



West Virginia Water Science Center

Flood Plan – 2011 Water Year

Internal Draft Document

**U.S. Department of the Interior
U.S. Geological Survey**

March 2011

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Introduction

The Flood Plan documents the advance planning for flood operations, familiarizes employees with changes in management, and provides a reference of needed information during a flood event. The Flood Plan is not intended as a rigid set of rules and procedures because no two flood events are the same, and a flexible system that changes with flood conditions is considered best for collection of information.

Employee Duties

Director

The Director assists the Flood Coordinator with communications in executing the Flood Plan and provides staff for collection of flood data. The Director will locate assistance from outside the Water Science Center (WSC) when significant hydrologic events overwhelm the available manpower.

Hugh Bevans is the Director.

Flood Coordinator

The Flood Coordinator is responsible for managing collection of flood data and communicating results. The Flood Coordinator will communicate with the Director, Flood Personnel, WSC staff, WSC staff in adjacent states, and federal and state agencies. The Flood Coordinator may assign duties to other personnel as conditions warrant, including those designated as the responsibility of the Flood Coordinator.

Ron Evaldi is the Flood Coordinator.

Flood Personnel

Flood Personnel are WSC employees under the direction of the Flood Coordinator. All employees of the WSC are potentially available for assignments during a flood.

Communications and Documentation

The Flood Coordinator will contact Flood Personnel as necessary to assign duties. Flood Personnel will contact the Flood Coordinator at a minimum after each measurement when able, randomly when significant observations warrant, and when the workday ends.

Communications by telephone is preferred when away from the office, but text messaging and electronic mail may be acceptable. Communicating with a cellular

telephone is favored, a land-line phone using the Federal Calling Card is acceptable, and a call charged to motel-room billing is appropriate when necessary.

The Flood Coordinator will communicate flood information to external parties. No other WSC employee will “predict”, “report” or “give out” expected flood crest or time of crest to news reporters, the general public, public safety officers, or other agencies without approval of the Flood Coordinator.

Selected Phone Numbers

AGENCY	CONTACT PERSON	TELEPHONE NUMBER
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West Virginia Division of Homeland Security and Emergency Management (DHSEM)		(304) 558-5380
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West Virginia Department of Transportation (for highway status)		1-877-982-7623 1-877-WVA-ROAD or 304-558-2889
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National Weather Service (NWS)	John Sikora,	(304) 746-0189
NWS Special Unlisted Media Line		(304) 746-0190
NWS for public contacts		(304) 746-0180

U.S. Army Corp of Engineers(USACE)		
Huntington District	Tim Curran	(304) 529-5666
(All WV except Monongahela and Potomac basins)		
Pittsburgh District	Bob Yue	(412) 395-7351
(Monongahela basin)		
Baltimore District	Stan Brua,	(410) 962-4894
(Potomac basin)		

U.S. Geological Survey (USGS) Maryland WSC		
Baltimore	Edward Doheny	(410) 238-4235
Frostburg	James Jeffries	(301) 687-0919 Ext. 12

USGS Pennsylvania WSC		
Pittsburgh	Clinton Hittle	(412) 490-3800

USGS Virginia WSC		
Richmond	Shaun Wicklein	(804) 261-2605
Marion	Mike Eckenwiler	(276) 783-6191 Ext. 21
		or 1-800-625-6127

USGS West Virginia WSC	office	(304) 347-5130 fax (304) 347-5133
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EMPLOYEE	OFFICE EXTENSION	TELEPHONE NUMBER
Hugh Bevans	office X223	cell (304) 590-1274
Ron Evaldi	office X239	cell (304) 590-3533
John Adkins	office X286	
Mark Board	office X287	cell (304) 590-1357
Fred Brogan	office X340	cell (304) 542-3507

EMPLOYEE	OFFICE EXTENSION	TELEPHONE NUMBER
Doug Chambers	office X231	cell (304) 590-1276
Gary Crosby	office X240	cell (304) 542-2426
Scott Flynn.....	office X271	cell (304) 542-2594
Allison Garrison.....	office X222	
Michelle Kibbe	office X221	
Terry Messinger.....	office X270	
Melvin Mathes	office X225	
Katherine Paybins	office X236	
Lary Rogers.....	office X245	cell (304) 542-3199
Britt Stock	office X271	cell (304) 542-3979
James Scott	office X247	cell (304) 542-2769
Jeremy White	office X246	cell (304) 542-0095
Jeff Wiley.....	office X234	
Jessica Wood.....	office X233	cell (304) 590-4805

Phone Numbers of Restricted Gage Telemarks

TELEMARK INSTRUCTIONS

Several of the voice telemarks (talking telemarks) give the ID, time, stage, precip., etc. without prompting. Some of the units give the ID and then say, “enter command”. At this time, if you use a touch-tone phone, you can enter a “0” and the last data stored will be revealed. If you wish to scan back, enter a “7” and the next oldest data is revealed. Enter “7” as far back as you wish. To disconnect from the system, enter a “#” on your phone. **NOTE: These numbers are not to be given out to the public or other agencies --have requestor contact appropriate COE contact (see page 3).**

LOCATION	STATION NUMBER	STREAM	TELEPHONE NUMBER
Albright, WV	03070260	Cheat	304-329-4254
Alderson, WV	03183500	Greenbrier	304-445-3105
Alton, WV.....	03052120	Buckhannon	304-924-5637
Baileysville, WV.....	03202400	Guyandotte.....	304-732-7396
Beech Fork Outflow.....	03207057	Beech Fork.....	304-522-6581
Belington, WV	03051000	Tygart Valley	304-823-2401
Belva, WV	03192000	Gauley	304-632-2071
Bemis, WV.....	03068000	Shavers Fork	304-636-9121
Bowden, WV	03068800	Shavers Fork	304-637-5705
Bradshaw, WV (Beartown)....	03212980	Dry Fork.....	304-967-5745
Branchland, WV	03204000	Guyandotte.....	304-778-7010
Buckeye, WV.....	03182500	Greenbrier	304-799-4222
Buckhannon, WV.....	03052450	Buckhannon	304-472-5651
Burnsville, WV	03151600	Little Kanawha.....	304-853-2570
Charleston, WV (Upper).....	03197990	Kanawha	304-346-2701
Charleston, WV (Lower)	03198000	Kanawha	304-744-3701

<u>LOCATION</u>	<u>STATION NUMBER</u>	<u>STREAM</u>	<u>TELEPHONE NUMBER</u>
Cheat Bridge, WV	03067510.....	Shavers Fork	304-456-5317
Clear Fork, WV	03202750.....	Guyandotte	304-682-5385
Colfax, WV	03057000.....	Tygart Valley	304-366-3177
Craigsville, WV	03189100.....	Gauley	304-742-6236
Davis, WV	03066000.....	Blackwater	304-259-5171
Dunlow, WV	03206600.....	E. Fk. Twelvepole Cr.	304-385-4190
East Lynn Outflow	03206790.....	E. Fk. Twelvepole Cr.	304-849-4823
Elizabeth, WV (Palestine).....	03155000.....	Little Kanawha.....	304-275-4320
Elm Grove, WV	03112000.....	Wheeling Creek.....	304-242-0630
Enterprise, WV	03061000.....	West Fork	304-592-0720
Frametown, WV	03196600.....	Elk	304-364-2471
Franklin, WV	01605500.....	So. Br. Potomac	304-358-7996
Gladwin, WV	03064800.....	Dry Fork.....	304-886-3816
Glenville, WV	03152000.....	Little Kanawha.....	304-462-8225
Guardian, WV	03195100.....	Right Fork Holly	304-847-2778
Headsville, WV	01604500.....	Patterson Creek	304-788-6385
Hendricks, WV	03065000.....	Dry Fork	304-478-6212
Hilldale, WV	03184000.....	Greenbrier	304-466-0913
Hinton, WV	03184500.....	New River	304-466-3710
Huntington, WV	03206000.....	Ohio.....	740-894-5721
Kanawha Falls, WV	03193000.....	Kanawha.....	304-779-2753
Litwar, WV	03213000.....	Tug Fork.....	304-938-3779
Logan, WV	03203600.....	Guyandotte	304-752-0247
Man, WV	03203000.....	Guyandotte	304-583-2084
Marietta, Ohio	03150800.....	Ohio.....	740-373-0548
Martinsburg, WV	01616500.....	Opequon Creek	304-263-2475
Millville, WV	01636500.....	Shenandoah River	304-535-6621
Moorefield, WV	01608000.....	S. Fk. S. Br. Potomac	304-434-2801
Mount Clare, WV	03058975.....	West Fork.....	304-624-5749
Mount Lookout, WV	03190400.....	Meadow.....	304-872-2315
Parkersburg, WV	03151000.....	Ohio.....	*304-428-8834
Parsons, WV	03069500.....	Cheat	304-478-8671
Petersburg, WV	01606500.....	S. Br. Potomac	304-257-1066
Pipestem, WV	03179000.....	Bluestone.....	304-466-1626
Point Pleasant, WV	03201500.....	Ohio.....	304-675-5352
Queen Shoals, WV	03197000.....	Elk	304-548-5264
R. D. Bailey Outflow	03202915.....	Guyandotte	304-664-2114
Replete, WV	03195250.....	Left Fork Holly	304-493-6483
Rockville, WV	03070500.....	Big Sandy Creek	304-379-4810
Springfield, WV	01608500.....	S. Br. Potomac	304-822-3670
Summersville Lake	03189590.....	Gauley	304-872-6228
Sutton Outflow	03195500.....	Elk	304-765-7956
Sutton Lake	03195400.....	Elk	304-765-7733
Thurmond, WV	03185400.....	New	304-465-0493
Tornado, WV	03200500.....	Coal	304-722-2591

