



STATE OF MAINE
DEPARTMENT OF AGRICULTURE, CONSERVATION AND FORESTRY
BOARD OF PESTICIDES CONTROL
28 STATE HOUSE STATION
AUGUSTA, MAINE 04333

JANET T. MILLS
GOVERNOR

AMANDA E. BEAL
COMMISSIONER

To: Board of Pesticides Control Members
From: Mary Tomlinson, Pesticides Registrar/Water Quality Specialist
Pam Bryer, Toxicologist
RE: Water Quality Monitoring Proposals: 2019 Surface Water and Sediment Monitoring Projects
Date: February 26, 2019

Background

The Board of Pesticides Control (BPC) surface monitoring program is rooted in statute and past precedent.

Under 7 M.R.S. §607-A. REVIEW OR REREGISTRATION 2-A, “The board shall conduct a water residue survey at least once every 6 years to establish a representative sample of a number of wells or bodies of water, selected at random, in areas of possible contamination or at other locations to be described by the board, for the purpose of testing these waters and preparing a profile of the kinds and amounts of pesticides present.
[2005, c. 620, §7 (NEW) .]”

The board has a history of monitoring surface water and sediment for pesticides that are prone to contaminate water bodies and underlying sediment via run-off. Past studies included: monitoring for blueberry pesticides in the Salmon, Pleasant, and Naraguagus Rivers; corn herbicides; potato herbicides; railroad rights-of-way pesticides in lakes bordering railroad tracks; browntail moth monitoring and urban watershed monitoring.

Past results of these studies indicate that pesticide contamination does occur in surface water due to runoff from agricultural and urban landscapes. Exceedances of maximum contaminate levels (MCLs), Lifetime Health Advisory Levels (HALs), Maine Maximum Exposure Guidelines (MEGs), or Aquatic Life Benchmarks (ALB) for atrazine, metribuzen, chlothalonil, and imidacloprid did occur at some sites after storm events. Bifenthrin is frequently in sediment samples collected in urban areas.

The surface water monitoring program is as critical as the groundwater monitoring program in identifying and addressing emerging contaminants in the state. Sampling results have been used in educational outreach to promote identification of best management practices to reduce groundwater contamination.

Two surface water studies are proposed for 2019 and will run concurrently. The estimated cost for both projects is \$68,760.

MEGAN PATTERSON, DIRECTOR
32 BLOSSOM LANE, MARQUARDT BUILDING



PHONE: (207) 287-2731
WWW.THINKFIRSTSPRAYLAST.ORG

Project 1: 2019 Penobscot Bay Study

This study is a follow up to the study conducted in September 2018.

Study Objectives

The objectives of this study are to:

- Assess the occurrence of pesticides in surface water and sediment after spring applications of pesticides.
- Compare spring and late fall results for evidence of variation in occurrence and concentration.

Sampling Plan

- The eight 2018 sampling sites will be re-sampled in June for surface water and sediment.
- One surface water grab sample and one sediment sample will be collected at each site.
- One Polar Organic Chemical Integrative Sampler (POCIS) will be deployed by the Maine Maritime Academy at an accessible site in the Bagaduce River near Castine.
- One surface water field duplicate, one surface water field blank, and one sediment field duplicate will be collected for quality control and quality assurance purposes. The number of duplicates and blanks are typically collected on a 5% basis.
- Water and sediment samples will be shipped to Montana Analytical Laboratory for pesticide analysis. The laboratory is accredited and has a current Quality Assurance Project Plan (QAPP) which is required by the Environmental Protection Agency (EPA) as part of the Cooperative Agreement between the EPA and Maine.
- Sediment samples will also be shipped to the University of Maine Analytical Laboratory for total organic carbon and particle size analysis.
- The analysis method employed for sediment samples will be the Montana Department of Agriculture “Universal Method for the Determination of Polar Pesticides in Water Using Solid Phase Extraction and Liquid Chromatography/Mass Spectrometry/ Mass Spectrometry” and analyzes for 102 pesticides.
- The analysis method employed for sediment samples will be the Montana Department of Agriculture, PYR_SI, Revision 2: January, 2014 “Determination of Pyrethroids in Sediment Using Solid Phase Extraction and GC/MS/NCI and /or GC/MS/MS E1.

