

# GRAHAM HILL ELEMENTARY Teacher Guide

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## How to Use This Guide

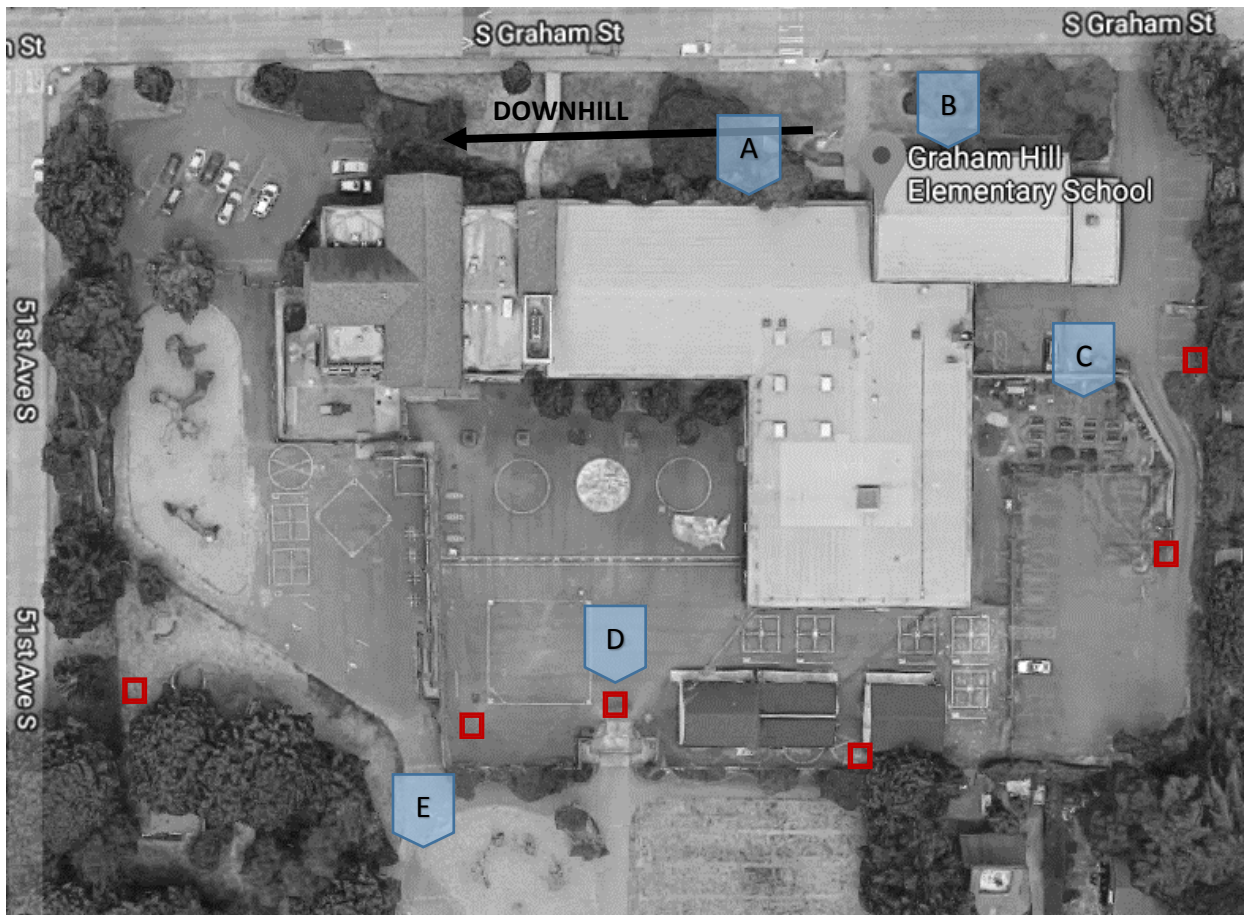
This guide supports the Community Waters Science Unit Teacher Manual with information, maps, and images specific to your school and neighborhood. It is written for teachers; its goal is to provide a better understanding of what is happening with stormwater in and around your school. The points of interest and walking field trip route are suggestions and should be adapted as desired.

