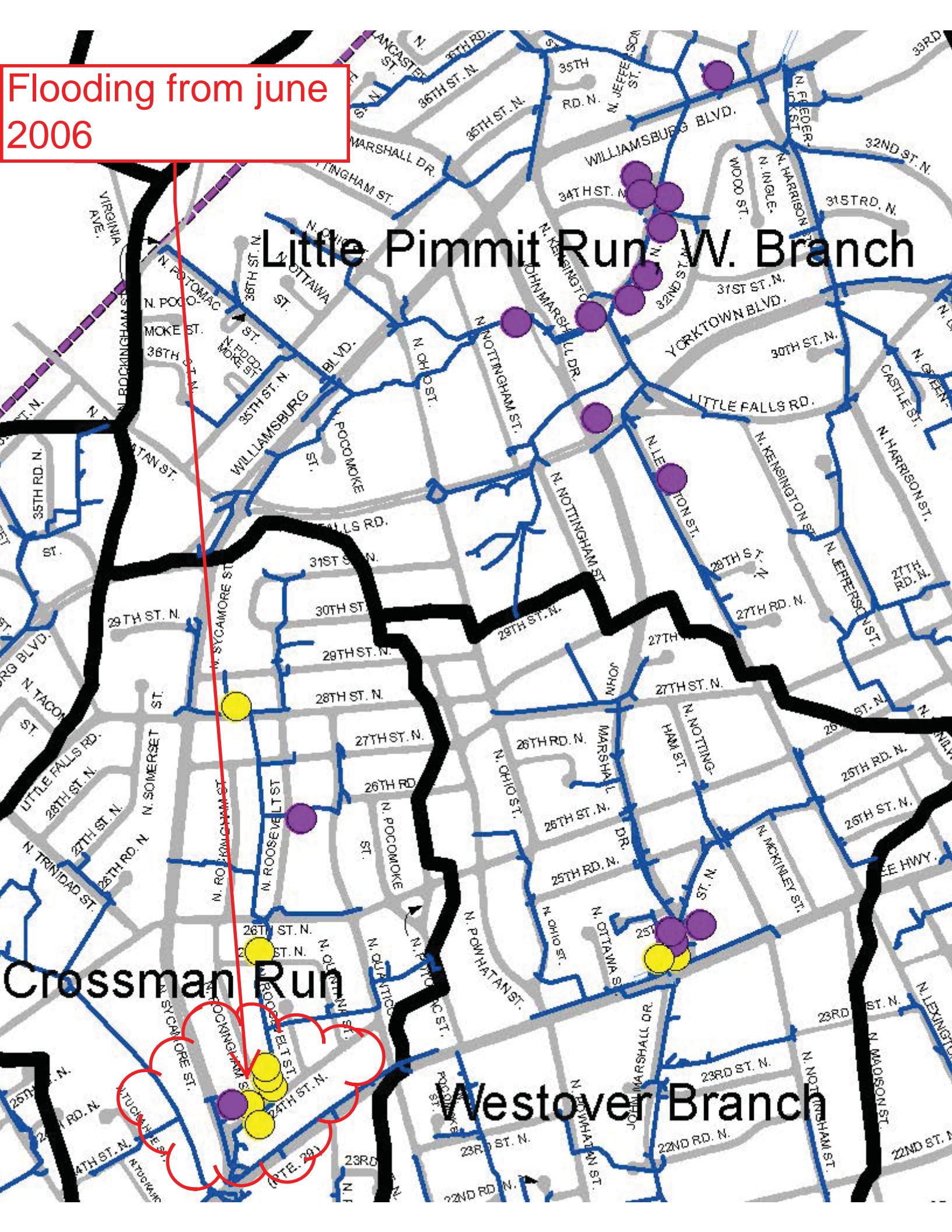


Flooding from june 2006

Little Pimmit Run, W. Branch

Crossman Run

Westover Branch



## Elizabeth Thurber

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**From:** Ravinder Singh  
**Sent:** Wednesday, August 16, 2017 5:41 PM  
**To:** Elizabeth Thurber; Mark Gundersen; Kevin Connolly; Dave Hundelt; Prabin Banepali  
**Cc:** Harry Wang; Chris White; Otis Pearson; Timothy Dove; Jason Papacosma; Nilesh Naikare; Ravinder Singh  
**Subject:** 170816 I don't know who else to ask [N. Sycamore Street- Storm Drain Improvements - S17D]

Liz – Here is what we observed yesterday on N. Sycamore Street- Storm Drain Improvements project related to flooding:

Regarding flooding issues on this project the following of us met on site yesterday (Tuesday, August 15, 2017 from 1:00-3:00 PM):

1. Sid Jain – Ardent Company
2. Mario Ruiz – Ardent Company
3. Vivek Thukral – Ardent Company
4. Leo Pineda – Ardent Company
5. Ravinder Singh – DES
6. Mark Wisdom – DES
7. Elizabeth Thurber – DES
8. Deon Shedrick - WRA

### Observations:

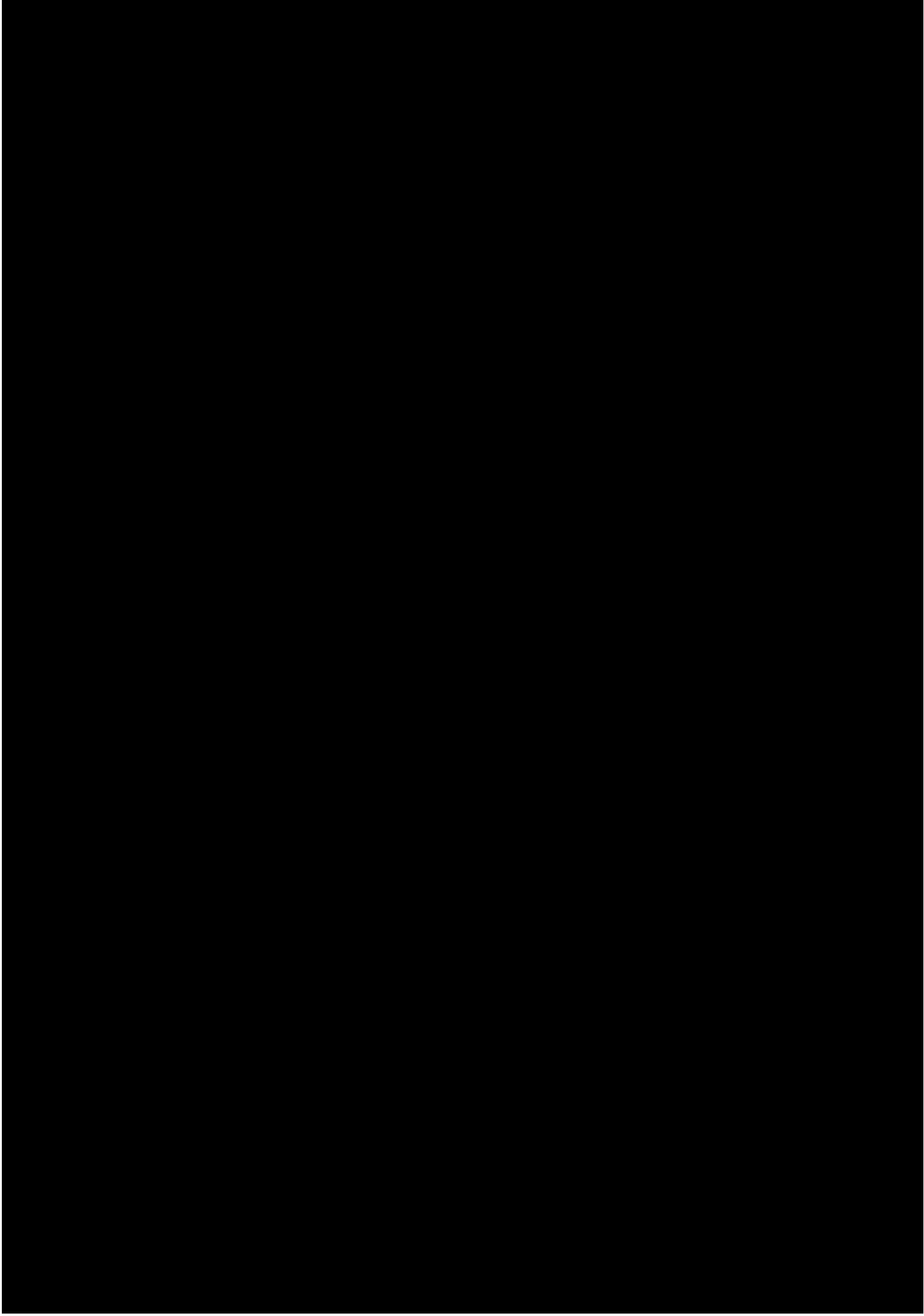
The flooded basements for three homes along North Rockingham Street at the intersection of 24<sup>th</sup> Street N. were discussed. Along with reps noted above, walked the project site to try to determine the cause of flooding for house numbers 6407 N. 24<sup>th</sup> Street, 2407, North Rockingham Street and 2411 North Rockingham Street. Together we checked storm drains: All New Storm Structures - 6462-N, 6617-N, 23695-N, 6337-N, and 6508 to see if storm water was flowing through the basins. We all agreed and witnessed, “All new storm structures listed were moving the storm water smoothly”.

