



COLORADO

Colorado Water
Conservation Board

Department of Natural Resources

1313 Sherman Street, Room 721
Denver, CO 80203

Memorandum

To: Matthew Buddie, CFM *MSB*
National Flood Insurance Program Specialist, FEMA Region VIII
From: Jamie Prochno, PE, CFM *JLP*
Community Assistance Program Coordinator
Date: September 21, 2014

Subject: Guidance for Hydrologic and Hydraulic Analyses

BACKGROUND

The September 2013 floods caused widespread damage to many communities along Colorado's Front Range. The amount of rainfall, over 15" in some areas, and steep topography resulted in major erosion, deposition, and relocation of several rivers and streams in the affected area. Therefore, many of the mapped Special Flood Hazard Areas (SFHAs) on effective Flood Insurance Rate Maps (FIRMs) no longer reflect current conditions. As communities begin permanent recovery work, the Colorado Water Conservation Board (CWCB) recognizes the need to provide guidance to local officials, property owners, and contractors for projects where the SFHA and current conditions no longer match. The purpose of this document is to help guide recovery efforts and ensure communities stay in compliance with minimum requirements of the National Flood Insurance Program (NFIP). Scenarios not described here should be discussed with the FEMA Region VIII Office or the CWCB.

It is the community's responsibility to manage all development occurring in the SFHA. Communities must ensure all local, State, and Federal permits are received, including a local floodplain development permit, and specific requirements are met before the project commences. In instances where there is a conflict between local, State, or Federal requirements the more restrictive regulation shall prevail.

The requirement to conduct a hydrologic and hydraulic analysis for proposed development in floodways is outlined in Title 44 of the Code of Federal Regulations, Section 60.3(d)(3). Pursuant to NFIP regulations, an analysis is required to show that proposed projects in the floodway will not cause any increase in Base Flood Elevations (BFE), which is referred to as a no-rise analysis. Section 60.3(d)(4) states that encroachments into the floodway may cause an increase in BFEs, provided that the community first applies for and receives a Conditional Letter of Map Revision (CLOMR). The CWCB Rules and Regulations for Regulatory Floodplains in Colorado, Rule 8(B) includes a higher standard than 44 CFR 60.3(c)(10) and stipulates that a CLOMR is required when a proposed project will increase BFEs more than 0.5 foot on a waterway with BFEs for which a regulatory floodway has not been computed. The requirements for submitting new technical data to FEMA are contained in 44 CFR 65.3 and require a community to submit technical or scientific data, in the form of a Letter of Map Revision (LOMR), to FEMA within six months of project completion when BFEs have increased or decreased as the result of a physical change to the floodplain.

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John W. Hickenlooper, Governor | Mike King, DNR Director | James Eklund, CWCB Director



POLICY GUIDANCE

The following guidance applies to projects that are located within a regulatory floodway or in a floodplain with BFEs where a floodway has not been defined; and therefore, may require a no-rise analysis, CLOMR or LOMR.

Restoring to Effective Conditions

Channels may be restored to effective conditions without further analysis. Effective condition is considered the modeled condition reflected in the effective Flood Insurance Study, including floodplain and floodway boundaries, base flood elevations, flows, and channel geometry. The project must adhere to any other federal, state or local regulations and permit requirements.

Projects that were properly designed, permitted, and constructed prior to the flood may be replaced in-kind without further analysis so long as the conveyance equals that of the original structure. The project must adhere to any other federal, state or local regulations and permit requirements. Reduction in conveyance as a result of sedimentation may require channel modification. Changes in structure design or channel modification must go through the normal review process which may include a no-rise analysis, CLOMR, and LOMR.

Stream Crossings and Restoration Projects

Where current and effective conditions do not match and the community does not intend to return the channel to effective conditions, hydrologic and hydraulic analysis will be required for proposed projects. A no-rise analysis must show that the proposed project does not increase water surface elevations of the base flood. A no-rise analysis may be defined as:

- The proposed conditions model shows no increase in water surface elevations compared to the existing conditions models; or
- The proposed conditions model shows no increase in water surface elevations compared to the pre-flood conditions model.

Additional engineering will be required to determine existing conditions in areas where the channel has migrated. Existing conditions should not reflect any man-made temporary work such as temporary crossings, bridges, culverts, hydraulic structures, or other developments that have been constructed since the flood. Structures present before the flood may be included in the existing conditions model even if they were washed out as a result of the flood. Pre-flood conditions may only be used for the no-rise analysis if sufficient data exists to determine the channel geometry and structures that were present prior to the flood.

CLOMR Requirements

A CLOMR may be required when proposed conditions show increases in water surface elevations of the base flood compared to existing conditions. If the project is located in a floodway, a CLOMR is required if a no-rise analysis cannot be completed according to the guidance outlined above. If the project is located in a floodplain with BFEs and no floodway, a CLOMR is required if the project causes more than 0.5 foot of increase in water surface elevations. For CLOMRs, the standard MT-2 process must be followed.