If you have any questions about these maps, accompanying lessons, or stormwater around your school, contact IslandWood staff at [communitywaters@IslandWood.org](mailto:communitywaters@IslandWood.org).



### Stormwater in the Schoolyard – Lesson 3

This map and points of interest (photos and info) can be used to guide your class' exploration of the schoolyard. You will find the student worksheet for this lesson following the teacher guide version. Please use the extra space on the pages to add your own notes and questions! ☺



There are many storm drains in the schoolyard, so they are marked here in red squares. You can find a note about them in the box 'A' below. There may be some that we missed.



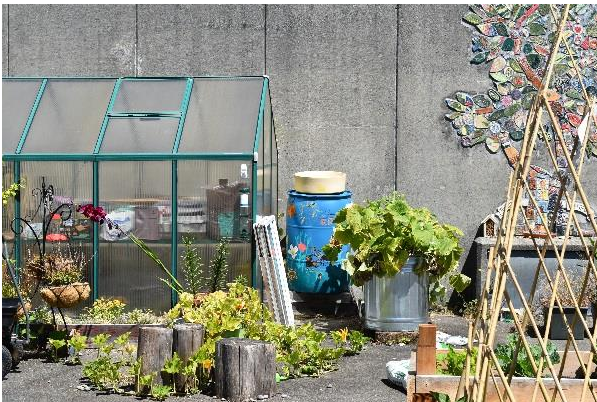
#### A. Rain barrels:

How are these rain barrels helping with stormwater?  
Where do they collect water from? (Is there anything that directs water into them, or do they simply catch the water that falls on them? Where does the water they collect go? (How is it used?) Is there something that could be done to make them catch more water?  
What info can you find out from the sign? What other questions do you have?

**B. Downspouts:**

These downspouts collect water from this roof, and send the stormwater into the ground. Can students find these themselves? Where do you think the water might go? Where else can you find downspouts?

Keep these in mind when you study the stormwater pipes in Lesson 11!

**C. Garden and rain barrel:**

How do the gardens help with stormwater, or not? What would be different if they were not there? Consider that vegetation slows stormwater by helping it soak into the ground and holding soil in place with its roots. However, anything that is put in the garden or on the plants may be washed off—including chemicals or fertilizers, if they are used. Presumably, school gardens have few or no chemicals.

**D. Storm drains:**

There are many storm drains on the school grounds. They are marked on your map in small red squares. Of particular interest are the ones that are overgrown with vegetation. There are a few on the grounds: See if you can find the others. This one had a large area of dirt around it that suggested it might have been a puddle at one point. Does this drain become flooded? Is it working the way it is supposed to?



