SCHUYLKILL RIVER – VISUAL ASSESSMENT PROTOCOL

BERKS, CHESTER, MONTGOMERY, & PHILADEPHIA COUNTIES, PA

JULY 2020

PREPARED FOR:

SCHUYLKILL RIVER GREENWAYS
ATTN: MR. TIM FENCHEL
DEPUTY DIRECTOR
140 COLLEGE DRIVE
POTTSTOWN, PA 19464

PREPARED BY:

PRINCETON HYDRO, LLC
203 EXTON COMMONS
EXTON, PA 19341
908-235-5660

Thank you for your interest in documenting the health, vibrance, and ecological characteristics of the Schuylkill River. We hope the following protocols help you to engage in the conservation and preservation of this special resource.

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1.0 INTRODUCTION

The Schuylkill River Greenways (SRG), in partnership with Berks Nature, Bartram's Garden, The Schuylkill Center for Environmental Education, Stroud Water Research Center, and Princeton Hydro, are conducting a Schuylkill River Partner Water Quality Project. This project, focused on the main stem of the Schuylkill River from Berks Nature in Reading to Bartram's Garden in southwest Philadelphia, is aimed to document the current ecological status and health of the river, and seeks to engage and educate a diverse set of river users and residents.

The Schuylkill River Partner Water Quality Project includes four components: (1) User opinion and perceptions survey, (2) community science water quality monitoring of the river, (3) community engagement, and (4) educational outreach. The survey, conducted in April 2020 by OpinionWorks, showed a significant concern of river users is the visual impairments associated with trash and litter. The secondary concern was associated with water quality, including potential excessive bacteria and nutrient inputs. We have incorporated these survey results into the design of the community science water quality monitoring effort. To maximize quality control and assure the data collected by volunteers is scientifically accurate, we divided the effort into two sessions and developed protocol for each: (1) Visual Assessments to document the abundance and distribution of trash and litter, and (2) Scientific Documentation of Critical Water Quality Parameters to understand bacterial inputs and associated metrics.

The **First** session, that is described in this document, is volunteer-based Visual Assessment monitoring associated with documenting the abundance and distribution of trash and litter throughout the river. The **Second** is associated with scientific documentation of critical water quality parameters including bacterial data and *in-situ* measures of temperature, pH, turbidity, specific conductance, and dissolved oxygen. In concert, these two metrics will be analyzed and integrated into a concise documentation of the current status of the Schuylkill River. SRG and the partners will then seek to engage and educate stakeholders on the status of the river following this data collection effort.

Your participation in the early phase of this project is critical towards documenting the status of litter along the Schuylkill River. This document is intended to serve as an Instruction Manual on how to document trash along the river utilizing a specially developed protocol and reporting structure. While we believe the Instruction Manual will not be required reading in order participate in the visual assessments, we are providing it so that anyone who choses to read more about the methodology or who would like to replicate such efforts in their community, has a more detailed reference available.

The data input associated with the Visual Assessment effort is to be conducted by community scientists through a user-friendly Arc123 Survey Portal/website, which can be accessed at the following link: **https://arcg.is/0HyDST**

2.0 METHODOLOGY

The following section will briefly describe the site location and visual assessment data collection portal fields associated with this survey.

2.1 DATA COLLECTION METHOD

Visual Assessments require no formal training or sampling experience and are meant to be a simple effort that any community scientist can complete. The goal is to document critical areas of trash accumulation or dumping points in order to guide management efforts to better deal with this pollution.

To do so, we have developed an assessment survey using Arc123 Survey Portal, which can be accessed and submitted via a smartphone or tablet by opening a link in a phone/tablet's browser. This link will allow community scientists to answer multiple-choice questions to rank trash levels and quantities. It also asks community scientists to submit a photo of the site and collect the GPS location. By utilizing this user-friendly platform, the data collected under this effort can be easily summarized in custom, georeferenced databases and/or visualized via an ArcGIS interactive map.

The Visual Assessment Arc123 Survey Portal can be accessed at the following link: https://arcg.is/0HyDST

2.2 AREA DESCRIPTION

The area associated with this survey is the main stem of the Schuylkill River from the upstream terminus at Berks Nature in Reading, Pennsylvania to the downstream terminus at Bartram's Garden in Philadelphia, Pennsylvania (Figure 1). Parties conducting this monitoring should survey a 100-foot section of the Schuylkill River. The associated web portal will mark your start location while the survey should be conducted approximately 100-feet upstream from your starting point.

