



**STATE OF NORTH CAROLINA**  
**OFFICE OF STATE BUDGET AND MANAGEMENT**

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July 19, 2006

MEMORANDUM

TO: Senator Marc Basnight, President Pro-Tempore of the Senate  
Representative James Black, Speaker of the House of Representatives

FROM: Charles Perusse *Charles Perusse*  
Deputy Budget Director

SUBJECT: Consultation on the Implementation of Flood Remediation Efforts Authorized in  
the Hurricane Recovery Act of 2005

Section 7 of S.L. 2005-1, Hurricane Recovery Act of 2005, directed the Department of Environment and Natural Resources (DENR) to study the causes of flooding in Biltmore Village, Canton, Clyde, and Newland and determine what measures could be taken to prevent or mitigate future flooding in these areas. DENR has completed the study and associated recommendations (see attached document) in consultation with local governments and other interested parties in the designated western communities. The study recommends that \$16,000,000 be provided to the communities for these remediation efforts. It also requests authorization to revise cost estimates and project specifications as needed, as well as substitute other priority projects if a specific project is found to be infeasible.

The western communities are ready to get these important flood control projects underway, and work can commence as soon as notification is received that the Governmental Operations consultation requirement has been satisfied. If you have any questions, please contact me at (919) 807-4760.

Summary of  
**Top Priority Recommendations**  
for  
Flood Damage Reduction  
Funded by Senate Bill 7

**Biltmore Village Area, City of Asheville**

1. Watershed-Wide Program for Comprehensive Flood Damage Reduction	\$2,500,000
2. River Redevelopment Plan Implementation	\$2,000,000
3. Biltmore Village Emergency Response Plan	\$75,000
4. Debris Jam Removal	\$50,000
<b>Biltmore Village Total</b>	<b>\$4,625,000</b>

**Town of Canton**

1. Improve Floodplain Management to Reduce Damage Potential	\$2,000,000
2. Town-wide Stormwater Master Plan and Correction of Existing Stormwater Problems	\$1,300,000
3. Upgrade of Pigeon River Stream Gages to Improve Flood Warning	\$45,000
4. Evaluate Flood Control Potential of Lake Logan	\$62,000
5. Improve Flood Damage Reduction in the Bethel Community	\$120,000
<b>Town of Canton Total</b>	<b>\$3,527,000</b>

**Town of Clyde**

1. Removal of Abandoned Bridge that Obstructs Floodway	\$350,000
2. Construct Off-Channel Flood Storage in Floodway	\$2,000,000
3. Town-Wide Stormwater Master Plan and Correction of Existing Stormwater Problems	\$450,000
<b>Town of Clyde Total</b>	<b>\$2,800,000</b>

**Town of Newland**

1. Construct Flood By-Pass Channel	\$800,000
2. Elevation Certificates for Buildings in Floodplain	\$37,000
3. Town-Wide Stormwater Master Plan and Correction of Existing Stormwater Problems	\$767,500
4. Floodproof Sewer Pump Station	\$94,000
5. Well Relocation	\$330,000
<b>Town of Newland Total</b>	<b>\$2,028,500</b>

**Sub-Total Funds Requested: \$12,980,500**

**Contingency Funds: \$3,019,500**

**Total Funds Requested: \$16,000,000**

## **BILTMORE VILLAGE AREA, CITY OF ASHEVILLE**

### **1. Watershed-Wide Program for Comprehensive Flood Damage Reduction.**

This three-phase flood damage reduction measure institutes a watershed-wide program for flood damage reduction in the Swannanoa watershed, and specifically the Biltmore Village area. The goal of this program is to find a combination of measures in the watershed to reduce flood damages in the Biltmore Village area.

**Phase 1** of this program is a watershed-wide flood modeling and economic analysis in the Swannanoa watershed. The goals of this modeling will be to investigate the following:

- Determine the economic damages of various levels of flooding in Biltmore Village;
- Determine the relationship between flood elevation reduction and the economic benefits of specific flood mitigation measures; and
- Use this information in planning and implementing policies and projects to reduce future flood damages.

