

Charlotte-Mecklenburg Utilities
Proposed Increase in Interbasin Transfer

Hearing Officer's Report

Public Hearing

December 11, 2001 – North Mecklenburg Water Plant, Huntersville

North Carolina
Department of Environment and Natural Resources
Division of Water Resources

Environmental Management Commission

February 2002

*Charlotte-Mecklenburg Utilities
Proposed Increase in Interbasin Transfer*

Hearing Officer's Report

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Part I

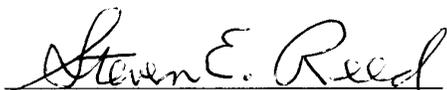
Hearing Officer's Recommendations

Charlotte-Mecklenburg Utilities
Proposed Increase in Interbasin Transfer
HEARING OFFICERS' RECOMMENDATIONS

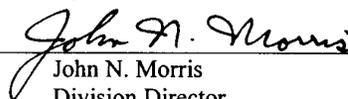
The public hearing on the Interbasin Transfer Certification Petition for the Charlotte-Mecklenburg Utilities was held on December 11, 2001 at 5:00 p.m. at the Charlotte-Mecklenburg Utilities' North Mecklenburg Water Plant, in Huntersville. A total of two oral comments and seven written comments were received during the comment period. Division of Water Resources staff responses to the comments is included in the 'Response to Comments Received' section of this report.

As a result of the comments received during the public process and requirements set forth in the North Carolina General Statutes, the Hearing Officers' recommend that the Environmental Management Commission grant the Charlotte-Mecklenburg Utilities an increase in their interbasin transfer from 16.1 mgd to 33 mgd with the following conditions:

1. Require Mecklenburg County to summarize progress in implementation of watershed management approaches of the Surface Water Improvement and Management Program (SWIM) on an annual basis. The Division of Water Resources shall have the authority to approve modifications to and need for continued reporting as necessary.
2. Require Mecklenburg County and the City of Charlotte to continue the stakeholder process to investigate water quantity control from single-family development and water quality control for all development until completed. To accomplish this end, the stakeholder group should consider evaluating the feasibility of single-family detention and recommending ordinance revisions based on technical, political, long-term maintenance, cost, and benefits related to the proposed ordinance changes.
3. The Goose Creek subbasin in Mecklenburg County is removed from the area to be served by the IBT. A moratorium on the installation of new interbasin transfer water lines (water lines crossing the ridgeline) into Goose Creek subbasin is in effect until the impacts of additional growth urban growth on the endangered species are fully evaluated. This moratorium will not impact Charlotte-Mecklenburg Utility's ability to fully utilize existing water lines. The Division of Water Resources shall have the authority to grant exemptions for reasons of public health and safety for dwellings existing on or before March 14, 2002.
4. If either the EA is found at a later date to be incorrect or new information becomes available such that the environmental impacts associated with this transfer are substantially different from those projected impacts that formed the basis for the above Findings of Fact and this certificate, the Commission may reopen the certificate to adjust the existing conditions or require new conditions to ensure that the detriments continue to be mitigated to a reasonable degree.
5. Require the applicant to develop a compliance and monitoring plan for reporting maximum daily transfer amounts, compliance with certificate conditions, progress on mitigation measures, and drought management activities. The Division of Water Resources shall have the authority to approve modifications to the compliance and monitoring plan and drought management plan as necessary.



Steven E. Reed
Hearing Officer
Division of Water Resources



John N. Morris
Division Director
Division of Water Resources

Part II

Interbasin Transfer Certificate

ENVIRONMENTAL MANAGEMENT COMMISSION

Certificate Authorizing the Charlotte-Mecklenburg Utilities to Increase Their Transfer of Water from the Catawba River basin to the Rocky River basin under the Provisions of G.S. 143-215.22I

In August 2001, the Charlotte-Mecklenburg Utilities (CMU) petitioned the Environmental Management Commission (EMC) for an increase in interbasin transfer (IBT) from the Catawba River Basin to the Rocky River Basin. CMU requested an increase from the grandfathered IBT of 16.1 million gallons per day (mgd) to 33 mgd (maximum day basis). The proposed IBT is based on additional water withdrawals from Lake Norman and Mountain Island Lake in the source basin (Catawba River Basin). The IBT will increase due to transfer of the water to the receiving basin (Rocky River Basin) via consumptive use in eastern Mecklenburg County and existing discharges at Mallard Creek Wastewater Treatment Plant [WWTP] and Water and Sewer Authority of Cabarrus County's [WSACC] Rocky River Regional (RRR) WWTP. CMU requested an increase to 33 mgd, will allow CMUD to meet projected water supply demands through the year 2030 in eastern Mecklenburg County. *This IBT does not include transfers associated with water or wastewater service provided to the Goose Creek watershed in the Town of Mint Hill in Mecklenburg County.* Public hearings on the proposed transfer increase were held in Huntersville on December 11, 2001 pursuant to G.S. 143-215.22I.

The EMC considered the petitioner's request at its regular meeting on March 14, 2002. According to G.S. 143-215.22I (g), the EMC shall issue a transfer certificate only if the benefits of the proposed transfer outweigh the detriments of the proposed transfer, and the detriments have been or will be mitigated to a reasonable degree.

The EMC may grant the petition in whole or in part, or deny it, and may require mitigation measures to minimize detrimental effects. In making this determination, the EMC shall specifically consider:

1. The necessity, reasonableness, and beneficial effects of the transfer.
2. Detrimental effects on the source river basin.
- 2a. The cumulative effect on the source major river basin of any water transfer or consumptive water use.
3. Detrimental effects on the receiving basin.
4. Reasonable alternatives to the proposed transfer.
5. Use of impounded storage.
6. Purposes and water storage allocations in a US Army Corps of Engineers multi-purpose reservoir.
7. Any other facts or circumstances necessary to carry out the law.

In addition, the certificate may require a drought management plan. The plan will describe the actions a certificate holder will take to protect the source basin during drought conditions.

The members of the EMC reviewed and considered the complete record which included the hearing officer's report, staff recommendations, the applicant's petition, the Final Environmental Assessment, the public comments relating to the proposed interbasin transfer, and all of the criteria specified above. Based on that record, the Commission makes the following findings of fact.

Finding of Fact

THE COMMISSION FINDS:

(1) **Necessity, Reasonableness, and Benefits of the Transfer**

The proposed transfer will provide water to Mecklenburg County, City of Charlotte, and other communities in the county. The current population served is about 636,000 with a maximum day water use of about 154 million gallons per day (mgd). Projections assume a 2.6 percent annual increase through 2010 decreasing to 1.3 percent by 2030. The projected 2030 serve population is 1,101,000 with a maximum day water use of about 245 mgd.

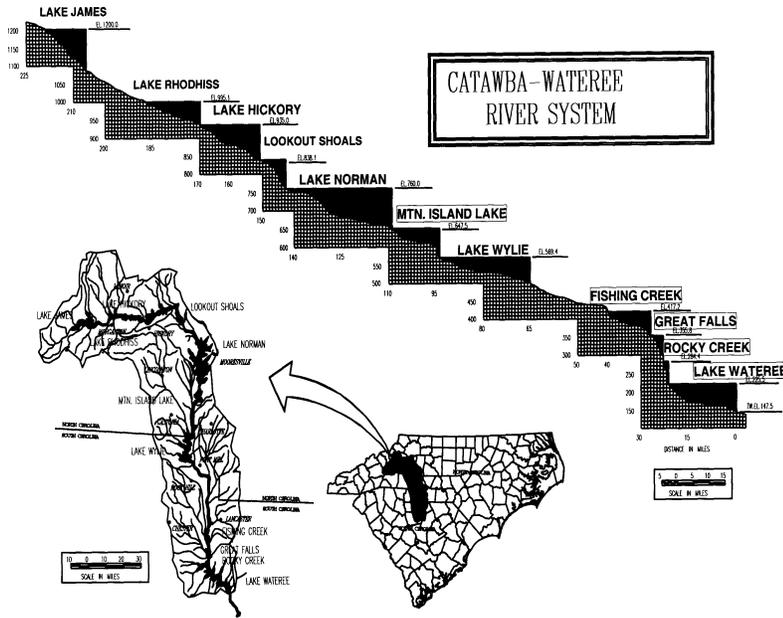
The western boundary of Mecklenburg county includes Lake Norman and Mountain Island Lake which are CMU's two water sources. CMU's current combined withdrawal capacity from both lakes is adequate to meet average day demands until about 2020. CMU has requested an increase from the Federal Energy Regulatory Commission (FERC) to increase their Mountain Island Lake withdrawal capacity. The requested increase from 165 mgd to 330 mgd (instantaneous maximum) will meet projected 2030 demands and add pumping flexibility.

The transfer of water will benefit the Mecklenburg County region by guaranteeing water to support the economic development and associated population growth that has occurred and projected to occur in this region of the State.

Based on the record the Commission finds the transfer is necessary to supply water to the growing communities of this area. Water from the source basin is readily available and within a short distance from the service area. Therefore the transfer is a reasonable allocation to these communities. The transfer will greatly benefit these communities by providing raw water of high quality for residential and industrial purposes.

(2) **Detrimental Effects on the Source Basin**

In order to assess the direct impacts of the proposed transfer on the source basin, the petitioners utilized Duke Energy’s Hydro-Electric Operations and Planning Model of the Catawba-Wateree Project. The Catawba-Wateree model simulates reservoir operations and withdrawals from Lake James in North Carolina to Lake Wateree in South Carolina (see the following figure the *Catawba-Wateree River System*). Details of the modeling analysis are included in this report Part V Applicant Supplemental Information.



As required under G.S. 143-215.22I(f)(2), local water supply plans were considered in developing the model. In addition, industrial and agricultural withdrawals were model inputs. Model runs were evaluated for present conditions, 2030 CMU water demands, and cumulative 2030 water demands.

As seen in the following table, a summary of daily releases from Lake Wylie, the transfer will have minimal impact on low flows. Similarly the model results show minimal impacts to both lake levels and hydropower generation.

Percent of Time that Daily Flow Releases from Lake Wylie Would Equal or Exceed Selected Average Daily Flow Thresholds During the Entire Year							
	400 cfs	500 cfs	700 cfs	1,000 cfs	1,250 cfs	1,500 cfs	2,00 cfs
Average Year							
Existing 2000	100%	100%	97%	87%	82%	82%	79%
CMU 2030	100%	100%	96%	87%	82%	82%	78%
Cumulative 2030	100%	100%	96%	87%	82%	82%	79%
Dry Year							
Existing 2000	100%	95%	88%	81%	76%	73%	61%
CMU 2030	100%	95%	88%	81%	76%	72%	60%
Cumulative 2030	100%	95%	88%	81%	75%	70%	59%
Drought Year							
Existing 2000	100%	85%	82%	70%	52%	39%	29%
CMU 2030	100%	84%	82%	62%	44%	35%	28%
Cumulative 2030	100%	84%	79%	55%	41%	32%	26%

Based on the modeling results the Commission finds that the detrimental effects on the source basin described in G.S. §143-215.22I(f)(2) will be insignificant.

(2a) **Cumulative effect on Source Basin of any transfers or consumptive water use projected in local water supply plans**

Local water supply plan data, including current and projected water use and water transfers, were used to develop the input data sets for the model discussed in Finding Number 2. The model was used to evaluate current and future scenarios of basin water use.

The safe yield of the reservoir system has not been determined. Duke Power does not have a policy on reallocation of power pool storage to water supply, for example unlike the Corps of Engineers. However, based on two 2030 model scenarios and current drought operations, the safe yield is at least as large or larger than the cumulative 2030 scenario of 624 mgd.

Based on the modeling discussed in Finding No. 2, the Commission finds the cumulative effects of this and other future water transfers or consumptive uses as described in G.S. §143-215.22I(f)(2a) will be insignificant.

(3) **Detrimental Effects on the Receiving Basin**

The proposed transfer will utilize existing permitted wastewater discharges to the Rocky River basins; therefore no additional permitted capacities will be required. Previous studies for the existing plant indicated no significant direct water quality or wastewater assimilation on the receiving stream. Additional growth and development in the receiving basin may impact water quality, stormwater runoff, frequency and intensity of flooding, and land use.

The Goose Creek watershed in Mecklenburg County was removed from the area to be served by this transfer certificate until the impacts of additional urban growth on Federally listed endangered mussel species are fully evaluated.

Based on the record the Commission finds the transfer will support continued population growth and the attendant impacts of that growth. These impacts include effects on wastewater assimilation, fish and wildlife habitat, and water quality. However, these impacts will be minimal. Reasonable mitigation includes:

- 1. Require the County to evaluate the feasibility of each element of the Surface Water Improvement and Management Program (SWIM) on an annual basis.*
- 2. Require the County and the Town of Mint Hill to consider the conclusions of Wildlife Resources Commission's Goose Creek watershed study when complete.*
- 3. Require Mecklenburg County and the City of Charlotte to continue the stakeholder process to investigate water quantity control from single-family development and water quality control for all development.*
- 4. The Goose Creek subbasin in Mecklenburg County is removed from the area to be served by the IBT. A moratorium on the installation of new IBT water lines into Goose Creek subbasin is in effect until the impacts of additional growth urban growth on the endangered species are fully evaluated.*

(4) **Alternatives to Proposed Transfer**

The petitioners evaluated three alternatives to the proposed transfer. The alternatives considered included:

1. No Action – Growth would be served by individual wells and septic tanks. The region is already experiencing water quality problems related septic tanks and package sewage plants. Also, a number of individual wells in this region have both low yields and poor water quality.
2. Obtain Water from the Rocky River – New reservoir project. Development of new impoundments for water supply in rapidly developing urban area face significant regulatory requirements and considerable public controversy.
3. Return wastewater discharge to the Catawba – Return wastewater to the McAlpine WWTP. Returning water to the Catawba would increase McAlpine’s discharge by 17 mgd. SC DHEC considers the McAlpine plant to be a significant contributor to phosphorus in the Catawba basin already at it’s current discharge level.
4. Proposed Action. The proposed action of using the Mallard Creek WTTP and the Rocky Regional WTTP increases the existing discharge of 8 mgd to 18 mgd by 2030 into the Rocky River.

Based on the information provided in the EA and the petition, the Commission finds that the proposed alternative is the most feasible means of meeting the petitioners’ long-term water supply needs while minimizing overall impacts and cost.

(5) **Impoundment Storage**

This criterion is not applicable, as the petitioners do not have an impoundment.

(6) **The water to be withdrawn or transferred is stored in a multipurpose reservoir constructed by the United States Army Corps of Engineers**

This criterion is not applicable, as the petitioners are using storage in Duke Power reservoirs.

(7) **Other Considerations**

The Commission finds that to protect the source basin during drought conditions, to mitigate the future need for allocations of the limited resources of this basin, and as authorized by G.S. § 143-215.22I(h), a drought management plan is appropriate. The plan should describe the actions that the Charlotte-Mecklenburg Utilities will take to protect the Catawba River Basin during drought conditions.

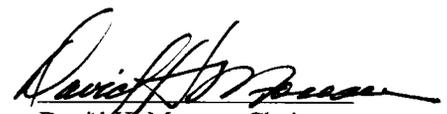
The Commission notes that future developments may prove the projections and predictions in the EIS to be incorrect and new information may become available that shows that there are substantial environmental impacts associated with this transfer. Therefore, to protect water quality and availability and associated benefits, modification of the terms and conditions of the certificate may be necessary at a later date.

