



Leadership on Regional Issues

Request for Expressions of Interest

Long Island Water Quality Challenge
to promote project-based learning in
Science, Technology, Engineering, and Mathematics
(STEM) in Long Island schools

Release: March 4, 2019

Due: April 5, 2019

A PROJECT OF THE
LONG ISLAND NITROGEN ACTION PLAN
NYSDEC, LIRPC, SUFFOLK & NASSAU COUNTIES
<http://www.NYSDEC.ny.gov/lands/103654.html>

NOTICE OF REQUEST FOR REQUEST FOR EXPRESSIONS OF INTEREST

Project Name: Long Island Water Quality Challenge: Low Input Landscaping and Stormwater Treatment on School Grounds

Agency: Long Island Regional Planning Council
1864 Muttontown Road
Syosset, NY 11791
516-571-7613

Project Intent: As part of the Long Island Nitrogen Action Plan (LINAP), the Long Island Regional Planning Council (LIRPC) is seeking participation from schools in the *Long Island Water Quality Challenge: Low Input Landscaping and Stormwater Treatment on School Grounds*. The initiative is being conducted to promote project-based learning in Science, Technology, Engineering, and Mathematics (STEM) in Long Island schools. Any NYS accredited educational institution on Long Island (in Nassau and Suffolk counties) that serves students in grades 6, 7 and 8 is eligible to submit a Letter of Interest (LOI).

About the LIRPC: The Long Island Regional Planning Council serves as the Island’s chief planner and a leading advocate for issues affecting the economic, environmental and social well-being of Long Island’s businesses, institutions and residents. The LIRPC conducts research, surveys and studies, which address regional needs, issues and opportunities.

Release Date: March 4, 2019

LOI Due: April 5, 2019

Information: website: www.lirpc.org
email: info@lirpc.org

Introduction

Project Goals

The *Long Island Water Quality Challenge: Low Input Landscaping and Stormwater Treatment on School Grounds* has been established by the Long Island Regional Planning Council (LIRPC) as part of New York State's Long Island Nitrogen Action Plan (LINAP). This initiative is being conducted to promote project-based learning in Science, Technology, Engineering, and Mathematics (STEM) in Long Island schools. The LIRPC recognizes the need for greater interaction between professionals engaged in STEM pursuits and our schools to generate excitement about STEM learning and stimulate interest in STEM careers. The goal of this STEM initiative is to connect students, teachers and their communities with two of the issues being addressed by LINAP to reduce pollutant loads to our groundwater and surface waters.

Project Background & Overview

The *Long Island Water Quality Challenge: Low Input Landscaping and Stormwater Treatment on School Grounds* will run in parallel with the LINAP program. LINAP is a multi-year effort led by the State's Department of Environmental Conservation (NYSDEC) and the LIRPC along with both counties and others to reduce the amount of nitrogen entering Long Island groundwater and surface water from wastewater (sewers and septic systems), stormwater runoff, and fertilizers. Excess nitrogen has led to deteriorated water quality, fish kills, shellfish die-offs, harmful algal blooms, and the declining health of our natural systems, along with impacts to recreational and commercial fisheries, boating and tourism.

Suffolk and Nassau counties are taking steps to reduce nitrogen loading from wastewater by expanding sewerage, improving treatment, and encouraging installation of alternative/innovative onsite wastewater treatment systems for single-family homes. Excess nitrogen from fertilizer use is also being addressed by a LINAP fertilizer workgroup that will be issuing a set of recommendations this year.

Citizens can also make an impact by improving their management of stormwater runoff and by reconfiguring their lawns and gardens to low input landscapes. This STEM Challenge presents an opportunity for students to research, plan and innovate at their schools. Specifically, student teams will focus on one of two Water Quality Challenge categories on school grounds:

- 1) Stormwater Treatment Challenge
- 2) Low Input Landscaping Challenge

In addition to project design, schools can pursue the installation if deemed feasible. However, evaluation and scoring will be limited to the project design.

