

Georgia Environmental Protection Division

Review Draft March 2010

Su	Summary of Results			
1.	. Resource Assessment			
	1.1	Study Objectives and Process	5	
	1.2	Gap Analysis	6	
2.	Basin	Delineation	8	
	2.1	Study Basins	8	
	2.2	Basic and Planning Nodes	10	
3.	Water Use Data		11	
4.	Unimp	Unimpaired Flow Development		
	4.1	Need for Unimpaired Flows	12	
	4.2	Unimpaired Flow Development Process	12	
5.	Flow R	legime Determination	15	
	5.1	General Procedures	15	
	5.2	Interim Instream Flow Protection Policy	17	
	5.3	Flow Regulation by Federal Reservoirs	18	
	5.4	Flow Regulation by Non-Federal Reservoirs	18	
	5.5	Run-of-River Reservoirs	19	
6.	River B	Basin Planning Tool	20	
	6.1	General Description	20	
	6.2	Modeling Approach	20	
7.	Currer	t Conditions Model Results	22	
	7.1	ACF Study Basin	23	
	7.2	ACT Study Basin	27	
	7.3	OOA Study Basin	30	
	7.4	OSSS Study Basin	33	
	7.5	SO Study Basin	35	
	7.6	TN Study Basin	39	
8.	Glossary of Key Terms 42			

Tables

Table 1	Shortfall Statistics	4
Table 7-1-1	OSSS Unregulated Nodes	34
Table 7-2-1	TN Regulated and Semi-Regulated Nodes	40
Table 7-2-2	TN Unregulated Nodes	40
Table 7-3-1	OOA Regulated and Semi-Regulated Nodes	31
Table 7-3-2	OOA Unregulated Nodes	31
Table 7-4-1	SO Regulated and Semi-Regulated Nodes	37
Table 7-4-2	SO Unregulated Nodes	37
Table 7-5-1	ACT Regulated and Semi-Regulated Nodes	28
Table 7-5-2	ACT Unregulated Nodes	28
Table 7-6-1	ACF Regulated and Semi-Regulated Nodes	25
Table 7-6-2	ACF Unregulated Nodes	25
Figures		
Figure 1-1	Surface Water Availability Resource Assessment Process	6
Figure 1-2	Simplified Illustration of Water Availability Gaps	7
Figure 2-1	Study Basins and Nodes	9
Figure 4-1	Unimpaired Flow Development Process Diagram	14
Figure 5-1	Monthly 7Q10	16
Figure 5-2	Unimpaired Flows Superimposed on Monthly 7Q10	16
Figure 5-3	Flow Regime Adjusted by Unimpaired Flows (Lesser of Monthly 7Q10 or Unimpaired Flow)	17
Figure 5-4	Adjusted Flow Regime	17
Figure 7-1	ACF Study Basin	26
Figure 7-2	ACT Study Basin	29
Figure 7-3	OOA Study Basin	32
Figure 7-4	OSSS Study Basin	35
Figure 7-5	SO Study Basin	38
Figure 7-6	TN Study Basin	41

Appendices

- A Apalachicola-Chattahoochee-Flint
 - Figure A-1-1 Total Storage at Buford (Chart Type 6)
 - Figure A-1-2 Percent of Total Storage at Buford Relative to Rule Curve (Chart Type 7)
 - Figure A-1-3 Frequency of Exceedence of Percent Total Storage at Buford Relative to Rule Curve (Chart Type 8)
 - Figure A-2-1 Total Storage at West Point (Chart Type 6)
 - Figure A-2-2 Percent of Total Storage at West Point Relative to Rule Curve (Chart Type 7)
 - Figure A-2-3 Frequency of Exceedence of Percent Total Storage at West Point Relative to Rule Curve (Chart Type 8)
 - Figure A-3-1 Total Storage at Walter F. George (Chart Type 6)
 - Figure A-3-2 Percent of Total Storage at Walter F. George Relative to Rule Curve (Chart Type 7)
 - Figure A-3-3 Frequency of Exceedence of Percent Total Storage at Walter F. George Relative to Rule Curve (Chart Type 8)
 - Figure A-4-1 Average Percentage of Flow Compared to Flow Regime at Montezuma (Chart Type 1)
 - Figure A-4-2 Current Conditions Flows Less Than Adjusted Flow Regime at Montezuma (Chart Type 2)
 - Figure A-4-3 Range of Deficit of Flow Regime at Montezuma (Chart Type 3)
 - Figure A-4-4 Unimpaired Monthly Range of Flow at Montezuma (Chart Type 4)
 - Figure A-4-5 Simulated Monthly Range of Flow at Montezuma (Chart Type 5)
 - Figure A-5-1 Average Percentage of Flow Compared to Flow Regime at Bainbridge (Charte Type 1)
 - Figure A-5-2 Current Conditions Flows Less Than Adjusted Flow Regime at Bainbridge (Chart Type 2)
 - Figure A-5-3 Range of Deficit of Flow Regime at Bainbridge (Chart Type 3)
 - Figure A-5-4 Unimpaired Monthly Range of Flow at Bainbridge (Chart Type 4)
 - Figure A-5-5 Simulated Monthly Range of Flow at Bainbridge (Chart Type 5)

