

Executive Summary

Introduction

The Cities of Concord and Kannapolis are requesting an interbasin transfer certificate to meet their projected water supply shortfall during the next 30 years. The Cities and their service areas in Cabarrus County (Figure ES-1) are within the Rocky River Subbasin and they are requesting an average interbasin transfer (IBT) of 22 million gallons per day (MGD) from a combination of the Catawba and Yadkin-Pee Dee River Basins. The associated maximum day IBT being requested is up to 36 MGD from the Catawba River Basin and 10 MGD from the Yadkin River Basin. If the IBT is granted from the Yadkin River Basin, then the amount of the transfer from the Catawba River Basin can be proportionately reduced.

The purpose of this Environmental Impact Statement (EIS) is to discuss the potential impacts of transferring water from one river basin to another from the source basins, the Catawba and Yadkin River Basins, and to the receiving basin, the Rocky River Subbasin. This includes the direct impacts of moving the water as well as the secondary and cumulative impacts of the growth and development facilitated by this additional water supply. The EIS presents alternatives for water supply that require an IBT as well as alternatives that do not require an IBT. The EIS does not discuss direct impacts of specific infrastructure construction projects that may be required to actually transfer the water. Any future construction associated with projects allowed by the IBT, if approved, will be discussed under a different environmental document in accordance with the North Carolina Environmental Policy Act (NCEPA). Location(s) of specific infrastructure projects and potential impacts are speculative at this time. Approval of an IBT certificate does not provide any pre-approval for permits needed for any new or expanded infrastructure.

The Cities have been working diligently on addressing water supply needs since 1999 and have been working with the N.C. Division of Water Resources (DWR) for the last five years to develop an EIS that examines the potential impacts of the IBT (Section 1.1). It is important to note that the Cities have coordinated their IBT planning and regulatory approval process with the ongoing Federal Energy Regulatory Commission (FERC) relicensing activities in the Yadkin-Pee Dee and Catawba River Basins.

As the Cities worked to obtain additional water supply, the area experienced an extensive drought which lasted from 1999 through the spring of 2003. The drought impacted the Cabarrus County communities for a long time because of the small size of their drinking water watersheds. This prompted the communities to adopt stringent water conservation programs including a tiered rate structure that promotes water conservation and discourages irrigation by making high levels of water use more expensive. Concord and Kannapolis have been cited by State officials as having one of the most aggressive water conservation programs and water rate structures in the State. Per capita water use has remained low after restrictions have been removed since the end of the drought (Section 1.4.1).

Also during the evolution of this EIS, the Cabarrus County region lost their largest employer, Pillowtex, in 2003 (Section 1.4). This loss of industry had a short-term effect of further reducing water demand. However, redevelopment of the industrial site into a major biomedical research complex has become a mission of a developer with support from the communities, region, the University of North Carolina System, the NC General Assembly, and U.S. Senate and Congressional delegation. This redevelopment effort is projected to require a similar water demand during the planning period as the Pillowtex facility and will further fuel the rapid growth that has occurred in Cabarrus County for more than the past decade.

The preferred alternative is a regional solution that allows the Cities to obtain water from neighboring communities in the Catawba and Yadkin River Basins. Approval of the IBT certificate is a prerequisite to negotiating long-term agreements for water. Once these agreements are in place, the associated infrastructure projects can be identified and the review and permitting process can begin.

Water Supply Needs

Existing Water Supply

Current water supplies (Figure ES-2) for the communities are from reservoirs located near the headwaters of the Rocky River Subbasin and a small creek in the South Yadkin Subbasin. The City of Concord's current raw water supplies include Lake Howell (Coddle Creek Reservoir) operated by the Water and Sewer Authority of Cabarrus County (WSACC), as well as Lake Concord and Lake Fisher. The City of Kannapolis' raw water supply, Kannapolis Lake (Rocky River Subbasin), has a limited watershed of approximately 10 square miles. However, Kannapolis Lake is supplemented with raw water transfers from Lake Howell (Rocky River Subbasin) and Second Creek (South Yadkin River Subbasin). The transfer from Second Creek has a grandfathered IBT of 6 MGD, but only increases the safe yield of Kannapolis Lake by approximately 2.5 MGD.

The available water supply in the Rocky River Subbasin is insufficient to meet projected demands. The 50-year safe yield of the Cities' current water supplies is 31 MGD and the 100-year safe yield is 16 MGD. This latter yield is based on the recent drought of record from 1999 to 2003. Potential reservoir sites in the Rocky River watershed have already been developed and Concord and Kannapolis already have more reservoir storage than they have watershed yield to supply these reservoirs. Watershed yield is limited due to the area's location in the uppermost portion of the Rocky River watershed (Figure ES-2). The possibility of constructing a reservoir on the Second Creek watershed was investigated, but this reservoir only provided about 8 MGD of additional water supply, would still require an IBT, and had stream and wetland impacts associated with new reservoir development. The land for this potential reservoir was recently sold at below market value by the City of Kannapolis to a land trust. While a reservoir will not be developed here, the City of Kannapolis will maintain its water intake on Second Creek. Another reservoir on Dutch Buffalo Creek was investigated but had limited yield and posed potential impacts to several State listed species of concern (Section 1.6).

Future Water Demands

Water use and future supply needs were projected as part of a comprehensive water and wastewater master planning effort for all of the communities within Cabarrus County conducted in 2000 through 2002 (Black and Veatch, 2003). Water demand calculations are based on projected populations and current water usage by type of use, such as residential, commercial and industrial. Water usage has been updated since the master planning effort to reflect the reduced demands after the adoption of aggressive water conservation programs during and following the 1999 through 2002 drought (Section 1.4). Other factors included recent development trends, planned transportation improvements, and changes to the non-residential demands.