We spoke with [REDACTED] at house #2411 on N. Rockingham St who was a witness to the flooding, said the water was bubbling upstream at the existing catch basin #6111 behind the house #2415 N Rockingham.

Mark Wisdom pulled the tops of all listed new structures including the existing catch basin #6111. Water was flowing through the structure without any obstructions. After checking all new and old structures, Elizabeth Thurber explained [REDACTED] how the water flooding is a result of being in a flood plain and all the storm water coming down the Crossman Run watershed. The under capacity upstream existing storm drain could not handle all the rain coming in. The water has to pass through existing two 90° turns between existing structure #5766 to reach the newly placed structure #6337-N on N. Rockingham St. Elizabeth also explained how the project is not complete and the new 60 inch RCP storm drain run proposed to relieve the high volume water flow has not been installed yet.

### Notes:

- 1.) Elizabeth Thurber informed all parties that she would have Otis Pearson from Arlington County to video the storm drain RCP for blockage behind houses along Rockingham Street to and from catch basin #6111.
- 2.) Elizabeth Thurber and Mark Wisdom agreed for Ardent Co. to remove all Stone packs at storm drains.
- 3.) At the end of the meeting all parties agreed as follows:
  - a. The flooding started at upstream this construction at the existing catch basin #6111 behind the house #2415 N Rockingham due to under capacity of the upstream storm system and including due to presence of existing two 60” RCP 90 degree bends.
  - b. The County could not plan/design under capacity upstream storm system due to unavailability of ROW and will continue to resolve flooding issues in multiple phases as and when possible.
  - c. On Rockingham Street and on 24<sup>th</sup> Street N., the rain water did not rise much above top of the curbs which further indicates flooding occurred from the back yards and not the front yards.



**Our Goal:** is to work together, speedup this construction, and get out of this flood zone as quickly as possible – hopefully by October 1, 2017. Countdown has begun, we are pushing this contractor very hard to complete this project sooner than later. Like many of our projects, this had been one of the most complicated projects but together we will succeed soon. Thanks



Regards,  
Ravinder



**ARLINGTON COUNTY, VIRGINIA**  
**Interdepartmental Memorandum**

August 24, 2017

**To:** Jay Fissette, Chair, Arlington County Board

**From:** Office of the County Manager

**Subject:** GRAM 390063

**Constituent/Group Name:** [REDACTED]

**Staff Preparing Response:** Elizabeth Thurber, Storm Water Infrastructure Team Leader for DES-OSEM, Project Manager for project S17D N. Sycamore St. - Storm Drain Improvements; 703-228-3363; ethurber@arlingtonva.us

**Issues to Be Addressed:**

- Resident is concerned over the significant disruption to the neighborhood resulting from construction of the storm drain improvements project.
- Resident stated that the disruptions have been ongoing for over one year.
- Resident stated that the disruptions include: restricted parking, construction debris, construction equipment, noise, and vibrations.
- Resident and two other neighbors' homes were flooded on August 15, 2017 during the storm of that date.
- Resident is unsatisfied with the responses provided by both the Project Manager (E. Thurber) and the Construction Manager (R. Singh)

**Current Status/Findings:**

- County Project S17D is currently under construction. This project consists of the installation of 850 linear feet of 60-inch diameter storm sewer pipe and 14 new, very large junction structures. Photos are attached below.
- The Notice to Proceed for project S17D was dated August 24, 2016. The commencement Date for construction of the new storm sewers was September 19, 2016. The completion date was set for September 18, 2017. The contractor is behind schedule and will not complete the work by the contract end date. Currently, it is expected that construction will be completed by early October, 2017. County Construction Management staff expect to impose liquidated damages due to the delayed completion date.
- The [REDACTED] and their neighbors have experienced construction for a period of approximately 24 months. County staff acknowledges that this is a long time period. The long period of construction is due to multiple

- construction projects occurring in the neighborhood including gas relocations, home remodeling, water line cleaning and lining, as well as the storm drainage improvement project.
- County construction and project managers have responded to each and every resident concern via email, phone calls and site meetings. Several emails to the residents are attached. Accommodations and adjustments have been made to the greatest extent possible given contract requirements, schedules, and the scope of work.
  - Flooding occurred in a widespread area of the County on August 15, 2017. Preliminary analysis of the storm by DES-OSEM staff indicates that the storm was very intense and exceeded infrastructure capacity.
  - [REDACTED] including the [REDACTED], at the intersection of N. Rockingham St. and 24<sup>th</sup> St. N., were flooded. Video provided by the residents clearly shows water bubbling up out of the storm inlets, indicating that the system capacity was exceeded.
  - Residents believed that the inlets on their street were blocked and prevented the storm water from entering the system. However, immediately after the storm, County Project staff inspected the inlets and all were flowing freely. Inlet protection devices had been removed, in advance, as preparation for the rainfall event.
  - At the time of the flood, only the existing storm drainage system, which has been identified as lacking capacity, was in service. The new 60-inch diameter storm drains were not yet connected or in service.
  - County staff shared their preliminary findings with the [REDACTED] and their neighbors on several separate occasions. Emails are attached.