1) Stormwater Treatment Challenge

Stormwater runoff contains a variety of pollutants including nitrogen. In some areas, runoff is collected in roadway or parking lot catch basins and piped to either recharge basins or the local harbor or bay. Soil bacteria in recharge basins provide some treatment, but none is provided when stormwater is discharged to surface water. Students participating in the *Stormwater Treatment Challenge* will identify ways, e.g. bioswales, permeable pavement and rain gardens, to collect and treat some of the runoff from their school grounds to help reduce pollutants. *

*SEE ATTACHMENT FOR HELPFUL INFORMATION ABOUT WHAT A STORMWATER TREATMENT PROJECT WOULD ENTAIL; THESE DETAILS WILL NEED TO BE INCLUDED IN THE FINAL REPORT BUT NOT REQUIRED FOR THE LETTER OF INTEREST.

2) Low Input Landscaping Challenge

Landscape maintenance requires inputs to insure healthy turfgrass, shrubs, and trees. These include water, nutrients (fertilizers), and sometimes pesticides to reduce/prevent diseases and insect damage. Fertilizers and pesticides seep into groundwater and find their way to surface water where they contribute to deteriorating water quality. Excessive watering (irrigation) can increase the flow of contaminants into these waters. Students participating in the *Low Input Landscaping Challenge* will identify ways to reduce these inputs, for example by choosing different landscape designs and plant varieties that require fewer and less harmful inputs. *

*SEE ATTACHMENT FOR HELPFUL INFORMATION ABOUT WHAT A LOW INPUT LANDSCAPING PROJECT WOULD ENTAIL; THESE DETAILS WILL NEED TO BE INCLUDED IN THE FINAL REPORT BUT NOT REQUIRED FOR THE LETTER OF INTEREST.

Selected student teams will choose a project from one of two Water Quality Challenge categories that is feasible and meaningful to them and their community. Schools and their teams are encouraged to explore the online resources available on the LIRPC website at the following link:

<https://lirpc.org/water-quality-challenge/>

These resources include information on stormwater treatment and low input landscaping.

Submission Requirements and selection

Letters of Interest

The LIRPC welcomes Letters of Interest (LOI) for participation in the *Low Input Landscaping Challenge* or the *Stormwater Treatment Challenge* for the winter/spring of 2019-2020. Letters of Interest should be signed by the principal or district administrator and submitted through the STEM Challenge page of the LIRPC website (www.lirpc.org) or by email (info@lirpc.org).

The LOI should be submitted on institutional letterhead and should include the following: 1) A brief description of the project of interest including which of the two Water Quality Challenge categories it falls under; 2) the class(es), grade(s), number of students, and designated faculty representatives and assistants (including contact information) for the program at the school; 3) how students will be selected for participation; and 4) a one or two-page description of the district's STEM programming. The LOI is not binding; therefore, the school may withdraw it at any time.

Eligibility

Any NYS accredited educational institution on Long Island (in Nassau and Suffolk counties) that serves students in grades 6, 7 and 8 is eligible to submit a Letter of Interest. Each school may submit up to two teams of any size. Final presentations, however, will be limited to 6-10 students per team. Schools should identify a faculty lead for each team or one lead for both teams. Schools are encouraged to create collaborations with other schools in the district or across districts. The LIRPC will select the participating teams.

Project Requirements and Submission

In the fall of 2019, prior to the selected teams starting their respective project reports, LIRPC will schedule an online briefing to review project requirements and dates to ensure that both can be coordinated with other school obligations. The basic project report requirements are outlined below:

- Identify current practices – report with references
- Design the improvements – preliminary design report with references
- Final design report with cost estimates
- Communicate the improvements – print or electronic media
- If chosen for final competition, student teams will present project to expert panel and peers – oral presentation with findings and design
- *Optional* - install the solution. Note: Installation will not influence the selection process.

*SEE ATTACHMENT FOR HELPFUL INFORMATION ABOUT WHAT THE STORMWATER TREATMENT AND LOW INPUT LANDSCAPING PROJECTS WOULD ENTAIL; THESE DETAILS WILL NEED TO BE INCLUDED IN THE FINAL REPORT BUT NOT REQUIRED FOR THE LETTER OF INTEREST.

Communication with the LIRPC

The LIRPC will assist team leaders with technical advice and resources and will be available to respond to questions. The LIRPC also plans to have subject matter experts available from other organizations for detailed technical questions. All communication with the LIRPC should be conducted by teachers or their assistants. Direct communication between students and the LIRPC is discouraged. Remote visits between school participants and the LIRPC may be possible via conference or video calls.

