



DEPARTMENT OF  
**ECOLOGY**  
State of Washington

## **School Supplies 2019**

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# **Addendum 4 to Quality Assurance Project Plan: Phthalates and Metals in Children's Products**

October 2019

Publication No. 19-04-018

Approved July 2019

## Publication Information

### Addendum

This Quality Assurance Project Plan Addendum is on the Washington State Department of Ecology's website at <https://fortress.wa.gov/ecy/publications/SummaryPages/1904018.html>

This is the fourth addendum to an original Quality Assurance Project Plan (QAPP). It is not a correction (errata) to the original plan.

This addendum includes numbering and format updates following Ecology's current QAPP format. This formatting was not available at the time of publication for the original QAPP or Addendum #1. Format updates do not adversely alter the substantive content of the publications.

### Original Publication

Stone, A. 2012. Quality Assurance Project Plan: Phthalates and Metals in Children's Products. Publication No. 12-07-023, <https://fortress.wa.gov/ecy/publications/SummaryPages/1207023.html>

### Funding

Funding for this study is provided by the Washington State Attorney General's Office.

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# School Supplies 2019

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## Addendum 4 to Quality Assurance Project Plan: Phthalates and Metals in Children's Products

Approved July 2019

**Approved by:**

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Client: The party responsible for which professional services are rendered.

AGO: Washington State Attorney General's Office

HWTR: Hazardous Waste and Toxics Reduction Program (Department of Ecology)

RTT: Reducing Toxic Threats

P2RA: Pollution Prevention and Regulatory Assistance

EAP: Environmental Assessment Program (Department of Ecology)

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## 3.0 Background

This document describes the 2019 plan to study lead and cadmium in school supplies. It is the fourth addendum to the Quality Assurance Project Plan: Phthalates and Metals in Children's Products (Stone, 2012). This fourth addendum will follow a sampling design similar to that used in Addendum 1 for Quality Assurance Project Plan: Phthalates and Metals in Children's Products (Stone, 2014).

It includes specific details employed during the

- School Supplies 2017, Addendum 2 to Quality Assurance Project Plan: Phthalates and Metals in Children's Products (Sekerak, 2017).
- School Supplies 2018, Addendum 3 to Quality Assurance Project Plan: Phthalates and Metals in Children's Products (Sekerak, 2018a).

## 4.0 Study Description

Beginning in July 2019, Ecology will purchase school supplies for analysis of lead and cadmium. Ecology will focus the purchasing effort on pencil pouches and pencil cases<sup>1</sup> and book covers tested in the 2015 (Trumbull et al., 2017), 2017, and 2018 studies. This 2019 study may also include investigations on other supplies marketed and sold as school supplies for use by a child 12 years old or younger. Ecology will purchase school supplies both online and in retail stores.

### 4.1 Study goals

This study aims to assess lead and cadmium concentrations in school supplies. The data from this study will serve to:

- Provide 2019 supplementary data on pencil pouches/cases and book covers previously tested in 2015, 2017, and 2018.
- Provide additional data on pencil pouches/cases, book covers, and other products sold as school supplies not tested in an earlier study.

### 4.6 Tasks required

The study will include the following tasks:

- Purchase up to 200 school supply products available online and in retail stores in Washington State.
- Screen products for lead and cadmium using the X-ray fluorescence (XRF) analyzer.
- Send up to 76 product samples to Manchester Environmental Laboratory for analysis of lead and cadmium.
- Perform a quality assurance (QA) review on analytical data and database entries.
- Transfer initial findings to client.
- Write a technical memo to accompany the final data set documenting methods and data quality assessment.

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<sup>1</sup> Pencil pouches and pencil cases will be collectively referred to as pencil pouches/cases for the remainder of this document.

## 5.0 Organization and Schedule

### 5.1 Key individuals and their responsibilities

Table 1. Organization of study staff and responsibilities.

