



MEMORANDUM

Date: August 22, 2019

To: The Honorable Chairman and Members
Pima County Board of Supervisors

From: C.H. Huckelberry
County Administrator

A handwritten signature in black ink, appearing to read "CHH", is written over the printed name "C.H. Huckelberry".

Re: **MyAlerts System – Flood Alerts by the Flood Control District**

The Pima County Office of Emergency Management (OEM) operates an emergency alert system known as MyAlerts. MyAlerts is a voluntary, opt-in emergency alert system that has the ability to provide alerts for a wide variety of emergencies, and is separate from the National Weather Service alerts that people may already receive. Residents must sign up for MyAlerts in order to take advantage of the emergency messages the system provides.

The Regional Flood Control District (District) has determined that the MyAlerts system provides an excellent opportunity for timely flood warning and safety messages to citizens in specific high-risk floodprone areas of Pima County where adequate stream and rainfall monitoring infrastructure exists. District staff uses the District's Automated Local Evaluation in Real Time (ALERT) network of stream and rain gages to determine when and to who receive MyAlerts messages.

In coordination with OEM, the District has established flood alert messages for numerous flood scenarios and inundation areas along the following watercourses: Agua Caliente Wash, Cañada del Oro Wash, Franco Wash, Pima Wash, Sabino Creek, Upper Santa Cruz River, Tanque Verde Creek, and Ventana Canyon Wash. The District has prepared the attached correspondence to send to property owners and residents in these areas, encouraging them to sign up for MyAlerts and explaining the intent of the messaging as well as the risks.

While this activity represents a significant leap forward in our ability to provide potentially lifesaving messages to the public, it is important to note that floods are dynamic, that the variables that affect the size and extent of a flood are numerous and that no flood warning system is perfect. The District will do its best to deliver timely, accurate warnings, but the outreach materials will also discuss the volatility of floods and the chance for unpredictable outcomes during floods. The decision to send messages will be determined by District staff monitoring the ALERT data, in coordination with OEM staff.

The Honorable Chairman and Members, Pima County Board of Supervisors
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In addition to providing flood warning as a public benefit, this service is a pre-requisite to the District improving its rating in the National Flood Insurance Program (NFIP) Community Rating System (CRS). The implementation of a flood warning system and the completion of a Floodplain Management Plan are the two final pre-requisites the District needs to complete to improve from a Class 5 community to a Class 4 community. It is possible that completion of these elements will result in gaining sufficient points for the District to become a Class 3 community. That would allow some residents of unincorporated Pima County to get an additional 10 percent discount on their flood insurance premiums, increasing the discount from 25 percent to 35 percent. If this CRS rating increase were to occur, Pima County would be among the top dozen or so communities in the nation.

For additional details about the history and process that allows the District to take this step, please see Appendix 1. The outreach letter and fact sheets for each watercourse being implemented may be found in Appendix 2.

CHH/mp

Attachments

c: Carmine DeBonis Jr., Deputy County Administrator for Public Works
Suzanne Shields, Director for Regional Flood Control District

Appendix 1

Providing Flood Warning Notifications

BACKGROUND

The ALERT system of weather and stream flow gages was established in 1984 as a flood threat recognition system. Since then, the number of gages has steadily increased and now consists of approximately 130 gages throughout Pima County. Pima County's ALERT system is integrated with the rainfall monitoring systems installed by other jurisdictions. The ALERT system provides direct or indirect situational awareness to the District, National Weather Service, Pima County Department of Transportation, Office of Emergency Management, Sheriff's Department, and others. The ALERT is used to establish generalized flood warning messages by the National Weather Service, as well as to provide information to public entities so that they can implement their flood response protocols, including closing roads and evaluating the integrity of flood control infrastructure.

The District has long been involved in emergency operations and planning regarding flood events, and ALERT data has been an important source of information to improve public safety. In recent years, the degree of collaboration between the District, OEM and other emergency response agencies has increased significantly. The OEM has been a great partner with the District in recognizing the threat of flooding in our community and working towards mitigating and responding to that threat. One aspect of this collaboration is conducting flood response drills that include multiple county, federal and private entities in order to maximize emergency response effectiveness. An example of the benefit for conducting drills is that previous drills have identified gaps in the use of certain flood terminology, which have been corrected.

The District and OEM have been collaborating to expand the ALERT system into a flood warning system. While the existing ALERT system operations of data collection and analysis will continue, the flood warning element will occur through the use of OEM's MyAlerts public notification system. The District will be able to send flood alerts to residents who are at risk of flooding, if they opt-in to receive such messages. Before notifying the public about the flood alerts messaging, a drill will be conducted to test the system.

