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MARYLAND DEPARTMENT OF THE ENVIRONMENT

Land and Materials Administration • Solid Waste Program  
1800 Washington Boulevard • Suite 605 • Baltimore Maryland 21230-1719  
410-537-3315 • 800-633-6101 x3315 • [www.mde.maryland.gov](http://www.mde.maryland.gov)

MAR 19 2018

LAND MANAGEMENT ADMIN.  
SOLID WASTE PROGRAM

**Coal Combustion Byproducts (CCBs)  
Annual Generator Tonnage Report  
Instructions for Calendar Year 2017**

The following is general information relating to the requirement for reporting quantities of coal combustion byproducts (CCBs) that were managed in the State of Maryland during calendar year 2017. Please answer the questions on the form provided, attaching additional information and any requested supplemental information to the back of the form. *Note that the form requires both volume and weight of the CCBs produced. If you know one of these parameters but not the others, for example, you have the tonnage produced but not the volume, you may calculate the other parameter; however, please provide the calculations and assumptions that you used in your estimate.* Questions can be directed to the Solid Waste Program at (410) 537-3315 or via email at [ed.dexter@maryland.gov](mailto:ed.dexter@maryland.gov).

**I. Background.** This requirement that generators of CCBs submit an annual report was instituted in the Code of Maryland Regulations COMAR 26.04.10.08, that was promulgated effective December 1, 2008. The regulation requires that any non-residential generator of CCBs submit a report to the Department by March 1 of each year describing the manner in which CCBs generated within the State were managed during the preceding calendar year. Additional information and specific instructions follow. For more detailed information, please refer to COMAR 26.04.10.08.

**II. General Information and Applicability.**

**A. Definitions.** CCBs are defined in COMAR 26.04.10.02B as:

*“(3) Coal Combustion Byproducts. (a) "Coal combustion byproducts" means the residue generated by or resulting from the burning of coal.  
(b) "Coal combustion byproducts" includes fly ash, bottom ash, boiler slag, pozzolan, and other solid residuals removed by air pollution control devices from the flue gas and combustion chambers of coal burning furnaces and boilers, including flue gas desulfurization sludge and other solid residuals recovered from flue gas by wet or dry methods.”*

A generator of CCBs is defined in COMAR 26.04.10.02B as:

*“(9) Generator.  
(a) "Generator" means a person whose operations, activities, processes, or actions create coal combustion byproducts.  
(b) "Generator" does not include a person who only generates coal combustion byproducts by burning coal at a private residence.”*

Facility Name: C.P. Crane LLC

## CCB Tonnage Report – 2017

**B. Applicability.** If you or your company meets the definition of a generator of CCBs as defined above, you must provide the information as required below. For the purposes of this report, “you” shall hereinafter refer to the generator defined above. Please note that COMAR 26.04.10.08 requires generators of CCBs to submit an annual report to the Department concerning the disposition of the CCBs that they generated the previous year. **THIS INCLUDES CCBS THAT WERE NOT SEPARATELY COLLECTED BUT WERE PRODUCED BY THE BURNING OF COAL AND WERE DIRECTLY CONTRIBUTED TO A PRODUCT, such as cement.** Where the amount cannot be directly measured, estimates based on the amount of coal burned can be used. The method of determining the volume of CCBs produced must be described.

**III. Required Information.** The following information must be provided to the Department by March 1, 2018:

A. Contact information:

Facility Name: C. P. Crane

Name of Permit Holder: C. P. Crane LLC

Facility Address: 1001 Carroll Island Road  
Street

Facility Address: Chase Maryland 21220  
City State Zip

County: Baltimore County

Contact Information (Person filing report or Environmental Manager)

Facility Telephone No.: 410-682-9797 Facility Fax No.: 410-682-9805

Contact Name: Joshua Sawyers

Contact Title: Environmental

Contact Address: 1001 Carroll Island Road  
Street

Contact Address: Chase Maryland 21220  
City State Zip

Contact Email: jsawyers@cpcranepower.com

Contact Telephone No.: 410-682-9715 Contact Fax No.: 410-682-9805

*For questions on how to complete this form, please contact the Solid Waste Program at 410-537-3315*

