

# BUILDING DOLLAR EXPOSURE & TYPE (Region 9)



Residential  
Home



Residential  
Manufactured Home



Residential  
Apartment



Non-Residential  
Commercial



Non-Residential  
Industrial



Non-Residential  
Other

**Building Inventory of Flood-Risk Structures:** This report identifies high-valued buildings and other building characteristics exposed in the 1%-annual-chance (100-year) floodplain. Flood Risk Assessment datasets are developed by pinpointing all primary insurable structures in the high-risk effective and advisory floodplains. Essential facilities (schools, fire, police, E-911, nursing homes, hospitals, nursing homes) are inventoried to the 0.2-percent (500-year) annual chance flood event. Community assets (government buildings, churches, historical structures, utilities, etc.) are also inventoried. Building characteristics inventoried and verified are **Occupancy Class**, Foundation Type, First Floor Height, Number of Stories, Area, and **Replacement Cost**. Default values are populated from the WV Property Tax Assessment Database and if necessary modified with user-defined values. Building pictures can be linked to the structure-level risk assessment using the unique building identifier (Parcel ID + Address Number).

**Building Replacement Value:** The repair costs to rebuild residential or non-residential structures from flood damage are significant insurance rating and mitigation construction factors. In addition, the structure's replacement value and other building characteristics (occupancy class, foundation type, first floor height, number of stories, and structure area) are inputs to model flood damage estimates. Appraisal values from the West Virginia property tax assessment records are the primary data source for buildings exposed in the 1%-annual-chance (100-yr) floodplain. These building replacement values in the statewide tax assessment database are updated every year by the WV Property Tax Division. If necessary, modified or user-defined values are entered in the enhanced building inventory database to override default appraisal records values when no appraisal values exist or are identified in an adjacent parcel; or if multiple buildings on a single parcel must be apportioned. Other data sources for building dollar replacement costs include neighborhood appraisal values, BRIM Insurance, and RS Means.

**Occupancy Classes:** The building type categories for residential and non-residential structures follow FEMA's Hazus occupancy classification. The primary source for the occupancy type is the 186 land use categories from tax assessment data. These land use codes are converted to the 33 Hazus building specific occupancy classes, and further generalized to residential and non-residential building classes. On the Risk MAP View of the WV Flood Tool, the building occupancy types based on *structure use* are classified as **Residential** (R - single dwelling, farmhouse, mobile home, multi-family, apartments, nursing homes, group quarters); **Commercial** (C - businesses or industrial), and **Other** Non-Residential (schools, government buildings, churches, non-inhabitable agricultural structures, etc.).

Different residential/non-residential categories may apply to different FEMA programs. Typically, the main difference is that for **structure use** applications the **Other Residential (> 4 units)** occupancy class (e.g., apartments, group housing) is categorized as RESIDENTIAL but for **structure type** applications is classified as NON-RESIDENTIAL. The **structure use** occupancy classification is based on habitable on non-habitable occupancy whereas the **structure type classification** is based on design and materials. Refer to the [Occupancy Class Types](#) table for a more detailed breakdown of the residential/non-residential categories by specific occupancy classes.

**FEMA Programs that utilize “Structure Use” Residential/Non-Residential Classification:** WV Flood Tool’s Risk MAP View (Residential, Commercial, and Other Non-Residential), NFIP Specific Rating Guidelines; Open Hazus FAST Flood Assessment Structure Tool (Building Damage, Debris Total, and Restoration Time); Population Displacement Model. Note that Other Residential (> 4 units) is included in the RESIDENTIAL classification.

**FEMA Programs that utilize “Structure Type” Residential/Non-Residential Classification:** FEMA’s Community Rating System (CRS 214) Program Data Table; Substantial Damage Estimator (SDE) Tool; Nonstructural Mitigation Measures. Note that Other Residential (> 4 units) is included in the NON-RESIDENTIAL classification.

**Manufactured Homes:** Every manufactured mobile home in the floodplain is counted as a primary structure. If singlewide and doublewide mobile homes are assessed as personal property with no listed appraisal values, then replacement manufactured costs are derived from other sources. For example, manufactured replacement home costs may be compiled from the Other Building and Yard Improvements tax assessment table. However, if no tax appraisal values are present, then a countywide average value of singlewide or doublewide home values may be applied.

**Owner Occupancy:** Owner Occupancy is determined from the tax class data value records. Class II properties are owner-occupied residential property used exclusively for residential purposes and all farmland used for agricultural purposes by its owner or bona fide tenant.

**Building Year and FIRM Status:** Collected from the tax assessment records, the building year is compared to the effective date of the initial Flood Insurance Rate Map to determine the Pre-FIRM or Post-FIRM status of each inventoried building. If the site of a post-FIRM structure was not mapped as a Special Flood Hazard Area at the time of construction, then repairs or alterations are regulated as though it is a pre-FIRM structure.

## **Community Engagement and Verification:**

**Building-Level Verification:** Verify the highly valued buildings using the [building-level table](#) and [Risk MAP View](#) of the WV Flood Tool. For buildings inventoried in the 1% floodplains, review the most expensive residential and non-residential buildings located in the high-risk flood zones sorted on building appraisal value from largest to smallest value. Identify building-level mitigation and outreach strategies.

- Confirm highly valued residential and non-residential buildings for correctness. Confirm recently vacated or demolished structures for correctness. Use the Construction Grade with the building replacement value to identify superior quality structures versus dilapidated/vacated structures. Submit map links of missing noteworthy structures in the high-risk floodplains, especially those of significant importance to the community.
- Filter by Occupancy Class and Regulatory Floodway to refine analysis of building types exposed to higher flood velocities associated with the main channel of the river or stream.

**Community-Level Verification:** Review community-level flood risk assessment statistics of the building stock to identify mitigation and outreach strategies.

- Percentage of residential versus non-residential homes which impact flood disaster response and flood proofing mitigation efforts.
- Percentage of Post-FIRM buildings and compliance with floodplain development standards.
- Review the more vulnerable building stock such as lighter-weight manufactured homes and rental homes where renters may not carry rental insurance.

**Building Counts / Building Dollar (\$) Exposure / Building Occupancy Type / Building Year.** Tables BE-1 through BE-5 present the building counts, building dollar exposure totals, median building values, residential/non-residential occupancy classes, owner-occupancy, building year, and Post-FIRM percentage. These building characteristics are for structures inventoried in the high-risk effective and advisory flood zones for a 1%-annual-chance (100-year) event.