**Next Steps and Timeframe for Completion:**

- Project and Construction Management staff are working with the contractor to complete the construction project as soon as possible.
- Staff expects construction of S17D to be completed by early October 2017.

**Additional Information / Background / Relevant History:**

- Flooding occurred at this location during the June 2006 storm. Multiple homes suffered damage. The drainage network in this area was analyzed as part of a countywide capacity analysis of the County's storm drainage system. This analysis confirmed the need for increased storm sewer capacity. The analysis is part of the County's Storm Water Masterplan. The project, S17D, will reduce the risk of flooding. However, the area where the resident lives is located in the low spot of the watershed and there is no overland relief. Hence, there will always be a risk of flooding in the area. Flooding again occurred in 2012.

- As part of the development of the project S17D, the [REDACTED] and the other residents whose homes flooded were approached by County staff for storm drainage easements that would have permitted the storm drain system to be reconfigured in a more hydraulically efficient manner. All three landowners declined to grant the requested easements. They notified County staff on April 4, 2014, after which the project design team revised plans and proceeded with the plan currently under construction. Only one resident in the neighborhood would grant temporary easements to facilitate the construction project.
- Without the requested temporary and permanent easements, the project improvements were limited to a restricted area. Certain improvements that could have improved the hydraulic efficiency of the storm drainage network could not be included in the project. This imposed technical challenges for the contractor and has also resulted in a very intense level of activity, within public right-of-ways, for the residents.

**Attachments:**

May 12, 2013 flooding of intersection at N. Rockingham St. and 24<sup>th</sup> St. N. This predates the S17D storm drainage improvement project by 3 years. Flooding also occurred June 2006, but there are no photos.



August 15, 2107 flooding at N. Rockingham St. and 24<sup>th</sup> St. N. Pipe shown in the photo is for portions of project S17D that have not yet been constructed. Pattern of flooding is very similar to past events.





June 28, 2017, construction of large junction box at intersection of N. Sycamore St. and 24<sup>th</sup> St. N. Photo shows the large construction footprint required to set junction boxes for 60-inch diameter pipe. The size of the equipment, pipe and construction footprint have frustrated residents due to road closures, parking restrictions, noise, vibrations, dust, and other normal aspects of very heavy construction.

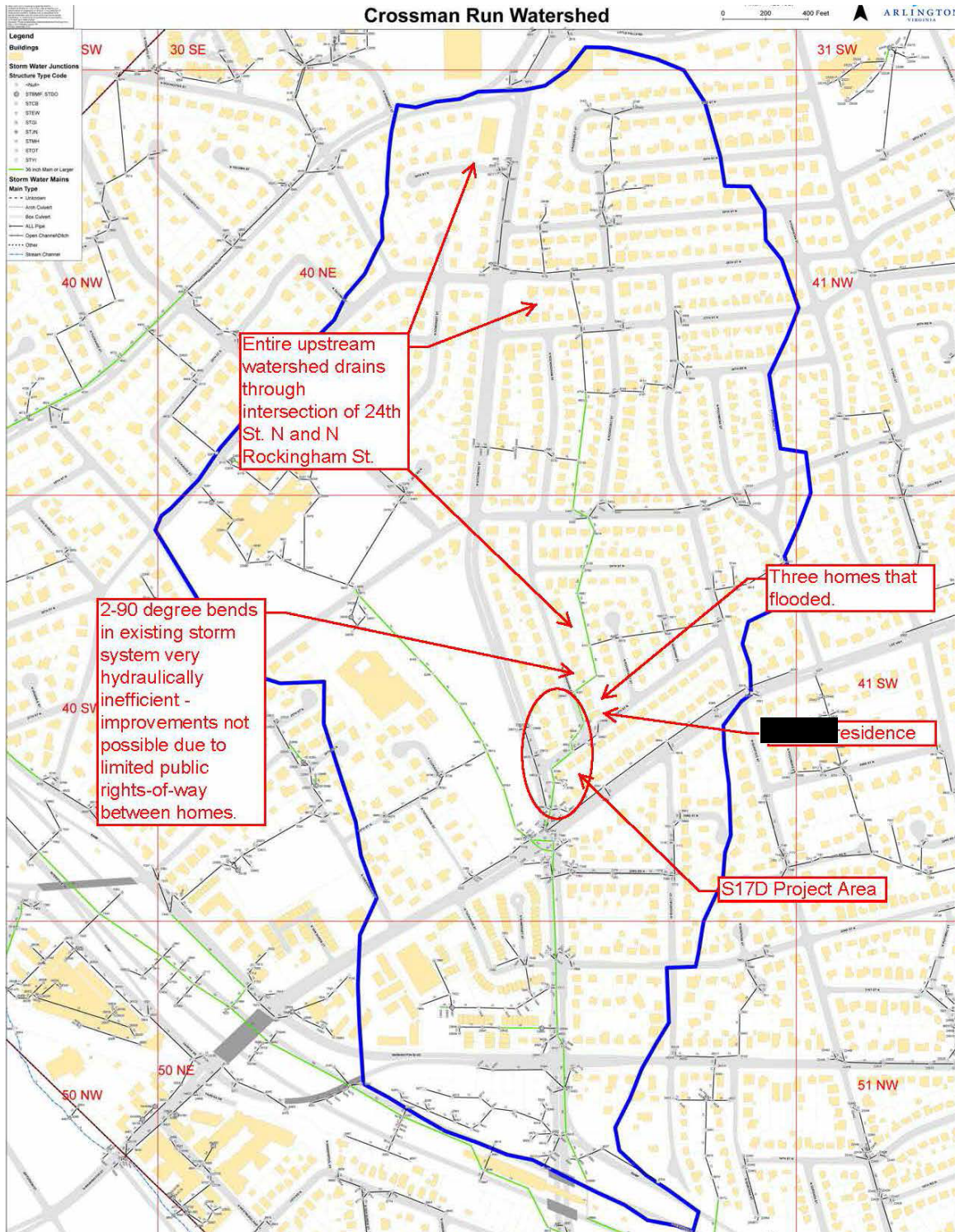


Second photo from June 28, 2017 showing scale of junction box. The construction project S17D entails the installation of 14 similar junction boxes.





Map showing watershed, S17D project area, and homes that flooded.





The County  
Manager's Office as



RE **The** County  
Manager's Office as



RE **Flooding** in  
three houses on Ro

**Elizabeth Thurber**

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**From:** Elizabeth Thurber  
**Sent:** Friday, August 25, 2017 12:28 PM  
**To:** [REDACTED]  
**Cc:** Ravinder Singh  
**Subject:** The County Manager's Office asked me to contact you regarding your concern about the storm drainage project and flooding

Dear [REDACTED]

I have been asked to contact you regarding your concerns, which you expressed on August 16, 2017.

I completely understand your concern for all the inconveniences resulting from the ongoing construction of the storm project. I am also very much aware of the flooding that you and your neighbors experienced on August 15. I am also aware that you are not satisfied by the contractor's performance or the responses that you have been receiving from Ravinder and myself. I am very sorry that this project has been so difficult for you and your neighbors.