Decision

Based on the hearing record and the recommendation of the hearing officers, the Commission, on March 14, 2002 by duly made motions concludes that by a preponderance of the evidence based upon the Findings of Fact stated above that (1) the benefits of the proposed transfer outweigh the detriments of the proposed transfer, and (2) the detriments of the proposed transfer will be mitigated to a reasonable degree. Therefore, and by duly made motions, the Commission grants the petition of the Charlotte-Mecklenburg Utilities (with conditions) to increase their transfer of water from the Catawba River basin to the Rocky River basin. The permitted transfer amount shall be 33 million gallons per day (mgd) on a maximum day basis from the effective date. This certificate is effective immediately. The certificate is subject to the following conditions, imposed under the authority of G.S. § 143-215.22I:

1. Require Mecklenburg County to summarize progress in implementation of watershed management approaches of the Surface Water Improvement and Management Program (SWIM) on an annual basis. The Division of Water Resources shall have the authority to approve modifications to and need for continued reporting as necessary.
2. Require Mecklenburg County and the City of Charlotte to continue the stakeholder process to investigate water quantity control from single-family development and water quality control for all development until completed. To accomplish this end, the stakeholder group should consider evaluating the feasibility of single-family detention and recommending ordinance revisions based on technical, political, long-term maintenance, cost, and benefits related to the proposed ordinance changes.
3. The Goose Creek subbasin in Mecklenburg County is removed from the area to be served by the IBT. A moratorium on the installation of new interbasin transfer water lines (water lines crossing the ridgeline) into Goose Creek subbasin is in effect until the impacts of additional growth urban growth on the endangered species are fully evaluated. This moratorium will not impact Charlotte-Mecklenburg Utility's ability to fully utilize existing water lines. The Division of Water Resources shall have the authority to grant exemptions for reasons of public health and safety for dwellings existing on or before March 14, 2002.
4. If either the EA is found at a later date to be incorrect or new information becomes available such that the environmental impacts associated with this transfer are substantially different from those projected impacts that formed the basis for the above Findings of Fact and this certificate, the Commission may reopen the certificate to adjust the existing conditions or require new conditions to ensure that the detriments continue to be mitigated to a reasonable degree.
5. Require the applicant to develop a compliance and monitoring plan for reporting maximum daily transfer amounts, compliance with certificate conditions, progress on mitigation measures, and drought management activities. The Division of Water Resources shall have the authority to approve modifications to the compliance and monitoring plan and drought management plan as necessary.

This is the 14th day of March, 2002.


David H. Moreau, Chairman

Part III

**Summary of December 11, 2001 Public Hearing and
Staff Response**

Summary of December 11, 2001 Public Hearing and Staff Response

Hearing Officer -- Steven E. Reed

I want to welcome all of you to this public hearing on the increase in interbasin transfer for the Charlotte-Mecklenburg Utilities. I am Steve Reed, the hearing officer and a staff member of the Division of Water Resources. The Division of Water Resources is holding this public hearing to receive comments on behalf of the North Carolina Environmental Management Commission.

This hearing has been called pursuant to North Carolina General Statute 143-215.22I for the purpose of inviting public comment on the proposed interbasin transfer certification recommended by the Division of Water Resources.

Public notice of this hearing was provided by first-class mail on November 16, 2001 to over 80 parties in and around the Catawba River Basin, including existing allocation holders, persons with registered withdrawals or permitted discharges, local governments, public water systems, legislators, and other interested private and public parties. Public notice was published in the Charlotte Observer on November 15, 2001. Public Notice was also published in Volume 16, Issue 1, of the NC Register on November 15, 2001.

The public is invited to comment on the applicants' petition and supporting environmental documentation. The Commission is considering and seeking comments on three options with regard to the interbasin transfer request. The options, in no particular order, are: (a) grant the certificate for the 33.0 mgd interbasin transfer request; (b) deny the 33.0 mgd interbasin transfer request; or (c) grant the certificate including any conditions necessary to achieve the purposes of the statute or to provide mitigation measures. The public is encouraged to comment on the following possible conditions and to suggest any other appropriate conditions, including other limitations on the amount of the transfer.

1. Require Mecklenburg County to summarize progress in implementation of watershed management approaches of the Surface Water Improvement and Management Program (SWIM) on an annual basis. The Division of Water Resources shall have the authority to approve modifications to and need for continued reporting as necessary.
2. Require Mecklenburg County and the City of Charlotte to continue the stakeholder process to investigate water quantity control from single-family development and water quality control for all development until completed. To accomplish this end, the stakeholder group should consider evaluating the feasibility of single-family detention and recommending ordinance revisions based on technical, political, long-term maintenance, cost, and benefits related to the proposed ordinance changes.
3. The Goose Creek subbasin in Mecklenburg County is removed from the area to be served by the IBT. A moratorium on the installation of new IBT water lines (water lines crossing the ridgeline) into Goose Creek subbasin is in effect until the impacts of additional growth urban growth on the endangered species are fully evaluated. This moratorium will not impact Charlotte-Mecklenburg Utility's ability to fully utilize existing water lines.

Require applicants to develop a compliance and monitoring plan for reporting maximum daily transfer amounts, compliance with certificate conditions, progress on mitigation measures, and drought management activities. The Division of Water Resources shall have the authority to approve modifications to the compliance and monitoring plan and drought management plan as necessary.

I have a few administrative announcements to make. As you entered, you should have filled out one of the registration forms so that we will have a record of your attendance. You should have also indicated on the form whether or not you wish to speak this evening. Please go to the registration table at this time if you have not already registered. Also, copies of the hearing notice that was mailed are available at the desk. At this time, Tom Fransen will summarize the interbasin transfer recommendations.

[Staff presentation by Tom Fransen]

I will now call on those persons who have indicated a desire to comment on the recommended allocations. Please limit your comments to matters relevant to the proposed recommendations. The hearing officer reserves the right to question speakers or respond to comments as appropriate. All speakers must come up to the microphone so that we can pick up your comments on our tape recording. If you have a written statement of your comments please give them to the person at the registration table. When your name is called, please step up to the microphone and identify yourself and your affiliation.

[Speakers are called]

If there are no further comments, we will close the hearing at this time. For persons wishing to comment later, the record will remain open for written comments until 5:00 PM Friday December 14, 2001. Written comments will be considered equally with oral comments. All comments will be a part of the permanent public record, which will be presented to the Environmental Management Commission before making a decision on this matter at an upcoming meeting.

Thank you for your interest in the management of North Carolina's water resources and for your participation in the public hearing on this important issue.

Staff Presentation – Tom Fransen

Charlotte-Mecklenburg Utilities is requesting an increase from the grandfathered Interbasin Transfer of 16.1 million gallons per day (mgd) to 33 mgd (maximum day basis). The proposed Interbasin Transfer is based on additional water withdrawals from Lake Norman and Mountain Island Lake in the source basin (Catawba River Subbasin). Interbasin Transfer will increase due to transfer of the water to the receiving basin (Rocky River Subbasin) via consumptive use in eastern Mecklenburg County and existing discharges at Mallard Creek Wastewater Treatment Plant and Water and Sewer Authority of Cabarrus County's Rocky River Regional Wastewater Treatment Plant. Charlotte-Mecklenburg Utilities is requesting a permitted Interbasin Transfer increase to 33 mgd, which will allow Charlotte-Mecklenburg Utilities to meet projected water supply demands of 163.5 mgd through the year 2030 in eastern Mecklenburg County. *This Interbasin Transfer does not include transfers associated with water or wastewater service provided to the Goose Creek watershed in the Town of Mint Hill in Mecklenburg County.*

In the source basin, storage in and flow through the Catawba-Wateree Project reservoirs, lost electrical generation, and reduced flow in the Catawba River immediately below the Wylie development would be the major resources directly affected. The indirect and cumulative impacts on fisheries and aquatic resources, water quality, threatened and endangered species and other resources would result primarily from changes in flow or lake levels. Operations of the Catawba-Wateree Project reservoirs were modeled using Duke Power's reservoir operations model during average, dry, and drought year conditions.

The model results indicated that there will be no changes in the surface water elevations of Lake Norman, Mountain Island Lake, or Lake Wylie due to the proposed increased Interbasin Transfer. Under normal and drought inflow conditions, Duke Power would manage the lakes and its power generation to offset increased water withdrawals to maintain the minimum release requirements and operating lake surface elevations. Direct impacts on water supply, water quality, wastewater assimilation, fish and wildlife resources, navigation, or recreation are not expected since there will be no significant changes in the hydrology of the system due to the increased withdrawal. The Interbasin Transfer will not require any increase in the currently permitted levels of wastewater discharges or any construction in either the source or receiving basins.

There are no secondary impacts related to growth in the source basin due to the transfer of water. However, the Interbasin Transfer will provide additional water supply to support growth and development in the receiving basin. Mitigation measures presented in this Interbasin Transfer Petition are expected to mitigate secondary impacts related to growth and development. The proposed Interbasin Transfer will not result in significant cumulative impacts in either the source or receiving basins.

Issues the Environmental Management Commission is seeking comment on.

The public is invited to comment on the applicants' petition and supporting environmental documentation. The Commission is considering and seeking comments on three options with regard to the interbasin transfer request. The options, in no particular order, are: (a) grant the certificate for the 33.0 mgd interbasin transfer request; (b) deny the 33.0 mgd interbasin transfer request; or (c) grant the certificate including any conditions necessary to achieve the purposes of the statute or to provide mitigation measures. The public is invited to comment on the following possible conditions and to suggest any other appropriate conditions, including other limitations on the amount of the transfer.

1. Require Mecklenburg County to summarize progress in implementation of watershed management approaches of the Surface Water Improvement and Management Program (SWIM) on an annual basis. The Division of Water Resources shall have the authority to approve modifications to and need for continued reporting as necessary.
2. Require Mecklenburg County and the City of Charlotte to continue the stakeholder process to investigate water quantity control from single-family development and water quality control for all development until completed. To accomplish this end, the stakeholder group should consider evaluating the feasibility of single-family detention and recommending ordinance revisions based on technical, political, long-term maintenance, cost, and benefits related to the proposed ordinance changes.
3. The Goose Creek subbasin in Mecklenburg County is removed from the area to be served by the Interbasin Transfer. A moratorium on the installation of new Interbasin Transfer water lines (water lines crossing the ridgeline) into Goose Creek subbasin is in effect until the impacts of additional growth urban growth on the endangered species are fully evaluated. This moratorium will not impact Charlotte-Mecklenburg Utility's ability to fully utilize existing water lines.
4. Require applicants to develop a compliance and monitoring plan for reporting maximum daily transfer amounts, compliance with certificate conditions, progress on mitigation measures, and drought management activities. The Division of Water Resources shall have the authority to approve modifications to the compliance and monitoring plan and drought management plan as necessary.

Public Comment

Staff had problems with the audio equipment and was not able to get a full transcript of the hearing. The following is a summary of the key issues raised by each speaker that did not provide a written copy of their comments.

Parker Wheaton

Mr. Wheaton was concerned about any impacts the transfer would cause on the 30 miles of free flowing river below Lake Wylie in SC.

Staff Response

In order to assess the direct impacts of the proposed transfer on the source basin, the petitioners utilized Duke Energy's Hydro-Electric Operations and Planning Model of the Catawba-Wateree Project. The Catawba-Wateree model simulates reservoir operations and withdrawals from Lake James in North Carolina to Lake Wateree in South Carolina. Details of the modeling analysis are included in this report Part V Applicant Supplemental Information.

As show in the table in the finding of fact, a Summary of Daily Releases from Lake Wylie, the transfer will have minimal impact on low flows. Similarly the model results show minimal impacts to both lake levels and hydropower generation.

Rich Hoffman

Mr. Hoffman objected to the short comment period and lack of time to be able review the petition and EA.

Staff Response

As required under G.S. §143-215.22I(d) public notice was provided by was provided by first-class mail on November 16, 2001 to over 80 parties in and around the Catawba River Basin, including existing allocation holders, persons with registered withdrawals or permitted discharges, local governments, public water systems, legislators, and other interested private and public parties. Public notice was published in the Charlotte Observer on November 15, 2001. Public Notice was also published in Volume 16, Issue 1, of the NC Register on November 15, 2001. The close of the comment period was 5:00 PM December 14, 2001. Copies of the petition and EA were available on the Division's website or mailed upon request.

Bruce A. Anderson (written comments submitted after speaking)

Public Hearing

12/11/2001

CMUD Proposed Increase in Interbasin Transfer

My name is Bruce Andersen. I am a resident of Lake Norman and a CoveKeeper in the Catawba RiverKeeper organization. I am not an expert in water quality but I do stay informed on the issues. Quoting ---

From Voices & Choices:

“Of the three river basins in this area, the Catawba is under the greatest pressure, due primarily to fast-paced growth. High erosion/sedimentation, increased nutrients and oxygen-consuming wastes, fecal coliform bacteria, toxic substances and color all impact various portions of this water basin. Increased development within the watersheds of lakes supplying potable water, notably Lakes Hickory, Norman, Mountain Island and Wylie, is also a concern. The lower reaches of the Catawba River, Lakes Wateree and Fishing Creek demonstrate eutrophication needing immediate attention.”

From the Catawba RiverKeeper:

“Growing wastewater discharges and drinking water withdrawals by the 14 counties, 22 municipalities and 2 states that depend on the Catawba River are already leading to heightened competition for the river’s resources. Assimilative capacity is directly linked to economic development and a community’s ability to grow. Without a management system to equitably allocate competing demands on the river, the Catawba is ripe for the Southeast’s next “water war.” Similar demands caused by Atlanta’s population growth led to the tri-state water wars between Florida, Alabama and Georgia.”

Perhaps we should take a lesson from those who have seen what happens when water allocation becomes a problem.

From an article - "WHOSE WATER IS IT ANYWAY? A SURVEY OF GEORGIA LAW ON SURFACE WATER AND GROUNDWATER WITHDRAWAL RIGHTS by Craig K. Pendergiast:

“Alabama, Georgia, and Florida are at war (subject to a temporary truce) over the allocation of surface waters shared by those states. In-state users of surface waters are no closer to consensus on how Georgia’s ultimate share of those waters is to be allocated. Counties and municipalities have squared off against each other over proposed interbasin transfers. Lake front property owners want water in the lakes for recreation. Electric producers, farmers, governments, and others want that same water flowing through the dam, albeit at different times and in different amounts, to support their own needs. The State’s Wildlife Resources Division wants a higher minimum instream flow to be free from withdrawals so as to support aquatic habitat, while the State’s Environmental Protection Division wants to keep a free hand to maximize the amount of water available for withdrawal by and allocation to competing human users. Commercial entities want permits to withdraw surface water for use on their riparian lands or to sell to non-riparian users, while governmental entities worry whether there will be enough water left to serve their citizens.”

From a Water Issues White Paper in Georgia, May 2001:

"The drought of 1998-2001. This drought is having profound negative impacts on agricultural and municipal water systems. During the summer of 2000, 23 cities and five counties faced critical water shortages; U. S. Department of Agriculture Secretary declared all of Georgia's 159 counties disaster areas due to drought. Significant environmental and economic impacts have been documented. Drought planning as a component of a comprehensive water management strategy is necessary to minimize those impacts and reduce the need for emergency relief."