This is not the first attempt to provide flood warning messages. In 2010, the County attempted to use reverse 911 to alert residents in the Tanque Verde Creek floodplain of an impending flood. This effort was generally considered to be a failure due to the fact that the emergency alert system required individuals outside of Pima County to be involved. Their slow response created messaging delays that were problematic when considering how quickly the County's watercourses flood in response to rainfall. As such, many residents received alert messages after the flash flood peak had passed. This created additional panic when they thought that an even bigger flood may be on the way. MyAlerts is a significant step forward from this experience. Since it is primarily geared for individuals who opt-in to the system, contact data should be more accurate than the 911 system data. In addition, the decision to send messages will rest with County staff, so messages can be sent without delay. Using the opt-in approach also allows the District to better guide expectations of the system.

WATERCOURSE SELECTION CRITERIA

The 10 watercourses that were chosen to receive flood alerts messaging through MyAlerts all meet a set of minimum criteria, namely:

- 1) Each watercourse has an ALERT stream gage at the upstream end of the notification area.
- 2) A floodplain study has established a predicted floodplain footprint for different sized floods, allowing the District to better understand who will be affected as water levels rise.
- 3) There is a reasonable expectation that a flood alert message can be sent in time for the public to take action to protect themselves and/or their property from flooding. It should be noted that in most cases, warning times will precede the flood on the order of minutes, rather than hours.

OVERCOMING CHALLENGES

Implementing a comprehensive flood warning system has its challenges and the District acknowledges and accepts that it will not be perfect and there will be a need for future improvements. The District believes that the benefits far outweigh potential negatives and is committed to continually updating the system based on feedback, new information and new capabilities. The following challenges have been considered and addressed:

- 1) Messaging: Perhaps the biggest challenge is ensuring that the public understands the messages that they receive, that they know what to do when they receive a message, and that they understand that there is no such thing as perfect flood prediction. This endeavor depends significantly on the willingness of the public to understand and accept that the District is providing flood alerts that, despite our best efforts, may not be perfect. The fact sheets in Appendix 2 attempt to explain the inundation areas, the messages that will be sent at different flood stages, and provide information regarding what to do when messages are received.

In addition to the fact sheet, the District will provide each resident with an example Flood Response Plan, with a recommendation for them, as a family or business, to prepare a specific and relevant plan for them. This may include preparing a kit of medication, first-aid supplies, and other necessities, identifying an offsite location to meet in the event the residence or business is inaccessible, storing valuables above the floodwaters, or knowing the best path to evacuate if necessary.

- 2) Floods Come Quickly: Flood warning in desert environments is difficult because warning times are typically very short. Unlike the Midwest, where peak flooding can be anticipated days or weeks in advance, the flood peaks in watercourses in the County may occur in an hour or less. The current emergency notification system, MyAlerts, can automatically deliver flood alerts once County staff has identified the threat. This is a significant improvement over previous systems.
- 3) Floodplain Determinations are Approximate: Floods are dynamic. The delineation of flood inundation areas is based on a wide range of factors, including channel geometry, topography, vegetation, and the placement of constructed improvements such as buildings and walls. These factors may change during a flood, which can change the anticipated inundation area. In addition, there is some amount of uncertainty with respect to estimating the extent of a real flood as opposed to a computer model of an estimated floodplain. These factors include:

- Rainfall Intensity
- Rainfall Duration
- Location of Rainfall within the Watershed
- Aerial Extents of the Rainfall over the Watershed
- Existing Soil Saturation Conditions
- Constructed Improvements within the Watershed (Including Unknown/Unpermitted Improvements)

- 4) Floodplain Modeling: Modeling techniques have improved dramatically, but are still estimates and need updating as watershed conditions change due to new development, expected rainfall characteristics, climate variability and the presence or absence of fire-affected areas. It will be necessary for the District to continually update and refine our floodplain models to ensure that they remain as accurate as possible.

The decision to send Flood Alerts is not taken lightly, and based on the challenges described, will require the coordination of District staff and OEM. Stream gage data, weather and surrounding rain gage data will be considered, as will the soil saturation level of the watershed. The system will always rely on knowledgeable and experienced District staff analyzing the data and making sound judgements based on all of the available data.

ALERT gages occasionally fail or return erroneous information. District staff has extensive experience with the system and can usually identify problems quickly. There is a slight risk that bad data is not immediately apparent and therefore an unnecessary alert is transmitted. In the case of messages sent in error or as the result of a false alarm, the District has pre-populated a “disregard” message in MyAlerts.

