

Basis for Request: Needed Supply

- Projected need in 2035 = 42.5 MGD (Ave. Day)
- Under DNER rules, new plan is required when demand = 80 percent of supply. The argument by K-C was that the 80 percent rule meant the supply was inadequate when demand = 0.8 x supply. Therefore

$$0.8 \times \text{Requested Supply} = 42.5$$

$$\text{Requested Supply} = 53 \text{ MGD (Ave. Day)}$$

Shortfall

- Requested supply = 53 MGD Avg. Day
- Existing within-basin supply = 31 MGD
- Shortfall = 22 MGD Average Day
- Max Day = 1.6 Average Day
- 36 MGD maximum day

Request

- 10 MGD max day IBT from Yadkin
- Balance to come from Catawba
 - 26 MGD max day if the IBT from Yadkin is granted
 - Otherwise, 36 MGD from Catawba

Recommended Decision presented to EMC for action in January

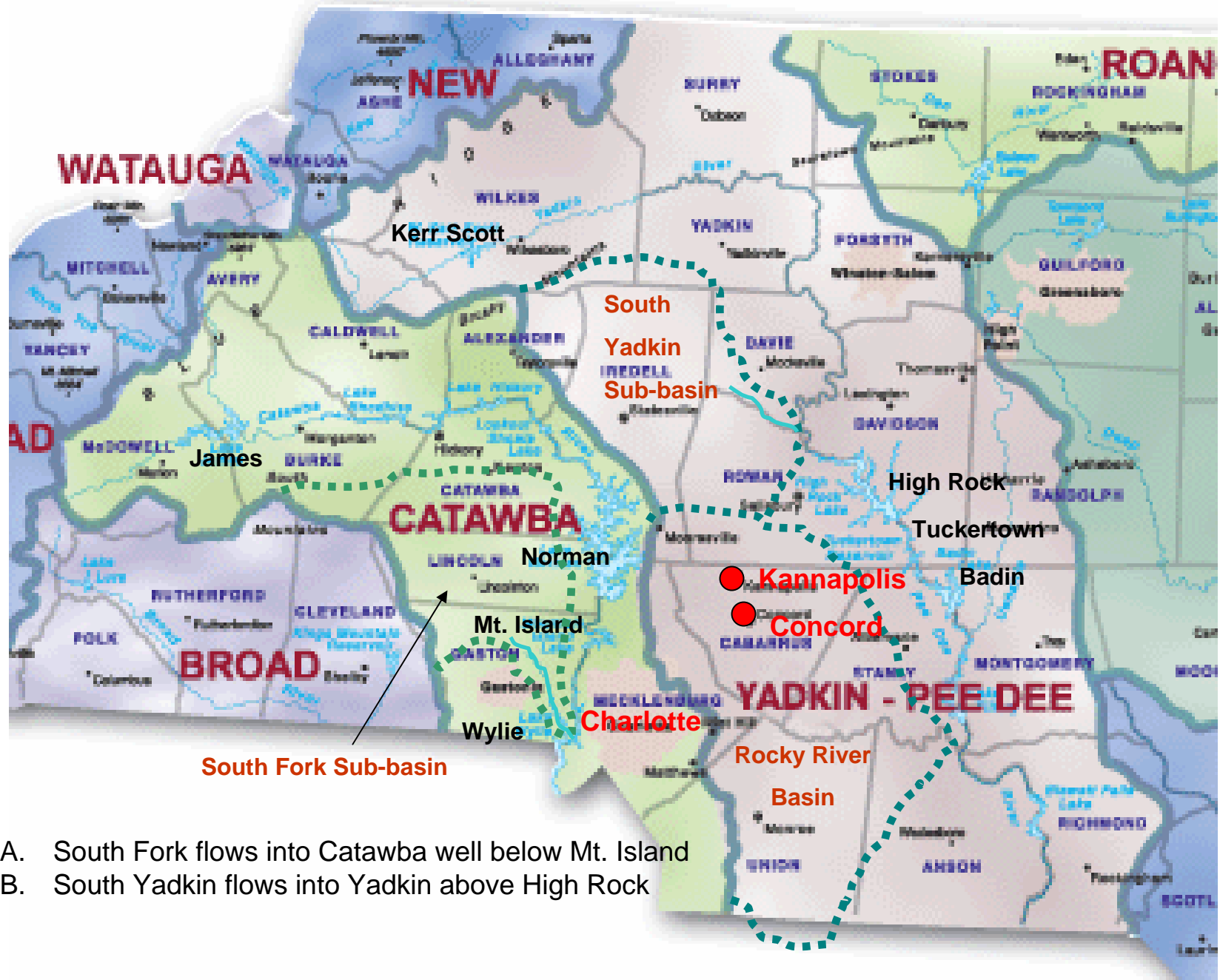
- Grant 10 MGD (max day) from Catawba via Charlotte-Mecklenburg Utilities
- Grant 10 MGD (max day) from Yadkin
- Subject to several conditions
 - Conservation policies in Catawba apply to Kannapolis-Concord
 - Changing needs in Catawba Basin
 - built in review after 20 years;
 - Capacity Use Act supercedes IBT certificate