The bottom line is that interbasin transfers leave less clean water available to assimilate the wastewater discharges and polluted runoff from developed areas. Decisions such as you are facing today should be based on documented evidence of the average and drought streamflows, the average and peak offstream withdrawals, the returns of treated waste water, and the total interbasin losses from the entire Catawba basin. These values should be developed for current conditions and for projected conditions. You should not allow further increases in interbasin transfers unless and until such documentation is provided.

I have attached for your information a copy of a table produced by the Virginia State Water Control Board that shows such information for the James River.

Bruce A. Andersen
16125 Weatherly Way
Huntersville, NC 28078
704-875-3233
bruceaa@ieee.org

shortages from system inadequacies are relatively common and occur in all basins for a variety of reasons. To the water user, distinctions among different types of water problems are of little consolation if adequate water is not available. Therefore, the water supply must give adequate attention to all aspects of water supply operations.

Comparison of Offstream Water Use to Streamflow

Conflict among offstream water users within a given basin increases as the total basin demand increases, but the nature and extent of conflict at a particular level of demand depends on several additional factors. Location on the stream and distance to one another is a principal determinant. Location of large users in headwaters areas of relatively low flow or on small tributaries is more likely to cause conflict than is location in areas of larger streamflows. Location of users with respect to one another is a critical factor because of the return flow issue. Many uses involve low water consumption and return a substantial portion of withdrawals after the intended use is complete. The water is then available to other users if adequate water quality is maintained and subsequent users are located below the point of return. Location that maximizes the opportunity for reuse allows cumulative withdrawals much in excess of total streamflow at any one point.

Alternatively, a concentration of demand with multiple users in close proximity can lead to direct competition for the available

streamflow without opportunity for successive use. Because of the impact of these location factors, a basinwide assessment of water supply adequacy (or any large scale comparison of supply and demand) must be viewed only as a general indicator of potential water supply conflict.

With this in mind, consider Tables 1 and 2. They present information about streamflow and offstream water demand in the James River Basin for the present (the latest tabulation of this data was published in 1988), and as projected for year 2030 (Virginia Water Control Board, "Virginia's Water Supply: Statewide Summary and Technical Data," March 1988a).

Column 1 presents average annual streamflow for the entire James Basin – flow in the James at Richmond is 4870 mgd. Total streamflow for all the Virginia watersheds is also shown in column 1 for the present and for the year 2030. Column 2 presents a drought flow designated as the 1Q30 flow, which indicates the average flow during the lowest day of flow expected to occur in each 30-year period. This flow is an extreme drought event. For the James Basin, the 1Q30 flow is shown by column 2 to be less than 4 percent of average flow. Column 3 shows the average rate of water withdrawal, while column 4 shows the rate of withdrawal during the month of heaviest water use. Columns 5 and 6 show the average and peak rates of water consumption, respectively.

Table 1. James River Basin Water Supply and Offstream Demand

	Streamflow (mgd)		Offstream Demand (mgd)			
	(1)	(2)	(3)	Withdrawal (4)	(5)	Consumption (5)
	Average	Drought	Average	Peak Month	Average	Peak Month
James (present)	7964	285	1470	1912	74	111
State (present)	27,389	1512	2674	3607	268	396
James (2030)	7964	285	1647	2169	118	169
State (2030)	27,389	1512	3128	4260	410	592

Source: Virginia State Water Control Board Planning Bulletin 347.

Table 2 provides comparisons of the various measures of water use to both average and drought flows. Column 1 indicates that present cumulative basin withdrawals equal 18 percent of the average flow, and are expected to increase to 21 percent by the year 2030. These values are somewhat larger than corresponding values of 10 and 11 percent for the state as a whole. This comparison suggests a greater potential for water-use conflict in the James than in the rest of the state. However, another factor to be considered is the longer length of the James compared to many of the state's waterways, which creates greater opportunity for reuse of water. Since withdrawals as shown are cumulative, a greater potential for reuse will create higher ratios in column 1.

To help put these withdrawal ratios in perspective, consider the conclusions of Malin Falkenmark and Gunnar Lindh (*Water*

for a Starving World, 1976). Based on observations of water development around the world, they suggest that 70 percent is the maximum achievable ratio of water withdrawal to total runoff. They conclude that, when water demand exceeds 20 percent of runoff, water problems are substantial and require major investments to remedy.

For the peak periods of water use, withdrawals in the James Basin increase to 24 and 27 percent of average flows as shown in column 3. Columns 5 and 7 indicate that water consumption as a percentage of average flow is insignificant for both the James Basin and the state, at present and in 2030.

A different perspective on potential conflict is given by comparisons of water demand to drought flows, which can be seen in Table 2 in columns 2, 4, 6, and 8 where water demands are compared to the 1Q30 flow. The worst case comparison indicates that

Staff Response

In order to assess the direct impacts of the proposed transfer on the source basin, the petitioners utilized Duke Energy's Hydro-Electric Operations and Planning Model of the Catawba-Wateree Project. The Catawba-Wateree model simulates reservoir operations and withdrawals from Lake James in North Carolina to Lake Wateree in South Carolina. Details of the modeling analysis are included in this report Part V Applicant Supplemental Information. Three model scenarios were done the existing situation, projected 2030 CMU demands, and the cumulative 2030 projected demands.

As show in the table in the finding of fact, a Summary of Daily Releases from Lake Wylie, the transfer will have minimal impact on low flows. Similarly the model results show minimal impacts to both lake levels and hydropower generation.

Part IV

Written Comments Received and Staff Response



2600 Bull Street
Columbia, SC 29201-1708

RECEIVED
DIVISION OF
WATER RESOURCES
December 14, 2001

COMMISSIONER:
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Mr. Tom Fransen
Division of Water Resources
North Carolina Department of Environment and Natural Resources
1611 Mail Service Center
Raleigh, NC 27699-1611

Re: Catawba River Interbasin Transfer

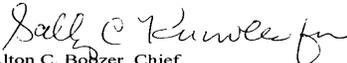
Dear Mr. Fransen:

The South Carolina Department of Health and Environmental Control has reviewed the proposed Inter-Basin Transfer from the Catawba River basin to the Yadkin-Pee Dee basin. The Department is concerned with the potential impact that this and any other proposed transfers will have on the water quality and quantity of the Catawba River, and what impact it will have on down stream users.

We need to be assured that withdrawal of water from the Catawba River basin, with ultimate disposal in the Yadkin-Pee Dee basin, would not have adverse impacts on water quality standards or water uses of the Catawba River. Municipalities and industries in South Carolina rely on the Catawba River for water supply and wastewater disposal. Moreover, citizens of South Carolina use the Catawba River and its lakes for recreation. Transfer of water from this basin could ultimately affect existing permits issued by SCDHEC.

Please consider this as notification of the Department's concerns of the proposed Interbasin Transfer Permit. I would appreciate receiving a copy of the draft permit, if issued.

Sincerely yours,


Alton C. Bobzer, Chief
Bureau of Water

SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL

Staff Response

In order to assess the direct impacts of the proposed transfer on the source basin, the petitioners utilized Duke Energy's Hydro-Electric Operations and Planning Model of the Catawba-Wateree Project. The Catawba-Wateree model simulates reservoir operations and withdrawals from Lake James in North Carolina to Lake Wateree in South Carolina. Details of the modeling analysis are included in this report Part V Applicant Supplemental Information.

As show in the table in the finding of fact, a Summary of Daily Releases from Lake Wylie, the transfer will have minimal impact on low flows. Similarly the model results show minimal impacts to both lake levels and hydropower generation.

Subject: Interbasin Transfer for Charlotte-Mecklenburg Utilities
Date: Wed, 12 Dec 2001 08:16:00 -0500
From: "Chuck Flowers" <cflowers@cityofbelmont.org>
To: <Tom.Fransen@ncmail.net>

Tom,

My name is Charles (Chuck) Flowers and I am with the City of Belmont Water Treatment Plant. I have a few concerns with the IBT that CMUD has requested. The first is an equitable allocation of the water along the lower Catawba River basin below the Mountain Island Lake dam. Since September of this year the water level at our intake, located 600 yards south of the HWY. 29-74 bridge, has dropped over nine (9') feet. After contacting Duke Power in the middle of September with our concerns of the sudden drop of approximately five (5') feet in the lake level, they advised at that time the current lake level would be maintained. But since that time the lake level has dropped an additional four (4') feet. When modeling the storage and flows in the Catawba-Wateree reservoirs was the current drought and the fifty (50) low water levels in the lakes taken into consideration? This is a major concern for the people of Belmont considering we are the sole major water user below the Mt. Island dam in North Carolina and we do not have an alternative source of water supply. With the current and projected growth for Belmont and the surrounding area we serve with a potable water supply adequate water supply is also a concern for our area and needed for our continued growth.

With the increasing demand for adequate water supply along the Catawba River Basin any additional transfer from it to another stream could be detrimental in the years to come for the people who solely rely on it for their drinking water. So, I would request that the North Carolina Environmental Management Commission would deny the request of Charlotte Mecklenburg Utilities to transfer an additional 16.9 mgd of water to the Rocky River Basin.

Respectfully Submitted
Chales B. Flowers, Jr.
City of Belmont
WTP Superintendent

Staff Response

In order to assess the direct impacts of the proposed transfer on the source basin, the petitioners utilized Duke Energy's Hydro-Electric Operations and Planning Model of the Catawba-Wateree Project. The Catawba-Wateree model simulates reservoir operations and withdrawals from Lake James in North Carolina to Lake Wateree in South Carolina. Details of the modeling analysis are included in this report Part V Applicant Supplemental Information.

The model results show minimal impacts to both lake levels under normal and drought conditions. The transfer is a small portion of CMU's total withdrawal and this water would bypass Belmont's intake even if there were no transfer because the treated wastewater is returned to the Catawba River downstream of Lake Wylie.

From: Lmccaw4449@aol.com
To: tom.Fransen@ncmail.net

Subject: Catawba/Rocky River transfer
Date: Wed, 12 Dec 2001 12:35:55 EST
From: Lmccaw4449@aol.com
To: tomFransen@ncmail.net
CC: RiverKeeper@infoave.net

I strongly oppose the increase of water transfer from the Catawba corridor. Right now Lake Wylie is highly eutrophic and the loss of water means that to keep levels up enough for any use means more stagnancy as we are robbed of normal flow. Please don't add any more burdens to this lake as we are already about the face the assault of a 4100 home development. That doesn't even take into account the people downstream in South Carolina. I note that the hearing was held in Huntersville, quite a long way from the people it will most affect. And then to read in the newspaper that the benefit here is more development can then happen to the Rocky River corridor! How long will it take for development to bury us? I would really hope that the Division of Water Quality would take a strong stand in promoting WATER QUALITY and I don't think that will happen in the Catawba chain if they keep taking water out.
Linda McCaw

Staff Response

The Applicant Supplement Information included in Part V of this report indicates the transfer has minimal impact on water quality.

Subject: CMUD interbasin transfer
Date: Thu, 13 Dec 2001 20:31:10 -0500
From: Valerie Munei <lwkeep@earthlink.net>
To: <Tom.Fransen@ncmail.net>
CC: Donna <RiverKeeper@InfoAve.Net>

Dear Mr. Fransen

I am very concerned about this proposal to transfer water out of the Catawba River system. With the continued urban growth along the shores of the Catawba, I cannot understand how taking water out this already endangered river system will not have an impact on water quality as pollutant loads increase. We've all seen dramatic decreases in the water levels of Lake Norman and Lake Wylie with these years of ongoing drought, and again I cannot understand how the modeling cited in the Staff Summary can be correct to indicate that taking 33 million gallons a day from the Catawba would have no effect on surface water elevations. How can we be guaranteed that Duke will increase the flow of water to make up for this loss when the water basins above Lake Norman are also suffering through this drought? And what about any future prolonged droughts?

Please do not approve this CMUD petition that will affect the drinking water and health of so many citizens in the Iredell, Mecklenburg, Gaston, and Union counties in North Carolina as well as York County in South Carolina.
Thank you for your thoughtful consideration of this matter!

-- Valerie Munei
Lake Wylie Lakekeeper | 803/831-0678

Staff Response

In order to assess the direct impacts of the proposed transfer on the source basin, the petitioners utilized Duke Energy's Hydro-Electric Operations and Planning Model of the Catawba-Wateree Project. The Catawba-Wateree model simulates reservoir operations and withdrawals from Lake James in North Carolina to Lake Wateree in South Carolina. Details of the modeling analysis are included in this report Part V Applicant Supplemental Information. Also, the Applicant Supplement Information indicates the transfer has minimal impact on water quality.

From: Mary Ann Wade [mailto:maw1@heathsprings.net]
Sent: Thursday, December 13, 2001 11:00 AM
To: tomFransen@ncmail.net
Cc: Donna Marie Lisenby
Subject: Catawba/RockyRiver transfer

I am opposed to the increase of water transfer from the Catawba corridor! My home is on Lake Wateree and the flow of clean water is vital to our existence, life style and homes on the lake. North Carolina should take a long look at the future of us all and stop/control the developments along the corridor.

Mary Ann Wade

Staff Response

Comment noted.

From: William Evans [mailto:hollybushes@hotmail.com]
Sent: Thursday, December 13, 2001 9:43 AM
To: tomFransen@ncmail.net
Cc: RiverKeeper@InfoAve.Net
Subject: Save the Catawba for Down Stream (SC) Citizens

Dear Mr. Fransen:

I concur with the comments from our River Keeper, Donna Lisenby.

We urge the State of North Carolina to consider the rights and needs of its friends to the South. Please don't divert the river flow.

William B. Evans

Staff Response

Comment noted.

Subject: Catawba/Rocky River transfer
Date: Fri, 14 Dec 2001 13:53:02 -0500
From: Mary Ann Wade <maw1@heathsprings.net>
To: Tom.Fransen@ncmail.net

This is to let you know that as a member of WHOA (Wateree Home Association) of Kershaw County, South Carolina that I oppose the increase of water transfer from the Catawba corridor. My home is on Lake Wateree and the flow of clean water is vital to our existence, life style and all homes on the lake. North Carolina should take a long look at the future for us all and stop/control the developments along the corridor

Staff Response

Comment noted.

Subject: CMUD interbasin transfers
Date: Fri, 14 Dec 2001 16:43:44 EST
From: CHUCKH2TENNIS@aol.com
To: Tom.Fransen@ncmail.net, MJones3244@aol.com, vetaylor@compuserve.com,
Shallowcove@aol.com, cclise@tntie.com, PJJC@aol.com,
Riverkeeper@infoave.net, pambeck@msn.com, rhs1holmes@charter.net

I oppose any increase in the interbasin transfer as I feel it encourages growth in inappropriate areas. In fact, I believe the current transfers should be reduced as quickly as possible. When an area's resources limit growth, then growth should proceed only to the extent that resources are freed up by reductions in existing need-for example if a plant closes its water needs would be available to others.

Chuck St. Clair
725 Southwest Dr.
Davidson, NC 28036
704-895-4653

Staff Response

Comment noted.