Facility Name: C.P. Crane LLC

**CCB Tonnage Report – 2017**

B. A description of the process that generates the CCBs, including the type of coal or other raw material that generates the CCBs. If the space provided is insufficient, please attach additional pages:

The C. P. Crane electric generating facility has two coal fired units which produce electricity for commercial sale. Unit 1 is equipped with a Babcock & Wilcox oncethrough subcritical, cyclone-fired, wet bottom boiler, and Unit 2 is equipped with a Babcock & Wilcox drum-type, cyclone-fired, wet bottom boiler. Both units burn subbituminous coal alone, or in combination with bituminous coal. Coal is transported to the plant by rail and stored in a pile adjacent to the plant. The coal is prepared for use by two Pennsylvania Crusher hammer-mill type crushers. Before crushing, limestone may be added to aid slag flow. After crushing, a proprietary additive, Cycleclean may be added also to the coal to aid in slag flow and reduce mercury in the flue gas.

C. The volume and weight of CCBs generated during calendar year 2017, including an identification of the different types of CCBs generated and the volume of each type generated. If the space provided is insufficient, please attach additional pages in a similar format. If converting from volume to weight or weight to volume, please provide your calculations and assumptions.

**Table I: Volume and Weight of CCBs Generated for Calendar Year 2017:** Please note that this table includes both the volume and weight of the types of CCBs your facility produces.

| <b>Volume and Weight of CCBs Generated for Calendar Year 2017</b> |                               |                               |                               |
|-------------------------------------------------------------------|-------------------------------|-------------------------------|-------------------------------|
| Fly Ash                                                           | Bottom Ash                    |                               |                               |
| Type of CCB                                                       | Type of CCB                   | Type of CCB                   | Type of CCB                   |
| 15,969                                                            | 4,613                         |                               |                               |
| Volume of CCB, in Cubic Yards                                     | Volume of CCB, in Cubic Yards | Volume of CCB, in Cubic Yards | Volume of CCB, in Cubic Yards |
| 11,857.0                                                          | 3,425.0                       |                               |                               |
| Weight of CCB, in Tons                                            | Weight of CCB, in Tons        | Weight of CCB, in Tons        | Weight of CCB, in Tons        |

Additional notes:

Facility Name: C.P. Crane LLC

**CCB Tonnage Report – 2017**

Coal combustion byproducts (“CCB”) are reported in dry tons. Cubic yards are calculated using a conversion factor of 1 ton = 1.3468 cubic yards.

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D. Descriptions of any modeling or risk assessments, or both, conducted relating to the CCBs or their use that were performed by you or your company during the reporting year. Please attach this information to the report.

E. Copies of all laboratory reports of all chemical characterizations of the CCBs. Please attach this information to the report.

F. A description of how you disposed of or used your CCBs in calendar year 2017, identifying:

(a) The types and volume of CCBs disposed of or used (if different than described in Paragraph C above) including any CCBs stored during the previous calendar year, the location of disposal, mine reclamation and use sites, and the type and volume of CCBs disposed of or used at each site:

**Fly Ash – Beneficial Reuse**

11,857 tons (15,969 CY) of fly ash was beneficially reused as ADC (active daily cover) by Waste Management at their King George County Landfill in Virginia.

**Bottom Ash (Boiler Slag) – Beneficial Reuse**

3,425 tons (4,613 CY) of bottom ash was beneficially reused as ADC by Waste Management at their King George County Landfill in Virginia.

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# Analytical Report for

**C.P. Crane LLC**

**Certificate of Analysis No.: 17071910**

**Project Manager: Joshua Sawyers**

**Project Name : Annual TCLP 7-17**

**Project Location: Carroll Island Road, MD**



**July 26, 2017**

**Phase Separation Science, Inc.**

**6630 Baltimore National Pike**

**Baltimore, MD 21228**

**Phone: (410) 747-8770**

**Fax: (410) 788-8723**

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FAX 410-788-8723

# PHASE SEPARATION SCIENCE, INC.



July 26, 2017

**Joshua Sawyers**  
**C.P. Crane LLC**  
1001 Carroll Island Rd  
Baltimore, MD 21220

Reference: PSS Work Order(s) No: **17071910**  
Project Name: Annual TCLP 7-17  
Project Location: Carroll Island Road, MD

Dear Joshua Sawyers :

This report includes the analytical results from the analyses performed on the samples received under the project name referenced above and identified with the Phase Separation Science (PSS) Work Order(s) numbered **17071910**.