#### Summary Community Building Counts

- **Jefferson, Berkeley, and Morgan** counties have similar countywide building counts and rank between 42 and 44 of the State's 55 counties. **Berkeley Unincorporated** (ranked 36<sup>th</sup> in unincorporated areas) and the incorporated town of **Bath** (ranked 60<sup>th</sup> for incorporated areas) have the *most buildings* in the high-risk floodplain.

#### Summary Community Building Values

- **Berkeley, Morgan, and Jefferson** counties have similar countywide total building values and rank between 24 and 28 in the State. **Jefferson Unincorporated** (ranked 20<sup>th</sup> in unincorporated areas) and the incorporated town of **Martinsburg** (ranked 14<sup>th</sup> for incorporated areas) have the *highest building dollar values* vulnerable to a 1%-annual-chance flood event.

#### Median Building Replacement Value

- **Jefferson** (\$96K), **Morgan** (\$79K), and **Berkeley** (\$62K) **counties** rank first, second, and fourth in the State for *countywide median building replacement value* and much higher than the statewide median building replacement value of \$37,000.
- **Jefferson** (\$101K), **Berkeley** (\$96K), and **Morgan** (\$80K) **counties** rank first, second, and fourth in the State for *countywide median single-family dwelling (RES 1 Occupancy Class) replacement value* and above the statewide median single family dwelling value of \$44,000.

#### Building Occupancy Class Type

- Most of the primary buildings are *residential*: **Berkeley County** (94%), **Jefferson County** (89%), and **Morgan County** (81%). Of the residential buildings, most of the building stock is *owner-occupied*: Berkeley County (74%), Jefferson County (71%), and Morgan County (69%).
- The total building value for **Jefferson County** is 73% *residential* for the countywide building stock value exposed in the 1% floodplain, while for **Berkeley County** and **Morgan County** the *non-residential* properties are 51% and 59% respectively of the countywide building stock dollar value exposure.
- **Berkeley County Unincorporated** (ranked 12<sup>th</sup> in the State and 1<sup>st</sup> in Region 9) has the highest percentage (34%) of *manufactured homes for single family dwelling* building stock (Hazard specific occupancy categories: RES1-single family dwelling and RES2-mobile home).

#### Building Year and FIRM Status

- **Berkeley** and **Jefferson counties** rank 11<sup>th</sup> in the State for the highest percentage of *Post-FIRM structures* or new development.
- Historical **Harpers Ferry** and **Shepherdstown** are two of the oldest communities in the State with *building year median values* of 1830 and 1900, respectively.

**Table BE-1. Community rankings of Total Building Counts and Total Building Replacement Values.** Statewide there are [268 flood-prone communities](#), consisting of 213 incorporated areas and 55 unincorporated areas/counties. For Region 9, eleven incorporated communities except for Hedgesville participate in the NFIP.

BUILDING COUNT RANKING		
Community	Region	State
<b>INCORPORATED</b>		
Bath	1	60
Ranson	2	86
Martinsburg	3	91
Shepherdstown	4	103
Harpers Ferry	5	143
<b>UNINCORPORATED</b>		
Berkeley	1	36
Jefferson	2	40
Morgan	3	41
<b>COUNTY</b>		
Jefferson	1	42
Berkeley	2	43
Morgan	3	44

BUILDING \$ VALUE RANKING		
Community	Region	State
<b>INCORPORATED</b>		
Martinsburg	1	14
Bath	2	27
Shepherdstown	3	44
Harpers Ferry	4	89
Ranson	5	102
<b>UNINCORPORATED</b>		
Jefferson	1	20
Morgan	2	21
Berkeley	3	31
<b>COUNTY</b>		
Berkeley	1	24
Morgan	2	27
Jefferson	3	28

Source: Region 9 Community-Level [Building Exposure](#) Table

- Highest number of primary structures in the 1% floodplain:
  - Bath (incorporated)
  - Berkeley County Unincorporated (unincorporated area)
  - Jefferson County (countywide)
  
- Highest building dollar exposure in the 1% floodplain:
  - Martinsburg (incorporated)
  - Jefferson County Unincorporated (unincorporated)
  - Berkeley County (countywide)

**Table BE-2. Building Dollar Exposure: Residential versus Non-Residential**

Community	RESIDENTIAL				COMMERCIAL NON-RESIDENTIAL		OTHER NON-RESIDENTIAL		TOTAL BUILDING VALUE		
Community Name	#	% Count	Value (\$)	% Value	#	Value (\$)	#	Value (\$)	#	Value (\$)	Rank <sup>1</sup>
Berkeley County*	619	97%	\$50,593K	96%	12	\$1,965K	4	\$373K	635	\$52,931K	3
Martinsburg	51	68%	\$6,124K	10%	21	\$55,166K	3	\$1,035K	75	\$62,324K	1
<b>BERKELEY</b>	<b>670</b>	<b>94%</b>	<b>\$56,717K</b>	<b>49%</b>	<b>33</b>	<b>\$57,131K</b>	<b>7</b>	<b>\$1,408K</b>	<b>710</b>	<b>\$115,255K</b>	<b>1</b>
Bolivar	3	100%	\$251K	100%	0	\$0K	0	\$0K	3	\$251K	8
Charles Town	23	85%	\$2,073K	65%	4	\$1,107K	0	\$0K	27	\$3,180K	6
Harpers Ferry	6	19%	\$722K	10%	25	\$6,243K	0	\$0K	31	\$6,965K	4
Jefferson County*	505	96%	\$60,022K	85%	14	\$4,889K	7	\$5,349K	526	\$70,260K	1
Ranson	79	99%	\$5,206K	98%	0	\$0K	1	\$100K	80	\$5,305K	5
Shepherdstown	38	58%	\$7,873K	42%	24	\$6,057K	4	\$4,794K	66	\$18,724K	3
<b>JEFFERSON</b>	<b>654</b>	<b>89%</b>	<b>\$76,146K</b>	<b>73%</b>	<b>67</b>	<b>\$18,295K</b>	<b>12</b>	<b>\$10,243K</b>	<b>733</b>	<b>\$104,685K</b>	<b>3</b>
Bath	64	50%	\$7,226K	21%	52	\$11,499K	13	\$16,499K	129	\$35,224K	2
Morgan County*	439	91%	\$35,347K	51%	38	\$11,135K	7	\$23,386K	484	\$69,867K	2
Paw Paw	16	53%	\$1,133K	41%	13	\$1,507K	1	\$130K	30	\$2,770K	7
<b>MORGAN</b>	<b>519</b>	<b>81%</b>	<b>\$43,705K</b>	<b>41%</b>	<b>103</b>	<b>\$24,141K</b>	<b>21</b>	<b>\$40,015K</b>	<b>643</b>	<b>\$107,862K</b>	<b>2</b>
<b>SUMMARY</b>	<b>1843</b>	<b>3</b>	<b>\$176,569K</b>	<b>54%</b>	<b>203</b>	<b>\$99,567K</b>	<b>40</b>	<b>\$51,666K</b>	<b>2086</b>	<b>\$327,802K</b>	