Factors Leading to Recommendation: Calculation of Shortfall

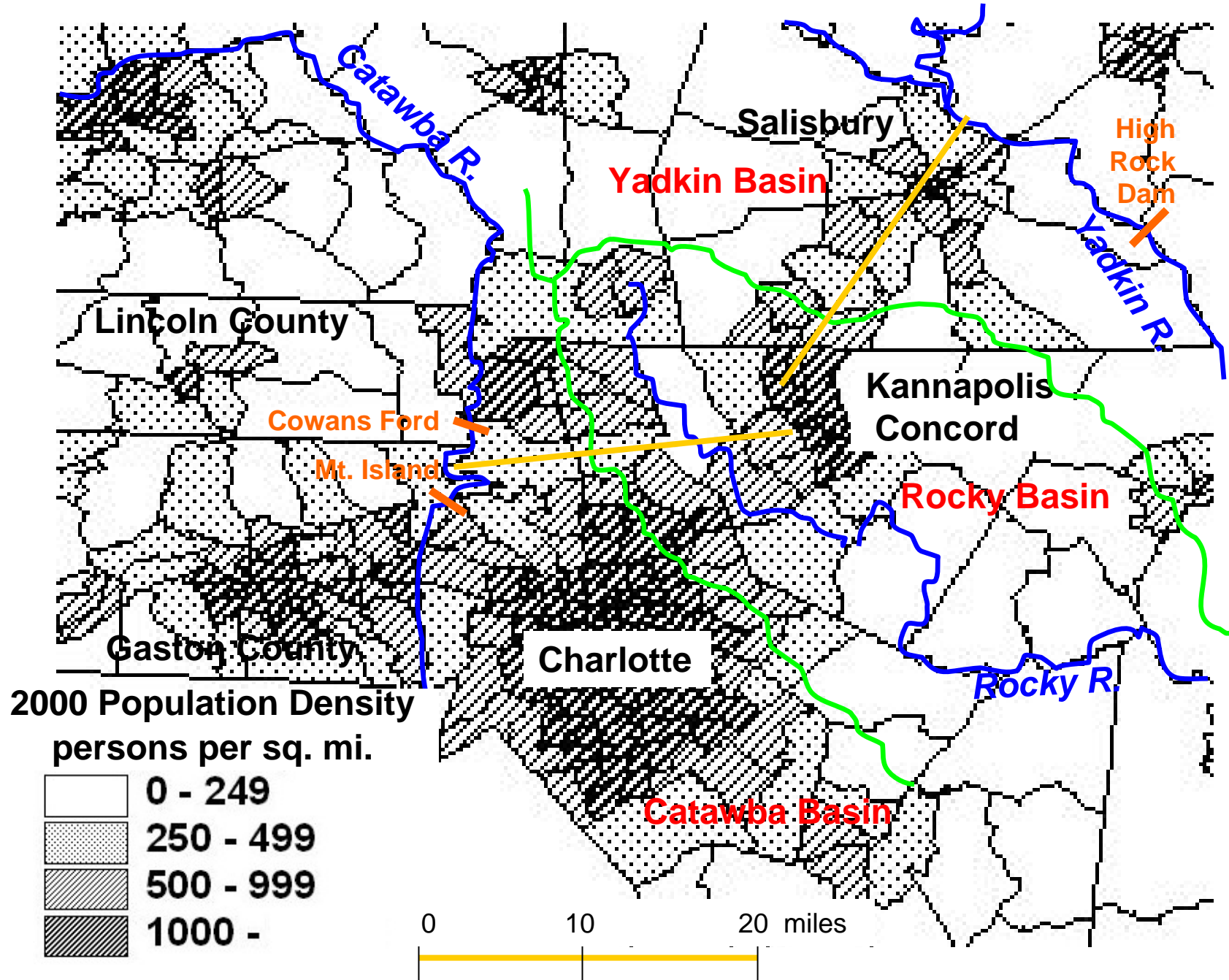
- Rejected argument based on 80 percent rule which put need at 53 MGD instead of the 42.5
- average daily need adjusted to
 $42.5 \text{ MGD} - 31 \text{ MGD} = 11.5 \text{ MGD}$
- Maximum day demand = $11.5 \times 1.6 = 18.4 \text{ MGD}$