B Alabama-Coosa-Tallapoosa

- Figure B-1-1 Average Percentage of Flow Compared to Flow Regime at Gaylesville (Chart Type 1)
- Figure B-1-2 Current Conditions Flow Less Than Adjusted Flow Regime at Gaylesville (Chart Type 2)
- Figure B-1-3 Range of Deficit of Flow Regime at Gaylesville (Chart Type 3)
- Figure B-1-4 Unimpaired Monthly Range of Flow at Gaylesville (Chart Type 4)
- Figure B-1-5 Simulated Monthly Range of Flow at Gaylesville (Chart Type 5)
- Figure B-2-1 Total Storage at Allatoona (Chart Type 6)
- Figure B-2-2 Percent of Total Storage at Allatoona Relative to Rule Curve (Chart Type 7)
- Figure B-2-3 Frequency of Exceedence of Percent Total Storage at Allatoona Relative to Rule Curve (Chart Type 8)
- Figure B-3-1 Total Storage at Carters Rereg Dam (Chart Type 6)
- Figure B-3-2 Percent of Total Storage at Carters Rereg Dam Relative to Rule Curve (Chart Type 7)
- Figure B-3-3 Frequency of Exceedence of Percent Total Storage at Carters Rereg Dam Relative to Rule Curve (Chart Type 8)
- Figure B-4-1 Average Percentage of Flow Compared to Flow Regime at Heflin (Chart Type 1)
- Figure B-4-2 Current Conditions Flow Less Than Adjusted Flow Regime at Heflin (Chart Type 2)
- Figure B-4-3 Range of Deficit of Flow Regime at Heflin (Chart Type 3)
- Figure B-4-4 Unimpaired Monthly Range of Flow at Heflin (Chart Type 4)
- Figure B-4-5 Simulated Monthly Range of Flow at Heflin (Chart Type 5)
- Figure B-5-1 Average Percentage of Flow Compared to Flow Regime at Newell (Chart Type 1)
- Figure B-5-2 Current Conditions Flow Less Than Adjusted Flow Regime at Newell (Chart Type 2)
- Figure B-5-3 Range of Deficit of Flow Regime at Newell (Chart Type 3)
- Figure B-5-4 Unimpaired Monthly Range of Flow at Newell (Chart Type 4)
- Figure B-5-5 Simulated Monthly Range of Flow at Newell (Chart Type 5)