The projections from the master plan included no projected increase in industrial water usage through 2050. Since the master planning effort, the City of Kannapolis's largest industrial water user, Pillowtex, closed its facility in 2003. Pillowtex's average daily water demand was approximately 5 MGD. For the purposes of this EIS, water demand for redevelopment of the Pillowtex site as a biomedical research facility and surrounding area is assumed to be back up to 5 MGD within the 30-year projection period.

Water demand projections have been made through 2050 as part of the master planning effort. For the purpose of the IBT request, projections were based on a 30-year planning period to 2035 based on discussions with DWR and previous IBT actions by the Environmental Management Commission (EMC). According to current water demand projections (Table ES-1), the combined demand will be about 42.5 MGD average daily demand (ADD) by 2035 and 52 MGD in the year 2050. Maximum daily demand (MDD) for 2035 and 2050 are projected at about 67 and 83 MGD, respectively.

TABLE ES-1
Current and Projected Water System Demands for the Water Service Areas
Concord/Kannapolis IBT Environmental Impact Statement

Service Area	2000		2010		2020		2035		2050	
	ADD	MDD	ADD	MDD	ADD	MDD	ADD	MDD	ADD	MDD
Concord/Harrisburg/ Midland	10.7	17.1	14.8	24.9	19.8	33.0	25.6	42.3	32.3	53.3
Mt. Pleasant	0.3	0.45	0.4	0.7	0.6	0.9	0.8	1.3	1.0	1.7
Kannapolis	8.6	11.8	11.6	16.6	14.0	20.4	16.0	22.9	18.7	27.6
Combined Total	19.6	29.3	26.75	42.2	34.3	54.4	42.5	66.5	52.0	82.6

Sources: Cabarrus County Water and Wastewater System Master Plan. December 2002; Cities of Concord and Kannapolis

Water Supply Shortfall

The State Water Supply Plan requires local governments to prepare a local water supply plan that assesses the ability of the system to meet water supply needs for a 20- to 25-year

period. If the ADD exceeds 80 percent of the available supply, a specific plan must be developed to identify how water supply needs will be met. The proposed IBT certificate(s) will be based on a 30-year planning period. Therefore, the IBT evaluation will be based on projected demand information to year 2035, when the ADD is projected to be 42.5 MGD. In order to meet the 80 percent criteria mentioned above, an available supply of 53 MGD is required. Based on the 50-year safe yield of existing supplies of 31 MGD, there is a 22 MGD ADD shortfall in available supply for the year 2035. This projected shortfall is the basis of the IBT request (Section 1.5).

Environmental Impact Analysis

The purpose of this EIS is to discuss the direct, secondary, and cumulative impacts of the proposed IBT on both the source and receiving basins including wetlands, urban lands, prime agricultural lands, forestry resources, public and recreational lands, archaeological and historical resources, fish and wildlife resources, sensitive aquatic and terrestrial species and habitats, water quality and water resources, air quality, groundwater, noise, and toxic substances. This EIS process was developed in cooperation with DWR, the EMC, and legal counsel from the North Carolina Attorney General's office.

EIS Study Area

The study areas discussed in the EIS are shown in Figure ES-3. The receiving basin is the Rocky River Subbasin which includes all of Cabarrus County. The City of Concord is located in Cabarrus County, which is adjacent to Mecklenburg County where the City of Charlotte is located. The Concord water system supplies areas within the Concord city limits and adjacent county areas and provides supplemental water to the Towns of Harrisburg, Mt. Pleasant, and Midland. The City of Kannapolis is located in northern Cabarrus County and southern Rowan County. The Kannapolis water system supplies areas within the Kannapolis city limits in both Cabarrus and Rowan Counties, and adjacent areas including the Town of Landis. The Town of Landis is in the South Yadkin River Basin; however water supplied to the town is not considered an IBT under the IBT statute. Combined, the Concord and Kannapolis water systems supply almost 100 percent of the public water supply in Cabarrus County.

In the Catawba River source basin, direct impacts on the immediate areas surrounding Mountain Island Lake and Lake Norman are discussed. Secondary and cumulative impacts (SCI) include impacts to the areas around these various reservoirs (i.e., the study areas) and also include impacts to water levels and outflows from the reservoirs in the Catawba River Basin from Lake James to Lake Wateree (Section 2.1.5).

In the Yadkin River source basin, direct and secondary impacts focused on the immediate areas surrounding High Rock Lake, Tuckertown Reservoir, and Badin Lake (Section 2.1.6).

As part of this Final EIS, the impacts of the IBTs on water levels and outflows were assessed using modeling tools developed as part of FERC relicensing efforts for both Duke Power's Catawba-Wateree Project, which includes reservoirs in both North and South Carolina, and the Yadkin Hydroelectric Projects operated by Alcoa Power Generating, Inc. (APGI) and Progress Energy.

IBT Alternatives

Four IBT alternatives and two non-IBT alternatives were considered in addition to the No Action Alternative (NAA). These are summarized as follows:

- Alternative 1 requires the development of a water supply contract with Charlotte-Mecklenburg Utilities (CMU) which would be for at least 10 MGD and up to 36 MGD MDD of finished water. A combination of finished water transferred through existing interconnections and transport of raw water from a new or existing intake on Lake Norman could also be utilized.
- Alternative 2 would involve an IBT of up to 36 MGD MDD of water from Tuckertown Reservoir or Badin Lake. For this alternative either raw water or finished water could be transferred.
- Alternative 3 would involve an IBT of 22 MGD of raw water from High Rock Lake. The 22 MGD would be transferred from High Rock Lake and pumped through a new raw water main that would discharge into Lake Howell in Cabarrus County and Kannapolis Lake in Rowan County.
- The Preferred Alternative is a combination of Alternatives 1 and 2, involving an IBT from both the Yadkin-Pee Dee River and the Catawba River Basins to the Rocky River Subbasin. This alternative would continue the use of the existing interconnections with Charlotte, Salisbury, and Albemarle to meet short-term increases in demands, and allow Concord and Kannapolis the opportunity to expand the amount of finished water obtained from Charlotte, Salisbury, and/or Albemarle or obtain raw water from Lake Norman in the Catawba River Basin. The Preferred Alternative IBT certificate would be for up to 36 MGD (MDD) from the Catawba River Basin and up to 10 MGD (MDD) from the Yadkin-Pee Dee River Basin; however, the total IBT from both sources will not exceed a MDD of 36 MGD or an ADD of 22 MGD. The IBT allowed from the Catawba River Basin can be proportionately less if the IBT is granted from the Yadkin River Basin.

