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OVERVIEW OF RVAAP PHASE I PCB PAINT TEST

Presented to Restoration Advisory Board

Joe Carvitti, Battelle Memorial Institute

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Battelle

Battelle is a global technology R&D and consulting firm that serves our clients through the development and deployment of economically valuable science and technology and through providing technical solutions for industry and government.

- *Over $1.2 billion in consulting and contract research revenues, plus $1.8 billion DOE labs*
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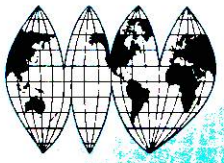
- *Over 1000 staff in environmental and safety areas of business*
- *12 of the most significant 100 new products developed worldwide (R&D Magazine)*
- *Ranked #2 in environmental science consulting (ENR, 2003)*



Phase I Testing – Planning To Date

- Conference call held on August 31, 2005 with Army, US EPA, and contractors to discuss test burn options.
- Concept paper submitted to Army on September 28 and forwarded to Ohio and US EPA.
  - Described consensus reached during August conference call for laboratory phase.
  - Became a building block for developing a detailed work plan and defining approval mechanism.
- Reviewed by Ohio EPA.
- Reviewed by US EPA.
- Meeting held in January 2006 to further discuss tests.
- Preliminary draft Quality Assurance Project Plan (QAPP) prepared in March 2006 to detail the test; submitted to Army for internal review.

Proposed Objective

- Objective: to investigate behavior of PCBs present in paint under various test conditions involving high temperatures.
- Results obtained will provide data on PCB volatilization as a function of temperature and decomposition/destruction of PCBs at high temperatures.
- Results should help define the upper limit on the quantity of PCB releases from the painted surfaces and the congeners (types) released.
- Help define requirements for monitoring in subsequent phases of testing.

QAPP Format (EPA/QA G-5)

- Group A Elements - PROJECT MANAGEMENT
  - A1 Title and Approval Page
  - A2 Table of Contents
  - A3 Abbreviations and Acronyms (not part of QA G-5)
  - A4 Distribution List
  - A5 Project/Task Organization Schedule
  - A6 Problem Definition/Background
  - A7 Project/Task Description
  - A8 Quality Objectives and Measurement Criteria
  - A9 Special Training/Certification
  - A10 Documentation and Records

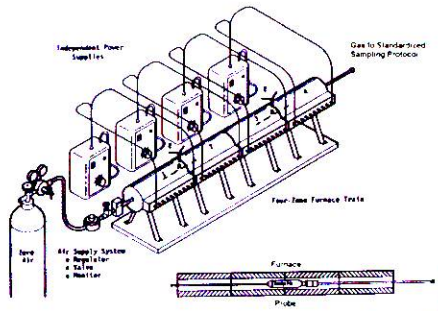
QAPP Elements (cont.)

- Group B Elements - MEASUREMENT AND DATA ACQUISITION
  - B1 Experimental Design
  - B2 Sample Methods Requirements
  - B3 Sample Handling and Custody Requirements
  - B4 Analytical Methods Requirements
  - B5 Quality Control Requirements
  - B6 Instrument/Equipment Testing, Inspection, and Maintenance
  - B7 Instrument Calibration and Frequency
  - B8 Inspection/Acceptance of Supplies and Consumables
  - B9 Non-Direct Measurements
  - B10 Data Management

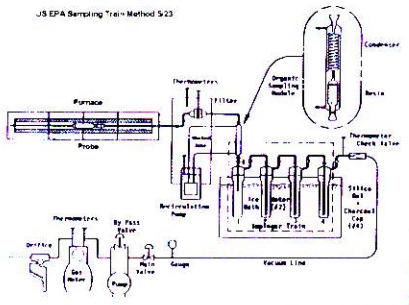
QAPP Elements (cont.)