С	Oconee-Ocmulgee-Altamaha
---	--------------------------

- Figure C-1-1 Total Storage at Jackson (Chart Type 6)
- Figure C-1-2 Percent of Total Storage at Jackson Relative to Rule Curve (Chart Type 7)
- Figure C-1-3 Frequency of Exceedence of Percent Total Storage at Jackson Relative to Rule Curve (Chart Type 8)
- Figure C-2-1 Average Percentage of Flow Compared to Flow Regime at Penfield (Chart Type 1)
- Figure C-2-2 Current Conditions Flow Less Than Adjusted Flow Regime at Penfield (Chart Type 2)
- Figure C-2-3 Range of Deficit of Flow Regime at Penfield (Chart Type 3)
- Figure C-2-4 Unimpaired Monthly Range of Flow at Penfield (Chart Type 4)
- Figure C-2-5 Simulated Monthy Range of Flow at Penfield (Chart Type 5)
- Figure C-3-1 Total Storage at Milledgeville (Chart Type 6)
- Figure C-3-2 Percent of Total Storage at Milledgeville Relative to Rule Curve (Chart Type 7)
- Figure C-3-3 Frequency of Exceedence of Percent Total Storage at Milledgeville Relative to Rule Curve (Chart Type 8)
- D Ochlockonee-Suwannee-Satilla-St. Mary's
 - Figure D-1-1 Average Percentage of Flow Compared to Flow Regime at Quincy (Chart Type 1)
 - Figure D-1-2 Current Conditions Flow Less Than Adjusted Flow Regime at Quincy (Chart Type 2)
 - Figure D-1-3 Range of Deficit of Flow Regime at Quincy (Chart Type 3)
 - Figure D-1-4 Unimpaired Monthly Range of Flow at Quincy (Chart Type 4)
 - Figure D-1-5 Simulated Monthly Range of Flow at Quincy (Chart Type 5)
 - Figure D-2-1 Average Percentage of Flow Compared to Flow Regime at Concord (Chart Type 1)
 - Figure D-2-2 Current Conditions Flow Less Than Adjusted Flow Regime at Concord (Chart Type 2)
 - Figure D-2-3 Range of Deficit of Flow Regime at Concord (Chart Type 3)
 - Figure D-2-4 Unimpaired Monthly Range of Flow at Concord (Chart Type 4)
 - Figure D-2-5 Simulated Monthly Range of Flow at Concord (Chart Type 5)
 - Figure D-3-1 Average Percentage of Flow Compared to Flow Regime at Pinetta (Chart Type 1)
 - Figure D-3-2 Current Conditions Flow Less Than Adjusted Flow Regime at Pinetta (Chart Type 2)
 - Figure D-3-3 Range of Deficit of Flow Regime at Pinetta (Chart Type 3)

- Figure D-3-4 Unimpaired Monthly Range of Flow at Pinetta (Chart Type 4)
- Figure D-3-5 Simulated Monthly Range of Flow at Pinetta (Chart Type 5)
- Figure D-4-1 Average Percentage of Flow Compared to Flow Regime at Statenville (Chart Type 1)
- Figure D-4-2 Current Conditions Flow Less Than Adjusted Flow Regime at Statenville (Chart Type 2)
- Figure D-4-3 Range of Deficit of Flow Regime at Statenville (Chart Type 3)
- Figure D-4-4 Unimpaired Monthly Range of Flow at Statenville (Chart Type 4)
- Figure D-4-5 Simulated Monthly Range of Flow at Statenville (Chart Type 5)
- Figure D-5-1 Average Percentage of Flow Compared to Flow Regime at Atkinson (Chart Type 1)
- Figure D-5-2 Current Conditions Flow Less Than Adjusted Flow Regime at Atkinson (Chart Type 2)
- Figure D-5-3 Range of Deficit of Flow Regime at Atkinson (Chart Type 3)
- Figure D-5-4 Unimpaired Monthly Range of Flow at Atkinson (Chart Type 4)
- Figure D-5-5 Simulated Monthly Range of Flow at Atkinson (Chart Type 5)
- Figure D-6-1 Average Percentage of Flow Compared to Flow Regime at Jennings (Chart Type 1)
- Figure D-6-2 Current Conditions Flow Less Than Adjusted Flow Regime at Jennings (Chart Type 2)
- Figure D-6-3 Range of Deficit of Flow Regime at Jennings (Chart Type 3)
- Figure D-6-4 Unimpaired Monthly Range of Flow at Jennings (Chart Type 4)
- Figure D-6-5 Simulated Monthly Range of Flow at Jennings (Chart Type 5)
- Figure D-7-1 Average Percentage of Flow Compared to Flow Regime at Fargo (Chart Type 1)
- Figure D-7-2 Current Conditions Flow Less Than Adjusted Flow Regime at Fargo (Chart Type 2)
- Figure D-7-3 Range of Deficit of Flow Regime at Fargo (Chart Type 3)
- Figure D-7-4 Unimpaired Monthly Range of Flow at Fargo (Chart Type 4)
- Figure D-7-5 Simulated Monthly Range of Flow at Fargo (Chart Type 5)
- Figure D-8-1 Average Percentage of Flow Compared to Flow Regime at Gross (Chart Type 1)
- Figure D-8-2 Current Conditions Flow Less Than Adjusted Flow Regime at Gross (Chart Type 2)
- Figure D-8-3 Range of Deficit of Flow Regime at Gross (Chart Type 3)
- Figure D-8-4 Unimpaired Monthly Range of Flow at Gross (Chart Type 4)

Figure D-8-5	Simulated Monthly	/ Range of Flow at	Gross	(Chart T	ype 5))
	•		0.000		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	ι.