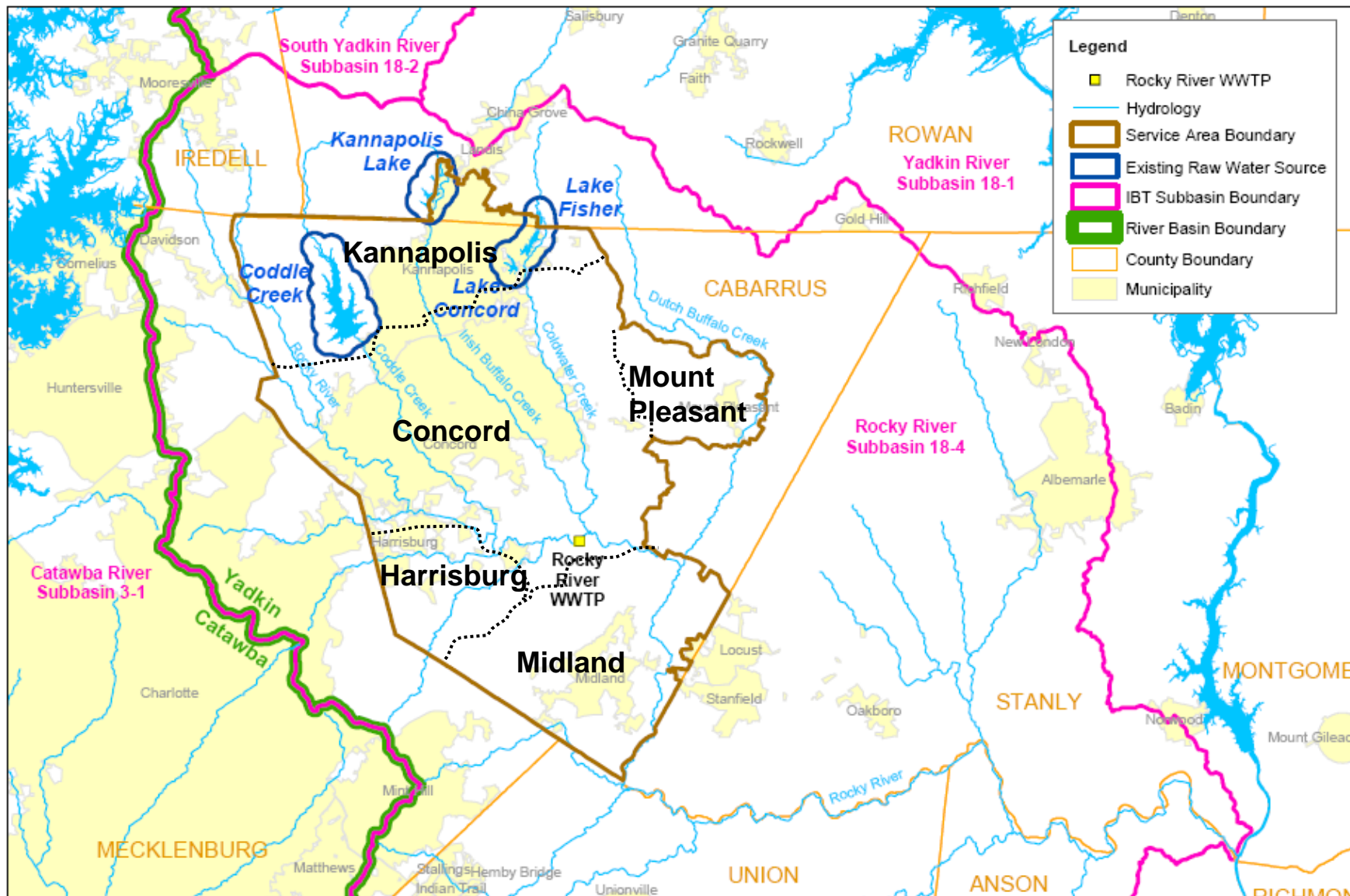
Factors Leading to Recommendation: Relative Impacts on Donor Basins

- Transfers in excess of 10 MGD begin to have impacts on Catawba (even they are not major)
- Water availability in Yadkin at High Rock approximately twice that in Catawba at Mt. Island
- Future needs (30-years hence) in all three basins are uncertain



- A. South Fork flows into Catawba well below Mt. Island
- B. South Yadkin flows into Yadkin above High Rock





5 2.5 0 5 Miles



Figure ES-1
IBT Receiving Basin Service Area and
Existing Raw Water Sources
Concord/Kannapolis IBT RFEIS