Estimated Project Cost

The estimated cost for analysis, shipping, and materials is \$12,750. Montana Analytical Laboratory offers a 20% discount on six or more samples shipped in a batch. There will likely be some overlap with the Ten Cities Project in Bangor which will slightly reduce the cost of this project.

Projected Costs for Proposal

	Item	Number	Total Cost (\$)
Analysis	Water/sediment pesticide analysis	18	9450
	Passive sampler analysis (includes laboratory validation experiment)	4	1500
	Particle size/total organic carbon analysis	9	675
Materials	Sediment sample containers/supplies	22	55
Shipping	Shipping to Montana	22	1070
Estimated project total			12750

Project 2: 2019 Ten Cities Project

The objectives of this study are to:

- Assess the occurrence of pesticides in surface water and sediment in urban waters along a population gradient of the 10 largest Maine cities.
- Establish the feasibility of implementing passive sampling techniques for future BPC water quality sampling by comparing passive sampling results to our traditional grab samples.
- Establish a baseline for future trend studies of pesticide contamination in urban waters of Maine's ten largest cities.

Sampling Plan

- Urban waters flowing through the ten largest Maine cities by population size will be selected.
- One Polar Organic Chemical Integrative Sampler (POCIS) will be deployed in June at an accessible site in each river downstream of each city.
- Three surface water grab samples will be collected at the POCIS sample site: one at deployment of the POCIS, one at two weeks after deployment, and one at recovery.
- One sediment sample will be collected at the POCIS sample site at recovery of the POCIS.
- Two additional surface water grab samples will be collected upstream in major tributaries as close to the river as possible two weeks after deployment of the sampler.
- Two surface water field duplicates, two surface water field blanks, and one sediment field duplicate will be collected for quality control and quality assurance purposes. The number of duplicates and blanks collected are typically equivalent to five percent of the total number of samples collected.
- Water and sediment samples will be shipped to Montana Analytical Laboratory for pesticide analysis. The laboratory is accredited and has a current Quality Assurance Project Plan (QAPP) which is required by the Environmental Protection Agency (EPA) as part of the Cooperative Agreement between the EPA and Maine.
- Sediment samples will also be shipped to the University of Maine Analytical Laboratory for total organic carbon and particle size analysis.
- The analysis method employed for sediment samples will be the Montana Department of Agriculture "Universal Method for the Determination of Polar Pesticides in Water Using Solid Phase Extraction and Liquid Chromatography/Mass Spectrometry/ Mass Spectrometry" and analyzes for 102 pesticides.
- The analysis method employed for sediment samples will be the Montana Department of Agriculture, PYR_SI, Revision 2: January, 2014 "Determination of Pyrethroids in Sediment Using Solid Phase Extraction and GC/MS/NCI and /or GC/MS/MS E1.

Estimated Project Cost

The estimated cost for analysis, shipping, equipment, and materials is \$56,010. Montana Analytical Laboratory offers a 20% discount on six or more samples shipped in a batch.

Projected Costs for Proposal

	Item	Number	Cost (\$)	Total Cost (\$)
Analysis	Water/sediment pesticide analysis	65	27100	46625
	Passive sampler analysis (includes laboratory validation experiment)	44	18700	
	Particle size/total organic carbon analysis	11	825	
Equipment/Materials	POCIS with SPMD	10	5680	8285
	POCIS & SPMD membranes	20	2550	
	Sediment sample containers/supplies		55	
Shipping	Shipping to Montana		1255	1100
Estimated project total				56,010