Part V

Attachments



CH2MHILL

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DEC 17 2001

DIVISION OF
WATER RESOURCES

CH2M HILL

4824 Parkway Plaza Blvd.

Suite 200

Charlotte, NC

28217-1968

Tel 704.329.0072

Fax 704.329.0141

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National Engineers Week 2000

December 14, 2001

Tom Fransen
Section Chief
Division of Water Resources
NC Dept. Environment and Natural Resources
Mail Service Center 1611
Raleigh, NC 27699-1611

Subject: Charlotte Mecklenburg Utilities Interbasin Transfer: Catawba River Lake Level,
Hydropower and Safe Yield Information

Dear Tom:

During the Environmental Management Commission (EMC) Water Allocation Committee (WAC) meeting in September, issues were raised regarding the effects of the proposed Charlotte Mecklenburg Utilities (CMUD) interbasin transfer on hydroelectric generation and safe yield in the Catawba-Wateree Project. In addition, several comments have been submitted to DWR regarding the potential impact of the transfer on downstream flows, lake levels, and assimilative capacity. A commenter also requested that DWR require information regarding CMUD's water use versus other water use in the Catawba River Basin prior to making a decision.

CMUD is currently proceeding through the Federal Energy Regulatory Commission (FERC) approval process to increase withdrawals from Mountain Island Lake, and an environmental assessment (EA) will be submitted to the FERC by Duke Energy in December 2001. Information from this EA is used below to provide details regarding these issues. Excerpts from the EA are included as an attachment and a copy of the entire EA will be available to DWR later this month when it is submitted to FERC.

Modeling Analyses Performed

Duke utilized the Computer Hydro-Electric Operations and Planning Model Software (CHEOPS) to simulate flows and lake levels through the Catawba Project for evaluating future withdrawals from the system. The attached figure is a graphical depiction of the Catawba-Wateree Project from Lake James in North Carolina to Lake Wateree in South Carolina. A combination of three representative years (average, dry, drought) and three withdrawal scenarios (Existing 2000, CMUD 2030, Cumulative 2030) were modeled for a total of nine scenarios. When developed, the calendar year 2000 was the extreme drought of

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record from the available data and was used as the drought year in the analyses. For each scenario, the entire year was run and the annual, monthly, and low-flow (July-August-September-October: JASO) periods were analyzed. Therefore, the model accounts for the effects on storage of inflows for extended periods of average, dry or drought periods that are important in accurately predicting lake levels and downstream flows. The withdrawal scenarios evaluated were as follows:

Withdrawals Evaluated with the CHEOPS Model for the FERC EA

Withdrawal Scenarios	CMUD Withdrawals, mgd	Other Withdrawals, mgd	Total Withdrawals, mgd
Existing	103	263	366
CMUD 2030	163	267	430
Cumulative 2030	163	461	624

Note: Includes NC and SC withdrawals in the entire project downstream to Lake Wateree

The withdrawals noted in this table do not include cooling water withdrawals for any of the Duke Power facilities on the project. Wastewater returns, consumptive losses, and interbasin transfers (for CMUD and all others based on best available records) were accounted for in the CHEOPS modeling runs. Appendix E of the FERC EA documents the development of the withdrawal projections used in the CHEOPS modeling.

Hydroelectric Generation

The Catawba-Wateree Project is operated for hydropower generation, flood control, water supply, and recreation. The Project is operated to optimize hydroelectric generation with the available flow, consistent with constraints on lake levels to meet the various needs and other power generation constraints. The larger reservoirs are operated to ensure reservoir storage for flood control, and to ensure there is considerable water storage throughout the system to allow for flexibility in control of the system. Because the storage in the entire system is considerable, the system responds primarily to average water demands and peak withdrawals have negligible effect on system management.

Minimum lake elevations are required to maintain operation of cooling water intakes for several fossil and nuclear power plants such as McGuire Nuclear Station on Lake Norman and Allen Steam Station on Lake Wylie. When inflows into the Project reach historically low drought conditions and downstream reservoirs start to reach minimum levels, such as in 1999 and 2000, storage in upstream reservoirs is used to maintain some generation and flow through the system. During the 1999/2000 drought period, flows still remained above the minimum daily average flow release of 411 cfs at Lake Wylie Dam. While flow data for 2001

Tom Fransen
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December 14, 2001

drought conditions and downstream reservoirs start to reach minimum levels, such as in 1999 and 2000, storage in upstream reservoirs is used to maintain some generation and flow through the system. During the 1999/2000 drought period, flows still remained above the minimum daily average flow release of 411 cfs at Lake Wylie Dam. While flow data for 2001 is still provisional, the minimum daily average flows during the extended drought always have been above 411 cfs at the Lake Wylie Dam.

The withdrawals associated with CMUD 2030 and Cumulative 2030 scenarios would slightly reduce flow through the lower reservoirs of the Catawba system thereby reducing the hydropower generation of all the lower Catawba developments, but otherwise would not significantly alter the operations of the Catawba-Wateree Project with respect to reservoir levels or minimum flow releases. The results of reservoir operations modeling indicate that CMUD 2030 and Cumulative 2030 water withdrawals would not substantially affect average pool elevations or the magnitude of water level fluctuations in any of the Catawba-Wateree Project reservoirs, even during drought conditions. During drought conditions, lake levels may reach lower levels earlier in the season, but the normal operating ranges, fluctuation zones and minimum lake elevation would remain largely the same as those that have occurred historically.

With regard to the proposed CMUD 2030 withdrawal, Duke has stated that it would adjust project operations (i.e. release from reservoir storage) to ensure it meets the required minimum flows. Based on the analysis, there is sufficient flow through the Catawba-Wateree Project in a severe drought year to meet that commitment with the projected cumulative water withdrawals through 2030. The fact that the 411 cfs minimum was recently exceeded by a substantial margin during a severe drought (based on both Existing 2000 model results, actual year 2000 historical data, and actual 2001 provisional data) further supports this contention.

Results indicate that higher minimum flows could be supported with the available flow, even with the proposed CMUD 2030 or Cumulative 2030 withdrawals. Based on the results presented herein, it can be concluded that the CMUD 2030 and Cumulative 2030 withdrawals would generally not prevent the establishment and maintenance of higher minimum flows. Even assuming minimum flows established above 700 cfs (the 7day, 10-year or 7Q10 low flow is about 683 cfs) and maintained during drought years, the CMUD 2030 and Cumulative 2030 withdrawals would contribute to a small incremental reduction in the percentage of time that the higher minimum flows could be met.

In summary, the impacts of the requested increase in CMUD's withdrawal rate will not result in any significant change in Catawba Project operation. The requested interbasin transfer of 33 mgd is approximately 20 percent of the 2030 withdrawal requested from FERC. Since the impacts of the average annual withdrawal increase have been shown to be minor, it can be concluded that the impacts of the IBT are also minor.

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December 14, 2001

Safe Yield

Safe yield, as defined by Dr. D.T. Lauria/UNC-Chapel Hill, is the maximum constant flow that can be released from a reservoir or system of reservoirs continuously over the period of time in the streamflow record used in the analysis. Safe yield determinations within hydropower systems are complex calculations, and currently, safe yield for the Catawba Project has not been determined by Duke Power. Unlike many Corp of Engineers reservoirs, there has not been a specific assignment of a pool capacity to water supply in the Catawba Project.

As stated above, Duke has exceeded the minimum release requirement of 411 cfs from Lake Wylie Dam during the current extreme drought conditions, and modeling results indicate that even higher minimum flows could be met during drought years. Within the range of 700 cfs, the CMUD 2030 and Cumulative 2030 withdrawals would result in only a small incremental reduction in the percentage of time that the higher minimum flows could be met. Therefore, although the safe yield of the project has not been established, we can assume that the safe yield is greater than the CMUD 2030 and Cumulative 2030 scenarios analyzed which are a total of 430 mgd (CMUD's 2030 withdrawal of 163 mgd plus the 2000 water withdrawals of other users of 267 mgd) and 624 mgd (CMUD's 2030 withdrawal of 163 mgd plus projected 2030 water withdrawals of other users of 461 mgd), respectively, within the entire Catawba Project. Of course the ability to support these withdrawals is also a function of the wastewater return, consumptive losses and interbasin transfers that are characteristic of this system.

Impact on Downstream Flows

At the public hearing on December 11, 2001, a commenter raised a concern about the impact of the transfer on flows below Lake Wylie. Information summarized above indicates that the CMUD 2030 and Cumulative 2030 withdrawals have minimal impact on low flows or the ability of Duke Power to meet higher flow targets. It should also be pointed out that the IBT is only 20 percent of CMUD's 2030 withdrawal from the system.

Impact on Lake Levels

Another comment in the public record cited extremely low water levels at the Belmont water intake during the recent ongoing drought and objected to water being transferred from the system. A question was raised whether there had been analysis of drought conditions and a request was made that the IBT be denied. As indicated above, there was extensive analysis of CMUD's total withdrawals and these withdrawals had minor impact on lake levels but do effect hydropower generation. As indicated above, the IBT is a small portion of CMUD's withdrawal and this water would bypass the Belmont intake even if there was no IBT because treated wastewater is returned to the Catawba River downstream of Lake Wylie via Sugar Creek and its tributaries. Impact on Assimilative Capacity.

A commenter at the public hearing raised concern that any transfer from the system would reduce assimilative capacity of the system. Information in the FERC EA indicates minimal

Tom Fransen
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December 14, 2001

impact on water quality from the entire withdrawal. Again the IBT represents only a portion of the entire withdrawal.

Water Use Projections for the Entire Catawba River Basin

A commenter at the public hearing indicated that complete water use projections for the entire river basin should be prepared to evaluate the CMUD IBT. To develop the scenarios included in the CHEOPS modeling, water use projections including return of water, consumption and IBT were projected based on the best information available. These are documented in Appendix E of the FERC EA as noted above.

We hope that these addresses the comments raised by the EMC WAC and commenters during the public notice period. As indicated above, a complete copy of the FERC EA will be provided to DWR when it is officially submitted. Attached are excerpts from the EA documenting the analysis of hydrological impacts discussed above. Please contact me at (704) 329-0072 or at bkreutzb@ch2m.com if you have any questions or require additional information.

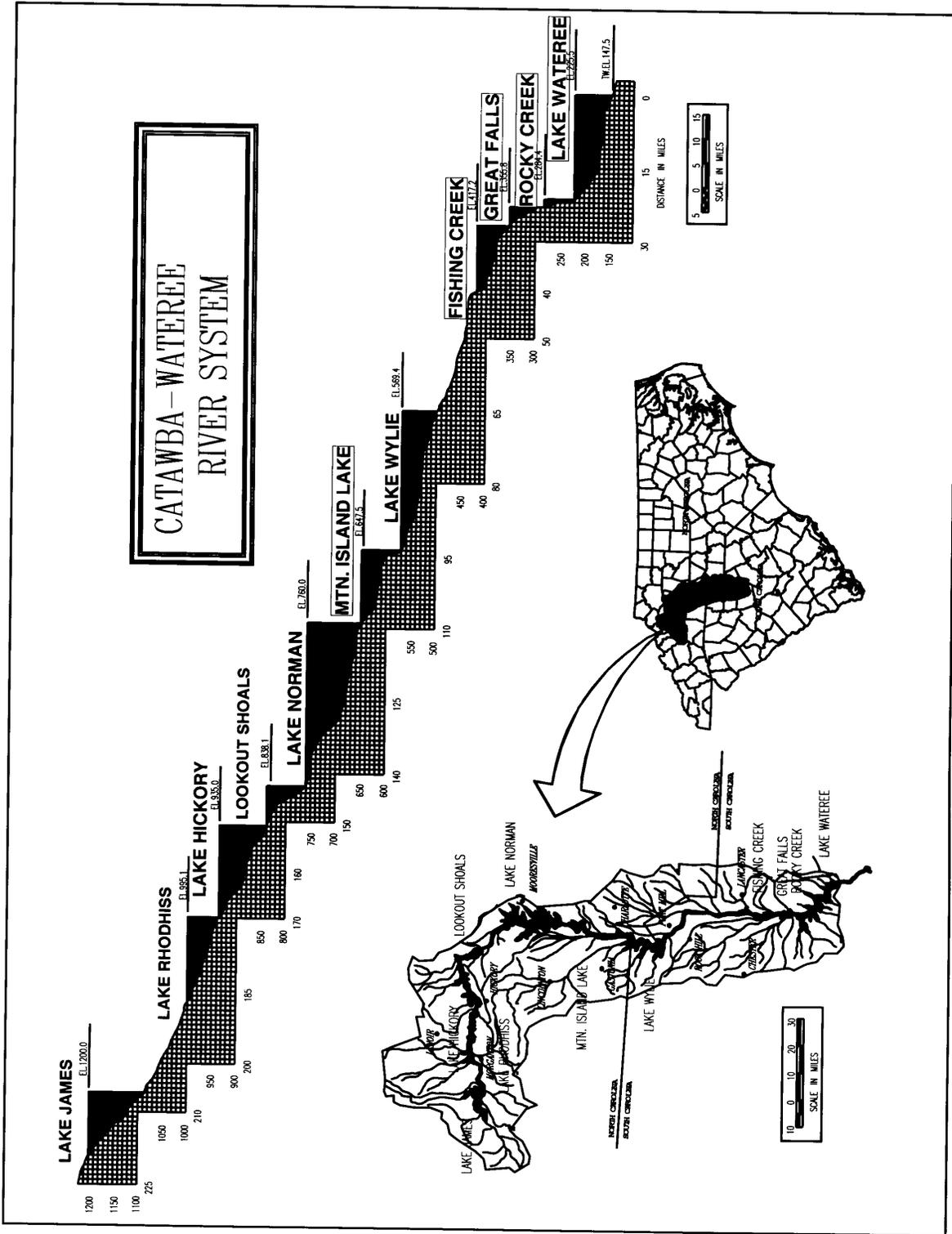
Sincerely,

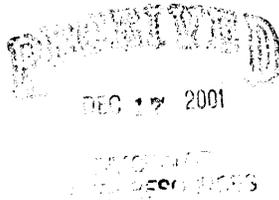
CH2M HILL



William Kreutzberger
Principal Water Resources Technologist

c: Barry Gullet/CMUD





Attachment
Excerpts from Environmental Assessment
Submitted to the Federal Energy Regulatory
Commission

152568/DWR SAFE YIELD_HYDRO RESPONSE 1201

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4.0
ENVIRONMENTAL EFFECTS

4.1 EFFECTS OF THE PROPOSED ACTION

4.1.1 Approach and Scope

In this section, we evaluate the direct, indirect, and cumulative effects of the proposed action. Electric generation and flow through the project reservoirs and in the Catawba River would be the only major resources directly affected. The potential indirect impacts on other resources (e.g., fisheries and aquatic resources, water quality, threatened and endangered species) would result primarily from changes in flow or lake levels. Because flow is such an important issue, we modeled project operations in the Catawba-Wateree Project reservoirs during average, dry, and drought year conditions, and estimated the change in lake levels and flows that would result from the proposed CMUD withdrawals. We describe the effects of the proposed water withdrawals on flow and lake levels in Section 4.2 and the indirect effects on other resources in subsequent sections. Other minor direct effects of the proposed action (e.g., dredging, fish entrainment) are addressed in each resource section.

