

Defining the Floodplain for Office of Housing Environmental Reviews: Instructions and Resources

October 2024

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Overview

Note: This guidance was developed by the Office of Housing for use in implementing FFRMS for Office of Housing programs, however the information in this document can be applicable to FFRMS implementation across other HUD programs.

HUD's update of its floodplain management regulations (24 CFR Part 55) expanded the regulatory floodplain from the 100-year floodplain, or 500-year floodplain for critical actions, to a forward-looking floodplain based on the Federal Flood Risk Management Standard (FFRMS). The FFRMS includes three concepts for determining an area of increased flood risk:

- The Climate Informed Science Approach (CISA), in which modeling on sea level rise is incorporated into flood risk mapping to provide floodplain boundaries that change over extended time horizons.
- The 500-year floodplain approach, in which the 500-year floodplain serves as the regulatory floodplain instead of the 100-year floodplain
- The Freeboard Value Approach (FVA), in which two feet, or three feet for critical actions*, is added to the 100-year flood elevation, and the floodplain is the area extending from the flooding source to that higher elevation

The new Part 55 requirements also include elevation or floodproofing of structures, up to the FFRMS elevation, for all new construction and substantial improvement**.

Figuring out compliance with Part 55 therefore requires new and more technical methods. Previously, reviewers could just look at the right Flood Insurance Rate Map (FIRM) and see if the project is located in the 100-year or 500-year floodplain. When HUD formally adopts a CISA resource, reviewers must follow its maps where available. For now, reviewers may check on the availability of CISA maps to use optionally, but must also find the 100-year and 500-year flood elevations and compare those elevations to those of the project site.

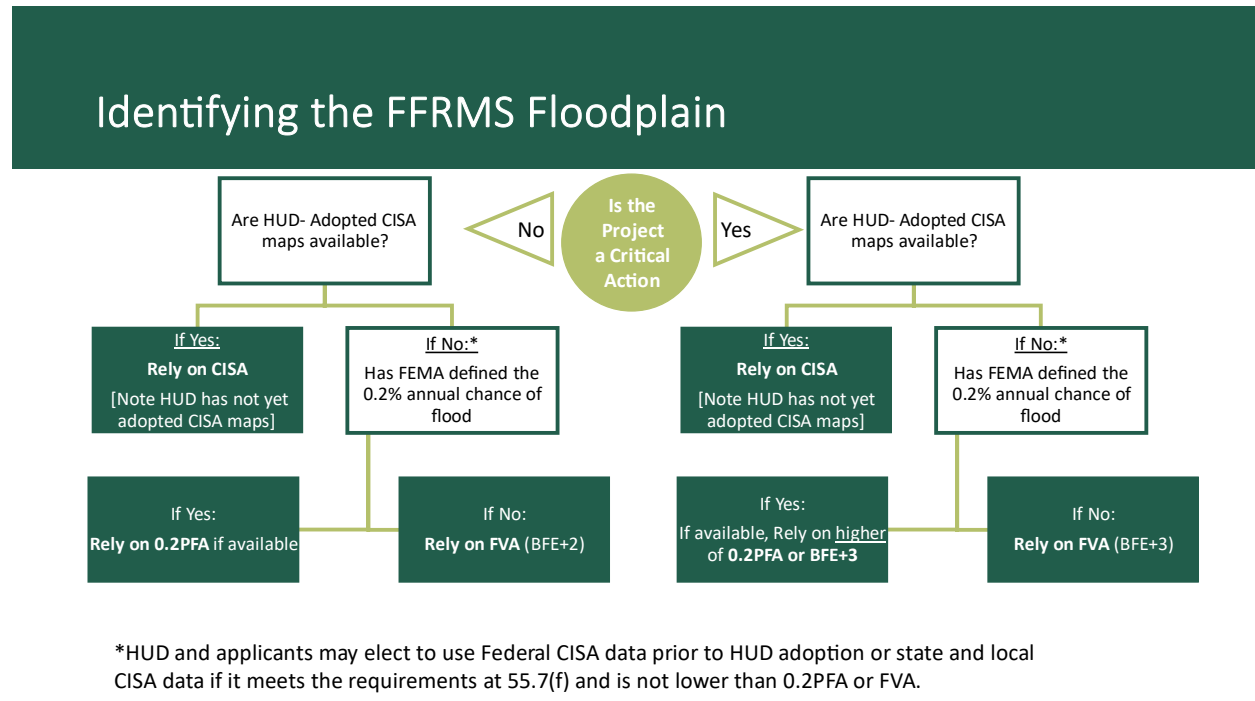
This document provides step-by-step instructions for reviewers to determine the boundaries of the floodplain and the flood elevation under the FFRMS, and to determine what the regulatory requirements are as a result. There are several online tools that can assist with this analysis, and these instructions include links to these tools and screenshots where helpful.

Please note that this resource is intended to provide a general guide for typical floodplain reviews, and will not cover all unique situations. Questions on individual environmental reviews can go to Multifamily and/or Office of Environment and Energy field staff. Contact information and geographic coverage for OEE staff can be found [here](#).

***Critical actions** are defined at 24 CFR 55.2 and are “any activity for which even a slight chance of flooding would be too great” including those that “Are likely to contain occupants who may not be sufficiently mobile to avoid loss of life or injury during flood or storm events, e.g., persons who reside in hospitals, nursing homes, convalescent homes, intermediate care facilities, board and care facilities, and retirement service centers. Housing for independent living for the elderly is not considered a critical action.”

**** Substantial improvement** is defined at 24 CFR 55.2 as “Any repair, reconstruction, modernization, or improvement of a structure, including a manufactured housing unit, the cost of which equals or exceeds 50 percent of the market value of the structure....before the improvement or repair is started...”

Flow Chart on Defining the FFRMS Based on Available Information



A Note on CISA:

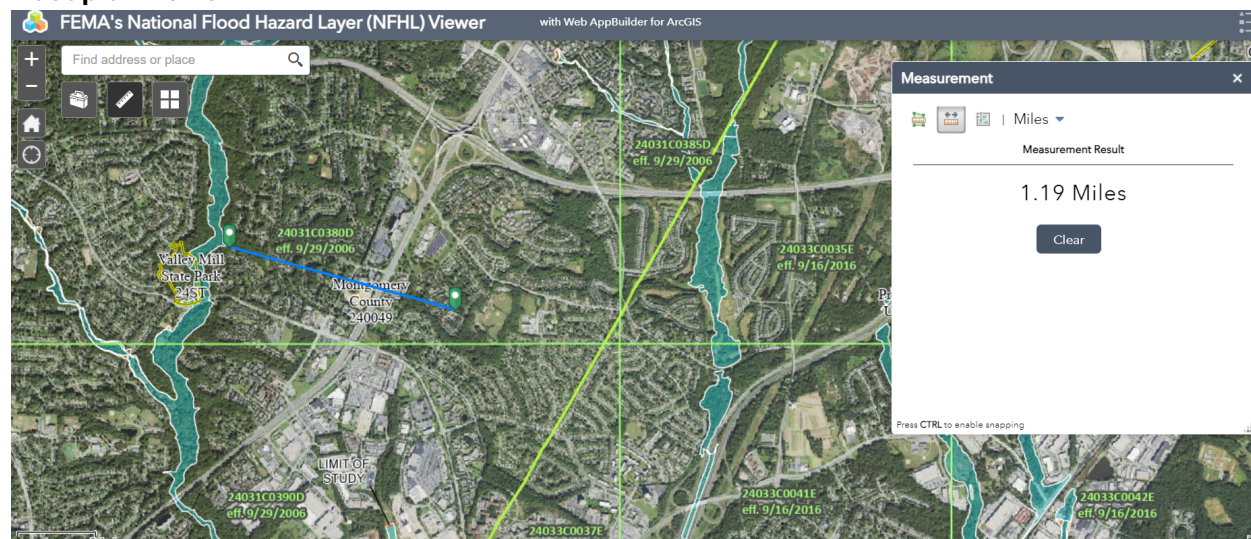
These instructions reflect that HUD has not formally adopted a resource for accessing Federal Climate Informed Science Approach (CISA) data. If HUD adopts such a resource, then it will serve as the prevailing method for determining the FFRMS floodplain for locations included in that resource. For now, federal CISA data may be optionally used to define the FFRMS floodplain as long as it does not result in a lower FFRMS elevation than the 500-year floodplain or Freeboard Value Approach.