At this point, I think the major concern that the project team has is to get the project finished as quickly as possible. Everyone is aware of the burden that your neighborhood has been under. In addition, the last phase of construction is most likely going to be very unpleasant due to the restricted work area in N. Rockingham St. The sooner that the project is finished, the sooner you can go about normal lives. We are pushing the contractor to speed up.

The project team is making every effort to minimize the disruption to your lives; however, the nature of the work is such that only so much can be done. In addition, we have to work with the contractor that won the bid process.

I hope you can bear with us a short time longer.

Please feel free to contact anyone on the project team.

Elizabeth L. Thurber, P.E.  
**Department of Environmental Services**  
Office of Sustainability and Environmental Management  
Stormwater Infrastructure  
Arlington County  
2100 Clarendon Boulevard, Suite 705  
Arlington, Virginia 22201  
703-228-3363 Ethurber@arlingtonva.us

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## Elizabeth Thurber

---

**From:** Elizabeth Thurber  
**Sent:** Monday, August 28, 2017 10:15 AM  
**To:** [REDACTED]  
**Cc:** Ravinder Singh; [REDACTED]  
**Subject:** RE: The County Manager's Office asked me to contact you regarding your concern about the storm drainage project and flooding

Dear [REDACTED]

The project was set up as a one year project and was supposed to be completed by September 18. The contractor is approximately 2 -3 weeks behind schedule now. We anticipate that the project will be completed in early October. That date is dependent on weather and other factors, which are beyond the control of County Staff. The contracts are set up so that the contractor is able to use his own means and methods to complete the project by the end date or face the imposition of liquidated damages. At this point, there will be liquidated damages imposed.

The project staff is well aware of your frustration. We are well aware of the complications implicit in the project extending into the new school year. The contractor will be obligated to provide the necessary precautions to handle pedestrian traffic thru the project area.

Regarding the flooding that you and your neighbors experienced on August 15: I have records that indicate that your area flooded in 2006, 2012 (water did not get in homes, but the street flooded) and now in 2017. It appears to me that the area floods every 6 years or so.

On August 15, many areas of the County flooded. We have reports of water overtopping culverts on Military Rd., in Gulf Branch and Little Pimmit Run. Weather data indicates that there was a very intense storm and the rainfall intensity exceeded design standards for many types of infrastructure. The three homes that flooded on your street were not the only homes that flooded; homes were flooded in other parts of the County, as well.

Staff understands that there have also been multiple construction projects in your area, and that has contributed to the frustrations. Some of those construction projects have not been related to the storm drainage project, some have even been private remodeling projects and improvements by Washington Gas, but they have extended the period in which the neighborhood has had to endure the restricted parking, noise, dust, etc.

The problem that County staff is struggling with is how to reduce flooding risks in areas such as yours, without so much disruption to the residents. The quantities of storm water that pass thru your area are so great that large diameter pipes are required. Because the pipes are large, the junction boxes are large. There is just no way to construct such improvements without large equipment and a significant construction footprint. That implies noise, dust, construction traffic, and all the things you have been frustrated with. In addition, there are sharp bends in the storm network that is located in your area. Those bends reduce the conveyance capacity of the system. However, when County staff approached numerous landowners for additional easements, which would have permitted us to reduce the bends in the system, the requests were turned down. In addition the right-of-way in which improvements can be constructed is very limited, which limits the type of improvements that can be made and also intensifies the activity in the areas where construction is possible.

Project staff is working with the contractor to finish the project as soon as possible. The way forward is to finish. That is the best way for your neighborhood to be able to return to normal.

I am sure that the final phase of the storm drainage improvement project is going to tax everyone's nerves. I respectfully request your patience while we complete the project. This contractor seems to struggle with some of the conditions of working within restricted right-of-way in Arlington's neighborhood streets. However, they were the winning low bidder, as required by County policies and state law. As such, County staff is making every effort to work with this contractor to finish the project and so your neighborhood can return to normal.

We will keep you informed of the situation as it unfolds.

I am truly sorry for the unpleasantness of all this construction activity. It should be completed soon.

Elizabeth L. Thurber, P.E.  
**Department of Environmental Services**  
Office of Sustainability and Environmental Management  
Stormwater Infrastructure  
Arlington County  
2100 Clarendon Boulevard, Suite 705  
Arlington, Virginia 22201  
703-228-3363 Ethurber@arlingtonva.us

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**From:** [REDACTED]  
**Sent:** Saturday, August 26, 2017 8:43 AM  
**To:** Elizabeth Thurber <Ethurber@arlingtonva.us>  
**Cc:** Ravinder Singh <rksingh@arlingtonva.us>; [REDACTED]  
**Subject:** Re: The County Manager's Office asked me to contact you regarding your concern about the storm drainage project and flooding

As always I do appreciate your response, but I guess the big unanswered question we all have is, when will this project really end? Based on the information given at the start of the project we all thought this would be over by now or very shortly. Do we have days left? Weeks? Months? No one knows here and that is quite frustrating.

Also, while of course we appreciate the sense of urgency you have to wrap this up, there is concern mistakes will be made by the contractor if they are indeed rushing. Especially in light of the odd flooding we had the other week and the general problems we have experienced with the contractor throughout this entire project.

Lastly, for now, I'd like to remind everyone that school starts 9/5. The children in this neighborhood are considered walkers and do not receive any bus service to school. I mention this because at this time there does not appear to be a safe sidewalk path for anyone to walk. We need to be able to walk up Rockingham to 26th street. Or down 24th to Sycamore. Either option works.

I hear you that the "work just needs to get done" but boy has this project put our neighborhood through a lot, too much for too long. And for what? We are questioning that as we clean out our basements from last week. Sadly, I really don't think anyone truly understands what we continue to suffer through except the residents themselves. I wish (but frankly have given up) that you along with someone from the county board would be willing to spend just one full day here to see what the environment is really like. And then decide if you'd want to pay the same taxes as folks who reside on quiet streets.

On Aug 25, 2017, at 12:28 PM, Elizabeth Thurber <[Ethurber@arlingtonva.us](mailto:Ethurber@arlingtonva.us)> wrote:

Dear [REDACTED]

I have been asked to contact you regarding your concerns, which you expressed on August 16, 2017.

I completely understand your concern for all the inconveniences resulting from the ongoing construction of the storm project. I am also very much aware of the flooding that you and your neighbors experienced on August 15. I am also aware that you are not satisfied by the contractor's performance or the responses that you have been receiving from Ravinder and myself. I am very sorry that this project has been so difficult for you and your neighbors.

At this point, I think the major concern that the project team has is to get the project finished as quickly as possible. Everyone is aware of the burden that your neighborhood has been under. In addition, the last phase of construction is most likely going to be very unpleasant due to the restricted work area in N. Rockingham St. The sooner that the project is finished, the sooner you can go about normal lives. We are pushing the contractor to speed up.

The project team is making every effort to minimize the disruption to your lives; however, the nature of the work is such that only so much can be done. In addition, we have to work with the contractor that won the bid process.

I hope you can bear with us a short time longer.

Please feel free to contact anyone on the project team.