The timeframe for our analysis was from 2000 to 2030, the planning period for which the proposed withdrawal is based. As described in Section 2, CMUD's withdrawals would grow over time and reach the proposed average annual withdrawal rate of 163 mgd by 2030. We have analyzed the potential effects of the proposed action at the proposed maximum withdrawal. The year 2030 impacts would not occur immediately, but would increase over time proportional to the growth in water withdrawals, eventually reaching the impacts that we have projected.

Table 4-1 summarizes the scenarios that we have evaluated. The baseline for the analysis was defined as the water withdrawals and consumptive water use rates that were in effect in the year 2000 (Existing 2000); the year for which the most current and complete data were available. We estimated the incremental impacts that would result specifically from the proposed 163 mgd average annual withdrawal (CMUD 2030), as well as the cumulative impacts that would result from the combination of the 163 mgd CMUD withdrawal and other projected 2030 consumptive water uses within the Catawba River Basin (Cumulative 2030). The latter analysis, carried through the analysis of effects on other resources, constitutes our cumulative impacts analysis required under the National Environment Policy Act (NEPA).

TABLE 4-1
Scenarios Analyzed to Address Incremental and Cumulative Effects of the Proposed Action

Scenario	Description	Comments
Existing 2000	2000 Catawba Basin water use	Serves as baseline for analysis of incremental and cumulative impacts
CMUD 2030	2000 Catawba Basin water use plus proposed CMUD 2030 water use	Incremental effect of CMUD's proposed action
Cumulative 2030	Projected 2030 Catawba Basin water use plus proposed CMUD 2030 water use	Cumulative effect of CMUD together with foreseeable future water use in basin

The geographic scope of our analysis was variable depending on the resource affected. The analysis of effects of withdrawals on lake levels and Catawba River flows and indirect effects on other reservoir resources encompassed the entire Catawba River Basin from the headwaters to Wateree Dam. Our detailed examination of the effects of proposed withdrawals on Catawba River flows focused on the 25-mile section of the Catawba River between Lake Wylie to Fishing Creek Reservoir, the only free-flowing portion of the Catawba River downstream of the Mountain Island withdrawal and upstream of the Wateree development which is the downstream-most development of the Catawba-Wateree project. The majority of water to be withdrawn by CMUD would be returned to the Catawba River via Sugar Creek, about halfway through this reach of river, so any potential water quantity impacts downstream of the return flows at Sugar Creek would be considerably less.

The analyses described in the following sections were designed to specifically address agency concerns outlined in Section 2.3. The agencies expressed concerns regarding reduced municipal and industrial water supply availability downstream, effects on Duke's hydropower operations, and alteration of the flow regime of the Catawba River. We specifically address agency requests for analysis of increases in consumptive water use, changes in reservoir operations, and impacts on flows downstream in the Catawba River (including minimum flows) at a detail specific enough to address daily flows for a variety of years including drought years.

4.2 WATER RESOURCES

This section describes our analysis of the effects of the proposed withdrawals on water quantity in the Catawba River and the related changes in lake levels and river flows. The cumulative effect on flows from the proposed action and projected future consumptive water uses in the basin is also considered. We used the current conditions in the watershed as the baseline, and hydrologic and reservoir operation models and hydrologic mass balance computations as the tools, to simulate reservoir operations and withdrawal and release scenarios.

4.2.1 Selecting Representative Hydrologic Conditions

The effects of the proposed withdrawal would occur in all years but would be most pronounced during summer, low-flow or drought conditions when river flows are low. To characterize the range of potential effects from year to year, we evaluated four representative hydrologic conditions: average, dry, very dry, and drought periods based on extensive analysis of the historical flow record (Table 4-2). In selecting the representative conditions, we considered both annual flow conditions and flow conditions during the summer-fall, low-flow period defined as July-August-September-October (JASO). Analysis of the historical flow record showed that these were the months with lowest flows. Detailed analysis of the hydrology for the Catawba River was provided by USGS (Cooney, personal communication, 2001), and the summary of our analysis of historical flow records is provided in Appendix D.

The year 2000 was selected as the drought period; it had the lowest recorded average annual flows in the Catawba River and the lowest average JASO flows (Table 4-2). The year 2000 is widely accepted as a drought year (Sanders, personal communication, 2001). Hydrologic conditions similar to those of 2000 represent extreme drought conditions and are very rare (i.e., annual flow conditions this dry or drier have occurred only once in 65 years).

We selected 1956 as the representative very dry year; its annual flow was one of the lowest recorded (average annual flow was ranked as the 6th lowest and its JASO flows were ranked 8th lowest among 65 years in the historical record). Summer-fall low-flow periods during 1956 were typically around the 75 percent exceedence flow level. Hydrologic conditions similar to those of the very dry year 1956 are rare (i.e., annual flow conditions dry or drier occurred in only 6 of the past 65 years).

We selected 1953 as the representative dry year; its annual flow was one of the lowest recorded (average annual flow was ranked as the 11th lowest and the JASO flows were ranked 11th lowest among years in the historical record). Summer-fall low-flow periods during 1953 were typically around the 75 percent exceedence flow level. Hydrologic conditions similar to those of the dry year 1953 are regular but infrequent (i.e., annual flow conditions this dry or drier occurred in only 11 of the past 65 years).

Finally, we modeled an average year to contrast the relative effects that would prevail many years (i.e., about 50 percent of all years would be average to wet years) versus those that would occur during less frequent dry periods. We selected 1946 as the average year; its annual flow being close to the median (ranked 35th) and its average JASO flows were 26th. Hydrologic conditions equal to or wetter than the average year might be expected in about 50 percent of all years.

We decided to represent drought, dry, and average years; very dry conditions were omitted because dry and drought conditions accurately bracketed the hydrology of low-flow conditions. Although other representative years could have been selected, the effects on our analysis of selecting years with slightly different monthly flow distributions would not be significant because of the amount of storage in the reservoir system provides significant month-to-month hydrologic buffering.

TABLE 4-2
Summary of Historical Flow Statistics for the Catawba River Near Rock Hill
(USGS Gauge 02146000) Used to Select Representative Average, Dry, and Drought Conditions for Hydrologic and Operations Modeling

Streamflow Condition	Year	Annual Flow			Summer/Fall Low-Flow (JASO) Period					
		Average Flow (cfs)	Rank Annual Average Flow	Approximate Occurrence of Annual Flows This Low or Lower ¹	Average JASO Flow (cfs)	Jul (J)	Aug (A)	Sep (S)	Oct (O)	
Drought	2000	1775	1	Less than 2 percent of all years	1044	1020	1016	1149	992	
Very Dry	1956	2227	6	Less than 9 percent of all years	1281	933	1628	1235	1329	
Dry	1953	3102	11	Less than 17 percent of all years	1889	2312	1966	1770	1507	
Average	1946	4408	35	50 percent	2754	2861	2762	2423	2969	

Note: Based on analysis of flow data from USGS Gauge, Catawba River near Rock Hill (USGS Gauge 02146000), 1938 – 2000
¹ Approximate estimate of the percentage of years that would have average daily flows less than or equal to this average annual flow based on period of record.

4.2.2 Hydrologic and Operations Modeling

In Section 3.2, we described the reservoir characteristics, project operations, and hydrology of the Catawba-Wataree Project. The following section describes the basic methods and procedures that we used to perform our flow analysis, including hydrologic calculations and operations modeling.

Two basic tools were used to estimate the effects of CMUD's withdrawals on lake levels and downstream flows. The first was Duke's Catawba-Wataree computer based reservoir operation model, and the second was mass flow balance computations. Duke's operation model was used as the primary tool. It allowed the integrated assessment of lake level, inflow, outflows, and project generation in a single model and accurately reflects on an annual and monthly basis how the Catawba-Wataree project is operated. Hydrologic mass balance calculations were used to confirm, check, and refine the operational model projections whenever small time periods were examined. The hydrologic mass balance calculations were simple, spreadsheet-based, mathematical computation of inflows, withdrawals, and outflows.

Reservoir Operation Model

Duke's reservoir operations model is a proprietary version of the commercially available CHEOPS (Computer Hydro-Electric Operations and Planning Model Software) model, now used at other hydroelectric projects. The model was calibrated specifically for the Catawba-Wataree Hydroelectric Project by Duke using detailed engineering and operations data for the project and historical flow records from available flow gauges in the basin.

The Catawba-Wataree operations model accounts for inflows (streamflows) and outflows (withdrawals, generation, and indirectly, evaporation) for each reservoir in the project. The model contains detailed data for storage-area-volume relationships, reservoir elevation constraints, operating rules, turbine and generator efficiency curves, travel times and paths. Duke engineers calibrated the model for the Catawba-Wataree system by using historical flow and generation records. This process consisted of using the available historical streamflow gage weighted data for the upper, middle, and lower sections of the basin and allocating proportionately weighted flow at each dam based on drainage size. (Inadequate historical flow data for the Catawba River system made this the only approach available for calibrating the model.) After initial test runs, minor adjustments to the model code were made based on comparison to long periods of generation (Bruce, personal communication, 2000).

The reservoir operations model operates much as the actual project is operated. Water flowing into the system is routed through the reservoirs. Reservoir operating levels are maintained according to "rule curves," which define preferred, minimum, and maximum reservoir levels, and generation is computed. Generation is simulated by rules that are determined by energy demand, with the constraints of available water and lake levels and station-specific characteristics.

Consumptive uses of water are accommodated within the model by allowing the user to specify water withdrawals and water returns to the system to simulate the municipal, industrial, etc. water uses that occur at any point in the system.

Mass Balance Computations

Mass balance calculations were used in some cases to verify certain reservoir operations model predictions for accuracy. A spreadsheet model was developed for Lake Wylie specifically to verify the accuracy of reservoir operations model projections of changes in generation at the Wylie powerhouse and flows released into the Catawba River below Lake Wylie. The spreadsheet model accounted for gross inflow, outflow, and withdrawals, and computed the volume, average release flow, and number of hours of generation needed to pass that amount of water.

Consumptive Water Use Estimates

We adjusted the hydrologic model to account for consumptive water use throughout the Catawba River Basin through the year 2030. Consumptive water use for this evaluation is the difference between the volume of water withdrawn by water users and the volume of water returned to the river. The principal consumptive water users in the Catawba Basin are municipal water supply, industry, power plants (make up cooling water), and irrigation and agriculture. Note however, that some of the largest water uses of power plant cooling water are not consumptive uses (Appendix E; Table E-12); these include once-through river and lake cooled stations such as Marshall Steam Station. In contrast, the make-up water taken by Catawba Nuclear Station is a consumptive use because it replaces water evaporated in the cooling towers. Interbasin transfers, where water is transferred in or out of the Catawba Basin, also factor into consumptive use calculations. Consumptive water use reduces the volume of water flowing through the rivers and reservoirs.

To address present and projected future 2030 consumptive water use in our modeling, we developed detailed, planning-level consumptive use estimates for the Catawba River Basin upstream of Wateree Dam using data from a variety of sources (see Appendix E for full details on data and methodology). Estimates were made for existing conditions, based on reported data from 1997 to 2000 (depending on source) and projections for 2030 based on reported projections, linear interpolation and other assumptions. In preparing the projections, we considered and made adjustments to the reported future projections in the case of Charlotte Mecklenburg, the City of York, and Statesville to reflect updated plans and information and ensure that plans for future water withdrawals were accurately reflected.

In summary, surface water withdrawal and discharge data were obtained from the NCDENR, Division of Water Resources, and from the SCDHEC, Bureau of Water and Department of Natural Resources. The data included all reported water uses and withdrawals as well as discharges. Other sources such as USGS (1995), Duke estimates of power plant consumptive uses (Bruce, 2000), and verbal communications with Mooresville and Lincoln County supplemented this data. Interbasin transfers were inherently accounted for in the estimates.

The results of the consumptive use estimates indicate that consumptive withdrawals in the Catawba Basin are greatest for municipal water supply and power plant cooling water. On the basis of reported and projected withdrawals and discharges, total consumptive demand is currently almost 187 mgd (Table 4-3). We estimate that total consumptive demand within the Catawba Basin upstream of Wateree Dam would reach approximately 250 mgd by 2030.

TABLE 4-3		
Existing and Projected Consumptive Water Use (mgd) in the Catawba River Basin, North Carolina and South Carolina		
	Estimated Consumptive Use (mgd)	
	Existing 2000	Projected 2030
Municipal	66	122
Industrial	10	17
Power Plants	77	77
Irrigation	34	34
Total (mgd)	187	250

For modeling purposes, to accurately reflect spatial aspects of consumptive demand, we compiled consumptive use estimates for each Catawba Basin subbasin entering each of the Catawba-Wateree Project reservoirs (Table 4-4). A negative value indicates more water returned to the subbasin than withdrawn. In addition, we examined the amount and location of water withdrawals and discharges to the Catawba River between Wylie Dam and Fishing Creek Reservoir for the analysis of impacts on streamflow in this section of the river.

Consumptive use varies seasonally and is typically greatest during the summer period when lawn watering and other forms of irrigation are at their highest levels. We examined monthly reported water withdrawal data, when available, to develop estimates of peak consumptive use.

Reservoir Operations and Inflows

Reservoir operating condition rules are established on the basis of Duke’s current operating practices. Current operations are a function of reservoir rule curves, reservoir levels, inflows, energy demand patterns, etc. which are programmed into the CHEOPS model as a set of guidelines and constraints. The model uses the available inflows and lake levels to maximize generation in response to energy demand functions within the constraints of limits on water levels in the reservoirs and other operating constraints. As a result, the net effect of an increased water withdrawal is reduced electrical production.

TABLE 4-4
Consumptive Water Use for Subbasins Draining into each of the Catawba-Wateree Project Reservoirs

Catawba-Wateree Project Reservoir	Estimated Consumptive Use (mgd)	
	Existing 2000	Projected 2030
Lake James	3	5
Lake Rhodhiss	17	24
Lake Hickory	11	23
Lookout Shoals Lake	1	9
Lake Norman	53	105
Mountain Island Lake	113	127
Lake Wylie	45	46
Fishing Creek Lake	-56	-83
Great Falls Lake	-9	-18
Rocky Creek Lake	1	1
Lake Wateree	8	11
Total (mgd)	187	250

Tributary inflow is the major source of flow through the Catawba reservoirs. Reservoir inflow hydrology for the CHEOPS model for the average, dry, and drought modeling scenarios were taken from the monthly flows for the representative years, 1946, 1953, and 2000 respectively. We took the average monthly flows at the Catawba River at Rock Hill and prorated them for the remainder of the basin based on the findings of the model calibration process.

Analysis Scenarios

We simulated flows through the Catawba-Wateree system and lake levels for the nine CHEOPS model scenarios, the combination of the three representative years (average, dry, drought) and the three withdrawal scenarios (Existing 2000, CMUD 2030, and Cumulative 2030). For each analysis scenario, we ran the entire year, and analyzed the annual, monthly, and JASO results. This was done to ensure that the model accounted for the effects of inflows for extended periods of average, dry, or drought periods on storage that are important to accurately predicting lake levels and downstream flows.

