

**TOWN OF SAN ANSELMO
STAFF REPORT
January 2, 2013**

For the Meeting of January 8, 2013

TO: Town Council

FROM: Debra Stutsman, Town Manager

SUBJECT: Winter Storm Emergency Procedures

RECOMMENDATION

That Council acknowledges and files the report regarding the Town's emergency procedures for winter storms and actions taken during recent storms.

BACKGROUND

The Town experiences threats of flooding during heavy winter storms on a periodic basis, as the capacity of the San Anselmo creek may be exceeded by heavy rainfall in a short amount of time when the ground is fully saturated. The Town has experienced several devastating floods, most notably in 1982 and 2005. Since the 2005 flood, the Town, working in conjunction with the County of Marin and other Ross Valley cities/towns, has taken steps to reduce the risk of flooding in the Ross Valley. The Ross Valley Watershed group, made up of the County of Marin and Fairfax, San Anselmo, Ross, Kentfield, and Larkspur, has worked to create a capital improvement plan that utilizes detention basins, channel improvements and creek maintenance work that will be paid for through a flood fee put in place by voters, augmented by State and Federal grant funding. Plans are underway to begin work on these improvements in the next few years.

TOWN FLOODING PROCEDURES

The Town's flooding procedures are attached. A flood event is categorized in five stages, as follows:

- Stage 1 Large storms predicted with the ground saturated
- Stage 2 Creek Level at 6.5 feet
- Stage 3 Creek Level at 8.14 feet
- Stage 4 Creek Level at 11.14 feet
- Stage 5 Creek Level at 13 feet

In Stage 1, staff begins preparations for stormy weather by participating in conference calls with the County and our Ross Valley neighbors, alerting merchants and the community to upcoming weather through the newsletter, emails and website, ensuring sand and bags are available, etc.

In Stage 2, staff receives the first text alert on the creek level at 6.5 feet, checks conditions, updates website and alerts merchants and public of storm through the newsletter, emails and website.

In Stage 3, staff receives the second text alert on the creek level at 8.14 feet, advises merchants and residents of current conditions, prepares automatic telephone alerts in case they're needed, schedules call out of public works crews, stages flood gates and considers installing, alerts EOC staff of situation, updates website.

In Stage 4, staff activates phone notifications to merchants and residents at 11.14 feet, considers call out of all staff, considers opening of Emergency Operating Center (EOC), places flood gates, considers evacuation of downtown and activates emergency notification icon on website.

In stage 5, flooding is imminent at 13 feet, staff sounds the flood horn, prepares for flooding and individual departments begin emergency response per departmental procedures.

The Emergency Procedures in Event of Winter Storms and Flooding is attached. (Attachment #1).

DISCUSSION

The Ross Valley continues to experience periodic threats of flooding in the downtown and several creek side neighborhoods, including Nokomis and Morningside, as well as localized flooding in many neighborhoods. Regarding localized flooding, the Town's drainage system is designed to handle the runoff from a 10-year storm, and rainfall of a greater intensity will, unfortunately, overwhelm the system and cause localized flooding.

Two large storm events have already been experienced this winter, one on Sunday, December 2 and one on Sunday, December 23. These two events illustrate how the level of the creek reacts radically differently depending on the rate and intensity of the rain and the saturation of the landscape, as well as the limited capacity of our drainage system and its impact on localized flooding. It is for this reason that the flooding procedures have built in an element of judgment to ensure that our response is appropriate, based upon the intensity of rain, the saturation of the ground and the weather predictions.

Sunday, December 2, 2012:

Storm Details - During this storm the creek rose at a maximum rate of rise of 6.1 feet per hour, which is unprecedented. Prior to this storm the highest rate of rise recorded was 2.6 feet per hour. A total of just 1.65 inches of rain fell between 4:30 a.m. and 9 a.m. that morning. The heaviest rainfall began at 7:00 a.m. at a rate recorded at 1.92 inches per hour for a short period of time. The creek level was 5.5 feet at 7 a.m., but rose dramatically to 12.75 at 8:45 a.m., a rise of 7.35 feet in less than two hours, again unprecedented. The ground became saturated and following that intense rainfall at 7:00 a.m. the creek continued to rise for an hour and 30 minutes, peaking at 8:45 a.m. at 12.75 feet. At 13 feet the water hits the building at Bridge Street and flooding is considered to be imminent. Creek water was beginning to come out of bank at Morningside at this time, along with overflow due to overwhelmed sewer lines caused by water infiltration. The flood horn was sounded, alerting residents and merchants to get to higher ground immediately. The 12/2/12 graph of the rainfall/creek data is attached (Attachment 2).