Elizabeth L. Thurber, P.E.  
**Department of Environmental Services**  
Office of Sustainability and Environmental Management  
Stormwater Infrastructure  
Arlington County  
2100 Clarendon Boulevard, Suite 705  
Arlington, Virginia 22201  
703-228-3363 [Ethurber@arlingtonva.us](mailto:Ethurber@arlingtonva.us)

## Elizabeth Thurber

---

**From:** Elizabeth Thurber  
**Sent:** Thursday, August 17, 2017 4:39 PM  
**To:** [REDACTED]  
[REDACTED]  
**Subject:** RE: Flooding in three houses on Rockingham/24th Street

Dear [REDACTED]

I am going to copy portions of emails that I have sent to others on the cc list. I responded individually to the various questions that have been asked and those responses may have been shared by some, but just so you all have the same information, I am going to cut and paste my responses below. I am sorry if you have not all gotten the same information, but, as stated above, I did not want to broadcast everyone's correspondence to everyone without permission. Some of this information may be a repeat of what I have already said and I apologize for repeating myself. Some of the information is new. I also apologize for the length of this email, but I am trying to answer your questions as best I can. Please note that this is my preliminary thinking, and I have not finished a more thorough analysis.

So here goes:

I am still analyzing all of the data that we collected and I am continuing to collect additional data. Most of the evidence I have seen so far indicates that the flooding was the result of an extremely intense storm in your portion of the County. Four watersheds in Arlington had reports of flooding: Crossman Run, Torreyson Run, Little Pimmit Run, and Four Mile Run Upper Mainstem. There may be others that I am not aware of because they were reported to other agencies. Areas to the east and south were not impacted as intensely. I have not uncovered anything that indicates there was a blockage. What follows is a brief description of some of the evidence that I have collected:

1. Rainfall data from at least one weather station, located near your neighborhood, indicates that almost 2 inches of rain fell in only 15 minutes. Such a rate exceeds the design flow for the system. When a system is so overwhelmed, it would be expected to see water bubbling up out of the inlets. So much water is trying to flow thru the pipe at such a high velocity that pressure builds up and the water leaves the pipe thru the inlets and manholes. The video confirms that this is what happened. Water was clearly bubbling up out of multiple inlets. Eye witness accounts also reported that water bubbled up out of an upstream inlet. So many inlets were surcharging (meaning that water bubbled up out of the inlet), **at the same time**, it indicates to me that lots of storm water was indeed flowing to the inlets, but could not pass the inlet fast enough so that the water bubbled out. To me, this indicates a lack of capacity, not a blockage. It appears to me that three or four inlets were all surcharging simultaneously. I have not finished looking at other weather stations. I have not yet downloaded radar images or data. So this is a preliminary analysis.
2. I have older photographs of the same area which also show water bubbling out of the inlets. Those photos are from similar intense storms before any project was under construction.
3. Immediately after the storm, I investigated the upstream areas of this watershed and saw evidence of flooding. There were debris lines, trash cans in disarray, etc. This was throughout the upstream portion of the watershed. We know that these areas also have capacity issues and there have been flooding and other drainage problems in those upstream areas.
4. The new pipe system is not operational yet so only the original is conveying storm water right now. We know the original system is under capacity; that is why we are doing this project. Once the project is completed the risk for flooding should be reduced. I have some confidence in this because three of the projects that I have worked on and which are already complete, seemed to function well. They were in different watersheds, but in the same area of the county where the most intense rains occurred.
5. All of the areas that flooded yesterday, that I have reports for, are from the north and western portions of the county. Four different watersheds reported flooding. They are all areas where we knew the systems were inadequate. My office is actively designing and developing plans and projects to address those areas, but the process is slow due to the need to obtain rights of way on private properties and to avoid conflicts with other existing utilities. **It is unlikely that all of these areas had obstructions or blockages simultaneously during the storm.** It is more likely that all of these areas experienced rainfall intensities that exceeded the capacity of the storm water conveyance systems, swales or channels.
6. Some of the areas that flooded were not adjacent to any construction project, and yet they still flooded.



7. Other jurisdictions also experienced flash flooding. Our contractor, Ardent, was not working in those areas, yet they also flooded. I personally spoke to one official from a different jurisdiction who also experienced flash flooding in areas where there was a history of past flooding.

8. Your intersection has been identified in our Storm Water Master Plan as an area in need of additional storm conveyance capacity. Hence, we are constructing a project to address that identified need. The pattern of flooding which occurred on August 15 is similar to past flooding events. There is a history of similar flooding at the intersection.

9. All of the investigations that were made of the system immediately after the water receded, when it was safe to open structures, showed unimpeded flow and there was no evidence of blockages. We opened all of the structures within the project area and also a short distance upstream, and there was no evidence of a blockage.

10. I was actually in the storm and experienced first-hand the intensity and witnessed the streets filling with storm water and the spread at the inlets becoming excessive. Although this is very anecdotal evidence, what I witnessed was the drainage systems being overwhelmed by the storm intensity, not blockages.

11. Your intersection is located at a low point in the watershed and there is no overland relief. Overland relief means a flow path, over the land and not in an underground system, where water can flow downstream without adversely impacting man made structures. It is an extra safety factor so that when the piped system is overwhelmed, there is still the overland path available. The need to provide overland relief was not well considered or required when your neighborhood was platted and the houses built. It will always be at some risk for flooding since all pipe systems are eventually overwhelmed by a storm that exceeds the one used to design the system. Areas with overland relief have a lower risk of flooding.

Based on the above, I am preliminarily concluding that the storm was so intense that it overwhelmed the capacity of the existing system, which is the only system that is currently serviceable. The newly constructed pipe is not yet in service. The storm affected a widespread area, covering portions of several counties/cities. Media reports indicate that portions of Fairfax, the City of Falls Church and Washington DC. experienced flash flooding.

I am continuing to collect information and look at rainfall data. But so far, I have seen no evidence to suggest that this was caused by a blockage created by the contractor or the construction project. I am not ruling out a blockage, but the evidence does not seem to me to point to that as a cause.

I am truly sorry that you and your neighbors have had to experience these flash floods. We are pushing the contractor to finish the work quickly, since the project is so badly needed.

As a precaution, it would be wise for all of you to have flood insurance. You are not required to do so since there is no FEMA flood plain in your area. Since you are not in one of the FEMA flood plains, you should be able to get favorable rates for flood insurance. I believe that I have mentioned this at the public meetings we had during the planning for this project. It is also something that my office mentions regularly to residents in flood prone areas that are not located in a FEMA flood plain. It is just one of many precautions that you can take to protect yourselves.

Please feel free to forward to me any information, photos, etc. from the flood. We use that information to try to quantify the flows, volumes and other characteristics of the rain event. We also use it to inform future designs on other projects, or to propose and develop new projects. (Due to systemic capacity problems in the Crossman Run watershed, where you live, additional projects, both upstream and downstream of your intersection, are identified in the Storm Water Master Plan. Those will take much longer to design, due to restricted rights-of way, conflicting utilities and the need to obtain the approval of outside agencies.) We also use the information provided by residents such as yourself, to educate other people.

I hope I have answered your questions. Thank you again for your continued patience.

Elizabeth L. Thurber, P.E.

