ATTACHMENT A. NRC NATIONAL ENVIRONMENTAL POLICY ACT ISSUES FOR LICENSE RENEWAL OF NUCLEAR POWER PLANTS

Southern Nuclear Operating Company has prepared this Environmental Report – Operating License Renewal Stage for the Edwin I. Hatch Nuclear Plant (HNP) in accordance with the requirements of 10 CFR 51.53. Included in the regulation is a list of environmental issues that the U.S. Nuclear Regulatory Commission (NRC) developed from the analysis presented in NRC's Generic Environmental Impact Statement (Reference 1), which examines possible environmental impacts that could occur as a result of renewing licenses of individual nuclear power plants. These 92 issues are listed in Table B-1 of Appendix B to Subpart A of Part 51 and are provided in Table A-1 of this document. For expediency, numbers have been assigned to each issue as it appears in Table B-1 and are referenced throughout this Environmental Report. Table A-1 also provides a cross-reference for each of NRC's environmental issues to the respective environmental report section where that issue is discussed.

Reference

1. NUREG-1437, Volume 1, "Generic Environmental Impact Statement for License Renewal of Nuclear Power Plants," December 1996.

Table A-1. HNP environmental report discussion of license renewal national environmental policy act issues (page 1 of 3).

	Issue[a]	Category	Section of this Environmental Report
1.	Impacts of refurbishment on surface water quality	1	3.1.1
2.	Impacts of refurbishment on surface water use	1	3.1.1
3.	Altered current patterns at intake and discharge structures	1	3.1.1
4.	Altered salinity gradients	1	3.1.1
5.	Altered thermal stratification of lakes	1	NA[b]
6.	Temperature effects on sediment transport capacity	1	3.1.1
7.	Scouring caused by discharged cooling water	1	3.1.1
8.	Eutrophication	1	3.1.1
9.	Discharge of chlorine or other biocides	1	3.1.1
10.	Discharge of sanitary wastes and minor chemical spills	1	3.1.1
11.	Discharge of other metals in waste water	1	3.1.1
12.	Water use conflicts (plants with once-through cooling systems)	1	NA[c]
13.	Water use conflicts (plants with cooling ponds or cooling towers using make-up water from a small river with low flow)	2	3.1.2
14.	Refurbishment impacts to aquatic resources	1	3.1.1
15.	Accumulation of contaminants in sediments or biota	1	3.1.1
16.	Entrainment of phytoplankton and zooplankton	1	3.1.1
17.	Cold shock	1	3.1.1
18.	Thermal plume barrier to migrating fish	1	3.1.1
19.	Distribution of aquatic organisms	1	3.1.1
20.	Premature emergence of aquatic insects	1	3.1.1
21.	Gas supersaturation (gas bubble disease)	1	3.1.1
22.	Low dissolved oxygen in the discharge	1	3.1.1
23.	Losses from predation, parasitism, and disease among organisms exposed to sublethal stresses	1	3.1.1
24.	Stimulation of nuisance organisms (e.g., shipworms)	1	3.1.1
25.	Entrainment of fish and shellfish in early life stages for plants with once-through and cooling pond heat dissipation systems	2	NA[c]
26.	Impingement of fish and shellfish for plants with once-through and cooling pond heat dissipation systems	2	NA[c]
27.	Heat shock for plants with once-through and cooling pond heat dissipation systems	2	NA[c]
28.	Entrainment of fish and shellfish in early life stages for plants with cooling-tower-based heat dissipation systems	1	3.1.1
29.	Impingement of fish and shellfish for plants with cooling-tower-based heat dissipation systems	1	3.1.1
30.	Heat shock for plants with cooling-tower-based heat dissipation systems	1	3.1.1
31.	Impacts of refurbishment on ground-water use and quality	1	3.1.1
32.	Ground-water use conflicts (potable and service water; plants that use < 100 gpm)	1	NA[d]
33.	Ground-water use conflicts (potable and service water, and dewatering; plants that use > 100 gpm)	2	3.1.3

Table A-1. HNP environmental report discussion of license renewal national environmental policy act issues (page 2 of 3).