Any 100-foot section of the river between Berks Nature and Bartram's Garden may be surveyed for this effort. If you wish to survey more than a 100' section of the river, please fill out multiple data web forms. Again, the link for this survey is: https://arcg.is/0HyDST
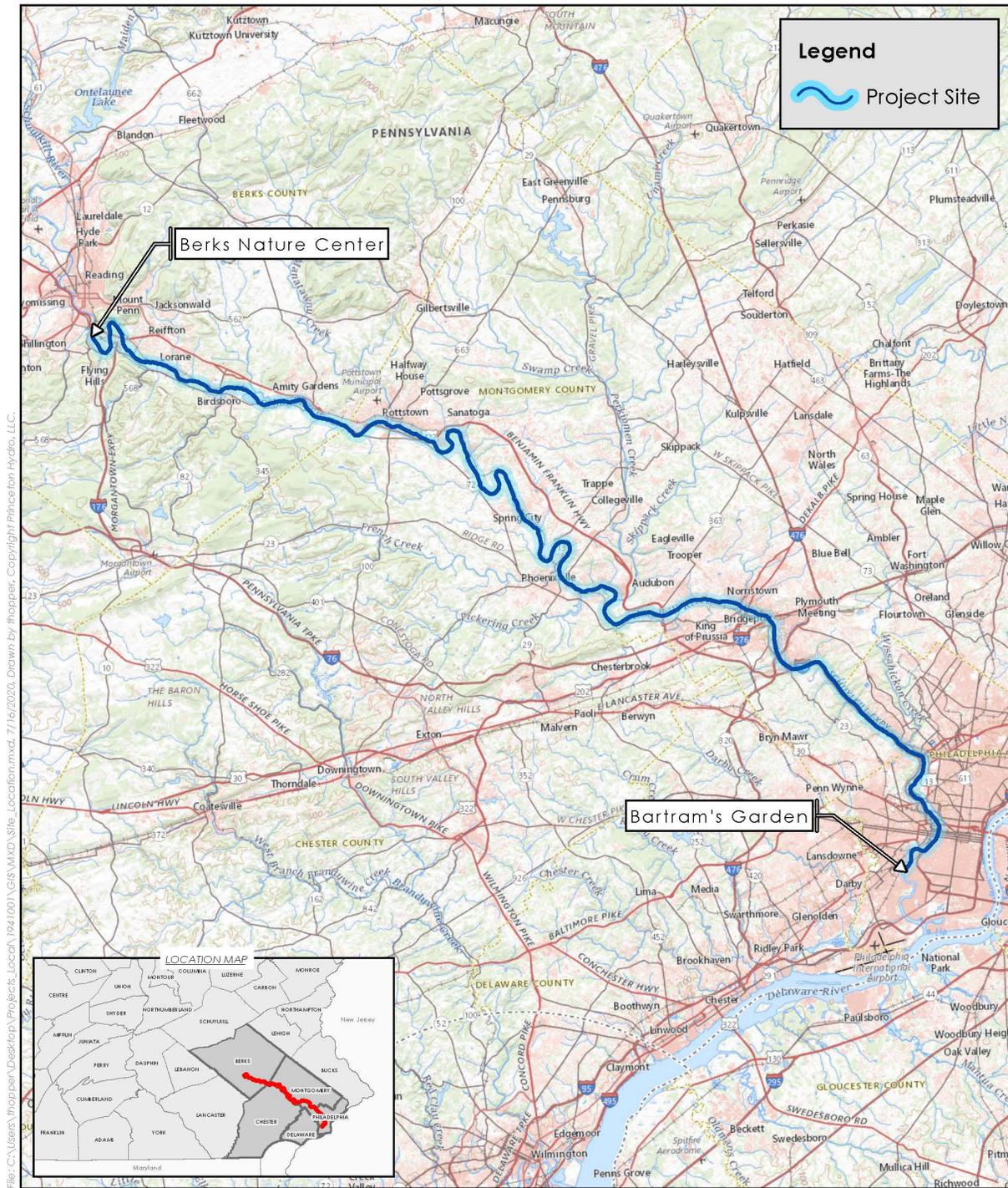
Legend

Project Site

Berks Nature Center

Bartram's Garden

LOCATION MAP

NOTES:
1. Project site consists of the main stem of the Schuylkill River between Berks Nature in Reading, Pennsylvania and Bartram's Garden in Philadelphia, Pennsylvania
2. USGS Topo Base Map obtained from USGS, The National Map, Web Services: https://viewer.nationalmap.gov/services/

0   16,000   32,000
Feet

Map Projection: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet

SITE LOCATION MAP

SCHUYLKILL RIVER GREENWAY
PARTNER WATER QUALITY PROJECT
BERKS, CHESTER, MONTGOMERY,
DELAWARE, & PHILADELPHIA COUNTY
PENNSYLVANIA

PRINCETON HYDRO
SCIENCE DESIGN ENGINEERING
www.PrincetonHydro.com

Figure 1: Site Location Map – Trash Visual Assessment Project Extent

2.3 VISUAL ASSESSMENT METHODOLOGY

The Visual Assessment Methodology associated with this effort is largely derived from similar efforts in the San Francisco Bay Region (Moore et al., 2007). The GOAL of this effort is to document critical areas of trash accumulation or dumping points in order to guide management efforts to better deal with this pollution. Management may include more targeted cleanup efforts, educational outreach in targeted communities, or a better understanding of accumulation points where current and River flow allow trash to accumulate.