4.2.3 Changes in Operations, Lake Levels, and Flows

Project Operations

The CMUD 2030 and Cumulative 2030 withdrawals would not change the basic operational mode of the Catawba-Wateree Project, but will reduce the amount of electrical generation produced from the Catawba-Wateree Project. All other things being equal, the operation of the project facilities would

continue much as it has in previous years. As the rate of consumptive use of water in the basin grows through 2030, the operation of the project would be adjusted to account for the slightly lower rate of flow through the system. This adjustment would be primarily through a reduction in the amount of daily or weekly generation to account for lower inflows into the reservoirs, rather than by changes in lake levels or patterns of generation. Our conclusions are based on the findings presented in the following sections as well as statements by Duke that it would adjust project operations to accommodate the increased withdrawals but reducing generation.

The CHEOPS model results indicate that during average to wet periods, when generation occurs for much of the day, the rate of generation would be slightly reduced. During periods of lower reservoir inflow (e.g., summer or fall periods, or during dry to drought years), when operation is more sporadic and related to times of peak energy demand, the amount of generation would be reduced. That is, the amount of energy produced during daily or weekly generation events would be reduced. Because the project is operated primarily for daily peak electricity generation, the number of generation events would be expected to stay about the same. However, with less water flowing through the reservoir as a result of the proposed withdrawals, a generation event that might normally use two turbines might instead use only one, possibly for a slightly longer period. The model indicates that during low-flow periods, when only one turbine might be used during a generation event, different turbine settings would be used, resulting in a lesser rate of generation for a longer period. In all cases the amount of energy produced would be reduced.

These changes in operations also provide the basis for understanding the changes in flow described in the following section.

Lake Levels

The model results indicate that CMUD 2030 and Cumulative 2030 water withdrawals would have little effect on average pool elevations or the magnitude of water level fluctuations in any of the Catawba-Wateree Project reservoirs, even during drought conditions (Appendix F). This is because of the way the project is operated. Generation throughout the Catawba-Wateree system would be operated based on maintaining lake levels within certain ranges, and the amount of generation would be reduced in proportion to the withdrawals. This results in less flow through the system, but similar lake levels.

The results of our analysis of the effects on lake levels were expected. This is because there are considerable engineering constraints on Duke's lake levels, such as the minimum lake elevations needed to run nuclear and fossil power plants on Lake Wylie and Lake Norman (see Section 3.2.2), as well Duke's need to maintain minimum elevations for efficient operation of the hydroelectric units. The CHEOPS model is designed to simulate the Catawba-Wateree Project to meet these requirements consistent with lake level rule curves, therefore, the model essentially simulates the changes in operation that are made to accommodate the changes in flow.

In actual practice, during drought conditions, lake levels may be slightly lower at any given time or reach lower levels sooner with the CMUD 2030 or Cumulative 2030 withdrawal than without (CH2M Hill, 1999), and electric generation would be reduced. However, given the amount of storage in the entire reservoir system, this effect would be relatively small. This is in part attributable to the fact that the impacts on lake levels would be spread across the 11 reservoirs of the Catawba-Wateree system.

In rare circumstances, when inflows into the Catawba-Wateree system reach historical drought conditions (about once every 20 years) and the downstream reservoirs reach minimum levels, storage in upstream reservoirs is used as needed to maintain minimum flow through the system. This was the case during the severe drought of 1999 and 2000, yet reservoir elevations did not go below historic levels.

Our conclusion is that that CMUD 2030 and Cumulative 2030 water withdrawals would have a minor effect on average pool elevations or the magnitude of lake level fluctuations in most years. During drought conditions, lake levels may reach lower levels earlier, but the normal operating ranges, fluctuation zones and minimum lake elevation would remain largely the same as those that have occurred historically.

Downstream Flows – Catawba River

CMUD's proposed withdrawal would affect one free flowing section of river, the Catawba River from Lake Wylie downstream to Fishing Creek Reservoir. This 27-mile section of the Catawba River can be divided into two different reaches: Reach 1, from Wylie Dam to Sugar Creek (12 miles), and Reach 2, from Sugar Creek to Fishing Creek Reservoir (Figure 3-2). Sugar Creek is the stream to which much of the return flow of the proposed CMUD withdrawal (minus water lost to consumptive use) would be discharged, via the Irwin, Little Sugar, and McAlpine WWTPs (Figure 3-2; CH2M Hill, 2000).

Based on the location of CMUD's return flows, and the additional flow contributions from tributaries and other municipal discharges, the effects of reduced flows in the Catawba River would be greatest in Reach 1, immediately downstream of Wylie Dam. Flow impacts on the lower section of the river would be considerably less, because at the confluence of Sugar Creek, approximately 60-70 percent of the water withdrawn from Mountain Island Lake would be returned to the river, depending on the season. In addition, there are a considerable number of tributaries (e.g., Sixmile Creek, Twelvemile Creek, Waxhaw Creek) that add flow to Reach 2 (Figure 3-2). For these reasons, our analyses focus on the upper section of the Catawba River, Reach 1. However, in our analysis in Section 4.3, Fisheries and Aquatic Habitat, we consider both reaches, and use relevant hydraulic, hydrologic, and habitat data from the river in both reaches.

Impacts on Average Daily Flow Releases

We evaluated the potential effect of CMUD's proposed 2030 withdrawals and cumulative withdrawals in 2030 on existing and future flows in the Catawba River in several ways. Operations and flow releases from Wylie Dam control flow in Reach 1, so we performed a detailed analysis of the hourly and daily

flows from the CHEOPS model output for the Wylie powerhouse. We used the model output to summarize flow releases in terms of the hours of generation, average daily flows, and minimum flow releases, and the percentage of time that average daily flow releases would equal or exceed various flow thresholds. The results were summarized for annual, JASO, and individual month periods. Then, as requested by the resource agencies, we considered the effects of CMUD 2030 and Cumulative 2030 withdrawals on the ability to meet future desired minimum flows.

The CHEOPS model results indicate that proposed CMUD 2030 and Cumulative 2030 water withdrawals would reduce average daily flow releases from Wylie Dam into the Catawba River by 85 cfs and 147 cfs, respectively (Table 4-5). This result is the same for annual flows and JASO flow periods. These numbers, 85 cfs and 147 cfs, match closely the incremental and cumulative consumptive water use in the Catawba River Basin down to Lake Wylie. This is an expected result; the CHEOPS model result is essentially confirming the result that the Catawba River flow would, on average, be reduced by the amount of the proposed consumptive use.

TABLE 4-5
Simulated Change in Average Annual Flow and Average Summer Flow Period (JASO) Flows Due to CMUD 2030 and Cumulative 2030 Withdrawals (cfs)

	Average Year		Dry Year		Drought Year	
	Annual	JASO	Annual	JASO	Annual	JASO
Existing 2000	4216	2734	3114	1886	1774	1094
CMUD 2030	4131	2649	3028	1802	1689	1010
CMUD 2030 minus Existing 2000	-85	-84	-86	-84	-85	-84
Cumulative 2030	4068	2588	2966	1741	1625	948
Cumulative 2030 minus Existing 2000	-149	-146	-148	-146	-149	-146

We further examined the resulting distribution of average daily flow releases from Wylie Dam for the Existing 2000, CMUD 2030, and Cumulative 2030 scenarios, and expressed the result as the percentage of days that average daily flow releases would be greater than or equal to various flow thresholds (Tables 4-6 and 4-7). In average flow years, the CMUD 2030 and Cumulative 2030 withdrawals would result in little change to the distribution of annual average daily flows less than 2,000 cfs (Table 4-6). Most of the change in average years would be manifested as 1-3 percent (CMUD 2030) and 3-5 percent (Cumulative 2030) reduction in the percentage of days with average daily releases in the range of 2,500 cfs to 4,000 cfs (Appendix F).

TABLE 4-6
Percent of Time that Daily Flow Releases from Lake Wylie Would Equal or Exceed Selected Average Daily Flow Thresholds During the Entire Year

	400 cfs	500 cfs	700 cfs	1,000 cfs	1,250 cfs	1,500 cfs	2,000 cfs
Average Year							
Existing 2000	100%	100%	97%	87%	82%	82%	79%
CMUD 2030	100%	100%	96%	87%	82%	82%	78%
Cumulative 2030	100%	100%	96%	87%	82%	82%	79%
Dry Year							
Existing 2000	100%	95%	88%	81%	76%	73%	61%
CMUD 2030	100%	95%	88%	81%	76%	72%	60%
Cumulative 2030	100%	95%	88%	81%	75%	70%	59%
Drought Year							
Existing 2000	100%	85%	82%	70%	52%	39%	29%
CMUD 2030	100%	84%	82%	62%	44%	35%	28%
Cumulative 2030	100%	84%	79%	55%	41%	32%	26%

TABLE 4-7
Percent of Time that Daily Flow Releases from Lake Wylie Would Equal or Exceed Selected Average Daily Flow Thresholds During the Summer-Fall Low-Flow (JASO) Period

	400 cfs	500 cfs	700 cfs	1,000 cfs	1,250 cfs	1,500 cfs	2,000 cfs
Average Year							
Existing 2000	100%	100%	93%	82%	71%	71%	71%
CMUD 2030	100%	100%	93%	82%	71%	71%	71%
Cumulative 2030	100%	100%	93%	82%	71%	71%	71%
Dry Year							
Existing 2000	100%	93%	78%	71%	71%	71%	62%
CMUD 2030	100%	93%	78%	71%	71%	62%	56%
Cumulative 2030	100%	93%	78%	71%	71%	62%	49%
Drought Year							
Existing 2000	100%	75%	71%	70%	39%	23%	14%
CMUD 2030	100%	72%	71%	56%	25%	14%	7%
Cumulative 2030	100%	72%	71%	43%	24%	10%	0%

Similar changes would occur in JASO months of average years, but the reduction in average daily flow releases in the range of 2,000 cfs to 3,000 cfs would be up to 6 percent for CMUD 2030 and 12 percent for Cumulative 2030. The percentage of days with average daily flows greater than 3,000 cfs would be reduced by 3-4 percent for both the CMUD 2030 and Cumulative 2030 withdrawals (Appendix F). As previously described, the CHEOPS model results indicate that these changes in average daily flows are largely attributable to reduced electrical generation manifested in a lesser duration or rate of daily peaking. Neither the CMUD 2030 nor Cumulative 2030 withdrawals would reduce the frequency of occurrence of average daily flow releases less than 2,000 cfs.

In dry years, the occurrences of higher average daily flow releases are naturally reduced by lower inflows to the basin. In dry flow years, the CMUD 2030 and Cumulative 2030 withdrawals would result in a small change in the distribution of annual average daily flows less than 2,000 cfs (Table 4-6). CMUD 2030 and Cumulative 2030 withdrawals would result in a 1-3 percent reduction in the percentage of days with average daily releases in the range of 1,000 cfs to 2,000 cfs (Table 4-6) and a 3-5 percent reduction in the percentage of days with average daily flows in the range of 2,000 cfs to 3,000 cfs (Appendix F).

During the JASO months of dry years, the reduction in average daily flow releases extends down to flows as low as 1,500 cfs, but days with average daily flows below 1,250 cfs would be unaffected. In dry years, the percentage of days with flows in the range of 1,500 cfs to 2,000 cfs would be reduced by 6-9 percent for CMUD 2030 and 6-13 percent for Cumulative 2030. The percentage of days with average daily flows greater than 3,000 cfs would be reduced by 3 and 7 percent for the CMUD 2030, and Cumulative 2030 withdrawals, respectively (Appendix F).

In a drought year, the occurrences of higher average daily flow releases are naturally reduced by lower inflows to the basin. On an annual basis, the CMUD 2030 and Cumulative 2030 withdrawals would reduce the occurrence of average daily flow releases in the 1,000 cfs to 2,000 cfs range (Table 4-6). Most of the change would be manifested as a 1-8 percent (CMUD 2030) and 3-15 percent (Cumulative 2030) reduction in the percentage of days with average daily releases in the range 1,000 cfs to 2,000 cfs. The percentage of days with average daily flow releases less than 750 cfs would change marginally (less than 1-3 percent), as would flows greater than 2,000 cfs. A greater reduction in flows would occur during the JASO months (Table 4-7). The reduction in average daily flow releases in the range of 1,000 cfs to 2,000 cfs would be 2-14 percent for CMUD 2030 and 2-27 percent for Cumulative 2030. Under drought conditions, during the JASO period, average daily flow releases below about 900 cfs would be unaffected by CMUD 2030 withdrawals (800 cfs for Cumulative 2030 withdrawals).

Impacts on Minimum Flow Releases

As described previously, Duke currently operates the Catawba-Wateree Project to meet the FERC-required minimum average daily flow of 411 cfs at Wylie. Under most conditions, average daily flow releases well exceed the minimum flow requirement (Tables 4-6 and 4-7 and Appendix F). During low-flow conditions, Wylie Dam is operated each day for a period sufficient to meet or exceed the 411 cfs requirement. Analysis of USGS flow records from the Catawba River at Rock Hill indicate that the

minimum flow requirement has always been met in the past, and that average daily flows as low as 411 cfs actually occur very infrequently. Based on the 1942-1999 period, average daily flows at Rock Hill exceed 711 cfs approximately 95 percent of the time (Appendix D). This finding is in general agreement with the CHEOPS modeling results, which indicate that average daily flow releases from Wylie Dam lower than about 750 cfs would occur only about 5 percent of the time in an average year under Existing 2000 conditions (Table 4-6).

The CHEOPS model results indicate that in dry to average flow years, the CMUD 2030 and Cumulative 2030 withdrawals would have little, or no effect, on the percentage of time that flows less than about 1,400 cfs occur. With the CMUD 2030 and Cumulative 2030 withdrawals in effect, Duke's 411 cfs minimum flow requirement would always be met, and in general flows in the low range would be similar to the Existing 2000 condition. This would be true on an annual basis and for the low-flow months (JASO).

In a severe drought condition, sufficient water is available to meet Duke's 411 cfs minimum flow requirement, and the CMUD 2030 and Cumulative 2030 withdrawals would have little effect on percent occurrence of average daily flow releases below about 700 cfs. Neither the CMUD 2030 nor the Cumulative 2030 withdrawals would jeopardize Duke's ability to meet the 411 cfs minimum flow requirement in the future. With regard to the proposed CMUD 2030 withdrawal, Duke has stated that it would adjust project operations to ensure it meets the required minimum flows. Based on our analysis, there is sufficient flow through the Catawba-Wataree Project in a severe drought year to continue to meet that commitment with the projected cumulative water withdrawals through 2030.

Ability to Meet Future Flow Requirements

The agencies also expressed concern that the adequacy of flows in the Catawba River downstream of Wylie Dam is not currently quantified, and that flows for fish and aquatic resources would be an issue during the relicensing process for the Catawba-Wataree Project. The agencies were concerned that the proposed 2030 CMUD withdrawals would reduce the ability of Duke to re-allocate water to instream-flow uses below Wylie (e.g., higher minimum flow) during relicensing.

We evaluated the potential impact of the CMUD 2030 and Cumulative 2030 withdrawals on the ability to meet different minimum flow levels, should they be established in the future. Tables 4-6 and 4-7 show the percentage of time that average daily flow releases would be greater than, or equal to, various flow thresholds under average, dry, and drought years. These results indicate that higher minimum flows could be supported with the available flow, even with the proposed CMUD 2030 or Cumulative 2030 withdrawals. The fact that the 411 cfs minimum was recently exceeded by a substantial margin during a severe drought (based on both Existing 2000 model results and actual year 2000 historical data) further supports this contention.