All work reported herein has been performed in accordance with current NELAP standards, referenced methodologies, PSS Standard Operating Procedures and the PSS Quality Assurance Manual unless otherwise noted in the Case Narrative Summary. PSS is limited in liability to the actual cost of the sample analysis done.

PSS reserves the right to return any unused samples, extracts or related solutions. Otherwise, the samples are scheduled for disposal, without any further notice, on August 23, 2017, with the exception of air canisters which are cleaned immediately following analysis. This includes any samples that were received with a request to be held but lacked a specific hold period. It is your responsibility to provide a written request defining a specific disposal date if additional storage is required. Upon receipt, the request will be acknowledged by PSS, thus extending the storage period.

This report shall not be reproduced except in full, without the written approval of an authorized PSS representative. A copy of this report will be retained by PSS for at least 5 years, after which time it will be disposed of without further notice, unless prior arrangements have been made.

We thank you for selecting Phase Separation Science, Inc. to serve your analytical needs. If you have any questions concerning this report, do not hesitate to contact us at 410-747-8770 or [info@phaseonline.com](mailto:info@phaseonline.com).

Sincerely,

A handwritten signature in black ink that reads "Dan Prucnal".

**Dan Prucnal**  
Laboratory Manager





**Sample Summary**  
**Client Name: C.P. Crane LLC**  
**Project Name: Annual TCLP 7-17**

**Work Order Number(s): 17071910**

The following samples were received under chain of custody by Phase Separation Science (PSS) on 07/19/2017 at 01:50 pm

| Lab Sample Id | Sample Id   | Matrix | Date/Time Collected |
|---------------|-------------|--------|---------------------|
| 17071910-001  | CPC-TCLP-FA | SOLID  | 07/12/17 12:40      |
| 17071910-002  | CPC-TCLP-BA | SOLID  | 07/12/17 12:50      |

Please reference the Chain of Custody and Sample Receipt Checklist for specific container counts and preservatives. Any sample conditions not in compliance with sample acceptance criteria are described in Case Narrative Summary.

**Notes:**

1. The presence of a common laboratory contaminant such as methylene chloride may be considered a possible laboratory artifact. Where observed, appropriate consideration of data should be taken.
2. Unless otherwise noted in the case narrative, results are reported on a dry weight basis with the exception of pH, flashpoint, moisture, and paint filter test.
3. Drinking water samples collected for the purpose of compliance with SDWA may not be suitable for their intended use unless collected by a certified sampler [COMAR 26.08.05.07.C.2].
4. The analyses of 1,2-dibromo-3-chloropropane (DBCP) and 1,2-dibromoethane (EDB) by EPA 524.2 and calcium, magnesium, sodium and iron by EPA 200.8 are not currently promulgated for use in testing to meet the Safe Drinking Water Act and as such cannot be used for compliance purposes. The listings of the current promulgated methods for testing in compliance with the Safe Drinking Water Act can be found in the 40 CFR part 141.1, for the primary drinking water contaminants, and part 141.3, for the secondary drinking water contaminants.
5. Sample prepared under EPA 3550C with concentrations greater than 20 mg/Kg should employ the microtip extraction procedure if required to meet data quality objectives.
6. The analysis of acrolein by EPA 624 must be analyzed within three days of sampling unless pH is adjusted to 4-5 units [40 CFR part 136.3(e)].
7. Method 180.1, The Determination of Turbidity by Nephelometry, recommends samples over 40 NTU be diluted until the turbidity falls below 40 units. Routine samples over 40 NTU may not be diluted as long as the data quality objectives are not affected.
8. Alkalinity results analyzed by EPA 310.2 that are reported by dilution are estimated and are not in compliance with method requirements.