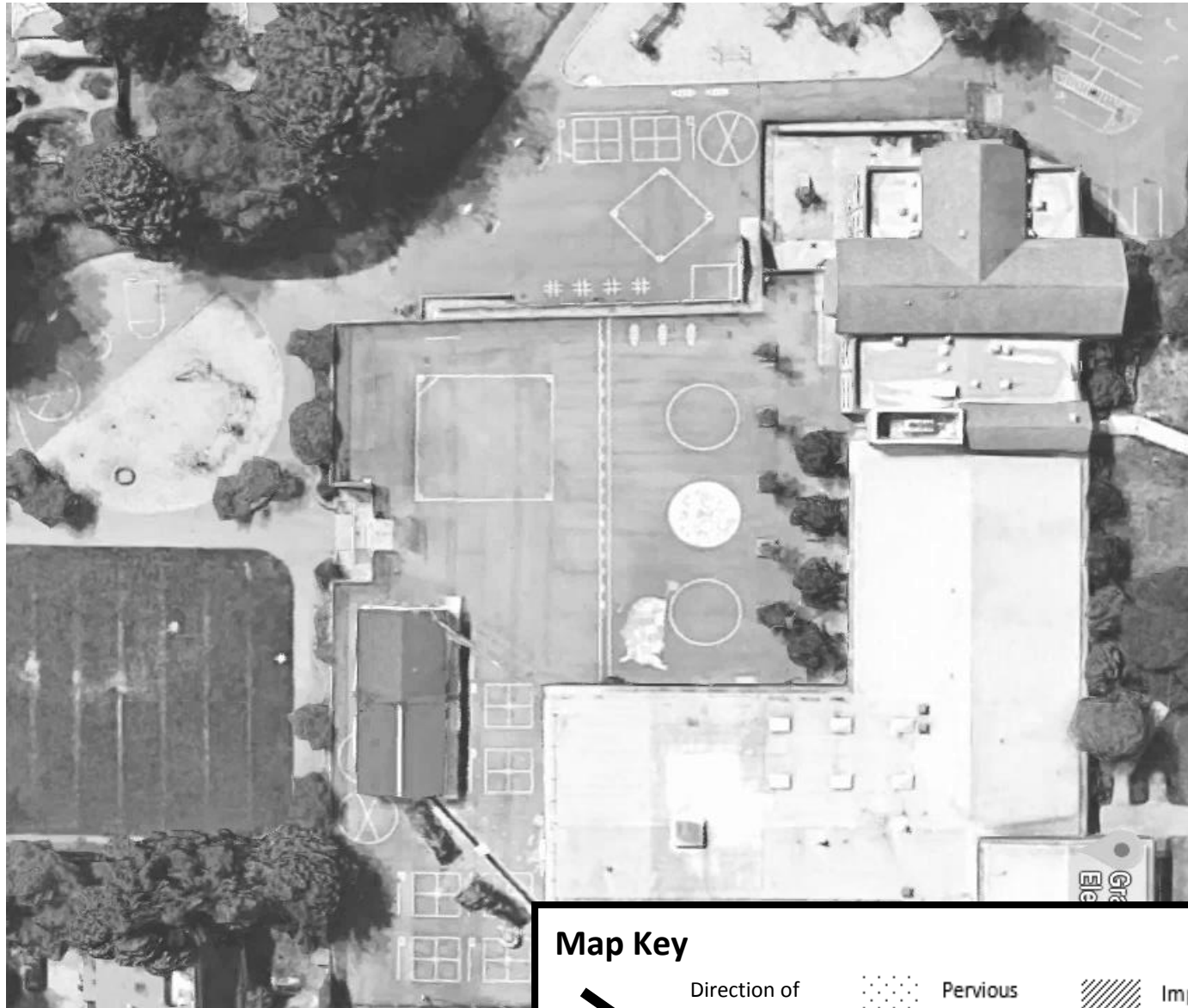


E. Ground surfaces:

Observe all of the surfaces in this area. Where does the water go? What do you see that slows down stormwater? What speeds it up? In particular, compare the perviousness of the woodchips to that of the paved surface and the grass. Which do you think creates more or fewer stormwater problems?

# Mapping Your Schoolyard – Graham Hill

Name: \_\_\_\_\_ Date: \_\_\_\_\_



## Include on your map:

- Symbols from the Key including flow of water, surfaces, and storm drains.
- Partially pervious surfaces can be shown with less dots.
- Label locations of litter, pollution and places where puddles form.
- Sketch any specific **stormwater problems** you see or are aware of.
- Sketch larger plants and bushes

### Map Key

Add your own symbol here!



Direction of  
water flow



Pervious  
Surface



Impervious  
Surface



Storm  
Drain

## Local Stormwater Systems – Lesson 5

### What happens with the Stormwater Pipes around your school?

- The stormdrains at your school connect to a stormwater pipe running south down 51<sup>st</sup> Ave S.