To check if federal CISA data exists at the project location, enter the project location in the [Federal Flood Standard Support Tool](#) (FFSST). Draw the project boundaries on the map, indicate if the project is a critical action, and enter '2070' or later for the project service life. The results will show whether CISA data exists for the project location, and will also provide the Freeboard Value Approach boundaries for most locations. (See Section 7 for detailed instructions and screenshots.)

State or local CISA data may also be optionally used if it has been formally adopted through State/local code or other adoption measures, and if it gives a flood elevation equal or higher to the 500-year floodplain or the FVA. To check if local CISA data exists, reviewers can check the websites for the State and local governments or contact the Field Environmental Officer for the project location. FEO assignments and contact information can be found [here](#).

Determining FFRMS for Non-Critical Actions

1. Locate the project site in FEMA's [Map Service Center](#) or [National Flood Hazard Layer](#).
2. Check for nearby floodplains on the FIRM panel for the project location. If the project is near the panel edge or corner, check the adjacent panel(s) too. How far away from the project site to look will depend on the local topography, and only flooding sources with a reasonable chance of extending to the project site need to be considered. Generally, a one-mile radius is enough.
 - a. If there are no FEMA identified floodplains within a one-mile radius (or other reasonable distance based on site topography), the project has no further floodplain compliance requirements. Ensure the review record contains a conclusive FIRMette or screenshot with the project location indicated. **End of floodplain review.**



This screenshot from FEMA's National Flood Hazard Layer demonstrates that no floodplains are within a mile of the project site. This would provide sufficient evidence for the environmental review record that no further analysis is necessary.

- b. If there are FEMA-identified floodplains that could affect the project site, *proceed to step 3.*
3. If the project site contains the 100-year floodplain or floodway, it is in the FFRMS floodplain. New construction or substantial improvement of any structures within the floodplain must include elevation or floodproofing (as allowed) to the FFRMS elevation, and HUD's restrictions on floodways apply (see 55.8). The FFRMS elevation is determined using the 500-year flood elevation if available in the Flood Insurance Study (see Section 6), or the Freeboard Value Approach otherwise (see this section, Step 5). **Conduct 8-step or 5-step decision making process (unless an exception from 55.12 or 55.13 applies).**

4. Check for 500-year floodplains, also called 0.2 percent annual chance flood hazards, on the FIRM:

- a. If the 500-year floodplain is visible on the FIRM:
 - i. Projects outside the 500-year floodplain are not in the FFRMS. Include the FIRMette showing the project location and 500-year floodplain in the review record. **End of floodplain review.**



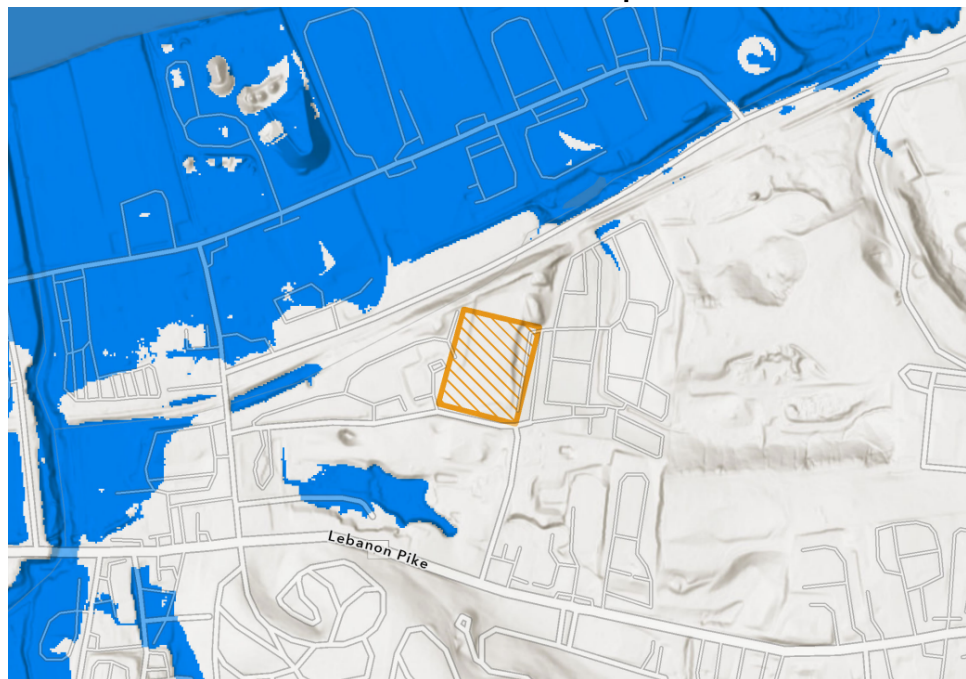
- ii. Projects containing the 500-year floodplain are in the FFRMS. New construction and substantial improvement within the 500-year floodplain must be elevated or floodproofed (as allowed) to the 500-year flood elevation, which can usually be found in the Flood Insurance Study. **Conduct 8-step or 5-step decision making process (unless an exception from 55.12 or 55.13 applies).**



- b. If the 500-year floodplain is not visible in the FIRM but the 500-year elevation is available in the FIS, then compare the 500-year elevation to the ALTA survey and site plans. Applicants can elect to skip to step 5 without checking the FIS when there is

no 500-year floodplain visible, though that will result in a higher flood elevation and larger floodplain.

- i. If the project site is not below the 500-year elevation, then the project is not in the floodplain. Include documentation such as maps, FIS charts, and site surveys in the review record. **End of floodplain review.**
 - ii. If any portions of the site are below the 500-year elevation, then the project is in the FFRMS floodplain, unless an exception at 55.12 or 55.13 applies. Any new construction or substantial improvement must include elevation or floodproofing (as allowed) to the 500-year elevation. **Conduct 8-step or 5-step decision making process (unless an exception from 55.12 or 55.13 applies).**
 - c. If the 500-year floodplain is not visible in the FIRM and no 500-year elevation is available in the FIS, *proceed to step 5.*
5. Determine the FFRMS floodplain using the Freeboard Value Approach. Use the FFSST tool or the FIRM plus site elevations as follows. Note that FFSST may not be appropriate for all areas, such as areas behind levees, areas with preliminary FIRMs, or near floodplains without defined BFEs.
- a. Use the FFSST tool to generate a map of the floodplain using the FVA if appropriate. (See Section 8 for detailed instructions and screenshots.)
 - i. If the project site is clearly outside the floodplain, then include a screenshot from the FFSST in the review record. **End of floodplain review.**



This screenshot from the FFSST shows a project site that is clearly outside the FFRMS floodplain based on the FVA.

- ii. If the FVA data in the tool is unavailable or inapplicable, for close calls requiring more precise boundaries, or for reviewer preference, *proceed to 5b.*



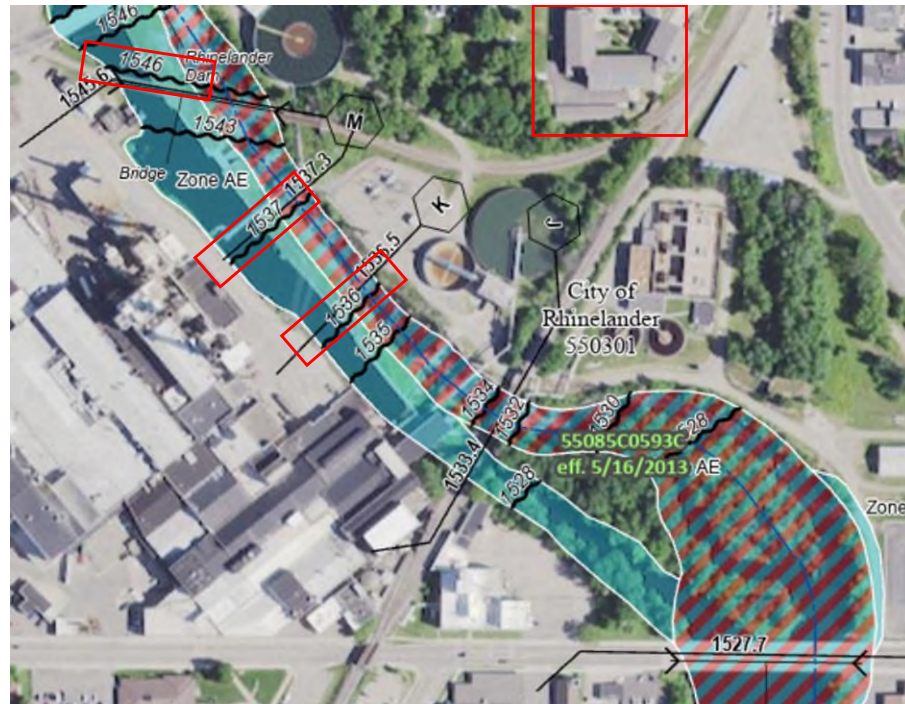
This screenshot shows a project site for which the FFSST might be inconclusive. A closer look at the flood profile and site survey would be necessary.