**Standard Flags/Abbreviations:**

- B A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.
- C Results Pending Final Confirmation.
- E The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.
- Fail The result exceeds the regulatory level for Toxicity Characteristic (TCLP) as cited in 40 CFR 261.24 Table 1.
- J The target analyte was positively identified below the reporting limit but greater than the MDL.
- MDL This is the Laboratory Method Detection Limit which is equivalent to the Limit of Detection (LOD). The LOD is an estimate of the minimum amount of a substance that an analytical process can reliably detect. This value will remain constant across multiple similar instrumentation and among different analysts. An LOD is analyte and matrix specific.
- ND Not Detected at or above the reporting limit.
- RL PSS Reporting Limit.
- U Not detected.

**Certifications:**

NELAP Certifications: PA 68-03330, VA 460156  
State Certifications: MD 179, WV 303  
Regulated Soil Permit: P330-12-00268  
NSWC USCG Accepted Laboratory  
LDBE MWAALD1997-0041-2015

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# PHASE SEPARATION SCIENCE, INC.



## CERTIFICATE OF ANALYSIS

No: 17071910  
 C.P. Crane LLC, Baltimore, MD  
 July 26, 2017

Project Name: Annual TCLP 7-17  
 Project Location: Carroll Island Road, MD

Sample ID: CPC-TCLP-FA Date/Time Sampled: 07/12/2017 12:40 PSS Sample ID: 17071910-001  
 Matrix: SOLID Date/Time Received: 07/19/2017 13:50

TCLP Metals Analytical Method: SW-846 6020 A Preparation Method: 3010A

|          | Result | Units | RL     | Flag | Dil | TCLP Limit | Prepared | Analyzed       | Analyst |
|----------|--------|-------|--------|------|-----|------------|----------|----------------|---------|
| Arsenic  | ND     | mg/L  | 0.050  |      | 1   | 5          | 07/20/17 | 07/20/17 18:04 | 1051    |
| Barium   | 1.5    | mg/L  | 1.0    |      | 1   | 100        | 07/20/17 | 07/20/17 18:04 | 1051    |
| Cadmium  | ND     | mg/L  | 0.050  |      | 1   | 1          | 07/20/17 | 07/20/17 18:04 | 1051    |
| Chromium | ND     | mg/L  | 0.050  |      | 1   | 5          | 07/20/17 | 07/20/17 18:04 | 1051    |
| Lead     | ND     | mg/L  | 0.050  |      | 1   | 5          | 07/20/17 | 07/20/17 18:04 | 1051    |
| Mercury  | ND     | mg/L  | 0.0020 |      | 1   | 0.2        | 07/20/17 | 07/20/17 18:04 | 1051    |
| Selenium | 0.14   | mg/L  | 0.050  |      | 1   | 1          | 07/20/17 | 07/20/17 18:04 | 1051    |
| Silver   | ND     | mg/L  | 0.050  |      | 1   | 5          | 07/20/17 | 07/20/17 18:04 | 1051    |

Sample ID: CPC-TCLP-BA Date/Time Sampled: 07/12/2017 12:50 PSS Sample ID: 17071910-002  
 Matrix: SOLID Date/Time Received: 07/19/2017 13:50

TCLP Metals Analytical Method: SW-846 6020 A Preparation Method: 3010A

|          | Result | Units | RL     | Flag | Dil | TCLP Limit | Prepared | Analyzed       | Analyst |
|----------|--------|-------|--------|------|-----|------------|----------|----------------|---------|
| Arsenic  | ND     | mg/L  | 0.050  |      | 1   | 5          | 07/20/17 | 07/20/17 18:11 | 1051    |
| Barium   | ND     | mg/L  | 1.0    |      | 1   | 100        | 07/20/17 | 07/20/17 18:11 | 1051    |
| Cadmium  | ND     | mg/L  | 0.050  |      | 1   | 1          | 07/20/17 | 07/20/17 18:11 | 1051    |
| Chromium | ND     | mg/L  | 0.050  |      | 1   | 5          | 07/20/17 | 07/20/17 18:11 | 1051    |
| Lead     | ND     | mg/L  | 0.050  |      | 1   | 5          | 07/20/17 | 07/20/17 18:11 | 1051    |
| Mercury  | ND     | mg/L  | 0.0020 |      | 1   | 0.2        | 07/20/17 | 07/20/17 18:11 | 1051    |
| Selenium | ND     | mg/L  | 0.050  |      | 1   | 1          | 07/20/17 | 07/20/17 18:11 | 1051    |
| Silver   | ND     | mg/L  | 0.050  |      | 1   | 5          | 07/20/17 | 07/20/17 18:11 | 1051    |



## Case Narrative Summary

Client Name: C.P. Crane LLC

Project Name: Annual TCLP 7-17

Work Order Number(s): 17071910

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Any holding time exceedances, deviations from the method specifications, regulatory requirements or variations to the procedures outlined in the PSS Quality Assurance Manual are outlined below.