Two non-IBT alternatives are discussed that utilize flows in the Rocky River that are augmented by wastewater discharges. In Alternative 4A, 22 MGD would be withdrawn near Midland from the Rocky River approximately 10 miles downstream of the Rocky River Wastewater Treatment Plant (WWTP) and raw water would be pumped up to Lake Howell. Alternative 4B would transfer 22 MGD of raw water from Lake Norman to Lake Howell, and simultaneously withdraw 22 MGD from the Rocky River near Midland and pump it over to McAlpine Creek near Mint Hill in the Catawba River Basin to mitigate the IBT. These alternatives were not found to be feasible because of several factors. In particular, the high proportion of flow in the Rocky River from wastewater significantly reduces its potential use as a water supply under the North Carolina water supply protection regulatory framework.

Alternatives that involved eliminating or reducing the IBT by returning wastewater to the source basins were not considered practical because the discharges would need to be to very small streams or directly to reservoirs in the systems. A summary of capital costs and environmental considerations associated with each of the alternatives is presented in Table ES-2.

TABLE ES-2
 Summary of Alternatives Analysis
 Concord/Kannapolis IBT Environmental Impact Statement

Alternative with Water Source(s) Listed	Capital Cost Rating	Environmental Consequences Rating	SCI to Receiving Basin Rating	Public Health Issues related to Water Supply	Impacts to Hydroelectric Power Generation Rating
Alt. 1 - Lake Norman/Catawba	\$86.5 M	Low	Low	Low	Low
Alt. 2 – Tuckertown-Badin Lake/ Yadkin	\$116.3 M	Low	Low	Low	Low
Alt. 3 - High Rock Lake/Yadkin	\$80.4 M	Middle	Low	Low	Low
Preferred Alternative	\$138.7 M ^a	Low	Low	Low	Low
Alt. 4A – Indirect Reuse/Rocky River	\$93.4 M	Middle	Low	High	Lowest
Alt. 4B – Reverse IBT/Catawba	\$107.7 M	Middle	Low	Low	Low
No Action	N/A ^b	Lowest	N/A	N/A	Lowest

^a This price could be reduced based on negotiations with neighboring communities after an IBT certificate is issued.

^b Costs of the NAA are difficult to quantify, but could include the costs of pursuing a non-IBT alternative, the development of private water systems, and other infrastructure.

Impact Summary

The direct impacts of the IBT in the source basins were evaluated using modeling tools developed for FERC relicensing. Evaluation of direct impacts to the source basin focused on water quality and water quantity, including reservoir levels and instream flows.

In order to address drought situations in the Catawba River Basin, a Low Inflow Protocol (LIP) was developed during the FERC relicensing application process on the basis that all users and parties with interests in water quantity will share the responsibility to conserve water during low inflow conditions (see Appendix D). This LIP was developed with a stakeholders group of water users and other interest groups. It includes five stages of water management (Stage 0 to Stage 4) starting with public notification and voluntary restrictions to extreme mandatory restrictions on water use (Table ES-3). The LIP is performance based using several criteria including that there be no more than two and preferably only one occurrence of LIP Stage 3 during the period of record and no occurrence of Stage 4. Descriptions of the assumptions used for modeling the LIP are included in Appendix CD-2.

A LIP is also under development as part of the FERC process for the Yadkin River Basin reservoir operations and the draft is included in Appendix E. The Catawba River Basin LIP

was model used for Yadkin River Basin LIP and also includes five stages of water management (Stage 0 to Stage 4).

TABLE ES-3
Summary of Catawba River Basin Low Inflow Protocol Stages
Concord/Kannapolis IBT Environmental Impact Statement

Stage	Public Water Supply Actions	Water Use Reduction Goals
0	Low Inflow Watch – DMAG Meets	-
1	Voluntary Water Use Restrictions	3 to 5 percent
2	Mandatory Level 1	5 to 10 percent
3	Mandatory Level 2	10 to 20 percent
4	Emergency	20 to 30 percent

DMAG = Drought Management Advisory Group

Catawba River Basin Impacts

In the Catawba River source basin, the direct impact of the IBT was evaluated based on the conservative assumption that all of the water requested by Concord and Kannapolis (22 MGD based on average demand) was obtained from the Catawba River Basin. The modeling analyses indicate that the direct impact of the IBT on Lake Norman and Mountain Island Lake are insignificant, particularly when compared to current and projected water demands of other water users during the planning period. Impacts to lake elevation and outflow from other reservoirs in the Catawba-Wateree project are also considered insignificant and are discussed in the EIS and the Catawba modeling summary included in Appendix CD-2. The modeling analysis included all anticipated withdrawals, transfers of water, and consumptive uses. The proposed IBT will not significantly change lake elevations or minimum dam releases, except during extreme cases, mainly because the IBT represents a small portion of the total consumptive use.

The modeling results show no significant impacts as a result of the IBT to other water users in each basin. In addition to water users, water elevations and outflows were also considered. Illustrations of the benefit of the LIP on managing water resources in the Catawba River Basin are shown in Figure ES-4 and ES-5. These figures illustrate model predictions of water levels in Lake James (Bridgewater dam) and Lake Norman (Cowans Ford dam) during the drought conditions that occurred in 2001 through 2002 assuming projected 2035 withdrawal conditions for all other water users with and without the IBT. This modeling analysis was done with a 24 MGD average IBT (the original IBT request before demands were updated since the original model runs). Therefore, the model results represent an impact of an IBT that is 2 MGD greater than the current request, assuming the entire request is provided from the Catawba River Basin.

