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## COLORADO ASSOCIATION OF STORMWATER AND FLOODPLAIN MANAGERS

March 8, 2010

Larry Larson, ASFPM Executive Director  
Doug Bellomo, FEMA Risk Analysis Division  
Ryan Pietramali, FEMA Region VIII

Subject: Non-levee Embankments

VIA EMAIL

Dear Colleagues:

The meeting notes from the October 6, 2009, Operating Partners Meeting included an action item seeking local experience related to non-levee embankments. The purpose of this letter is to add CASFM's voice to the discussion. Several of our members have been affected by this evolving issue. The highest profile case in Colorado has been focused on the Fort Collins railroad embankment at Spring Creek. The CLOMR for a downstream development was recently approved. Supporting documents for that decision included a letter of reasonable assurance (statement of base flood protection), stamped and sealed by a Colorado professional engineer. However, CASFM is not commenting on the specifics of the Fort Collins case, rather we would like to offer several observations and recommendations related to non-levee embankments in general. The Colorado Water Conservation Board has also corresponded on this subject with FEMA Region VIII, letter attached.

First of all, the definition of non-levee embankments needs clarification. Procedure Memorandum (PM) No. 51, dated February 27, 2009, reiterated the levee definition from 44 CFR Section 59.1. The PM goes on to discuss non-levee embankments, such as highways and railroads, but does not make a distinction between embankments that run parallel to flooding sources as opposed to perpendicular. For example, for a perpendicular embankment that was designed for regional flood control, would 44 CFR Section 65.10 apply?

Secondly, the PM discusses a procedure for communities that are due to receive updated maps as a result of a non-levee embankment to undertake further study. The PM lacks clarity on what further study might entail. This lack of clarity surrounds the entire non-levee embankment issue. We understand it is very difficult for FEMA to anticipate every situation and answer with written regulations. However, the vast majority of situations could be addressed by dealing with highway and railroad embankments. FEMA could issue a guidance document, similar to TB 10-01, Reasonably Safe from Flooding. The guidance document could cover such issues as definitions, when should an embankment be flagged for concern, how should risk and residual risk be identified, how should peak flood flow attenuation be addressed and so forth. Guidance on supporting documentation for the different scenarios mentioned would be enormously helpful.

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The issue of letters of reasonable assurance is very problematic. ASCE Resolution 529, adopted January 25, 2009, attached, articulates ASCE's strong position with respect to levee certification. The remainder of this paragraph is paraphrased from Resolution 529 and Lawrence Roth's address at the 2009 NAFSMA Annual Meeting. Certification of a levee is a technical finding of compliance with minimum NFIP standards and serves as evidence of reasonable assurance to FEMA that the structure will contain the base flood. Levee certification is not equivalent to a profession statement of risk to public health, safety and welfare posed by a flood risk reduction system such as a levee, or non-levee embankment in this discussion. Certification requirements unintentionally place a professional engineer in serious ethical and legal jeopardy by making it seem to confirm the "safety" of a structure that he/she has not designed. ASCE has declared such certifications to be contrary to the Code of Ethics and good public policy. Do we really want someone certifying a levee or non-levee structure who is rather cavalier about their own professional liability? Engineers must put public safety first, and accurate, credible flood risk identification is essential to a professional engineer's core ethical and legal responsibilities.

Lastly, we know of no guidance from FEMA available to a community that seeks to retrofit a non-levee embankment. For example, take that ancient railroad embankment at the edge of town that has always been recognized as providing flood protection. All parties agree that the embankment does not provide a reasonable level of protection. It could fail during a major flood event, resulting in harm to people who were previously lulled into a false sense of security. A responsible community would seek to mitigate this risk. In addition to mandatory flood insurance and land use restrictions, they might consider enlarging the conveyance in order to avoid impoundment. Alternatively, they could buttress the embankment to formalize the flood attenuation and residual floodplain. Certainly a CLOMR would be in order, but what would sufficient supporting documentation include?

CASFM recognizes the pressing need to correctly identify and communicate risk. We are concerned that in the absence of guidance and technical standards, communities will miss the opportunity to correctly and convincingly address flood risk, and will lack the tools necessary to mitigate that risk. The only non-levee embankment guidance on FEMA's website that we are aware of refers the public to local community officials for answers. Without guidance and standards, community officials cannot offer useful answers. FEMA will also miss the opportunity to implement Risk MAP effectively as these cases tend to quickly escalate to political debates. Many CASFM members have expressed a willingness to partner with ASFPM, NAFSMA and FEMA on this issue, so we stand ready to help. Let me close with an invitation to ASFPM, NAFSMA and FEMA Headquarters and/or Region VIII to present in a technical session or workshop at our annual conference scheduled for September 21-24, 2010, in Snowmass, Colorado, on this or a related flood risk identification topic.

