



Federal Emergency Management Agency

Washington, D.C. 20472

FEB 12 2001

The Honorable Avery B. Wilkerson, Jr.
Mayor of the City of Cayce
P.O. Box 2004
Cayce, South Carolina 29171-2004

Dear Mayor Wilkerson:

This is in response to your letter of February 1, 2001, to Matthew B. Miller of my staff. Mr. Miller is Chief of the Federal Emergency Management Agency's (FEMA's) Hazards Study Branch and represented me at the January 29, 2001, meeting in the FEMA Regional Office in Atlanta, Georgia. Your letter was in reference to that meeting and to the resolution passed by the City of Cayce on December 5, 2000, to adopt a floodway based on the hydraulic model used to calculate Base (1% annual chance) Flood Elevations (BFEs) depicted on the September 26, 2000, preliminary Flood Insurance Rate Map (FIRM) for Lexington County and incorporated areas (hereinafter referred to as the Lexington County model). The Lexington County model assumes that flow will not occur landward of the Manning dike in Richland County upstream of Interstate Route 77. Your letter suggested that Mr. Miller's remarks at the conclusion of the January 29 meeting indicated that the resolution adopted by Cayce was consistent with the minimum floodplain management regulations of the National Flood Insurance Program (NFIP) found in Title 44 Code of Federal Regulations, Chapter I, Part 60. This was not Mr. Miller's intent. He simply stated that FEMA had not formally reviewed the resolution.

Although still in draft form, we used the September 26, 2000, preliminary FIRM for Lexington County and incorporated areas to complete our review of the resolution and concluded, in consultation with our Regional Office, that a floodway adopted by the City of Cayce based on the Lexington model could potentially result in increases to flood hazards beyond those acceptable under 44CFR 60.3(d)(2). Further, any increases would impact existing structures including residential homes and the wastewater treatment plant in Lexington County. A floodway based on the December 5, 2000, resolution is not consistent with the minimum floodplain management requirements of the NFIP.

Once all appeals have been addressed and the maps are finalized, our Region IV Office is available to assist the City of Cayce in its endeavor to seek alternative floodways, which meet their needs and satisfy the minimum Federal standards. Please note that the floodway configuration shown on the September 26, 2000, preliminary FIRM does not prevent upgrading of the Manning dike. Rather, it requires an assessment of potential increased flood damages to existing structures be identified and mitigated should such a project be within the floodway. This, and related requirements, are summarized at 44CFR 65.12.

The remainder of this letter will address why the December 5, 2000, resolution, if implemented, could exacerbate flooding, and does not meet minimum floodplain management requirements of the NFIP. It will also discuss the approaches used to develop the proposed BFEs and floodway along the Congaree River in the area of the Manning dike and explains why FEMA cannot revise the floodway as requested in the City of Cayce resolution.

The NFIP regulations are found in Title 44 Code of Federal Regulations, Chapter I, Parts 59 through 78. Part 65 of the NFIP regulations provides the Federal regulatory framework for the identification and mapping of Special Flood Hazard Areas for the NFIP, including the determination of BFEs and floodways. These regulations provide the broad framework and criteria that NFIP flood studies must meet; however, they do not generally prescribe or dictate specific engineering methods for completing flood studies or address all situations. Thus, FEMA has developed standards, practices, and procedures to complete flood studies nationwide in accordance with the regulatory requirements of Part 65 of the NFIP regulations. These standards and practices, which are based on more than 30 years of program experience and are consistent with standard engineering practice, are documented in the January 1995 document, Flood Insurance Study Guidelines and Specifications for Study Contractors (FEMA 37).

How the BFEs Were Determined

Because of the inherent flood risk associated with dikes and levees, FEMA uses a conservative approach when determining BFEs in areas affected by dikes or levees that do not meet NFIP accreditation criteria for providing protection from the 1% annual chance flood (requirements for levee accreditation can be found in Section 65.10 of the NFIP regulations). That is, for the riverward side of the dike, the BFEs are computed as if the dike prevents any flow from occurring landward of it. For the landward side of the dike, the BFEs are determined assuming flow occurs behind it. Because there is more area over which to convey the same amount of flood water, this latter analysis results in lower computed BFEs for the area behind the dike than for the riverward side. This approach, which was used to determine BFEs for the Congaree River in the area along the Manning dike, is documented in Chapter 7 of FEMA 37.

In order to determine if flow could occur behind the Manning dike, FEMA developed a two-dimensional hydraulic model. This tool proved useful in making this determination, however, it was very limited in its ability to quantify exactly how much flow would occur behind the dike during a 1% annual chance flood. Nonetheless, the model suggested flow is likely to occur behind the Manning dike during the base flood. Because there remains a possibility that flow is confined to the riverward side of the dike, we felt it appropriate to use the above-described approach when determining BFEs.

How the Floodway Was Determined

For rivers and streams that have been studied using detailed engineering methods (as was the Congaree River), the 1% annual chance floodplain on the FIRM is typically subdivided into the "floodway" and "flood fringe." The floodway is the channel of the river and immediately adjacent land areas where flow velocities are most hazardous that must be kept free of encroachment to pass the base (1% annual chance) flood without increasing the water-surface elevation more than a designated height (this increase is referred to as the "surcharge"). The flood fringe is the area of the 1% annual chance floodplain outside the floodway. The floodway concept is a floodplain management tool provided to communities to help guide floodplain development away from the most hazardous areas of the floodplain (i.e., the floodway); it limits future increases in flood levels to no more than the surcharge amount, but allows for the less hazardous areas of the floodplain (i.e., the flood fringe) to be developed without the requirement of a detailed flood hazard impact assessment.