- b. Using the FIRM, identify the Base Flood Elevation (BFE) nearest the project site using one of the following methods. Preliminary FIRMs or advisory BFEs must be used when available.
 - i. For coastal flooding areas, identify the nearest Zone AE segment. The segment will have the BFE indicated in parenthesis.



The project location and the BFE are outlined in red.

- ii. For riverine flooding areas, identify the nearest BFEs along the flooding source. BFEs are indicated by wavy lines across the waterbody. Use the higher BFE marking if the project is located in between markings, or find more precise BFEs using the flood profiles or other information in the FIS.



The project site and relevant BFEs are outlined in red.

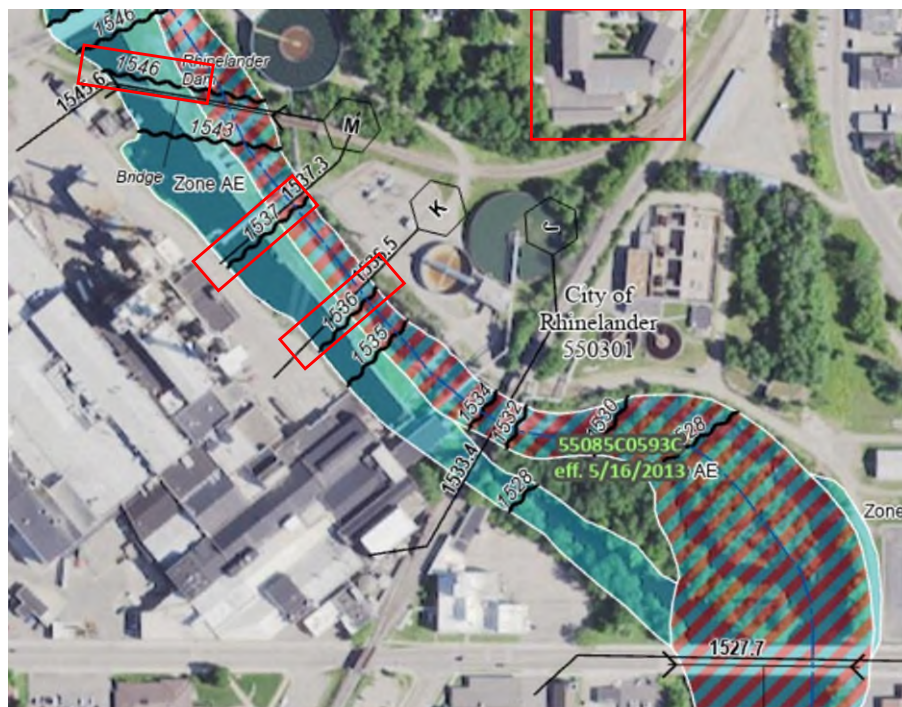
- c. Add two feet to the BFE to get the FFRMS floodplain elevation.
- d. Compare the FFRMS elevation to the project site.
 - i. If no portions of the site are below the FFRMS elevation, then the project has no further requirements for floodplains. Include FIRMette, surveys, and/or screenshots of online tools as needed to provide adequate documentation in the review record. (See *Example* below) **End of floodplain review.**
 - ii. If any part of the project site is below the FFRMS elevation, the project is in the FFRMS floodplain. If any new construction or substantial improvement will take place within the FFRMS floodplain, then elevation or floodproofing (as allowed) to the FFRMS elevation is required. **Conduct 8-step or 5-step decision making process (unless an exception from 55.12 or 55.13 applies).**

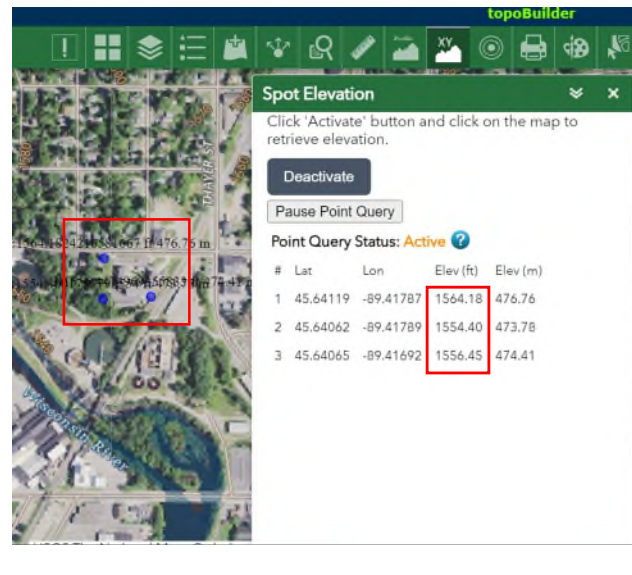
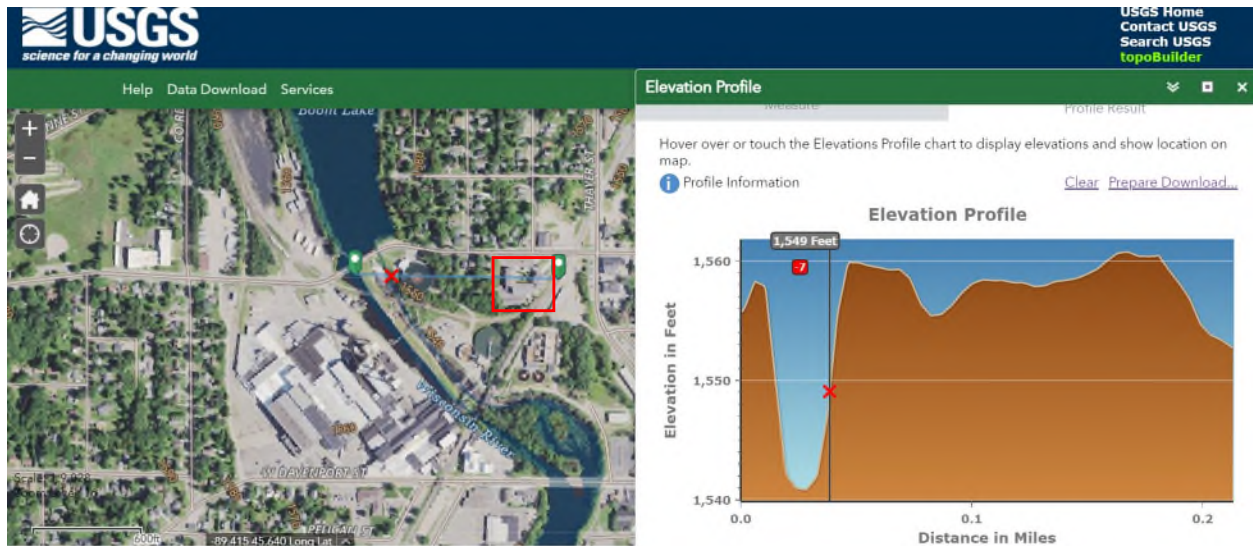
Reviewers can use the United States Geological Survey's National Map application to document site elevations and floodplain determinations in clear-cut cases. (See

Section 8 for detailed instructions and screenshots of the USGS tool.) Close calls will require a detailed site survey for accurate determinations.