Modeling and planning will be done by the municipalities and the County in cooperation with DWR and a consultant.

**Phase 2** of this program will be implementation of a variety of projects, in the manner and priority justified by the modeling efforts under Phase 1. Top priority flood damage reduction measures recommended for implementation include:

- Conduct a watershed-wide assessment to identify land available for acquisition or protection to reduce risk and repetitive loss, provide open space, off channel flood water storage and/or other related watershed hydrology benefits.
- Perform a feasibility study to investigate flood damage reduction benefits from a potential site near Mamma T's and the dam at the former site of Lake Craig. Implement this project if found beneficial and feasible.
- Additionally, conduct analysis and implementation of other projects identified as beneficial through the modeling effort. These may include projects such as those identified through this planning study, including:
  - Conduct a study of Lake Susan at Montreat to understand capacity, drawdown, and management issues.
  - Conduct a Municipal Sanitary District (MSD) trunkline review.
  - Investigate the reactivation of Lake Craig.
  - Evaluate various stream restoration projects throughout the watershed where controls are needed to slow velocities or allow the stream to reclaim an abandoned floodplain.
  - Investigate an undeveloped area at Warren Wilson College for flood reduction measures.
  - Conduct a capacity, drawdown, and management study at Kenilworth Lake.
  - Other projects as identified through modeling analyses in the watershed.

**Phase 3** of this program will be the completion of future conditions hydrological modeling and associated flood mapping for the Swannanoa Watershed as a way of quantifying the effects of future land use change on floodplain and floodway boundaries and elevations. This phase of study cannot begin until the revised NCFMP floodmaps for the French Broad basin are complete, anticipated in 2008, as this information will be used as base data for the future conditions hydrology modeling effort.

Responsibility: This effort would be led by the three jurisdictions in the Swannanoa Watershed, Buncombe County, the City of Asheville, and the Town of Black Mountain through an inter-jurisdictional agreement or a Flood Damage Reduction Task Force (if available). The project would be assisted by DWR. Local contacts for this action are Cynthia Barcklow (Buncombe County) Cathy Ball (Asheville) and Mary Leonard White (Black Mountain).

Estimated Funds Required: \$2,500,000 (Includes modeling, economic impacts and implementation of some projects.) Additional funds will be required to implement many of the potential projects listed above.

## **2. River Redevelopment Plan Implementation.**

This flood damage reduction measure is to aid the City in implementing the River Redevelopment Plan, developed in 2005 and approved by the City of Asheville. This Plan was written with Senate Bill 7 funds provided through the NC Rural Center and followed by \$700,000 of implementation funding August 2005, and another \$80,000 in November 2005.

A need identified in the Plan that has not yet received funding is the acquisition of eight identified parcels on Swannanoa River Road. The acquisition of these parcels is also consistent with the Wilma Dykeman Riverway Plan (2004, approved by the City of Asheville). As stated in the River Redevelopment Plan, these "vacant buildings and property in the floodway and floodplain that are not able to be redeveloped safely and create safety and blighting problems for surrounding businesses and for the community as a whole. Acquisition of these properties would allow redevelopment as greenway sections, or small riverside parks, or would facilitate the introduction of a more desirable development pattern" as described in both the Wilma Dykeman Riverway Plan and the River Redevelopment Plan.

Neither FEMA nor NCDEM funding is available for this effort. This measure will provide flood damage reduction benefits by maintaining or creating open space and/or more desirable development patterns in the floodplain and floodway through property acquisition. This use of the floodplain and floodway will provide for greater flood storage and infiltration. Acquisition of this property has been identified by several community planning efforts as critical to meeting the goals and objectives of flood damage reduction.

Responsibility: Cathy Ball (City of Asheville)

Estimated Funds Required: \$2,000,000

### **3. Biltmore Village Emergency Response Plan.**

The Biltmore Village area does not have an adequate emergency flood response plan that includes details specific to the community's needs. This recommendation is to create an emergency action committee and plan for Biltmore Village with details specific to the area, such as appropriate responses to flood warnings, details for sand bagging when needed, temporary flood walls, and coordination with community safety officials.

