



# Taylor Run in Alexandria's Chinquapin Park

A Stream Worth Protecting and  
Preserving

Presenters:  
Russ Bailey and Bill Gillespie

We would like to explain that...

A “stream restoration” on Taylor Run will not improve the water quality in the Chesapeake Bay, and

Viable alternatives exist that allow the City to meet its Chesapeake Bay Program requirements. The City has identified alternatives and plans to pursue those options.





**Disturbed or  
Excavated Area**

Residents looked at the Taylor Run project and discovered it would:

- Make wholesale changes to Taylor Run
- Excavate an area 1,900 by 75 feet
- Cut down about 250+ trees.
- Raise the stream bed 3 to 7 feet
- Destroy existing plant and animal communities.
- Threaten a unique wetland with 25 rare species.

*This made residents question why a “stream restoration” was needed....*



The park is a natural area full of life. So, why was a “stream restoration” a priority?



## The City originally claimed:

- The Taylor Run stream restoration project was needed to meet nitrogen, phosphorous and sediment reductions for the Chesapeake Bay Program.
- Stream restorations were essential for obtaining the nutrient reduction credits needed for the Chesapeake Bay Program.

*A group of residents questioned these claims....*



We will show that:

- The stream is not the problem.
- Huge episodic volumes of water from the stormwater system are the problem.
- Viable options exist to earn nutrient reduction credits needed for the Chesapeake Bay Program. These credits do *not* involve stream restorations.

## The City's dubious claim about phosphorus content

In the Phase III Stream Assessment Study, the City claimed the stream banks contained 1.05 lbs of phosphorous per ton of sediment.

- This estimate was not based on actual soil samples, but soil samples from a Pennsylvania stream.
- Four soil samples taken along Taylor Run indicated the soils contained only about 0.22 lbs of phosphorus per ton of sediment.



# Residents Decided to do some Citizen Science

Citizens wanted to understand what is really happening in Taylor Run.



- The North Ridge Citizens' Association received a \$5,000 grant from DEQ to monitor Taylor Run.



- The Alliance for the Chesapeake Bay provided free equipment and training for on-site physical and chemical testing.



## The Taylor Run Water Sampling Team

Left to right: Chuck Kent,  
Trisha Gruesen, Rita Leffers,  
John Fehrenbach, Bill  
Gillespie, Amy Krafft

Not pictured: Russ Bailey,  
Don Bobby.



- Water quality measurements were made at two sites twice a month.
- Air and water temperature, pH, conductivity, turbidity and dissolved oxygen were measured.
- Water samples were taken to a certified lab for total nitrogen, total phosphorous and total suspended sediment measurements.



Stream flow is low most of the year...



Infrequent but powerful high-water events occur during heavy rains.  
The stormwater sewer system funnels water into the stream.