	Issue[a]	Category	Section of this Environmental Report
34.	Ground-water use conflicts (plants using cooling towers withdrawing make-up water from a small river)	2	3.1.3
35.	Ground-water use conflicts (Ranney wells)	2	NA[e]
36.	Ground-water quality degradation (Ranney wells)	1	NA[e]
37.	Ground-water quality degradation (saltwater intrusion)	1	3.1.1
38.	Ground-water quality degradation (cooling ponds in salt marshes)	1	NA[c]
39.	Ground-water quality degradation (cooling ponds at inland sites)	2	NA[c]
40.	Refurbishment impacts to terrestrial resources	2	3.1.4
41.	Cooling tower impacts on crops and ornamental vegetation	1	3.1.1
42.	Cooling tower impacts on native plants	1	3.1.1
43.	Bird collisions with cooling towers	1	NA[f]
44.	Cooling pond impacts on terrestrial resources	1	NA[c]
45.	Power line right-of-way management (cutting and herbicide application)	1	3.1.1
46.	Bird collisions with power lines	1	3.1.1
47.	Impacts of electromagnetic fields on flora and fauna (plants, agricultural crops, honeybees, wildlife, livestock)	1	3.1.1
48.	Floodplains and wetlands on power line right of way	1	3.1.1
49.	Threatened or endangered species	2	3.1.5
50.	Air quality during refurbishment (non-attainment and maintenance areas)	2	3.1.6
51.	Air quality effects of transmission lines	1	3.1.1
52.	Onsite land use	1	3.1.1
53.	Power line right of way	1	3.1.1
54.	Radiation exposures to the public during refurbishment	1	3.1.1
55.	Occupational radiation exposures during refurbishment	1	3.1.1
56.	Microbiological organisms (occupational health)	1	3.1.1
57.	Microbiological organisms (public health)(plants using lakes or canals, or cooling towers or cooling ponds that discharge to a small river)	2	3.1.7
58.	Noise	1	3.1.1
59.	Electromagnetic fields, acute effects (electric shock)	2	3.1.8
60.	Electromagnetic fields, chronic effects	NA[g]	NA[g]
61.	Radiation exposures to public (license renewal term)	1	3.1.1
62.	Occupational radiation exposures (license renewal term)	1	3.1.1
63.	Housing impacts	2	3.1.9
64.	Public services: public safety, social services, and tourism and recreation	1	3.1.1
65.	Public services: public utilities	2	3.1.10
66.	Public services, education (refurbishment)	2	3.1.11
67.	Public services, education (license renewal term)	1	3.1.1
68.	Offsite land use (refurbishment)	2	3.1.12

Table A-1. HNP environmental report discussion of license renewal national environmental policy act issues (page 3 of 3).

	Issue[a]	Category	Section of this Environmental Report
69.	Offsite land use (license renewal term)	2	3.1.13
70.	Public services, transportation	2	3.1.14
71.	Historic and archaeological resources	2	3.1.15
72.	Aesthetic impacts (refurbishment)	1	3.1.1
73.	Aesthetic impacts (license renewal term)	1	3.1.1
74.	Aesthetic impacts of transmission lines (license renewal term)	1	3.1.1
75.	Design basis accidents	1	3.1.1
76.	Severe accidents	2	3.1.16
77.	Offsite radiological impacts (individual effects from other than the disposal of spent fuel and high level waste)	1	3.1.1
78.	Offsite radiological impacts (collective effects)	1	3.1.1
79.	Offsite radiological impacts (spent fuel and high level waste disposal)	1	3.1.1
80.	Nonradiological impacts of the uranium fuel cycle	1	3.1.1
81.	Low-level waste storage and disposal	1	3.1.1
82.	Mixed waste storage and disposal	1	3.1.1
83.	On-site spent fuel	1	3.1.1
84.	Nonradiological waste	1	3.1.1
85.	Transportation	1	3.1.1
86.	Radiation doses (decommissioning)	1	3.1.1
87.	Waste management (decommissioning)	1	3.1.1
88.	Air quality (decommissioning)	1	3.1.1
89.	Water quality (decommissioning)	1	3.1.1
90.	Ecological resources (decommissioning)	1	3.1.1
91.	Socioeconomic impacts (decommissioning)	1	3.1.1
92.	Environmental justice	NA[g]	3.1.18