Responsibility: City of Asheville, Jim Augins (Biltmore Village shop owner)

Estimated Funds Required: \$75,000

### **4. Debris Jam Removal.**

This measure is for the removal of debris jams in the Swannanoa watershed. Removal of these debris jams as a preventive flood damage reduction measure will reduce the opportunity for backing up of floodwaters during flood events and for associated scouring of stream channels and damage to roads. Debris jam locations have been identified.

Responsibility: Buncombe County Emergency Management

Estimated Funds Required: \$50,000

**Total Funds Requested for Biltmore Village: \$4,625,000**

## **TOWN OF CANTON**

### **1. Improve Floodplain Management to Reduce Damage Potential.**

Many floodplain and floodway properties between Canton and Clyde have been or are scheduled to be acquired under a variety of programs including the State Hazard Mitigation Grant Program (HMGP) and Federal Flood Mitigation Assistance (FMA). There are remaining properties and/or structures that need to be acquired to complete the Town's vision of a unified protected Pigeon Riverfront from Canton downstream through Clyde. Haywood County has submitted a Clean Water Management Trust Fund (CWMTF) grant application for acquisition of 164 floodplain and floodway parcels. The outcome of this application is not yet known. However, thirteen of these properties currently contain structures, the acquisition of which is not allowed under Clean Water Management Trust Fund guidelines.

Also, there are nineteen additional properties along the Pigeon River that the Town would like to acquire to add to the continuity of open space along the Pigeon River that are not included in the CWMTF application, because they are not eligible for CWMTF funding.

The recommendation made here is for acquisition of the parcels and structures not eligible for funding under other programs needed to complete the open space along the Pigeon Riverfront, once the outcomes of the CWMTF application and any other pending Federal Emergency Management Agency (FEMA) and NC Division of Emergency

Management (NCDEM) applications are known. Participation in this acquisition program is voluntary and willingness to sell must be confirmed with each property owner.

This action will provide flood damage reduction benefits by maintaining or creating open space in the floodplain and floodway through property acquisition. The result will be greater flood storage and infiltration and reduction of flooding caused by floodway constrictions. Acquisition of this property has been identified by the Towns and by other planning efforts as critical to meeting the goals of flood damage reduction.

Responsibility: William G. Stamey (Manager, Town of Canton)

Estimated Funds Required: \$2,000,000. (This amount would provide partial funding for acquisitions along the Pigeon River from Canton to Clyde.)

## **2. Town-Wide Stormwater Master Plan and Correction of Existing Stormwater Problems.**

This recommendation includes the following:

- Development and Implementation of a Town of Canton Stormwater Master Plan. The Canton Stormwater Master Plan will assess the current storm drainage situation, the existing stormwater infrastructure, and additional infrastructure needs. This plan will develop solutions to stormwater issues. This plan will be used to manage current and future stormwater infrastructure development in Canton. Estimated funds required for this portion of the recommendation: \$200,000.
- Design and install improvements to address West Canton stormwater that is currently piped under Blue Ridge Paper property, causing the waste water treatment plant to overflow during high stormwater flow. Stormwater that drains the west side of the Town of Canton is piped under the Blue Ridge Paper facility, with an overflow that goes toward the Town waste water treatment plant (operated by Blue Ridge Paper). This configuration causes a risk of water quality degradation during heavy rains, due to waste water treatment plant overflow. This action includes engineering, design and construction of a rerouting of stormwater conveyance around the Blue Ridge Paper facility so that high flows do not cause the waste water treatment plant to overflow. Estimated funds required for this portion of the recommendation: \$800,000.
- Analyze and rectify the storm drainage problem that occurs near the Fiberville Road and Main Street intersection. A chronic storm drainage problem near the intersection of Fiberville Road and Main Street causes damages and unsafe conditions and needs to be corrected. This project includes engineering, design and implementation of a solution to this storm drainage problem. Estimated funds required for this portion of the recommendation: \$300,000.