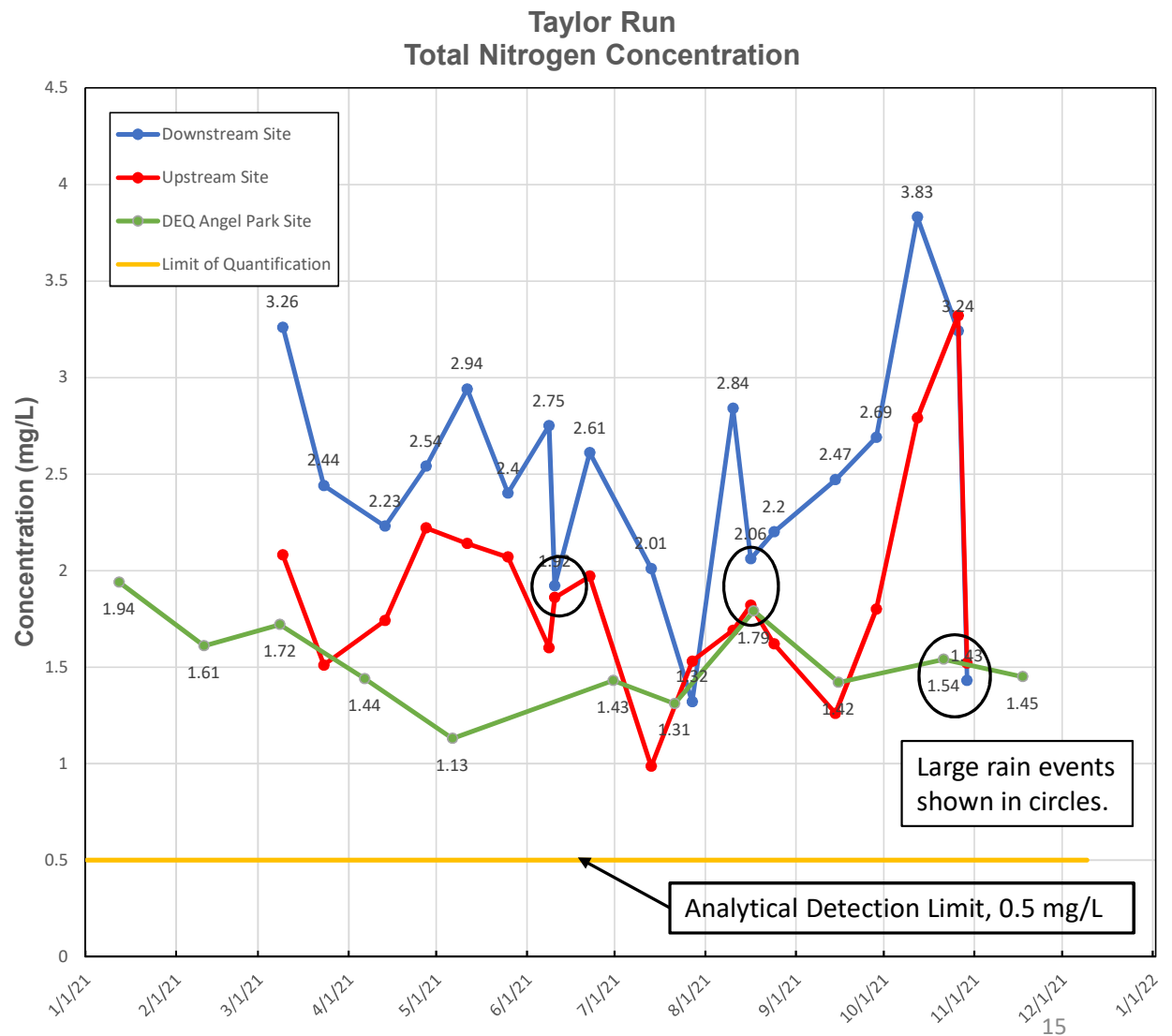


We sampled during high and low water

Volunteers measured stream height every day for 8 months

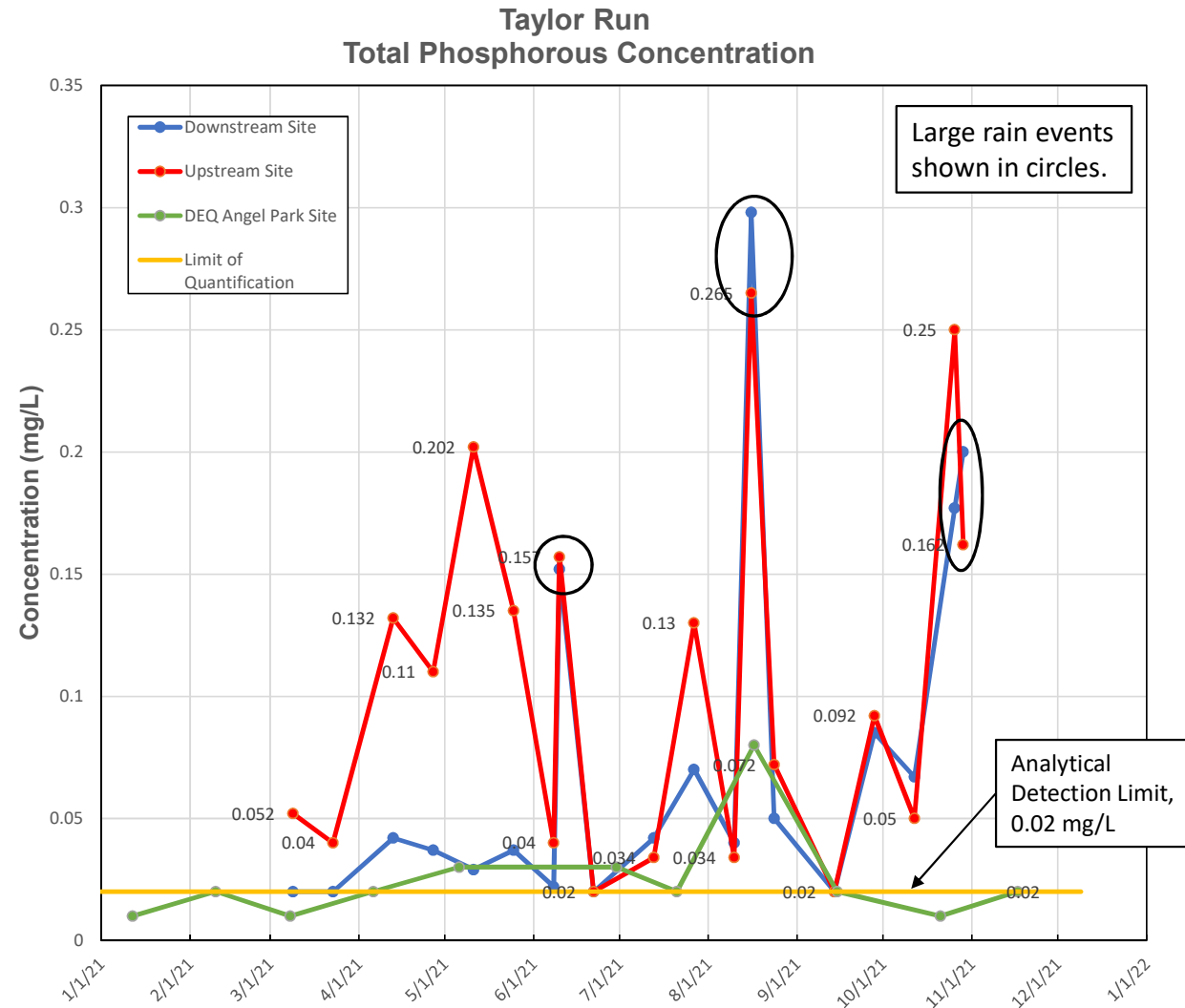
# Total Nitrogen (TN) Concentration (milligrams per liter)

- About 75% of the TN arrives in the stream from the storm sewer system (Red Line).
- At low flows, the downstream site exhibits somewhat higher TN concentrations (Blue Line) than the upstream site (Red Line).
- During big rain events, TN concentrations are similar.
- DEQ measured N downstream from our sites. DEQ found lower concentrations of N (Green Line).