Again, as technology improves and confidence increases regarding the accuracy of the flood data and the ability to deliver flood alerts, the District believes that the benefits significantly outweigh the risks. While we anticipate a learning curve as this program is implemented and as the District and OEM become more comfortable with MyAlerts, additional watercourses will be evaluated to determine if the placement of ALERT stream gages might allow for the expansion of MyAlerts to provide flood messages to additional at-risk residents.

MyAlerts Flood Messages

Watercourse	Notification Trigger (cfs)	Message sent to	Public Recipients	Agency Recipients
Disregard Message			The flooding message you may have recently received was sent in error. Please disregard that message. We apologize for any fear or confusion this message may have caused.	The flooding message you may have recently received was sent in error. Please disregard that message. We apologize for any fear or confusion this message may have caused.
Agua Caliente at Milagrosa Canyon (Gage ID: 2203)	5000-6000 (trigger if flows are likely to increase to 7000 cfs)	7,000 cfs polygon	Flooding on Agua Caliente Wash is expected out of banks. Flooded homes possible. Expect hazardous road conditions. Be prepared to activate your emergency response plan. If you are experiencing flooding and feel like you are in danger call 911. This message is from the Pima County Office of Emergency Management.	Flood water in Agua Caliente Wash flow may breakout around the east end of the spur dike and cross Tanque Verde Road east of the bridge. Sundance Drive and Melpomene Way are trouble areas. Flooding may affect homes, especially near Melpomene and Conestoga. Evacuation of area residents in Bel Aire Estates and south of Tanque Verde Road may be necessary. (See inundation map at pima.gov/FloodAlerts)
	8000-9000 cfs	13,000 cfs polygon	Flooding on Agua Caliente Wash is expected out of banks. Flooded homes expected, especially south of Ft. Lowell. Expect hazardous road conditions. Be prepared to activate your emergency response plan. If you are experiencing flooding and feel like you are in danger call 911. This message is from the Pima County Office of Emergency Management.	Flooding along Agua Caliente Wash expected to flood homes, mainly east of the wash between Ft. Lowell Rd. and Tanque Verde Creek. Road conditions may be hazardous. Evacuation of area residents may be necessary. (See inundation map at pima.gov/FloodAlerts)
Canada del Oro Wash at Golder Ranch Road (Gage ID: 1103)	1500 at Rancho Solano (1083 and 1079) or 2000 cfs at 1103	5200 cfs polygon	Flooding on Canada del Oro Wash is expected out of banks. Flooded homes possible. Expect hazardous road conditions. Be prepared to activate your emergency response plan. If you are experiencing flooding and feel like you are in danger call 911. This message is from the Pima County Office of Emergency Management.	Flood water on Canada del Oro Wash expected out of banks. Home flooding possible north of Cloud Nine Dr. and south of Rollins Rd. Pima Pistol Club and Spirit Dog Ranch likely affected, with people possibly trapped on east side of the wash. (See inundation map at pima.gov/FloodAlerts)
	>5000 at 1103	17,500 cfs polygon	Flooding on Canada del Oro Wash is expected out of banks. Flooded homes expected. Home flooding is most likely north of Cloud Nine Dr. and south of Rollins Rd. Expect hazardous road conditions. Be prepared to activate your emergency response plan. If you are experiencing flooding and feel like you are in danger call 911. This message is from the Pima County Office of Emergency Management.	Flooding on Canada del Oro Wash continues to expand. Home flooding is most likely north of Cloud Nine Dr. and south of Rollins Rd. Pima Pistol Club and Spirit Dog Ranch likely severely affected, with high ground to the east being the only route to safety. (See inundation map at pima.gov/FloodAlerts)
Franco Wash at Swan Road (Gage ID: 6213)	450	2,800 cfs polygon	Flooding on Franco Wash is expected out of banks. Do not cross flooded roads. Flooded homes possible, particularly in the vicinity of Old Vail Connection Rd and Nogales Hwy. Expect hazardous road conditions. Be prepared to activate your emergency response plan. If you are experiencing flooding and feel like you are in danger call 911. This message is from the Pima County Office of Emergency Management.	Flood water on Franco Wash expected out of banks. (See inundation map at pima.gov/FloodAlerts)