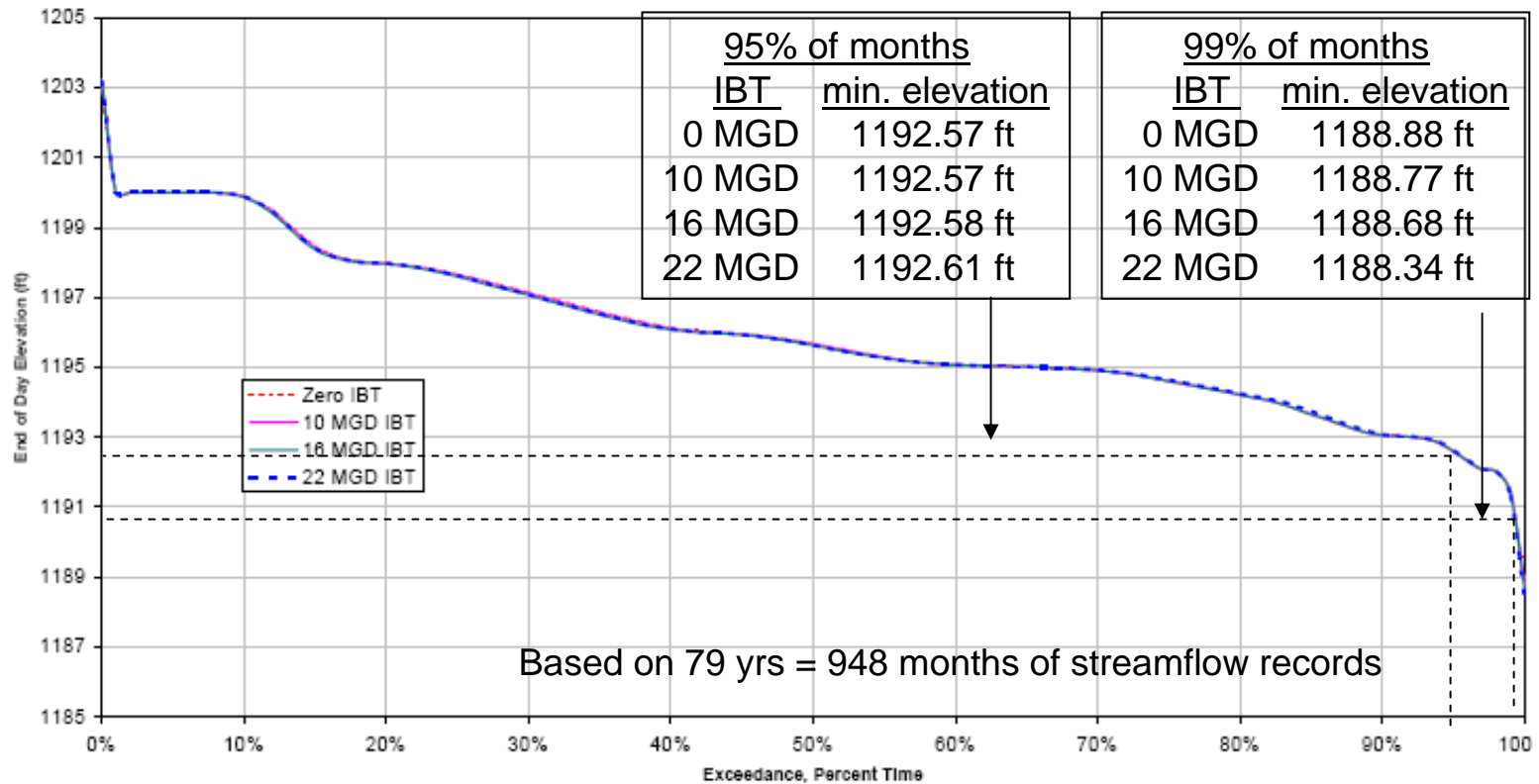
IMPACT ON CATAWBA BASIN

- IBT Scenarios
(1) Zero (2) 10 MGD (3) 16 MGD (4) 22 MGD
- Summary of performance for 79 years of streamflow records with projected needs in Catawba Basin
- Worst case in record 2000-2002
- Simplified check on credibility of model

FIGURE ES-4

Lake James Elevation Duration Curve
Concord/Kannapolis IBT RFEIS

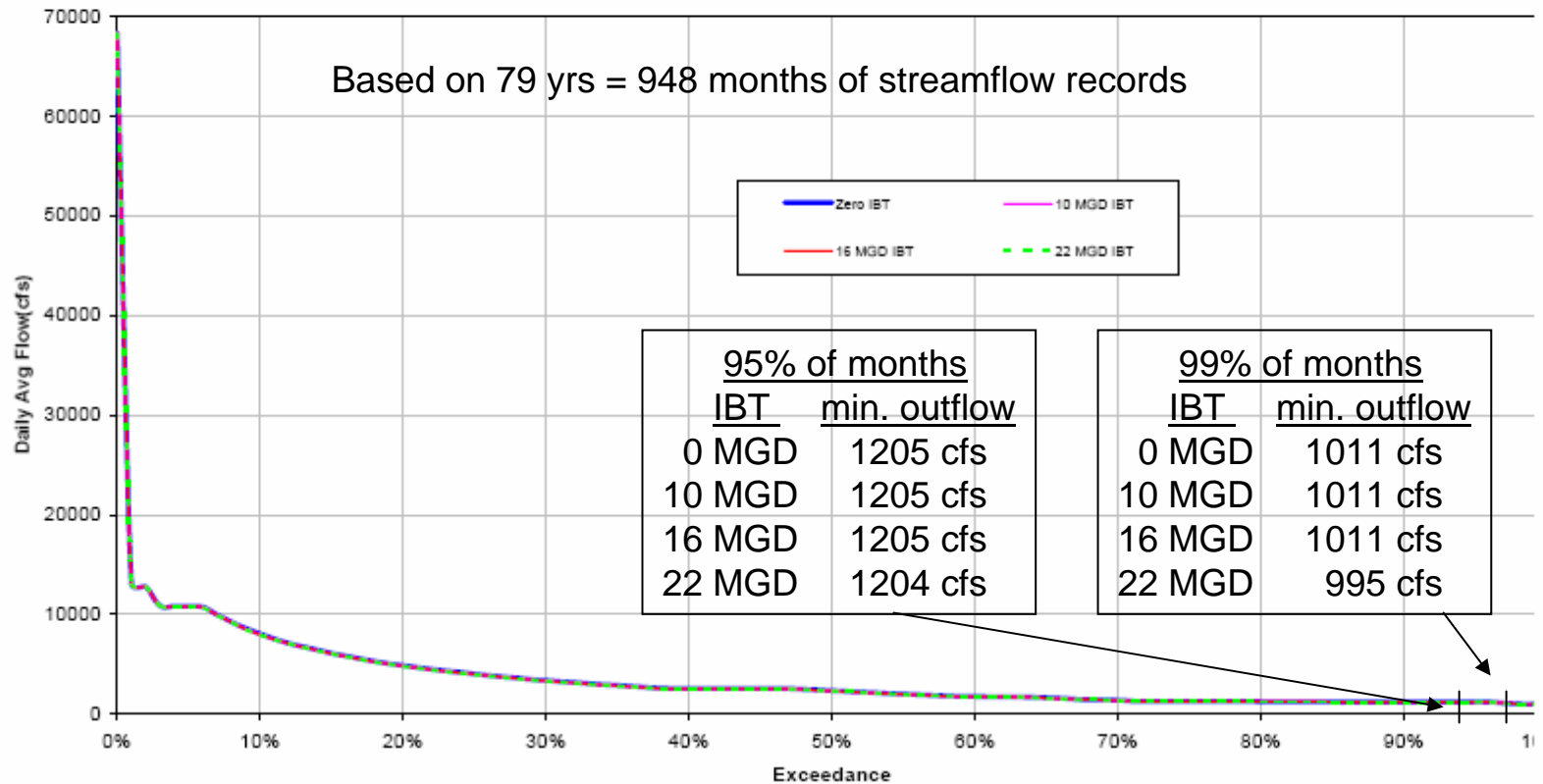
Exceedance Curve of Lake James Elevations
for all Elevations Between Jan 1, 1929 and Dec 31, 2003