Project Schedule

- March 4, 2019 Request for Expressions of Interest announced
- March 18, 2019 Conference call (4pm to 5:00pm) – for teachers/officials ONLY
 - ✓ to provide overview and answer questions
 - ✓ **Call-in number:** 712.770.8024 AND **Conference code:** 295847
- April 5, 2019 Letters of Interest due
- May 1, 2019 LIRPC notifies participants
- Early October 2019 Project starts following an online briefing about report requirements
- Late March 2020 Final reports submitted by this date
- Early May 2020 Final competition and Award Ceremony (evening event)

Evaluation of Final Reports

Final written reports will be evaluated on originality, technical merit, quality of ideas, and practicality. Final reports will also be evaluated on the degree to which they are clear and understandable and make effective use of visuals to explain what is being proposed.

Final Competition and Awards Ceremony

Following a review of the written reports that were submitted, the winning teams will be invited to a final competition event (to present to a panel of experts). An awards ceremony will immediately follow the final competition. Additional details about the final competition and awards ceremony will be announced soon.

Disclaimer

The LIRPC and its respective officers, directors, agents, members and employees make no representation or warranty and assume no responsibility for the accuracy of the information set forth in this RFEOI. Further, the LIRPC does not warrant, nor make any representations as to the quality, content, accuracy or completeness of the information, text, graphics, links or other facets of this RFEOI once it has been downloaded or printed from any server, and hereby disclaims any liability for technical errors or difficulties of any nature that may arise in connection with the LIRPC or other website on which this RFEOI may be posted, or in connection with any other electronic medium utilized by respondents or potential respondents in connection with or otherwise related to the RFEOI.

ATTACHMENT A

PROJECT DETAILS FOR CONSIDERATION*

(*For full report – NOT necessary for the letter of interest)

LOW INPUT LANDSCAPING

Defining the Inputs

- What inputs are used to maintain your school’s landscaping?
 - Topsoil, soil amendments, fertilizers, pesticides, gasoline for power equipment?
- How much water is used?
 - How much is used for specific areas?
 - Where does the water come from and where does it go?

Identifying the Environmental Impacts

- What impacts do the inputs have on the soil, groundwater, air?

Lowering the Inputs

- Could your school’s landscape be sustained with fewer inputs?
 - Which inputs could be reduced and by how much?
 - How would that be better for the environment?

Designing the Solution

- What would a ‘Low Input’ landscape/garden look like?
 - What specific area/use could be improved?
 - What plantings would be best and what are their requirements?
- What are the inputs?
 - Describe and quantify the required inputs and potential reductions.
 - How is the solution better for the environment?
- What are the costs?
 - What are the material and labor costs to install it?
 - How will it be maintained and at what cost?

If project team seeks to install the low input landscape, please include the following information:

- When and by whom will the garden be installed?
- What, if any, approvals and additional resources are needed?
- What is the schedule?
- Communicating the Improvements – Who should learn about what has been done?; What would the message be?; What media will be used?

STORMWATER TREATMENT

Identifying Current Practices

- Is stormwater being collected? If so, how and where is stormwater collected?
- Do any areas flood?
- What, if any, treatments are provided and for what contaminants?
- Is the stormwater recharged or does it run off the property? Where does it go?
- What pollutants might be found in the stormwater?
- Estimate the quantities of stormwater and pollutants.

Improving Collection, Treatment, and Recharge

- How and where could stormwater collection be improved?
- What types of treatments would reduce which pollutants?
- What fraction of the stormwater could be recharged on site and how?
- Why are these solutions better for the environment?

Designing the Solution

- Which stormwater treatments are proposed?
 - Rain garden, swales, bioretention areas, permeable pavements, green roofs, infiltration planters, trees and tree boxes, rainwater harvesting, other.
- What would each selected treatment look like?
 - What specific area is targeted?
 - What types and quantities of materials are required?
 - What types and quantities of plant material are required?
- How much and what type of treatments are provided?
 - Describe the type of treatment and quantity of stormwater treated.
- What are the costs?
 - What are the material and labor costs to install it?
 - How will it be maintained and at what cost?

If project team seeks to install the stormwater treatment solution, please include the following information:

- When and by whom will the solution(s) be installed?
- What, if any, approvals and additional resources are needed?
- What is the schedule?
- Communicating the Improvements – Who should learn about what has been done?; What would the message be?; What media will be used?

*(*These details are for the full report – NOT necessary for the letter of interest)*