Staff	Title	Responsibilities
William Sherman Attorney General's Office Phone: 206-442-4485	External Client	Along with other team staff, clarifies scope of the study. Provides review of the QAPP addendum and approves the final QAPP addendum.
Kari Trumbull RTT Unit HWTR Phone: 360-407-6093	Project Manager	Writes the QAPP addendum. Leads purchasing, product sampling strategy, prioritizing samples for lab analysis, sample processing, chain-of-custody, and transport of samples to/from the laboratory. Conducts QA review of lab data and PTDB study, analyzes and interprets all data, and enters lab data into PTDB. Writes the draft and final technical memo.
Chrissy Wiseman RTT Unit HWTR Phone: 360-407-7672	Project Assistant	Leads sample screening. Assists with purchasing, sample processing, and transport of samples to/from the laboratory. Tracks online purchases, including product packaging and packing receipts. Conducts QA review of internal product log-in.
Prajwol Tuladhar RTT Unit HWTR Phone: 360-407-6745	Project Assistant	Leads product data entry into internal PTDB and photographing products. Assists with purchasing, sample screening, sample processing, and chain-of-custody.
Kara Steward RTT Unit HWTR Phone: 360-407-6250	<i>Acting</i> Unit Supervisor	Approves the study scope and budget, provides internal review of the QAPP addendum, approves the final QAPP addendum, and tracks progress. Reviews the draft and final technical memo.
Ken Zarker P2RA HWTR Phone: 360-407-6724	Section Manager	Reviews the study scope and budget, reviews the draft QAPP addendum, and approves the final QAPP addendum.
Samuel Iwenofu P2RA HWTR Phone: 360-407-6346	HWTR Quality Assurance Coordinator	Reviews draft QAPP addendum and approves the final QAPP addendum.
Alan Rue Manchester Environmental Laboratory, EAP Phone: 360-871-8801	Lab Director	Reviews and approves the final QAPP addendum.
Arati Kaza EAP Phone: 360-407-6964	Ecology Quality Assurance Officer	Reviews draft QAPP addendum and approves the final QAPP addendum.

PTDB: Product Testing Database

RTT: Reducing Toxic Threats

P2RA: Pollution Prevention and Regulatory Assistance

HWTR: Hazardous Waste and Toxics Reduction Program

EAP: Environmental Assessment Program

## 5.4 Study schedule

Table 2. Schedule for completing product collection, data entry, and screening

Task	Due Date	Lead Staff
Product purchase complete	8/23/2019	Kari Trumbull
Product data entry complete	8/30/2019	Prajwol Tuladhar
Product screening complete	9/6/2019	Chrissy Wiseman
Internal product data entry QA complete	10/15/2019	Chrissy Wiseman

QA: Quality Assurance

Table 3. Schedule for sending samples to the lab and lab analysis

Task	Due Date	Lead Staff
Samples sent to lab complete	9/20/2019	Kari Trumbull
All laboratory analyses complete	10/23/2019	Dean Momohara

Table 4. Schedule for data and study reviews and data transfer to client

Task	Due Date	Lead Staff
Lab data QA reviewed	11/6/2019	Kari Trumbull
Lab data loaded into PTDB	11/6/2019	Kari Trumbull
PTDB study QA review complete	11/13/2019	Kari Trumbull
Preliminary data transfer to client	11/15/2019	Kari Trumbull

QA: Quality Assurance

PTDB: Product Testing Database

Table 5. Schedule for final technical memo

Task	Due Date	Lead Staff
Draft due to supervisor/peer reviewer	1/1/2020	Kari Trumbull
Draft due to publications coordinator	1/20/2020	Kari Trumbull
Technical memo due to AGO	2/10/2020	Kari Trumbull

AGO: Attorney General's Office

QA: Quality Assurance

PTDB: Product Testing Database



## 5.6 Budget and funding

The estimated study budget is displayed in Table 6 and 7. Funding for this study is provided by the AGO.

Table 6. Study budget for purchasing products

Products	No. Purchased	QC Samples*	Average \$ per Sample	Subtotal
School Supplies	200	0	\$10.00	\$2,000

Table 7. Study budget for lab analysis

Lab Analysis	No. of Samples	QC Samples*	\$ per Sample	Subtotal
Metals (lead, cadmium)	76	12	\$90.00	\$7,920

**Study Total: \$9,920<sup>#+</sup>**

\*Quality Control (QC) samples in this table are those not provided free of charge (matrix spike, matrix spike duplicate, duplicate)

<sup>#</sup> Estimate based up to 200 purchased products and 76 samples plus 12 QC samples

<sup>+</sup> Not to exceed \$10,000

## 6.0 Quality Objectives

All laboratory measurement quality objectives (MQOs) are as established in the original QAPP (Stone, 2012), consistent through the 2015, 2017, and 2018 studies, and are restated below (Table 8).

Table 8. Laboratory measurement quality objectives

Analyte	LCS (% recovery)	Matrix Spikes (% recovery)	Sample and LCS Duplicates (RPD)	Matrix Spike Duplicates (RPD)	Lowest Concentration of Interest (ppm)*
Metals (lead, cadmium)	85 - 115%	75 - 125%	≤ 20%	≤ 20%	1.0

LCS: Laboratory control sample

RPD: Relative percent difference

ppm: parts per million

\*Cited as “Method Blanks” in original QAPP

## 7.0 Study Design

### Product selection

Product selection of children's school supplies will remain consistent with the strategy used in 2017 and 2018. Ecology will consider purchasing products that are:

- Brightly colored.
- Decorated or embellished with features that might appeal to a child (age 12 years or younger).
- Contain childish themes, or are sized more appropriately for use by a child.

### Online purchases

Ecology plans to:

- Purchase approximately (a maximum of) 120 of 200 children's school supply products from online sources.
- Prioritize purchasing school supply products that were found to contain lead or cadmium<sup>2</sup> in the previous 2015, 2017, and 2018 studies.