The analyses of chlorine, pH, dissolved oxygen, temperature and sulfite for drinking water and non-potable samples tested for compliance have a maximum holding time of 15 minutes. As such, all laboratory analyses for these analytes exceed holding times.

Matrix spike and matrix spike duplicate analyses may not be performed due to insufficient sample quantity. In these instances, a laboratory control sample and laboratory control sample duplicate are analyzed unless otherwise noted or specified in the method.

### **Sample Receipt:**

All sample receipt conditions were acceptable.

**NELAP accreditation was held for all analyses performed unless noted below. See [www.phaseonline.com](http://www.phaseonline.com) for complete PSS scope of accreditation.**



**Analytical Data Package Information Summary**

**Work Order(s): 17071910**

Report Prepared For: C.P. Crane LLC, Baltimore, MD

Project Name: Annual TCLP 7-17

Project Manager: Joshua Sawyers

| Method               | Client Sample Id | Analysis Type | Lab Sample Id   | Analyst | Mtx | Prep Batch | Analytical Batch | Sampled    | Prepared         | Analyzed         |
|----------------------|------------------|---------------|-----------------|---------|-----|------------|------------------|------------|------------------|------------------|
| <b>SW-846 6020 A</b> | CPC-TCLP-FA      | Initial       | 17071910-001    | 1051    | W   | 67049      | 144567           | 07/12/2017 | 07/20/2017 11:00 | 07/20/2017 18:04 |
|                      | CPC-TCLP-BA      | Initial       | 17071910-002    | 1051    | W   | 67049      | 144567           | 07/12/2017 | 07/20/2017 11:00 | 07/20/2017 18:11 |
|                      | 67049-1-BKS      | BKS           | 67049-1-BKS     | 1051    | W   | 67049      | 144567           | -----      | 07/20/2017 11:00 | 07/20/2017 17:25 |
|                      | 67049-1-BLK      | BLK           | 67049-1-BLK     | 1051    | W   | 67049      | 144567           | -----      | 07/20/2017 11:00 | 07/20/2017 17:18 |
|                      | S.B301+MS/MSN S  | MS            | 17071911-002 S  | 1051    | W   | 67049      | 144567           | 07/19/2017 | 07/20/2017 11:00 | 07/20/2017 17:38 |
|                      | S.B301+MS/MSN SD | MSD           | 17071911-002 SD | 1051    | W   | 67049      | 144567           | 07/19/2017 | 07/20/2017 11:00 | 07/20/2017 17:44 |

