.9			Downstream of Bellefonte Discharge TRM 389.0 - 390.0			Guntersville Forebay TRM 349.8 - 350.5		
	Max. Day <sup>3</sup>	April-Sept. Mean <sup>4</sup>	July-Aug. Mean <sup>4</sup>	Max. Day	April-Sept. Mean	July-Aug. Mean	Max. Day	April-Sept. Mean	July-Aug. Mean	Max. Day	April-Sept. Mean	July-Aug. Mean
Temperature (°F) <sup>2</sup>												
Reference	85.4	76.6	83.0	86.5	77.0	83.4	86.5	77.1	83.5	89.4	77.9	85.3
Base	85.4	76.6	83.0	87.9	78.5	84.4	87.6	78.5	84.5	89.5	78.1	85.6
B&W	85.4	76.6	83.0	88.0	78.5	84.4	87.6	78.5	84.5	89.6	78.1	85.6
AP 1000	85.4	76.6	83.0	88.0	78.5	84.4	87.6	78.5	84.5	89.6	78.1	85.6
Dissolved Oxygen (mg/L) <sup>2</sup>	Min. Day <sup>5</sup>	April-Sept. Mean	July-Aug. Mean	Min. Day	April-Sept. Mean	July-Aug. Mean	Min. Day	April-Sept. Mean	July-Aug. Mean	Min. Day	April-Sept. Mean	July-Aug. Mean
Reference	5.3	6.8	6.0	5.2	6.7	5.9	5.2	6.7	5.9	6.5	8.8	8.2
Base	5.3	6.8	6.0	5.2	6.6	5.9	5.2	6.6	5.9	6.5	8.8	8.0
B&W	5.3	6.8	6.0	5.2	6.6	5.9	5.2	6.6	5.9	6.5	8.8	8.0
AP 1000	5.3	6.8	6.0	5.2	6.6	5.9	5.2	6.6	5.9	6.4	8.8	8.0
Algae Biomass (mg/L) <sup>2</sup>	Max. Day	April-Sept. Mean	July-Aug. Mean	Max. Day	April-Sept. Mean	July-Aug. Mean	Max. Day	April-Sept. Mean	July-Aug. Mean	Max. Day	April-Sept. Mean	July-Aug. Mean
Reference	0.1	0.0	0.0	0.6	0.1	0.1	0.6	0.1	0.1	3.5	2.2	2.1
Base	0.1	0.0	0.0	0.6	0.1	0.1	0.5	0.1	0.1	3.6	2.1	2.0
B&W	0.1	0.0	0.0	0.6	0.1	0.1	0.5	0.1	0.1	3.6	2.1	2.0
AP 1000	0.1	0.0	0.0	0.6	0.1	0.1	0.5	0.1	0.1	3.6	2.1	2.0

<sup>1</sup>All values in table are from model simulation results and are based on the 6-hour model output for the parameter indicated.

<sup>2</sup>All values are based on model results at the 5-foot depth

<sup>3</sup>Max day is the maximum daily value for the entire year

<sup>4</sup>Mean is the average of the 6-hour model outputs over the designated time period

