Federal Emergency Management Agency

Washington, D.C. 20472

JUL 7 2003

MEMORANDUM FOR: FEMA Regional Directors
Regions I – X

ATTENTION: Mitigation Division Directors
Administration and Resource Planning Division Directors
Response and Recovery Division Directors
Regions I – X

FROM: Anthony S. Lowe
Director
Mitigation Division

SUBJECT: Guidance for Pilot Alternative Determination of Cost-effectiveness for Certain Insured Repetitive Loss Properties

FEMA is introducing a pilot program that allows a simplified, alternate, FEMA-approved methodology to conduct the Benefit-Cost Analysis (BCA) for certain repetitively flooded properties currently insured under the National Flood Insurance Program (NFIP). This pilot effort is designed to support the mitigation of these NFIP-insured structures by providing a framework that allows States, Tribal governments and local community applicants to use NFIP-provided data to determine the "benefits" portion of the BCA to demonstrate cost-effectiveness of proposed mitigation projects.

Generally, applicants use a FEMA-approved software-based BCA to determine the cost effectiveness of projects. This memorandum provides guidance regarding how to use the pilot alternate cost-effectiveness methodology. This pilot alternate methodology applies to all FEMA Mitigation Grant Programs including: Hazard Mitigation Grant Program, Flood Mitigation Assistance, Pre-Disaster Mitigation and Supplemental Mitigation Grants. Projects submitted for consideration under any of these programs must adhere to all requirements set forth in the various governing statutes and program regulations.

Applicants requesting mitigation funds may use this alternative cost-effectiveness methodology and data for any project meeting the guidelines described herein from the date of this memorandum through December 31, 2003, or until the pilot NFIP repetitive loss properties list is superseded by updated data.

Repetitive loss properties included in the pilot

FEMA has determined through NFIP insurance data that a select list of repetitive flood loss properties exhibit a level of risk that may be cost-effective to mitigate. These are properties that have experienced four or more insured flood losses, or have the highest severity of flooding (i.e., cumulative losses paid exceeds the property value), with some properties satisfying both criteria. There are approximately 10,000 such properties, which represent about one quarter of one percent of all NFIP policies. These properties have expected average annual losses of about $80 million, which account for about 10% of expected total NFIP annual losses.

We have limited the properties for which we have provided "potential future damages avoided" data to single family and 2-4 family residences for the pilot program. An electronic list of pilot NFIP repetitive loss structures for each State in your region is provided as an attachment to this memorandum. To aid with location of these structures, we also have included the Repetitive Loss Number. This should prove helpful for those communities that have previously worked with these Repetitive Loss lists.

Potential future damages avoided

This pilot alternative methodology combines the NFIP history of certain NFIP structures with the theoretical loss experience for the average Pre-FIRM structure by using an actuarial concept called credibility weighting. The result of that calculation is a credibility-weighted average "annual insured loss." Credibility weighting is an approach that has been used since the founding of casualty actuarial science 90 years ago, and gained such wide acceptance that it is now required by statute in many states when insurance companies calculate their rates.

For each of the pilot NFIP repetitive loss structures, a "potential future damages avoided" value has been calculated based on the net present value of thirty years of credibility-weighted average annual insured loss. For mitigation projects that completely eliminate or significantly reduce future losses, this value is comparable to the net present value of benefits used in the current FEMA BCA software modules. Instructions on how to use this estimate of "potential future damages avoided," are provided in this guidance; however, the following caveats need to be made concerning this data:

- The "potential future damages avoided" value is based on insurance data and, therefore, may not accurately reflect the maximum potential future damages avoided for all properties;
- Property addresses on the list are the best available from existing NFIP records. The applicant or Regional Staff should contact Errol Garren (202 646-3678) for assistance in locating these properties and updating the address; and
- We estimate that up to 5% of these properties will not be 1-4 family residences or will have multiple structures at the property location. FEMA Regional Mitigation staff and Applicants should work with Headquarters staff to determine the appropriate use of the "potential future damages avoided" value in determining cost effectiveness for projects addressing these properties.

Eligible project types included in the pilot

This memorandum applies only to the required determination of cost-effectiveness relevant to projects submitted for funding in which pilot NFIP repetitive loss properties are included. This alternative methodology may only be applied to projects meeting the following criteria:

- Projects that address pilot NFIP repetitive loss properties on the electronic list provided with this memorandum;
- Projects that are designed to accomplish property acquisition/demolition, structure relocation or structure elevation; and
- For structural elevation projects, each structure must provide a minimum 1-foot of freeboard above the base flood elevation (BFE). Freeboard means a factor of safety, expressed in feet, above a specified flood level. Freeboard tends to compensate for factors that could contribute to flood heights greater than the height calculated for a selected flood frequency, such as wave action, bridge openings and the hydrological effect of urbanization of the watershed. More stringent State or local requirements must be met where applicable.