Example:

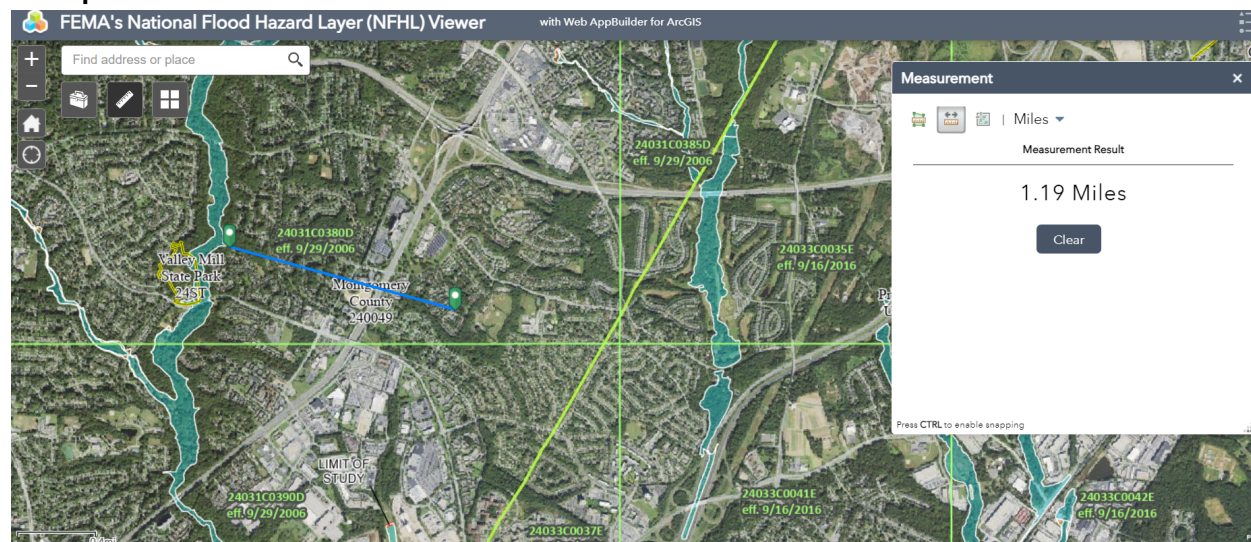
*In the first image, from FEMA's NFHL, we see that the highest BFE for the flooding source is 1546 feet. Adding two feet for a non-critical action, the FFRMS elevation would be 1548 feet. Drawing an elevation profile or selecting individual elevation points in the USGS National Map (see Section 8 for instructions), the reviewer clearly demonstrates that the project site is outside of the FFRMS floodplain. **This exercise assumes there is no 500-year elevation found in the FIS.***





Determining FFRMS for Critical Actions

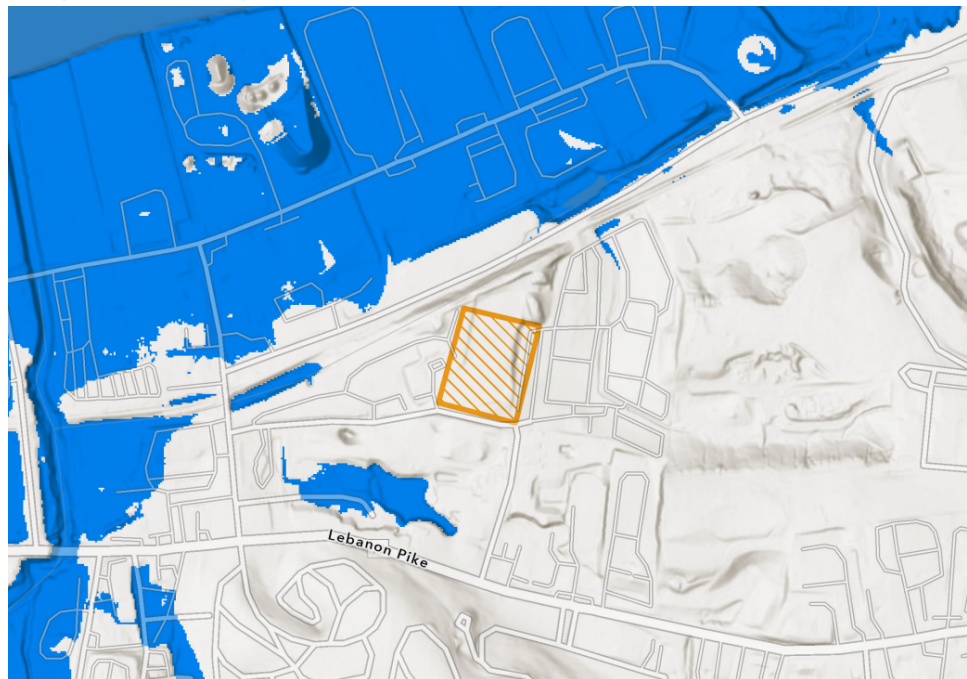
1. Locate the project in FEMA's [Map Service Center](#). For projects with future addresses, use the address of an adjacent property or latitude and longitude.
2. Check for nearby floodplains on the FIRM panel for the project location. If the project is near the panel edge or corner, check the adjacent panel(s) too. How far away from the project site to look will depend on the local topography, and only flooding sources with a reasonable chance of extending to the project site need to be considered. Generally, a one-mile radius is more than enough.
 - a. If there are no FEMA identified floodplains within a one-mile radius (or other reasonable distance based on site topography), the project has no further floodplain compliance requirements. Ensure the review record contains a conclusive FIRMette or screenshot with the project location indicated. **End of floodplain review.**



This screenshot from FEMA's National Flood Hazard Layer demonstrates that no floodplains are within a mile of the project site. This would provide sufficient evidence for the environmental review record that no further analysis is necessary.

- b. If there are FEMA-identified floodplains that could affect the project site, proceed to step 3.
3. If the project site contains the 100-year floodplain or floodway, it is in the FFRMS floodplain. New construction or substantial improvement of any structures within the floodplain must include elevation or floodproofing (as allowed) to the FFRMS elevation, and HUD's restrictions on floodways apply (see 55.8). The FFRMS elevation is determined using the higher of the 500-year flood elevation and the Base Flood Elevation plus three feet. **Conduct 8-step or 5-step decision making process (unless an exception from 55.12 or 55.13 applies).**

4. Check the FIRM(s) for the mapped 500-year floodplain. If the project is within the 500-year floodplain, find the 500-year flood elevation in the FIS, if available. (See Section 6 for finding the elevation in the FIS)
5. Determine the FFRMS floodplain using the Freeboard Value Approach. Use the FFST tool or the FIRM plus site elevations as follows. Note that FFSST may not appropriate for all areas, such as areas behind levees, areas with preliminary FIRMs, or near floodplains without defined BFEs.
 - a. Use the FFSST tool, if appropriate, to generate a map of the floodplain using the FVA. (See Section 8 for detailed instructions and screenshots.)
 - i. If the project site is clearly outside the floodplain, then *download the report and proceed to step 6.*



This screenshot from the FFSST shows a project site that is clearly outside the FFRMS floodplain based on the FVA.

- ii. If the FVA data in the tool is unavailable or inapplicable, for close calls requiring more precise boundaries, or for reviewer preference, *proceed to 5b.*

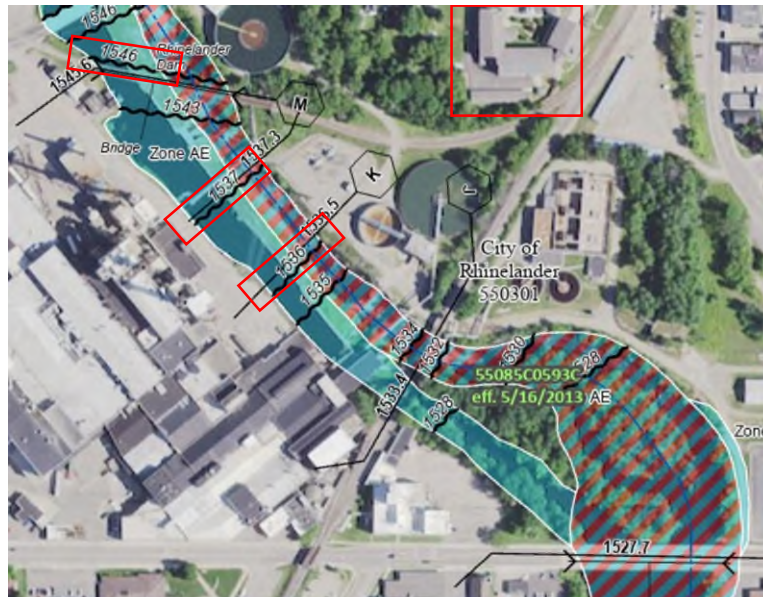


This screenshot shows a project site for which the FFSST might be inconclusive. A closer look at the flood profile and site survey would be necessary.