a. Source: 10 CFR Part 51, Subpart A, Appendix B, Table B-1 (Issue numbers added to facilitate discussion.)
b. Not applicable because HNP is not located on a lake.
c. Not applicable because HNP does not use a cooling pond or once-through heat dissipation system.
d. Not applicable because HNP uses > 100 gpm of groundwater.
e. Not applicable because HNP does not use Ranney wells.
f. Not applicable because HNP does not use natural draft cooling towers (NUREG-1437, Section 4.3.5.2).
g. Not applicable because the categorization and impact finding definitions do not apply to this issue (10 CFR 51, Subpart A, Appendix B, Table B-1, footnote 4).

ATTACHMENT B. SURFACE WATER WITHDRAWAL IMPACT ASSESSMENT

B.1 Surface Water Impact Calculations

The U.S. Geological Survey (USGS) measures streamflow characteristics at locations, called gauging stations, throughout the U.S. The USGS has prepared tables, called rating tables, that show the relationship between the height of water at a gauging station and the volume of water, called discharge, passing that station. For example, Rating Table 13 for USGS Gauging Station 02225000, located in Georgia on the Altamaha River at the U. S. Highway 1 bridge indicates that if the gauge height reading is 8.7 feet, the USGS has calculated that the river discharge at that time is 11,520 cubic feet per second. Conversely, if the river discharge were 9,619 cubic feet per second, the expected gauge height reading would be 7.7 feet. A copy of Rating Table 13 is attached as Table B-1.

The reader will note that the right-hand column of Rating Table 13 shows the difference in river discharge, Q, per foot of gauge height. If the river sides were vertical, the difference would remain effectively the same regardless of gauge height; each additional 1,000 cubic feet per second, for example, would raise the river height the same amount. Because rivers in cross section are generally shaped like a broad letter "V," however, the higher the water level, the more room there is to contain water. This is why Rating Table 13 indicates that an increase in gauge height from 1 foot to 2 feet adds only 732 cubic feet per second of discharge whereas an increase from 21 feet to 22 feet adds 17,500 cubic feet per second.

The USGS also publishes annual summaries of streamflow data for each gauging station. Attached, as Table B-2, is the water year[1] 1997 discharge data for Altamaha River Gauging Station 02225000. For example, the table indicates that on January 20, 1997, the river discharge was 22,500 cubic feet per second. Referring to Rating Table 13 (Table B-1), this value corresponds to the gauge height of 13 feet, the approximate gauge reading on that day.

In addition to annual discharge data, Table B-2 presents statistical analyses of annual and multi-year data. The table indicates that, based on 49 years of data (1949 – 1997), 11,580 cubic feet per second is the river's annual mean discharge, that March is the month that has the highest mean discharge (24,570 cubic feet per second) and maximum discharge (47,260 cubic feet per second), and that September is the month that has the lowest mean discharge (4,907 cubic feet per second) and minimum discharge (1,864 cubic feet per second). The annual discharge table for fiscal year 1990, attached as Table B-3, also indicates that the historical lowest daily mean was 1,620 cubic feet on July 21, 1986.

The equations use data presented in attached ratings and annual discharge tables in calculating information presented in Section 3.1.2.1.