	2800	2,800 cfs polygon	Flooding on Franco Wash is expected out of banks. Do not cross flooded roads. Flooded homes expected, particularly in the vicinity of E Old Vail Road and S Old Nogales HWY. Expect hazardous road conditions. Be prepared to activate your emergency response plan. If you are experiencing flooding and feel like you are in danger call 911. This message is from the Pima County Office of Emergency Management.	Flooded homes and hazardous road conditions expected. Other washes in the area expected to be flowing as well. Surface access to flooded residents may not be possible. (See inundation map at pima.gov/FloodAlerts)
Pima Wash at Ina Road (Gage ID: 1253)	3000	5,800 cfs polygon	Flooding on the Pima Wash is expected out of banks. Do not cross flooded roads. Flooded homes possible, particularly south of Ina Rd near E Deone Ln and E Florence Rd. Expect hazardous road conditions. Be prepared to activate your emergency response plan. If you are experiencing flooding and feel like you are in danger call 911. This message is from the Pima County Office of Emergency Management.	Flood water in Pima Wash is rising. At grade crossings at Deone Lane, Florence Road and Rudasil may be affected.
	5800	5,800 cfs polygon	Severe flooding is expected along Pima Wash. Flooded homes expected, particularly south of Ina Rd near E Deone Ln and E Florence Rd. Hazardous road conditions are expected. Be prepared to activate your emergency response plan. If you are experiencing flooding and feel like you are in danger call 911. This message is from the Pima County Office of Emergency Management.	Flooding along Pima Wash expected to flood homes, particularly south of Ina Rd near E Deone Ln and E Florence Rd. Evacuation of area residents may be necessary. (See inundation map at pima.gov/FloodAlerts)
Sabino Creek at Sabino Dam (Gage ID: 2163)	combined flows from Sabino (2163) and Bear Canyon (2184) >5500	7,000 cfs polygon	Flooding on Sabino Creek expected out of banks. Flooded homes possible. Be prepared to activate your emergency response plan. If you are experiencing flooding and feel like you are in danger call 911. This message is from the Pima County Office of Emergency Management.	Flood water on Sabino Creek at Sabino Dam is rising. Home flooding possible if waters continue to rise, especially on the east side of the creek pm the west side of Palisades Dr. south of Snyder Rd. (See inundation map at pima.gov/FloodAlerts)
	combined flows from Sabino (2163) and Bear Canyon (2184) >7000	14,000 cfs polygon	Flooding on Sabino Creek expected out of banks. Flooded homes expected. Be prepared to activate your emergency response plan. If you are experiencing flooding and feel like you are in danger call 911. This message is from the Pima County Office of Emergency Management.	Flood water on Sabino Creek at Sabino Dam continues to rise. Home flooding expected, especially on the east side of the creek pm the west side of Palisades Dr. south of Snyder Rd. (See inundation map at pima.gov/FloodAlerts)
Santa Cruz River (Upper) at Continental Road (Gage ID: 6049)	25000	45,000 cfs polygon	Flooding on the Santa Cruz River expected out of banks south of W San Xavier Rd and extending south through Green Valley. Do not drive into flooded washes. Be aware of your surroundings. If you are experiencing flooding and feel like you are in danger call 911. This message is from the Pima County Office of Emergency Management.	Flood water height in Santa Cruz River at Continental Road indicates flooding may impact homes in the area. (See inundation map at pima.gov/FloodAlerts)
	40000	45,000 cfs polygon	Flooding on the Santa Cruz River expected out of banks south of W San Xavier Rd and extending south through Green Valley. Flooded homes possible. Do not drive into flooded washes. Be aware of your surroundings. Be prepared to activate your emergency response plan. If you are experiencing flooding and feel like you are in danger call 911. This message is from the Pima County Office of Emergency Management.	Santa Cruz River at Continental Road continues to rise to historic levels. Flooded homes likely. (See inundation map at pima.gov/FloodAlerts)
	>60,000	45,000 cfs polygon	Flooding on the Santa Cruz River is out of banks south of Tucson extending through Green Valley. Flooded homes expected. Be prepared to activate your emergency response plan. If you are experiencing flooding and feel like you are in danger call 911. Bridges may be closed. Avoid the area around the river.	Santa Cruz River flowing above historic levels at Continental Road. Flooded homes expected. Flow exceeds known historical floods. Expected severity of hazards and extent of damage unknown. Exercise caution at bridge crossings. (See inundation map at pima.gov/FloodAlerts)