There are several interesting observations from this analysis:

- During the drought of record, the model predicts that the proposed IBT would result in earlier implementation of Stage 2 restrictions under the LIP. Stage 2 restrictions include moderate mandatory restrictions from Owners of Public Water Supply Intakes.
- Because of the earlier restrictions on water use with the LIP, the model predicts that further water use restrictions would not be required. In other words, no Stage 3 restrictions are predicted by the model.
- Without the proposed IBT, the model predicts that Stage 2 restrictions would be implemented later and Stage 3, which includes more extreme water use restrictions, would also be implemented.
- Because of the earlier implementation of moderate LIP water restrictions, water levels during the drought of record are actually predicted to be maintained at slightly higher levels. Figures ES-4 and ES-5 show the results for Lake James and Lake Norman.

It is important to note that these results are based on a set of assumed levels of water use reduction associated with each of the LIP stages.

To reiterate, the LIP was developed by a stakeholders group of water users and other interest groups through the FERC relicensing process, with the criteria that there be no more than two and preferably only one occurrence of LIP Stage 3 during the period of record and no occurrences of Stage 4. The model predicts that in fact, the 2035 water use scenario including the proposed IBT shows no occurrences of LIP Stage 3 restrictions but an increased number of months of Stage 2 restrictions. LIP restriction level occurrences are summarized in Table ES-4. The total numbers of months of Stages 1 through 3 are about the same, with and without the proposed IBT. This analysis shows the value of the LIP in protecting all interests in the Catawba-Wateree Project.

TABLE ES-4
LIP Stage Summary - 2035
Concord/Kannapolis IBT Environmental Impact Statement

LIP Stage	2035 Demands without IBT		2035 Demands with IBT	
	Number of Occurrences (months)	Percent of Time	Number of Occurrences (months)	Percent of Time
-1	573	64%	576	64%
0	294	33%	292	32%
1	22	2%	13	1%
2	7	<1%	19	2%
3	4	<1%	0	0%
4	0	0%	0	0%

Note: Data are for time period of 1/1/1929 to 12/1/2003

Yadkin River Basin Impacts

In the Yadkin River source basin, model results were used to assess the impact of the proposed 10 MGD IBT on the lakes through several withdrawal scenarios including purchasing finished water from the Cities of Salisbury and Albemarle. The model results predict that the direct impacts of the IBT on High Rock Lake, Tuckertown Reservoir and Badin Lake (Narrows Reservoir) would be insignificant. Figure ES-6 shows the impact of the various IBT scenarios on High Rock Lake elevation frequency. This chart shows the percent of time the elevation would exceed an elevation for the different scenarios. None of the scenarios show that the impacts of the proposed IBT would cause a significant deviation from the impacts of projected demands of all users in the basin. The results did show a measurable change in elevation of Tuckertown Reservoir of about 6 inches for the scenario in which the entire proposed IBT is withdrawn from Tuckertown Reservoir under moderate drought conditions. However, the same scenario showed no difference in elevation under extreme drought conditions. The LIP minimized changes in lake elevation under extreme drought conditions.

Receiving Basin Impacts

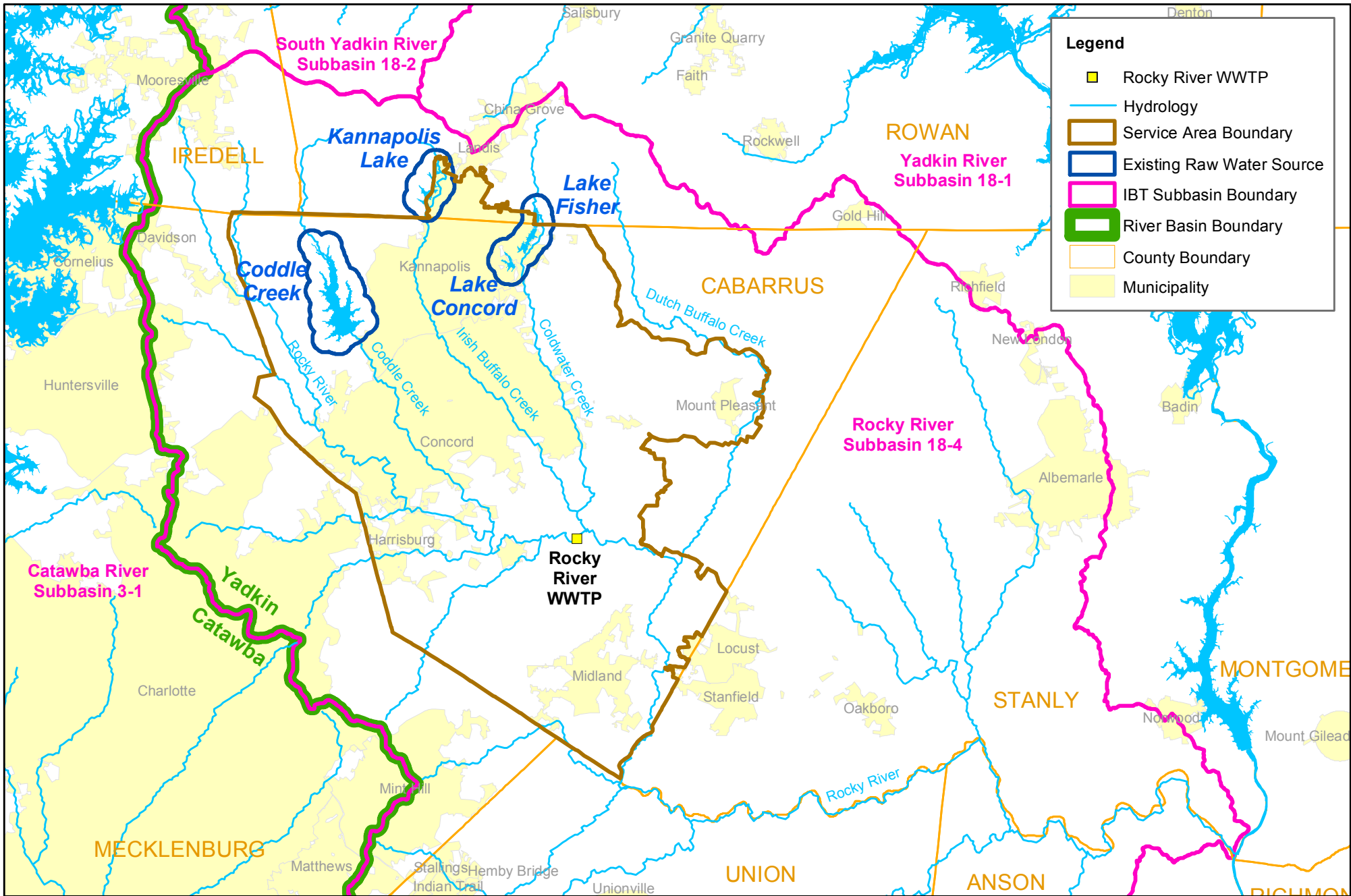
Secondary impacts in the receiving basin will result from the proposed IBT because the additional water supply will facilitate growth. Urbanization of portions of the service areas may cumulatively cause degradation and/or loss of wetlands, aquatic resources and habitats, forest resources, prime agriculture land, wildlife habitat, and archeological resources. Specifically, land use development, if not properly planned and managed, can alter the natural hydrology and riparian buffers of an area. Changes in land use have an effect on both the quantity and quality of stormwater runoff.

