DEPARTMENT OF ECOLOGY
State of Washington

School Supplies 2018

Addendum 3 to Quality Assurance Project Plan: Phthalates and Metals in Children's Products

August 2019
Publication 19-03-109
[Approved June 2018]

Publication Information

This Quality Assurance Project Plan Addendum is on the Department of Ecology's website at https://fortress.wa.gov/ecy/publications/SummaryPages/1903109.html. This is the third 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. Washington State Department of Ecology, Olympia. https://fortress.wa.gov/ecy/publications/documents/1207023.pdf.

Related Publications
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. https://fortress.wa.gov/ecy/publications/SummaryPages/1703114.html.

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

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Approved June 2018

Approved by:

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Signatures are not available on the Internet version.
Client: The party responsible for which professional services are rendered.
AGO: Washington State Attorney General's Office
CSPA: Children's Safe Products Act
EAP: Environmental Assessment Program (Department of Ecology)
HWTR: Hazardous Waste and Toxics Reduction Program (Department of Ecology)
RTT: Reducing Toxic Threats

3.0 Background

This document describes the 2018 plan to assess lead and cadmium in school supplies. It is the third addendum to the Quality Assurance Project Plan: Phthalates and Metals in Children's Products (Stone, 2012). This third addendum will follow a sampling design similar to that used in Addendum #1 to Quality Assurance Project Plan: Phthalates and Metals in Children's Products (Stone, 2014) and includes specific details employed during the 2017 study: School Supplies 2017, Addendum 2 to Quality Assurance Project Plan: Phthalates and Metals in Children's Products (Sekerak, 2017).

4.0 Study Description

Beginning in July 2018, Ecology will purchase school supplies for analysis of lead and cadmium. Ecology will focus most of the purchasing effort on pencil pouches and pencil cases[1] tested in the 2015 (Trumbull et al., 2017) and 2017 studies. This 2018 study may also include investigations on a small number of book covers and other supplies marketed and sold as school supplies for use by a child 12 years old or younger. School supplies will be purchased 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 2018 supplementary data on pencil pouches/cases and book covers previously tested in 2015 and 2017.
- Provide additional data on pencil pouches/cases 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 approximately 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 76 samples in four batches 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.

[1] 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.
Tina Schaefer RTT Unit HWTR Phone: 360-407-6997	CSPA Compliance Lead	Provides review of the QAPP Addendum and approves the final QAPP Addendum. Assists with purchasing, log-in, prioritizing samples for lab analysis and processing.
Sara Sekerak TS Unit EAP Phone: 360-407-6997	Project Manager	Writes the QAPP Addendum. Conducts QA review of PTDB and lab data, analyzes and interprets all data, and enters lab data into PTDB. Writes the draft and final Technical Memo.
Chrissy Wiseman RTT Unit HWTR Phone: 360-407-6492	Sampling Lead	Leads product sampling strategy and purchasing, sample screening, sample log-in and processing, chain-of–custody, and transport of samples to/from the laboratory.
Debby Sargeant TS Unit EAP Phone: 360-407-6965	Unit Supervisor for the Project Manager	Provides internal review of the QAPP Addendum, approves the budget, and approves the final QAPP Addendum.
Jessica Archer SCS EAP Phone: 360-407-6997	Section Manager for the Project Manager	Reviews the study scope and budget, tracks progress, reviews the draft QAPP Addendum, and approves the final QAPP Addendum.
Sean Smith RTT Unit HWTR Phone: 360-407-7609	Unit Supervisor for RTT Staff	Reviews the study scope, schedules assistant's time, reviews the draft QAPP Addendum, and approves the final QAPP Addendum.
Alan Rue Manchester Environmental Laboratory Phone: 360-871-8801	Director	Reviews and approves the final QAPP Addendum.
Tom Gries Phone: 360-407-6964	Acting Ecology Quality Assurance Officer	Reviews draft QAPP Addendum and approves the final QAPP Addendum.

CSPA: Children's Safe Products Act
EAP: Environmental Assessment Program
HWTR: Hazardous Waste and Toxics Reduction
PTDB: Product Testing Database
RTT: Reducing Toxics Threats
SCS: Statewide Coordination Section
TS: Toxic Studies

5.4 Study schedule

Table 2. Schedule for completing product collection and laboratory work, data reviews, data entry into Product Testing Database (PTDB), and final Technical Memo.

Product Collection and Processing	Due Date	Lead Staff
Product purchase complete	8/17/2018	Chrissy Wiseman
Product logging complete	8/24/2018	Chrissy Wiseman
Product screening complete	9/07/2018	Chrissy Wiseman
Internal login data QA complete	10/15/2018	Chrissy Wiseman
Sample to Lab and Lab Analyses		
Samples sent to lab in batches	9/7 - 9/21/2018	
All laboratory analyses complete	10/24/2018	
Data		
Lab data QA reviewed	11/07/2018	Sara Sekerak
Lab data loaded into PTDB	11/07/2018	Sara Sekerak
PTDB data QA review complete	11/09/2018	Sara Sekerak
Data Transfer to Client		
Preliminary Data Transfer to Client	11/09/2018	Sara Sekerak
Final Technical Memo		
Author lead	Sara Sekerak	
Draft due to supervisor/peer reviewer	1/1/2019	
Draft due to publications coordinator	1/20/2019	
Technical Memo due to AGO	2/10/2019	

QA: Quality Assurance; PTDB: Product Testing Database

5.6 Budget and funding

The estimated study budget is displayed in Table 3. Funding for this study is provided by the AGO.