\* Unincorporated

\*\* Split Community

<sup>1</sup> Group Rank on Community Type: County, Unincorporated, Incorporated

Region 9 Tabular Community-Level Report: <https://data.wvgis.wvu.edu/pub/RA/State/CL/> (Building Exposure)

**Table BE-3. Building Dollar Exposure Breakdown by Single Family**

Community		SINGLE FAMILY HOME		MANUFACTURED (MOBILE) HOME			SINGLE FAMILY TOTAL		
Community Name	County	Count	Value (\$)	Count	% Count	Value (\$)	Count	Value (\$)	Group Rank <sup>1</sup>
Berkeley County*	BERKELEY	404	\$45,448K	206	34%	\$3,947K	610	\$49,396K	2
Martinsburg	BERKELEY	41	\$4,507K	0	0%	\$0K	41	\$4,507K	4
	<b>BERKELEY</b>	<b>445</b>	<b>\$49,956K</b>	<b>206</b>	<b>32%</b>	<b>\$3,947K</b>	<b>651</b>	<b>\$53,903K</b>	<b>2</b>
Bolivar	JEFFERSON	3	\$251K	0	0%	\$0K	3	\$251K	8
Charles Town	JEFFERSON	21	\$1,991K	0	0%	\$0K	21	\$1,991K	5
Harpers Ferry	JEFFERSON	6	\$722K	0	0%	\$0K	6	\$722K	7
Jefferson County*	JEFFERSON	421	\$56,946K	77	15%	\$2,311K	498	\$59,257K	1
Ranson	JEFFERSON	65	\$4,494K	10	13%	\$351K	75	\$4,845K	3
Shepherdstown	JEFFERSON	35	\$7,191K	0	0%	\$0K	35	\$7,191K	1
	<b>JEFFERSON</b>	<b>551</b>	<b>\$71,595K</b>	<b>87</b>	<b>14%</b>	<b>\$2,663K</b>	<b>638</b>	<b>\$74,257K</b>	<b>1</b>
Bath	MORGAN	52	\$5,542K	3	5%	\$53K	55	\$5,595K	2
Morgan County*	MORGAN	367	\$33,782K	66	15%	\$1,211K	433	\$34,993K	3
Paw Paw	MORGAN	12	\$806K	0	0%	\$0K	12	\$806K	6
	<b>MORGAN</b>	<b>431</b>	<b>\$40,130K</b>	<b>69</b>	<b>14%</b>	<b>\$1,265K</b>	<b>500</b>	<b>\$41,394K</b>	<b>3</b>
<b>SUMMARY</b>		<b>1,427</b>	<b>\$161,680K</b>	<b>362</b>	<b>20%</b>	<b>\$7,875K</b>	<b>1,789</b>	<b>\$169,555K</b>	

\* Unincorporated

\*\* Split Community

<sup>1</sup> Group Rank on Community Type: County, Unincorporated, Incorporated

Region 9 Tabular Community-Level Report: <https://data.wvgis.wvu.edu/pub/RA/State/CL/> (Building Exposure)

**Table BE-4. Building Year, Building Value, Building Value Single Family Dwelling (RES 1 occupancy class)**

Community Name	County	Average Building Year	Median Building Year	Average Building Value	Median Building Value	Average Building Value RES 1	Median Building Value RES 1
Berkeley County*	BERKELEY	1969.6	1978	\$83K	\$57K	\$82K	\$56K
Martinsburg	BERKELEY	1961.9	1970	\$831K	\$103K	\$120K	\$103K
	<b>BERKELEY</b>	<b>1968.7</b>	<b>1977</b>	<b>\$162K</b>	<b>\$62K</b>	<b>\$112K</b>	<b>\$96K</b>
Jefferson County*	JEFFERSON	1958.3	1973	\$134K	\$93K	\$119K	\$94K
Bolivar	JEFFERSON	1878	1870	\$84K	\$86K	\$84K	\$86K
Charles Town	JEFFERSON	1938.2	1920	\$118K	\$60K	\$90K	\$55K
Harpers Ferry	JEFFERSON	1848.5	1830	\$225K	\$188K	\$120K	\$110K
Ranson	JEFFERSON	1970.5	1977	\$66K	\$63K	\$66K	\$63K
Shepherdstown	JEFFERSON	1886.5	1900	\$284K	\$207K	\$207K	\$173K
	<b>JEFFERSON</b>	<b>1947.4</b>	<b>1969</b>	<b>\$143K</b>	<b>\$96K</b>	<b>\$130K</b>	<b>\$101K</b>
Morgan County*	MORGAN	1971	1975	\$144K	\$70K	\$81K	\$65K
Bath	MORGAN	1941.1	1940	\$273K	\$113K	\$113K	\$92K
Paw Paw	MORGAN	1946.9	1941	\$92K	\$66K	\$71K	\$66K
	<b>MORGAN</b>	<b>1963.7</b>	<b>1968</b>	<b>\$168K</b>	<b>\$79K</b>	<b>\$93K</b>	<b>\$80K</b>
<b>State Statistics</b>		<b>1959.1</b>	<b>1960</b>	<b>\$91K</b>	<b>\$37K</b>	<b>\$57K</b>	<b>\$44K</b>

\* Unincorporated

Region 9 Tabular Community-Level Report: <https://data.wvgis.wvu.edu/pub/RA/State/CL/> (FIRM)