# PHASE SEPARATION SCIENCE, INC.

## QC Summary 17071910

C.P. Crane LLC  
Annual TCLP 7-17

**Analytical Method: SW-846 6020 A**

Seq Number: 144567

MB Sample Id: 67049-1-BLK

Matrix: Water

LCS Sample Id: 67049-1-BKS

Prep Method: SW3010A

Date Prep: 07/20/17

| Parameter | MB Result | Spike Amount | LCS Result | LCS %Rec | Limits | Units | Analysis Date  | Flag |
|-----------|-----------|--------------|------------|----------|--------|-------|----------------|------|
| Arsenic   | <0.05000  | 0.4000       | 0.4139     | 103      | 80-120 | mg/L  | 07/20/17 17:25 |      |
| Barium    | <1.000    | 2.000        | 2.171      | 109      | 80-120 | mg/L  | 07/20/17 17:25 |      |
| Cadmium   | <0.05000  | 0.4000       | 0.4144     | 104      | 80-120 | mg/L  | 07/20/17 17:25 |      |
| Chromium  | <0.05000  | 0.4000       | 0.3901     | 98       | 80-120 | mg/L  | 07/20/17 17:25 |      |
| Lead      | <0.05000  | 0.4000       | 0.4086     | 102      | 80-120 | mg/L  | 07/20/17 17:25 |      |
| Mercury   | <0.002000 | 0.01000      | 0.01000    | 100      | 80-120 | mg/L  | 07/20/17 17:25 |      |
| Selenium  | <0.05000  | 0.4000       | 0.3924     | 98       | 80-120 | mg/L  | 07/20/17 17:25 |      |
| Silver    | <0.05000  | 0.4000       | 0.4120     | 103      | 80-120 | mg/L  | 07/20/17 17:25 |      |

F = RPD exceeded the laboratory control limits  
 X = Recovery of MS, MSD or both outside of QC Criteria  
 H = Recovery of BS,BSD or both exceeded the laboratory control limits  
 L = Recovery of BS,BSD or both below the laboratory control limits





# Phase Separation Science, Inc

## Sample Receipt Checklist

|                      |                  |                      |                        |
|----------------------|------------------|----------------------|------------------------|
| <b>Work Order #</b>  | 17071910         | <b>Received By</b>   | Barb Weber             |
| <b>Client Name</b>   | C.P. Crane LLC   | <b>Date Received</b> | 07/19/2017 01:50:00 PM |
| <b>Project Name</b>  | Annual TCLP 7-17 | <b>Delivered By</b>  | Trans Time Express     |
| <b>Disposal Date</b> | 08/23/2017       | <b>Tracking No</b>   | Not Applicable         |
|                      |                  | <b>Logged In By</b>  | Barb Weber             |

### Shipping Container(s)

No. of Coolers 1

|                         |     |                    |        |
|-------------------------|-----|--------------------|--------|
|                         |     | Ice                | Absent |
| Custody Seal(s) Intact? | N/A | Temp (deg C)       | 29     |
| Seal(s) Signed / Dated? | N/A | Temp Blank Present | No     |

### Documentation

|                                |     |
|--------------------------------|-----|
| COC agrees with sample labels? | Yes |
| Chain of Custody               | Yes |

|                 |                   |
|-----------------|-------------------|
| Sampler Name    | <u>Operations</u> |
| MD DW Cert. No. | <u>N/A</u>        |

### Sample Container

|                                     |     |
|-------------------------------------|-----|
| Appropriate for Specified Analysis? | Yes |
| Intact?                             | Yes |
| Labeled and Labels Legible?         | Yes |

|                         |                |
|-------------------------|----------------|
| Custody Seal(s) Intact? | Not Applicable |
| Seal(s) Signed / Dated  | Not Applicable |

Total No. of Samples Received 2

Total No. of Containers Received 2

### Preservation

|                                                            |         |     |
|------------------------------------------------------------|---------|-----|
| Total Metals                                               | (pH<2)  | N/A |
| Dissolved Metals, filtered within 15 minutes of collection | (pH<2)  | N/A |
| Orthophosphorus, filtered within 15 minutes of collection  |         | N/A |
| Cyanides                                                   | (pH>12) | N/A |
| Sulfide                                                    | (pH>9)  | N/A |
| TOC, DOC (field filtered), COD, Phenols                    | (pH<2)  | N/A |
| TOX, TKN, NH3, Total Phos                                  | (pH<2)  | N/A |
| VOC, BTEX (VOA Vials Rcvd Preserved)                       | (pH<2)  | N/A |
| Do VOA vials have zero headspace?                          |         | N/A |
| 624 VOC (Rcvd at least one unpreserved VOA vial)           |         | N/A |
| 524 VOC (Rcvd with trip blanks)                            | (pH<2)  | N/A |

### Comments: (Any "No" response must be detailed in the comments section below.)

For any improper preservation conditions, list sample ID, preservative added (reagent ID number) below as well as documentation of any client notification as well as client instructions. Samples for pH, chlorine and dissolved oxygen should be analyzed as soon as possible, preferably in the field at the time of sampling. Samples which require thermal preservation shall be considered acceptable when received at a temperature above freezing to 6°C. Samples that are hand delivered on the day that they are collected may not meet these criteria but shall be considered acceptable if there is evidence that the chilling process has begun such as arrival on ice.