Table 3. Study budget.

	No. Purchased	QC Samples	$ per Sample	Subtotal
Products	200	---	$10.00	$2,000
Lab Analysis	No. of Samples	QC Samples*		
Metals (lead, cadmium)	76	12	$90.00	$7,920
			Study Total:	**$9,920 # +**

*Quality Control (QC) samples in this table are those not provided free of charge (matrix spike, matrix spike duplicate, duplicate).
Estimate based on up to 200 purchased products and 76 samples + QC.
+ Not to exceed $10,000.

6.0 Quality Objectives

All laboratory measurement quality objectives (MQOs) are as established in the original QAPP (Stone, 2012) and are restated below (Table 4).

Table 4. Laboratory Measurement Quality Objectives.

Analyte	Bias		Precision		Sensitivity
	LCS (% recov.)	Matrix Spikes (% recov.)	Lab 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

Online purchases

- Approximately 110 children's school supply products will be purchased from online sources.
- Priority targets for purchase include any school supply product that was found to contain lead or cadmium[2] in the previous study.

Retail store purchases

- Approximately 90 children's school supplies will be purchased from retail stores visited in the 2017 study. Collection of products from retail stores is planned to occur in the weeks immediately following the July 4th 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 visited in the 2017 study.
- Priority targets for purchase include any school supply products where lead or cadmium[2] were previously detected.
- Other school supplies products not investigated previously may be included after a reasonable effort has been made to collect the priority targets. Additional school supply products will be minimal and will not exceed 20% of the total store purchased products.

In all cases, product selection of children's school supplies will remain consistent with the strategy used in 2017. Products will be considered for purchase when they 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.

Product screening

Products will be screened for lead and cadmium using a portable X-Ray Fluorescence (XRF) analyzer.

XRF screening will follow the PT Program SOP:

- PTP003 Standard Operating Procedure for the Operation of the Thermo Fisher Scientific Niton XL3t 700 X-Ray Fluorescence Analyzer (Sekerak, 2018).

In March 2018 the PTP003 SOP was updated to broaden the scope to allow for titanium screening and to add a titanium check standard. Minor edits to format and spelling were also made during this update. None of the 2018 updates adversely affect the method process, or the ability to generate screening results for lead and cadmium comparable to those obtained previously.

[2] 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.

XRF results will be used to prioritize specific component samples (e.g., metal zipper, fabric case material) to be sent for laboratory analysis. Multiple component samples, representing different components from one product, may be submitted to the laboratory for testing.

Component samples will be prioritized based on 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, 2018a)

This version of the SOP identifies the new processing and primary sample storage room (OL-21), defines a few more commonly used terms, makes minor changes to the SOP format, and condenses relevant sections of Ecology's Chemical Safety and Hygiene Manual (Appendix G). These differences from the original (SOP PTP001 version 1.0) do not substantively alter product or sample processing and consequently do not affect data quality (e.g., comparability).

The 2017 study samples were processed in OL-21 after a cleaning and wipe test determined the space was free from the study target contaminates. All future sample processing will occur in OL-21.

8.8 Other activities

Web screen captures and web screen recordings will be collected during online purchasing. This strategy is consistent with previous documentation during the 2017 study.

9.0 Laboratory Procedures

The procedures described below are consistent with those used in the 2017 study.

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 will be in place of 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. The LLOQ is defined as the lowest point of quantitation and is in most cases the lowest concentration on 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 5 displays the types, numbers, and frequency of quality control. This table is consistent with the 2017 study.

Table 5. Quality control.

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

Batch = 19 product samples[3]

11.0 Management Procedures

11.1 Data recording and reporting requirements

Product login will follow the Product Testing SOP:

- PTP002 Data Entry and Database Use, Version 2.0 (Wiseman, 2018b)

The 2018 version includes formatting edits and minimal administrative updates that will not adversely affect the consistency of data collected between the 2017 study (using the 2016 PTP002 SOP) and 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 Product Testing Database 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.

[3] Batch sizes will be reduced to 19 client product samples to adjust 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. https://fortress.wa.gov/ecy/publications/SummaryPages/1703114.html.

Sekerak, S., 2018. Standard Operating Procedures for the Operation of the Thermo Fisher Scientific Niton XL3t 700 X-Ray Fluorescence Analyzer (XRF), Version 1.1. Internal Document No. PTP003. Washington State Department of Ecology, Olympia, WA.

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Wiseman, C., 2018b. Standard Operating Procedures for Product Testing Data Entry and Database Use, Version 2.0. Internal Document No. PTP002. Washington State Department of Ecology, Olympia, WA.