- b. Using the FIRM, identify the Base Flood Elevation (BFE) nearest the project site using one of the following methods. Preliminary FIRMs and advisory BFEs must be used when available.
 - i. For coastal flooding areas, identify the nearest Zone AE segment. The segment will have the BFE indicated in parenthesis.



- ii. For riverine flooding areas, identify the nearest BFEs along the flooding source. BFEs are indicated by wavy lines across the waterbody. Use the higher BFE marking if the project is located in between markings, or find more precise BFEs using the flood profiles or other information in the FIS.



- c. Add three feet to the BFE to get the FFRMS floodplain elevation. *Proceed to step 6.*
6. Compare the boundaries and elevations of the floodplain using the 500-year floodplain and the FVA (BFE +3). Use the higher elevation and larger floodplain to define the FFRMS elevation and floodplain. If the FIRM does not depict the 500-year floodplain, then applicants may use just the boundaries and elevation from the FVA.
 7. Compare the FFRMS boundaries and elevation to the project site:
 - a. If the project site does not contain the FFRMS floodplain, then the project has no further floodplain requirements. Include FIRMette, surveys, and/or screenshots of online tools as needed to provide adequate documentation in the review record.
End of floodplain review.
 - b. If any portions of the site are below the FFRMS elevation, then the project is in the FFRMS. If any new construction or substantial improvement will take place within the FFRMS floodplain, then elevation or floodproofing (as allowed) to the FFRMS elevation is required. Floodproofing is not allowed for residential critical actions but is allowed for hospitals. **The 8-step or 5-step decision making process is required, unless an exception from 55.12 or 55.13 applies.**

Reviewers can use the United States Geological Survey's National Map application to document site elevations and floodplain determinations in clear-cut cases. (See Section 8 for detailed instructions and screenshots of the USGS tool.) Close calls will require a detailed site survey for accurate determinations.

Finding Flood Elevations in the Flood Insurance Study







1. Enter the project location in FEMA's Map Service Center
2. Note the name of the flooding source on the map, then Click 'Show ALL Products'

The screenshot shows the FEMA Map Service Center interface. On the left is a navigation menu with links like 'Navigation', 'Search', 'MSC Home', 'MSC Search by Address', 'MSC Search All Products', 'MSC Products and Tools', 'Hazus', 'LOMC Batch Files', 'Product Availability', 'MSC Frequently Asked Questions (FAQs)', 'MSC Email Subscriptions', and 'Contact MSC Help'. The main content area has a search bar with the address '225 W 7th Ave, Homestead, PA 15120' and a 'Search' button. Below the search bar is a lightbulb icon and a text box explaining flood insurance. The search results section is titled 'Search Results—Products for WEST HOMESTEAD, BOROUGH OF' and includes a 'Show ALL Products »' link. It displays the flood map number '42003C0368H' effective on '9/26/2014'. There are three main sections: 'DYNAMIC MAP' with a 'PRINT MAP/FIRMnote' icon, 'MAP IMAGE' with a 'DOWNLOAD FIRM PANEL' icon, and 'Changes to this FIRM' with links for 'Revisions (0)', 'Amendments (0)', and 'Revalidations (0)'. At the bottom, there is a 'Go To NFHL Viewer »' link.

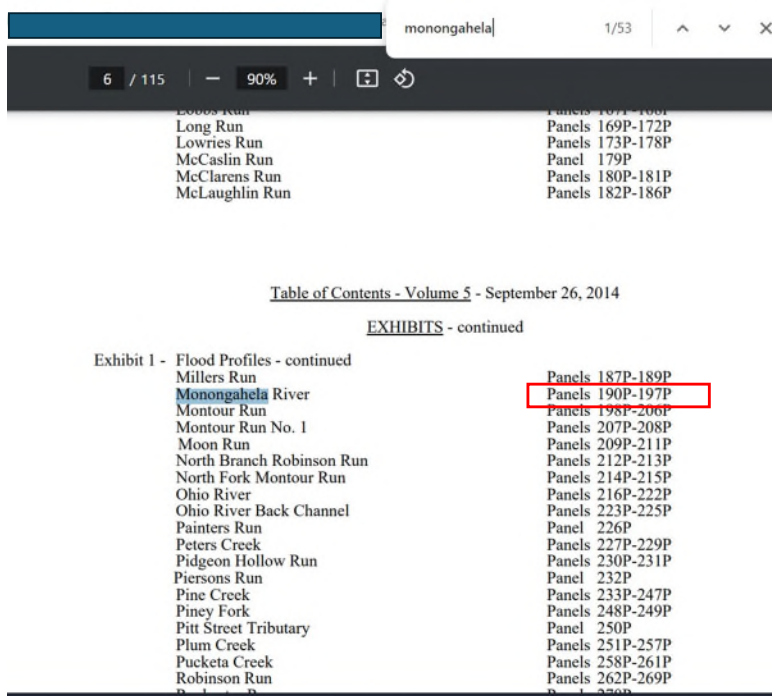
3. Click 'Effective Products' to open a drop-down menu, then 'FIS Reports'. Select the first document with the correct panel number (e.g. 42003CV001B) and click the icon in the 'Download' column.

The screenshot shows a drop-down menu titled 'Effective Products (17)'. It contains two sub-items: 'FIRM Panels (9)' and 'FIS Reports (6)'. Both sub-items have a 'DL ALL' button next to them. The 'FIS Reports (6)' item is highlighted with a red box.

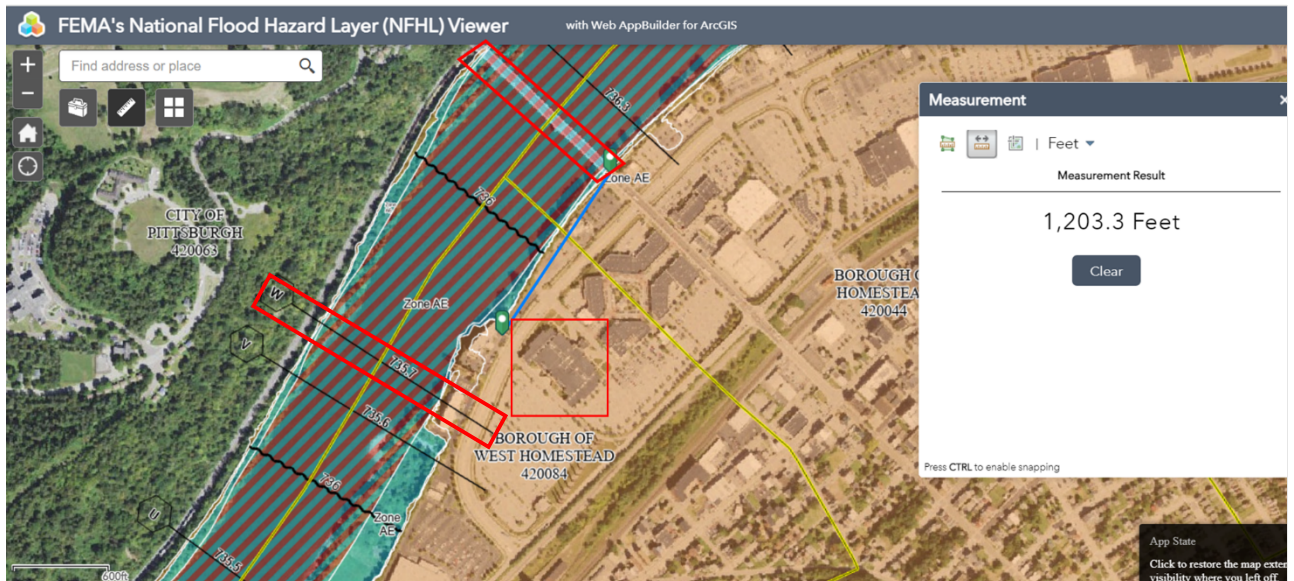
Please note: Sometimes small portions of the FIS are revised by Letters of Map Revisions (LOMR). When using the FIS report, you should also check LOMR documents listed in the LOMC section below for revisions that affect your specific area of interest.