**Table BE-5. Initial FIRM Effective Date, Pre-FIRM/Post-FIRM percentages**

CID	Community Name	County	Initial FIRM Effective Date	Total Building Count	% Pre-FIRM	% Post-FIRM	% Unknown
540282	Berkeley County*	BERKELEY	8/4/1988	635	58%	32%	10%
540006	Martinsburg	BERKELEY	12/18/1979	75	79%	21%	0%
		<b>BERKELEY</b>		<b>710</b>	<b>60%</b>	<b>31%</b>	<b>9%</b>
540030	Bolivar	JEFFERSON	12/18/2009	3	100%	0%	0%
540066	Charles Town	JEFFERSON	12/4/1979	27	74%	22%	4%
540067	Harpers Ferry	JEFFERSON	8/24/1984	31	100%	0%	0%
540065	Jefferson County*	JEFFERSON	10/15/1980	526	59%	36%	5%
540068	Ranson	JEFFERSON	6/15/1979	80	66%	33%	1%
540069	Shepherdstown	JEFFERSON	3/18/1980	66	85%	8%	8%
		<b>JEFFERSON</b>		<b>733</b>	<b>64%</b>	<b>31%</b>	<b>5%</b>
540005	Bath	MORGAN	1/2/1980	129	88%	12%	0%
540144	Morgan County*	MORGAN	7/1/1987	484	65%	33%	2%
540252	Paw Paw	MORGAN	11/2/1984	30	90%	10%	0%
		<b>MORGAN</b>		<b>643</b>	<b>71%</b>	<b>28%</b>	<b>2%</b>

\* Unincorporated

Region 9 Tabular Community-Level Report: <https://data.wvgis.wvu.edu/pub/RA/State/CL/> (FIRM)

**Verification - Tabular Report:** Building Dollar Exposure for structures located in the high-risk 1%-annual-chance (100-yr) floodplain can be viewed and verified for each community by linking to the risk assessment [tabular report](#) (Excel spreadsheet). To verify the geographic location of each high-valued building, the Excel table provides map view links. Refine the search by filtering residential and non-residential records.

**Table BE-6A.** Highly valued buildings in 1% Floodplain for **Berkeley County**. Source of Building Replacement Values: Assessment Records, Neighborhood Values, BRIM Insurance, RS Means, or any other available sources. Which high-valued-structures are vulnerable to riverine flooding?

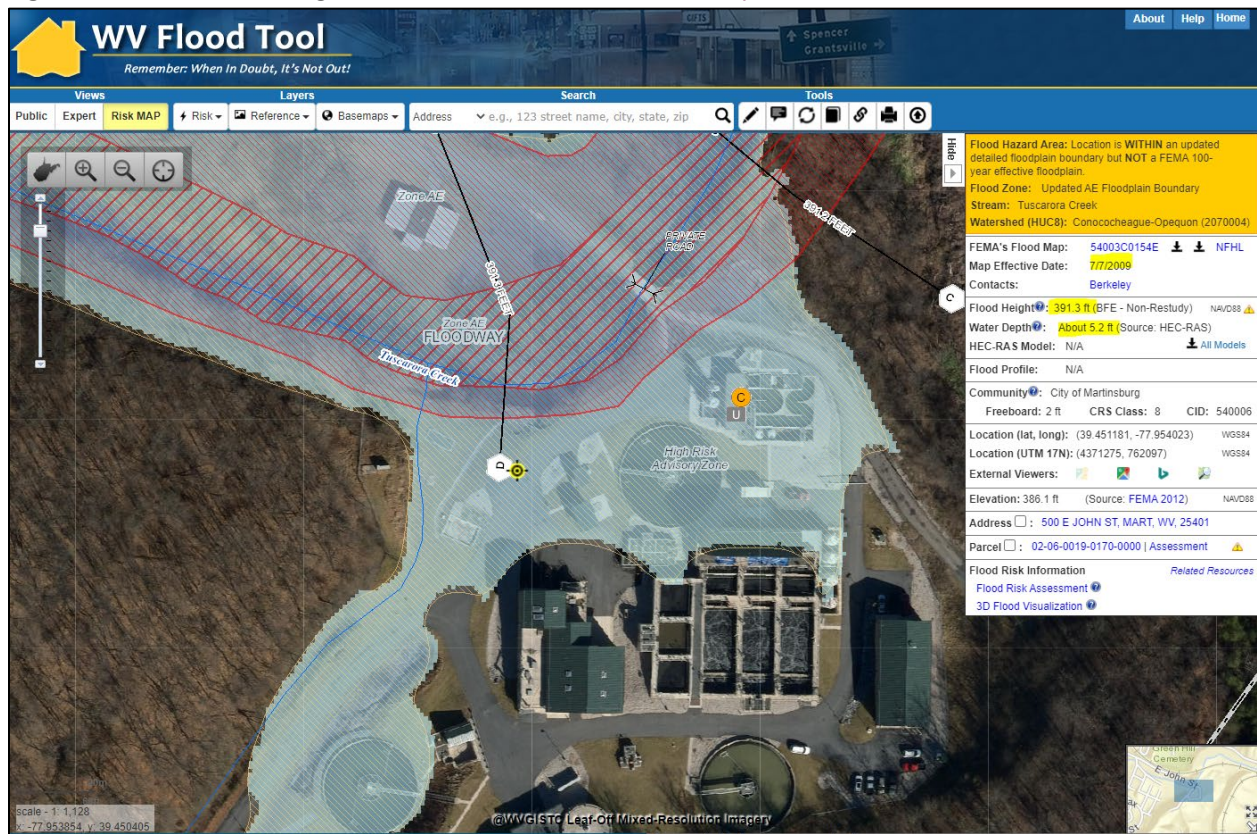
Community Name	WV Flood Tool Link	Owner Name or Building ID	Hazard Occupancy Code	General Occupancy	Building Appraisal
Martinsburg	<a href="#">FT</a>	<a href="#">Martinsburg Treatment Plant</a>	COM4	Commercial	\$ 51,776,300
Martinsburg	<a href="#">FT</a>	COUNTY COUNCIL OF BERKELEY COUNTY WEST VIRGINIA	COM2	Commercial	\$ 945,800
Berkeley County*	<a href="#">FT</a>	SHEPHERDS COVE LLC	RES1	Residential	\$ 851,200
Martinsburg	<a href="#">FT</a>	CITY OF MARTINSBURG	GOV1	Other	\$ 785,600
Berkeley County*	<a href="#">FT</a>	02-04-0003-0049-0000_1340	RES1	Residential	\$ 714,000
Berkeley County*	<a href="#">FT</a>	02-02-0017-0040-0000_1210	RES1	Residential	\$ 638,100
Martinsburg	<a href="#">FT</a>	MAGYARI PROPERTIES LLC	IND2	Commercial	\$ 573,200
Berkeley County*	<a href="#">FT</a>	02-02-005A-0055-0000_315	RES1	Residential	\$ 559,900
Berkeley County*	<a href="#">FT</a>	BUNKER HILL ANTIQUES ASSOCIATES LLC	COM1	Commercial	\$ 546,000
Martinsburg	<a href="#">FT</a>	CAPITAL MEATS INC	COM2	Commercial	\$ 498,000
Berkeley County*	<a href="#">FT</a>	02-08-0009-0001-0004_555	RES1	Residential	\$ 411,000
Berkeley County*	<a href="#">FT</a>	02-04-0003-0002-0000_413	RES1	Residential	\$ 399,500
Berkeley County*	<a href="#">FT</a>	02-02-0003-0075-0000_955	RES1	Residential	\$ 369,400
Berkeley County*	<a href="#">FT</a>	02-04-037M-0013-0000_197	RES1	Residential	\$ 346,300
Berkeley County*	<a href="#">FT</a>	LEATHERMAN LYNN EUGENE	COM1	Commercial	\$ 338,500
Berkeley County*	<a href="#">FT</a>	02-02-0003-0077-0000_1061	RES1	Residential	\$ 338,400
Berkeley County*	<a href="#">FT</a>	02-04-0040-0005-0003_8973	RES1	Residential	\$ 329,800
Berkeley County*	<a href="#">FT</a>	02-02-0010-0052-0001_21	RES1	Residential	\$ 314,000
Berkeley County*	<a href="#">FT</a>	02-02-0018-0003-0009_1147	RES1	Residential	\$ 313,700
Berkeley County*	<a href="#">FT</a>	02-02-0003-0119-0000_421	RES1	Residential	\$ 313,300
Berkeley County*	<a href="#">FT</a>	02-02-010M-0007-0000_18	RES1	Residential	\$ 302,800
Berkeley County*	<a href="#">FT</a>	02-02-0002-0058-0000_1433	RES1	Residential	\$ 301,500
Martinsburg	<a href="#">FT</a>	02-06-004D-0146-0000_331	RES3B	Residential	\$ 300,300