Responsibility: William Stamey (Town Manager, Canton) and Bob Williams (Blue Ridge Paper)

Total Estimated Funds Required: \$1,300,000

### **3. Upgrade of Pigeon River Stream Gages to Improve Flood Warning.**

The US Geological Survey (USGS) stream gages above Canton currently transmit stream flow data too slowly to be useful in a flood warning system. This project will acquire and install upgraded satellite-linked data collection platforms at each of the Blue Ridge Paper funded USGS stream gages. This work is critical to flood hazard reduction, as it will make streamflow data more quickly and readily available. These equipment upgrades are necessary to support the new flood warning system for Western North Carolina being developed by the NC Division of Emergency Management. These upgraded data collection platforms are proposed to be installed at the following stations:

Station Number	Station Name
03455500	West Fork Pigeon River above Lake Logan near Hazelwood.
03455773	Lake Logan at Dam near Hazelwood
0345577330	West Fork Pigeon River near Retreat
03456100	West Fork Pigeon River at Bethel
03456500	East Fork Pigeon River near Canton

Responsibility: DWR

Estimated Funds Required: \$45,000

### **4. Evaluate Lake Logan for Flood Control Potential.**

Blue Ridge Paper owns and operates Lake Logan, an impoundment on the Pigeon River upstream of Canton. This project is evaluating the potential use of this impoundment to reduce flooding in Canton. The work is being accomplished by the Nashville District of the Army Corps of Engineers under agreement with the NC Division of Water Resources (DWR). Phase one, which is almost complete, is assessing the amount of sediment buildup in the lake and the extent to which its storage capacity has been reduced.

Phase two will evaluate the amount and frequency of flood flows into the lake, the amount of water storage capacity in the lake, the nature of the lake's outlet works, and other relevant information to determine the lake's flood control potential.

Responsibility: DWR

Estimated Funds Required: \$62,000

### **5. Improve Flood Damage Reduction in the Bethel Community**

Through various studies, public opinion surveys, and other activities funded by the North Carolina Rural Economic Development Center (as part of Section 5 of the Hurricane Recovery Act), Haywood County and the Bethel Community have focused on rural preservation as the primary tool to minimize impervious surface, maximize the semi-natural function of the hydrological system, and support the positive economic impact of rural farms and forests. The primary results of these rural preservation efforts will include long-term protection of infiltration capacity of the soils in the upper watershed and the maintenance of large, undeveloped floodplain areas to receive floodwaters during

storm events. These outcomes will benefit both the rural community of Bethel and the downstream urban communities of Canton and Clyde. This strategy will be implemented in two phases:

- Phase 1 – Analysis and ranking of land parcels in the project area and discussions with landowners.
- Phase 2 – Legal protection of priority lands, including easements and fee title acquisition.

Phase 1 will focus on determining which lands in the Upper Pigeon River Valley provide the best use of available dollars, given such factors as total acreage; feet of streambank or riverbank; acreage of land in the floodway; acreage of land in the floodplain; the potential to reduce or prevent impervious surfaces; and funding issues (including the possibility of bargain sales or donations, as well as opportunities to attract matching funds from other sources). This phase is expected to last three to six months and will be conducted in close partnership with the Haywood Soil and Water Conservation District and other partners.

Phase 2 will focus on securing legal protection of priority lands for which other funding is not available. While several landowners are already willing to provide easements on their property, the ranking process in Phase 1 will ensure that flood recovery money is spent on the highest impact properties first. The project manager will also continue to seek other funds from other sources to protect other properties with desirable flood-management characteristics and promote other land conservation programs such as enhanced voluntary agricultural districts.

The Southern Appalachian Highlands Conservancy, the Haywood Soil and Water Conservation District, and Haywood County are already involved in this effort, and they are all willing and able to assist with holding and managing easements and/or fee title ownership of the selected properties; securing supplemental funds; and promoting other protection programs like enhanced voluntary agricultural districts.