Tanque Verde Creek (Lower) at Craycroft Road (Gage ID: 2123)	25000	40,000 cfs polygon	Flooding on the Tanque Verde Creek is expected out of bank. Flooded homes possible, especially south of the wash near Craycroft Road including The Gregory School, Castlehill Country Day School and E placita Del Mesquite Rd. If you are experiencing flooding and feel like you are in danger call 911. This message is from the Pima County Office of Emergency Management.	Tanque Verde creek expected out of channel near Craycroft Road. Highest probability of flooded homes is south of the creek along Craycroft Road. (See inundation map at pima.gov/FloodAlerts)
Tanque Verde Creek (Middle) at Tanque Verde Road (Gage ID: 2109)	15000 at 2109 or 12,000 at 2093	20,000 cfs polygon	Flooding on Tanque Verde Creek expected out of banks. Flooded homes possible, particularly along Woodland Rd. Expect hazardous road conditions. Be prepared to activate your emergency response plan. If you are experiencing flooding and feel like you are in danger call 911. This message is from the Pima County Office of Emergency Management.	Tanque Verde Creek expected out of channel between Bonanza Ave. and Tanque Verde Rd. Flooded homes possible. (See inundation map at pima.gov/FloodAlerts)
	20000	28,000 cfs polygon	Severe flooding is expected along Tanque Verde Wash. Flooded homes expected particularly along Woodland Rd. Expect hazardous road conditions. Be prepared to activate your emergency response plan. If you are experiencing flooding and feel like you are in danger call 911. This message is from the Pima County Office of Emergency Management.	Flooded homes upstream of Tanque Verde Road likely as Tanque Verde Wash flooding is expanding. Homes along Woodland Rd. especially at risk. Expect potentially hazardous road conditions on Woodland Rd., making evacuation difficult for this area. (See inundation map at pima.gov/FloodAlerts)
Tanque Verde Creek (Upper) at Tanque Verde Guest Ranch (Gage ID: 2093)	8000	12,650 cfs polygon	Flooding on Tanque Verde Creek expected out of banks. Flooded homes possible. Expect hazardous road conditions. Be aware of your surroundings. If you are experiencing flooding and feel like you are in danger call 911. This message is from the Pima County Office of Emergency Management.	Flood water on Tanque Verde Wash expected out of banks. Home flooding possible along North bank, Barbary Coast Road and vicinity. Residences on the south overbank near Houghton and Speedway may be affected at 12,000 cfs. The Tanque Verde Falls area in Reddington Pass will be extremely dangerous to hikers. (See inundation map at pima.gov/FloodAlerts)
	12000	17,500 cfs polygon	Flooding on Tanque Verde Creek expected out of banks. Flooded homes expected, particularly in southern 49ers Country Club, near Houghton Road, Tanque Verde Loop Road, and the Woodland Road area. Expect hazardous road conditions. Be prepared to activate your emergency response plan. If you are experiencing flooding and feel like you are in danger call 911. This message is from the Pima County Office of Emergency Management.	Flooding along Tanque Verde Wash will likely cause home flooding in 49ers and along Woodland Road. Hazardous road conditions expected. Evacuation of area residents may be necessary. Tanque Verde Falls area in Reddington Pass will be extremely dangerous to hikers. (See inundation map at pima.gov/FloodAlerts)
	20000	23,000 cfs polygon	Severe flooding is expected along Tanque Verde Wash. Flooded homes and hazardous road conditions are expected. Be prepared to activate your emergency response plan. If you are experiencing flooding and feel like you are in danger call 911. If emergency responders are present, follow their instructions. This message is from the Pima County Office of Emergency Management.	Flooding along Tanque Verde Wash expected to flood homes in 49ers and Woodland Road area. Most impacted residents will be on the north side of the creek. Road conditions may be hazardous. Evacuation of area residents may be necessary. (See inundation map at pima.gov/FloodAlerts)
Ventana Canyon Wash at River Road (Gage ID: 2173)	3200	4,340 cfs polygon	Flooding on the Ventana Canyon Wash expected out of banks. Home flooding possible. Do not cross flooded roads. If you are experiencing flooding and feel like you are in danger call 911. If emergency responders are present, follow their instructions. This message is from the Pima County Office of Emergency Management.	Flood waters expected out of banks on Ventana Canyon Wash. Home flooding possible. Snyder Road likely impassable. (See inundation map at pima.gov/FloodAlerts)