EQUATION B.1 – ANNUAL FLOW RATE

Calculate the Altamaha River annual flow rate in cubic feet per year by converting average mean discharge of 11,580 cubic feet per second from Table B-2:

> 11,580 cubic feet per second × 3,600 seconds per hour × 24 hours per day × 365 days per year = 365,186,880,000 or 3.65 × 1011 cubic feet per year

1. A water year runs from October 1 through September 30.

EQUATION B.2 – IMPACT ON AVERAGE FLOW

Calculate the percent that HNP cooling water consumptive use by evaporation, 32.6 million gallons per day (Section 2.1.4), reduces Altamaha River the annual mean discharge of 11,580 cubic feet per second (cfs) (Table B-1). First, convert consumptive loss units to same as discharge units:

$$\frac{32{,}600{,}000 \text{ gallons per day} \times 0.1336719 \text{ cubic feet per gallon}}{3600 \text{ seconds per hour} \times 24 \text{ hours per day}} = 50.44 \text{ cubic feet per second}$$

Second, determine percentage represented by consumptive loss:

$$\frac{50.44 \text{ cubic feet per second}}{11{,}580 \text{ cubic feet per second}} \text{x}100 = 0.44 \text{ percent}$$

EQUATION B.3 – IMPACT ON MINIMUM FLOW

Calculate the percent that HNP cooling water consumptive use by evaporation, 50.44 cubic feet per second (Equation B-2), would have reduced the Altamaha River historic lowest daily mean discharge of 1,620 cubic feet per second (Table B-3):

$$\frac{50.44 \text{ cubic feet per second}}{1{,}620 \text{ cubic feet per second}} \text{x}100 = 3.1 \text{percent}$$

EQUATION B.4 – IMPACT ON AVERAGE ELEVATION

Calculate the amount that HNP cooling water consumptive use by evaporation, 50.44 cubic feet per second (Equation B.2), reduces the Altamaha River elevation at the time of the annual mean discharge of 11,580 cubic feet per second.

Table B-1 is the USGS rating table for the referenced gauging station. It provides flow rates for gage height increments of 0.1 feet. For all practical purposes, there is a straight line relationship between gage height and flow rate between these small increments of gage height.

The average flow rate of 11,580 cfs is between the following points on the rating table.

Flow rate (cfs)	Gage height (feet)
11,520	8.7
11,720	8.8

A straight line between these points is:

$$\text{gage height (ft)} = 8.7 + \frac{8.8 - 8.7}{11{,}720 - 11{,}520} \times (\text{flow rate} - 11{,}520)$$

therefore, 11,580 cfs occurs at a gage height of

$$8.7 + \frac{0.1}{200}(11{,}580 - 11{,}520) = 8.73 \text{ ft}$$

subtraction of the consumptive withdrawal reduces the flow rate to

11,580 – 50.44 = 11,529.6 cfs

This is also between the two reference points, therefore gage height would be

$$8.7 + \frac{.1}{200} \times (11{,}529.6 - 11{,}520) = 8.70 \text{ ft}$$

The difference in gage height (0.03 ft) is negligible.

EQUATION B.5 – IMPACT ON MINIMUM ELEVATION

Calculate the amount that HNP cooling water consumptive use by evaporation, 50.44 cubic feet per second (Equation B.2) would have reduced the Altamaha River historic lowest daily mean discharge of 1,620 cubic feet per second (Table B-3):

The lowest flow rate of record (1,620 cfs) is between the following points on the rating table:

Flow rate (cfs)	Gage height (feet)
1,553	1.1
1,621	1.2

A straight line between these points is:

$$\text{gage height (ft)} = \quad 1.1 + \frac{1.2 - 1.1}{1{,}621 - 1{,}553}(\text{flow rate} - 1{,}553)$$

therefore, 1,620 cfs occurs at a gage height of:

$$1.1 + \frac{0.1}{68} \text{ x } (1{,}620 - 1{,}553) = 1.20 \text{ ft}$$

subtraction of the consumptive withdrawal reduces the flow rate to

1,620 – 50.44 = 1,569.6

This is also between the two reference points, therefore gage height would be

$$1.1 + \frac{0.1}{68} \text{ x } (1{,}569.6 - 1{,}553) = 1.12 \text{ ft}$$

The difference in gage height (0.08 ft) is negligible.