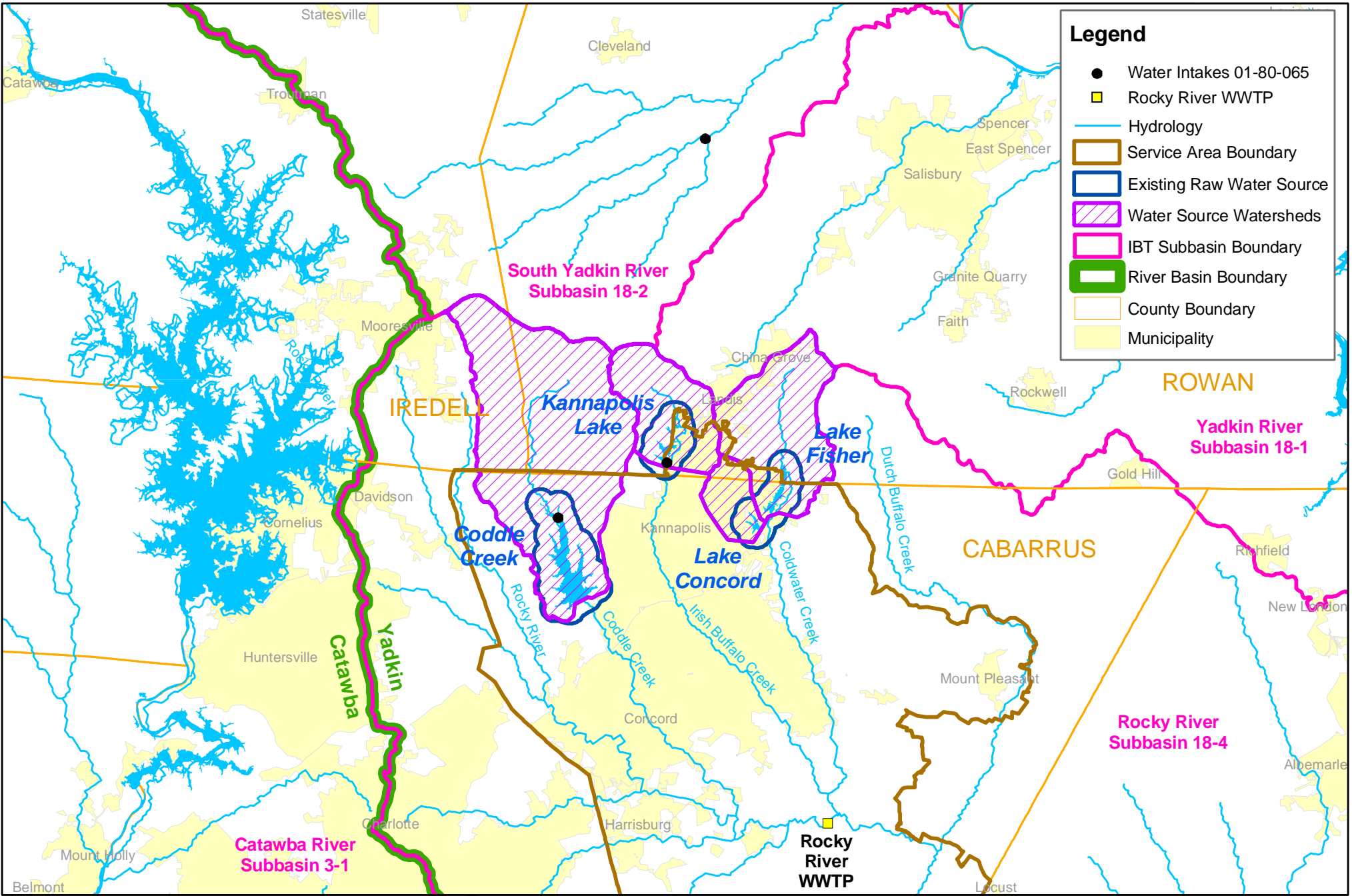
In addition to State and Federal programs and regulations that will help offset these potential impacts associated with increased growth, Concord, Kannapolis and other Cabarrus County communities have adopted a Unified Development Ordinance (UDO) (Appendix CD-1). Cooperative efforts between all municipalities within the County contributed to the UDO's development. The following is a summary of the measures to address growth related impacts:

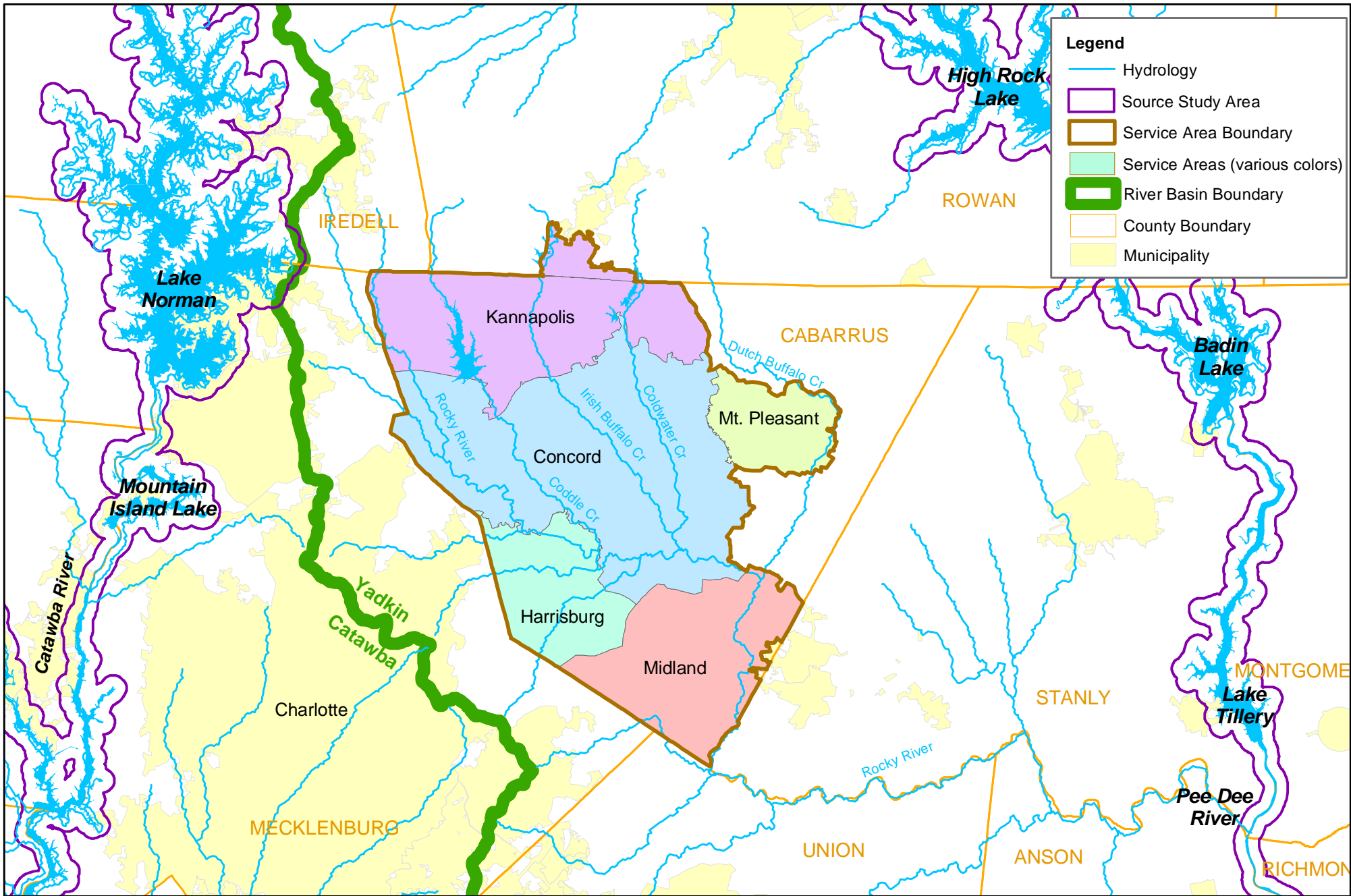
- Updates to the UDO have been implemented to address, and go beyond, Phase II Stormwater Rule requirements, protect stream buffers, and other natural resources.
- Stream buffer rule updates are a part of the updated UDO. An undisturbed buffer of at least 50 feet shall be established along both sides of perennial streams, as measured from the top of the stream bank. Each ordinance also requires additional buffer width based on slope up to a maximum buffer width of 120 feet. Buildings or structures may not be placed within an additional 20 foot zone outside the buffer. Intermittent stream are protected in accordance with the Phase II Stormwater Rules; however, when development is planned, streams will be determined on-site by a qualified professional to ensure proper application of stream buffer rules.
- Floodplain protection regulations limit land disturbing and fill activities within existing floodplains, protecting and preserving their valuable water quality and flood control functions.
- The City of Concord has developed and approved the use of a Stormwater Technical Standards Manual (Manual).

These efforts to address growth related impacts were reviewed and accepted by agencies within NC Department of Environment and Natural Resources (DENR) during the initial EIS review.

In summary, the direct impacts associated with the IBT are not considered to be significant in the source and receiving basins. Secondary and cumulative impacts to the source basins are not likely to be significant. In the receiving basin, the local communities have worked with NC DENR agencies on programs to minimize impacts as growth occurs.