### What happens to the stormwater runoff?

- The map on the next page shows where the runoff from different parts of the city ends up.
- The stormwater pipe on 51<sup>st</sup> Ave S continues until S Cloverdale St where it empties into Lake Washington at Pritchard Island Beach.
- From Lake Washington water flows through the Montlake Cut and into Lake Union before going through the Chittenden Locks to Puget Sound.
- We suggest watching the “**Drained: Urban Stormwater Pollution**” video (OPTION B) from 0:00 to 2:11 during Lesson 5. You can find this video linked on communitywaters.org or at <https://vimeo.com/51603152>.

### Additional Notes:

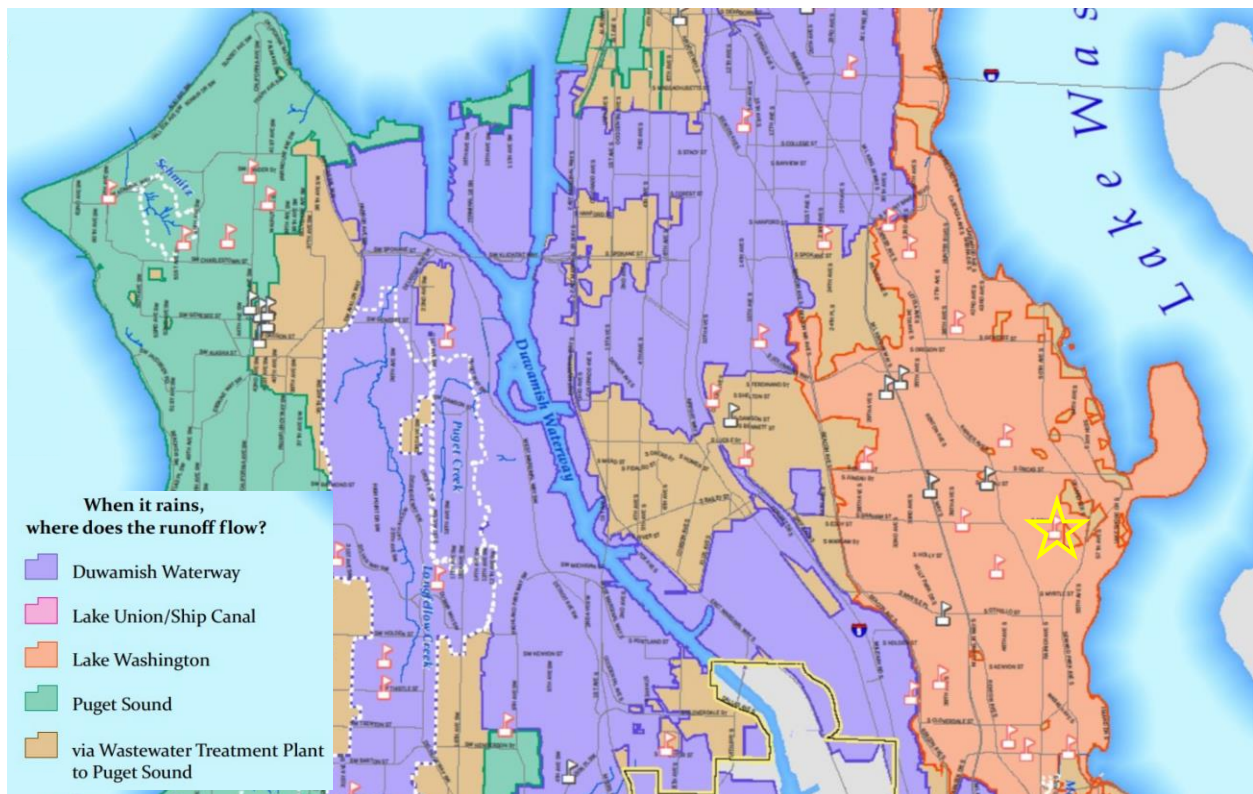
- While your school’s local stormwater drains directly into Lake Washington, there are also combined sewer and stormwater pipes that converge at Seward Park before entering a pipe destined for the Wastewater Treatment Plant at Discovery Park. During big storm events the combined water can end up flowing directly into Lake Washington offshore from Seward Park.
- To reduce the number of combined sewer overflows, Seattle Public Utilities built the “North Henderson Combined Sewer Overflow Reduction project” with a 2.65 million gallon storage tank under the tennis courts and adjacent parking at Seward Park. If you are down there with your students it is worth pointing out! You can learn more about it at:



<http://www.seattle.gov/util/EnvironmentConservation/Projects/NorthHendersonBasin/index.htm>

**Please Note:** The pipes information provided here is our best estimate of the stormwater flow in your community based on the information we have currently. If you encounter more information in the course of your investigation please let us know so we can update future versions of this document.

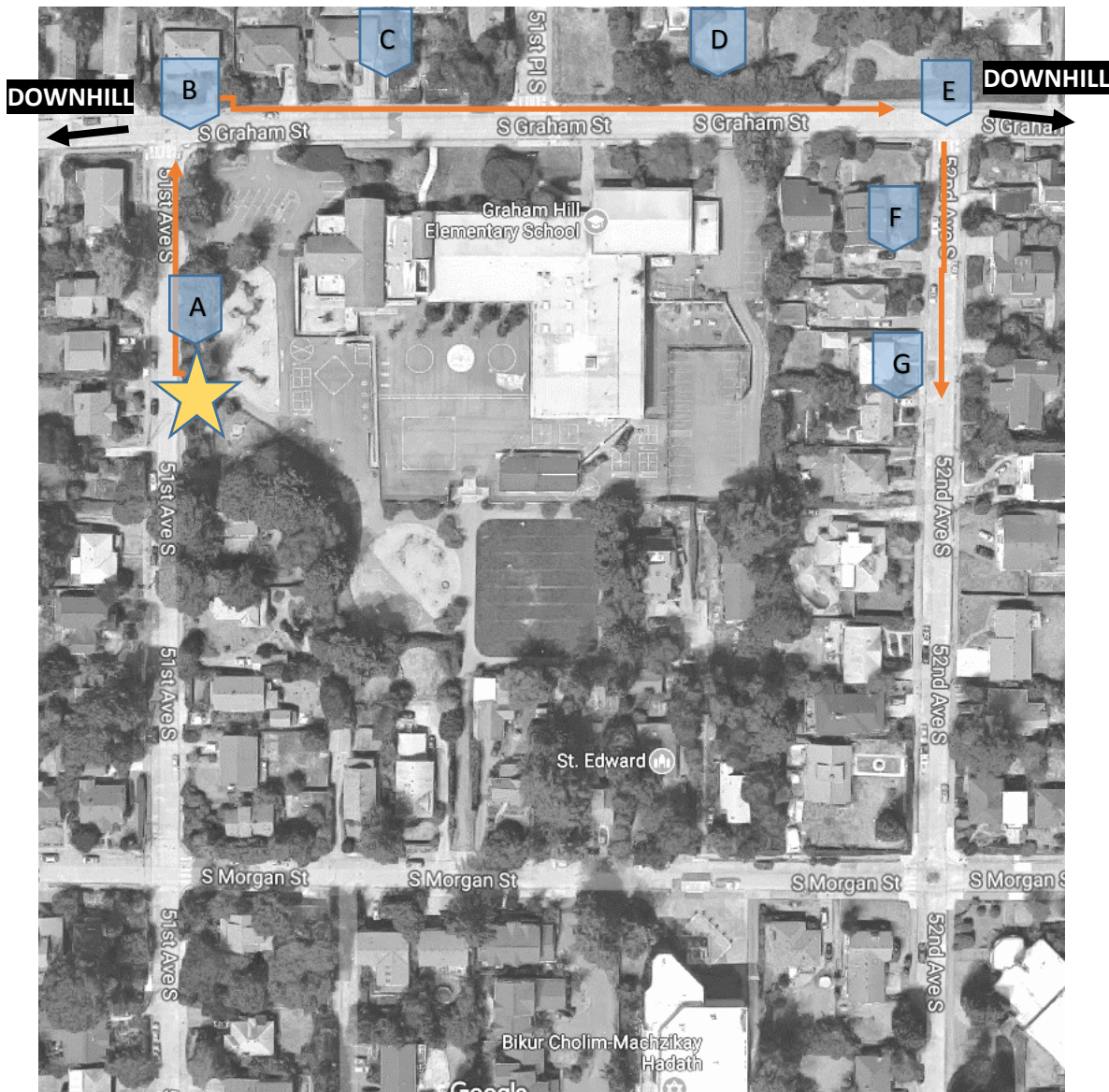
Graham Hill has a yellow star around it on the map.





## Stormwater in Our Community – Lesson 6

Please use this map and points of interest as suggestions for your walking field trip, recognizing there may be other things of importance to note in other areas. It may be useful to bring the stormwater pipes map with you for reference.



**Suggested Route:** Exit from the side of the schoolyard down the ramp onto 51<sup>st</sup> Ave S. Turn right and walk up to S. Graham Street. Take a look at the view down S. Graham to the west, but cross the street and continue east (to the right) on S. Graham. At the end of the block, cross over to 52<sup>nd</sup> Ave S. and walk about halfway down the block. In our experience, this is enough distance for students, but you can keep going if you like. We suggest not trying to make it around the whole school block—it's pretty large! Instead, simply turn around and head back to the front of the school or other convenient entrance.



## Points of Interest



### A. Storm drain:

As you descend the ramp, notice the slope of the ground at the edge of your schoolyard. What does this mean for runoff? What do you see that will speed up stormwater? What will slow it down?

Keep an eye out for storm drains around the neighborhood—such as this one hidden among the plants!

Where does the water that enters them come from? What else might be going in them besides water? Where do you think they send the water?



### B. View downhill:

From the corner of 51<sup>st</sup> and S Graham, you can see all the way down the road to where it starts to slope uphill again. This is a good opportunity for students to imagine stormwater runoff on a large scale.

Based on the models you've studied, how do you think stormwater runoff moves in this landscape? Which way does it flow? Who or what might be impacted by stormwater problems?





C. Downward sloping driveway:  
Consider how stormwater flows on this driveway. What might happen in a big storm? Where does the water go? What might happen if the residents washed their car in the driveway?



D. Sloped yard:  
Here is an interesting yard, with sloped edges. Do you think this design helps with stormwater problems or not? Why?



E. View downhill:  
From the corner of 52<sup>nd</sup> and S Graham, you can see all the way down the road to the water. What body of water is it?  
Which way does runoff flow here? Who or what might be most impacted by stormwater problems? Also ask: Who is probably least affected by stormwater problems in the areas you've observed today?  
(Hint: since your school is on top of the hill, you aren't receiving stormwater runoff from anywhere else—but everyone downhill from your school may be impacted if there is too much water! Additionally, water that enters the sewer pipes here flows into Lake Washington—how does that affect you [students]? Does anyone in the class use the lake? Who else does?)



#### F. Downspout and driveway channels:

This house has disconnected downspouts that deposit roof runoff directly onto the driveway. Where will the runoff go next? What problems could this cause to the homeowner or others?

At the edges of the driveway, the pavement has channels to direct the water. Where will the redirected water go?



#### G. Rain barrels and semi-pervious walkway:

Some of this resident's roof runoff flows into rain barrels. What do you predict might happen in a heavy rainstorm?

\*Notice how this barrel has a spigot to allow for excess water to be released into the yard.

This resident also built a semi-pervious pathway from their driveway to front door using paver stones with spaces in between.

How will stormwater move on this type of surface? How is this pathway different than the one leading from the side walk to the front door? What might be some drawbacks to this path's design?