Table B-1. USGS Expanded Rating Table, Altamaha River Station 02225000, Rating No. 13.0.

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY - WATER RESOURCES DIVISION PAGE 1
EXPANDED RATING TABLE TYPE: LOG
02225000 DATE PROCESSED: 12-22-1998 @ 11:35 BY wrstokes
ALTAMAHA RIVER NEAR BAXLEY, GA. DD: 3 TYPE: 001 RATING NO: 13.0
OFFSET: -4.0 START DATE/TIME: 10-01-1997 (0001)

BASED ON _______ DISCHARGE MEASUREMENTS, NOS ________, AND ________, AND IS ______ WELL DEFINED BETWEEN ______ AND ______ CFS
COMP BY _____ DATE ________ CHK. BY _____ DATE ________
SAME AS RATING NO 12 BELOW 20 FEET.

GAGE HEIGHT (FEET)	DISCHARGE IN CUBIC FEET PER SECOND (EXPANDED PRECISION) .0	.1	.2	.3	.4	.5	.6	.7	.8	.9	DIFF IN Q PER FOOT
.0						1180*	1238	1298	1360	1423	614.0
1.0	1487	1553	1621	1690	1761	1833	1907	1983	2060	2139	732.0
2.0	2219	2301	2385	2470	2557	2646	2736	2828	2922	3017	895.0
3.0	3114	3212	3312	3414	3518	3623	3730	3838	3949	4061	1061
4.0	4175	4290	4407	4526	4647	4769	4893	5019	5146	5276	1232
5.0	5407	5540	5674	5810	5948	6088	6230	6373	6519	6665	1407
6.0	6814	6965	7117	7271	7427	7585	7744	7906	8069	8234	1587
7.0	8401	8569	8740	8912	9086	9262	9440	9619	9801	9984	1769
8.0	10170	10360	10550	10740	10930	11120	11320	11520	11720	11920	1950
9.0	12120	12330	12540	12750	12960	13170	13390	13600	13820	14040	2150
10.0	14270	14490	14720	14950	15180	15410	15640	15880	16120	16360	2330
11.0	16600*	16870	17140	17410	17690	17970	18250	18530	18820	19110	2800
12.0	19400*	19700	20000	20300	20610	20920	21230	21540	21860	22180	3100
13.0	22500*	22880	23270	23660	24050	24450	24850	25260	25670	26080	4000
14.0	26500*	26990	27490	27990	28500	29020	29540	30070	30610	31150	5200
15.0	31700*	32290	32900	33500	34120	34750	35380	36020	36670	37330	6300
16.0	38000*	38680	39370	40070	40780	41500*	42280	43070	43870	44680	7500
17.0	45500*	46370	47260	48160	49070	50000*	50910	51840	52780	53730	9200
18.0	54700*	55650	56600	57570	58560	59550	60560	61570	62610	63650	10010
19.0	64710	65780	66860	67960	69060	70190	71320	72470	73630	74810	11290
20.0	76000*	77250	78510	79790	81090	82400	83720	85060	86420	87790	13180
21.0	89180	90590	92010	93450	94910	96380	97870	99380	100900	102400	14820
22.0	104000*	105700	107300	109000	110700	112500	114200	116000	117800	119600	17500
23.0	121500	123300	125200	127100	129100	131000	133000	135000	137000	139000	19600
24.0	141100	143200	145300	147400	149600	151700	153900	156200	158400	160700	21900*
25.0	163000*										

Table B-2. USGS Discharge Table for the Altamaha River Water Year October 1996 to September 1997 (Station 02225000).