- E Savannah-Ogeechee
 - Figure E-1-1 Total Storage at Thurmond (Chart Type 6)
 - Figure E-1-2 Percent of Total Storage at Thurmond Relative to Rule Curve (Chart Type 7)
 - Figure E-1-3 Frequency of Exceedence of Percent Total Storage at Thurmond Relative to Rule Curve (Chart Type 8)
 - Figure E-4-1 Average Percentage of Flow Compared to Flow Regime at Claxton (Chart Type 1)
 - Figure E-4-2 Current Conditions Flow Less Than Adjusted Flow Regime at Claxton (Chart Type 2)
 - Figure E-4-3 Range of Deficit of Flow Regime at Claxton (Chart Type 3)
 - Figure E-4-4 Unimpaired Monthly Range of Flow at Claxton (Chart Type 4)
 - Figure E-4-5 Simulated Monthly Range of Flow at Claxton (Chart Type 5)
 - Figure E-5-1 Average Percentage of Flow Compared to Flow Regime at Kings Ferry (Chart Type 1)
 - Figure E-5-2 Current Conditions Flow Less Than Adjusted Flow Regime at Kings Ferry (Chart Type 2)
 - Figure E-5-3 Range of Deficit of Flow Regime at Kings Ferry (Chart Type 3)
 - Figure E-5-4 Unimpaired Monthly Range of Flow at Kings Ferry (Chart Type 4)
 - Figure E-5-5 Simulated Monthly Range of Flow at Kings Ferry (Chart Type 5)
 - Figure E-6-1 Average Percentage of Flow Compared to Flow Regime at Eden (Chart Type 1)
 - Figure E-6-2 Current Conditions Flow Less Than Adjusted Flow Regime at Eden (Chart Type 2)
 - Figure E-6-3 Range of Deficit of Flow Regime at Eden (Chart Type 3)
 - Figure E-6-4 Unimpaired Monthly Range of Flow at Eden (Chart Type 4)
 - Figure E-6-5 Simulated Monthly Range of Flow at Eden (Chart Type 5)
- F Tennessee
 - Figure F-1-1 Average Percentage of Flow Compared to Flow Regime at New England (Chart Type 1)
 - Figure F-1-2 Current Conditions Flow Less Than Adjusted Flow Regime at New England (Chart Type 2)
 - Figure F-1-3 Range of Deficit of Flow Regime at New England (Chart Type 3)
 - Figure F-1-4 Unimpaired Monthly Range of Flow at New England (Chart Type 4)
 - Figure F-1-5 Simulated Monthly Range of Flow at New England (Chart Type 5)

- Figure F-2-1Average Percentage of Flow Compared to Flow Regime at Chickamauga (Chart
Type 1)Figure F-2-2Current Conditions Flow Less Than Adjusted Flow Regime at Chickamauga
(Chart Type 2)
- Figure F-2-3 Range of Deficit of Flow Regime at Chickamauga (Chart Type 3)
- Figure F-2-4 Unimpaired Monthly Range of Flow at Chickamauga (Chart Type 4)
- Figure F-2-5 Simulated Monthly Range of Flow at Chickamauga (Chart Type 5)
- Figure F-3-1 Total Storage at Blue Ridge (Chart Type 6)
- Figure F-3-2 Percent of Total Storage at Blue Ridge Relative to Rule Curve (Chart Type 7)
- Figure F-3-3 Frequency of Exceedence of Percent Total Storage at Blue Ridge Relative to Rule Curve (Chart Type 8)
- Figure F-4-1 Average Percentage of Flow Compared to Flow Regime at Little Tennessee (Chart Type 1)
- Figure F-4-2 Current Conditions Flow Less Than Adjusted Flow Regime at Little Tennessee (Chart Type 2)
- Figure F-4-3 Range of Deficit of Flow Regime at Little Tennessee (Chart Type 3)
- Figure F-4-4 Unimpaired Monthly Range of Flow at Little Tennessee (Chart Type 4)
- Figure F-4-5 Simulated Monthly Range of Flow at Little Tennessee (Chart Type 5)

The Georgia Environmental Protection Division acknowledges the efforts of ARCADIS U.S., Inc. in development of the analysis and models summarized here and in preparation of this document.