

Executive Order 11988, Floodplain Management, addresses concerns over about the potential loss of the natural and beneficial functions of the nation's floodplains as well as the increased cost to Federal, state and local governments of from flooding disasters caused that are worsened by unwise development of the floodplain. When funding actions, Federal agencies are required to avoid to the extent possible the long and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative. FEMA's procedures for implementing this EO are found at Title 44 Part 9 of the Code of Federal Regulations (44 CFR 9). Section 9.6 of these procedures includes an eight-step process that decision-makers must use when considering projects that have potential impacts to or within a floodplain. The questions in this section will identify if the proposed project is in the floodplain and, if so, will provide the opportunity to justify why locating the project in the floodplain is necessary it needs to be their and identify any means to minimize the impacts.

E.-1 Determining if your project is in the floodplain

Federally funded activities in or affecting the floodplain are regulated under Executive Order (EO) 11988 and it is the responsibility of the sponsoring Federal Agency to assure compliance. This EO encompasses ALL permanent construction and other activities, including debris, roads, bridges, culverts, etc. The regulatory floodplain is defined by areas inundated by a 100-year or 500-year rain event. For most projects, any activities occurring in the 100-year floodplain will require analysis under EO 11988. For any activities associated with a critical facility, such as a hospital or fire department, the 500-year floodplain triggers this executive order. Floodplains are typically regulated by state or local agencies, and have been mapped on documents known as flood insurance rate maps (FIRMs), and Flood Hazard Boundary Maps (FHBM). To obtain a copy of a FIRM or FHBM for your project area, you can contact your state or local floodplain administrator, go on-line to the FEMA map store (<http://store.msc.fema.gov/webapp/wcs/stores/servlet/FemaWelcomeView?storeId=10001&catalogId=10001&langId=-1>), or contact a local bank which typically maintains copies for home loan purposes. If you are unsure who your floodplain administrator is, contact the FEMA Map Assistance Center at 1-877-336-2627.

The 100-year floodplain is designated as Zone A or AE; the 500-year floodplain is designated as Zone B, C, or shaded zone X on older maps; and areas outside the floodplain are designated as unshaded Zone X. Floodways, areas usually in the center of the floodplain where flood water is likely to be deepest and fastest, are also marked on the FIRM with hash marks. To see an example of a FIRM, click here. Map keys vary, so check the legend of your map to identify the areas.

If the FIRM indicates that the project is in the 100-year floodplain or the project is a critical facility in the 500-year floodplain, answer "yes" to Section E, Question 1.

It is important to include the FIRM effective date and panel number in the comments area of Section E of the PDM Environmental and Historic Preservation Questions, whether or not the project is in the floodplain. It is also important to include a copy of the FIRM with your project area marked on it.

E.-2 Documenting alternatives to locating a project in the floodplain

If you answered “yes” to Section E, Question 1 of the PDM Environmental and Historic Preservation Questions, it is important to identify the means or alternatives considered to eliminate or minimize impacts to a floodplain. Whenever a proposed project is located in or may affect a floodplain, FEMA follows an 8-step process to evaluate, eliminate or at least minimize adverse impacts to floodplain function and value to comply with EO 11988 (<http://www.fema.gov/ehp/feo.shtm>). The key to the process is the analysis of alternatives to locating a project in the floodplain. If a project is located in or may affect the floodplain, it is critical to identify, develop, and evaluate alternate projects that could eliminate or minimize impacts to the floodplain, including a No Action alternative (what happens if you do not do the work you are proposing).

Some proposed projects are location dependent in the floodplain, i.e. streambank stabilization or a bridge repair, and do not lend themselves to alternatives outside the floodplain. However, alternative methods of design, construction or materials should be considered if they have the potential of lessening the impacts on the floodplain or base flood elevations.

The alternatives you considered should be documented and summarized in the comment area of Section E of the PDM Environmental and Historic Preservation questions. To document alternatives, write a description of each alternative considered and include a statement why it was dismissed. Also include in this section any measures you have identified to minimize the impacts to the floodplain for the proposed action.

The following illustrates how project alternatives should be developed in your application:

The project site is located along the north side of the Thompson Subdivision (map attached). A 24-inch corrugated metal pipe (CMP) culvert currently conveys Hayson Creek under Bayshore Drive. The capacity of the culvert is inadequate to carry stormwater and erosion has caused sediment to build up in the culvert while degrading the bank below the adjacent park. Due to the inadequacy of the current structure to convey floodwaters, high flow conditions during a 5-year or 10-year event and most definitely during a 50-year or 100-year event, would result in total structure failure and road collapse. Two nearby structures have also been flooded. The proposed mitigation project would place double 24-inch corrugated metal pipes in place of the existing single culvert.

Alternative A – No Action Alternative

By leaving the existing culvert in place and taking no action, Bayshore Drive would be subjected to continual flooding and potential washout. This alternative was determined infeasible because the two structures would continue to be flooded and the road would flood trapping residents and blocking emergency personnel from the subdivision.