UNITED STATES DEPARTMENT OF THE INTERIOR - GEOLOGICAL SURVEY - GEORGIA INSTALLATION 12/22/1998

STATION NUMBER 02225000 ALTAMAHA RIVER NEAR BAXLEY, GA. STREAM SOURCE AGENCY USGS
LATITUDE 315620 LONGITUDE 0822113 DRAINAGE AREA 11600.00 DATUM 61.51 STATE 13 COUNTY 001

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3350	2790	3730	6300	17700	49900	7920	11600	6220	5320	8750	2430
2	3340	2730	4070	6160	17400	47500	7960	12800	6710	5610	6790	2380
3	3980	2680	4670	6500	16300	43800	7880	14000	6920	6360	6530	2330
4	4780	2700	5960	6660	15400	39400	7540	15200	7090	6060	6990	2270
5	5190	2800	7800	6790	14600	34800	7190	16100	6990	5680	7220	2220
6	5510	2880	9170	6880	13800	31200	6960	17000	6790	5680	6960	2150
7	5320	2890	10200	6930	13200	28800	6630	17800	6580	5660	6600	2080
8	5520	2890	10200	7230	12600	27900	6200	18600	6490	5040	6280	2040
9	6420	3010	8690	8470	12200	29200	5890	19200	6430	4640	5720	1990
10	7070	3380	7530	10400	11600	32900	5820	19700	6310	4200	5230	1950
11	7300	3860	7100	12300	11300	36900	6190	19500	6130	3880	4900	1920
12	6960	4680	7150	13600	11400	40100	6260	17800	5860	3810	4480	1860
13	6690	4920	7040	14800	11300	41300	6100	14800	5380	3720	3920	1840
14	6340	5000	6550	15900	12400	39400	5980	12000	4840	3600	3560	1820
15	5720	5110	6210	17100	17100	35500	5720	10200	4430	3510	3360	1820
16	4960	5250	6200	18500	22900	31900	5390	9300	4250	3480	3230	1840
17	4350	5350	6120	19900	26500	27700	5110	8880	4390	3400	3190	1850
18	3980	4930	6060	21100	28700	23800	5050	8180	5000	3300	3280	1850
19	3660	4490	6630	22000	29600	20700	5490	7000	6560	3210	3250	1840
20	3450	4230	7880	22500	30000	18200	5820	6070	7600	3240	3200	1820
21	3420	3810	9150	22300	30700	16000	5710	5230	8310	3370	3260	1810
22	3350	3510	9460	20800	33100	14500	5370	4700	9070	3790	3470	1830
23	3220	3330	9030	19200	38600	13600	5180	4380	9820	4070	3450	1820
24	3090	3380	8120	18400	44700	12900	4820	4280	10300	4360	3230	1820
25	2990	3670	7090	17600	48600	12100	4530	4530	9330	4250	3020	1800
26	2900	3800	6310	16500	50600	11100	4470	4670	7690	3990	2860	1820
27	2820	3820	6070	16000	50900	10200	4850	4500	6640	5310	2710	1900
28	2800	3800	5870	15500	50800	9220	6720	4340	6310	6970	2630	2310
29	2780	3680	5530	15000	---	8520	9140	4490	6140	8220	2590	4660
30	2800	3640	5830	15200	---	8110	10700	4840	5590	9380	2530	6770
31	2820	---	6630	16400	---	8030	---	5530	---	10100	2490	---
TOTAL	136880	113010	218050	442920	694000	805180	188590	327220	200170	153210	135680	66840
MEAN	4415	3767	7034	14290	24790	25970	6286	10560	6672	4942	4377	2228
MAX	7300	5350	10200	22500	50900	49900	10700	19700	10300	10100	8750	6770
MIN	2780	2680	3730	6160	11300	8030	4470	4280	4250	3210	2490	1800
CFSM	.38	.32	.61	1.23	2.14	2.24	.54	.91	.58	.43	.38	.19
IN.	.44	.36	.70	1.42	2.23	2.58	.60	1.05	.64	.49	.44	.21