<sup>5</sup>Min. day is the minimum daily value for the entire year

**Table A-3. Summary of 2007 Guntersville Reservoir Model Results<sup>1</sup>**

Parameter (Units)	Upstream of Widow's Creek Intake TRM 409.5 - 410.7			Upstream of Bellefonte Intake TRM 393.0 - 393.9			Downstream of Bellefonte Discharge TRM 389.0 - 390.0			Guntersville Forebay TRM 349.8 - 350.5		
	Max. Day <sup>3</sup>	April-Sept. Mean <sup>4</sup>	July-Aug. Mean <sup>4</sup>	Max. Day	April-Sept. Mean	July-Aug. Mean	Max. Day	April-Sept. Mean	July-Aug. Mean	Max. Day	April-Sept. Mean	July-Aug. Mean
Temperature (°C) <sup>2</sup>	86.5	77.0	83.8	86.9	77.4	84.2	87.2	77.5	84.4	88.5	78.4	85.5
Reference	86.5	77.0	83.8	86.9	77.4	84.2	87.2	77.5	84.4	88.5	78.4	85.5
Base	86.5	77.0	83.8	88.4	79.0	85.6	88.3	79.0	85.7	88.6	78.5	85.7
B&W	86.5	77.0	83.8	88.4	79.0	85.6	88.3	79.1	85.7	88.7	78.5	85.7
AP 1000	86.5	77.0	83.8	88.4	79.0	85.6	88.3	79.0	85.7	88.7	78.5	85.7
Dissolved Oxygen (mg/L) <sup>2</sup>	Min. Day <sup>5</sup>	April-Sept. Mean	July-Aug. Mean	Min. Day	April-Sept. Mean	July-Aug. Mean	Min. Day	April-Sept. Mean	July-Aug. Mean	Min. Day	April-Sept. Mean	July-Aug. Mean
Reference	5.2	6.6	5.8	5.1	6.4	5.6	5.0	6.5	5.6	7.1	8.9	8.5
Base	5.2	6.6	5.8	5.1	6.4	5.6	5.0	6.4	5.5	6.9	8.9	8.5
B&W	5.2	6.6	5.8	5.1	6.4	5.6	5.0	6.4	5.5	6.9	8.9	8.5
AP 1000	5.2	6.6	5.8	5.1	6.4	5.6	5.0	6.4	5.5	6.9	8.9	8.5
Algae Biomass (mg/L) <sup>2</sup>	Max. Day	April-Sept. Mean	July-Aug. Mean	Max. Day	April-Sept. Mean	July-Aug. Mean	Max. Day	April-Sept. Mean	July-Aug. Mean	Max. Day	April-Sept. Mean	July-Aug. Mean
Reference	0.1	0.0	0.0	0.4	0.2	0.1	0.5	0.2	0.2	3.8	2.8	3.1
Base	0.1	0.0	0.0	0.3	0.1	0.1	0.4	0.2	0.2	3.9	2.9	3.1
B&W	0.1	0.0	0.0	0.3	0.1	0.1	0.4	0.2	0.2	3.9	2.9	3.1
AP 1000	0.1	0.0	0.0	0.3	0.1	0.1	0.4	0.2	0.2	3.9	2.9	3.1

<sup>1</sup>All values in table are from model simulation results and are based on the 6-hour model output for the parameter indicated.

<sup>2</sup>All values are based on model results at the 5-foot depth

<sup>3</sup>Max day is the maximum daily value for the period April through September

<sup>4</sup>Mean is the average of the 6-hour model outputs over the designated time period

<sup>5</sup>Min. day is the minimum daily value for the period April through September

Parameter (Units)	Upstream of Widow's Creek Intake TRM 409.5 - 410.7			Upstream of Bellefonte Intake TRM 393.0 - 393.9			Downstream of Bellefonte Discharge TRM 389.0 - 390.0			Guntersville Forebay TRM 349.8 - 350.5		
	Max. Day <sup>3</sup>	April-Sept. Mean <sup>4</sup>	July-Aug. Mean <sup>4</sup>	Max. Day	April-Sept. Mean	July-Aug. Mean	Max. Day	April-Sept. Mean	July-Aug. Mean	Max. Day	April-Sept. Mean	July-Aug. Mean
Temperature (°F) <sup>2</sup>												
Reference	85.4	76.6	83.0	86.5	77.0	83.4	86.5	77.1	83.5	89.4	77.9	85.3
Base	85.4	76.6	83.0	87.9	78.5	84.4	87.6	78.5	84.5	89.5	78.1	85.6
B&W	85.4	76.6	83.0	88.0	78.5	84.4	87.6	78.5	84.5	89.6	78.1	85.6
AP 1000	85.4	76.6	83.0	88.0	78.5	84.4	87.6	78.5	84.5	89.6	78.1	85.6
Dissolved Oxygen (mg/L) <sup>2</sup>	Min. Day <sup>5</sup>	April-Sept. Mean	July-Aug. Mean	Min. Day	April-Sept. Mean	July-Aug. Mean	Min. Day	April-Sept. Mean	July-Aug. Mean	Min. Day	April-Sept. Mean	July-Aug. Mean
Reference	5.3	6.8	6.0	5.2	6.7	5.9	5.2	6.7	5.9	6.5	8.8	8.2
Base	5.3	6.8	6.0	5.2	6.6	5.9	5.2	6.6	5.9	6.5	8.8	8.0
B&W	5.3	6.8	6.0	5.2	6.6	5.9	5.2	6.6	5.9	6.5	8.8	8.0
AP 1000	5.3	6.8	6.0	5.2	6.6	5.9	5.2	6.6	5.9	6.4	8.8	8.0
Algae Biomass (mg/L) <sup>2</sup>	Max. Day	April-Sept. Mean	July-Aug. Mean	Max. Day	April-Sept. Mean	July-Aug. Mean	Max. Day	April-Sept. Mean	July-Aug. Mean	Max. Day	April-Sept. Mean	July-Aug. Mean
Reference	0.1	0.0	0.0	0.6	0.1	0.1	0.6	0.1	0.1	3.5	2.2	2.1
Base	0.1	0.0	0.0	0.6	0.1	0.1	0.5	0.1	0.1	3.6	2.1	2.0
B&W	0.1	0.0	0.0	0.6	0.1	0.1	0.5	0.1	0.1	3.6	2.1	2.0
AP 1000	0.1	0.0	0.0	0.6	0.1	0.1	0.5	0.1	0.1	3.6	2.1	2.0

<sup>1</sup>All values in table are from model simulation results and are based on the 6-hour model output for the parameter indicated.