Samples Inspected/Checklist Completed By:

*Barb Weber*

Date: 07/19/2017

Barb Weber

PM Review and Approval:

*Lynn Jackson*

Date: 07/19/2017

Lynn Jackson

## SCIENCE LAB SAFETY REINFORCEMENT AGREEMENT

While all experiments in this manual are micro-scale or small-scale, which reduces most potential risks, unforeseen risks may still exist. The need to prevent injuries and accidents cannot be over-emphasized.

Use of this lab manual and the LabPaq® are expressly conditioned upon your agreeing to follow all safety precautions and accept full responsibility for your own actions. Thus, it is prudent to review the LabPaq's® basic safety rules and relevant safety precautions. You should study the safety section of the manual until you can honestly state the following:

I know that except for water, most solvents such as toluene, alcohols, acetone, ethers, ethyl acetate, etc., are highly flammable and should never be used near an open flame.

I know that the heat created when water is added to concentrated acids is sufficient to cause spattering. When preparing dilute acid solutions, I will always add the acid to the water (rather than the water to the acid) while slowly stirring the mixture.

I know it is wise to wear rubber gloves when handling acids and other dangerous chemicals and that acid spills should be neutralized with sodium bicarbonate (baking soda), and that acid spilled on the skin or clothes should be washed off immediately with a lot of cold water.

I know that many chemicals produce toxic fumes and that cautious procedures should be used when smelling any chemical. When I wish to smell a chemical I will never hold it directly under my nose but instead will use my hand to waft vapors toward my nose. If I experiment at home I will keep a window or door open while performing experiments.

I will always handle glassware with respect and promptly replace any defective glassware because even a small crack can cause glass to break when heated. To avoid cuts and injuries, I will immediately clean up and properly dispose of any broken glassware.

I will avoid burns by testing glass and metal objects for heat before handling. I know that the preferred first aid for burns is to immediately hold the burned area under cold water for several minutes.

I know that serious accidents can occur if the wrong chemical is used in an experiment. I will always carefully read the label before removing any chemical from its container.

I will avoid the possibility of contamination and accidents by never returning an unused chemical to its original container. To avoid waste I will try to pour out only the approximate amount of chemicals required.

I will select a work area that is inaccessible to children and pets while experiments are in progress. I will not leave experiments unattended and I will not leave my work area while chemical equipment is set up unless the room will be locked.

To avoid the potential for accidents I will clear my home-lab workspace of all non-laboratory items before setting up my lab equipment and chemical experiments.

Before beginning an experiment I will first read all directions and then assemble and organize all required equipment and supplies.

**I will wear approved safety glasses at all times while working on lab experiments involving chemicals**, and if I ever spill any chemical on myself I will immediately flush the spill with a lot of water and then consult a doctor if required.

To protect myself from potential hazards I will wear long pants, a long-sleeved shirt, and enclosed shoes and I will tie up any loose hair, clothing, or other materials when performing chemical experiments.



I will never attempt an experiment until I fully understand it. If in doubt about any part of an experiment, I will first speak with my instructor before proceeding.

I will never eat, drink, or smoke while performing experiments.

After completing all experiments I will clean up my work area, store the lab equipment in a safe place that is inaccessible to children and pets, and wash my hands to remove any chemicals.

I will always conscientiously work in a reasonable and prudent manner so as to optimize my safety and the safety of others whenever and wherever I am involved with any type of chemical equipment or experimentation.

Permission to utilize a LabPaq® is contingent upon your agreeing to follow all prescribed safety procedures. Please review this document several times until you are certain you understand it and then sign the agreement below. Your instructor may require you to send him/her a copy.

I am a responsible adult who has read, understood, and agree to fully abide by all safety precautions prescribed by my science lab manual for lab work and the use of LabPaq's®. I recognize the inherent hazards potentially associated with science experimentation and I will always experiment in a safe and prudent manner. I unconditionally accept full and complete responsibility for any and all liability related to my purchase and/or use of a science LabPaq® or any other science products or materials provided by Hands-On Labs, Inc. (HOL).

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Student's Signature

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Date