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1949 - 1997, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	5577	5729	10060	16030	22410	24570	19080	9903	7057	6506	6351	4907
MAX	24560	14480	29870	36550	41600	47260	41730	20630	19380	32470	19600	13860
(WY)	1995	1996	1993	1993	1973	1975	1975	1975	1973	1994	1994	1949
MIN	1864	2115	2763	3395	4803	9112	5635	2576	2302	1796	1902	2228
(WY)	1982	1982	1988	1981	1989	1985	1986	1986	1988	1988	1988	1997

SUMMARY STATISTICS	FOR 1996 CALENDAR YEAR		FOR 1997 WATER YEAR		WATER YEARS 1949 - 1997	
ANNUAL TOTAL	4023250		3481750			
ANNUAL MEAN	10990		9539		11580	
HIGHEST ANNUAL MEAN					17720	1975
LOWEST ANNUAL MEAN					5210	1988
HIGHEST DAILY MEAN	57800	Feb 12	50900	Feb 27	97900	Jul 16 1994
LOWEST DAILY MEAN	2650	Sep 22	1800	Sep 25		
ANNUAL SEVEN-DAY MINIMUM	2760	Oct 29	1820	Sep 20	1660	Jul 17 1986
INSTANTANEOUS PEAK FLOW			51300	Feb 27	98800	Jul 16 1994
INSTANTANEOUS PEAK STAGE			17.64	Feb 27	22.70	Mar 12 1971
ANNUAL RUNOFF (CFSM)	.95		.82		1.00	
ANNUAL RUNOFF (INCHES)	12.90		11.17		13.56	
10 PERCENT EXCEEDS	27500		20700		25500	
50 PERCENT EXCEEDS	6410		6160		7190	
90 PERCENT EXCEEDS	3140		2760		2720	

STATISTICS COMPUTED BY: rogermc DATE: 04/21/1998 AT: 07:48:32

Table B-3. USGS Water Discharge Record Water Year October 1990 to September 1991, Altamaha River Station 02225000.

ALTAMAHA RIVER BASIN

02225000 ALTAMAHA RIVER NEAR BAXLEY, GA.

LOCATION.--Lat 31°56'20", long 82°21'13", Appling-Toombs County line, Hydrologic Unit 03070106, on right bank 400 ft downstream from bridge on U.S. Highway 1, 2.2 mi upstream from Bay Creek, 8 mi downstream from Bullards Creek, and 12 mi north of Baxley.
DRAINAGE AREA.--11,600 mi², approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--August 1949 to June 1951, October 1970 to current year.
GAGE.--Water-stage recorder. Datum of gage is 61.51 ft above National Geodetic Vertical Datum of 1929. Aug. 13, 1949, to June 30, 1 nonrecording gage at site 400 ft upstream at same datum.
REMARKS.--No estimated daily discharges. Records good.
AVERAGE DISCHARGE.--22 years (water years 1950, 1971-91), 11,190 ft^3/s, 13.10 in/yr.
EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 97,500 ft^3/s, Mar. 12, 1971, gage height, 22.7 ft; minimum daily discharge, 1,620 ft^3/s, July 21, 1986.
EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Dec. 10, 1948, reached a stage of 25.1 ft, from floodmark, discharge, 130,000 ft^3/s. Flood of January 1925 reached a stage of 30.0 ft, from information furnished by Georgia Department of Transportation.
EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 25,000 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 7	2100	50,500	17.75	Apr. 10	2000	28,100	14.78
Mar. 10	1100	*62,500	*19.04				