LOCATION	STATION NUMBER	STREAM	TELEPHONE NUMBER
Tygart Outflow	03056000	Tygart Valley	304-265-5916
Walkersville, WV	03057300	West Fork	304-452-8801
Wayne, WV	03207020	Twelvepole Creek	304-272-5195
Webster Springs, WV	03194700	Elk	304-847-5532
Welch, WV	03212750	Tug Fork	304-436-4643
Weston, WV	03058020	West Fork	304-269-4130
Wildcat, WV	03151400	Little Kanawha	304-765-2411
Williamson, WV	03213700	Tug Fork	606-237-6372
Winfield, WV	03201305	Kanawha	304-586-9817

* Phone number may be password protected during floods due to high usage.

Phone Numbers of Selected Motels

CITY/TOWN	MOTEL	TELEPHONE NUMBER
BARTOW	Hermitage	456-4808
BEAVER (see Beckley)	Sleep Inn	255-4222
BECKLEY	Best Western	252-0671
	Comfort Inn	255-2161
	Sleep Inn	255-4222
	Econo Lodge	877-6455
	Super 8	253-0802
BERKELEY SPRINGS	Best Western	258-9400
BRIDGEPORT (Clarksburg)	Super 8	842-7381
BUCKHANNON	Hampton Inn	473-0900
CHARLESTON	Ramada Inn	744-4641
	Red Roof Inn	757-6392
	Super 8	345-9779
CLARKSBURG	Knights Inn	842-7115
	Sleep Inn	842-1919
DAVIS	Canaan State Park	866-4121
	Best Western	259-5245
	Budget Host	259-5551
ELKINS	Best Western	636-7711
	Econo Lodge	636-5311
	Super 8	636-6500
	Motor Lodge	636-1400
	Days Inn	637-4667
	Holiday Inn Express	630-2266
	Hampton Inn	630-7500
FAIRMONT	Comfort Inn	367-1370
	Red Roof Inn	366-6800
	Days Inn	366-5995
FAYETTEVILLE	Comfort Inn	574-3443
FRANKLIN	Thompsons	358-2331
GALLIPOLIS (OH)	Super 8	740-446-8080

GILBERT	Compton Inn	664-2238
<u>CITY/TOWN</u>	<u>MOTEL.....</u>	<u>TELEPHONE NUMBER</u>
GLENVILLE	Best Western (nr Prison)	462-5511
	Conrad Motel	462-7316
HARRISONBURG (VA).....	Days Inn	703-433-9353
	Sheraton	703-433-2521
INEZ (KY)	Inez Motel	606-298-7111
JANE LEW	Wilderness Plantation Inn	884-7806
LA VALE, MD	Comfort Inn.....	301-729-6400
	Super 8	301-729-6265
LEWISBURG	Holiday Inn Express.....	645-5750
	Embassy Inn	645-7070
	Brier Inn	645-7722
	Super 8	647-3188
	Hampton Inn	645-7300
LOGAN.....	Super 8	752-8787
	Holiday Inn Express.....	752-6495
LOUISA (KY).....	Best Western (Village Inn Motel).....	606-638-9417
	Super 8	606-638-7888
MAN	Colonial Inn.....	583-6138
MARION (VA).....	Best Western	540-783-3193
	Days Inn	540-783-2144
MARIETTA	Super 8	740-374-8888
	Econo Lodge	740-374-8481
	Comfort Inn.....	740-374-8190
MARLINTON.....	Marlinton Motor Inn	799-4711
	Inn at Snowshoe	572-2900
MARTINSBURG.....	Comfort Inn.....	263-6200
	Days Inn Shenandoah.....	263-1800
	Super 8	263-0801
	Leisure Inn (Best Western)	263-8810
MOOREFIELD.....	South Branch Inn	538-2033
MORGANTOWN.....	Ramada Inn	296-3431
	Holiday Inn	599-1680
	Coliseum Motel (Econolodge)	599-8181
	Comfort Inn.....	296-9364
	Super 8	296-4000
OAK HILL	Super 8	465-0010
PAINTSVILLE (KY).....	Heart of the Highlands	606-789-3551
PARKERSBURG.....	Motel 6	424-5100
	Best Western Inn	485-6551
	Holiday Inn	485-6200
	Red Roof Inn.....	485-1741
	Ramada Inn	422-5401

CITY/TOWN	MOTEL	TELEPHONE NUMBER
PETERSBURG	Hermitage Motel	257-1711
	Homestead Inn	257-1049
	K & J Motel	257-2789
	Fort Hill Motel	257-4717
PIKEVILLE (KY).....	Pikeville Motel.....	606-437-4068
PINEVILLE	Twin Falls	294-4000
PITTSBURGH, PA.....	Vista.....	412-281-3700
	Knights Inn (Bridgeville).....	412-221-8110
PRESTONBURG (KY)	Kentucky Motel	606-886-2387
PRINCETON	Econo Lodge (Old Holiday Inn)	425-8711
	Econo Lodge (Newer Motel)	487-6161
	Comfort Inn.....	487-6101
	Days Inn.....	425-8100
	Princeton Motel.....	425-8116
RICHWOOD	Four Seasons Lodge.....	846-4605
RIPLEY	McCoy's Best Western	372-9122
	Super 8	372-8880
ROMNEY	Kool Wink.....	822-3595
SENECA ROCKS (nr Cabins)	Smoke Hole Log Motel.....	257-4442
	Hedricks 4-U Motel	567-2111
SNOWSHOE	Quality Inn (Lodge at Snowhoe)	572-2900
ST. CLAIRSVILLE (OH) (nr Wheeling)	Super 8	740-695-1994
ST. MARYS.....	Best Western	684-2233
STEPHENS CITY (VA)	Comfort Inn.....	540-869-6500
(East of Wardensville, WV)		
SUMMERSVILLE	Super 8	872-4888
	Best Western	871-6900
	Sleep Inn	872-4500
	Hampton Inn	872-7100
	Comfort Inn.....	872-6500
SUTTON.....	Days Inn.....	765-5055
	Sutton Lane	765-7351
TOWSON (MD)	Embassy Suites	410-584-1400
WAYNESBURG (PA)	Super 8	724-627-8880
WESTON.....	Super 8	269-1086
WILLIAMSON (South) (KY)	Super 8	606-237-5898
WEBSTER SPRINGS	Mineral Springs Motel	847-5305

Project Alert

The Flood Coordinator will notify Headquarters of the event via Project Alert. Project Alert is used by the Division to inform the Director, the Department of the Interior (DOI), and Congress of critical water-related events and the USGS role in dealing with these events. To simplify Project Alert reporting, templates have been created and are available at http://water.usgs.gov/project_alert/alert_form.html.

The page includes a form for reporting events. Once you exit the template, electronic mail will be sent automatically to all Project Alert recipients. You should receive an acknowledgment of receipt of your message within 4 hours.

Domestic Emergency Notification System

The Flood Coordinator will use the Domestic Emergency Notification System (DENS) to immediately report a sudden catastrophic event, such as a dam break or toxic spill near public supply inlets, etc. Information received by DENS is transmitted to the Director, the Secretary of the Interior, and the President, as appropriate. Notification criteria for reporting to DENS can be checked at http://water.usgs.gov/usgs/project_alert/dens.html.

Required Documentation

The Flood Coordinator will maintain a flood file containing information requests, the responses, and identities of employees answering the inquiries for each flood event. The flood file will include tabulated peak stages, times, and dates for stations affected by the flood. (OSW Technical Memorandum 80.02)

Flood Operations and Procedures

The implementation of the flood plan occurs when flood conditions are present or are highly probable. Awareness of hydrologic conditions that can produce flooding is the responsibility of most WSC employees as part of routine operations and communication of potential flooding concerns is shared with coworkers, supervisors, and the Flood Coordinator. Many of the operations and procedures addressed herein are followed during ordinary high flows as a part of routine operations without full control of field operations becoming the responsibility of the Flood Coordinator;. WSC management will decide when full control of field operations becomes the responsibility of the Flood Coordinator, and when responsibilities are returned to routine supervision.