<sup>2</sup>All values are based on model results at the 5-foot depth

<sup>3</sup>Max day is the maximum daily value for the entire year

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Parameter (Units)	Upstream of Widow's Creek Intake TRM 409.5 - 410.7			Upstream of Bellefonte Intake TRM 393.0 - 393.9			Downstream of Bellefonte Discharge TRM 389.0 - 390.0			Guntersville Forebay TRM 349.8 - 350.5		
	Max. Day <sup>3</sup>	April-Sept. Mean <sup>4</sup>	July-Aug. Mean <sup>4</sup>	Max. Day	April-Sept. Mean	July-Aug. Mean	Max. Day	April-Sept. Mean	July-Aug. Mean	Max. Day	April-Sept. Mean	July-Aug. Mean
Temperature (°F) <sup>2</sup>												
Reference	85.4	76.6	83.0	86.5	77.0	83.4	86.5	77.1	83.5	89.4	77.9	85.3
Base	85.4	76.6	83.0	87.9	78.5	84.4	87.6	78.5	84.5	89.5	78.1	85.6
B&W	85.4	76.6	83.0	88.0	78.5	84.4	87.6	78.5	84.5	89.6	78.1	85.6
AP 1000	85.4	76.6	83.0	88.0	78.5	84.4	87.6	78.5	84.5	89.6	78.1	85.6
Dissolved Oxygen (mg/L) <sup>2</sup>	Min. Day <sup>5</sup>	April-Sept. Mean	July-Aug. Mean	Min. Day	April-Sept. Mean	July-Aug. Mean	Min. Day	April-Sept. Mean	July-Aug. Mean	Min. Day	April-Sept. Mean	July-Aug. Mean
Reference	5.3	6.8	6.0	5.2	6.7	5.9	5.2	6.7	5.9	6.5	8.8	8.2
Base	5.3	6.8	6.0	5.2	6.6	5.9	5.2	6.6	5.9	6.5	8.8	8.0
B&W	5.3	6.8	6.0	5.2	6.6	5.9	5.2	6.6	5.9	6.5	8.8	8.0
AP 1000	5.3	6.8	6.0	5.2	6.6	5.9	5.2	6.6	5.9	6.4	8.8	8.0
Algae Biomass (mg/L) <sup>2</sup>	Max. Day	April-Sept. Mean	July-Aug. Mean	Max. Day	April-Sept. Mean	July-Aug. Mean	Max. Day	April-Sept. Mean	July-Aug. Mean	Max. Day	April-Sept. Mean	July-Aug. Mean
Reference	0.1	0.0	0.0	0.6	0.1	0.1	0.6	0.1	0.1	3.5	2.2	2.1
Base	0.1	0.0	0.0	0.6	0.1	0.1	0.5	0.1	0.1	3.6	2.1	2.0
B&W	0.1	0.0	0.0	0.6	0.1	0.1	0.5	0.1	0.1	3.6	2.1	2.0
AP 1000	0.1	0.0	0.0	0.6	0.1	0.1	0.5	0.1	0.1	3.6	2.1	2.0