Responsibility: Haywood County (Local contact: George Ivey, Bethel Rural Preservation Project Manager)

Estimated Funds Required: \$120,000

Breakout of Funding:

- Phase 1 expenses primarily consist of project management; mapping assistance; and related costs, with a projected total expense of \$20,000 over six months.
- Phase 2 costs will primarily consist of expenses for easements (\$2,000-5,000 per acre); some fee title acquisition (\$8,000-10,000 per acre); and related fees for surveys, appraisals, title work, legal consultations, etc. (\$5,000-\$15,000 per property). Phase 2 also includes a staffing component (\$1,200 per month) and other support costs. \$100,000 provided to initiate Phase 2.

Total Funds Request for the Bethel Rural Community: \$120,000

**Total funds requested for Town of Canton: \$3,527,000**



## TOWN OF CLYDE

### **1. Removal of an Abandoned Bridge.**

An abandoned bridge in Clyde causes a hydraulic restriction of flood waters, exacerbating flooding at nearby homes and businesses. The bridge is no longer in use and needs to be removed. Removal of the bridge will include the pier, trusses, deck, and span. The concrete abutments will likely remain.

Responsibility: DWR. Local Contact: Joy Garland (Town Manager, Clyde)

Estimated Funds Required: \$350,000

### **2. Create Off Channel Flood Storage in Floodway.**

There is a need for more storage of flood waters above Clyde to help alleviate flooding downstream in the downtown area. Some riparian areas in the Clyde area have been converted from natural land cover that stores flood waters (such as wetlands) to developed land uses that do not store as much water (such as residential and agricultural lands). This recommendation will create off channel flood storage and a wetland park on the left (looking downstream) floodplain of the Pigeon River just upstream of Clyde's downtown area.

Implementation of this action will be done in three phases:

- Phase 1 – Feasibility Study
- Phase 2 – Design and Construction
- Phase 3 – Maintenance

A feasibility study (phase 1) will first be conducted to determine the flood damage reduction potential of the site and identify design options. If it is found to be feasible and beneficial to flood concerns, the project will continue to phases 2 and 3.

Phase 1 and 2 Responsibility: DWR (Acquisition of properties needed for project implementation will be the responsibility of the Town of Clyde).

Phase 3 Responsibility: Joy Garland (Town Manager, Clyde)

Estimated Funds Required: \$2,000,000

### **3. Town-Wide Stormwater Master Plan and Correction of Existing Stormwater Problems.**

This recommendation includes:

- Development and Implementation of a Town of Clyde Stormwater Master Plan.  
The Clyde Stormwater Master Plan will assess the current storm drainage situation in Town, existing stormwater infrastructure, and additional infrastructure needs. The study will develop recommended solutions to stormwater problems. This plan will be used to manage current and future stormwater infrastructure development in Clyde. Some stormwater master planning is already being done

in Clyde to comply with NPDES Phase II requirements. This project will be an enhancement of the current effort. Estimated funds required for this portion of recommendation: \$100,000.

- Stream channel and box culvert improvements adjacent to the Clyde Fire Station. Flood waters back up at the box culvert adjacent to the fire station. During the 2004 floods, the stream channel was damaged, and the banks are now eroded and unstable. Stream channels are slumping along approximately 400 linear feet. Regrading and slope stabilization is recommended, as well as double box culvert headwall and wing wall improvements for increased hydraulic capacity. This task will require coordination with NCDOT and adjacent property owners (fire station, bank and church). Estimated funds required for this portion of recommendation: \$200,000.
- Stormwater drainage at Spencer Street Park. During heavy rains, stormwater damages private property adjacent to the park on Spencer Street. This recommendation is to correct the stormwater drainage problem to direct flow onto the town park and to construct stormwater detention features. Estimated funds required for this portion of recommendation: \$150,000.

Responsibility: Joy Garland (Town Manager, Clyde)

Total Estimated Funds Required: \$450,000

**Total Funds Requested for Town of Clyde: \$2,800,000**

## **TOWN OF NEWLAND**

### **1. Create Flood By-Pass Channel.**

A tight meander bend in the natural channel of the North Toe River creates a flood flow constriction, causing backwater flooding in a large area of the Town of Newland. This recommendation is to create a flood bypass channel to relieve the flood waters from constriction at the meander bend. Engineering analysis will be necessary to determine project feasibility and design.