Product ID	Effective Date	Size	Download
42003CV001B	09/26/2014	1MB	
42003CV002B	09/26/2014	1MB	
42003CV003B	09/26/2014	1MB	
42003CV004B	09/26/2014	1MB	
42003CV005B	09/26/2014	2MB	
42003CV006B	09/26/2014	1MB	

- Use the Find function (Ctrl+F) to search for the name of the flooding source (e.g. Monongahela River) and locate the panel numbers for that source.

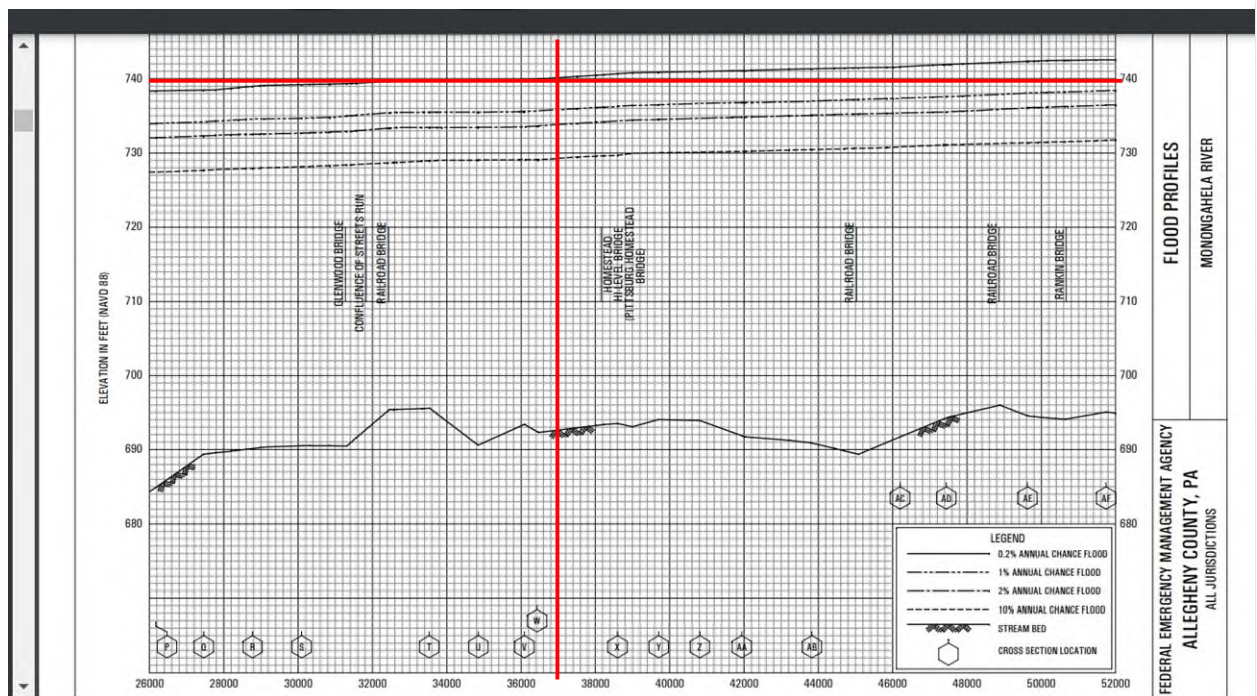


- Locate the panel(s) for the flood source, sometimes in a separate segment file from the same FIS. (e.g. 42003CV005B). This may require checking multiple files.
- Use the road crossings, cross-section markings, and measured distances to locate the project site along the horizontal axis in the stream profile.



In this example, the highlighted building is about 1,200 feet downstream of the Homestead Hi-Level Bridge. Cross-sections W and V could also be used to locate the project location in the FIS charts.

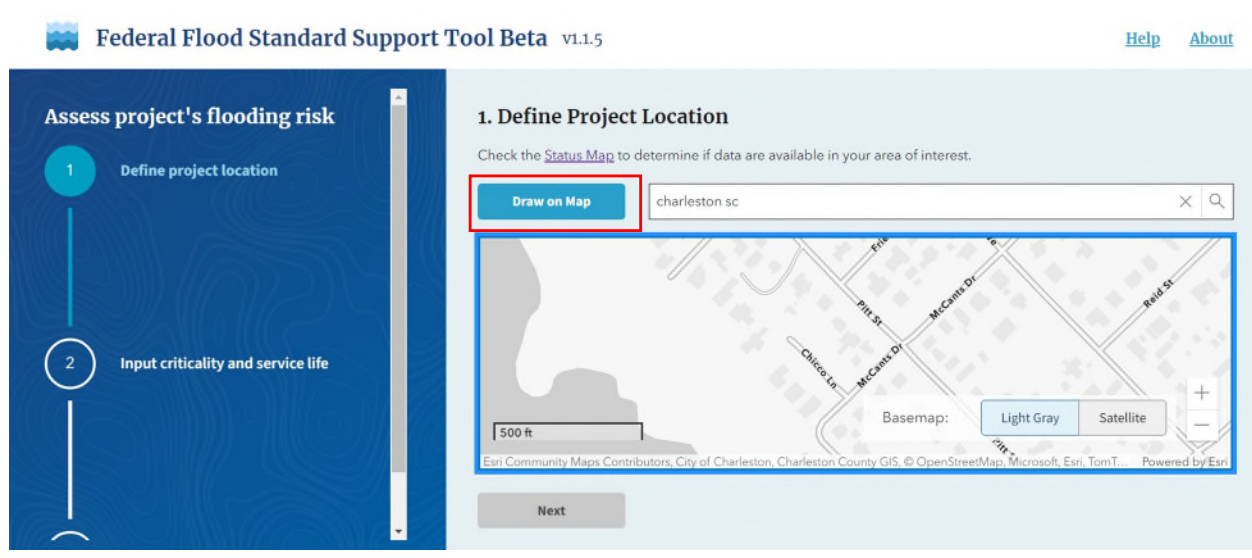
Find the desired elevation line at that horizontal point and then find the corresponding elevation in feet along the vertical axis.



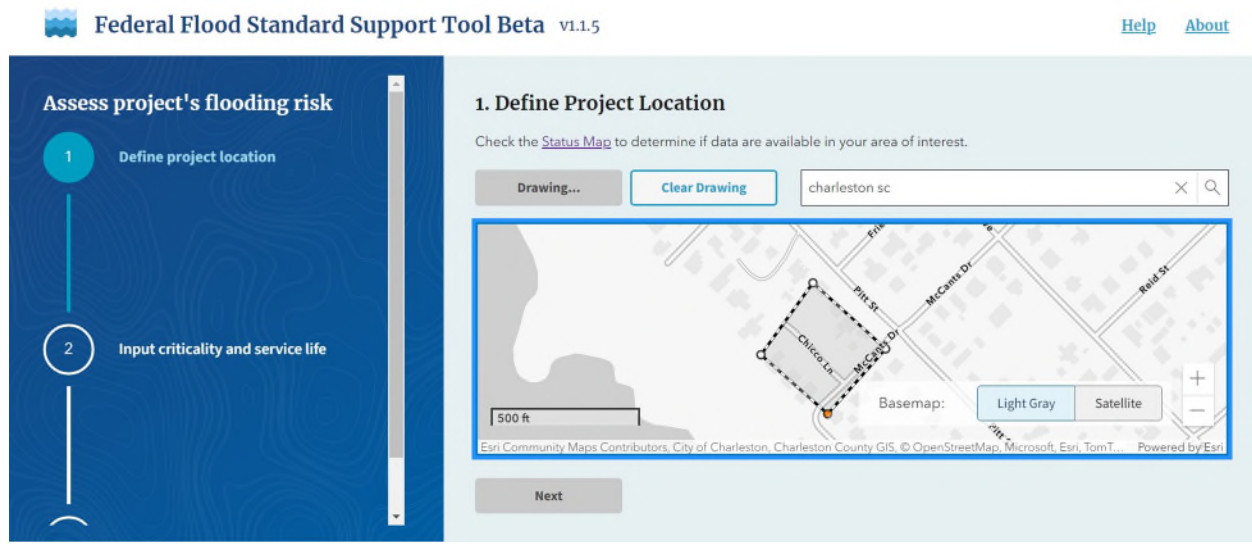
In this example, each small square in the grid is 200 feet of in distance along the river, and one foot of vertical elevation. The solid line on the graph will indicate the 500-year flood elevation, if available, and the line with two small dashes at regular intervals (_____) indicates the 100-year flood elevation. The subject property is ~600 feet upstream of Cross Section W, and ~1,200 feet downstream of the Homestead Bridge. The 500-year flood elevation at that location is ~740 feet. *Red lines added to indicate project location and 500-year flood elevation.*