**Department of Environmental Services**

Office of Sustainability and Environmental Management

Stormwater Infrastructure

Arlington County

2100 Clarendon Boulevard, Suite 705

Arlington, Virginia 22201

703-228-3363 Ethurber@arlingtonva.us

*All correspondence sent to and from Arlington County Government is subject to the public record laws of the Commonwealth of Virginia.*

**From:** [REDACTED]

**Sent:** Thursday, August 17, 2017 2:43 PM

**To:** Elizabeth Thurber <Ethurber@arlingtonva.us>

Cc: [REDACTED]

Subject: Re: Flooding in three houses on Rockingham/24th Street

Elizabeth,  
This is not an adequate response considering the videos, pictures, and serious damage done by a limited amount of rain this week. It was obvious that several of the junction boxes were not functional or blocked almost entirely, and not allowing for water to be routed out of the bottom of N Rockingham St and 24th St N. LOOK AT THE VIDEOS -- IT WASN'T JUST ABOUT WATER GETTING INTO THEM, IT WAS ABOUT WATER POURING OUT OF THEM! The junction in front of the [REDACTED] house does not seem operational even considering water from other streets and neighborhoods is still routed to that junction box. The junction boxes in front of the [REDACTED] were not working -- water was coming out of them. Can you confirm how the water which storm sewer routes will actually be functional with the inlet protection devices removed? How does water get out of our neighborhood?

[REDACTED]

On Wed, Aug 16, 2017 at 5:41 PM, Elizabeth Thurber <[Ethurber@arlingtonva.us](mailto:Ethurber@arlingtonva.us)> wrote:

I am writing to let you all know that we have instructed the contractor to pull the inlet protection devices. That is not because we believe that they caused the issues yesterday, but as additional precautions.

We are still analyzing the storm data, but preliminary info indicates that there was a very intense 5 minute burst of rainfall. That 5 minute burst was part of a very intense 15 minute burst. The impacted areas were mostly in your area (Crossman Run) , Torreyson Run and the areas near Falls Church. A cursory review of news reports indicates that portions of Fairfax and Washington DC were impacted. Southern Arlington and areas near National Airport seem to have experienced less intense rainfall patterns. I haven't tracked down all the data or the radar images/data yet, so this is preliminary.

Please let me know if I can assist any of you in your clean up operations or preparations for the forecast rain. Right now it looks to me as though Friday may have more rain than Thursday. We will continue to monitor the forecast.

Elizabeth L. Thurber, P.E.  
Department of Environmental Services  
Office of Sustainability and Environmental Management  
Stormwater Infrastructure  
Arlington County  
2100 Clarendon Boulevard, Suite 705  
Arlington, Virginia 22201  
[703-228-3363](tel:703-228-3363) [Ethurber@arlingtonva.us](mailto:Ethurber@arlingtonva.us)

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-----Original Message-----

From: [REDACTED]  
Sent: Tuesday, August 15, 2017 12:56 PM  
To: Elizabeth Thurber <[Ethurber@arlingtonva.us](mailto:Ethurber@arlingtonva.us)>  
Cc: Ravinder Singh <[rksingh@arlingtonva.us](mailto:rksingh@arlingtonva.us)>; [REDACTED]

None in my house, but the [REDACTED] all had some degree of flooding. The county and/or Ardent need to address this asap given the expected rains to come this weekend. Something has obviously changed wrt the drainage because of the construction.

Sent from my iPhonejt

> On Aug 15, 2017, at 12:34 PM, Elizabeth Thurber <[Ethurber@arlingtonva.us](mailto:Ethurber@arlingtonva.us)> wrote:

>

> Did you get water in your houses?

>

> Elizabeth L. Thurber, P.E.

> Department of Environmental Services

> Office of Sustainability and Environmental Management Stormwater

> Infrastructure Arlington County

> 2100 Clarendon Boulevard, Suite 705

> Arlington, Virginia 22201

> [703-228-3363](tel:703-228-3363) [Ethurber@arlingtonva.us](mailto:Ethurber@arlingtonva.us)

>

>

> All correspondence sent to and from Arlington County Government is subject to the public record laws of the Commonwealth of Virginia.

>

> -----Original Message-----

> From:

[REDACTED]

> Sent: Tuesday, August 15, 2017 12:34 PM

> To: Elizabeth Thurber <[Ethurber@arlingtonva.us](mailto:Ethurber@arlingtonva.us)>; Ravinder Singh

> <[rksingh@arlingtonva.us](mailto:rksingh@arlingtonva.us)>

> Cc:

[REDACTED]

[REDACTED]

> Subject: Flooding in three houses on Rockingham/24th Street

>

> Hello Ms. Thurber and Mr. Singh,

>

> As I'm sure you have heard by now, three houses on Rockingham and 24th St. have flooding from this morning's rains. From what I understand, the rains were not even that heavy, and it has been years since these houses have had flooding, so it stands to reason that the construction has amplified this problem. What can you do to help? The ardent contractors were out here looking and they say everything is draining fine – obviously that is not the case!

>

> Thanks,

> [REDACTED]

>

>

> Sent from my iPhone





# POINT PRECIPITATION FREQUENCY ESTIMATES FROM NOAA ATLAS 14



**CLARENDON LYON PARK, VIRGINIA (44-1729) 38.9 N 77.8833 W 39 feet**

from "Precipitation-Frequency Atlas of the United States" NOAA Atlas 14, Volume 2, Version 3

G.M. Benson, D. Martin, B. Liu, T. Parrybick, M. Yekta, and D. Riley  
NOAA, National Weather Service, Silver Spring, Maryland, 2004

Extracted: Wed Dec 23 2009

Confidence Limits

Seasonality

Location Maps

Other Info

GIS data

Maps

Docs

R

## Precipitation Frequency Estimates (inches)

ARI* (years)	5 min	10 min	15 min	30 min	60 min	120 min	3 hr	6 hr	12 hr	24 hr	48 hr	4 day	7 day	10 day	20 day	30 day	45 day	60 day
1	0.36	0.57	0.71	0.97	1.22	1.42	1.51	1.85	2.24	2.60	3.02	3.36	3.90	4.45	6.01	7.40	9.30	11.07
2	0.43	0.68	0.86	1.19	1.49	1.73	1.84	2.24	2.71	3.15	3.65	4.06	4.69	5.35	7.15	8.76	10.97	13.01
5	0.51	0.81	1.03	1.46	1.87	2.19	2.33	2.83	3.44	4.04	4.68	5.19	5.93	6.68	8.64	10.41	12.82	15.04
10	0.57	0.91	1.15	1.66	2.17	2.54	2.73	3.32	4.07	4.83	5.56	6.17	6.99	7.79	9.85	11.75	14.24	16.57
25	0.64	1.02	1.30	1.92	2.56	3.04	3.29	4.04	5.03	6.05	6.89	7.62	8.58	9.42	11.54	13.59	16.12	18.55
50	0.70	1.11	1.41	2.12	2.88	3.45	3.75	4.65	5.87	7.13	8.05	8.89	9.95	10.78	12.90	15.06	17.55	20.02
100	0.75	1.20	1.51	2.32	3.20	3.89	4.24	5.31	6.80	8.35	9.34	10.30	11.46	12.25	14.32	16.55	18.96	21.43
200	0.81	1.28	1.62	2.52	3.53	4.33	4.76	6.03	7.84	9.74	10.78	11.88	13.13	13.84	15.79	18.09	20.33	22.78
500	0.88	1.39	1.75	2.78	3.98	4.98	5.50	7.08	9.43	11.87	12.96	14.24	15.63	16.20	17.84	20.19	22.12	24.49
1000	0.93	1.47	1.84	2.98	4.35	5.50	6.12	7.98	10.81	13.75	14.83	16.28	17.76	18.17	19.46	21.83	23.45	25.73

\* These precipitation frequency estimates are based on a partial duration series. ARI is the Average Recurrence Interval. Please refer to NOAA Atlas 14 Document for more information. NOTE: Formatting forces estimates near zero to appear as zero.