Pre-Flood Planning

Supervisors will make employees aware of the Flood Plan. The WSC will make pre-selected vehicles ready for quick assemblage of measuring and sampling equipment as a matter of routine operations. All gaging stations (except crest-stage gages or others without protective structures) will house copies of the Station Description including a Job Hazard Analysis, Rating Table, and Traffic Control Plan where applicable.

Flood Monitoring

Streamflow conditions at streamflow gaging stations are monitored using the Go2 script. The Flood Coordinator and WSC employees may need to run Go2 multiple times during a flood event to retrieve more up-to-date information. Daily plots from the GO2 script are available at \\Igsancewus001\goplots.

The National Weather Service provides text and graphic weather forecasts, and a link to radar images at <http://www.erh.noaa.gov/er/rlx/>.

The National Weather Service forecasts streamflow at selected streamflow gages. Forecasts can be located at <http://waterwatch.usgs.gov/?m=real&r=wv> by “clicking” on a forecast gaging station and selecting the “Forecast” tab.

The West Virginia Division of Homeland Security and Emergency Management present rainfall totals at sites located statewide. Precipitation totals can be located at <http://www.rainfall.net/index.php> by selecting different time periods using the “15 Min.”-to-“24 Hour” tabs and then placing the curser over the site.

Field Equipment Checklists

Station Information and Personal

Life jacket
Flood plan
Field station folder
Job Hazard Analysis document
Tool box
Traffic Control Plan
Special keys
Waders and hip boots
Safety signs, cones, and flares
Shovel
Pad, pencil, and note forms
First-aid kit
Cellular phone
Hard hat & gloves
Headlight with batteries
Wet-weather clothing
Thermometers

Flood-recording

Hand or string level and string
Flood stage markers (flagging tape, crayons, nails, stakes, etc.)

Gage Maintenance

Lap-top computer
Metallic tape
12-volt battery
Spare DCP equipment
Spare data loggers
Spare encoder
Spare antenna

Acoustic Miscellaneous

Range finder
Thermometer
Compact flash card / USB stick
ADCP field notes
Vendor-supplied tools
Salinity/Conductivity meter
Wind speed meter
Hand-held radios
Digital multimeter

AA Meter Measurement

Measurement forms
Current meters
Stop watches
Headsets and adapter
Reel and weight pins
Tagline
Wading rod
Bridge rig
Spare connector
Spare hanger
Handline
Cable cutters
Cable-car puller
Boat equipment
Steel tape & weight
Vertical angle indicator
PDA (if used, e.g. Trimble Recon)
Sounding and counter weights

Acoustic Measurement

ADCP with attachments: bolts and nuts
ADCP cables
Field computer with appropriate software
Screen shade/rain protection for computer
Spare 12V battery and wiring assembly
Power inverters / Power strips
Battery Charger
ADCP toolkit
Safety line for ADCP
ADCP mount
Marker buoys
Tethered boat and harness / RC boat
Long rope for tethered boat
Radio modems and cables
Small 12V-9A batteries and charger
Boat repair kit
Sea anchor
Weight for tether
DGPS and power / data cables
DGPS antenna and cables
Pole for DGPS antenna over ADCP
12V DC battery and spare fuses

Priority of Data Collection

The Flood Coordinator and WSC employees will use the Go2 script, weather and stream forecasts, rainfall totals, and tabulated data (pages 14-24) to determine priorities. Go2 is run daily for all continuous gages and plots are available at Igsancewus001\goplots. The tabulated data includes stations that do not transmit data electronically, like crest-stage stations, that are not included using the Go2 script. Employees should set their own priorities until the WSC determines the Flood Coordinator will oversee the operations.

The general priority of stations follow in order of importance follows:

- 1) Regular gage network (pages 16-24);
- 2) Crest-stage gage network (page 15); and,
- 3) Miscellaneous network (page 14).

Measurement Procedures During Rapidly Changing Stage

The brief discussion below is a summary of WSP 2175, pages 174-177.

Large Streams.— A measurement can be made in about 15-20 minutes using the three practices below. If the subsurface method of observing velocities is used, some vertical velocity curves will be needed later to establish coefficients to convert observed velocity to mean velocity. The standard measurement procedure can be modified in the following manner:

- 1) Use the 0.6-depth method. The 0.2-depth or subsurface method may be used if placing the meter at the 0.6-depth creates vertical angles requiring time-consuming corrections, or if the vertical angle increases because of drift collecting on the sounding line;
- 2) Reduce the velocity-observation time to about 20-30 seconds; and,
- 3) Reduce the number of sections taken to about 15-18.

Small Streams.—The time of the measurement is reduced using pre-measurement preparations and the practices listed below. For pre-preparations, the location of the observation verticals are determined and marked first. These marks are placed on the bridge rail, bridge deck, or cableway used for the discharge measurement. The elevation of the streambed, referred to gage datum, is determined at the observation verticals. The standard measurement procedure can be further modified in the following manner:

- 1) Use the 0.6-depth method. The 0.2-depth may be used if placing the meter at the 0.6-depth creates vertical angles requiring time-consuming corrections, or if the vertical angle increases because of drift collecting on the sounding line;
- 2) Reduce the velocity-observation time to about 20-30 seconds;
- 3) Reduce the number of sections taken to about 6-10; and,
- 4) Take readings of an auxiliary staff or tape-down every third velocity observation. (The recorder may not record the rapidly changing stage.)

Required Field Information

Flood Personnel should relay the following information to the Flood Coordinator as soon as possible:

- 1) Gage height (reset/recharge stage indicator);
- 2) Time;
- 3) Stream rising or falling;
- 4) Approximate gage height of discharge measurement and measured discharge;
- 5) Samples taken (if observer samples, communicate flood sampling techniques);
- 6) Time and gage height of recorded peak if it has occurred and high water mark (HWM) found and flagged (upstream and downstream);
- 7) Weather and road conditions; and,
- 8) Any significant information such as equipment or gage malfunctions, immediate needs, etc.

Post-Flood Operations

The Flood Coordinator will manage emergency rehabilitation of damaged stations and follow-up measurements to define the recession, close gaps in ratings, and define rating shifts. The Flood Coordinator will oversee the surveying of high-water marks at stations and flagging indirect measurement reaches.

Special Safety Concerns

Collection of data during flooding events can present some safety issues that are not routinely encountered:

- 1) Highways may be closed or impassible. The West Virginia Department of Transportation provides a status of highway conditions at <http://www.wvdot.com> or by calling 1-877-982-7623 (1-877-WVA-ROAD) or 304-558-2889.
- 2) Vehicles can be moved by water flowing over highways.
- 3) Bridges, cableways, or other structures can have foundations undermined resulting in failure.
- 4) Significant flowing debris (like a tree or an iceberg, most is underwater and unseen) can hang a cable suspending meters or sampling equipment. All reels are equipped with break-away cables, but serious recoil can occur. Be prepared to cut a cable should it become necessary and expect recoil.
- 5) Working on bridges has an additional hazard of drivers wishing to view the high water. Traffic Control Plans (pages 25-35) are followed to ensure the safety of the public and employees.

Miscellaneous Network

Station Number	Station Name	Need measurements at the indicated stage
374643080533401	Lick Creek near Sandstone, WV	Above 6.5 ft
374847080552401	Meadow Creek at Meadow Creek, WV	Above 3 ft
375041081054201	Piney Creek near McCreery, WV	Above 11 ft
375105081024801	Laurel Creek at Quinnimont, WV	Above 9 ft
375635081051601	Dunloup Creek near Thurmond, WV	Above 6 ft
375834081063201	Arbuckle Creek at Minden, WV	Above 3 ft
380351081045401	Wolf Creek near Fayetteville, WV	Above 1.5 ft
380427081053901	Marr Branch near Fayetteville, WV	Above 2 ft

Crest-Stage Gage Network

Station Number	Station Name	Need measurements at the indicated stage
01607510	Heavener Run near Brandywine	Above 9.5 ft
01609650	Little Cacapon River at Frenchburg	Above 7.5 ft
03052340	Mud Lick Run near Buckhannon	Above 8.5 ft
03069880	Buffalo Creek near Rowlesburg (long-term site)	Above 4 ft
03114650	Buffalo Run near Little (long-term site)	Above 6 ft
03155525	Goose Creek near Petroleum	Above 19 ft
03177100	Payne Branch near Oakvale	Above 5 ft
03184200	Big Creek near Bellepoint	Above 8 ft
03190100	Anglins Creek near Nallen	Above 7 ft
03193830	Gilmer Run near Marlinton	Above 6 ft
03201410	Poplar Fork at Teays	Above 11 ft
03202245	Marsh Fork at Maben	Above 10 ft
03202480	Brier Creek at Fanrock (long-term site)	Above 4 ft
03206450	Fourpole Creek near Huntington	Above 9 ft