Using the FFSST for CISA and FVA

1. Use the search bar to navigate to the project location, and then click 'Draw on Map'.



2. Outline the project parcel boundaries by clicking on each corner. Double-click on the last corner to finalize the boundaries.



3. Select critical or non-critical, and select the service life based the length of the mortgage, rounding up to the later decade

The screenshot shows the 'Federal Flood Standard Support Tool Beta v1.1.5' interface. On the left, a vertical progress bar indicates the current step is '2. Input criticality and service life'. The main content area is titled '2. Input Criticality and Service Life'. It features a 'Service Criticality' dropdown menu set to 'Non-critical'. Below this, a section titled 'Is the action critical or non-critical?' provides a definition and a link to 'What is the difference between a critical and non-critical federally funded action?'. The 'Service Life' dropdown menu is set to '2070'. A section titled 'What is the expected service life?' explains the term and provides a link to 'How to'. At the bottom, there are 'Back' and 'Next' buttons.

4. If CISA is available, the tool will provide CISA and FVA reports with a floodplain determination and elevation. If CISA is not available, the tool will provide only a report on FVA.

The screenshot shows the 'Federal Flood Standard Support Tool Beta v1.1.5' interface at Step 3: Download Reports. The left sidebar shows the progress bar with Step 2 completed. The main content area is titled '3. Download Reports' and includes a note: 'The following report(s) are based on the project specifics that you entered and the FFRMS data. Note that CISA reports are only available for coastal areas.' There are two tabs: 'CISA Report' (selected) and 'Freeboard Value Approach Report'. The 'CISA Report' tab displays a 'Summary' section with the following text: 'Based on the user-defined location, service life (46 Years), and non-critical designation, the proposed action is in the FFRMS floodplain.' Below this, it states: 'The 2050 estimated sea-level rise amount is 2 ft, corresponding to a FFRMS flood elevation of 13 FT NAVD88.' and 'The 2070 estimated sea-level rise amount is 2 ft, corresponding to a FFRMS flood elevation of 13 FT NAVD88.' At the bottom, there are 'Back', 'Download CISA Report', and 'Start New Assessment' buttons.

8. Scrolling down, the report will show a map with the project boundaries and the floodplain boundaries. Dark blue is in the FFRMS floodplain based on CISA.

Federal Flood Standard Support Tool Beta v1.1.5 [Help](#) [About](#)

Assess project's flooding risk

- 1 Define project location
- 2 Input criticality and service life

Service Criticality
Non-critical

Service Life
2070

3. Download Reports

The following report(s) are based on the project specifics that you entered and the FFRMS data. Note that CISA reports are only available for coastal areas.

CISA Report Freeboard Value Approach Report

Back Download CISA Report Start New Assessment

9. For FVA reports, make sure to select the 'Freeboard Value Approach Report' tab if there are two options. The FVA report will provide a floodplain determination and elevation for the selected area, with a map of the floodplain further down in the report.

Federal Flood Standard Support Tool Beta v1.1.5 [Help](#) [About](#)

Assess project's flooding risk

- 1 Define project location
- 2 Input criticality and service life

Service Criticality
Non-critical

Service Life
2070

3. Download Reports

The following report(s) are based on the project specifics that you entered and the FFRMS data. Note that CISA reports are only available for coastal areas.

CISA Report **Freeboard Value Approach Report**


FFRMS Freeboard Value Approach Report Created: Tue Sep 17 2024

Summary

Based on the user-defined location and non-critical designation the proposed action is in the FFRMS floodplain. A 2 foot freeboard is applicable per the Freeboard Value Approach. This corresponds to a FFRMS flood elevation of 13 FT NAVD88.

The North American Vertical Datum of 1988 (NAVD88) is the datum used on FEMA Digital Flood Insurance Rate Maps


Back Download Freeboard Value Approach Report Start New Assessment

 **Federal Flood Standard Support Tool Beta** v1.1.5 [Help](#) [About](#)

Assess project's flooding risk

1

Define project location



2

Input criticality and service life

Service Criticality

Non-critical

Service Life


2070

3. Download Reports

The following report(s) are based on the project specifics that you entered and the FFRMS data. Note that CISA reports are only available for coastal areas.

CISA Report

Freeboard Value Approach Report



Back

Download Freeboard Value Approach Report

Start New Assessment

Using the National Map for Project Site Elevations

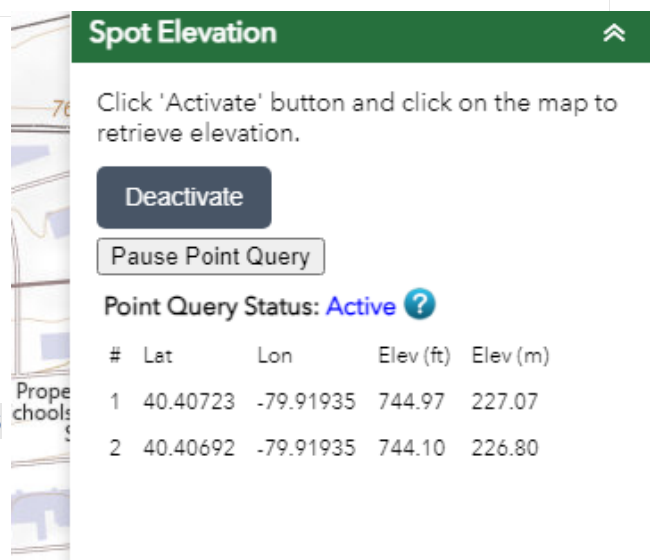
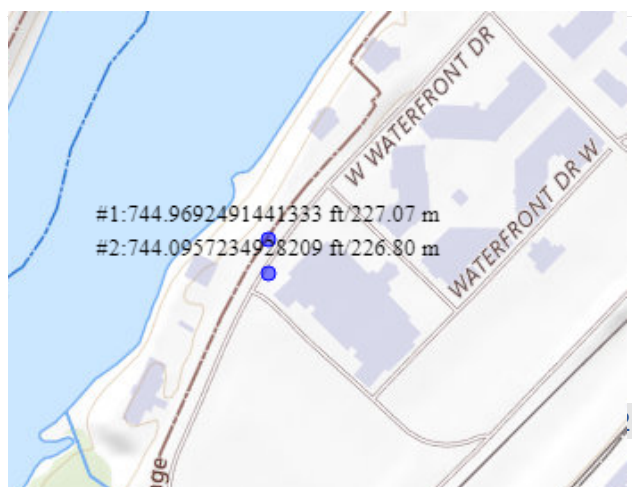
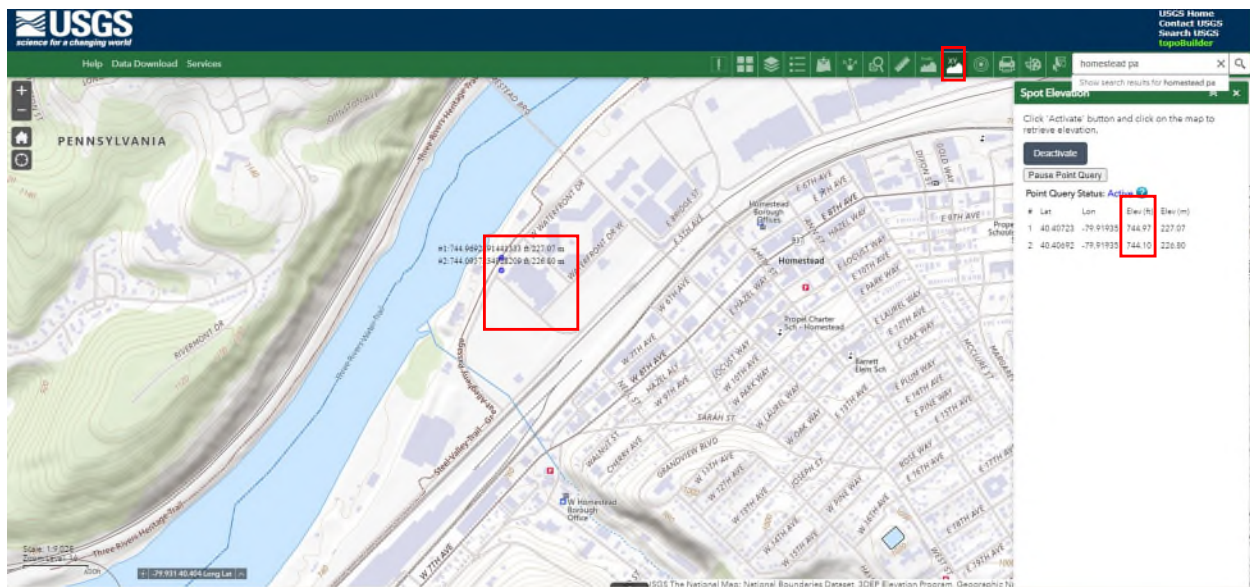
While the site survey will give the most accurate picture of elevation across the project site, the United States Geological Survey's National Map website can provide a convenient screening tool to verify cases that are clearly outside of the FFRMS floodplain.