## \* Upper bound of the 90% confidence interval Precipitation Frequency Estimates (inches)

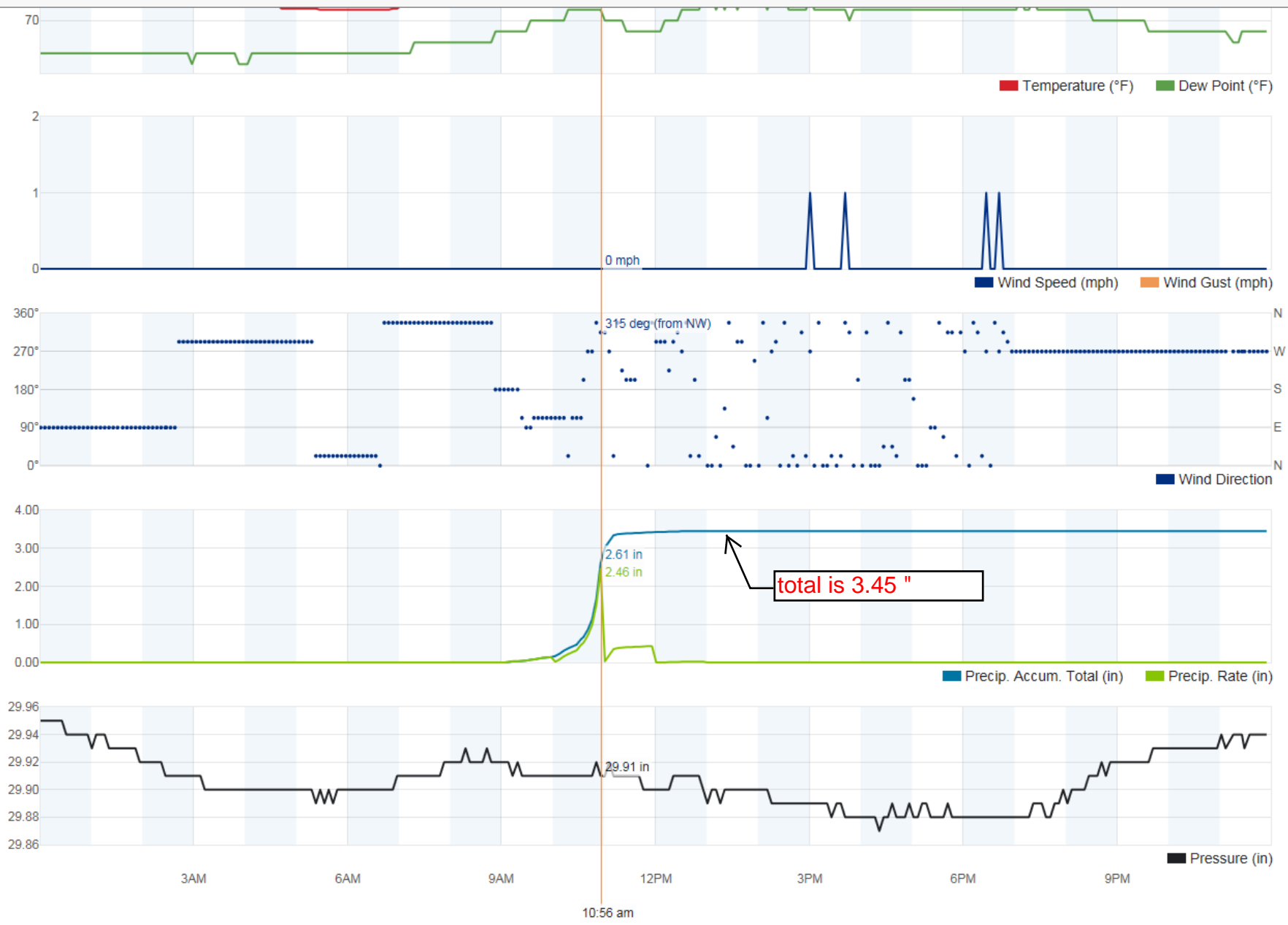
ARI** (years)	5 min	10 min	15 min	30 min	60 min	120 min	3 hr	6 hr	12 hr	24 hr	48 hr	4 day	7 day	10 day	20 day	30 day	45 day	60 day
1	0.39	0.62	0.78	1.07	1.34	1.56	1.68	2.05	2.51	2.90	3.35	3.73	4.29	4.89	6.50	7.96	9.90	11.76
2	0.47	0.75	0.94	1.30	1.64	1.90	2.04	2.48	3.03	3.51	4.05	4.51	5.17	5.87	7.73	9.42	11.67	13.81
5	0.56	0.90	1.13	1.61	2.06	2.40	2.58	3.13	3.85	4.50	5.18	5.75	6.53	7.33	9.33	11.20	13.63	15.96
10	0.62	1.00	1.26	1.83	2.38	2.79	3.01	3.67	4.55	5.36	6.15	6.82	7.69	8.55	10.63	12.63	15.15	17.59
25	0.71	1.13	1.43	2.12	2.83	3.35	3.62	4.46	5.61	6.67	7.59	8.41	9.41	10.31	12.44	14.60	17.14	19.67
50	0.77	1.23	1.56	2.34	3.18	3.81	4.13	5.14	6.55	7.82	8.85	9.79	10.89	11.78	13.90	16.17	18.67	21.24
100	0.83	1.33	1.68	2.57	3.54	4.29	4.68	5.88	7.62	9.13	10.24	11.32	12.54	13.38	15.42	17.77	20.17	22.75
200	0.90	1.42	1.80	2.80	3.92	4.81	5.28	6.71	8.82	10.62	11.81	13.04	14.36	15.10	17.01	19.42	21.66	24.21
500	0.98	1.55	1.95	3.11	4.46	5.56	6.14	7.95	10.68	12.91	14.19	15.63	17.11	17.70	19.23	21.70	23.60	26.05
1000	1.05	1.65	2.07	3.36	4.90	6.18	6.88	9.01	12.34	14.91	16.26	17.90	19.48	19.87	21.02	23.50	25.05	27.40

The upper bound of the confidence interval at 90% confidence level is the value which 5% of the simulated quantile values for a given frequency are greater than. \*\* These precipitation frequency estimates are based on a partial duration series. ARI is the Average Recurrence Interval.

Please refer to NOAA Atlas 14 Document for more information. NOTE: Formatting prevents estimates near zero to appear as zero.