Responsibility: DWR

Estimated Funds Required: approximately \$800,000, depending on final design

### **2. Elevation Certificates for Buildings in Floodplain.**

This recommendation is to identify the vulnerability of structures to flood risk by completing elevation certificates for structures in the floodplain. It is estimated that elevation certificates are needed for approximately 100 buildings. The certificates will help the owners evaluate whether floodproofing will be effective for their buildings.

Responsibility: Brenda Pittman (Town Manager, Newland)

Estimated Funds Required: \$37,000

### **3. Town-Wide Stormwater Master Plan and Correction of Existing Stormwater Problems.**

This recommendation includes:

- Create and Implement a Town of Newland Stormwater Master Plan. The Newland Stormwater Master Plan will assess the current storm drainage situation in Town, the current infrastructure, future infrastructure needs, and problem areas. The plan will develop solutions to stormwater issues and will be used in the future to manage current and future stormwater infrastructure development in Newland. Estimated funds required for this portion of the recommendation: \$60,000.
- Stormwater Management BMP Retrofit at Shopping Center (Mountain Heritage, Phillips, and Blackburn Buildings). This recommendation addresses a persistent flooding problem at the shopping center at Beech and Calvary Streets. The project includes a comprehensive drainage study to determine flood damage history and to identify existing drainage infrastructure and best management practice (BMP) retrofit opportunities. The goal is to reduce the risks to public health and safety. This recommendation will employ low impact development (LID) stormwater design for flood reduction and water quality benefits. Project design will be based on the outcome of the comprehensive drainage study. Estimated funds required for this portion of the recommendation: \$300,000.
- Use of Property for Flood Damage Reduction #1. This recommendation is for acquisition of three vacant parcels near the downtown business district for maintaining open space and creation of stormwater features to improve drainage conveyance and water quality. Acquisition of these properties will prevent future development on these parcels, and preservation of this open space will provide flood damage reduction benefits. This project is consistent with other flood damage reduction and water quality projects currently ongoing in Town, including a Town riverside park and wetland complex designed by the NC State Cooperative Extension Service. These properties are currently for sale. Responsibility for this portion of recommendation: Brenda Pittman (Newland) and Wendy Patoprsty (NC State Cooperative Extension Service). Estimated funds required for this portion of the recommendation: \$270,000 (including acquisition, engineering, and construction).
- Use of Property for Flood Damage Reduction #2. This recommendation is for acquisition of a .32 acre lot with a condemned flood damaged building. The property is adjacent to the 10 acre Shoemaker Bottom Property that the Town acquired through a 2005 NC Rural Center grant. The Shoemaker Bottom property is being developed into a Town riverside park and wetland complex designed by the NC State Cooperative Extension Service. This property is desired for use as additional floodplain open space. Purchase will prevent redevelopment in this floodprone area. This property was not eligible for FEMA or HMGP buyout funding because it is a commercial property. Estimated funds required for this portion of recommendation: \$137,500 (acquisition of property and structure only).

Responsibility: Brenda Pittman (Town Manager, Newland)

Estimated Funds Required: \$767,500

**4. Floodproof Sewer Pump Station**

The Newland sewer pump station is below the 100 year floodplain elevation and was put out of operation during the 2004 floods. This recommendation is for floodproofing the pump station.

Responsibility: Brenda Pittman (Town Manager, Newland)

Estimated Funds Required: \$93,000

**5. Well Relocation**

During the 2004 floods, one of the Town's wells used for public water supply was inundated with flood waters. This well lies within the 100-year floodplain and needs to be relocated outside the 100-year floodplain. The well is critical to residential and commercial water customers. This recommendation includes capping the existing well, identification of a new well site, property and easement acquisition, project design, engineering, and construction. The cost estimate for this project is based on a similar project completed by the Town of Bakersville within the last two years.

Responsibility: Brenda Pittman (Town Manager, Newland)

Estimated Funds Required: \$330,000

**Total Funds Requested for Town of Newland: \$2,028,500**