Legend

- Hydrology
- Source Study Area
- Service Area Boundary
- Service Areas (various colors)
- River Basin Boundary
- County Boundary
- Municipality


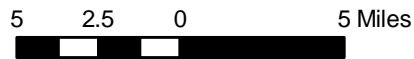





Figure ES-3
 Current Service Area
Concord/Kannapolis IBT Environmental Impact Statement

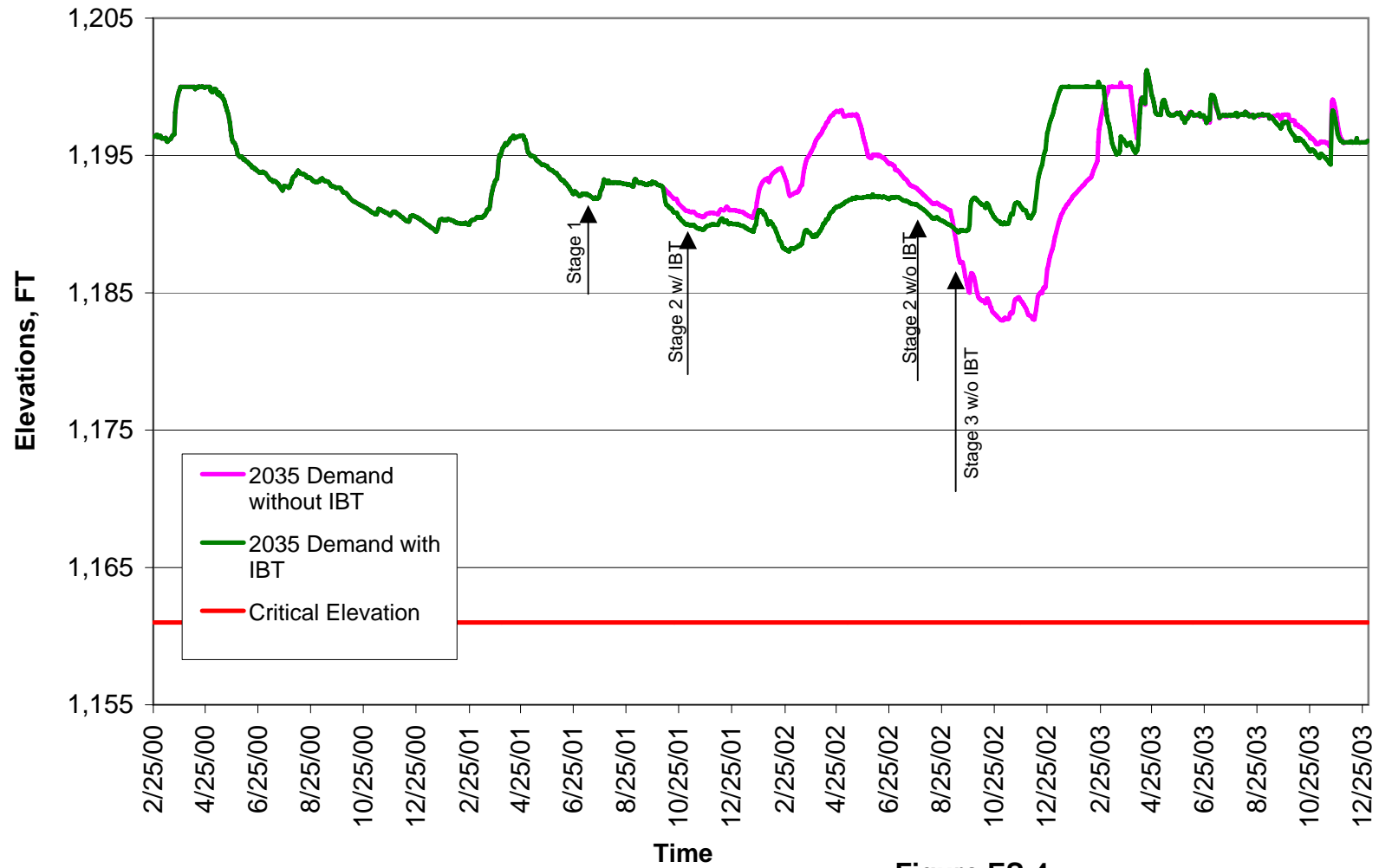


Figure ES-4
 Comparison of Bridgewater (Lake James)
 Elevations Showing the Impacts of LIP