Enter your project location in the search bar and zoom in to the desired scale.

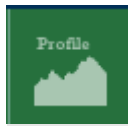
For elevation at individual points, select the Spot Elevation Query Tool from the menu at the top of the map.



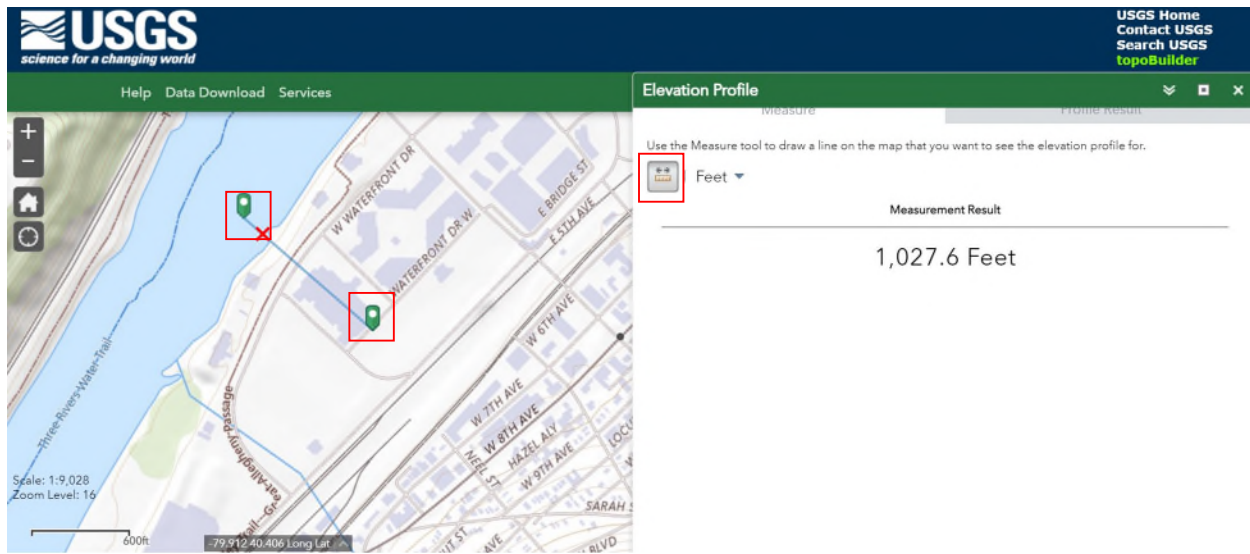
Click 'Activate' on the menu that appears, and then select points in the map to retrieve elevations. Markers will appear on the map indicating your selections, and a list will appear in the menu with the numbered points and their elevations. (When using smaller monitors, users will need to change the screen resolution in the computer settings for the markers to be visible.)



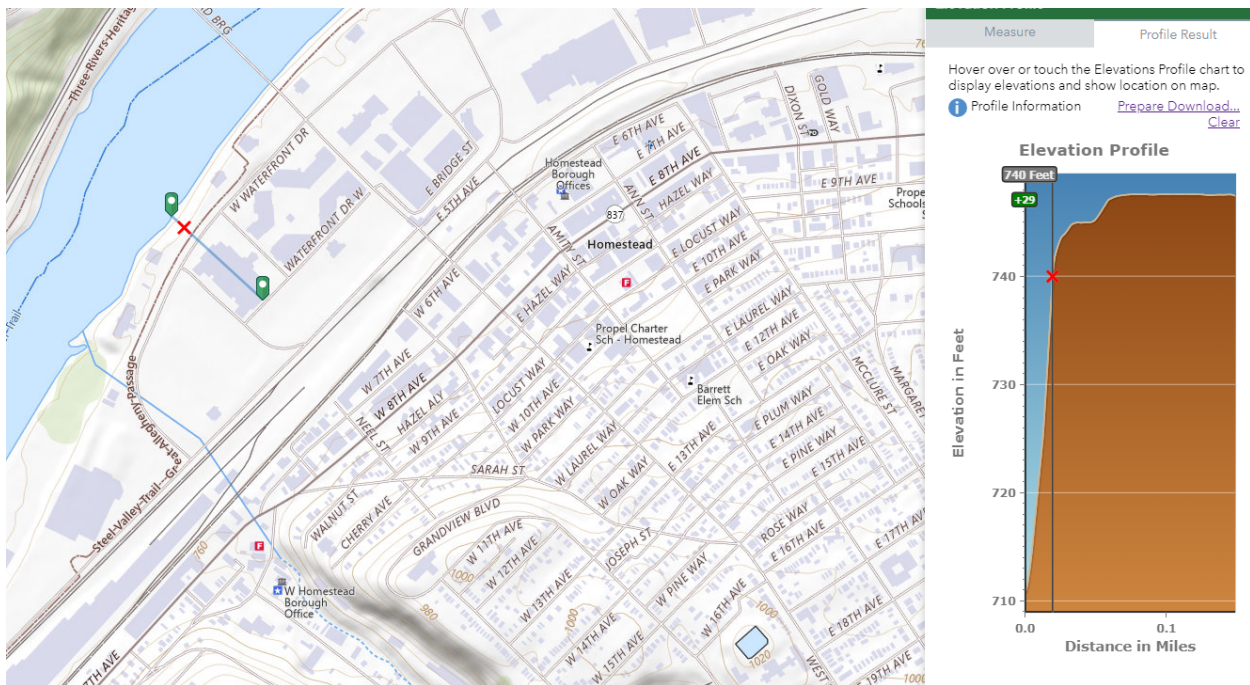
For an elevation profile along a user-defined line, select the Elevation Profile tool from the top menu



Click the Measure icon. Then click a starting point and double-click an ending point.



The elevation profile will generate. Reviewers can scroll along the profile chart, and a corresponding red X will appear on both the profile chart and the user-defined line.



Tools and Resources

FEMA Map Service Center: <https://msc.fema.gov/portal/home>

FEMA National Flood Hazard Layer: <https://msc.fema.gov/nfhl>

Federal Flood Standard Support Tool: <https://floodstandard.climate.gov/tool>

The National Map: <https://apps.nationalmap.gov/viewer/>

HUD Environmental Staff Contacts: <https://www.hudexchange.info/programs/environmental-review/hud-environmental-staff-contacts/>