## \* Lower bound of the 90% confidence interval Precipitation Frequency Estimates (inches)

ARI** (years)	5 min	10 min	15 min	30 min	60 min	120 min	3 hr	6 hr	12 hr	24 hr	48 hr	4 day	7 day	10 day	20 day	30 day	45 day	60 day
1	0.32	0.52	0.65	0.89	1.10	1.29	1.38	1.69	2.03	2.37	2.71	3.05	3.51	4.07	5.68	7.07	8.97	10.83




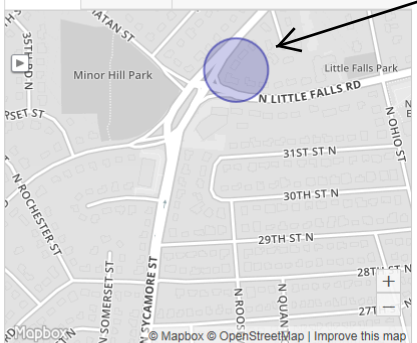
Kitty Kingdom - Williamsburg **KVAARLIN94** [About this PWS](#) | [Report](#)

Forecast for Arlington, VA > 38.901 -77.155 > 407 ft

PWS Data PWS Widgets WunderStation

PWS viewed 17 times since August 1, 2017

Radar Webcam 



**Current Conditions** Station reported 19 seconds ago

**80.5 °F**

Feels Like **84.5 °F**

**0.0 mph**  
Wind from **SSW**

Dew Point: **71 °F** UV: **2** ●●●●●  
Humidity: **75%** Solar: --  
Precip Rate: **0 in/hr** Soil Moisture: --  
Precip Accum: **0.00 in** Soil Temp: --  
Pressure: **30.02 in** Leaf Wetness: --

6:23 AM 8:01 PM

☾ Waning Crescent | 32% Illuminated


Very close to S17D  
and also Torreyson  
Run and  
Underwood/  
Williamsburg



HP ENVY CURVED All-in-One  
SKU # 34-b010  
Total immersion.  
Absolute seduction.  
Cortana is your truly  
personal digital assistant.  
Starting at: \$1,999<sup>99</sup>  
See more  

Today's Mortgage Rate **3.04%** APR 15 Year Fixed

Select Loan Amount **\$225,000**

 [Calculate Payment >](#)

Terms & Conditions apply. NMLS#1130

### Weather History for Arlington, VA [KVAARLIN94]

[Previous](#) Daily Mode August 15 2017 [View](#) Next

#### Summary August 15, 2017

	High	Low	Average		High	Low	Average
Temperature	77.1 °F	71 °F	74.1 °F	Wind Speed	2 mph	--	0 mph





Time	Temperature	Dew Point	Humidity	Wind	Speed	Gust	Pressure	Precip. Rate.	Precip. Accum.
9:38 AM	73.1 °F	70 °F	90 %	ESE	0 mph	-- mph	29.91 in	0.08 in	0.08 in
9:43 AM	73.1 °F	70 °F	90 %	ESE	0 mph	-- mph	29.91 in	0.1 in	0.1 in
9:48 AM	73.4 °F	70 °F	90 %	ESE	0 mph	-- mph	29.91 in	0.12 in	0.12 in
9:53 AM	73.4 °F	70 °F	90 %	ESE	0 mph	-- mph	29.91 in	0.13 in	0.13 in
9:58 AM	73.4 °F	70 °F	90 %	ESE	0 mph	-- mph	29.91 in	0.14 in	0.14 in
10:03 AM	73.4 °F	70 °F	90 %	ESE	0 mph	-- mph	29.91 in	0.02 in	0.17 in
10:08 AM	73.5 °F	70 °F	90 %	ESE	0 mph	-- mph	29.91 in	0.08 in	0.23 in
10:13 AM	73.5 °F	70 °F	90 %	ESE	0 mph	-- mph	29.91 in	0.16 in	0.31 in
10:18 AM	73.8 °F	71 °F	91 %	NNE	0 mph	-- mph	29.91 in	0.22 in	0.37 in
10:23 AM	73.8 °F	71 °F	91 %	ESE	0 mph	-- mph	29.91 in	0.27 in	0.42 in
10:28 AM	73.8 °F	71 °F	91 %	ESE	0 mph	-- mph	29.91 in	0.32 in	0.47 in
10:33 AM	73.8 °F	71 °F	91 %	ESE	0 mph	-- mph	29.91 in	0.46 in	0.61 in
10:36 AM	73.8 °F	71 °F	91 %	SSW	0 mph	-- mph	29.91 in	0.52 in	0.67 in
10:41 AM	73.9 °F	71 °F	91 %	West	0 mph	-- mph	29.91 in	0.71 in	0.86 in
10:46 AM	73.9 °F	71 °F	91 %	West	0 mph	-- mph	29.91 in	0.98 in	1.13 in
10:51 AM	73.9 °F	71 °F	91 %	NNW	0 mph	-- mph	29.92 in	1.52 in	1.67 in
10:56 AM	73.8 °F	71 °F	91 %	NW	0 mph	-- mph	29.91 in	2.46 in	2.61 in
11:01 AM	73.5 °F	70 °F	91 %	NW	0 mph	-- mph	29.91 in	0.03 in	3.02 in
11:06 AM	73.4 °F	70 °F	91 %	West	0 mph	-- mph	29.92 in	0.19 in	3.18 in
11:11 AM	73.4 °F	70 °F	91 %	NNE	0 mph	-- mph	29.91 in	0.35 in	3.34 in
11:16 AM	73.1 °F	70 °F	91 %	NNW	0 mph	-- mph	29.91 in	0.38 in	3.37 in
11:21 AM	72.8 °F	70 °F	91 %	SW	0 mph	-- mph	29.91 in	0.39 in	3.38 in
11:26 AM	72.6 °F	69 °F	91 %	SSW	0 mph	-- mph	29.91 in	0.4 in	3.39 in
11:31 AM	72.6 °F	69 °F	91 %	SSW	0 mph	-- mph	29.91 in	0.4 in	3.39 in
11:36 AM	72.6 °F	69 °F	91 %	SSW	0 mph	-- mph	29.91 in	0.41 in	3.4 in
11:41 AM	72.6 °F	69 °F	91 %	NNW	0 mph	-- mph	29.91 in	0.41 in	3.4 in
11:46 AM	72.6 °F	69 °F	91 %	NNW	0 mph	-- mph	29.9 in	0.42 in	3.41 in
11:51 AM	72.6 °F	69 °F	91 %	North	0 mph	-- mph	29.9 in	0.43 in	3.42 in
11:56 AM	72.6 °F	69 °F	91 %	NNW	0 mph	-- mph	29.9 in	0.43 in	3.42 in
12:01 PM	72.6 °F	69 °F	91 %	WNW	0 mph	-- mph	29.9 in	0 in	3.43 in
12:06 PM	72.6 °F	69 °F	91 %	WNW	0 mph	-- mph	29.9 in	0 in	3.43 in
12:11 PM	72.8 °F	70 °F	91 %	WNW	0 mph	-- mph	29.9 in	0 in	3.43 in
12:16 PM	72.8 °F	70 °F	91 %	SW	0 mph	-- mph	29.9 in	0.01 in	3.44 in

0.94" in 5 min.

1.52 in  
2.46 in

1.89" in 15 minutes  
- this is off the charts! if it isn't an error.