Upon arriving to your designated site you should click the Visual Assessment link on your smartphone or tablet: https://arcg.is/0HyDST. This link will contain several fields; descriptions for each are provided below:

2.3.1   INTRODUCTORY AND LOCATION FIELDS

The following five (5) fields will ask for basic identification and location parameters and are as follows:

1. The first field will ask your name, or if wish to stay anonymous, a suitable moniker.

2. The second field will ask what group or organization you are associated with. If you are a private citizen, not associated with a conservation group or non-profit, just enter 'Private.'

3. The third field will ask for the date and time of the start of your survey.

4. The fourth field will ask for the location of the start of your survey. You may have to allow location services on your smart device for this field to work. You may also move the pin to your location manually if desired.

5. The next (fifth) field is 'Overall Site Photo (Optional)' – This field will allow you to snap a photo of what you feel is a representative depiction of the 100-foot stretch of River that you are surveying.

2.3.2   VISUAL ASSESSMENT FIELDS

The second set of fields, starting with field six (6) contain the Visual Assessment Scoring Category fields. Each field provides a brief description of each Rating (Optimal, Sub-Optimal, Marginal, Poor etc.) and allows for the inclusion of a user provided photograph. A detailed description of the definition and purpose of each field are provided in Section 3.0. A brief description of each field is as follows:

6. Field six starts the Scoring Category associated with the Visual Assessment and is entitled *Level of Trash:* This assessment parameter is intended to reflect a 'first impression' of the site, after observing the entire length (100') of the river.

7. Field seven describes the Scoring Category entitled *Threats to Aquatic Life:* This assessment parameter Is intended to characterize specific types of trash that can directly or indirectly harm aquatic life.

8. Field eight describes *Threat to Human Health:* This assessment parameter describes specific types of trash, such as medical wastes, that could directly impact human health.

9. Field nine describes *Illegal Dumping:* This parameter is intended to identify locations of acute, heavy trash accumulation resultant from dumping activities.

10. Field ten describes *Illegal Littering:* This section aims to describes the prevalence and abundance of human derived litter that is not specifically associated with dumping.

11. Field eleven describes *Accumulation of Trash:* This section aims to describes accumulation of litter from river current or downstream flow.

12. Finally, an *Additional Comments* section is provided where the user can input any additional info about the site.

3.0 DETAILED CATEGORY DESCRIPTIONS

The following section will provide a more detailed overview of the Scoring Categories described in Section 2.0. Reviewing this section will provide the user with a more holistic understanding of each Scoring Category and will therefore allow for a more accurate assessment of the accumulation of trash and litter throughout the project area.

1. *Level of Trash* – This assessment parameter is intended to provide a qualitative "first-impression" of the 100' reach you have selected to survey. Scoring ranges from Optimal – no or little trash visible to Poor – trash immediately distracts the eye at first glance.

2. *Actual Number of Trash Items Found* – This category is based on the total tally of trash along the 100' river reach. Total the number of individual trash items observed both below and above the high-water line, and choose an appropriate conditional score based on the total number of pieces of trash observed.

3. *Threats to Aquatic Life* – Certain characteristics of trash may be particularly harmful to aquatic life. If trash items are floatable and relatively small, they may be mistaken as food items by wildlife. Larger items, such as netting, can cause entanglement. Furthermore, some types of trash may contain toxic substances (e.g. paints, medical wastes, chemicals). These factors are considered in the threat of the observed trash to aquatic life.

4. *Threats to Human Health* – This category seeks to describe potential trash items that are dangerous to people who may wade, swim, or otherwise come into contact with the river and pollutants that could potentially accumulate in fish and other aquatic organisms such as mercury. Types of trash associated with this category include medical wastes which could potentially harbor viruses or bacteria, diapers, and human or pet solid wastes.

5. *Illegal Dumping* – This assessment relates to the acute accumulation of trash and garbage derived from human dumping. Sites that may be particularly active dumping locations are those with easy vehicular site access.

6. *Illegal Littering* – As opposed to illegal dumping, the Illegal Littering category is associated with general littering not associated with bulk or large-scale dumping.

7. *Accumulation of Trash* – This category seeks to describe the accumulation of trash via downstream transport. Faded colors, silt marks, trash wrapped around roots or rocks, are all indicative of downstream transport. This section is particularly important as it may serve to guide collection efforts from the city or various municipalities along the River.

4.0 WHAT NEXT?

The data collected under this effort will be summarized in custom, georeferenced databases. This data will be utilized by the project partners to fully understand the breadth and type of litter and trash pollution along the main stem of the Schuylkill River. A summary of the data and engagement content, to be developed by the project partners, will displayed by the Schuylkill River Greenways at http://schuylkillriver.org.

Thank you, dedicated community scientist, for your contribution to this special project!

5.0 REFERENCES

Moore, Steven, Cover, Matthew, & Senter, Anne. 2007. *A Rapid Trash Assessment Method Applied to Waters of the San Francisco Bay Region: Trash Measurement in Streams.* Regional Water Quality Control Board, Sand Francisco Bay Region, Surface Ambient Monitoring Program.