# Total Phosphorous (TP) Concentration (milligrams per liter)

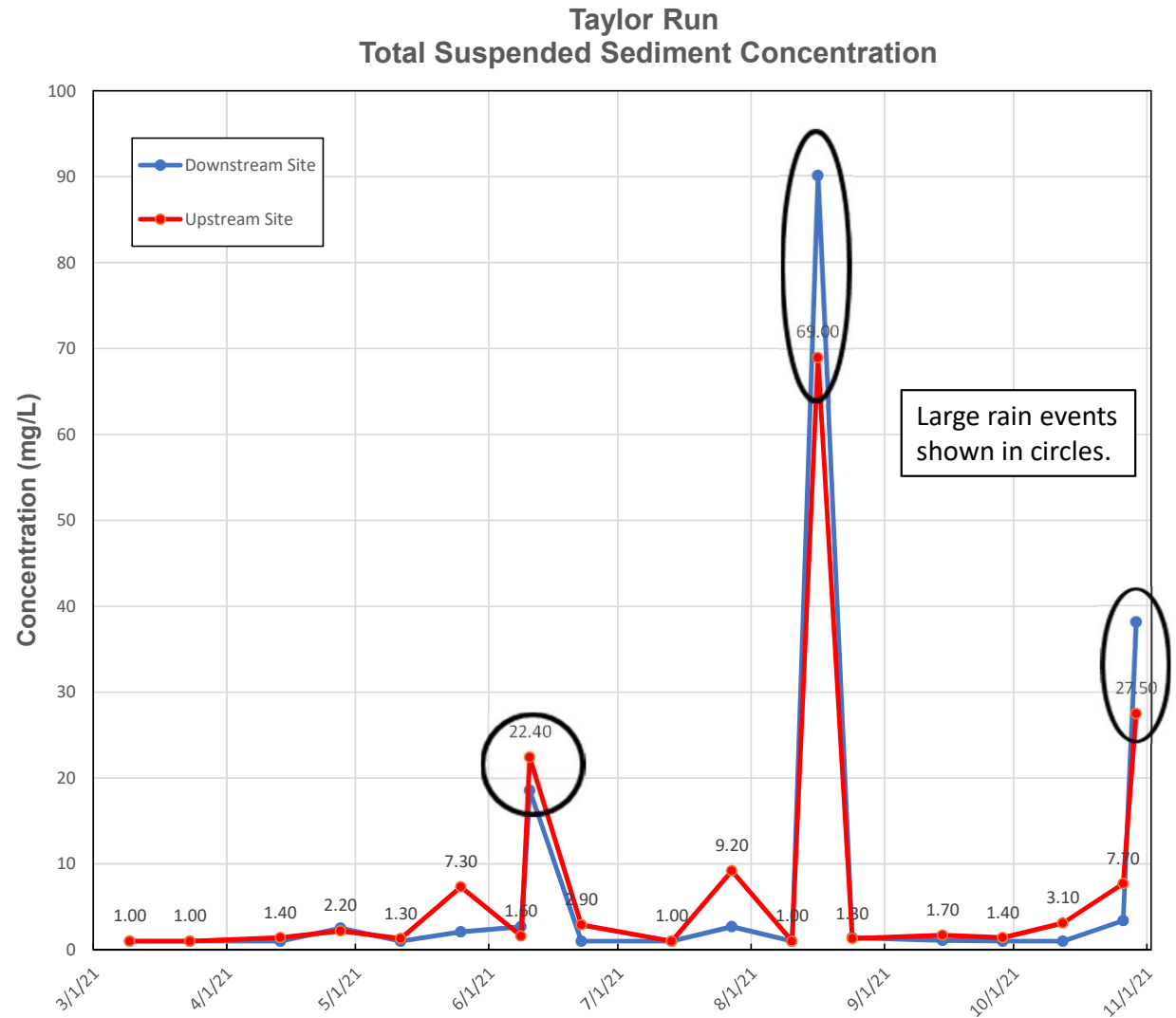
- During most sampling events, TP concentrations were higher at the upstream site (Red Line) than the downstream site.
- **Most of the phosphorous arrives in the stream from the storm sewer system.**
- At low flow, many TP measurements at the downstream site and the DEQ site further downstream were at or near the detection limit for TP.





# Total Suspended Sediment (TSS) Concentration (milligrams per liter)

- At low flows, TSS concentrations were low and about the same at the upstream and downstream sites.
- At low flows, many TSS measurements were below the detection limit for TSS, 1.00 mg/L.
- During high water events, a large concentration of sediment arrives in the stream from the stormwater sewer system.