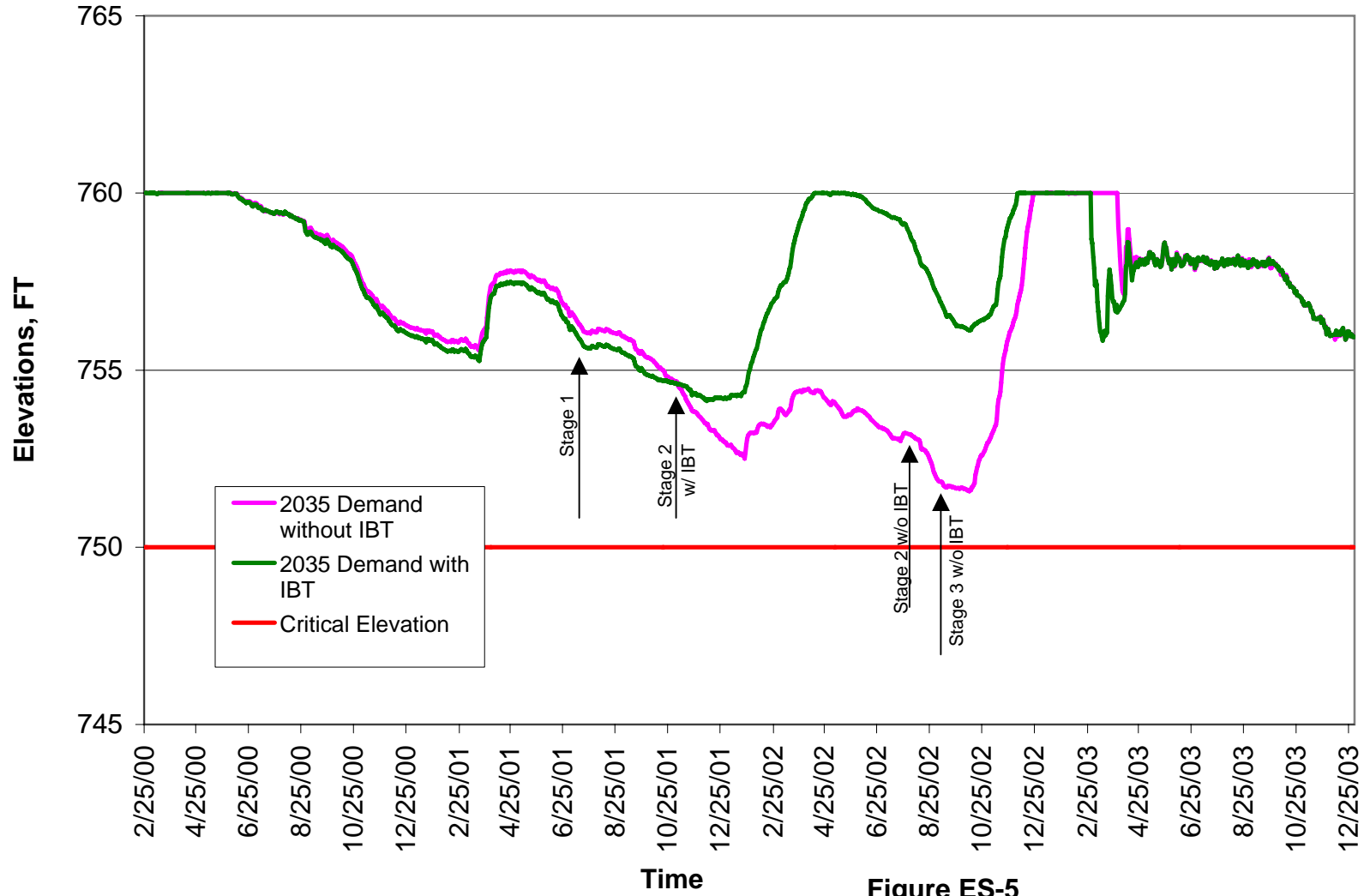
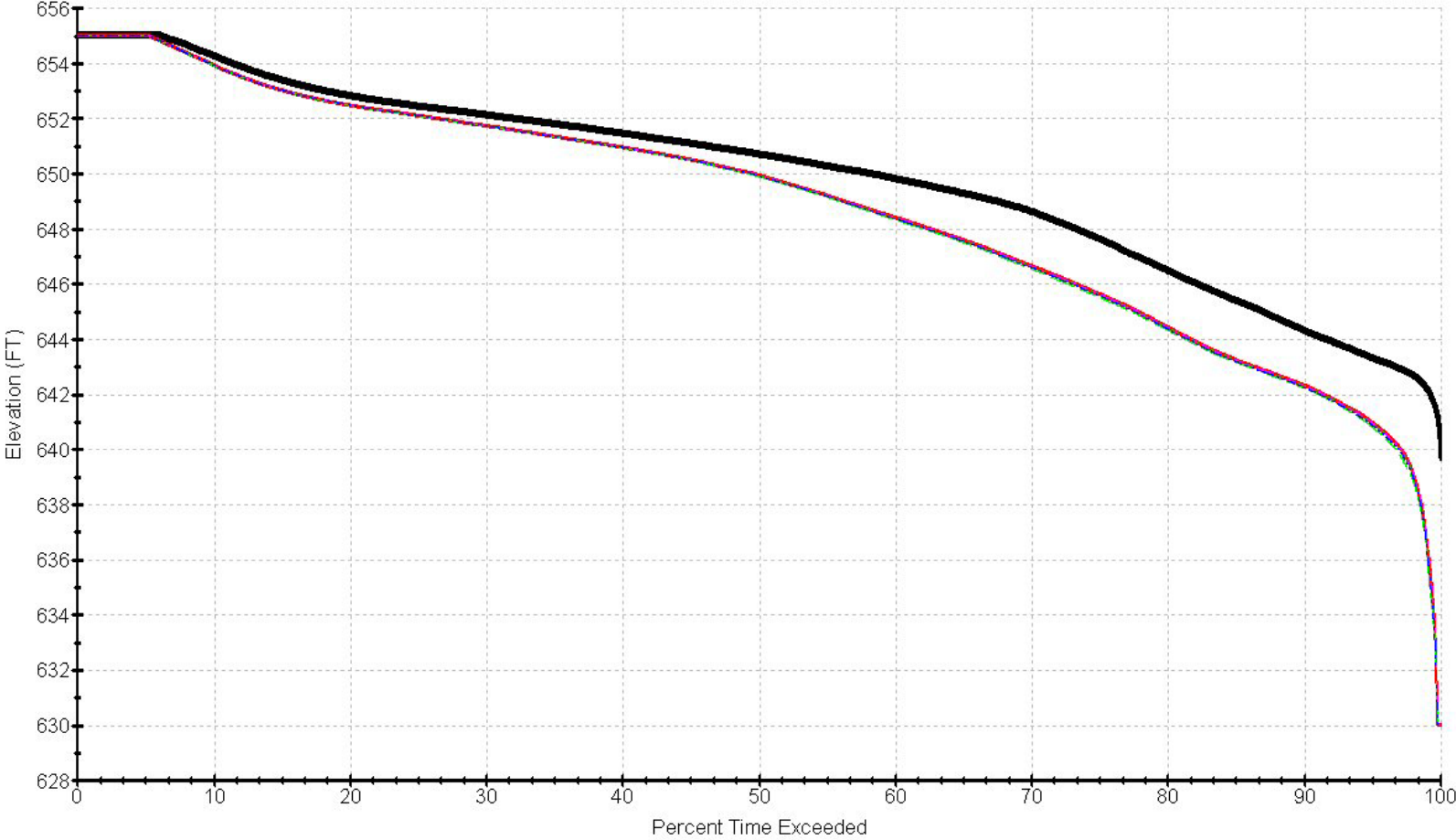


Figure ES-5

Comparison of Cowan Ford (Lake Norman) Elevations Showing the Impacts of LIP

Concord/Kannapolis IBT Environmental Impact Statement

High Rock Reservoir -- Lake Levels



— BaseCase2008
 — Basecase2038
 — Salisbury2038
 - - - Tuckertown2038
 - - - TuckertownNarrows2038
- - - TuckertownSalisbury2038

Figure ES-6
 High Rock Lake Elevation
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