Sincerely,

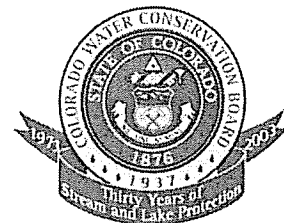


David Mallory, P.E., CFM  
Chair

Cc: VIA EMAIL  
Susan Gilson, NAFSMA Executive Director  
Lawrence Roth, ASCE Deputy Executive Director  
Kevin Houck, Colorado Water Conservation Board  
CASFM Membership

# STATE OF COLORADO

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## Colorado Water Conservation Board

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November 10, 2009

Mr. Doug Gore, Regional Administrator  
Federal Emergency Management Agency, Region VIII  
Building 710, Denver Federal Center, Box 25267  
Denver, CO 80225-0267

Dear Mr. Gore:

The Colorado Water Conservation Board (CWCB) is requesting assistance from Federal Emergency Management Agency (FEMA) to formally address the issue and growing concerns related to Non-Levee Embankments (NLE) in Colorado. Our staff has been working informally with several Colorado communities and with staff from FEMA Region VIII regarding this issue. Unfortunately, the discussions to date have not led to a meaningful direction that is clear and consistent. Therefore, it seems appropriate to request a more formal process to assist all interested parties with achieving an acceptable outcome. That said, we believe that FEMA has the ultimate duty and responsibility to devise and adopt specific criteria based on existing federal laws or regulations.

The State has initiated a formal rulemaking process for its own "Rules and Regulations for Floodplain Management in Colorado." We have the ability at this time to ensure that our proposed State regulations are consistent with any federal criteria addressing the NLE issue.

We are particularly concerned with feedback received thus far from a number of communities regarding the uncertain impacts this issue will have. CWCB staff members have conducted meetings with several local jurisdictions, at the request of their civic leaders, regarding this issue. Specific concerns have been expressed regarding financial, economic, legal, and political implications that may arise from the potentially inconsistent treatment of the NLE structures. Further concern has been expressed from community staff and elected officials that FEMA does not yet have an adequate definition of NLEs, much less criteria for managing them.

The State is also troubled about the effects this issue will have on the floodplain mapping process. The CWCB is one of two Cooperating Technical Partners (CTP) involved in producing maps in Colorado, and is spending a significant amount of state money to update maps according

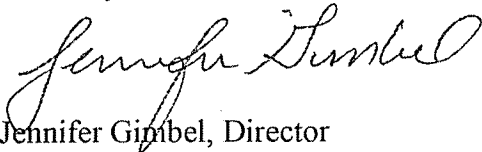
to established FEMA criteria. It is our belief that the absence of adequate written procedures and criteria for guiding the creation of floodplain maps could lead to a substantial amount of non-federal monies and efforts being used inefficiently. Revisions to relatively new maps caused by future NLE designations would be quite costly.

Communities and the CTPs are urging the Risk Analysis Branch of the Mitigation Division at FEMA Region VIII to bolster internal communications as well as efforts to work with Colorado interests in a transparent, participatory, and collaborative way that is consistent with President Obama's Executive Order dated January 21, 2009.

Without extensive collaboration and communication to address this very real issue, the State and its communities face an uncertain future regarding the mapping process and related management of NLE structures. Until new written criteria are developed and adopted by FEMA, we are advising Colorado communities to regulate and map established floodplain areas according to the regulations and criteria that currently exist.

We extend our sincere thanks to FEMA in advance for decisive and timely action on this matter. The CWCB is committed to assisting you in a way that will yield a collaborative and mutually beneficial solution. Feel free to contact the Watershed Protection & Flood Mitigation staff of my agency by phone at (303) 866-3441 for any questions or further discussions that you may wish to have.