Regular Gage Network

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Station number	Station name	DA, in mi ²	Period of record, in WY	Maximum of record		Maximum measurement			Measurement needed	Measure-ment facility	Prior-ity	Remarks
				GH	Dis-charge	GH	Dis-charge	Type				
01604500	Patterson Creek nr Headsville	211	1938 to date	12.20	16,000	12.85	14,500	CM	Above 10 ft	Bridge	Med.	Ensure side flow is included.
01605500	SB Potomac River at Franklin	179	1940 to 1969 1976 to date	22.58	44,000	22.58	44,000	SA	Above 4 ft FS 7 ft	Bridge	High	
01606000	NFSB Potomac River at Cabins	310	1940 to 1961 1979 to 1980 1985 1998 to date	---	90,000	---	90,000	SA	Above 9 ft	Bridge	High	
01606500	SB Potomac River nr Petersburg	651	1928 to date	*25.40	130,000	*25.40	130,000	SA	Above 10 ft FS 10 ft	Cable	High	*at previous site and datum
01607500	SFSB Potomac River at Brandywine	103	1943 to date	18.42	41,200	18.42	41,200	SA	Above 8 ft	Bridge	High	Measure at upstream bridge 1.2 mi.
01608000	SFSB Potomac River nr Moorefield	277	1928 to 1935 1938 to date	19.99	110,000	19.99	110,000	SA	Above 4.5 ft FS 10 ft	Cable below 8 ft stage	High	(Maximum safe cableway 8 ft)
01608500	SB Potomac River nr Springfield	1,461	1894 to 1896 1899 to 1902 1903 to 1906 1928 to date	44.22	240,000	44.22	240,000	SA	Above 17 ft FS 15 ft	Bridge	High	May be stranded--water over road both routes to gage at about 11 ft.

Regular Gage Network - continued

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Station number	Station name	DA, in mi ²	Period of record, in WY	Maximum of record		Maximum measurement			Measure-ment needed	Measure-ment facility	Prior-ity	Remarks
				GH	Dis-charge	GH	Dis-charge	Ty pe				
01610400	Waites Run nr Wardensville	12.6	2002 to date	6.09	1,380	5.31	433	CM	Above 6 ft	Bridge	Med.	
01611500	Cacapon River nr Great Cacapon	675	1922 to 1995 1997 to date	30.10	87,600	30.07	103,000	SA	Acoustic below 6.5 ft at gage Above 8 ft u/s bridge	Route 9 bridge 5.6 mi u/s	High	Maximum wading at gage 3.2 ft.
01614000	Back Creek nr Jones Springs	235	1929 to 1931 1939 to 1975	25.17	22,400	---	*14,500	CM	Above 3.5 ft	Bridge	High	*made at Hedgesville.
01616500	Opequon Creek nr Martinsburg	273	1905 to 1906 1947 to date	18.76	23,400	15.00	7,360	CM	Above 12 ft WS 10 ft	Bridge	Low	Use new bridge d/s.
01617000	Tuscarora Creek above Martinsburg	11.3	1949 to 1963 1968 to 1977 2006 to date	*11.92	*610	6.13	418	SA	Above 6 ft	Wade	Low	*at previous site and datum
01618100	Rockymarsh Run at Scrabble	9.90	2008 to date			1.54	41	CM	Above 1.8 ft	Wade	Med	
01636464	Bullskin Run blw Kabletown	21.8	2008 to date			2.55	79.2	CM	Above 2.3 ft	Wade	Low	
01636500	Shenandoah River at Millville	3,041	1895 to 1909 1928 to date	32.41	230,000	32.41	230,000	SA	Above 6 ft FS 13.5 ft	Bridge	High	Bridge 3 mi upstream.

Regular Gage Network - continued

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Station number	Station name	DA, in mi ²	Period of record, in WY	Maximum of record		Maximum measurement			Measure-ment needed	Measure-ment facility	Prior-ity	Remarks
				GH	Dis-charge	GH	Dis-charge	Ty pe				
03050000	Tygart Valley nr Dailey	185	1915 to 1975 1988 to date	17.20	19,900	13.08	11,500	CM	Above 14 ft FS 14 ft	SA	High	Road overflow near FS. Flag SA above 14 ft.
03051000	Tygart Valley River at Belington	406	1907 to date	23.65	29,500	18.27	17,200	CM	Above 15 ft FS 14 ft	Bridge	Med.	
03052000	Middle Fork at Audra	148	1942 to 1979 1989 to date	15.6	16,700	13.89	12,800	SA	Above 10 ft WS 10 ft	Cable	Med.	
03052500	Sand Run nr Buckhannon	14.3	1946 to date	8.34	3,200	5.39	1,510	SA	Acoustic above 4 ft	2 men?	High	
03053500	Buckhannon River at Hall	277	1915 to date	16.88	15,000	16.88	15,000	SA	Above 12 ft	Bridge	Med.	
03054500	Tygart Valley River at Philippi	914	1940 to date	31.83	61,000	31.83	61,000	SA	Above 16 ft FS 17 ft	Bridge	Med.	
03056000	Tygart Valley River at Tygart Dam	1,182	1938 to 1982 1986 to 1991 2006 to date	*18.5	21,100	15.37	14,450	CM	Above 16 ft	Bridge	High	*estimated 1.1 mi d/s
03056250	Three Fork Creek nr Grafton	96.8	1984 to date	20.13	12,000	20.13	12,000	SA	Above 11 ft	Bridge	High	
03058000	West Fork River below Stonewall Jackson Dam near Weston	101	1946-1991 2006 to date	*16.76	*10,500	9.59	546	CM	Above 10 ft	Bridge	Very High	*at previous site and datum

Regular Gage Network - continued

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Station number	Station name	DA, in mi ²	Period of record, in WY	Maximum of record		Maximum measurement			Measure-ment needed	Measure-ment facility	Prior-ity	Remarks
				GH	Dis-charge	GH	Dis-charge	Type				
03061000	West Fork River at Enterprise	759	1907 to 1916 1932 to date	30.37	41,100	27.84	36,000	SA	Above 10 ft	Bridge	Med.	
03061500	Buffalo Creek at Barrackville	116	1907 to 1908 1915 to 1924 1932 to date	16.76	10,400	15.79	9,060	CM	Above 12 ft	Bridge	High	
03062500	Deckers Creek at Morgantown	63.2	1946 to 1969 2003 to date	12.36	7,550	5.73	3,020	CM	Above 4 ft	Bridge	Very High	Make measurement above Aaron's Fk. inflow
03065000	Dry Fork at Hendricks	349	1940 to date	20.74	100,000	20.74	100,000	SA	Above 9 ft	Cable	Very High	
03065400	Blackwater River nr Davis	54.7	1992 to 1998 2003 to date	10.51	3,710	10.51	3,710	SA	Above 4 ft	Wading Only	Very High	Try Acoustic or flag for SA.
03066000	Blackwater River at Davis	85.9	1921 to date	17.67	12,500	12.60	6,560	CM	Above 12 ft	Bridge	High	
03067510	Shavers Fork nr Cheat Bridge	60.16	2001 to date	15.57	7,600	10.50	2,640		Above 11 ft	Bridge	Very High	Make bridge measurement at u/s CSG site.
03068800	Shavers Fork below Bowden	151	1973 to 1981 1998 to date	12.37	22,900	8.85	6,720	CM	Above 9 ft	Bridge	High	
03069500	Cheat River nr Parsons	722	1913 to date	24.30	170,000	24.30	170,000	SA	Above 11 ft FS 13 ft	Bridge	High	