Summary of performance over 79 years of streamflow records

FIGURE ES-5
Lake Wylie Outflow Duration Curves
Concord/Kannapolis IBT RFEIS

Exceedance Curve of Wylie Outflows
for all Outflows Between Jan 1, 1929 and Dec 31, 2003

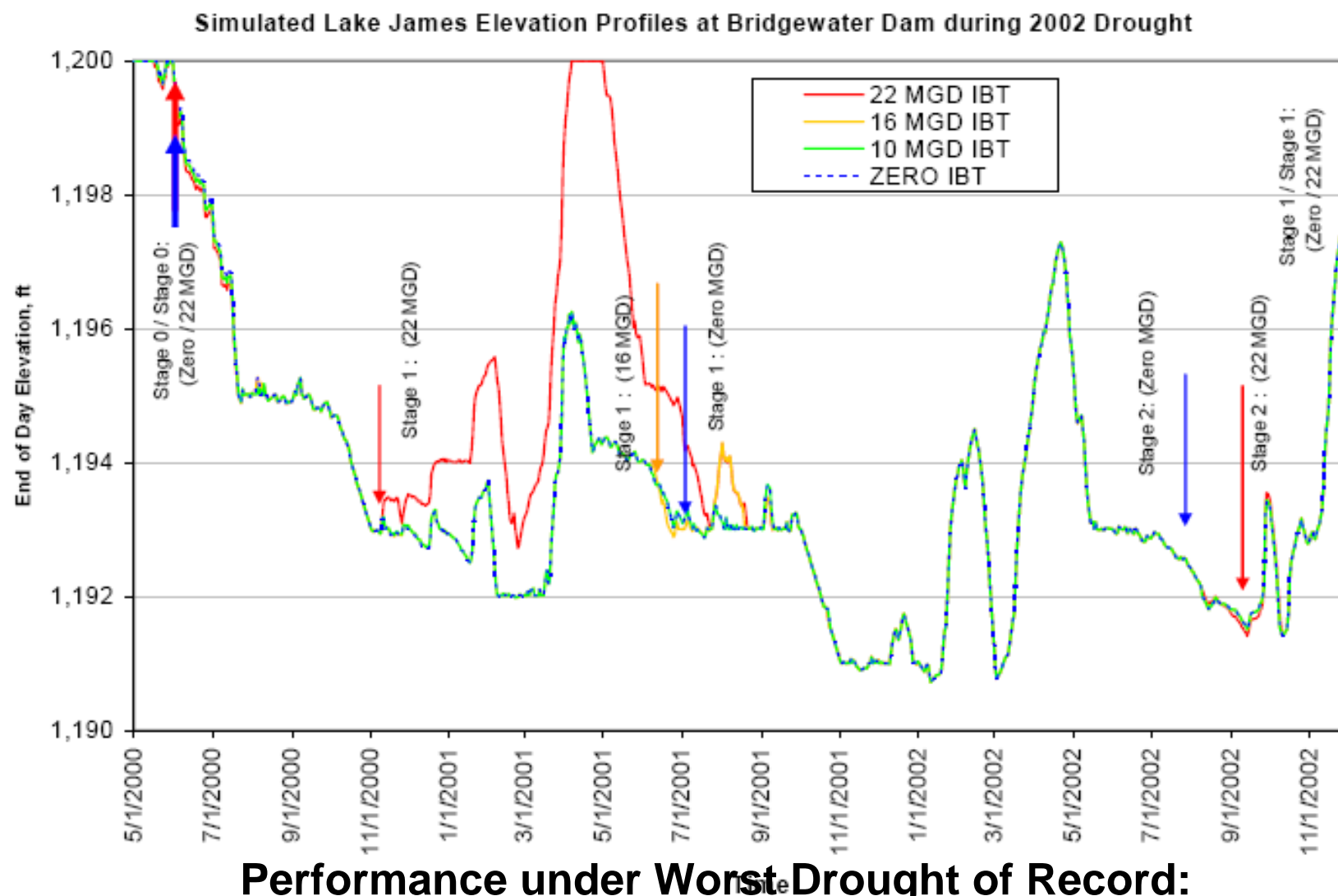


Summary of performance over 79 years of streamflow records:
Outflows from Lake Norman

FIGURE ES-6

Lake James Elevation during 2001-02 Drought

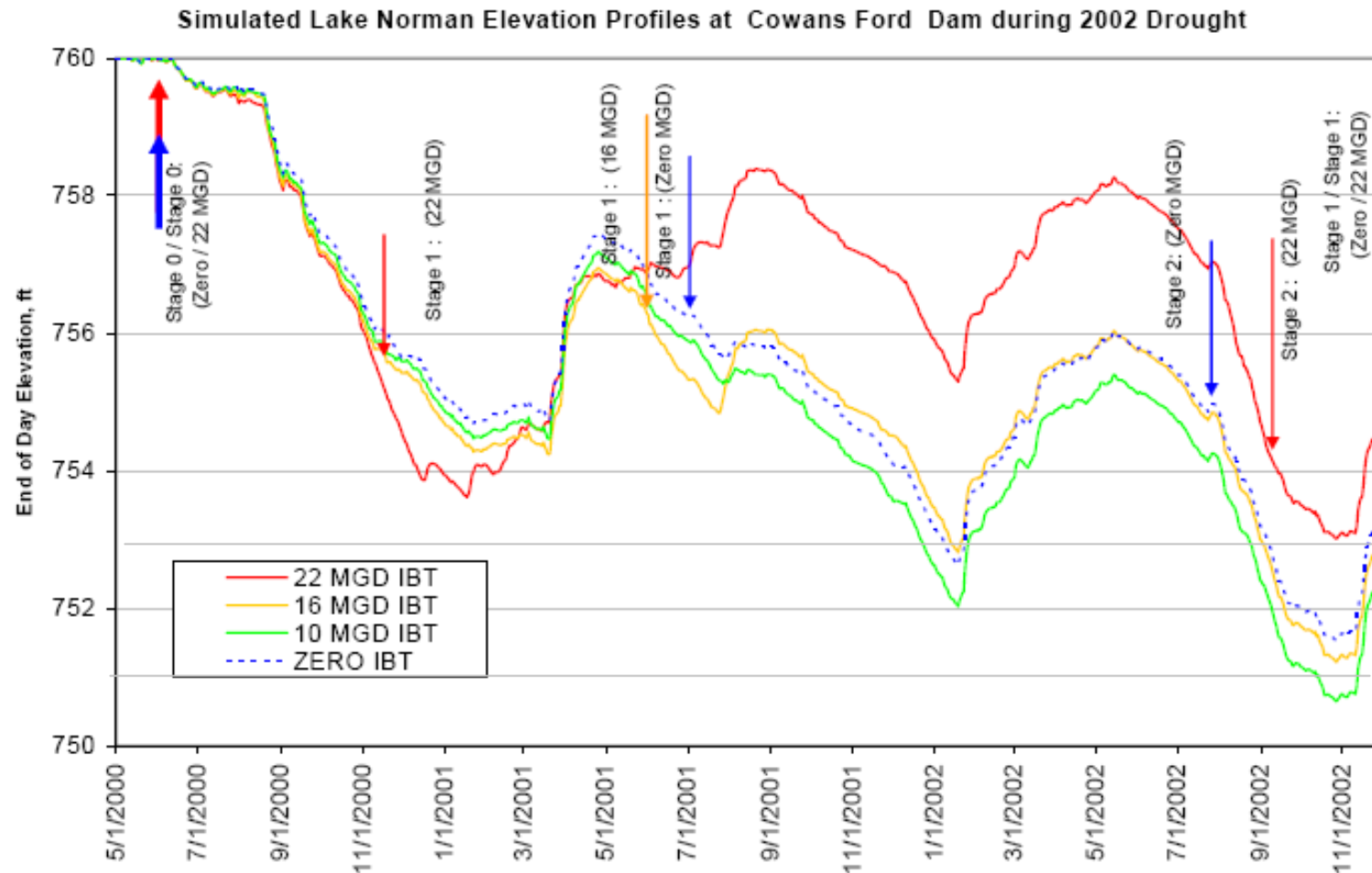
Concord/Kannapolis IBT RFEIS



**Performance under Worst Drought of Record:
Lake James Reservoir Levels**

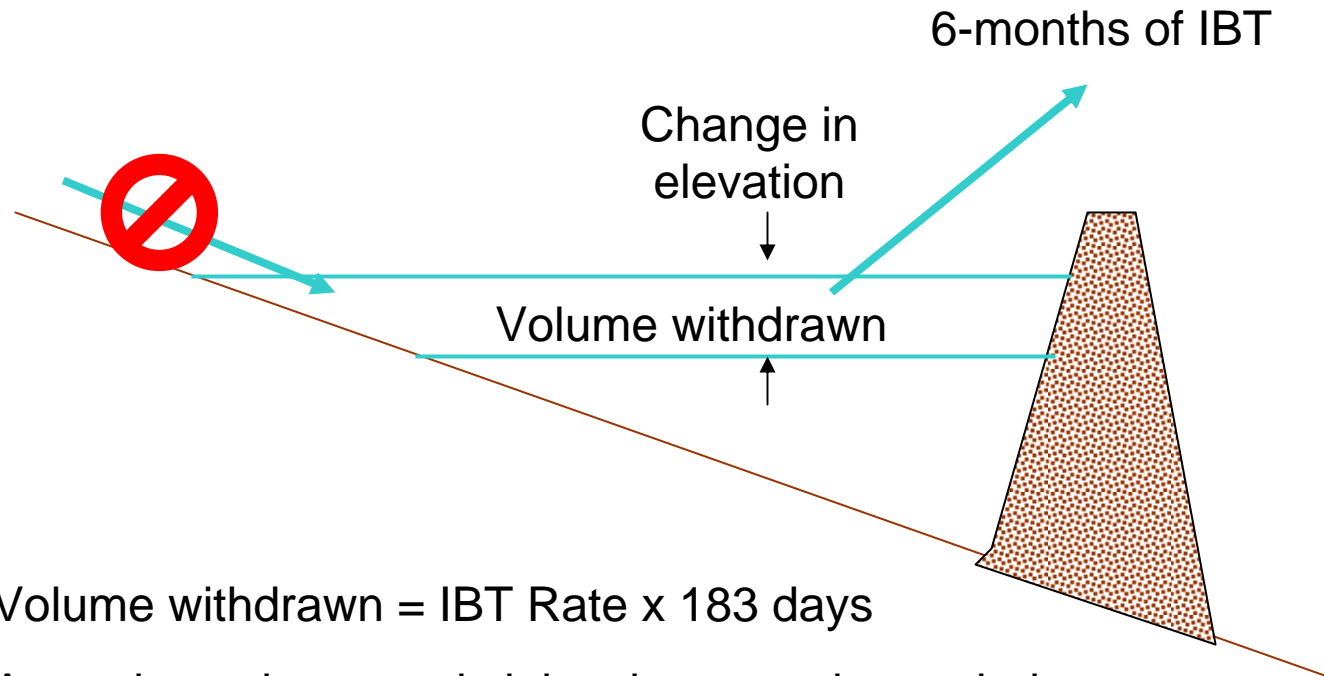
FIGURE ES-7

Lake Norman Elevation during 2001-02 Drought
Concord/Kannapolis IBT RFEIS



**Performance under Worst Drought of Record:
Lake Norman Reservoir Levels**

Simple Check – Upper Bounds on Changes in Elevation



- 1) $\text{Volume withdrawn} = \text{IBT Rate} \times 183 \text{ days}$
- 2) Apportion volume to six lakes in proportion to their storage levels at 75 and 90 percent full.
- 3) $\text{Calculate change in elevation} = \text{volume withdrawn} / \text{surface area}$

Results

TABLE 2-14

Simple Analysis based on Stage-Storage Curves and Assumption of No Inflow
 Concord/Kannapolis IBT RFEIS

Reduction in Reservoir Elevations (inches) for Transfers of 10, 16, and 22 mgd						
Reservoir	10 mgd		16 mgd		22 mgd	
	Initial Storage Conditions					
	90% storage	75% storage	90% storage	75% storage	90% storage	75% storage
James	2.1	2.3	2.1	3.7	4.5	5.0
Rhodhiss	1.1	1.2	1.1	1.9	2.4	2.6
Hickory	1.4	1.6	1.4	2.5	3.0	3.5
Lookout Shoals	1.3	1.3	1.3	2.1	2.8	2.9
Norman	1.4	1.7	1.4	2.6	3.1	3.6
Mountain Island	0.9	1.0	0.9	1.6	2.1	2.3

IMPACT ON YADKIN BASIN:
Summary of Performance
over 75 Years of Streamflow Records

FIGURE ES-8
High Rock Lake Level Duration Curves – Maximum Daily Demands
Concord/Kannapolis IBT RFEIS