Staff Response – With storms predicted over the weekend, staff arranged for 4 additional street sweepers to sweep the entire town on Thursday, November 29 to try to minimize storm drain blockages from the voluminous amount of leaves still on trees. On Sunday, December 2, at 7 a.m. the creek was at just 5 feet. Fire was responding to multiple storm related incidents and normal on-duty staffing was doubled, from 9 to 18 personnel. As the rain continued and the creek rose rapidly, however, staff began arriving at Town Hall by 8 a.m., installing the flood gates, calling in additional assistance, responding to calls for assistance, reviewing the weather reports, contacting merchants in person and by email and beginning the flood procedures. Police officers went to the businesses that were open to advise them of the situation. The creek quickly exceeded the 12.75 foot mark at 8:45 a.m., the horn was sounded. Soon the rain eased and the creek began to recede.

Sunday, December 23, 2012:

Storm Details – During this storm the creek rose at a maximum rate of rise of 4 feet per hour, which is also a very high rate. A total of 2.75 inches of rain fell between 3 a.m. and 1 p.m. that day. The heaviest rainfall began at 10:15 a.m. at a rate recorded at .76 inches per hour for a short period of time. The creek level was 4 feet at 5 a.m., but rose to nearly 11 feet at 1:15 p.m., a rise of 7 feet in 7 hours. Again, the ground was saturated and following that intense rainfall at 10:15 a.m. the creek continued to rise for 2.75 hours, peaking at 1:15 p.m. at 11 feet. The 12/23/12 graph of the rainfall/creek data is attached (Attachment 3).

Staff Response – A weather alert was sent out by email to merchants on Thursday, 12/20, and to the newsletter list and Nixle list on Friday, 12/21. A weather alert for the weekend was also posted on the news flash section of the website on the home page on Friday, 12/21. On Sunday, December 23, management staff was on scene at 11 a.m., as well as Public Safety and Public Works crew members, when the creek was at 6.5 feet. Police officers went to the businesses that were open to advise them of the situation. Flood gates were staged and an alert was sent to merchants and residents by email at 12:30 p.m. alerting them that the creek had reached a level of over 8 feet and that the storm was predicted to continue. The flood gates were installed and additional crew called in. A telephone message was prepared to be sent out via the TENS system. When the creek came close to 11 feet at 1:15 p.m. the automated telephone message was directed to be sent to residents/merchants in areas designated as susceptible to flooding from Fairfax to Corte Madera. That message went out about 2 p.m., although by then the danger had passed.

Town staff met following both incidents to review our response and make adjustments to our protocols. With respect to the December 2 storm, the quick rate of rise truncated efforts to the most essential tasks. The December 23 storm was a textbook case in how we strive to respond to a flooding situation, per the Town's protocols.

FREQUENTLY ASKED QUESTIONS

Following are answers to some of our most frequently asked questions about storms, flooding and response protocol:

1. When do you sound the flood horn? The protocol is to sound the flood horn when flooding is imminent, which is at 13 feet. When the horn is sounded, residents and merchants are advised to proceed immediately to a higher floor or to higher ground. The flood horn does not mean to come downtown to see the creek or move merchandise to higher areas. Rising flood waters are fast moving and dangerous.
2. Why can't you sound the flood horn earlier? The flood horn is reserved to alert all residents and merchants that flooding is imminent. Many times during a storm the water level hovers around 11 feet, sometimes for days. Were the flood horn to be sounded each time the creek level gets to 11 feet, for example, it could be necessary to sound it repeatedly for days, diluting the message and most probably resulting in people ignoring the warning. In this age of technology, we have many other methods of notifying merchants and residents of pending storms and rainfall/creek updates.
3. How is the public notified of pending winter storms and flooding danger? Our ability to notify residents and merchants of pending storms and flooding danger has improved exponentially over the last 8 years, since the major flood event of 2005. After the 2005 event, the automatic telephone

notification system was put in place to notify both residents and merchants in areas prone to flooding of imminent danger. In addition, we now have email lists of merchants who have requested notification, the Town newsletter email list to whom we can send immediate alerts during an incident, and the Police Nixle system, as occurred on December 23, 2012. We also encourage people to stay tuned to local TV and radio stations for weather updates to augment the above information.