Minimum daily discharge, 2,330 ft^3/s, Oct. 9.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2450	6030	3590	5230	31000	14400	14900	16200	10600	9300	13300	17100
2	2420	5580	4070	5430	33900	16000	16200	16200	10800	9600	17900	17200
3	2380	4850	4250	5800	37000	21800	17300	16100	10900	9830	20600	16000
4	2350	4650	3890	5960	42000	30800	18500	16100	10700	9640	21100	12800
5	2350	5180	3690	6050	47400	41900	20400	16400	11200	9750	19900	10000
6	2380	5190	3710	6200	49800	51100	23100	17100	11900	9640	17700	8860
7	2420	4470	4430	6470	50100	57300	25100	17900	12700	9860	15500	8140
8	2370	4280	4980	6650	50200	60200	26600	18800	12700	10300	13300	7880
9	2330	5510	5260	6330	49400	61300	27600	19200	11400	10800	11100	7690
10	2480	6870	5520	5940	47800	62000	28000	19000	10200	10700	9070	7320
11	2700	8190	5190	6110	45400	61400	27900	18800	9100	10500	7940	6660
12	3140	9110	4700	8260	42200	59200	27500	19300	7900	10500	8440	5910
13	4050	9590	4590	10600	37300	55900	26600	19600	6540	9740	10200	5190
14	6660	9340	4710	12300	30800	51800	25300	19700	5700	9200	9940	4670
15	8680	8450	4880	13700	25900	46900	23700	20100	5460	9360	10000	4340
16	9620	7300	4860	14500	22400	40700	22400	20700	5470	10200	11000	4180
17	8940	8280	4800	14700	20100	33400	21700	21700	5630	11900	12000	3930
18	6820	5720	4360	15100	18100	28300	21200	22900	5980	13300	12700	3640
19	5380	5450	4220	15600	16100	25600	19800	24000	6330	14700	13300	3490
20	4550	5210	4570	17300	14500	23800	18300	24300	6400	15900	13500	3630
21	4110	4560	5310	19400	13100	21800	16300	22700	6490	16400	12600	3740
22	4170	4130	5550	20800	12300	19900	15500	20600	7280	16700	12000	3650
23	4220	3910	5470	21600	11800	18600	15400	19200	7720	16800	11900	3530
24	4160	3800	5580	22100	11400	17000	15600	18000	7960	16300	11200	3450
25	4630	3870	5740	23100	11500	15400	15800	16700	8430	15000	9980	3360
26	6280	3950	5980	24200	12100	14200	16100	15300	8870	14000	10600	3260
27	8120	3880	6350	24700	12900	12900	16400	13900	8600	13400	12500	3220
28	9150	3730	6060	25300	13700	12000	16300	12800	8380	13000	13400	3320
29	9110	3580	5640	25800	—	11900	16500	11900	8500	12500	13800	3210
30	8240	3490	5380	27500	—	12600	16400	11200	8890	12000	15000	3110
31	6650	—	5270	29300	—	13400	—	10900	—	12000	16300	—
TOTAL	153510	166130	152380	451930	810000	1013300	612400	557300	258750	373020	407770	192480
MEAN	4952	5538	4915	14580	28930	32690	20410	17980	8625	12030	13150	6416
MAX	9620	9590	6350	29300	50200	62000	28000	24300	12700	16800	21100	17200
MIN	2330	3490	3590	5230	11400	11900	14900	10900	5470	9200	7940	3110
CFSM	.43	.48	.42	1.26	2.49	2.82	1.76	1.55	.74	1.04	1.13	.55
IN.	.49	.53	.49	1.45	2.60	3.25	1.96	1.79	.83	1.20	1.31	.62

CAL YR 1990	TOTAL 3905730	MEAN 10700	MAX 65000	MIN 1840	CFSM .92 IN. 12.53
WTR YR 1991	TOTAL 5140970	MEAN 14110	MAX 62000	MIN 2330	CFSM 1.22 IN. 16.51