Projects not meeting the above criteria must undergo a standard FEMA BCA. Furthermore, for elevation projects, applicants are required to verify elevation data by providing a signed FEMA Elevation Certificate (FEMA Form 18-31) from a registered professional engineer, registered land surveyor or, in the case of unnumbered A Zones or AO Zones, a Certified Floodplain Manager (CFM) or local floodplain administrator authorized to provide elevation information. The certification must stipulate that both the structure and all associated utilities are elevated to a minimum of 1-foot above the BFE or depth specified in AO Zones, based on an accurate floodplain survey. Any project application that does not provide adequate certification and documentation for these elevations will not be considered for approval using the pilot alternative approach.

Pilot alternate cost effectiveness methodology

OMB Circular A-94, Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs, describes the economic principles and methods by which most Federal programs, including FEMA's mitigation programs, must analyze and verify the cost effectiveness of projects they fund. OMB requires that both costs and benefits be computed on a net present value basis, and that applicants use a discount rate of 7% for determining BCA on all FEMA mitigation projects.

This pilot alternate methodology adheres to the requirements set forth by OMB, and in no way waives the requirement of determining cost effectiveness for pilot NFIP repetitive loss properties. Rather, it provides an alternate method for demonstrating cost-effectiveness for projects that meet the criteria and assumptions stated in this memorandum. The following sections provide an alternative framework through which States, Tribal governments and local community applicants can determine whether a proposed project meets the cost-effectiveness criteria for mitigation grants when the project includes pilot NFIP repetitive loss properties.

FEMA-funded mitigation projects may not cost more than the anticipated value of the reduction in both direct damages and subsequent negative impacts to the area if future disasters were to occur. Traditionally, this demonstration of cost effectiveness is done via a BCA, resulting in a

benefit-cost ratio (BCR) of at least 1.0. This pilot alternate methodology requires applicants to use the following formula to determine a project's BCR:

Potential Future Damages Avoided / Total Project Cost = Benefit-Cost Ratio

For example, to determine a benefit-cost ratio for a sample property with potential future damages avoided equaling $152,652 and a total project cost of $85,254, you would use the following formula:

$152,652 / $85,254 = 1.79

Maximizing benefits

FEMA encourages all applicants to demonstrate the maximum benefits for all mitigation projects. Keep in mind that using the "potential future damages avoided" value for pilot NFIP repetitive loss properties will not account for all possible avoided damages, such as potential displacement costs or uninsured losses. In such cases, applicants can either forego this alternate methodology and perform a traditional BCA for these properties, or maximize the benefits by adding the net present value of benefits from these additional considerations to the "potential future damages avoided" value. However, the additional benefits must not duplicate the avoided structural and content damages, which are represented by the "potential future damages avoided" value. The resulting value should be divided by the total project cost to determine a BCR for the project.

Projects that combine pilot NFIP repetitive loss properties and other properties

In some situations applicants may propose projects that include structures on FEMA's pilot NFIP repetitive loss properties list as well as flood prone structures not on this list. For projects that consider a mix of repetitive loss and other flood prone loss properties, the applicant may aggregate the benefits by adding total "potential future damages avoided" for all pilot NFIP repetitive loss properties to the total net present value of benefits derived from the FEMA BCA software for other properties included in the project. The resulting value will be divided by the total project cost to determine a BCR for the project.

In order to use this aggregated method, any acquisition, relocation, or elevation project must include only properties with a similar building type and flood hazard risk, and located in a contiguous area. Individual building types include residential structures such as 1-story with basement, 1-story without basement, 2-story with basement, etc, while the flood hazard refers to the depth of flooding above the first floor. Structures involving different building types or flood depths cannot be aggregated for purpose of a group BCA.

Considerations when using this information

Not all repetitive flood loss properties on this list will be cost-effective using this alternative methodology. FEMA encourages applicants to focus on mitigating the repetitive loss structures that are cost-effective. Potential applicants should be reminded that mitigation projects with higher BCRs will be more competitive in FEMA's Pre-Disaster Mitigation competitive grant program. FEMA encourages all applicants to demonstrate the maximum benefits for all mitigation projects.

If you have questions or need additional information regarding this pilot alternative methodology, please contact one of the following individuals:

Insurance Data
Tom Hayes, Chief Actuary, (202) 646-3419

NFIP Repetitive Loss List
Errol Garren, Program Specialist, (202) 646-3678
Cynthia Pollnow, Program Specialist, (202) 646-4636

Benefit-Cost Analysis
Jonathan Smith, Mitigation Program Specialist, (202) 646-2847
Matt Smith, Mitigation Program Specialist, (202) 646-3748

Attachment