# What the Chemical Monitoring has Told Us

Nitrogen: About 75% of the nitrogen arrives in the stream from the urban watershed and storm sewer system. DEQ measured even lower nitrogen levels downstream from our monitoring sites.

Phosphorous: Almost all the phosphorous found in the stream water originates upstream of Taylor run in the urban watershed and stormwater sewer system.

Sediment: A large fraction of the waterborne sediment is delivered to the stream by the urban watershed and stormwater sewer system.

*More can and should be done to prevent pollutants from entering the stream.*



## The Good News:

- There is room for Best Management Practices (BMPs) that slow down, filter and capture stormwater *upstream* of Taylor Run.
- BMPs include: Rain gardens, bioretention ponds, bioswales, and more...



The area along King Street in front of the Chinquapin Rec Center.



The area along the loop road in Chinquapin Park.



The area along King Street from the Bradlee Shopping Center to Safeway.

# Alexandria Residents Showed there were Viable Alternatives to Stream Restoration Projects

Residents showed that Chesapeake Bay TMDL credits could be obtained from:

- The AlexRenew Project
- Tree planting projects
- Purchasing credits on the nutrient credit trading market

# The Importance of Considering Alternatives

After pressure from civic associations and residents, the City of Alexandria proposed a new Chesapeake Bay TMDL plan that relied less on stream restorations.

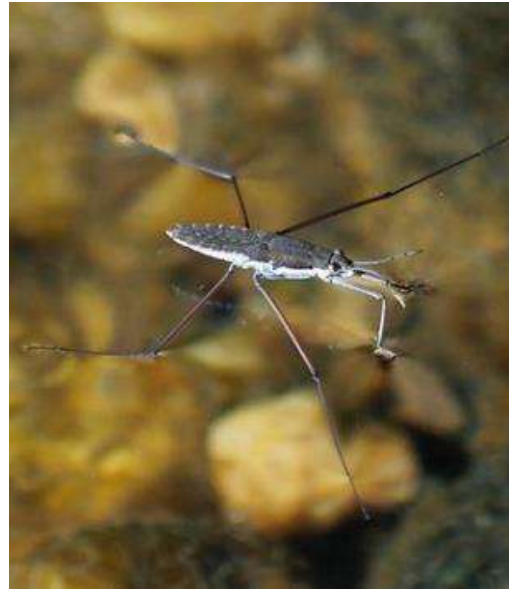
Pollutant	2028 100% Req't.	Reductions to Date (6/30/2021)	Remaining Credits due by 2028 <sup>1</sup>	Proposed FY22 to FY 28						Credits after Proposed Reductions	Annual AlexRene w Credits <sup>6</sup>	Credits Remaining <sup>7</sup>
				Landmark Development <sup>2</sup>	North Potomac Dev <sup>2</sup>	Estimated Annual Redev. through FY28 <sup>3</sup>	Lucky Run <sup>4</sup>	ROW Retrofits <sup>5</sup>	Retrofits on City Properties <sup>5</sup>			
TN (lbs/ac/yr)	7,597	5,327	2,270	192	85	725	658	86	47	477	1,500	(1,023)
TP (lbs/ac/yr)	1,005	743	262	32	11	105	257	13	8	(163)	500	(663)
TSS (lbs/ac/yr)	861,937	595,822	266,115	15,014	4,969	49,266	489,818	10,722	6,561	(310,235)	30,000	(340,235)

1. Based on current understanding; to be included in the 2023-2028 MS4 Permit
2. Current plan estimates
3. Approximately 15 lbs/ac/yr reduced annually through 2028; note that the annual average includes larger projects that have occurred in the past like Potomac Yard, etc.
4. Using default approach
5. From 5% Bay TMDL Action Plan development; 5 potential Right-of-Way (ROW) projects and 6 City property projects to be further evaluated with 100% Action Plan development
6. Planned completion to meet CSO Law by 2025; with 2026 first year of operation for calculating annual credits for that year
7. Based on current requirements and this discussion, would exceed current requirements

Source: January 24, 2022, City of Alexandria staff presentation to the Environmental Policy Commission of Alexandria.