Sincerely,



Jennifer Gimbel, Director

**cc:**


James Hague, U.S. Senator Mark Udall's Office  
Alex Davis, DNR Executive Director's Office  
Doug Bellomo, Director, FEMA Risk Analysis Division  
Susan Schneider, Colorado Attorney General's Office



FEMA

FEB 27 2009

**MEMORANDUM FOR:** Mitigation Division Directors  
Regions I - X

**FROM:**   
Doug Bellomo, Director  
Risk Analysis Division

**SUBJECT:** Procedure Memorandum No. 51  
Guidance for Mapping of Non-Levee Embankments  
Previously Identified as Accredited

**EFFECTIVE DATE:** February 27, 2009 – All studies/mapping projects for which  
Preliminary DFIRMs have been issued on or after  
August 22, 2005 and Letters of Final Determination have  
not yet been issued.

**Background:** One of the primary roles of the Federal Emergency Management Agency (FEMA) as administrator of the National Flood Insurance Program (NFIP) is to identify and map flood hazards from flooding sources in various locations, including areas in the vicinity of levee systems. With the August 2005 issuance of Procedure Memorandum No. 34 (PM 34), *Interim Guidance for Studies Including Levees*, FEMA reiterated the importance of investigating the status of levee systems identified on effective Flood Insurance Rate Maps (FIRMs) and Digital Flood Insurance Rate Maps (DFIRMs) being updated. As referenced in PM 34 and defined in Title 44, Chapter 1, Section 59.1 of the Code of Federal Regulations (44 CFR Section 59.1), levees are structures designed for flood control purposes to contain, control, or divert the flow of water in order to provide protection to a defined area adjacent to the floodplain.

Recently, it has been determined that areas in the vicinity of some non-levee embankments have been shown as not being subject to the base (1-percent-annual-chance) flood, even though the embankments, such as those for highways or railroads, were not designed or constructed as flood-control structures. In some cases, it may be that the embankments, while not designed to prevent flooding behind them, do have a mitigating effect on flooding.

**Issue:** Some effective FIRMs and Preliminary DFIRMs identify areas in the vicinity of non-levee embankments as not subject to the base flood. These embankments cannot be accredited in accordance with 44 CFR Section 65.10 because they are not levees. In these cases, it should be clearly demonstrated how the embankment impacts flooding in the areas around it.

Where areas in the vicinity of non-levee embankments have been shown on a Preliminary DFIRM as not being subject to the base flood and then been mapped on a subsequent Revised Preliminary DFIRM as Special Flood Hazard Areas (SFHAs), local community officials and the general public are surprised to learn that there is a previously unidentified flood risk in the impacted areas. Additionally, they are first learning of this risk relatively late in the mapping process. This causes great concern for the community and can lead to a long and difficult post-Preliminary process, as well as a lack of faith in the information presented on the new DFIRM.

**Action Taken:**

The procedure presented below applies to studies/DFIRMs that meet both of the following criteria:

1. An area was incorrectly identified as not subject to the base flood on a Preliminary DFIRM issued after August 22, 2005 (the issuance date for PM 34),
2. A sound technical justification for the delineation of the flood hazards in the vicinity of the embankment is unavailable.

FEMA will contact community officials in all impacted communities to inform them that the previously issued Preliminary DFIRM is under review and that the non-levee embankment is being re-evaluated. FEMA will also explain the process that will follow. A template that may be used to make this initial contact with an impacted community is provided in Attachment A.

As soon as technical data supporting the change is developed and draft work maps for the revised DFIRM are completed, FEMA will hold a meeting with the impacted community or communities and present the information used to identify the SFHA. FEMA will also provide the analysis performed in reaching its conclusion to identify the area as SFHA. FEMA will provide a period of 30 days after presenting the work map and data for the officials of the impacted community/communities to review the study and, if desired, commit in writing to perform a more detailed study of flood hazards for the area. This study is to be performed solely to analyze the impact the embankment has on the SFHA and not to undertake improvements to the non-levee embankment. A template that may be used to make a follow-up contact with an impacted community is provided in Attachment B.

**Procedure for Situation Where Community Does Not Agree To Undertake Further Study**

If community officials do not choose to commit to providing additional analysis and mapping within 30 days of being presented with work maps and data, FEMA will issue the Revised Preliminary DFIRM panels and Flood Insurance Study (FIS) report as soon as they are completed following the meeting. The Revised Preliminary version of the DFIRM will be based on the draft work maps and data discussed at the meeting. Following issuance of the Revised Preliminary DFIRM and FIS report, FEMA will follow standard flood mapping processes and procedures, including the initiation of 90-day appeal periods for new or modified BFEs.