### Retail store purchases

Ecology plans to:

- Purchase approximately (a maximum of) 80 of 200 children's school supplies from any retail store previously visited in the 2015, 2017, and 2018 studies.
- Collect products from retail stores in the weeks immediately following the July 4<sup>th</sup> holiday when retail stores increase types of merchandise geared toward the upcoming school year. For chain-type stores, the location of the store does not need to be consistent with those previously visited. An assessment of the retail store location will include vulnerable communities.
- Prioritize purchasing school supply products where lead or cadmium<sup>2</sup> were previously detected.
- Possibly investigate other school supply products not investigated previously after a reasonable effort has been made to collect the priority products.

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<sup>2</sup> Detections above the Children's Safe Products Act limits of 90 ppm for lead and 40 ppm for cadmium are used to characterize a product as a priority target product.

## Product screening

Ecology will screen products for lead and cadmium using a portable X-Ray Fluorescence (XRF) analyzer.

XRF screening will follow the PT Program SOP:

- PTP003 Standard Operating Procedures for the Operation of the Thermo Fisher Scientific Niton XL3t 700 X-Ray Fluorescence Analyzer (XRF), Version 1.1 (Sekerak, 2018b)

The procedures are consistent with those used in the 2018 study.

Ecology will use XRF results to prioritize specific component samples (for example, a metal zipper or fabric case material) to send for laboratory analysis. Multiple component samples, representing different components from one product, may be submitted to the laboratory for testing.

Ecology will prioritize component samples with XRF-confirmed lead or cadmium over component samples with no detected levels of lead and cadmium.

## 8.0 Field Procedures

### 8.2 Measurement and sampling procedures

Product collection and processing will follow the Product Testing Program SOP:

- PTP001 Sample Collection and Processing, Version 2.0 (Wiseman, 2018)

The procedures are consistent with those used in the 2018 study.

### 8.8 Other activities

Web screen captures and web screen recordings will be collected during online purchasing using TechSmith Camtasia® Version 2018.0. This strategy is consistent with previous documentation during the 2017 and 2018 studies.

## 9.0 Laboratory Procedures

The procedures described below are consistent with those used in the 2017 and 2018 studies. Samples for this study will be prepared by the U.S. Environmental Protection Agency (EPA) method EPA 3052, less the addition of hydrofluoric acid. Analysis of lead and cadmium will be performed in accordance with EPA 6020B. This method replaces EPA 6020A, which was used in the original study.

In 2015 guidance was developed by the EPA for SW-846 analytical methods replacing the MDL methodology with a Lower Limit of Quantitation (LLOQ) methodology. LLOQ is the lowest concentration at which the laboratory has demonstrated target analytes can be reliably measured and reported with a certain degree of confidence, which must be greater than or equal to the lowest point in the calibration curve.

In early 2017 Manchester Environmental Laboratory (MEL) implemented this guidance and adopted the latest version of EPA method 6020: EPA 6020B, for the analysis of metals. The

lowest concentration of interest (reporting limit; 1 ppm) for this study will not be adversely affected by this change in methodology.

## 10.0 Quality Control Procedures

### 10.1 Laboratory quality control

Table 9 displays the types, numbers, and frequency of quality control.

Table 9. Quality control

Analyte	Method Blank	Sample Duplicate	Laboratory Control Sample/ Laboratory Control Sample Duplicate*	Matrix Spike/ Matrix Spike Duplicate*
Metals (lead, cadmium)	1/batch	1/batch	1 set/batch	1 set/batch

Batch = 19 product samples<sup>3</sup>

\*Either a laboratory control sample duplicate or a matrix spike duplicate will be selected for each batch.<sup>4</sup>

## 11.0 Management Procedures

### 11.1 Data recording and reporting requirements

Product login will follow the PT Database SOP:

- PTP002 Data Entry and Data Entry Quality Assurance, Version 2.0 (Wiseman, 2019)

The procedures are consistent with those used in the 2018 study.

## 12.0 Audits and Reports

### 12.4 Responsibility for reports

At the earliest point possible after completion of the laboratory data review and the QA review of the PTDB data, the project manager will compile and send an initial preliminary data set, in CSV format, to the client.

A technical memo discussing the methods, data quality, and usability of the data will accompany the final data set transferred to the AGO. The data set will include spreadsheets of data, photos of products, screen captures, and screen-recording videos.

<sup>3</sup> Batch sizes will be reduced to 19 client product samples to adjust for microwave prep method size limitations.

<sup>4</sup> A batch size of 19 product samples can include only 5 QC for microwave prep method size limitations.

## 15.0 References

- Sekerak, S. 2017. School Supplies 2017, Addendum 2 to Quality Assurance Project Plan: Phthalates and Metals in Children's Products. Publication 17-03-114. Washington State Department of Ecology, Olympia, WA.
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