Subparagraph 60.3(d)(2) of the NFIP regulations requires communities to select and adopt a regulatory floodway based on the principle that the area chosen for the floodway must be designed to carry the base flood without increasing the water-surface elevation of that flood more than 1 foot at any point. Further, Subparagraph 60.3(d)(3) of the NFIP regulations requires communities to prohibit encroachments, including fill, new construction, and other development, within the adopted regulatory floodway unless it has been demonstrated that the proposed encroachment would not result in any increase in flood levels during the occurrence of the 1% annual chance flood discharge. Through this approach, communities can permit development in the flood fringe and limit future increases in the 1% annual chance water-surface elevations to that of the floodway surcharge, as long as the floodway is kept free of encroachments and obstructions that would cause increases in flood levels.

To assist a community with fulfilling its obligation under Subparagraph 60.3(d)(2) to select and adopt a regulatory floodway, FEMA typically develops a proposed floodway configuration when conducting the hydraulic analysis associated with an initial flood study or a restudy. This proposed floodway is then presented to the community on its preliminary FIRM.

To determine the floodway configuration in areas affected by dikes and levees that do not meet NFIP accreditation criteria, an analysis is conducted that considers flow occurring both on the riverward and landward sides of the dike. This approach ensures that all areas that will possibly convey flow are kept free of encroachment and that the floodway is determined in the fairest way possible. This approach, which is documented in Chapter 7 of FEMA 37, was used by FEMA to determine the floodway for the Congaree River along the Manning dike. This means that the model used to determine the BFEs for the areas landward of the dike was also used to establish the floodway limits. As mentioned previously, a two-dimensional model of the subject areas along the Congaree River suggests that flow is likely to occur landward of the Manning dike. Thus, the above-described approach for determining the floodway is sound. Please see the enclosed schematic, which explains the floodway configuration of the Congaree River.

FEMA's Response to the City of Cayce Resolutions

As described above, the BFEs and floodway depicted on the September 26, 2000, preliminary FIRM are consistent with the requirements for identifying and mapping Special Flood Hazard Areas in Part 65 of the NFIP regulations and the practices and guidelines documented in FEMA 37. The floodway regulations found in Paragraph 60.3(d) of the NFIP regulations are designed to help communities limit development in the most hazardous areas of the floodplain and limit future increases to 1% annual chance water-surface elevations. Rather than focusing on the location of the floodway limits, we feel it is most important for all potentially affected parties to carefully consider the effect on flood elevations, flow paths, and impacted property owners, of any proposal to restrict or eliminate flow landward of the Manning dike.

Two-dimensional modeling of the area indicate that flow will likely occur landward of the dike during the base flood. This flow effectively acts to reduce flood levels. If areas in the floodway, behind the Manning dike are obstructed, flow could be reduced or eliminated, thus removing the existing possibility of lower flood levels. Furthermore, these obstructions coupled with obstructions in the flood fringe on the Lexington County side of the Congaree River could result

in flood elevations that exceed the BFEs shown for Lexington County. For these reasons, we cannot revise the floodway using the Lexington County model, which does not account for flow landward of the dike, as requested in the resolutions presented by the City of Cayce.

After completing a review of the data and comments submitted between September 26, 2000, and February 15, 2001, we will issue a notice of final flood elevation determination finalizing BFEs and the floodway of the Congaree River in late April 2001, in accordance with Section 67.11 of the NFIP regulations. Your community and all other impacted communities will have 6 months from the notice of final determination to adopt the BFEs and floodway depicted on the FIRM. If your community, Lexington County, Richland County, or any other incorporated communities within those counties affected by the floodway configuration of the Congaree River wish to subsequently pursue an alternative floodway configuration, they may submit a floodway revision request under the provisions of Section 65.7 of the NFIP regulations. Such a floodway revision request must:

- be agreed to and requested in writing by all affected communities and counties,
- be based on a hydraulic model of the Congaree River that represents existing conditions and as appropriate accounts for flow behind the Manning dike, and
- limit floodway surcharges to no more than 1.0 foot at all cross sections.

We appreciate the input that has been provided by all interested parties into the analyses and mapping of the Congaree River flood hazards. This has helped achieve the goals of the NFIP to provide communities with the most accurate flood hazard information possible. If you have any further questions, please do not hesitate to contact Matthew B. Miller, P.E., at our Headquarters in Washington, D.C., at (202) 646-3461 or by facsimile at (202) 646-4596.

Sincerely,



Michael K. Buckley, P.E., Director
Technical Services Division
Mitigation Directorate

Enclosure

cc: Mr. Bruce E. Rucker, Lexington County Council Chairperson
Ms. Kit Smith, Richland County Council Chairperson
The Honorable Robert D. Coble, Mayor of the City of Columbia
The Honorable Wyman M. Rish, Mayor of the City of West Columbia
[REDACTED] Consultant to Columbia Venture

(cc list continued)

Ms. Martha Bogle, National Park Service

Ms. Sarah Brown, U.S. Army Corps of Engineers, Charleston District

Ms. Marjorie S. Davenport, U.S. Geological Survey

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Ms. Lisa Holland, NFIP State Coordinator

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Mr. William Hulbert, P.E., South Carolina Department of Transportation

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Paul Sandifer, Ph.D., South Carolina Department of Natural Resources

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Distribution List of Private Citizens