- Group C Elements - ASSESSMENT AND OVERSIGHT
  - C1 Assessments and Response Actions
  - C2 Reports to Management
- Group D Elements - DATA VALIDATION AND USABILITY
  - D1 Data Review, Validation, and Verification Requirements
  - D2 Validation and Verification Methods
  - D3 Reconciliation with User Requirements
- REFERENCES
- APPENDIX

Proposed Test Design - Furnace



Proposed Test Design - Gas Sampling



US EPA's Burn Hut in North Carolina

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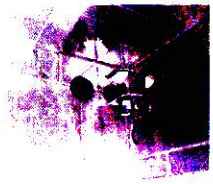
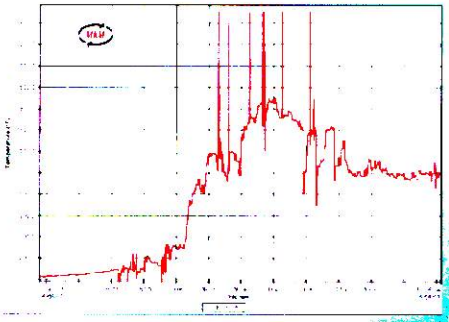
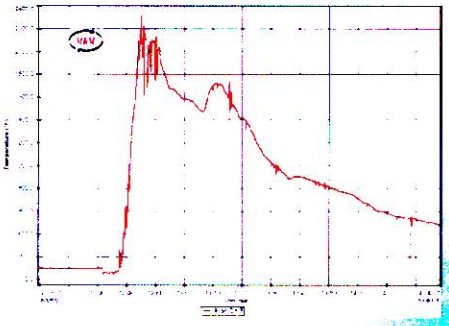


Proposed Test Design – Temperatures



Proposed Test Design – Temperatures (continued)



Proposed Test Design - Test Summary

Test Run	Initial PCB conc., ppm	Furnace Temp., F	Elapsed Time, minutes	Number of Samples
1 a, b, c	9,100	1,200	60	up to 12 + QC
		1,600	60	up to 12 + QC
		2,100	60	up to 12 + QC
2 a, b, c	8,900	1,200	60	up to 12 + QC
		1,600	60	up to 12 + QC
		2,100	60	up to 12 + QC
3 a, b, c	4,300	1,200	60	up to 12 + QC
		1,600	60	up to 12 + QC
		2,100	60	up to 12 + QC
4 a, b, c	4,800	1,200	60	up to 12 + QC
		1,600	60	up to 12 + QC
		2,100	60	up to 12 + QC

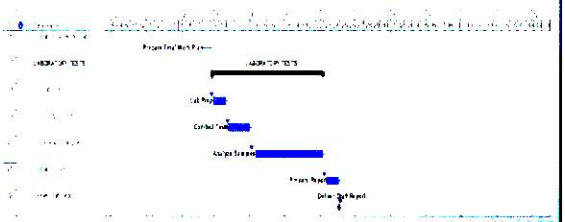
Proposed Test Design - Test Matrix

Point Sample	Temp	Pre-heat (Solid Samples)			Heat (Gas Samples)	Post-heat (Solid Samples)		
		PCB D/F	Metals	Hg	PCB/D/F	PCB/D/F	Metals	Hg
Field Blank					1			
1	1200	1	1	1	3	1	3	3
	1600				3	1	3	3
	2100				3	1	3	3
Matrix Spike		1				1	1	1
Duplicate		1				1	1	1
=Total for 1 Sample		=3	1	1	10	=5	11	11
Total for 4 Samples		6	4	4	40	16	44	44

Proposed Test Design - Sampling/Analysis

- Analysis of pre-heat and post-heat solid samples
- Gas samples collected based on US EPA Method 23
- Samples collected at each temperature
- Gas chromatography/high resolution mass spectrometry (GC/HRMS)
- Inductively-coupled plasma mass spectrometry
- Analysis for all PCB congeners
- Analysis for 17 dioxins/furans (WHO)
- Analysis of all metals
- Blank/QA samples

Laboratory Test Schedule



For Additional Information

- Point of Contact

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