Regular Gage Network - continued

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Station number	Station name	DA, in mi ²	Period of record, in WY	Maximum of record		Maximum measurement			Measure-ment needed	Measure-ment facility	Prior-ity	Remarks
				GH	Dis-charge	GH	Dis-charge	Ty pe				
03070260	Cheat River at Albright		1990 to date	*7.4	35,700	6.70	16,300	CM	All	Bridge	Very High	*estimate
03070500	Big Sandy Creek at Rockville	200	1909 to 1918 1921 to date	18.00	21,300	13.02	9,490	CM	Slope Area Above 15 ft	Bridge	High	Flag for Slope Area above 15 ft
03110830	Kings Creek at Weirton	48.9	1977-1978 2003 to date	17.21	8,700	17.21	8,700	SA	Above 5 ft	Bridge	High	Bridge deteriorating.
03112000	Wheeling Creek at Elm Grove	281	1940 to date	13.83	22,300	13.67	22,100	SA	Above 6 ft	Bridge	High	
03114500	Middle Island Creek at Little	458	1915 to 1922 1925 to 1955 2009 to date	28.00	25,000	22.40	21,000	CM	Above 18 ft	Bridge	Very High	
03151400	Little Kanawha River nr Wildcat	112	1973 to 1983 1985 to date	18.47	19,600	18.47	19,600	SA	Above 9 ft	SA	High	"Do not use cableway" Road overflow above 10 ft
03155000	Little Kanawha River at Palestine	1,516	1939 to date	*40.04	50,700	39.26	45,600	CM	Above 32 ft FS 36 ft	Bridge	Low	*backwater
03155220	S.F. Hughes River blw MacFarlan	229	2009 to date			22.69	8,930	A M	Above 25 ft	Bridge	Very High	

Regular Gage Network - continued

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Station number	Station name	DA, in mi ²	Period of record, in WY	Maximum of record		Maximum measurement			Measure-ment needed	Measure-ment facility	Prior-ity	Remarks
				GH	Dis-charge	GH	Dis-charge	Type				
03179000	Bluestone River nr. Pipestem	395	1950 to date	15.82	19,300	13.86	14,700	CM	Above 10 ft	Cable	High	
03180500	Greenbrier River at Durbin	133	1943 to date	15.82	37,100	15.82	37,100	SA	Above 7 ft FS 7 ft	Two Bridges	Very High	Two forks--need TD's at both bridges
03182500	Greenbrier River at Buckeye	540	1929 to date	23.20	82,000	23.20	82,000	SA	Above 19 ft FS 15 ft	Bridge	Med.	
03183500	Greenbrier River at Alderson	1,364	1895 to date	24.33	94,000	23.95	90,600	SA	Above 9 ft FS 14 ft	Bridge	High	
03184000	Greenbrier River at Hilldale	1,619	1936 to date	26.88	93,000	26.46	89,600	CM	Above 12 ft	Bridge	Med.	
03185000	Piney Creek at Raleigh	52.7	1951 to 1982 2003 to date	11.47	3,030	11.47	3,030	SA	Above 6 ft	Bridge	Low	
03185400	New River at Thurmond	6,687	1981 to date	20.35	100,000	18.30	76,000	CM	Above 18 ft	Bridge	Low	Need big base and 150# weight.
03186500	Williams River at Dyer	128	1929 to date	18.45	22,000	18.45	22,000	SA	Between 7-9 ft (low priority)	Low steel of bridge 9 ft	Med. for SA	Need slope-area flagged above 12 ft. Deck of bridge 10.5 ft +/-

Regular Gage Network - continued

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Station number	Station name	DA, in mi ²	Period of record, in WY	Maximum of record		Maximum measurement			Measure-ment needed	Measure-ment facility	Prior-ity	Remarks
				GH	Dis-charge	GH	Dis-charge	Ty pe				
03187500	Cranberry River nr Richwood	80.4	1944 to 1951 1964 to date	11.93	11,200	11.00	9,800	SA	Above 8 ft	Bridge	High	
03189100	Gauley River nr Craigsville	529	1964 to date	25.94	63,500	21.46	35,500	CM	Above 17 ft	Old unused bridge	High	
03190400	Meadow River nr Mount Lookout	365	1966 to date	16.31	27,200	12.18	14,100	CM	Above 8 ft	Cable	Med.	Flag for SA Above 13 ft
03191500	Peters Creek at Lockwood	40.2	1946 to 1971 1980 to 1982 1997 to 1998 2003 to date	19.70	11,300	19.70	11,300	SA	Above 7 ft	Private Bridge	Very High	
03192000	Gauley River above Belva	1,317	1928 to date	28.60	105,000	24.22	65,100	CM	Above 12 ft FS 20 ft	Cable	Med.	
03193000	Kanawha River at Kanawha Falls	8,371	1877 to date	37.80 old	320,000 datum	22.21 present	145,000 datum	CM	Above 18 ft FS 25 ft	Bridge with meter.	Med.	Acoustic with boat.
03194700	Elk River below Webster Springs	266	1959 to date	17.20	38,000	10.24	10,800	CM	Above 10 ft WS 10 ft	Bridge	High	High priority to flag for SA above 10 ft.

Regular Gage Network - continued

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Station number	Station name	DA, in mi ²	Period of record, in WY	Maximum of record		Maximum measurement			Measure-ment needed	Measure-ment facility	Prior-ity	Remarks
				GH	Dis-charge	GH	Dis-charge	Type				
03197000	Elk River at Queen Shoals	1,145	1928 to date	29.20	72,000	22.31	39,200	CM	Above 18 ft FS 19 ft	Bridge	High	
03198000	Kanawha River at Charleston	10,448	1939 to date	39.72	216,000	29.44	107,000	CM	Above 24 ft FS 30 ft	Bridge with meter.	Very High	Boat with acoustic.
03198350	Clear Fork at Whitesville	62.8	1996 to date	28.47	12,000	28.47	12,000	SA	Above 18 ft	Bridge	High	
03198500	Big Coal River at Ashford	391	1908 to 1916 1930 to date	36.30	35,800	25.54	24,500	CM	Above 13 ft	Bridge	High	
03200500	Coal River at Tornado	862	1908 to 1912 1928 to 1931 1961 to date	31.98	35,500	26.38	28,900	CM	Above 17 ft FS 25 ft	Bridge	High (Rising stage) above 14 ft.	Need measurements on rise and fall to define possible loop curve.
03201405	Hurricane Creek at Hurricane	26.8	1998 to date	18.01	3,690	14.69	2,040	CM	Above 16 ft	Private Bridge	High	
03202400	Guyandotte River nr. Baileysville	306	1968 to date	31.25	46,400	26.89	36,700	SA	Above 7 ft	Bridge	High	Bridge 2 mi d/s
03202750	Clear Fork at Clear Fork	126	1974 to date	18.64 (Old Site)	10,700	*15.65	*10,700	SC	Above 5 ft	Cable	High	*Present Site.

Regular Gage Network - continued

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				GH	Dis-charge	GH	Dis-charge	Ty pe				
03203600	Guyandotte River at Logan	833	1960 to date	34.98	55,000	34.98	55,000	SA	Above 15 ft FS 20 ft	Bridge	High	
03206600	East Fork Twelvepole Creek nr. Dunlow	38.5	1964 to date	15.84	5,100	15.84	5,100	SA	Above 8 ft	Cable (Max. 10.5 ft)	Med.	
03212750	Tug Fork at Welch	174	1985 to date	22.09	13,100	19.77	11,500	SA	Above 7 ft WS 10 ft	Bridge	High	
03212980	Dry Fork at Beartown	209	1985 to date	15.21	15,900	10.50	7,700	CM	Above 6 ft WS 10 ft	Bridge	High	
03213500	Panther Creek near Panther	31.0	1946 to 1986 2003 to date	12.10	6,160	* 16.57	* 14,700	SA	Above 5 ft	Bridge	Very High	*outside period of record Bridge .5 mi d/s or .45 mi u/s
03213700	Tug Fork at Williamson	936	1967 to date	52.56	94,000	42.20	44,700	CM	Above 11 ft FS 27 ft	Bridge	High	
03214500	Tug Fork at Kermit	1,280	1985 to date	46.29	35,300	38.03	34,000	CM	Above 12 ft FS 38 ft	Bridge	High	

Traffic Control Plans

Station number	Station name	Route number of bridge activity	Where activity normally performed	Classification of Traffic Control Plan
01604500	Patterson Creek nr Headsville	WV Route 46	Downstream	Plan IV
01605002	Painter Run near Fort Ashby			Not required
01605500	SB Potomac River at Franklin	County Route 220/12	Downstream	Plan IV
01606000	NFSB Potomac R at Cabins	County Route 28/11	Downstream	Plan IV
01606500	So. Branch Potomac River nr Petersburg		Cableway	Not required
01606900	South Mill Creek near Mozer			Not required
01607300	Brushy Fork near Sugar Grove			Not required
01607500	SFSB Potomac R at Brandywine	US Highway 33	Downstream	Plan I
01607510	Heavener Run near Brandywine			Not required
01608000	SFSB Potomac River nr Moorefield		Cableway	Not required
01608500	SB Potomac River near Springfield	County Route 3	Downstream	Plan IV
01609650	Little Cacapon River at Frenchburg	County Route 50/9	Downstream	Plan IV
01610195	Parker Hollow Run at Needmore			Not required
01610400	Waites Run nr Wardensville	County Route 5/1		Plan IV
01611500	Cacapon River near Great Cacapon	WV Route 9	Downstream	Plan IV
01613020	Unnamed Trib to Warm Sp Run nr Berkley Springs			Not required
01614000	Back Creek near Jones Spring	County Route 6	Downstream	Plan IV
01616500	Opequon Creek nr Martinsburg	WV Route 9	Downstream	Plan I
01617000	Tuscarora Ck above Martinsburg	County Route 10	Downstream	Plan IV
01618100	Rockymarsh Run at Scrabble	County Route 5	Upstream	Plan IV
01636464	Bullskin Run blw Kabletown	County Route 25/14	Downstream	Plan IV
01636500	Shenandoah River at Millville	WV Route 9	Downstream	Plan IV
03050000	Tygart Valley River nr Dailey	US 219/250	Downstream	Plan IV
03050500	Tygart Valley River near Elkins	County Route 21	Upstream	Plan I
03051000	Tygart River at Belington	County Route 11	Upstream	Plan V
03052000	Middle Fork River at Audra		Cableway	Not required
03052340	Mud Lick Run nr Buckhannon			Not required
03052450	Buckhannon River at Buckhannon	County Route 13 (near cemetery)	Downstream	Plan IV
03052500	Sand Run near Buckhannon			Not required