Appendix 2

Public Outreach Letter and Watercourse Fact Sheets



July 8, 2019 (DRAFT)

{Property owner name/address}

Re: Flood alerts for [Watercourse Name] through MyAlerts

Dear {Property Owner}:

Your property at {address} is in a floodplain.

The Pima County Regional Flood Control District wants to help keep you and your family safe when the next flood happens. But if we can't reach you, we can't alert you.

We need you to take a simple action now so we can send you important messages later.

The Pima County Office of Emergency Management (OEM) has recently implemented an emergency alert system known as **MyAlerts**, which can alert you to various emergency situations. The Regional Flood Control District (District) has determined that the MyAlerts system provides an excellent opportunity to provide important flood alert and safety messages in near-real-time to citizens in certain highly floodprone areas. In coordination with OEM, the District has established flood alerts notifications through MyAlerts for [watercourse name], which affects your property. The enclosed MyAlerts pamphlet includes information on how to sign up.

While this represents a significant leap forward in providing potentially life-saving messages to you, I must stress to you that **floods are dynamic, that the variables that affect the size and extent of a flood are numerous, and that no flood warning system is perfect.** If you sign up for MyAlerts the District will do its best to provide you with timely, accurate alerts, but wants you to be prepared for the unpredictability of floods. A flood may impact areas that have not received an alert and alerts may be sent for a flood that ends up not affecting all flood alert recipients. However, we feel that if we have the ability to provide flood alerts and give people an opportunity to take action to protect themselves or their property, we should do so.

It is important to understand that MyAlerts is a voluntary, opt-in emergency alert system that is separate from the National Weather Service alerts that you may already receive. You must sign up for MyAlerts in order to take advantage of the emergency messages that the District is now able to provide you. Please sign up for MyAlerts now at myalerts.pima.gov.

I would also like to encourage you to take this time to create an emergency response plan for your home or business. Floods and other emergencies may occur when you least expect them so preparedness is your key to protecting yourself, your loved ones, your co-workers, and your property. Your emergency response plan should include having an emergency supply kit and a plan for everyone in the home or business, including a safe rallying point, a point of contact outside the immediate area, and important medical information. Taking care of your pets should also be included in the plan. Your plan should cover not only evacuation, but also sheltering in place, which may be a safer option.

The enclosed information will tell you more about MyAlerts and how to sign up, as well as give you details about the alerts you will receive in the event of a flood and what they mean. This information can also be found at: <http://www.pima.gov/FloodAlerts/>

Suzanne Shields, P.E., Director

201 N. Stone Avenue, 9th Floor, Tucson, Arizona 85701-1207 • Phone: 520-724-4600 • Fax: 520-724-4621

Sincerely,

Suzanne Shields, P.E.
Director, Pima County Regional Flood Control District

Enclosure(s): Flood Alerts Fact Sheet
MyAlerts pamphlet
Emergency Response Plan Guide

Suzanne Shields, P.E., Director

201 N. Stone Ave, 9th Floor, Tucson, Arizona 85701-1207 • Phone: 520-724-4600 • Fax: 520-724-4621

Upper Tanque Verde Creek Inundation Areas

ALERT Gage 2093

The Pima County Regional Flood Control District (District) operates a flood warning system that measures the depth and discharge (flow volume) of a variety of watercourses, including the Upper Tanque Verde Creek. The District has mapped areas that may become flooded (Inundation Areas) at different flow levels to help determine when it's appropriate to send timely flood warning and safety messages to MyAlerts recipients in those areas. Flood warning messages can help MyAlerts recipients that may be impacted by flooding to take action to protect themselves, their loved ones, and their property. The mapped inundation areas are based on a flood discharge measured in cubic feet per second (cfs) at a specific stream gage. It's important to know that flood alerts will be sent at a lower discharge than the inundation area discharge to provide time for message recipients to react.

MyAlerts

Opt in to MyAlerts to receive the messages on the back of this page. The messages are examples of what you can expect to receive when flows of the stated magnitude at the stream gage for this area are observed. Actual messages may vary slightly depending on conditions.

Since floods are dynamic, actual inundation areas may be different than these estimates shown. Floods in Pima County can develop quickly and there are many factors that affect the extent of flooding that are unpredictable. It is possible that you may receive a warning and the events described do not occur. It is also possible that flooding occurs in areas that did not get an alert. Even though these uncertainties exist, the District believes that it is better to alert people that a flood is coming, if possible. However, please remember that no message can guarantee your safety. It is your responsibility to use sound judgment in and around flood waters.

Additional Predicted Flood Hazard Information for Upper Tanque Verde Creek, based on computer modeling

- Tanque Verde Creek breaks out of the channel on the south bank at Houghton Road around 12,000 cfs.
- Tanque Verde Creek breaks out on the north overbank onto Woodland Road around 13,000 cfs.
- Tanque Verde Creek breaks out of the channel at Tanque Verde Loop Road around 14,000 cfs.
- The southern part of 49ers Subdivision is subject to overbank flooding from Tanque Verde Creek at around 14,000 cfs.
- Hazardous driving conditions exist at the dip crossing of Tanque Verde Creek at Tanque Verde Loop Road and Wentworth Road whenever flows are present.