4. Why can't you establish a hard and fast protocol of exactly what you are going to do and when you are going to do it in a storm situation? As we can see from comparing the two storm events of December 2 and December 23, the creek reacts quite differently depending on the rate of rainfall, the ground saturation, the areas receiving the most rainfall, the duration of the rainfall, etc. Each storm/flooding event is different and calls have to be made based on the available data to ensure an appropriate and timely response.

CONCLUSION

Staff takes the responsibility for emergency response very seriously. The emergency response management team has met on several occasions to critique our responses to these storms and to adjust protocols as needed to ensure our response is meeting the needs of the community.

Respectfully submitted,



Debra Stutsman
Town Manager

Attachment 1 – Emergency Procedures

Attachment 2 – 12/2/12 Creek Graph

Attachment 3 – 12/23/12 Creek Graph

**TOWN OF SAN ANSELMO
EMERGENCY PROCEDURES IN EVENT OF
WINTER STORMS AND FLOODING**

Stage	Creek Level:	Action:	Responsible Dept/position:
1	Large storms predicted with ground saturated	Alert merchants/community of upcoming storms, may include flyers to merchants, emails, Town newsletter, etc.	PIO
		Participate in County conference calls to stay up to date on forecast and conditions	Police, Fire, PW, Admin
		Conference call with Ross, FX and RVFD to ensure all are on same page.	Fire
		Ensure sufficient supply of sand and bags	PW
		Deliver sand and sand bags to tennis court lot	PW
		Update Website, Town newsletter	PIO
		Evaluate need and timing for additional staffing or staff call back	Police, Fire, PW, Admin
		Check flood gates for readiness	PW
2	6.5 feet	First creek level alert text sent to staff list	Fire
		Check current and expected conditions – Radar; NWS forecast, advisory, watches, warnings; Fairfax and Ross creek levels	Police, Fire, PW, Admin
		Notify merchants and public of storm situation. Advise preparations w/sandbags, flood gates	PIO
		Update website	PIO
3	8.14 feet	Second creek level alert text sent to staff list	Fire
		Send email to merchant/newsletter list advising of current conditions.	PIO
		Prepare MEANS announcement in case it's needed in Stage 4 – consider timing of announcement, coordinate with Fairfax, Ross, Kentfield, Larkspur, Corte Madera	PIO
		Contact County regarding possible TENS announcement in Stage 4.	PIO
		Schedule call out of PW crews, consider calling in two members now, if not already here	PW
		Stage flood gates – consider installing	PW
		Alert EOC staff to possible callout by email/text	PIO
		Update website	PIO
		Check current and expected conditions – Radar; NWS forecast, advisory, watches, warnings; Fairfax and Ross creek levels	Police, Fire, PW, Admin
4	11.14	Activate MEANS phone call to merchants – Coordinate	PIO