# The Take Home Message

- *The stream is not the problem. The upstream urban/residential watershed is the problem!* Let's work together to fix that.
- A stream restoration on Taylor Run will *not*:
  - improve water quality in Taylor Run or the Chesapeake Bay.
  - produce nutrient reduction credits for the Chesapeake Bay program.
- BMPs installed upstream of Taylor Run will improve water quality.
- Stream restorations should be based on rigorous measurements and sound science.
- Stream restorations should be conducted in the least invasive, least destructive way possible.



## Taylor Run contains lots of wildlife

- Deer
- Raccoon
- Water Strider
- Cicada
- Vole
- Crayfish Chimney

Additional information and background materials are provided in the following slides.



# How Nutrient Reduction Estimates Changed with Soil Sampling and Stream Monitoring

Pollutant	Reductions Based on Original Engineering Estimates (lbs/yr)	Reductions Based on Stream Bank Soil Sampling (lbs/yr)	Reductions as a % of the Original Estimates (%)
Total Nitrogen	632	126.4	20.0
Total Phosphorous	291.2	89.9	30.9
Total Suspended Sediment	554,680	369,707	66.7

**The Lesson:  
Measurements  
are Important!**

Even these reduction estimates are inflated because about 75% of the TN and almost all the TP and TSS arrives in the stream from the stormwater sewer system.

# Streams Should be Evaluated by Good Measurement Methods *BEFORE* “Stream Restorations” are Performed

Stream Bank Sampling is Inexpensive:

- Bulk density samples for Total Nitrogen and Total Phosphorous are inexpensive.
- Sampling at four locations costs about \$500 to \$1,000.

Water Quality Sampling is also Inexpensive:

- Total Nitrogen: \$89 per sample.
- Total Phosphorous: \$45 per sample.
- Total Suspended Sediment: \$18 per sample.

# Alexandria Residents Showed there were Viable Alternatives to Two Stream Restoration Projects

	Nitrogen (lbs./yr.)	Phosphorous (lbs./yr.)	Sediment (lbs./yr.)
Nutrient Reductions Needed by 2028	2,374	287	280,879
Lucky Run Stream Restoration	-658	-257	-489,818
Remaining Balance	1,716	30	-208,939
RiverRenew Nutrient Reduction Credits	-1,500	-500	-30,000
Remaining Balance	216	-470	-238,939
Tree Planting Project	-185	-46	NA
Remaining Balance	31	-516	-238,939

The City's sediment goals would be achieved after the Lucky Run project.

The City's phosphorous goals would be achieved after applying AlexRenew credits.

## Some Thoughts Going Forward...

- States are spending a lot of money obtaining TMDL credits. Virginia has awarded over \$52 million in “stream restoration” grants. Montgomery County, MD has spent about 38 million on “stream restorations.” Is this an effective use of taxpayer dollars?
- Rigorous stream monitoring studies are needed to determine if “stream restorations” are effective nutrient reduction measures.
- In EPA’s Air Program, for a state to take credit for a measure that improves air quality, the measure must be “...real, quantifiable, permanent and enforceable.” Shouldn’t similar standards apply to credits in the Chesapeake Bay Program?



We also conducted macroinvertebrate surveys...



Frank Graziano with Wetland Studies and Solutions, Inc., the City's contractor, has stated in public meetings that: "...anything living in there will have trouble surviving and you will not find Mayflies..."



There was a surprising amount of life in the stream... including many Mayflies (lower left)





Foot paths need maintenance to slow, divert and absorb runoff.



Curbs and gutters have not been maintained -- creating erosion.



Paved roads in the park send stormwater into the stream valley.

Chinquapin Park does needs work...