Traffic Control Plans - continued

Station number	Station name	Route number of bridge activity	Where activity normally performed	Classification of Traffic Control Plan
03053500	Buckhannon River at Hall	County Route 46/1	Upstream	Plan IV
03054500	Tygart River at Philippi	Walnut Street	Downstream	Plan V
03055500	Tygart Lake nr Grafton			Not required
03056000	Tygart Valley R at Tygart Dam nr Grafton	Beech Street	Downstream	Plan V
03056250	Three Fork Creek nr Grafton	County Route 50/9	Upstream	Plan IV
03057000	Tygart River at Colfax	County Route 62	Upstream	Plan IV
03057300	West Fork River at Walkersville	County Route 44	Downstream	Plan IV
03057900	Stonewall Jackson Lake near Weston			Not required
03058000	West Fork R bl Stonewall Jackson Dam nr Weston	State Park Road	Downstream	Plan V
03058020	West Fork River at Weston	County Route 24	Upstream	Plan V
03058500	West Fork River at Butcherville			Not required
03059875	West Fk River nr Mount Clare	County Route 34	Downstream	Plan IV
03061000	West Fork at Enterprise	County Route 19/2	Upstream	Plan IV
03061430	Whetstone Run nr Mannington			Not required
03061500	Buffalo Creek at Barrackville	County Route 21	Downstream	Plan V
03062225	Monongahela R at Opekiska L&D (Lower)			Not required
03062245	Monongahela R at Hildebrand L&D (Upper)			Not required
03062250	Monongahela R at Hildebrand L&D (Lower)			Not required
03062450	Monongahela R at Morgantown L&D (Lower)			Not required
03062500	Deckers Creek at Morgantown	County Route 64	Downstream	Plan IV
03065000	Dry Fork at Hendricks		Cableway	Not required
03065400	Blackwater R nr Davis			Not required
03066000	Blackwater R at Davis	State Route 32	Downstream	Plan IV
03067510	Shavers Fork nr Cheat Bridge	County Route 250/4	Upstream	Plan IV
03068800	Shavers Fork below Bowden	County Route 33/8	Downstream	Plan IV
03069500	Cheat River nr Parsons	County Route 1	Downstream	Plan IV
03069880	Buffalo Creek near Rowlesburg	County Route 72/3	Downstream	Plan IV
03070260	Cheat River at Albright	WV Route 26	Upstream	Plan IV
03070500	Big Sandy Creek at Rockville	County Route 14	Downstream	Plan IV

Traffic Control Plans - continued

Station number	Station name	Route number of bridge activity	Where activity normally performed	Classification of Traffic Control Plan
03071590	Cheat Lake nr Stewartstown			Not required
03071600	Cheat River at Lake Lynn, PA			Not required
03110685	Ohio R at New Cumberland L&D (Upper)			Not required
03110690	Ohio R at New Cumberland L&D (Lower)			Not required
03110830	Kings Creek nr Weirton	County Route 11/5	Upstream	Plan IV
03111515	Ohio R at Pike Island L&D (Upper)			Not required
03111520	Ohio R at Pike Island L&D (Lower)			Not required
03111950	Dunkard Fork near Majorsville			Not required
03112000	Wheeling Creek at Elm Grove	Washington Street	Upstream	Plan V
03112500	Ohio River at Wheeling			Not required
03114280	Ohio River at Hannibal L&D (Lower)			Not required
03114500	Middle Island Creek at Little	County Route 6	Upstream	Plan IV
03114650	Buffalo Run near Little			Not required
03150700	Ohio River at Marietta			Not required
03151400	Little Kanawha River near Wildcat		Cableway	Not required
03151550	Saltlick Creek near Flatwoods			Not required
03151600	Little Kan River at Burnsville	WV Route 5	Downstream	Plan IV
03153500	Little Kanawha R at Grantsville	WV Route 16	Downstream	Plan V
03154000	WF Little Kan R at Rocksdale	County Route 11	Downstream	Plan IV
03154980	Little Kanawha River at Palestine Aux Gage			Not required
03155000	Little Kanawha River at Palestine	WV Route 5	Downstream	Plan V
03155220	S.F. Hughes River blw MacFarlan	County Route 22	Upstream	Plan IV
03155405	North Fork Hughes River near Cairo			Not required
03155525	Goose Creek near Petroleum	County Route 18	Downstream	Plan IV
03159750	Tug Fork at Statts Mills			Not required
03177100	Payne Branch near Oakvale	County Route 219/3	Downstream	Plan IV
03178150	Middle Fork Brush Creek at Edison			Not required
03179000	Bluestone River near Pipestem		Cableway	Not required
03180500	Greenbrier River at Durbin	County Route 250/2 & 250/13 (2 bridges)	Downstream	Plan IV

Traffic Control Plans - continued

Station number	Station name	Route number of bridge activity	Where activity normally performed	Classification of Traffic Control Plan
03182050	Marlin Run at Marlinton			Not required
03182500	Greenbrier River at Buckeye	County Route 219/15	Downstream	Plan IV
03182888	Dry Creek at Tuckahoe			Not required
03183500	Greenbrier River at Alderson			Not required
03184000	Greenbrier River at Hildale	WV Route 12	Downstream	Plan I
03184200	Big Creek near Bellepoint	County Route 10	Downstream	Plan IV
03184500	New River at Hinton	WV Route 20	Downstream	Plan V
03185000	Piney Creek at Raleigh	County Route 25/8	Upstream	Plan IV
03185400	New River at Thurmond	County Route 25	Downstream	Plan IV
03186500	Williams River at Dyer	County Route 46	Downstream	Plan IV
03187000	Gauley R at Camden-on-Gauley	County Route 48/2	Downstream	Plan IV
03187500	Cranberry River near Richwood	Public Road 76	Downstream	Plan IV
03189100	Gauley River near Craigsville	WV Route 20 & 55	Downstream	Plan I
03189600	Gauley River below Summersville Dam			Not required
03190100	Anglins Creek near Nallen	County Route 24/7	Downstream	Plan IV
03190400	Meadow River near Mt. Lookout		Cableway	Not required
03191500	Peters Creek near Lockwood	Private - Claude Blankenship Bridge	Downstream	Plan V
03192000	Gauley River above Belva	County Route 39/1	Downstream	Plan IV
03193000	Kanawha River at Kanawha Falls	County Route 13	Downstream	Plan IV
03193830	Gilmer Run near Marlinton			Not required
03194700	ELk River below Webster Springs	County Route 7	Downstream	Plan IV
03195500	Elk River at Sutton	County Route 19/40	Upstream	Plan V
03196600	Elk River near Frametown			Not required
03196800	Elk River at Clay	County Route 28	Downstream	Plan IV
03197000	Elk River at Queen Shoals	County Route 1	Downstream	Plan IV
03197910	Unnamed Trib to Elk Twomile Cr nr Charleston			Not required
03197990	Kanawha River at Charleston Auxiliary			Not required
03198000	Kanawha River at Charleston	Patrick Street	Upstream	Plan V
03198350	Clear Fork at Whitesville	County Route 21/1	Downstream	Plan IV