Alternative B – Construction of a 3-Acre Detention Pond

A five foot deep, 3-acre detention pond would be built along the main tributary on private land. The basin would accommodate flows from storms in excess of the 25-year storm event. This project was determined infeasible because of rising real estate prices the cost of purchasing the private land is prohibitive.

Alternative C – Increase Holding Capacity

Under Alternative C, the city would increase the holding capacity on the upstream side of Bayshore Drive. The park would be excavated to serve as a holding pond. This project was determined infeasible because the project would removed three-fourths of the park which is frequently used by residents.

Alternative D – Add wing walls to the culvert and elevate structures.

The two structures would be elevated three feet to bring them out of the floodplain. Four foot wing walls would be added to both sides of the culvert. Though erosion would be prevented from around the culvert this project was determined infeasible because culvert capacity is still inadequate and flooding would still wash over the road and trap residents in the subdivision.

Alternative E – Bridge

A two lane bridge would be built over Hayson Creek. The bridge would be approximately 40 feet long and 30 feet wide. The culvert would be removed and the bank widened to the stream width of 12 feet. The bridge would be out of the floodplain, but according to the H&H study the increased water flow downstream would affect other culverts along Hayson Creek. This alternative was dismissed because of the downstream affect and the cost induced to upgrade all the culverts.

E.-3 Determining if your project alters a waterway

In general, alteration to a waterway, water flow, or drainage way includes any action that would straighten, shorten, change, divert, or interfere with a drainage feature, including removal or addition of any material, or changing the course of a drainage feature. Some examples of waterway modification include: upgrading culverts, building swales, lining channels with rock or concrete, installing storm water drainage inlets, pumping water away from an area, or creation of a detention pond. Any project that involves improving drainage away from an area has the potential to affect a nearby waterway by increasing storm water runoff volume to that waterway. If your project involves any modification to existing drainage patterns, whether in or out of the floodplain, it has the potential to cause negative impacts to the floodplain downstream and possible cause greater damage than the proposed project will fix. The documentation needed for FEMA to make this determination is discussed in Section E.-4.

If you determine your project will alter a waterway, answer “yes” to Section E, Question 2 in the PDM Environmental/Historic Preservation Questions. It is also necessary to coordinate with relevant regulatory agencies to identify permitting requirements. These agencies include the United State Army Corps of Engineers (USACE), state water

resource agency or the local water management district that has jurisdiction over the floodplain in your area. Some of this coordination may have already occurred as part of your efforts in completing PDM Section C of the Environmental and Historic Preservation Questions.

You should initiate contact with each of these agencies, requesting that they identify any permitting requirements for this project. Your communication, should:

- Indicate you are applying for federal aid, and you are requesting information about permitting requirements for your project
- Include the name of the nearest city and the names of the county and state where the project will occur
- Include a detailed description of the proposed project and how the project will alter the waterway
- Include a 1:24,000 USGS topographic map marked with the project location
- Include a copy of a current H&H study.

These agencies typically take at least 30 days to respond, so it is important to initiate your correspondence early. If you have not received an agency response as you are finalizing your application, it is a good idea to follow up with them to find out when you can expect it or see if you can get relevant permitting requirements over the telephone. Indicate the status of this correspondence in the project application, and scan and attach any letters you receive in response to your contact.

Once you receive a response from the regulatory agency, read it carefully to determine if any permitting will be required, or if the agency needs additional information. Responses from regulatory agencies can contain valuable information pertinent to your project, such as: conditions for permitting required environmental mitigation measures, or even suggestions for changes to the scope of work. Incorporate comments from your local floodplain manager directly into the PDM application. If floodplain mitigation is required, include that in your scope of work and as a line item in your cost estimate. Be sure to include in your scope of work and cost estimate any post-construction treatments needed to restore the site such as seeding, mulching, or planting. Additional project costs that are necessary for permitting conditions, mitigation, and site restoration are eligible expenses under PDM if they are identified in the scope of work and in the cost estimate.

E.-4 How to Address Adverse Effects

Adverse effects to floodplains include increasing flood elevation or velocities upstream or downstream, modifying the function or value of the floodplain, and encouraging the occupancy of the floodplain. If you anticipate that your project will have an adverse effect to the floodplain, then you should consider ways to avoid those effects, minimize the effects, and if necessary, compensate for the effects. When possible, all projects should be designed to avoid adverse effects to floodplains. If adverse effects cannot be avoided, develop appropriate treatment measures into the scope of work so adverse

effects are reduced and minimized. Listed below are some of the possible adverse effects that your project may have, together with possible treatment measures that you may include in your project to avoid, reduce or minimize, or compensate for adverse effects. The list is illustrative, and does not include all adverse effects that a project may have or all of the ways to potentially treat those effects.

Adverse Effects	Treatment
<ul style="list-style-type: none"> • Increase floodplain elevations or velocities upstream or downstream • Occupy the floodplain with a building or structure • Project encourages occupancy of the floodplain 	<ul style="list-style-type: none"> • Consult with the floodplain manager and obtain a permit • Acquire a “no-rise” certification • Construct retention ponds • Expand the floodplain through excavation • Consult with the floodplain manager and obtain a permit • Acquire a “no-rise” certification • Design the building or structure to accommodate flooding • Choose a location outside the floodplain for the building or structure • • Restrict occupancy of the floodplain through zoning

E.-5 How to provide helpful and relevant support documentation.

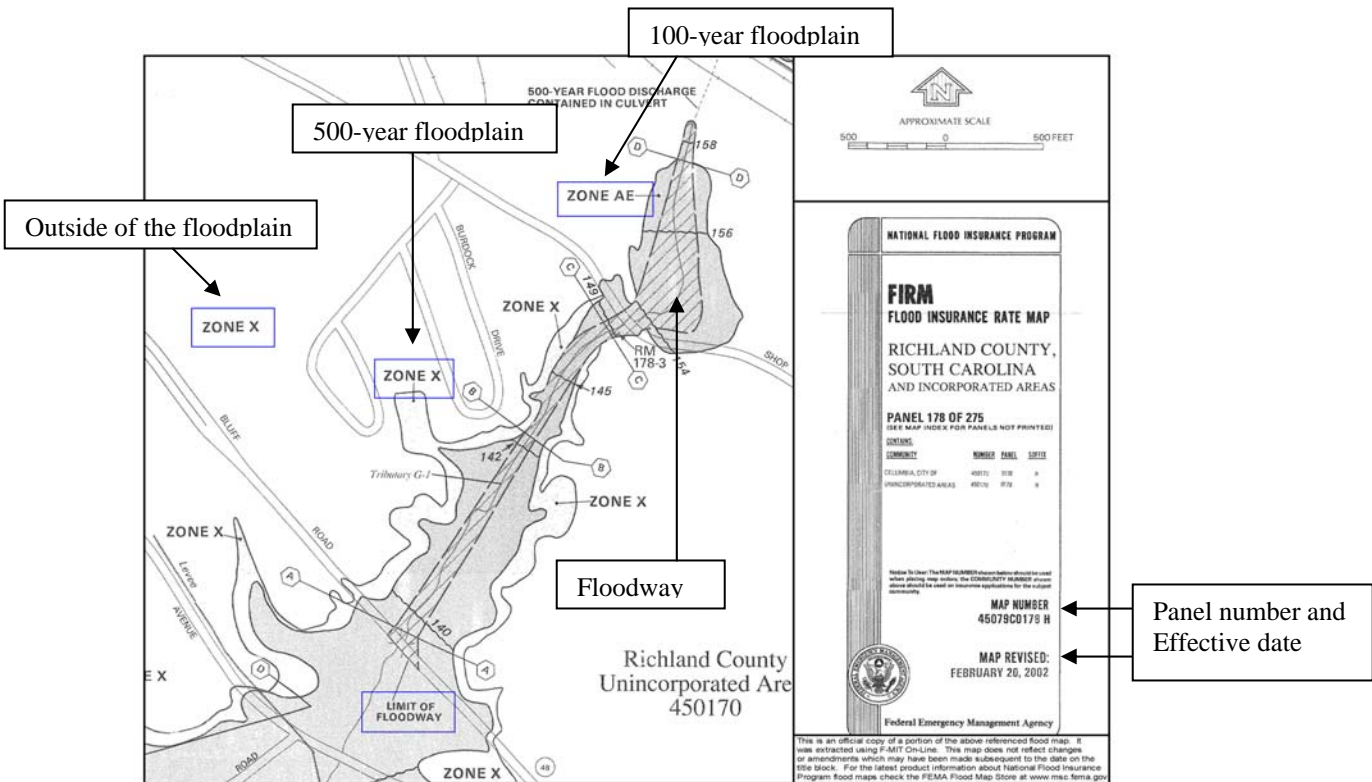
If you answered “yes” to Section E, Question 2 of the PDM Environmental and Historic Preservation Questions, there are two important things to attach to your application as support documentation, if possible. Many of these items may already be included as part of your documentation in Section C or D of the PDM Environmental and Historic Preservation Questions. It is not necessary to provide the information again, but please reference it in the comment area of Section E.

First, include a copy of the results of any engineering review and analysis that is performed to determine the potential impacts of the floodplain for any project that changes a waterway, water flow, or a drainage way (e.g. adding a culvert or increasing the size of an existing culvert). This analysis is called a Hydrology and Hydraulics study (H&H). An H&H study models the flow of water during different rainfall events and

predicts how a watershed and stream will react during those events. If your project involves changing the drainage volume or patterns of a waterway, an H&H analysis is required to determine if flood elevations or velocities are effected upstream and downstream of your project. It will also give you an idea of the true benefits of the project.

Second, include documentation of your contact with relevant regulatory agencies, including:

- scanned and attached copies of response letters and emails summaries of relevant telephone conversations
- the status of any outstanding correspondence



Panel number and Effective date