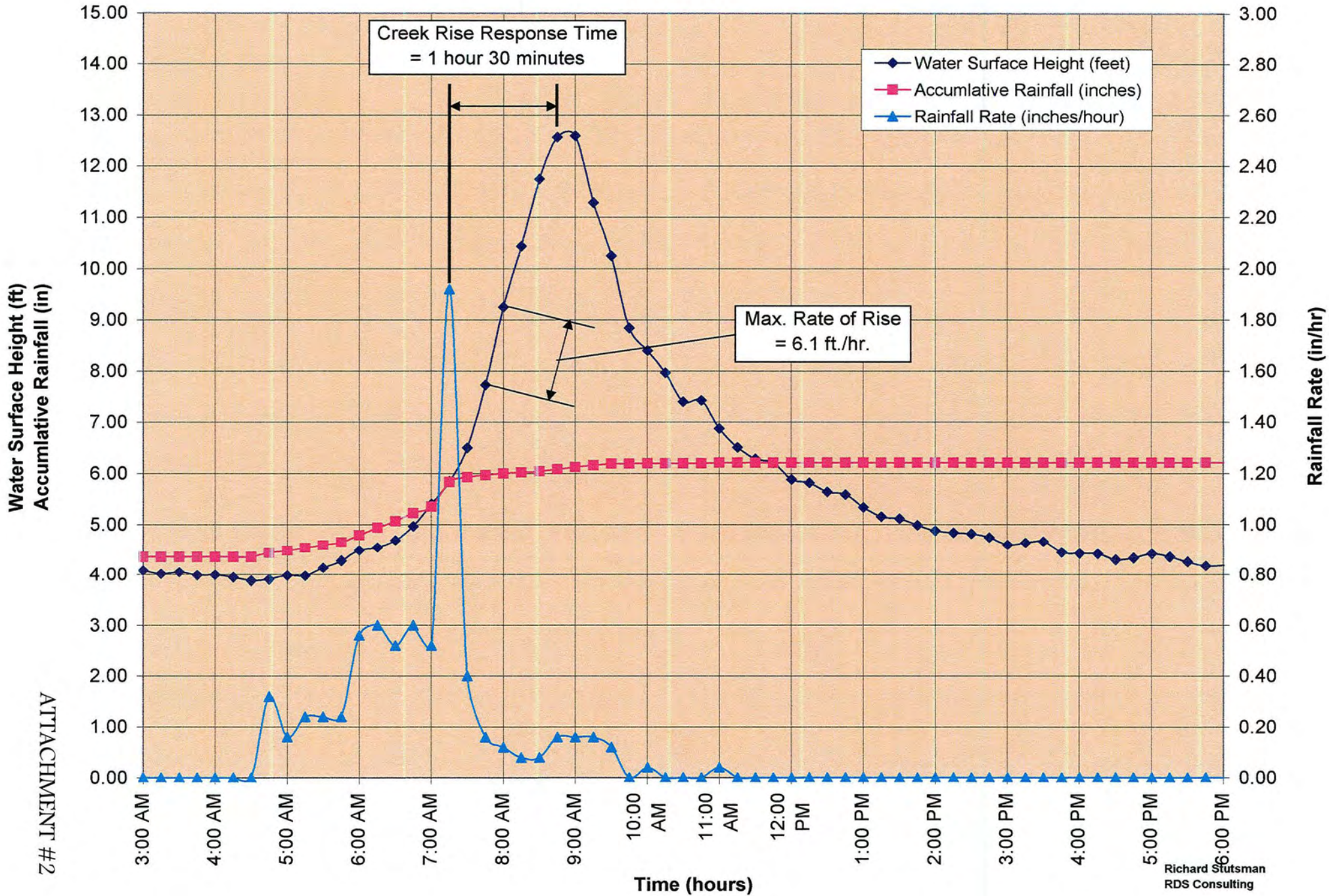
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		with FX, Ross, Kentfield, Larkspur, Corte Madera	
		Activate TENS phone call to flood prone areas – plus MEANS notification to local officials. Coordinate with FX, Ross, Kentfield, Larkspur, Corte Madera, alerting them to creek height and to move cars.	PIO to County
		Ring down all Ross Valley stations alerting re: TENS message	Fire
		Consider call out of all EOC personnel	EOC Chief
		Consider call out all staff as disaster workers	Dept. Mgrs.
		Consider opening Emergency Operating Center (EOC)	EOC Chief
		Place flood gates (may be done in Stage 3)	PW
		Consider evacuation of downtown – decide level of evacuation: public, merchants, mandatory, voluntary	PD
		Activate Emergency Notification icon on website	PIO
5	13+ feet	Flooding imminent. Sound Flood Horn – 5 blasts, a pause, 5 blasts, a pause and 5 more blasts. Alert other cities first.	EOC Chief
		Prepare for flooding	EOC members
		Run flooding incident per individual department procedures for emergency incidents	PW, Police, Fire, EOC

San Anselmo Creek @ Station 19

December 2, 2012

(rev. 1/3/2013)



San Anselmo Creek @ Station 19

December 23, 2012

(Rev 12/31/2012)