Procedure for Situation Where Community Does Agree To Undertake Further Study

If community officials do choose to commit in writing to perform a more in-depth analysis within the 30-day timeframe, FEMA will suspend issuance of a Revised Preliminary DFIRM for 12 months and will issue a letter to this effect. The letter will recommend that development permits not be issued until flood hazards for the area are more accurately defined and encourage local property owners to purchase flood insurance. Further, the letter will clearly state that the data that the community officials would like to have incorporated into the pending Revised Preliminary DFIRM must be postmarked no later than 10 months from the due date of the agreement.

If the results of the new analysis are received within 10 months of the local agreement due date, FEMA will review and incorporate the data as part of a Revised Preliminary DFIRM, as appropriate. If the results of the new analysis are received after 10 months, FEMA will not be able to reflect the information on the Revised Preliminary DFIRM, but if they are received within 16 months of the local agreement due date, FEMA will reflect the data on the final DFIRM. If the data are provided after 16 months, FEMA will not have time to reflect it on the final DFIRM, however, FEMA will use the data, as appropriate, to process a revision to the DFIRM as soon as possible.

Completion of Map Project

As stated above in this memorandum, once FEMA issues the Revised Preliminary DFIRM, FEMA will proceed with the standard map processing and post-preliminary processing procedures, including the initiation of 90-day appeal periods for new or modified BFEs.

cc: See Distribution List

**Distribution List** (electronic distribution only):

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## LEEVE CERTIFICATION

Approved by the Energy, Environment and Water Policy Committee on December 10, 2008

Approved by the Policy Review Committee on December 12, 2008

Adopted by the Board of Direction on January 25, 2009

WHEREAS, a fundamental canon of the Code of Ethics of the American Society of Civil Engineers (ASCE) declares that engineers shall hold paramount the safety, health, and welfare of the public.

WHEREAS, the solution to levee safety and flood-risk reduction must be developed within the complex context of community development, land use, building codes, emergency preparedness (especially warning, evacuation, and risk communication).

WHEREAS, levee accreditation by the Federal Emergency Management Agency (FEMA) is a technical finding for the National Flood Insurance Program (NFIP) that is not in any way a representation that any accredited levee will provide for the safety, health, and welfare of the public.

WHEREAS, in order for FEMA to accredit a levee on its NFIP maps a Professional Engineer must certify that the system complies with all the requirements established by FEMA at 44 CFR 65.10 (b)1 through (b) 7 or a federal agency with levee design and construction qualifications may certify that the levee has been adequately designed and constructed to provide protection against the base flood (a flood which has a one percent annual chance of occurrence, often called the 100-year flood).

WHEREAS, there is a vast difference between a document that FEMA uses to prepare NFIP rating maps and a document that is prepared by a Professional Engineer, based on the appropriate standard of care, that assesses the risk to the public safety, health, and welfare posed by a flood-risk-reduction system such as a levee.

WHEREAS, the FEMA rule mandating certification of non-federal levees requires a Professional Engineer to certify a document that inadvertently might mislead the public with respect to public safety and place the engineer in serious ethical and legal jeopardy is contrary to the ASCE Canon of Ethics and good public policy.

THEREFORE BE IT RESOLVED that ASCE recommends that FEMA amend the regulation at 44 C.F.R. 65-10 that requires a Professional Engineer's certification to make clear that such certification applies solely to the development of NFIP insurance rates.

BE IT FURTHER RESOLVED that ASCE encourages FEMA to develop and adopt a hazard-ranking system for NFIP rating maps that is based on either a) the maximum flood that will likely be experienced in an area (the Probable Maximum Flood) or b) a carefully developed plan of community development, land use, building codes, emergency preparedness (especially warning, evacuation, and risk communication), as well as an efficient and orderly system of indemnification for the inevitable losses when levees fail or are overtopped.

BE IT FURTHER RESOLVED that ASCE encourages its members, FEMA, state and local government, as well as all other stakeholders in community development, to communicate directly to the public in the clearest possible terms the risk that floods pose to any community so that the community may use that risk information for the purposes of planning for appropriate development, land use, building codes, and emergency preparedness. This risk communication is especially important in situations such as levee construction where the community is often emboldened by an erroneous sense of security to greatly increase development in areas protected for a time by levees; and at the same time the consequences of such failure have dramatically increased due to flood depth and velocities which accompany such failures.

*ASCE Resolution 529  
First Approved in 2009*