Traffic Control Plans - continued

Station number	Station name	Route number of bridge activity	Where activity normally performed	Classification of Traffic Control Plan
03198500	Big Coal River at Ashford	County Route 1	Downstream	Plan IV
03200500	Coal River at Tornado	County Route 9	Downstream	Plan V
03201405	Hurricane Creek at Hurricane	County Route 19/6	Downstream	Plan IV
03201410	Poplar Fork at Teays	County Route 46	Downstream	Plan IV
03201500	Ohio River at Point Pleasant			Not required
03202245	Marsh Fork at Maben	WV Route 97	Downstream	Plan IV
03202400	Guyandotte River nr Baileysville	County Route 14	Downstream	Plan IV
03202480	Brier Creek near Fanrock	County Route 8	Downstream	Plan IV
03202750	Clear Fork at Clear Fork		Cableway	Not required
03202915	Guyandotte River Below R.D. Bailey Dam			Not required
03203000	Guyandotte River at Man	County Route 10/14	Downstream	Plan V
03203600	Guyandotte River at Logan	Midelburg Bridge	Downstream	Plan V
03204000	Guyandotte River at Branchland	County Route 11	Downstream	Plan IV
03204250	Mud River at Palermo			Not required
03206000	Ohio River at Huntington			Not required
03206450	Fourpole Creek near Huntington	County Route 48/1	Downstream	Plan IV
03206600	East Fork Twelvepole Creek near Dunlow		Cableway	Not required
03207020	Twelvepole Creek below Wayne	County Route 52/43	Downstream	Plan IV
03212640	Johns Knob Branch at Elkhorn			Not required
03212750	Tug Fork at Welch	County Route 7/8	Downstream	Plan IV
03212980	Dry Fork at Beartown	County Route 80/3	Upstream	Plan IV
03213500	Panther Creek near Panther	State Park Road	Downstream	Plan IV
03213700	Tug Fork at Williamson	County Route 52/31	Upstream	Plan V
03214500	Tug Fork at Kermit	County Route 52/41	Downstream	Plan V
374643080533401	Lick Creek nr Sandstone	WV Route 20	Downstream	Plan IV
374847080552401	Meadow Creek at Meadow Creek	County Route 7/1	Upstream	Plan IV
375041081024801	Piney Creek near McCreery	WV Route 41	Upstream	Plan IV
375105081024801	Laurel Creek at Quinnimont	Rail Road	Downstream	Not required
375635081051601	Dunloup Creek nr Thurmond	County Route 25 (1 mile above mouth)	Downstream	Plan IV

Traffic Control Plans - continued

Station number	Station name	Route number of bridge activity	Where activity normally performed	Classification of Traffic Control Plan
375834081063201	Arbuckle Creek at Minden	County Route 17/11	Upstream	Plan IV
380351081045401	Wolf Creek nr Fayetteville	County Route 82	Downstream	Plan IV
380427081053901	Marr Branch near Fayetteville	Private Road	Downstream	Not required
380649081083301	New River below Hawks Nest Dam			Not required
383734080104402	Pickens Rain			Not required
383828079544901	Huttonsville 4SE Rain			Not required
384704080131501	Alexander Rain			Not required
384911079351701	Whitmer 3W Rain			Not required
390038079262801	Cannan Valley 4S Rain			Not required
391710080323501	Ten Mile Creek near Salem near Clarksburg Rain			Not required
393127080195301	Buffalo Creek near Mannington 3W Rain			Not required
394153080302701	Hundred 3WNW Rain			Not required
394337079544201	Monongahela River at Point Marion, PA			Not required
394533079581501	Dunkard Creek at Shannopin , PA	PA Route 2012	Upstream	Plan IV
394912080341401	Cameron 1S Rain			Not required

Plan I - Traffic Control Safety Plan for Bridge Measurements

Lane Closure for One Lane - Two Way Traffic Control -

Note: Plan is for daylight hours, short term (1-12 hrs) work. Remaining travel lane must be a minimum of 10 ft. in width. For short duration work (<1 hr.), "End Road Work" signs are optional.

Direction:



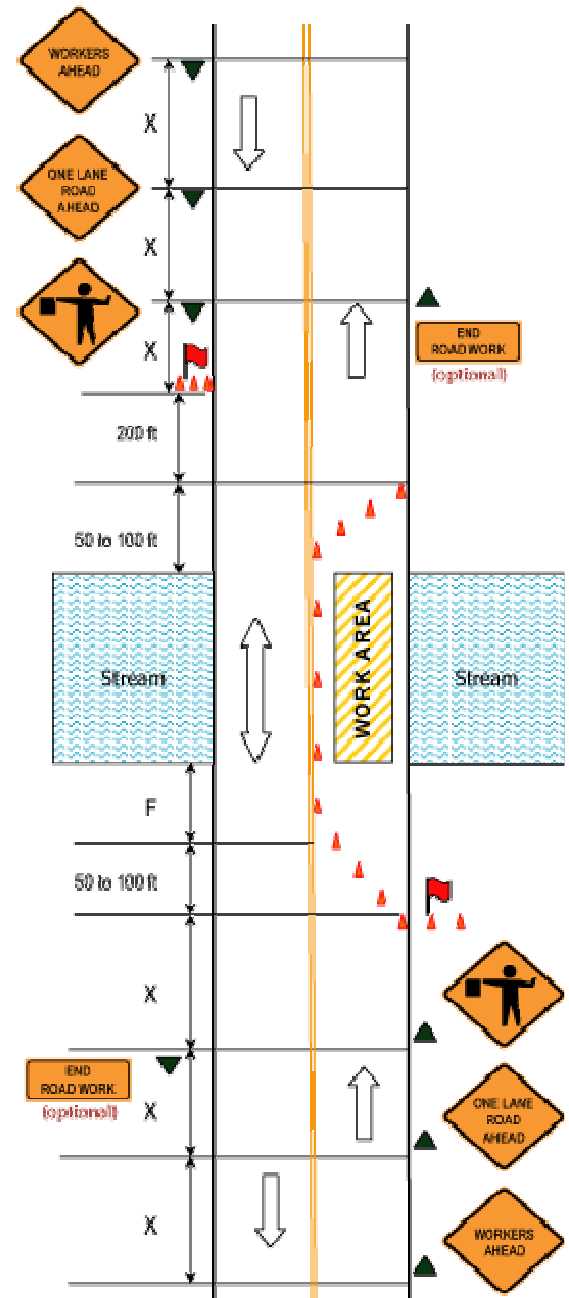
Traffic Cone:



Flagger Station:



Speed Limit (MPH)	Suggested Max Spacing of Cones		Advanced Warning Sign Spacing "X" (ft)	Flagger Station Buffer "F" (ft)
	On a Taper (ft)	On a Tangent (ft)		
20	20	60 - 75	120	35
25				55
30				85
35		70 - 90	160	120
40		80 - 100	240	170
45		90 - 110	320	220
50		100 - 125	400	280
55		110 - 140	500	335
60		120 - 150	600	415
65		130 - 165	700	485
70		140 - 175	800	585
75		150 - 185	900	720



Plan II - Traffic Control Safety Plan for Bridge Measurements

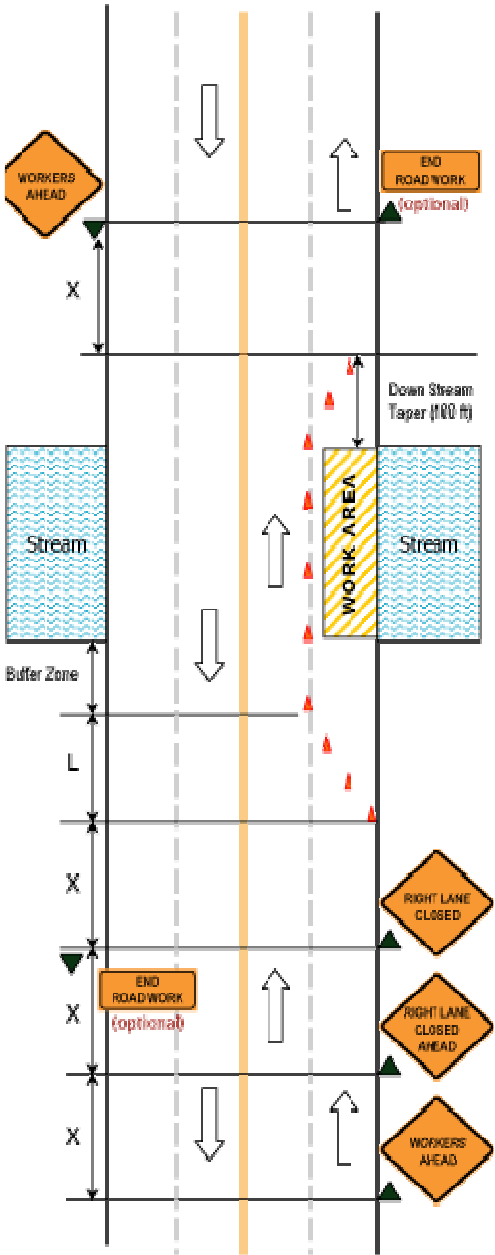
Lane Closure on Four Lane - Two Way Road -

Note: Plan is for daylight hours, short term (1-12 hrs) work. Remaining travel lane must be a minimum of 10 ft. in width.