\* Unincorporated

Region 9 Tabular Building-Level Report Link: [https://data.wvgis.wvu.edu/pub/RA/Region9/BLRA/4\\_BldgDollarExposure](https://data.wvgis.wvu.edu/pub/RA/Region9/BLRA/4_BldgDollarExposure)



Figure BE-6B. Martinsburg Wastewater Treatment Plant. [Map link.](#)



A high-risk advisory floodplain was redelineated using newer 2012 elevation LiDAR data. In 2016, **Martinsburg's wastewater treatment plant** was revamped at a cost of \$53.5 million. Some structures of the wastewater treatment plant are in the high-risk advisory floodplain at a 1% (100-year) and 0.2% (500-year) estimated flood inundation depths of 5 feet and 10 feet, respectively.

New flood maps: An active flood study is being performed for this location which in the future will produce new effective flood maps and base flood elevations. If the natural grade changed when the new wastewater treatment plant was revamped, a newer topographic elevation source other than the 2012 LiDAR should be incorporated into the flood study update. In 2021 the USGS is setting up a task order for new LiDAR to be flown for the Eastern Panhandle which could be an updated topographic source.

Examples of mitigation measures for *utilities* include:

- Emergency response plan
- Barriers around key assets
- Elevated electrical equipment
- Emergency generators
- Bolted down chemical tanks

Online Resources:

- [EPA FLOOD RESILIENCE: A Basic Guide for Water and Wastewater Utilities](#)
- [Tips for Flood-Proofing Wastewater Treatment Plants](#)
- [Flood-Resistant Wastewater Treatment Plant Upgrades](#)

**Table BE-6C.** Highly valued buildings in 1% Floodplain for **Morgan County**. Which high-valued-structures are vulnerable to riverine flooding?

Community Name	WV Flood Tool Link	Owner Name or Building ID	Hazard Occupancy Code	General Occupancy	Building Appraisal
Morgan County*	<a href="#">FT</a>	BOARD OF EDUCATION	EDU1	Other	\$ 15,000,000
Bath	<a href="#">FT</a>	MORGAN CO BLDG COMM	GOV1	Other	\$ 10,591,500
Morgan County*	<a href="#">FT</a>	BOARD OF EDUCATION	EDU1	Other	\$ 6,210,000
Morgan County*	<a href="#">FT</a>	U S SILICA	IND4	Commercial	\$ 3,304,600
Morgan County*	<a href="#">FT</a>	BOARD OF EDUCATION	EDU1	Other	\$ 1,650,000
Bath	<a href="#">FT</a>	CATHOLIC CHURCH	REL1	Other	\$ 1,565,700
Bath	<a href="#">FT</a>	MORGAN ARTS COUNCIL INC	COM8	Commercial	\$ 1,482,300
Bath	<a href="#">FT</a>	CITIZENS NATIONAL BANK OF BERKELEY SPRINGS	COM5	Commercial	\$ 1,448,900
Morgan County*	<a href="#">FT</a>	RANKIN & ASSOCIATES LLC	COM8	Commercial	\$ 1,122,100
Bath	<a href="#">FT</a>	BERKELEY SPRINGS STATE PARK	COM8	Commercial	\$ 1,009,900
Morgan County*	<a href="#">FT</a>	DANIEL G KAMIN BERKELEY SPRINGS LLC	COM1	Commercial	\$ 934,900
Bath	<a href="#">FT</a>	THE COUNTRY INN OF BERKELEY SPRINGS LLC	RES4	Residential	\$ 931,600
Bath	<a href="#">FT</a>	MORGAN COUNTY COMMISSION (THE)	EDU1	Other	\$ 872,400
Bath	<a href="#">FT</a>	BOARD OF EDUCATION	EDU1	Other	\$ 702,900
Morgan County*	<a href="#">FT</a>	BERKELEY ON THE RUN LLC	COM2	Commercial	\$ 653,200
Bath	<a href="#">FT</a>	M E CHURCH TR	REL1	Other	\$ 615,900
Morgan County*	<a href="#">FT</a>	WARM SPRINGS PUBLIC SERVICE	COM4	Commercial	\$ 606,600
Bath	<a href="#">FT</a>	CHURCH OF CHRIST OF B S	REL1	Other	\$ 547,600
Morgan County*	<a href="#">FT</a>	33-08-002A-0059-0000_167	RES1	Residential	\$ 511,100
Paw Paw	<a href="#">FT</a>	ROGERS PROPERTIES LLC	COM1	Commercial	\$ 482,600
Morgan County*	<a href="#">FT</a>	33-01-0019-0029-0000_4581	RES1	Residential	\$ 448,900
Morgan County*	<a href="#">FT</a>	CITIZENS NATIONAL BANK OF BERKELEY SPRINGS	COM5	Commercial	\$ 439,100
Morgan County*	<a href="#">FT</a>	MCDONALDS CORP A DEL CORP	COM8	Commercial	\$ 409,800

\* Unincorporated

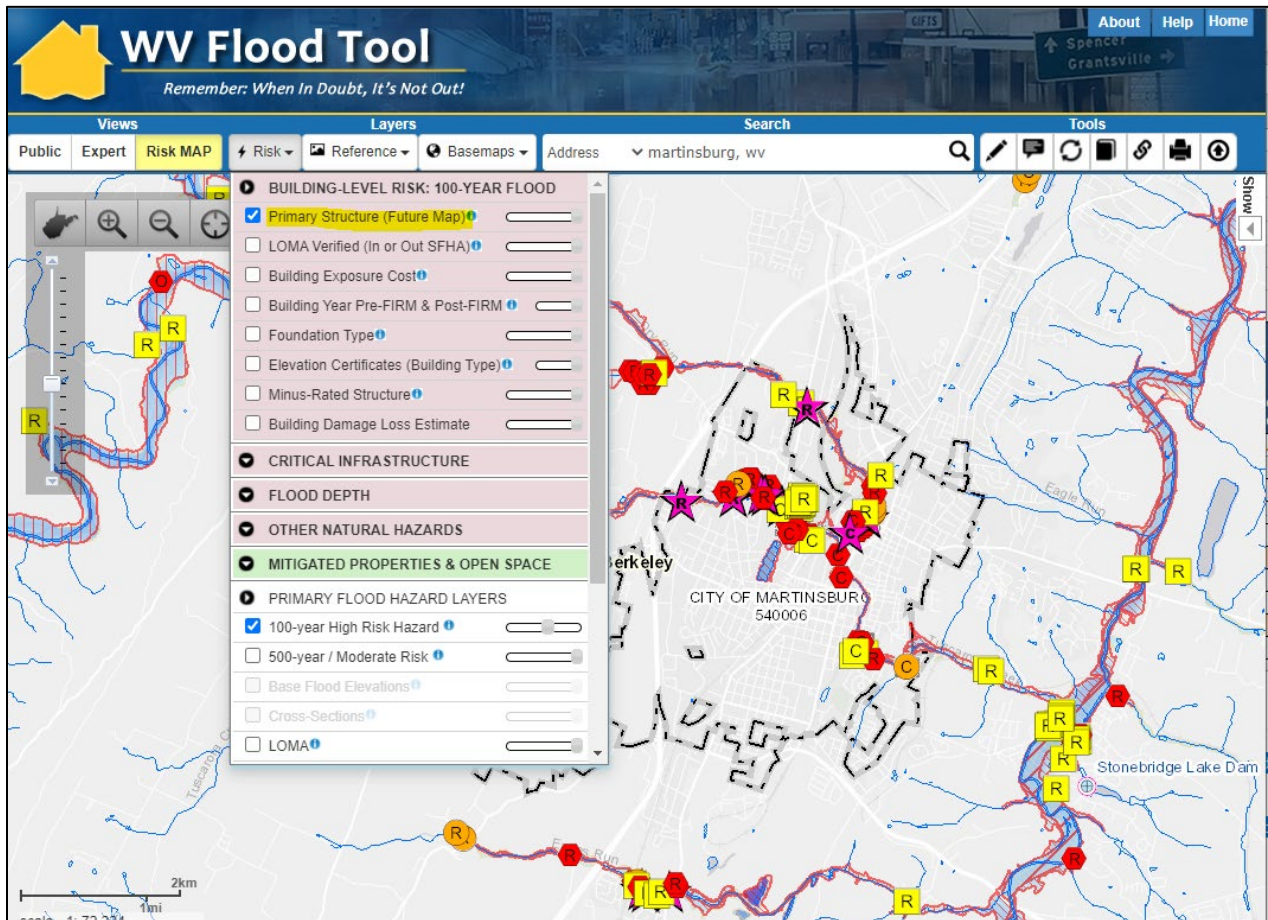
Region 9 Tabular Building-Level Report: [https://data.wvgis.wvu.edu/pub/RA/Region9/BLRA/4\\_BldgDollarExposure](https://data.wvgis.wvu.edu/pub/RA/Region9/BLRA/4_BldgDollarExposure)

Two high-value structures greater than \$10 million in or near Berkeley Springs (Bath) are the Berkeley Springs High School and Berkeley County Courthouse. The flood source is Warm Springs Run.








In the building-level dollar exposure report, data fields include Community Identifiers, Building Identifier, Address, Owner Name, Flood Zone designation, FIRM Status, Building Characteristics (year, occupancy, grade, foundation type, first floor height, area), Building Appraisal, Building Value Source, Depth Grid, Depth in Structure, Building Damage Percent, Building Loss Dollar Value, and Flood Tool Link.

**Verification - WV Flood Tool Risk MAP:** The **WV Flood Tool Risk Map View** should be used to view and verify inventories high-value buildings and other risk layers, such as the examples below of Martinsburg in Berkeley County and Berkeley Springs (Bath) in Morgan County. Figure BE-7A shows the primary structures default view for Residential, Commercial, and Non-Residential properties.