Based on the results presented herein, it can be concluded that the CMUD 2030 and Cumulative 2030 withdrawals would generally not prevent the establishment and maintenance of higher minimum flows. In years with flows greater than dry year conditions, which would be the majority of years, a range of higher minimum flows would be supportable, even with Cumulative 2030 withdrawals in place. However, as is clear from the discussion in the previous section, during drought years, the CMUD 2030 and Cumulative 2030 withdrawals would cause an incremental reduction in the percentage of time that the higher minimum flows could be met for minimum flows established above about 700 cfs.

It is important to note that in this section we evaluated minimum flows from the perspective of average daily releases, not continuous instantaneous minimum flows, although these two are nearly synonymous from a daily water mass balance perspective. That is, an average daily flow released downstream as three hours of generation takes about the same total amount of water as a continuous release at the average daily flow rate. However, they are not equal on the basis of the ability to produce electricity based on existing facilities at Wylie Dam. In the following section, we address the dynamic nature of the downstream flow regime in more detail.

It is also important to note that the above discussion assumes that future Catawba-Wateree Project operation would be similar to current operation. We have not fully considered the range of operational changes that may be possible to increase minimum flows in the Catawba River in the future during drought years with future withdrawals. Neither have we considered the effects of various changes on the amount or timing of generation, or the ability of Duke to meet peak period electrical demand. Full consideration of such factors is well beyond the scope of this environmental document, because the specific considerations and developments that may occur in the licensing process for the Catawba-Wateree Project are not foreseeable.

4.2.4 Water Quality

Mountain Island Lake

The USGS, CMUD, and Mecklenburg County collected hydrologic data from April 1994 to September 1997, and water quality data from April 1996 to September 1997, to characterize the lake, and to support development of a water quality model. The USGS simulated circulation and water quality processes using CE-QUAL-W2. The CE-QUAL-W2 model is a two-dimensional hydrodynamic model that was developed by the U.S. Army Corps of Engineers. The Mountain Island Lake model was developed to examine the following management issues:

- The movement of conservative water quality constituents, such as chloride or total dissolved solids through the reservoir;
- The effects of Duke Energy's Riverbend thermal discharge on water temperature;
- The effects of increased water supply withdrawals on water quality; and
- The effects of changes in point and nonpoint source loads on reservoir water quality.

The CE-QUAL-W2 model for Mountain Island Lake contains 36 segments along the lake mainstem. These segments range in length from about 1,380 to 3,740 feet in length. In addition, four coves were simulated with at least three segments. The external water quality loadings were determined for the period May 1996-April 1997 for the model. To simulate the impacts of CMUD's proposed water supply withdrawal increase, a constant withdrawal of 330 mgd was input to the model for the 1996-1997 simulation period. This would overstate the impact of the proposed withdrawal increase, because the 330 mgd withdrawal is proposed as a maximum instantaneous value, and the average annual withdrawal would be held to 163 mgd. In order to maintain the 1996-1997 water levels in the lake, the inflows from Lake Norman were increased as well.

The water quality modeling results indicated that water temperature, chlorophyll *a*, and DO concentrations in the lake mainstem were essentially identical for both sets of withdrawal conditions. There could be some impacts to flow patterns around the intake, but the existing CE-QUAL-W2 model is not refined enough spatially to examine these potential impacts. In summary, CMUD's proposed 2030 withdrawal would not impact water quality in Mountain Island Lake. Because the model was run at a constant withdrawal of 330 MGD, when their average annual withdrawal would be held to 163 MGD, it can also be concluded that the cumulative impacts of other withdrawals within North Carolina would not impact water quality in Mountain Island Lake.

Retention Times in Lakes

As flows are withdrawn from Lake Norman and Mountain Island Lake, the average retention time in lakes can increase. As retention time increases, water movement slows and allows more nutrients to be taken up resulting in a higher potential for algal blooms to occur. It was assumed that the largest impact to retention time would occur in Lake Wylie as most of the water withdrawn by CMUD is returned below Lake Wylie. Lake Wylie has a longer retention time than Mountain Island Lake, and as stated above is considered to be eutrophic while Mountain Island Lake is considered to be oligotrophic.

In order to evaluate the impact of flow changes on retention time through the Lake Wylie, a model was developed to predict the changes in flow out of lake under existing conditions, CMUD 2030 and Cumulative 2030 withdrawals. The model was run for a drought year (average recurrence interval of once in 20 years). For the drought year, annual average flows out of Lake Wylie were predicted along with average flows out of Lake Wylie during the summer months (July, August, September, and October). Table 4-8 shows the predicted flows.

The following formula can be used to predict the change in retention time:

$$\text{Retention Time} = \text{Lake Volume}/\text{Flow}$$

TABLE 4-8
**Average Daily Flow Releases from Lake Wylie to the Catawba River
for Existing and Future Water Withdrawal Scenarios in Drought Year**

	Annual Flow (cfs)	Summer Flows (cfs)
Existing 2000 Conditions	1774	1094
CMUD 2030 Withdrawal	1689 (5% change from exist.)	1010 (8% change from exist.)
Cumulative 2030	1625 (8% change from exist.)	948 (13% change from exist.)

According to NCDWQ, the average volume in Lake Wylie is approximately $353 \times 10^6 \text{ m}^3$. It was assumed that the volume would not change significantly under the proposed withdrawal. The calculated retention times based on the flows shown in Table 4-8 were calculated and are presented in Table 4-9:

TABLE 4-9
**Average Retention Time in Lake Wylie for
Existing and Future Water Withdrawal Scenarios in Drought Year**

	Annual Retention Time (days)	Summer Retention Time (days)
Existing 2000 Conditions	81	132
CMUD 2030 Withdrawal	85	143
Cumulative 2030	89	152

These predicted changes in retention times should not affect the response of Lake Wylie to nutrient loading. Under these low-flow conditions, there is sufficient retention time under existing 2000 conditions to result in algal blooms, if there is sufficient nutrient loading. These retention times are also based on the entire lake. It is likely that the retention time of the mainstem of the lake is much shorter while the retention times of the lake arms are longer. Since the withdrawals would affect the flows coming through the mainstem, it is unlikely that they would impact nutrient response. According to data collected by NCDWQ and modeling completed by them, the greatest impacts from nutrients occur in the Catawba Creek and Crowders Creek arms of Lake Wylie (NCDWQ, 1995). Thus, the change in predicted retention time in Lake Wylie under CMUD's proposed 2030 withdrawal and under the cumulative impacts of all withdrawals from the system, would not significantly impact water quality within the lake.

Public Hearing Notice

Charlotte-Mecklenburg Utilities Proposed Increase in Interbasin Transfer

NOTICE OF PUBLIC HEARING December 11, 2001, 5:00 PM

The North Carolina Environmental Management Commission (EMC) will hold a public hearing to receive comments on the petition for an increase in interbasin transfer from the Catawba River Basin to the Rocky River Basin. Charlotte-Mecklenburg Utilities (CMUD) is requesting an increase from the grandfathered Interbasin Transfer (IBT) of 16.1 million gallons per day (mgd) to 33 mgd (maximum day basis). The proposed IBT is based on additional water withdrawals from Lake Norman and Mountain Island Lake in the source basin (Catawba River Basin). The IBT will increase due to transfer of the water to the receiving basin (Rocky River Basin) via consumptive use in eastern Mecklenburg County and existing discharges at Mallard Creek Wastewater Treatment Plant [WWTP] and Water and Sewer Authority of Cabarrus County's [WSACC] Rocky River Regional (RRR) WWTP. CMUD is requesting a permitted IBT increase to 33 mgd, which will allow CMUD to meet projected water supply demands through the year 2030 in eastern Mecklenburg County. *This IBT does not include transfers associated with water or wastewater service provided to the Goose Creek watershed in the Town of Mint Hill in Mecklenburg County.* Notice of these hearings is given in accordance N.C. General Statute 143-215.221(d).

The public hearing will start at 5:00 PM on December 11, 2001 at the North Mecklenburg Water Treatment Plant, 7980 Babe Stillwell Road, Huntersville, NC. In addition, Division of Water Resources staff will be available to answer questions from 4:00 PM to 5:00 PM at the hearing location. The public may inspect the staff's recommendation report, the interbasin transfer petition, and the final Environmental Assessment (EA) during normal business hours at the offices of the Division of Water Resources, 512 N. Salisbury Street, Room 1106, Archdale Building, Raleigh. These documents may also be viewed at the Division's web site: http://www.ncwater.org/Permits_and_Registration/Interbasin_Transfer/Status/Cmud/.

The purpose of this announcement is to encourage those interested in this matter to provide comments and to comply with the public participation requirements regarding this matter. You may attend the public hearing and make relevant oral comments and/or submit written comments, data, or other relevant information. Written submissions of oral comments at the hearing are requested. The hearing officer may limit the length of oral presentations if many people want to speak. If you are unable to attend, written comments can be mailed to Tom Fransen, Division of Water Resources, DENR, 1611 Mail Service Center, Raleigh, NC 27699-1611. Comments may also be submitted electronically to Tom.Fransen@ncmail.net. All comments must be received before 5:00 PM, December 14, 2001.

Under the Regulation of Surface Water Transfers Act (G.S. 143-215.221), persons intending to transfer 2.0 mgd or more, or increase an existing transfer by 25 percent or more, must first obtain a certificate from the Environmental Management Commission. As part of the petition process, the applicants completed an environmental assessment. Review of the environmental assessment by the Department of Environment and Natural Resources has been completed in accordance with the State Environmental Policy Act.

North Carolina G.S. 143-215.221(e) requires the notice of public hearing include *a conspicuous statement in bold type as to the effects of the water transfer on the source and receiving river basins.*

The proposed transfer is an increase of 16.9 mgd, an increase from the grandfathered transfer of 16.1 mgd to 33 mgd (maximum day basis). The proposed IBT is based on additional water withdrawals from Lake Norman and Mountain Island Lake in the source basin (Catawba River Basin). IBT will increase due to transfer of the water to the receiving basin (Rocky River Basin) via consumptive use in eastern Mecklenburg County and existing discharges at Mallard Creek WWTP and Water and Sewer Authority of Cabarrus County's Rocky River Regional WWTP.

In the source basin, storage in and flow through the Catawba-Wateree Project reservoirs, lost electrical generation, and reduced flow in the Catawba River immediately below the Wylie development would be the major resources directly affected. The indirect and cumulative impacts on fisheries and aquatic resources, water quality, threatened and endangered species and other resources would result primarily from changes in flow or lake levels. Operations of the Catawba-Wateree Project reservoirs were modeled using Duke Power's reservoir operations model during average, dry, and drought year conditions.

The model results indicated that there will be no changes in the surface water elevations of Lake Norman, Mountain Island Lake, or Lake Wylie due to the proposed increased IBT. Under normal and drought inflow conditions, Duke Power would manage the lakes and its power generation to offset increased water withdrawals to maintain the minimum release requirements and operating lake surface elevations. Direct impacts on water supply, water quality, wastewater assimilation, fish and wildlife resources, navigation, or recreation are not expected since there will be no significant changes in the hydrology of the system due to the increased withdrawal. The IBT will not require any increase in the currently permitted levels of wastewater discharges or any construction in either the source or receiving basins.

There are no secondary impacts related to growth in the source basin due to the transfer of water. However, the IBT will provide additional water supply to support growth and development in the receiving basin. Mitigation measures presented in this IBT Petition are expected to mitigate secondary impacts related to growth and development in the receiving basin. The proposed IBT will not result in significant cumulative impacts in either the source or receiving basins.

The public is invited to comment on the applicants' petition and supporting environmental documentation. The Commission is considering and seeking comments on three options with regard to the interbasin transfer request. The options, in no particular order, are: (a) grant the certificate for the 33.0 mgd interbasin transfer request; (b) deny the 33.0 mgd interbasin transfer request; or (c) grant the certificate including any conditions necessary to achieve the purposes of the statute or to provide mitigation measures. The public is invited to comment on the following possible conditions and to suggest any other appropriate conditions, including other limitations on the amount of the transfer.

1. Require Mecklenburg County to summarize progress in implementation of watershed management approaches of the Surface Water Improvement and Management Program (SWIM) on an annual basis. The Division of Water Resources shall have the authority to approve modifications to and need for continued reporting as necessary.
2. Require Mecklenburg County and the City of Charlotte to continue the stakeholder process to investigate water quantity control from single-family development and water quality control for all development until completed. To accomplish this end, the stakeholder group should consider evaluating the feasibility of single-family detention and recommending ordinance revisions based on technical, political, long-term maintenance, cost, and benefits related to the proposed ordinance changes.
3. The Goose Creek subbasin in Mecklenburg County is removed from the area to be served by the IBT. A moratorium on the installation of new IBT water lines (water lines crossing the ridgeline) into Goose Creek subbasin is in effect until the impacts of additional growth urban growth on the endangered species are fully evaluated. This moratorium will not impact Charlotte-Mecklenburg Utility's ability to fully utilize existing water lines.
4. Require applicants to develop a compliance and monitoring plan for reporting maximum daily transfer amounts, compliance with certificate conditions, progress on mitigation measures, and drought management activities. The Division of Water Resources shall have the authority to approve modifications to the compliance and monitoring plan and drought management plan as necessary.

For more information, visit the Division of Water Resources' website at:
http://www.ncwater.org/Permits_and_Registration/Interbasin_Transfer/Status/Cmud/. You may also contact Tom Fransen in the Division of Water Resources at 919-715-0381, or email: tom.fransen@ncmail.net.

December 11, 2001 -- Public Hearing
LIST OF ATTENDEES

- | | | | |
|----|--|-----|--|
| 1. | Donna Lisenby
Catawba Riverkeeper
926 Elizabeth Avenue
Charlotte, NC 28204 | 9. | Joe DeBruhl
Willis Engineers
1520 South Blvd.
Charlotte, NC 28203 |
| 2. | Bruce A. Anderson
Catawba Riverkeeper
16125 Weatherly Way
Huntersville, NC 28078 | 10. | Charles B. Flowers, Jr.
City of Belmont
PO Box 431
Belmont, NC 28012 |
| 3. | Rich Hoffman
Catawba County Government
PO Box 389
Newton, NC 28658 | 11. | Jeff Slough
City of Concord
PO Box 308
Concord, NC 28027 |
| 4. | Bill Kreutzberger
CH2M Hill
4824 Parkway Plaza Blvd., Suite 200
Charlotte, NC 28226 | 12. | Henry Waldroup
City of Concord
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| 5. | Chip Smith
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| 6. | Heather Dyke
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115 Perimeter Center
Atlanta, GA 30346 | 14. | Wilce Martin
Town of Mooresville
PO Box 878
Mooresville, NC 28115 |
| 7. | Terry A. Gross
City of Concord
PO Box 308
Concord, NC 28026 | 15. | Charles A. Willis
Willis Engineers
1520 South Blvd.
Charlotte, NC 28211 |
| 8. | Parker Wheaton | 16. | Barry Gullet
CMUD
5100 Brookshire Blvd.
Charlotte, NC 28216 |

Statutory Authority for Regulating Interbasin Transfers

Part 2A. Registration of Water Withdrawals and Transfers; Regulation of Surface Water Transfers.

' 143-215.22G. Definitions.

In addition to the definitions set forth in G.S. 143-212 and G.S. 143-213, the following definitions apply to this Part.