NOTE: The alerts provided err on the side of caution. It is possible that you may receive a warning and the events described do not occur. This is, in part, because floods in Pima County can develop so quickly that we have to anticipate possible events early in order to give the public reasonable time to react to the potential threat. In addition, there are many factors that affect the extent of flooding that are unpredictable. Flood damage may be lower or higher than what we expect. The District strives to provide the best possible information based upon the best available data and is not liable for errors. No message can guarantee your safety.

We will occasionally be wrong, but that does not mean that the safety messages should be ignored. It is your responsibility to use sound judgment in and around flood waters.

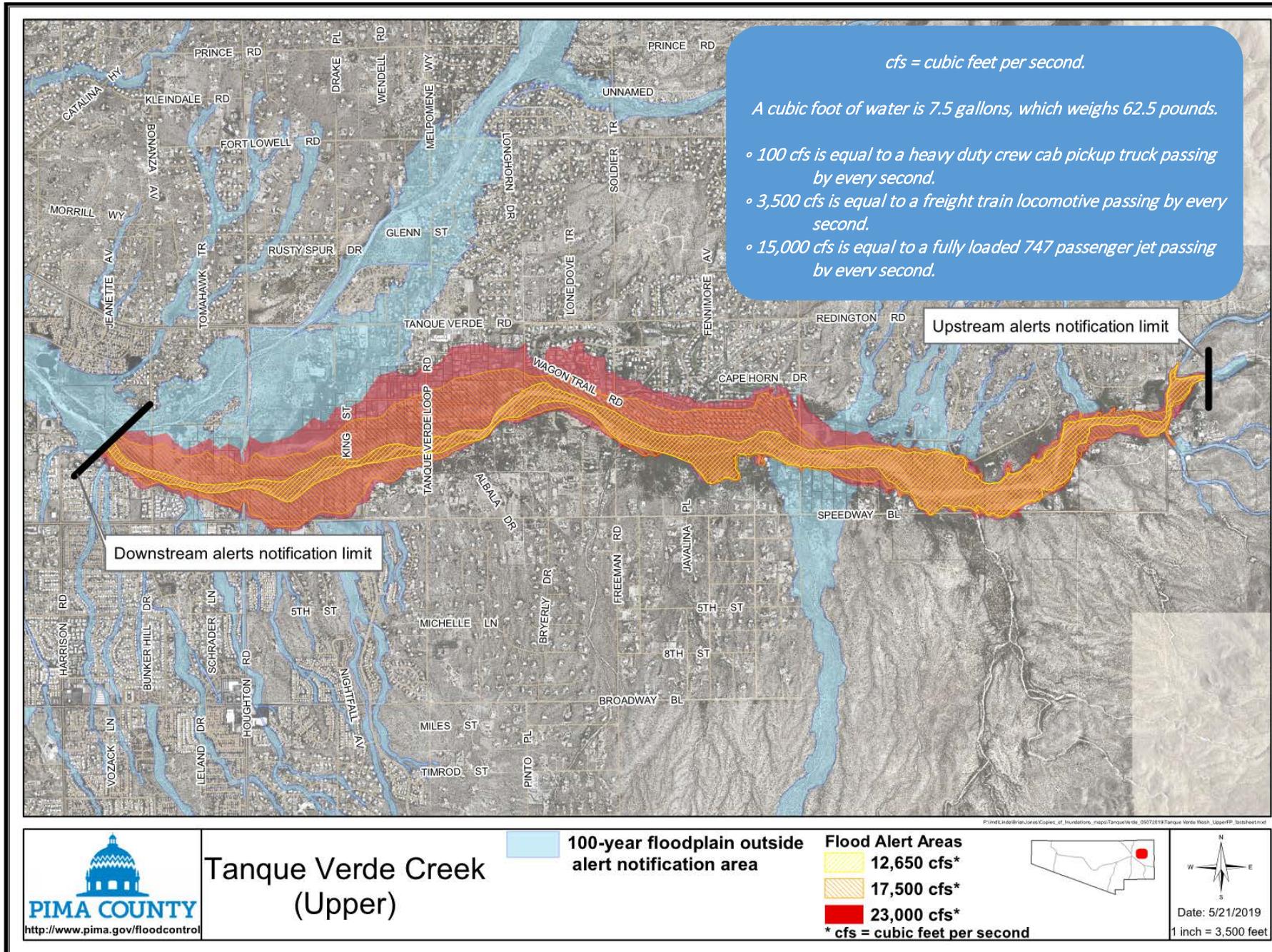
BE PREPARED

- Know your routes to high ground
- Establish a safe meeting spot for family members
- Prepare a kit with medications, water, snacks, first-aid supplies, flashlights and batteries
- Plan for evacuating pets
- Move valuables to high areas
- Make sure all family members know how to turn off electricity, gas, and water

An inundation map is attached (on reverse side) showing the estimated floodprone areas at the flood magnitudes used for MyAlerts. Additional information and interactive maps can be found at:
<http://webcms.pima.gov/cms/one.aspx?portalId=169&pageId=457327>



Flood Alert Messages



12,650 cfs Flooding on Tanque Verde Creek expected out of banks. Flooded homes possible. Expect hazardous road conditions. Be prepared to evacuate or shelter in place. If emergency responders are present, follow their instructions. This may be the only notification you receive. If you are experiencing flooding and feel like you are in danger call 911.