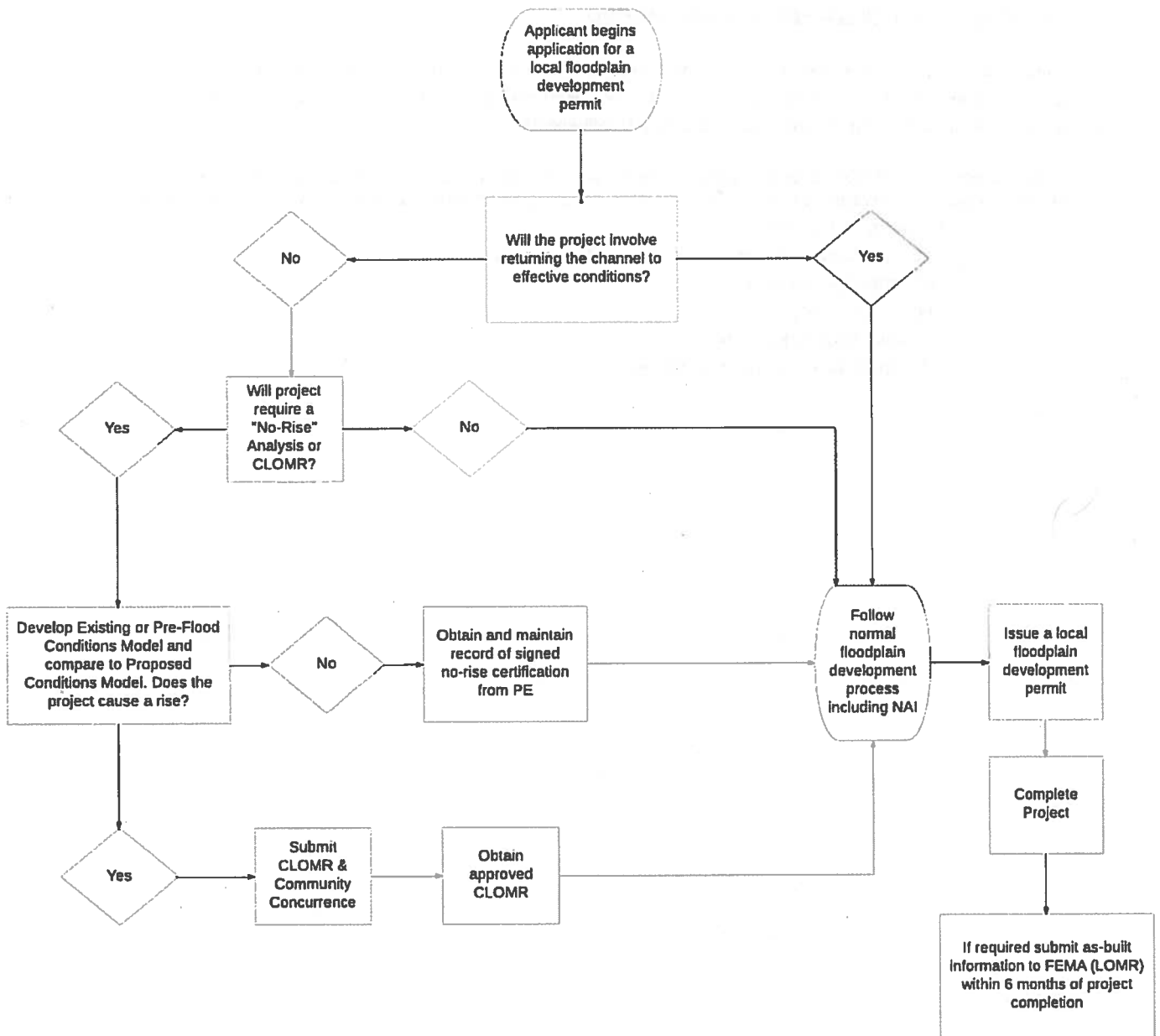
LOMR Requirements

A LOMR must be submitted within six months of completion for all projects when the proposed conditions model shows an increase or decrease in BFEs compared to the effective model. The standard MT-2



process must be followed, including as-built information showing post-project conditions. It is the community's responsibility to ensure all information is submitted to FEMA in a timely manner.

The following flow chart illustrates a simplified representation of the process for floodplain permitting:



RECOMMENDED PRACTICES

CWCB encourages communities to look holistically at projects and ensure the effects of one project will not negatively impact others. In the event potential adverse impacts are identified, the local jurisdiction should be prepared to take steps to minimize and mitigate the impacts. The Association of State Floodplain Managers refers to this principal as “No Adverse Impact” (NAI). NAI should be a lens in which local officials, property owners, and contractors look at every project. Additional information on NAI can be found at <http://www.floods.org/index.asp?menuID=460>.

Local floodplain development permits should also be considered outside of the effective SFHA where projects are now subject to flood damage as a result of channel migration. This determination must be made by the local floodplain administrator using Best Available Data.

CWCB encourages communities to ensure that proposed projects within rivers and floodplains are aligned with community, regional and watershed plans. Projects should also consider multiple objectives, which may include:

- Restoring stream channels,
- Providing habitat for aquatic and terrestrial species,
- Restoring riparian areas,
- Reducing erosion,
- Reducing flood hazards, or
- Increasing the capacity to utilize water.