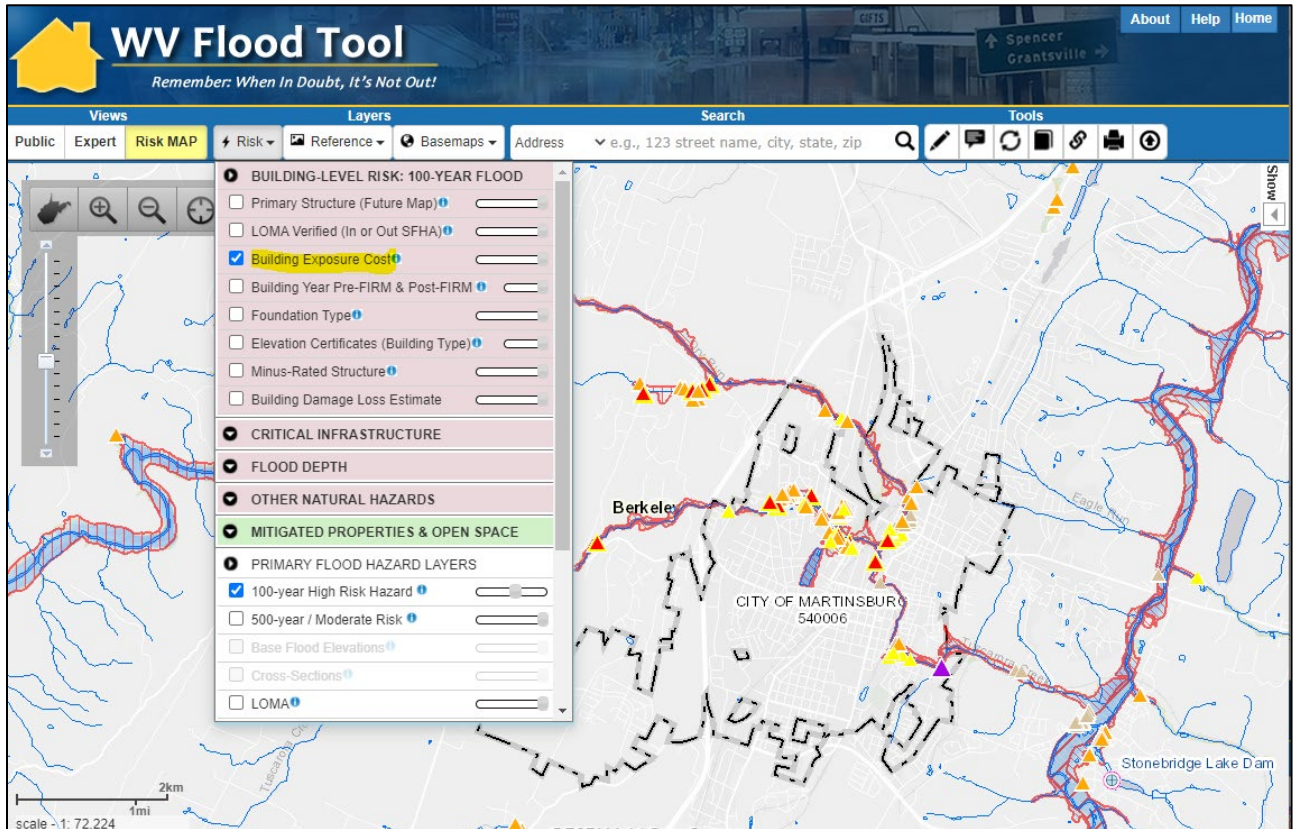
**Figure BE-7A.** Martinsburg's primary structures viewable on the [Risk MAP View](#) of the WV Flood Tool. Symbol letters indicate general occupancy (**R**esidential, **C**ommercial, **O**ther Non-Residential).



WV Flood Tool Map Link: <https://mapwv.gov/flood/map/?wkid=102100&x=-8679568&y=4788783&l=7&v=2>

Future Map Condition		Land Use Category	
	Mapped Out SFHA		Residential
	Mapped In SFHA		Commercial
	Remains Same		Other
	Remains Same Floodway		

**Figure BE-7B.** Martinsburg's high-value building floodplain structures viewable on the Risk MAP View of the WV Flood Tool. Symbol letters indicate building exposure cost.



WV Flood Tool Map Link: <https://mapwv.gov/flood/map/?wkid=102100&x=-8679568&y=4788783&l=7&v=2>

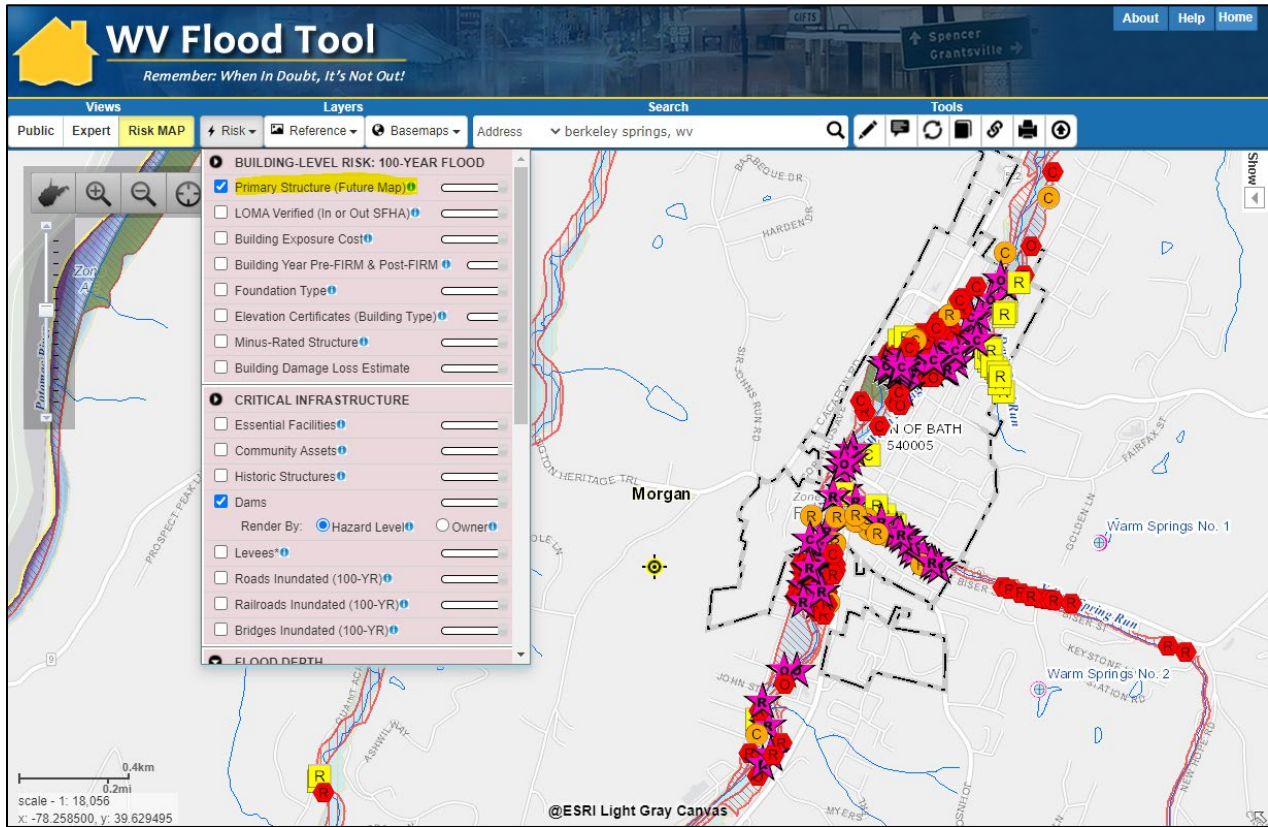
**Legend for General Occupancy Class**

- R – Residential** (homes, apartments, group quarters)
- C – Commercial** (industrial)
- O – Other Non-Residential** (schools, churches, govt.)