(1) "River basin" means any of the following river basins designated on the map entitled "Major River Basins and Sub-basins in North Carolina" and filed in the Office of the Secretary of State on 16 April 1991. The term "river basin" includes any portion of the river basin that extends into another state. Any area outside North Carolina that is not included in one of the river basins listed in this subdivision comprises a separate river basin.

- a. 1-1 Broad River.
- b. 2-1 Haw River.
- c. 2-2 Deep River.
- d. 2-3 Cape Fear River.
- e. 2-4 South River.
- f. 2-5 Northeast Cape Fear River.
- g. 2-6 New River.
- h. 3-1 Catawba River.
- i. 3-2 South Fork Catawba River.
- j. 4-1 Chowan River.
- k. 4-2 Meherrin River.
- l. 5-1 Nolichucky River.
- m. 5-2 French Broad River.
- n. 5-3 Pigeon River.
- o. 6-1 Hiwassee River.
- p. 7-1 Little Tennessee River.
- q. 7-2 Tuskasegee (Tuckasegee) River.
- r. 8-1 Savannah River.
- s. 9-1 Lumber River.
- t. 9-2 Big Shoe Heel Creek.
- u. 9-3 Waccamaw River.
- v. 9-4 Shallotte River.
- w. 10-1 Neuse River.
- x. 10-2 Contentnea Creek.
- y. 10-3 Trent River.
- z. 11-1 New River.
- aa. 12-1 Albemarle Sound.
- bb. 13-1 Ocoee River.
- cc. 14-1 Roanoke River.
- dd. 15-1 Tar River.
- ee. 15-2 Fishing Creek.
- ff. 15-3 Pamlico River and Sound.
- gg. 16-1 Watauga River.
- hh. 17-1 White Oak River.
- ii. 18-1 Yadkin (Yadkin-Pee Dee) River.
- jj. 18-2 South Yadkin River.
- kk. 18-3 Uwharrie River.
- ll. 18-4 Rocky River.

(2) "Surface water" means any of the waters of the State located on the land surface that are not derived by pumping from groundwater.

(3) "Transfer" means the withdrawal, diversion, or pumping of surface water from one river basin and discharge of all or any part of the water in a river basin different from the origin. However, notwithstanding the basin definitions in G.S. 143-215.22G(1), the following are not transfers under this Part:

- a. The discharge of water upstream from the point where it is withdrawn.

b. The discharge of water downstream from the point where it is withdrawn. (1991, c. 712, s. 1; 1993, c. 348, s. 1; 1997-443, s. 15.48(b).)

' **143-215.22H. (V2)(Effective March 1, 2000) Registration of water withdrawals and transfers required.**

(a) Any person who withdraws 100,000 gallons per day or more of water from the surface or groundwaters of the State or who transfers 100,000 gallons per day or more of water from one river basin to another shall register the withdrawal or transfer with the Commission. A person registering a water withdrawal or transfer shall provide the Commission with the following information:

(1) The maximum daily amount of the water withdrawal or transfer expressed in thousands of gallons per day.

(1a) The monthly average withdrawal or transfer expressed in thousands of gallons per day.

(2) The location of the points of withdrawal and discharge and the capacity of each facility used to make the withdrawal or transfer.

(3) The monthly average discharge expressed in thousands of gallons per day.

(b) Any person initiating a new water withdrawal or transfer of 100,000 gallons per day or more shall register the withdrawal or transfer with the Commission not later than six months after the initiation of the withdrawal or transfer. The information required under subsection (a) of this section shall be submitted with respect to the new withdrawal or transfer.

(b1) Subsections (a) and (b) of this section shall not apply to a person who withdraws or transfers less than 1,000,000 gallons per day of water for activities directly related or incidental to the production of crops, fruits, vegetables, ornamental and flowering plants, dairy products, livestock, poultry, and other agricultural products.

(c) A unit of local government that has completed a local water supply plan that meets the requirements of G.S. 143-355(l) and that has periodically revised and updated its plan as required by the Department has satisfied the requirements of this section and is not required to separately register a water withdrawal or transfer or to update a registration under this section.

(d) Any person who is required to register a water withdrawal or transfer under this section shall update the registration by providing the Commission with a current version of the information required by subsection (a) of this section at five-year intervals following the initial registration. A person who submits information to update a registration of a water withdrawal or transfer is not required to pay an additional registration fee under G.S. 143-215.3(a)(1a) and G.S. 143-215.3(a)(1b), but is subject to the late registration fee established under this section in the event that updated information is not submitted as required by this subsection.

(e) Any person who is required to register a water transfer or withdrawal under this section and fails to do so shall pay, in addition to the registration fee required under G.S. 143-215.3(a)(1a) and G.S. 143-215.3(a)(1b), a late registration fee of five dollars (\$5.00) per day for each day the registration is late up to a maximum of five hundred dollars (\$500.00). A person who is required to update a registration under this section and fails to do so shall pay a fee of five dollars (\$5.00) per day for each day the updated information is late up to a maximum of five hundred dollars (\$500.00). A late registration fee shall not be charged to a farmer who submits a registration that pertains to farming operations. (1991, c. 712, s. 1; 1993, c. 344, s. 1; c. 553, s. 81; 1998-168, s. 3.)

' **143-215.22I. Regulation of surface water transfers.**

(a) No person, without first securing a certificate from the Commission, may:

(1) Initiate a transfer of 2,000,000 gallons of water or more per day from one river basin to another.

(2) Increase the amount of an existing transfer of water from one river basin to another by twenty-five percent (25%) or more above the average daily amount transferred during the year ending July 1, 1993, if the total transfer including the increase is 2,000,000 gallons or more per day.

(3) Increase an existing transfer of water from one river basin to another above the amount approved by the Commission in a certificate issued under G.S. 162A-7 prior to July 1, 1993.

(b) Notwithstanding the provisions of subsection (a) of this section, a certificate shall not be required to transfer water from one river basin to another up to the full capacity of a facility to transfer water from one basin to another if the facility was existing or under construction on July 1, 1993.

(c) An applicant for a certificate shall petition the Commission for the certificate. The petition shall be in writing and shall include the following:

(1) A description of the facilities to be used to transfer the water, including the location and capacity of water intakes, pumps, pipelines, and other facilities.

(2) A description of the proposed uses of the water to be transferred.

(3) The water conservation measures to be used by the applicant to assure efficient use of the water and avoidance of waste.

(4) Any other information deemed necessary by the Commission for review of the proposed water transfer.

(d) Upon receipt of the petition, the Commission shall hold a public hearing on the proposed transfer after giving at least 30 days' written notice of the hearing as follows:

(1) By publishing notice in the North Carolina Register.

(2) By publishing notice in a newspaper of general circulation in the area of the river basin downstream from the point of withdrawal.

(3) By giving notice by first-class mail to each of the following:

a. A person who has registered under this Part a water withdrawal or transfer from the same river basin where the water for the proposed transfer would be withdrawn.

b. A person who secured a certificate under this Part for a water transfer from the same river basin where the water for the proposed transfer would be withdrawn.

c. A person holding a National Pollutant Discharge Elimination System (NPDES) wastewater discharge permit exceeding 100,000 gallons per day for a discharge located downstream from the proposed withdrawal point of the proposed transfer.

d. The board of county commissioners of each county that is located entirely or partially within the river basin that is the source of the proposed transfer.

e. The governing body of any public water supply system that withdraws water downstream from the withdrawal point of the proposed transfer.

(e) The notice of the public hearing shall include a nontechnical description of the applicant's request and a conspicuous statement in bold type as to the effects of the water transfer on the source and receiving river basins. The notice shall further indicate the procedure to be followed by anyone wishing to submit comments on the proposed water transfer.

(f) In determining whether a certificate may be issued for the transfer, the Commission shall specifically consider each of the following items and state in writing its findings of fact with regard to each item:

(1) The necessity, reasonableness, and beneficial effects of the amount of surface water proposed to be transferred and its proposed uses.

(2) The present and reasonably foreseeable future detrimental effects on the source river basin, including present and future effects on public, industrial, and agricultural water supply needs, wastewater assimilation, water quality, fish and wildlife habitat, hydroelectric power generation, navigation, and recreation. Local water supply plans that affect the source major river basin shall be used to evaluate the projected future municipal water needs in the source major river basin.

(2a) The cumulative effect on the source major river basin of any water transfer or consumptive water use that, at the time the Commission considers the application for a certificate is occurring, is authorized under this section, or is projected in any local water supply plan that has been submitted to the Department in accordance with G.S. 143-355(1).

(3) The detrimental effects on the receiving river basin, including effects on water quality, wastewater assimilation, fish and wildlife habitat, navigation, recreation, and flooding.

(4) Reasonable alternatives to the proposed transfer, including their probable costs, and environmental impacts.

(5) If applicable to the proposed project, the applicant's present and proposed use of impoundment storage capacity to store water during high-flow periods for use during low-flow periods and the applicant's right of withdrawal under G.S. 143-215.44 through G.S. 143-215.50.

(6) If the water to be withdrawn or transferred is stored in a multipurpose reservoir constructed by the United States Army Corps of Engineers, the purposes and water storage allocations established for the reservoir at the time the reservoir was authorized by the Congress of the United States.

(7) Any other facts and circumstances that are reasonably necessary to carry out the purposes of this Part.

(f1) An environmental assessment as defined by G.S. 113A- 9(1) shall be prepared for any petition for a certificate under this section. The determination of whether an environmental impact statement shall also be required shall be made in accordance with the provisions of Article 1 of Chapter 113A of the General Statutes. The applicant who petitions the Commission for a certificate under this section shall pay the cost of special studies necessary to comply with Article 1 of Chapter 113A of the General Statutes.

(g) A certificate shall be granted for a water transfer if the applicant establishes and the Commission concludes by a preponderance of the evidence based upon the findings of fact made under subsection (f) of this section that: (i) the benefits of the proposed transfer outweigh the detriments of the proposed transfer, and (ii) the detriments have been or will be mitigated to a reasonable degree. The conditions necessary to ensure that the detriments are and continue to be mitigated to a reasonable degree shall be attached to the certificate in accordance with subsection (h) of this section.

(h) The Commission may grant the certificate in whole or in part, or deny the certificate. The Commission may also grant a certificate with any conditions attached that the Commission believes are necessary to achieve the purposes of this Part. The conditions may include mitigation measures proposed to minimize any detrimental effects of the proposed transfer and measures to protect the availability of water in the source river basin during a drought or other emergency. The certificate shall include a drought management plan that specifies how the transfer shall be managed to protect the source river basin during drought conditions. The certificate shall indicate the maximum amount of water that may be transferred. No person shall transfer an amount of water that exceeds the amount in the certificate.

(i) In cases where an applicant requests approval to increase a transfer that existed on July 1, 1993, the Commission shall have authority to approve or disapprove only the amount of the increase. If the Commission approves the increase, however, the certificate shall be issued for the amount of the existing transfer plus the requested increase. Certificates for transfers approved by the Commission under G.S. 162A-7 shall remain in effect as approved by the Commission and shall have the same effect as a certificate issued under this Part.

(j) In the case of water supply problems caused by drought, a pollution incident, temporary failure of a water plant, or any other temporary condition in which the public health requires a transfer of water, the Secretary of the Department of Environment and Natural Resources may grant approval for a temporary transfer. Prior to approving a temporary transfer, the Secretary of the Department of Environment and Natural Resources shall consult with those parties listed in G.S. 143-215.22I(d)(3) that are likely to be affected by the proposed transfer. However, the Secretary of the Department of Environment and Natural Resources shall not be required to satisfy the public notice requirements of this section or make written findings of fact and conclusions in approving a temporary transfer under this subsection. If the Secretary of the Department of Environment and Natural Resources approves a temporary transfer under this subsection, the Secretary shall specify conditions to protect other water users. A temporary transfer shall not exceed six months in duration, but the approval may be renewed for a period of six months by the Secretary of the Department of Environment and Natural Resources based on demonstrated need as set forth in this subsection.

(k) The substantive restrictions and conditions upon surface water transfers authorized in this section may be imposed pursuant to any federal law that permits the State to certify, restrict, or condition any new or continuing transfers or related activities licensed, relicensed, or otherwise authorized by the federal government.

(l) When any transfer for which a certificate was issued under this section equals eighty percent (80%) of the maximum amount authorized in the certificate, the applicant shall submit to the Department a detailed plan that specifies how the applicant intends to address future foreseeable water needs. If the applicant is required to have a local water supply plan, then this plan shall be an amendment to the local water supply plan required by G.S. 143-355(l). When the transfer equals ninety percent (90%) of the maximum amount authorized in the certificate, the applicant shall begin implementation of the plan submitted to the Department.

(m) It is the public policy of the State to maintain, protect, and enhance water quality within North Carolina. Further, it is the public policy of the State that the cumulative impact of transfers from a source river basin shall not result in a violation of the antidegradation policy set out in 40 Code of Federal Regulations ' 131.12 (1 July 1997 Edition) and the statewide antidegradation policy adopted pursuant thereto. (1993, c. 348, s. 1; 1997-443, ss. 11A.119(a), 15.48(c); 1997-524, s. 1; 1998-168, s. 4.)

Administrative Code for Interbasin Transfer

**TITLE 15A. DEPARTMENT OF ENVIRONMENT, HEALTH, AND NATURAL RESOURCES
CHAPTER 2. ENVIRONMENTAL MANAGEMENT
SUBCHAPTER 2G. WATER RESOURCES PROGRAMS
SECTION .0400 - REGULATION OF SURFACE WATER TRANSFERS**

.0401 APPLICABILITY

(a) Pursuant to G.S. 143-215.22G(3), the amount of a transfer shall be determined by the amount of water moved from the source basin to the receiving basin, less the amount of the water returned to the source basin.

(b) Pursuant to G.S. 143-215.22G(3)(a) and 143-215.22G(3)(b), and notwithstanding the definition of basin in G.S. 143-215.22G(1), the following are not transfers:

- (1) The discharge point is situated upstream of the withdrawal point such that the water discharged will naturally flow past the withdrawal point.
- (2) The discharge point is situated downstream of the withdrawal point such that water flowing past the withdrawal point will naturally flow past the discharge point.

(c) The withdrawal of surface water from one river basin by one person and the purchase of all or any part of this water by another party, resulting in a discharge to another river basin, shall be considered a transfer. The person owning the pipe or other conveyance that carries the water across the basin boundary shall be responsible for obtaining a certificate from the Commission. Another person involved in the transfer may assume responsibility for obtaining the certificate, subject to approval by the Division of Water Resources.

(d) Under G.S. 143-215.22I(b), a certificate is not required to transfer water from one river basin to another up to the full capacity of a facility to transfer water from one basin to another if the facility was existing or under construction on July 1, 1993. The full capacity of a facility to transfer water shall be determined as the capacity of the combined system of withdrawal, treatment, transmission, and discharge of water, limited by the element of this system with the least capacity as existing or under construction on July 1, 1993.

History Note: Statutory Authority G.S. 143-215.22G; 143-215.22I; 143B-282(a)(2); Eff. September 1, 1994.

.0402 JUDICIAL REVIEW

Judicial Review of the Commission's decision shall be as provided in G.S. 143-215.5.

History Note: Statutory Authority G.S. 143-215.5; 143B-282(a)(2); Eff. September 1, 1994.