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	Max. Day <sup>3</sup>	April-Sept. Mean <sup>4</sup>	July-Aug. Mean <sup>4</sup>	Max. Day	April-Sept. Mean	July-Aug. Mean	Max. Day	April-Sept. Mean	July-Aug. Mean	Max. Day	April-Sept. Mean	July-Aug. Mean
Temperature (°F) <sup>2</sup>												
Reference	85.4	76.6	83.0	86.5	77.0	83.4	86.5	77.1	83.5	89.4	77.9	85.3
Base	85.4	76.6	83.0	87.9	78.5	84.4	87.6	78.5	84.5	89.5	78.1	85.6
B&W	85.4	76.6	83.0	88.0	78.5	84.4	87.6	78.5	84.5	89.6	78.1	85.6
AP 1000	85.4	76.6	83.0	88.0	78.5	84.4	87.6	78.5	84.5	89.6	78.1	85.6
Dissolved Oxygen (mg/L) <sup>2</sup>	Min. Day <sup>5</sup>	April-Sept. Mean	July-Aug. Mean	Min. Day	April-Sept. Mean	July-Aug. Mean	Min. Day	April-Sept. Mean	July-Aug. Mean	Min. Day	April-Sept. Mean	July-Aug. Mean
Reference	5.3	6.8	6.0	5.2	6.7	5.9	5.2	6.7	5.9	6.5	8.8	8.2
Base	5.3	6.8	6.0	5.2	6.6	5.9	5.2	6.6	5.9	6.5	8.8	8.0
B&W	5.3	6.8	6.0	5.2	6.6	5.9	5.2	6.6	5.9	6.5	8.8	8.0
AP 1000	5.3	6.8	6.0	5.2	6.6	5.9	5.2	6.6	5.9	6.4	8.8	8.0
Algae Biomass (mg/L) <sup>2</sup>	Max. Day	April-Sept. Mean	July-Aug. Mean	Max. Day	April-Sept. Mean	July-Aug. Mean	Max. Day	April-Sept. Mean	July-Aug. Mean	Max. Day	April-Sept. Mean	July-Aug. Mean
Reference	0.1	0.0	0.0	0.6	0.1	0.1	0.6	0.1	0.1	3.5	2.2	2.1
Base	0.1	0.0	0.0	0.6	0.1	0.1	0.5	0.1	0.1	3.6	2.1	2.0
B&W	0.1	0.0	0.0	0.6	0.1	0.1	0.5	0.1	0.1	3.6	2.1	2.0
AP 1000	0.1	0.0	0.0	0.6	0.1	0.1	0.5	0.1	0.1	3.6	2.1	2.0

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<sup>2</sup>All values are based on model results at the 5-foot depth

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Parameter (Units)	Upstream of Widow's Creek Intake TRM 409.5 - 410.7			Upstream of Bellefonte Intake TRM 393.0 - 393.9			Downstream of Bellefonte Discharge TRM 389.0 - 390.0			Guntersville Forebay TRM 349.8 - 350.5		
	Max. Day <sup>3</sup>	April-Sept. Mean <sup>4</sup>	July-Aug. Mean <sup>4</sup>	Max. Day	April-Sept. Mean	July-Aug. Mean	Max. Day	April-Sept. Mean	July-Aug. Mean	Max. Day	April-Sept. Mean	July-Aug. Mean
Temperature (°F) <sup>2</sup>												
Reference	85.4	76.6	83.0	86.5	77.0	83.4	86.5	77.1	83.5	89.4	77.9	85.3
Base	85.4	76.6	83.0	87.9	78.5	84.4	87.6	78.5	84.5	89.5	78.1	85.6
B&W	85.4	76.6	83.0	88.0	78.5	84.4	87.6	78.5	84.5	89.6	78.1	85.6
AP 1000	85.4	76.6	83.0	88.0	78.5	84.4	87.6	78.5	84.5	89.6	78.1	85.6
Dissolved Oxygen (mg/L) <sup>2</sup>	Min. Day <sup>5</sup>	April-Sept. Mean	July-Aug. Mean	Min. Day	April-Sept. Mean	July-Aug. Mean	Min. Day	April-Sept. Mean	July-Aug. Mean	Min. Day	April-Sept. Mean	July-Aug. Mean
Reference	5.3	6.8	6.0	5.2	6.7	5.9	5.2	6.7	5.9	6.5	8.8	8.2
Base	5.3	6.8	6.0	5.2	6.6	5.9	5.2	6.6	5.9	6.5	8.8	8.0
B&W	5.3	6.8	6.0	5.2	6.6	5.9	5.2	6.6	5.9	6.5	8.8	8.0
AP 1000	5.3	6.8	6.0	5.2	6.6	5.9	5.2	6.6	5.9	6.4	8.8	8.0
Algae Biomass (mg/L) <sup>2</sup>	Max. Day	April-Sept. Mean	July-Aug. Mean	Max. Day	April-Sept. Mean	July-Aug. Mean	Max. Day	April-Sept. Mean	July-Aug. Mean	Max. Day	April-Sept. Mean	July-Aug. Mean
Reference	0.1	0.0	0.0	0.6	0.1	0.1	0.6	0.1	0.1	3.5	2.2	2.1
Base	0.1	0.0	0.0	0.6	0.1	0.1	0.5	0.1	0.1	3.6	2.1	2.0
B&W	0.1	0.0	0.0	0.6	0.1	0.1	0.5	0.1	0.1	3.6	2.1	2.0
AP 1000	0.1	0.0	0.0	0.6	0.1	0.1	0.5	0.1	0.1	3.6	2.1	2.0

<sup>1</sup>All values in table are from model simulation results and are based on the 6-hour model output for the parameter indicated.

<sup>2</sup>All values are based on model results at the 5-foot depth

<sup>3</sup>Max day is the maximum daily value for the entire year

<sup>4</sup>Mean is the average of the 6-hour model outputs over the designated time period

<sup>5</sup>Min. day is the minimum daily value for the entire year

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