**Legend for Building Exposure Cost**

- | Building Exposure Cost |                     |
|------------------------|---------------------|
| ▲                      | >\$1M               |
| ▲                      | \$250,000-\$1M      |
| ▲                      | \$100,000-\$250,000 |
| ▲                      | \$50,000-\$100,000  |
| ▲                      | 0-\$50,000          |

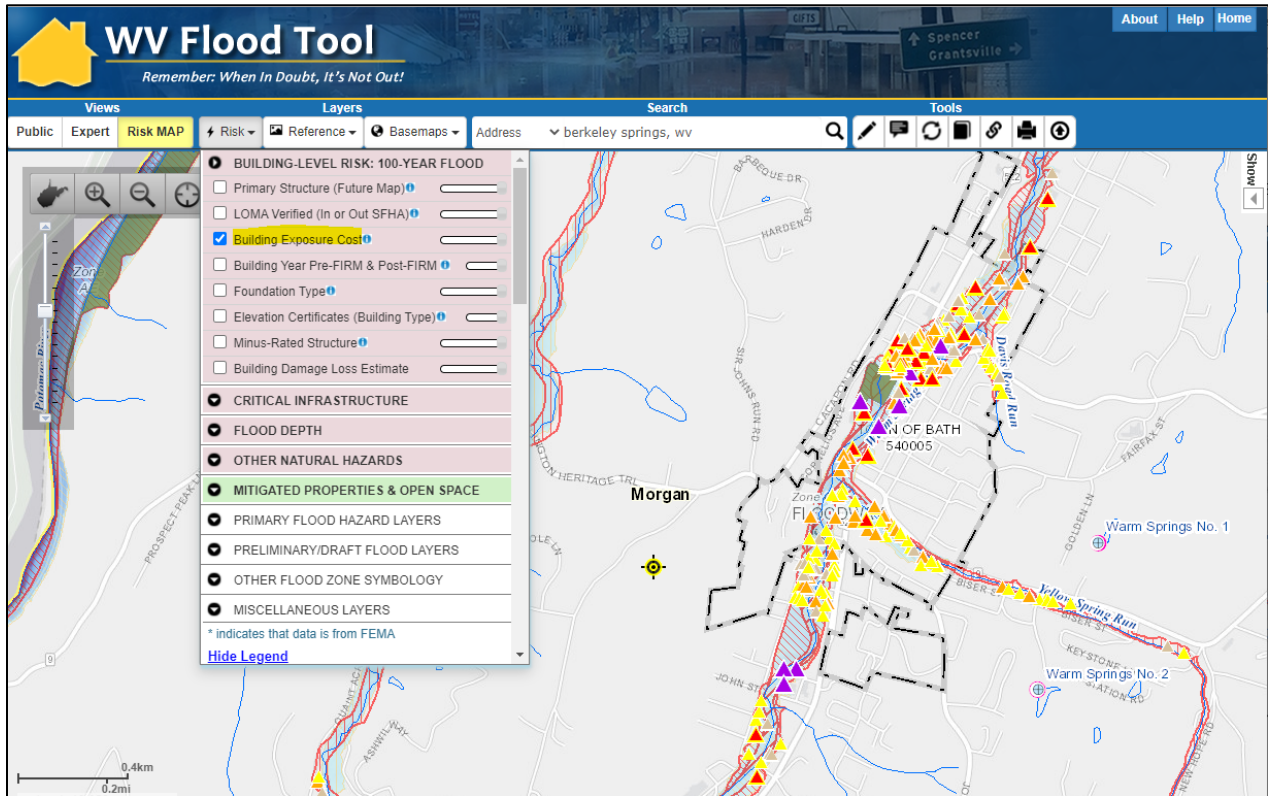
Figure BE-7C. Bath's primary structures viewable on the Risk MAP View of the WV Flood Tool. Symbol letters indicate general occupancy (Residential, Commercial, Other Non-Residential).



WV Flood Tool Map Link: <https://mapwv.gov/flood/map/?wkid=102100&x=-8708553&y=4811397&l=9&v=2>

Future Map Condition	Land Use Category
Mapped Out SFHA	Residential
Mapped In SFHA	Commercial
Remains Same	Other
Remains Same Floodway	

**Figure BE-7D.** Bath's high-value building floodplain structures viewable on the [Risk MAP View](#) of the WV Flood Tool. Symbol letters indicate building exposure cost.



WV Flood Tool Map Link: <https://mapwv.gov/flood/map/?wkid=102100&x=-8708553&y=4811397&l=9&v=2>

**Legend for General Occupancy Class**

<b>R</b>	<b>Residential</b> (homes, apartments, group quarters)
<b>C</b>	<b>Commercial</b> (industrial)
<b>O</b>	<b>Other Non-Residential</b> (schools, churches, govt.)

**Legend for Building Exposure Cost**

Building Exposure Cost	
▲	>\$1M
▲	\$250,000-\$1M
▲	\$100,000-\$250,000
▲	\$50,000-\$100,000
▲	0-\$50,000

## RESOURCES:

Reference Tables: [Occupancy Classes](#) | [Foundation Types](#)

Flood Risk Methodology: [WV Flood Risk Assessment](#) | [FEMA's Hazus Loss Estimation](#)

WV Flood Tool: [Resources Page](#) | [Glossary](#)

\* \* \*

## Statewide Risk Assessment Contacts:

Statewide Risk Assessment Technical Support, WVU GIS Technical Center

- Kurt Donaldson ([kurt.donaldson@mail.wvu.edu](mailto:kurt.donaldson@mail.wvu.edu))
- Maneesh Sharma ([maneesh.sharma@mail.wvu.edu](mailto:maneesh.sharma@mail.wvu.edu))

State NFIP Coordinator, WV Office of the Insurance Commissioner

- Chuck Grishaber ([Charles.C.Grishaber@wv.gov](mailto:Charles.C.Grishaber@wv.gov))

WV Emergency Management Division

- Brian Penix, State Hazard Mitigation ([Brian.M.Penix@wv.gov](mailto:Brian.M.Penix@wv.gov))
- Kevin Sneed, CTP Coordinator ([Kevin.L.Sneed@wv.gov](mailto:Kevin.L.Sneed@wv.gov))
- Nuvia E. Villamizar, GIS Manager ([nuvia.e.villamizar@wv.gov](mailto:nuvia.e.villamizar@wv.gov))