What you need to know: Flood waters continue to rise. Homes near the creek and along the southern edge of 49ers subdivision may be flooded. Be prepared to protect your home from flooding and/or evacuate before roads become impassable. Gather valuables and your flood preparedness supplies.

17,500 cfs Flooded homes likely as Tanque Verde Creek flooding is expanding. Expect hazardous road conditions. Be prepared to evacuate or shelter in place. If emergency responders are present, follow their instructions. If you are experiencing flooding and feel like you are in danger call 911.

What you need to know: Flood severity is increasing, affecting more homes. See above for more details.

23,000 cfs Severe flooding is expected along Tanque Verde Creek. Flooded homes and hazardous road conditions are expected. Be prepared to evacuate or shelter in place. If emergency responders are present, follow their instructions. If you are experiencing flooding and feel like you are in danger call 911.

What you need to know: Flood waters expected to reach full extent of the inundation area shown on the map below. Exercise extreme caution if you evacuate. Road conditions will be hazardous.



MyAlerts.pima.gov

During an emergency, urgent messaging is effective only if it reaches you quickly. That's what Pima County's new mass notification system can do.

Our Everbridge system can quickly and reliably push emergency messages to numerous devices, making it the go-to tool for keeping the public informed. Everbridge subscribers receive emergency alerts and information when it counts.

How it works

Go to MyAlerts.pima.gov to create a profile and start receiving notifications. Subscribers can specify how they want to be notified.

Emergency notifications are issued based on geographic location. The more information included in a profile, the more specific the notifications will be. Messages could warn of potential safety hazards, law enforcement situations or any number of emergency situations.

Information provided is confidential and will not be shared.

To learn more, visit MyAlerts.pima.gov



**Signing up for emergency alerts is free, but standard text messaging fees from your cell carrier may apply.*



Emergency Response Plan Guide

There are a lot of great examples on the internet to help you create an emergency response plan. We'll highlight a few from respected sources and give you some flood specific tips for you to include in your plan for your home or business. Go to <http://www.pima.gov/FloodAlerts/> for additional resources to help you create your plan.

For Your Home

- Flood waters can arrive very quickly on desert washes, so it's important to have a "Go Kit" handy at all times in case you need to evacuate at a moment's notice. Keep water, shelf stable food, a flashlight, spare phone charger and other essentials in it at all times, then add things like medications to it when you have to evacuate.
- Don't forget to include pet supplies in your Go Kit.
- Establish a family rallying point well outside the floodplain. Make sure there is a safe travel route from your home, work, or school to that location so that everyone can get there.
- Establish a reliable person outside your immediate area for everyone to contact and relay messages through in case phone systems are down or someone's cellphone battery dies. Make sure everyone memorizes the email and phone number of your designated contact person.
- Have sandbags handy. You can also search "sandless sandbags" for other alternatives that may work better for you.

For Your Business

- Have a plan for closing the business down in an emergency.
- Keep a list of employee phone numbers and let them know when not to come to work due to flooding.
- Make sure employees establish safe travel routes to and from work in times of flooding.
- Your plan should include being prepared for employees remaining at work until it is safe to leave.
- Have sandbags handy. You can also search "sandless sandbags" for other alternatives that may work better for you.

Medical Care, Assisted Living, Child Care, Utilities, or other Critical Facility

There are special considerations for medical facilities, assisted living facilities, schools, day care facilities, or other locations considered to be vital in an emergency, like utilities providers.

- If your facility includes individuals who will not be self-sufficient in an emergency (patients, elderly, children), make sure to discuss your plan with the Office of Emergency Management. They will need to know how many people may need assistance and what kind of assistance will be needed.
- Utility companies should have a continuity of operations plan.

Internet Resources

The District recommends looking at each of the resources below and picking one that works best for you.

Ready.gov – <https://www.ready.gov/make-a-plan>

Red Cross – <https://www.redcross.org/get-help/how-to-prepare-for-emergencies/make-a-plan.html>

FEMA – <https://www.fema.gov/media-library/assets/documents/89518>