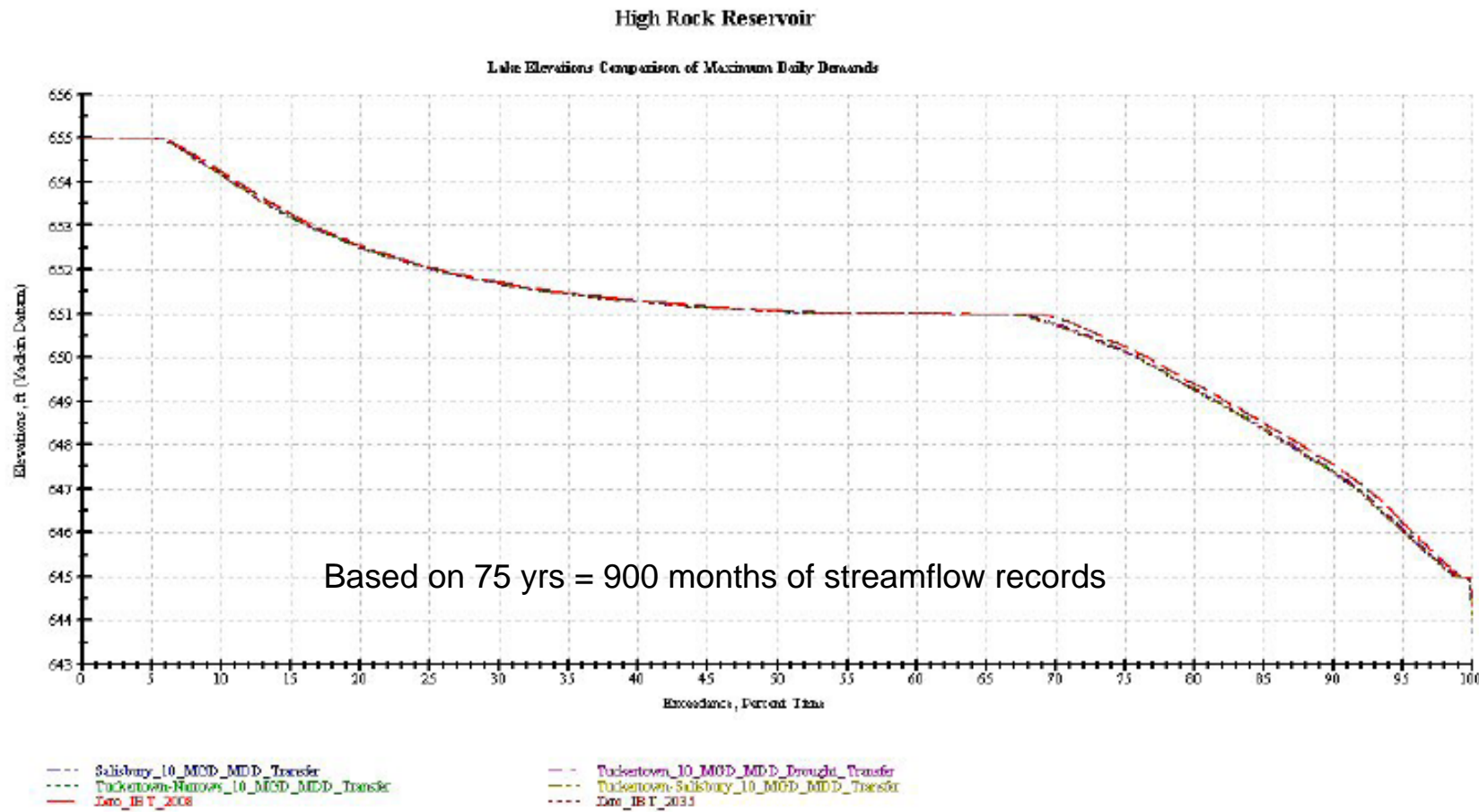
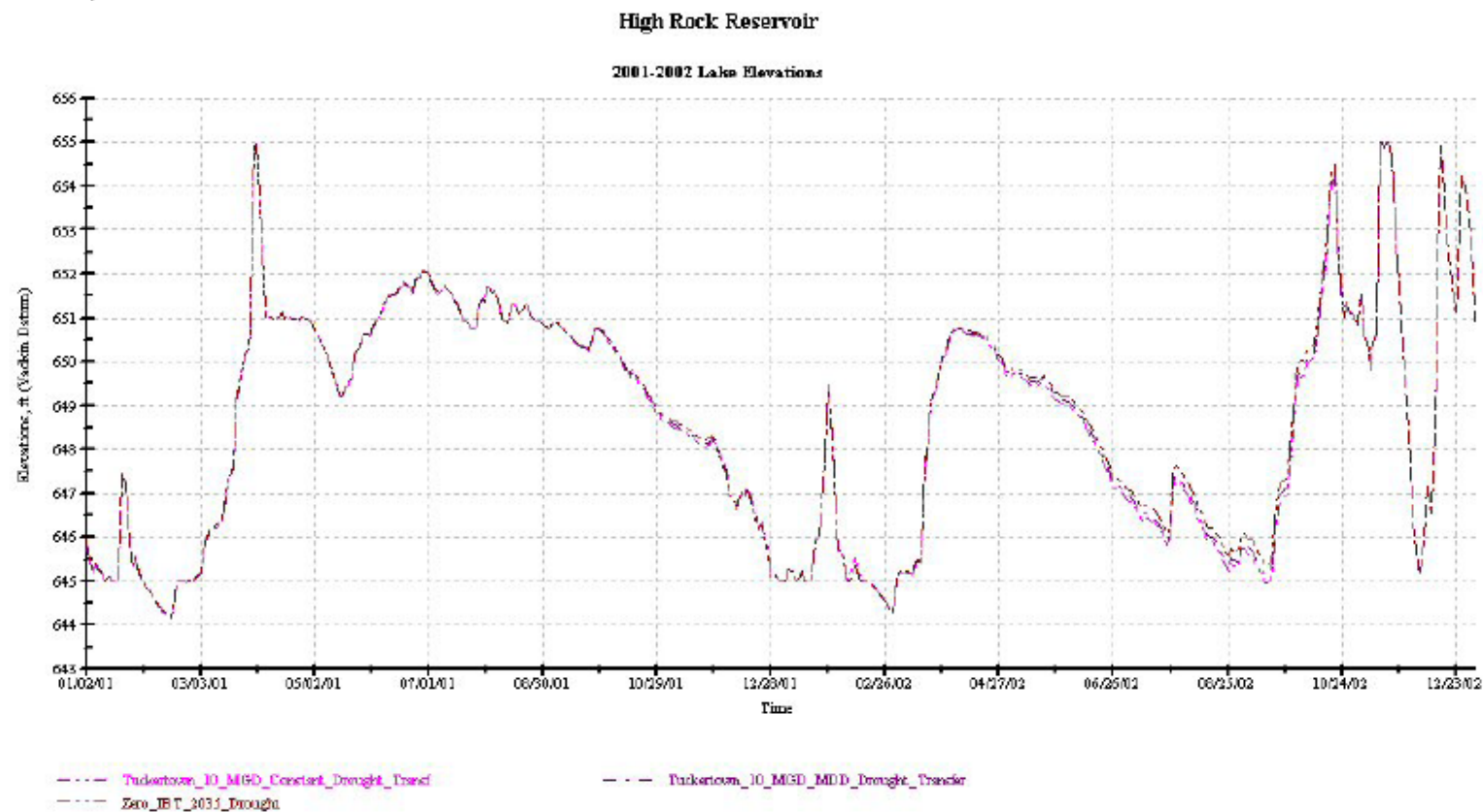


FIGURE ES-10
 High Rock Reservoir 2001-2002 Drought Lake Levels
 Concord/Kannapolis IBT RFEIS



Simple Check – Upper Bounds on Changes in Elevation

Storage, % of Available <u>Capacity</u>	Drawdown in inches resulting <u>from 183 days of 10 MGD IBT</u>		
	<u>High Rock</u>	<u>Narrows</u>	<u>Tillery</u>
100%	2.7	3.6	1.6
75%	3.3	3.9	1.7
50%	4.4	4.4	1.9

Comparative Analysis

Drainage Areas and Average Flow

Location	Drainage Area	Average Flow
Catawba River at Mt. Island	1,856 sq. mi.	1,495 MGD
Yadkin River at High Rock	3,940 sq. mi.	3,208 MGD

Average June-November Flows, cfs

<u>Percentile (75 yrs)</u>	<u>Mt. Island</u>	<u>High Rock</u>
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Lowest	358	642
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5% of years	461	875
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10% of years	539	1087
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25% of years	702	1468
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50% of years	987	2135
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Items for Discussion on IBT Statute and Process

- Weights on donor versus receiving basins
- Time limits on certificates – 20-30 years
- Seasonal limits on transfers – take water during high flow months and put in off-stream storage
- Two-stage public involvement
 - Notice of receipt of petition
 - Hearing on recommended decision