Direction:  Traffic Cone: 

Posted Speed (MPH)	Minimum Desirable Taper Lengths "L"				Work Area Buffer Zone (ft)	Advanced Warning Sign Spacing "X" (ft)	Suggested Max Spacing of Cones	
	Formula	10' Offset	11' Offset	12' Offset			On a Taper (ft)	On a Tangent (ft)
20	$L = \frac{WS^2}{60}$	70	75	80	35	120	30	60-75
25		105	115	125	55			
30		150	165	180	85			
35		205	225	245	120	160	35	70-90
40		265	295	320	170	240	40	80-100
45	L=WS	450	495	540	220	320	45	90-110
50		500	550	600	280	400	50	100-125
55		550	605	660	335	500*	55	110-140
60		600	660	720	415	600*	60	120-150
65		650	715	780	485	700*	65	130-165
70		700	770	840	585	800*	70	140-175
75		750	825	900	720	900*	75	150-185

*Increase distance between signs to have 1500 ft advance warning.
 [L=Length of Taper (ft); W=Width of Offset; S=Posted Speed (MPH)]



Plan III - Traffic Control Safety Plan for Bridge Measurements

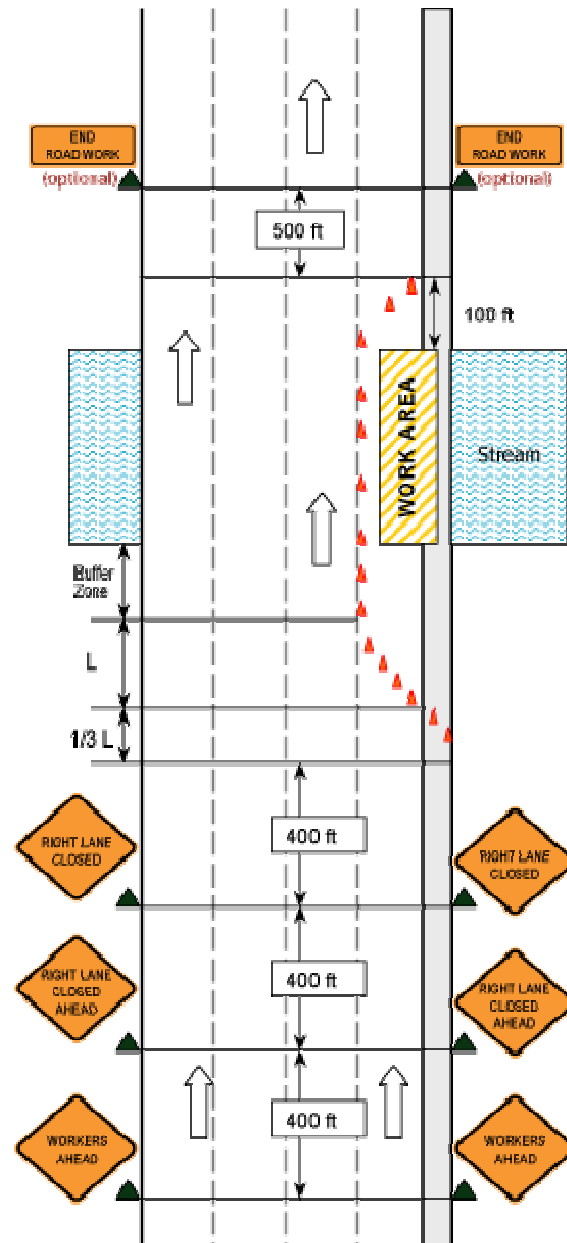
Lane Closure on Multi-Lane, Divided Highway -

Note: Plan is for daylight hours, short term (1-12 hrs) work, on Highways and Expressways.

Direction: → **Traffic Cone:** ▲

Posted Speed (MPH)	Minimum Desirable Taper Lengths "L"				Work Area Buffer Zone (ft)	Suggested Max Spacing of Cones	
	Formula	10' Offset	11' Offset	12' Offset		On a Taper (ft)	On a Tangent (ft)
20	$L = \frac{WS^2}{60}$	70	75	80	35	30	60-75
25		105	115	125	55		
30		150	165	180	85		
35		205	225	245	120	35	70-90
40	$L = WS$	265	295	320	170	40	80-100
45		450	495	540	220	45	90-110
50		500	550	600	280	50	100-125
55		550	605	660	335	55	110-140
60		600	660	720	415	60	120-150
65		650	715	780	485	65	130-165
70		700	770	840	585	70	140-175
75		750	825	900	720	75	150-185

[L=Length of Taper (ft); W=Width of Offset; S=Posted Speed (MPH)]



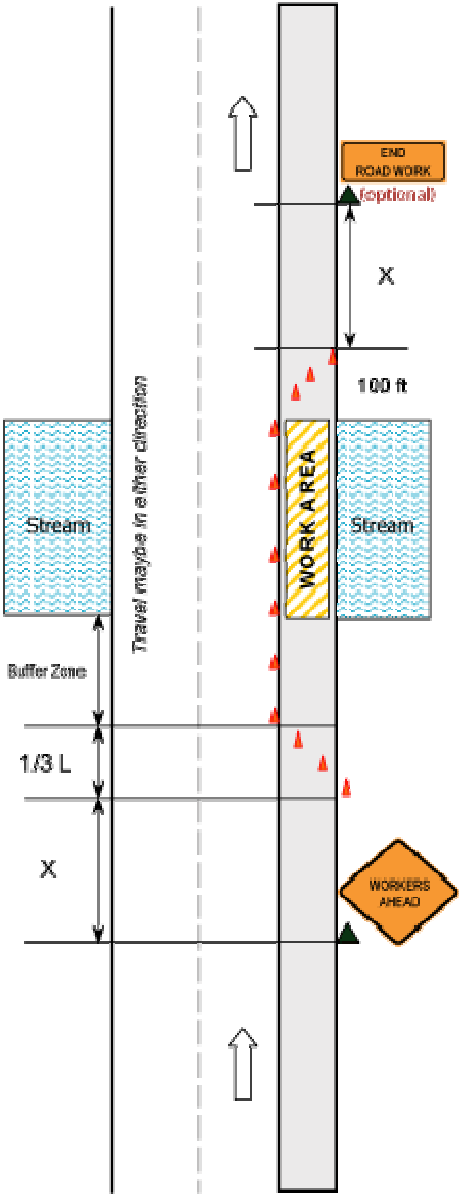
Plan IV - Traffic Control Safety Plan for Bridge Measurements Shoulder Work -

Note: Plan is for daylight hours, short-term (1-12 hrs) work, done on the shoulder, outside of travel lanes. For short-duration work (less than 1 hr.), all signs and channelizing devices may be eliminated if a vehicle with activated rotating lights or strobe lights is placed 30 ft. before the work area. The vehicle will be parked with the emergency brake set, transmission in park, and front wheels turned outward.

Direction:
 
 Traffic Cone:
 

Posted Speed (MPH)	Minimum Desirable Taper Lengths "L"				Work Area Buffer Zone (ft)	Advanced Warning Sign Spacing "X" (ft)	Suggested Max Spacing of Cones	
	Formula	10' Offset	11' Offset	12' Offset			On a Taper (ft)	On a Tangent (ft)
20	$L = \frac{WS^2}{60}$	70	75	80	35	120	30	60-75
25		105	115	125	55			
30		150	165	180	85			
35		205	225	245	120	160	35	70-90
40		265	295	320	170	240	40	80-100
45	L=WS	450	495	540	220	320	45	90-110
50		500	550	600	280	400	50	100-125
55		550	605	660	335	500	55	110-140
60		600	660	720	415	600	60	120-150
65		650	715	780	485	700	65	130-165
70		700	770	840	585	800	70	140-175
75		750	825	900	720	900	75	150-185

[L=Length of Taper (ft); W=Width of Offset; S=Posted Speed (MPH)]



Plan V - Traffic Control Safety Plan

Work Behind Barrier or Beyond the Shoulder -

Note: Plan is for daylight hours, short term (1-12 hrs) work. For short-duration work (less than 1 hr), all signs and channelizing devices may be omitted if all vehicles within the work area display activated rotating lights or strobe lights. Signs and channelization devices may be omitted where the work area is behind a barrier or 30 ft or more from the edge of any roadway. If the work area is in the median of a divided highway, advanced warning signs and channelization devices shall also be placed on the left side of the directional roadway.

Posted Speed (MPH)	Advanced Warning Sign Spacing "X" (ft)	Suggested Max Spacing of Cones
20	120	30
25		
30		
35	160	35
40	240	40
45	320	45
50	400	50
55	500*	55
60	600*	60
65	700*	65
70	800*	70
75	900*	75

*Increase distance between signs to have 1500 ft advance warning.

Direction:



Traffic Cone:

