



**LABORATORY DATA CONSULTANTS, INC.**

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ERM  
5761 N. Church Street  
Glen Rock, PA 17327  
ATTN: Mr. Jeff Boggs

April 14, 2015

SUBJECT: Harbor Point, MD, Hexavalent Chromium Monitoring, Data Validation

Dear Mr. Boggs,

Enclosed is the final validation report for the fraction listed below. This SDG was received on April 9, 2015. Attachment 1 is a summary of the samples that were reviewed for each analysis.

**LDC Project #34058:**

<b><u>SDG</u></b>	<b><u>Fraction</u></b>
5040218/5040306	Hexavalent Chromium

The data validation was performed under EPA Level IV guidelines. The analyses were validated using the following documents, as applicable to each method:

- Air Monitoring Program Quality Assurance Project Plan, Area 1, Phase 1 Development, Version 1, Baltimore Works Site, Baltimore, Maryland, March 2014
- USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, January 2010

Please feel free to contact us if you have any questions.

Sincerely,

Christina Rink  
Project Manager/Chemist



## Laboratory Data Consultants, Inc. Data Validation Report

**Project/Site Name:** Harbor Point, MD, Hexavalent Chromium Monitoring  
**Collection Date:** April 1 through April 2, 2015  
**LDC Report Date:** April 14, 2015  
**Matrix:** Air  
**Parameters:** Hexavalent Chromium  
**Validation Level:** EPA Level IV  
**Laboratory:** Eastern Research Group  
**Sample Delivery Group (SDG):** 5040218/5040306

### Sample Identification

OAM 1 (04/01/15)  
OAM 2 (04/01/15)  
PAM-1 (04/01/15)  
PAM-1D (04/01/15)  
PAM-2 (04/01/15)  
PAM-3 (04/01/15)  
PAM-4 (04/01/15)  
PAM-21 (04/01/15)  
PAM-31 (04/01/15)  
OAM 1 (04/02/15)  
OAM 2 (04/02/15)  
PAM-1 (04/02/15)  
PAM-1D (04/02/15)  
PAM-2 (04/02/15)  
PAM-3 (04/02/15)  
PAM-4 (04/02/15)  
PAM-21 (04/02/15)  
PAM-31 (04/02/15)  
PAM-1 (04/01/15) DUP  
PAM-1D (04/01/15) DUP  
PAM-1 (04/02/15) DUP  
PAM-1D (04/02/15) DUP

The date was appended to the sample ID to differentiate between samples.

## Introduction

This data review covers 22 air samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per ASTM D7614 for Hexavalent Chromium.

This review follows the Air Monitoring Program Quality Assurance Project Plan, Area 1, Phase 1 Development, Version 1, Baltimore Works Site, Baltimore, Maryland (March 2014) and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

## **I. Technical Holding Times**

All technical holding time requirements were met.

## **II. Initial Calibration**

All criteria for the initial calibration were met.

## **III. Continuing Calibration**

Continuing calibration frequency and analysis criteria were met.

## **IV. Blanks**

Method blanks were reviewed for each matrix as applicable. No hexavalent chromium was found in the method blanks.

Samples PAM-31 (04/01/15) and PAM-31 (04/02/15) were identified as trip blanks. No hexavalent chromium was found.

Samples PAM-21 (04/01/15) and PAM-21 (04/02/15) were identified as field blanks. No hexavalent chromium was found.

## **V. Matrix Spike/Matrix Spike Duplicates**

Matrix spike (MS) and matrix spike duplicate (MSD) analysis was not required by the method.

## **VI. Duplicates**

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits.

## **VII. Laboratory Control Samples**

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

## **VIII. Sample Result Verification**

All sample result verifications were acceptable.

## **IX. Overall Assessment of Data**

Data flags are summarized at the end of this report if data has been qualified.

## X. Field Duplicates

Samples PAM-1 (04/01/15) and PAM-1D (04/01/15) and samples PAM-1 (04/02/15) and PAM-1D (04/02/15) were identified as field duplicates. No hexavalent chromium was detected in any of the samples with the following exceptions:

Analyte	Concentration (ng/m <sup>3</sup> )		RPD (Limits)	Flags	A or P
	PAM-1 (04/01/15)	PAM-1D (04/01/15)			
Hexavalent chromium	0.0222	0.0248	11 (≤20)	-	-

Analyte	Concentration (ng/m <sup>3</sup> )		RPD (Limits)	Flags	A or P
	PAM-1 (04/02/15)	PAM-1D (04/02/15)			
Hexavalent chromium	0.0587	0.0570	3 (≤20)	-	-

**Harbor Point, MD, Hexavalent Chromium Monitoring  
Hexavalent Chromium - Data Qualification Summary - SDG 5040218/5040306**

No Sample Data Qualified Due to QA/QC Exceedances in this SDG

**Harbor Point, MD, Hexavalent Chromium Monitoring  
Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG  
5040218/5040306**

No Sample Data Qualified Due to Laboratory Blank Contamination in this  
SDG

**Harbor Point, MD, Hexavalent Chromium Monitoring  
Hexavalent Chromium - Field Blank Data Qualification Summary - SDG  
5040218/5040306**

No Sample Data Qualified Due to Field Blank Contamination in this SDG

LDC #: 34058A6

**VALIDATION COMPLETENESS WORKSHEET**

Date: 4/10/15

SDG #: 5040218/5040306

Level IV

Page: 1 of 2

Laboratory: Eastern Research Group

Reviewer: JD

2nd Reviewer: CR

**METHOD: (Analyte) Hexavalent Chromium (ASTM D7614)**

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	4/01/15 - 4/02/15
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Laboratory Blanks	A	
V	Field blanks	ND	FB=(8)(17) TB=(9)(18)
VI.	Matrix Spike/Matrix Spike Duplicates	N	Not Required
VII.	Duplicate sample analysis	A	DUP
VIII.	Laboratory control samples	A	LCS/D
IX.	Field duplicates	SW	FD=(3,4)(12,13)
X.	Sample result verification	A	
XI	Overall assessment of data	A	

Note: A = Acceptable  
N = Not provided/applicable  
SW = See worksheet

ND = No compounds detected  
R = Rinsate  
FB = Field blank

D = Duplicate  
TB = Trip blank  
EB = Equipment blank

SB=Source blank  
OTHER:

	Client ID	Lab ID	Matrix	Date
1	OAM 1 (04/01/15)	5040218-01	Air	04/01/15
2	OAM 2 (04/01/15)	5040218-02	Air	04/01/15
3	PAM-1 (04/01/15)	5040218-03	Air	04/01/15
4	PAM-1D (04/01/15)	5040218-04	Air	04/01/15
5	PAM-2 (04/01/15)	5040218-05	Air	04/01/15
6	PAM-3 (04/01/15)	5040218-06	Air	04/01/15
7	PAM-4 (04/01/15)	5040218-07	Air	04/01/15
8	PAM-21 (04/01/15)	5040218-08	Air	04/01/15
9	PAM-31 (04/01/15)	5040218-09	Air	04/01/15
10	OAM 1 (04/02/15)	5040306-01	Air	04/02/15
11	OAM 2 (04/02/15)	5040306-02	Air	04/02/15
12	PAM-1 (04/02/15)	5040306-03	Air	04/02/15
13	PAM-1D (04/02/15)	5040306-04	Air	04/02/15
14	PAM-2 (04/02/15)	5040306-05	Air	04/02/15
15	PAM-3 (04/02/15)	5040306-06	Air	04/02/15
16	PAM-4 (04/02/15)	5040306-07	Air	04/02/15
17	PAM-21 (04/02/15)	5040306-08	Air	04/02/15

Prep log m<sup>3</sup> inconsistent with Form 1  $\frac{1}{2}$  COL m<sup>3</sup>; COL m<sup>3</sup> used

LDC #: 34058A6

# VALIDATION COMPLETENESS WORKSHEET

Date: 4/1/15

SDG #: 5040218/5040306

Level IV

Page: 2 of 2

Laboratory: Eastern Research Group

Reviewer: *[Signature]*

2nd Reviewer: *[Signature]*

**METHOD: (Analyte) Hexavalent Chromium (ASTM D7614)**

	Client ID	Lab ID	Matrix	Date
18	PAM-31 (04/02/15)	5040306-09	Air	04/02/15
19	PAM-1 (04/01/15)DUP	5040218-03DUP	Air	04/01/15
20	PAM-1D (04/01/15)DUP	5040218-04DUP	Air	04/01/15
21	PAM-1 (04/02/15)DUP	5040306-03DUP	Air	04/02/15
22	PAM-1D (04/02/15)DUP	5040306-04DUP	Air	04/02/15
23				
24				
25				
26				
27				

Notes: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Method: Inorganics (EPA Method See Cover)

Validation Area	Yes	No	NA	Findings/Comments
<b>I. Technical holding times</b>				
All technical holding times were met.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Cooler temperature criteria was met.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>II. Calibration</b>				
Were all instruments calibrated daily, each set-up time?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were the proper number of standards used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all initial calibration correlation coefficients > 0.995?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all initial and continuing calibration verification %Rs within the <del>90-110%</del> <u>85-115%</u> QC limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were titrant checks performed as required? (Level IV only)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Were balance checks performed as required? (Level IV only)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<b>III. Blanks</b>				
Was a method blank associated with every sample in this SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<b>IV. Matrix spike/Matrix spike duplicates and Duplicates</b>				
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<u>Airs</u> Were the MS/MSD or duplicate relative percent differences (RPD) ≤ 20% for <del>waters</del> and ≤ 35% for soil samples? A control limit of ≤ CRDL (≤ 2X CRDL for soil) was used for samples that were ≤ 5X the CRDL, including when only one of the duplicate sample values were < 5X the CRDL.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>V. Laboratory control samples</b>				
Was an LCS analyzed for this SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was an LCS analyzed per extraction batch?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% (85-115% for Method 300.0) QC limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>VI. Regional Quality Assurance and Quality Control</b>				
Were performance evaluation (PE) samples performed?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Were the performance evaluation (PE) samples within the acceptance limits?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

**VALIDATION FINDINGS CHECKLIST**

Validation Area	Yes	No	NA	Findings/Comments
<b>VII. Sample Result Verification</b>				
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	/			
Were detection limits < RL?	/			
<b>VIII. Overall assessment of data</b>				
Overall assessment of data was found to be acceptable.	/			
<b>IX. Field duplicates</b>				
Field duplicate pairs were identified in this SDG.	/			
Target analytes were detected in the field duplicates.	/			
<b>X. Field blanks</b>				
Field blanks were identified in this SDG.	/			
Target analytes were detected in the field blanks.		/		

LDC# 34058A6

**VALIDATION FINDINGS WORKSHEET**  
**Field Duplicates**

Page: 1 of 1  
Reviewer: SD  
2nd Reviewer: AK

**Inorganics:** Method See Cover

Analyte	Concentration (ng/m3)		RPD ( $\leq 20$ )	Qual.
	3	4		
Hexavalent Chromium	0.0222	0.0248	11	

Analyte	Concentration (ng/m3)		RPD ( $\leq 20$ )	Qual.
	12	13		
Hexavalent Chromium	0.0587	0.0570	3	

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LDC #: 34058A6

**VALIDATION FINDINGS WORKSHEET**  
**Level IV Recalculation Worksheet**

Page: 1 of 1  
Reviewer: SD  
2nd Reviewer: G

**METHOD:** Inorganics, Method See Cover

Percent recoveries (%R) for a laboratory control sample and a matrix spike sample were recalculated using the following formula:

$$\%R = \frac{\text{Found}}{\text{True}} \times 100$$
 Where, Found = concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation, Found = SSR (spiked sample result) - SR (sample result).  
True = concentration of each analyte in the source.

A sample and duplicate relative percent difference (RPD) was recalculated using the following formula:

$$RPD = \frac{|S-D|}{(S+D)/2} \times 100$$
 Where, S = Original sample concentration  
D = Duplicate sample concentration

Sample ID	Type of Analysis	Element	Found / S (units)	True / D (units)	Recalculated	Reported	Acceptable (Y/N)
					%R / RPD	%R / RPD	
LCS 12:28	Laboratory control sample	Cr <sup>+6</sup> ↓	1.046 ng/ml	1.00 ng/ml	105%R	105%R	Y
N	Matrix spike sample		(SSR-SR)				
DUP 13:31	Duplicate sample			0.0219 ng/m <sup>3</sup>	0.0222 ng/m <sup>3</sup>	1.36%RPD	1.24%RPD

Comments: \*Rounding

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**VALIDATION FINDINGS WORKSHEET**  
**Sample Calculation Verification**

**METHOD:** Inorganics, Method See Cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

- Y  N  N/A Have results been reported and calculated correctly?
- Y  N  N/A Are results within the calibrated range of the instruments?
- Y  N  N/A Are all detection limits below the CRQL?

Compound (analyte) results for (4) Cr<sup>4+</sup> reported with a positive detect were recalculated and verified using the following equation:

Concentration =  $(A - C_0) C_1$        $V_f = 10 \text{ ml}$       Recalculation:  $\frac{0.0381068 - (-4.46E-03)}{0.782488} = 0.0544 \text{ ng/ml}$

$C_0 = -4.46E-03$        $m^3 = 21.94$

$C_1 = 0.782488$        $\frac{(\text{ng/ml})(\text{ml})}{m^3} = \text{ng/m}^3$

$A = 0.0381068$        $\frac{0.0544 \text{ ng/ml} (10 \text{ ml})}{21.94 m^3} = 0.0248 \text{ ng/m}^3$

#	Sample ID	Analyte	Reported Concentration (ng/m <sup>3</sup> )	Calculated Concentration (ng/m <sup>3</sup> )	Acceptable (Y/N)
	1	Cr <sup>4+</sup>	0.0596	0.0596	Y
	2		0.0128	0.0128	Y
	3		0.0222	0.0222	Y
	4		0.0248	0.0248	Y
	5		0.0142	0.0142	Y
	6		0.0075	0.0075	Y
	7		0.0230	0.0230	Y
	8		ND	ND	Y
	9		ND	ND	Y
	10		0.0268	0.0269	Y*
	11		0.0316	0.0316	Y
	12		0.0587	0.0587	Y
	13		0.0570	0.0570	Y
	14		0.0412	0.0412	Y
	15		0.0567	0.0567	Y
	16		0.111	0.111	Y
	17		ND	ND	Y
	18		ND	ND	Y

Note: \*Rounding      4/14/15: verified with lab COC m<sup>3</sup> USE

Prep log m<sup>3</sup> inconsistent with Form 1 & COC m<sup>3</sup>  
 RECALC.6      101-...<sup>3</sup> used for...



# CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 04/09/15 14:30

SUBMITTED: 04/02/15 to 04/03/15

AQS SITE

CODE: Honeywell Hex Chrome Study  
SITE CODE:

<b>Description:</b> OAM 1	<b>Lab ID:</b> 5040218-01	<b>Sampled:</b> 04/01/15 14:56
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.43 m <sup>3</sup>	<b>Received:</b> 04/02/15 11:03
<b>Comments:</b> Start Time 3/31/15 14:56		<b>Analysis Date:</b> 04/06/15 14:37

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	0.0096		0.0038

APR 14 2015

Initials: CR

Eastern Research Group

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REPORTED: 04/09/15 14:30

SUBMITTED: 04/02/15 to 04/03/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

<b>Description:</b> OAM 2	<b>Lab ID:</b> 5040218-02	<b>Sampled:</b> 04/01/15 15:10
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.52 m <sup>3</sup>	<b>Received:</b> 04/02/15 11:03
<b>Comments:</b> Start Time 3/31/15 15:16		<b>Analysis Date:</b> 04/06/15 14:47

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0128		0.0038

**APR 14 2015**

Initials: *ER*

Eastern Research Group

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REPORTED: 04/09/15 14:30

SUBMITTED: 04/02/15 to 04/03/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

<b>Description:</b> PAM-1	<b>Lab ID:</b> 5040218-03	<b>Sampled:</b> 04/01/15 15:58
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.93 m <sup>3</sup>	<b>Received:</b> 04/02/15 11:03
<b>Comments:</b> Col 1 Start Time 3/31/15 15:58		<b>Analysis Date:</b> 04/06/15 13:21

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	0.0222		0.0038

APR 14 2015

Initials: ER

Eastern Research Group

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FILE #: 3926.00

REPORTED: 04/09/15 14:30

SUBMITTED: 04/02/15 to 04/03/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

<b>Description:</b> PAM-1D	<b>Lab ID:</b> 5040218-04	<b>Sampled:</b> 04/01/15 16:21
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.94 m <sup>3</sup>	<b>Received:</b> 04/02/15 11:03
<b>Comments:</b> Col 2 Start Time 3/31/15 15:59		<b>Analysis Date:</b> 04/06/15 13:40

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	0.0248		0.0038

APR 14 2015

Initials: *CR*

Eastern Research Group

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FILE #: 3926.00

REPORTED: 04/09/15 14:30

SUBMITTED: 04/02/15 to 04/03/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

<b>Description:</b> PAM-2	<b>Lab ID:</b> 5040218-05	<b>Sampled:</b> 04/01/15 15:55
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.75 m <sup>3</sup>	<b>Received:</b> 04/02/15 11:03
<b>Comments:</b> Start Time 3/31/15 15:45		<b>Analysis Date:</b> 04/06/15 15:19

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	0.0142		0.0038

APR 14 2015

Initials: *CR*

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FILE #: 3926.00

REPORTED: 04/09/15 14:30

SUBMITTED: 04/02/15 to 04/03/15

AQS SITE

CODE: Honeywell Hex Chrome Study  
SITE CODE:

<b>Description:</b> PAM-3	<b>Lab ID:</b> 5040218-06	<b>Sampled:</b> 04/01/15 15:43
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.67 m <sup>3</sup>	<b>Received:</b> 04/02/15 11:03
<b>Comments:</b> Start Time 3/31/15 15:39		<b>Analysis Date:</b> 04/06/15 15:30

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	0.0075		0.0038

APR 14 2015

Initials: *CR*

Eastern Research Group

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# CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 04/09/15 14:30

SUBMITTED: 04/02/15 to 04/03/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

<b>Description:</b> PAM-4	<b>Lab ID:</b> 5040218-07	<b>Sampled:</b> 04/01/15 15:32
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.58 m <sup>3</sup>	<b>Received:</b> 04/02/15 11:03
<b>Comments:</b> Start Time 3/31/15 15:33		<b>Analysis Date:</b> 04/06/15 15:41

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	0.0230		0.0038

APR 14 2015

Initials: ER

Eastern Research Group

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FILE #: 3926.00

REPORTED: 04/09/15 14:30

SUBMITTED: 04/02/15 to 04/03/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

<b>Description:</b> PAM-21	<b>Lab ID:</b> 5040218-08	<b>Sampled:</b> 04/01/15 00:00
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.75 m <sup>3</sup>	<b>Received:</b> 04/02/15 11:03
<b>Comments:</b>		<b>Analysis Date:</b> 04/06/15 15:51

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0038

APR 14 2015

Initials: ER

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REPORTED: 04/09/15 14:30

SUBMITTED: 04/02/15 to 04/03/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

<b>Description:</b> PAM-31	<b>Lab ID:</b> 5040218-09	<b>Sampled:</b> 04/01/15 00:00
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.67 m <sup>3</sup>	<b>Received:</b> 04/02/15 11:03
<b>Comments:</b>		<b>Analysis Date:</b> 04/06/15 16:02

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	ND	U	0.0038

APR 14 2015

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FILE #: 3926.00

REPORTED: 04/09/15 14:30

SUBMITTED: 04/02/15 to 04/03/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

<b>Description:</b> OAM 1	<b>Lab ID:</b> 5040306-01	<b>Sampled:</b> 04/02/15 14:33
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.38 m <sup>3</sup>	<b>Received:</b> 04/03/15 11:39
<b>Comments:</b> Start Time 4/1/15 14:48		<b>Analysis Date:</b> 04/06/15 16:13

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	0.0268		0.0038

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FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 04/09/15 14:30

SUBMITTED: 04/02/15 to 04/03/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

<b>Description:</b> OAM 2	<b>Lab ID:</b> 5040306-02	<b>Sampled:</b> 04/02/15 14:53
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.29 m <sup>3</sup>	<b>Received:</b> 04/03/15 11:39
<b>Comments:</b> Start Time 4/1/15 15:13		<b>Analysis Date:</b> 04/06/15 16:24

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	0.0316		0.0038

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FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 04/09/15 14:30

SUBMITTED: 04/02/15 to 04/03/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

<b>Description:</b> PAM-1	<b>Lab ID:</b> 5040306-03	<b>Sampled:</b> 04/02/15 16:12
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.43 m <sup>3</sup>	<b>Received:</b> 04/03/15 11:39
<b>Comments:</b> Col 1 Start Time 4/1/15 16:23		<b>Analysis Date:</b> 04/06/15 13:59

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	0.0587		0.0038

APR 14 2015

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FILE #: 3926.00

REPORTED: 04/09/15 14:30

SUBMITTED: 04/02/15 to 04/03/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

<b>Description:</b> PAM-1D	<b>Lab ID:</b> 5040306-04	<b>Sampled:</b> 04/02/15 16:14
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.44 m <sup>3</sup>	<b>Received:</b> 04/03/15 11:39
<b>Comments:</b> Col 2 Start Time 4/1/15 16:24		<b>Analysis Date:</b> 04/06/15 14:18

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	0.0570		0.0038

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FILE #: 3926.00

REPORTED: 04/09/15 14:30

SUBMITTED: 04/02/15 to 04/03/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

<b>Description:</b> PAM-2	<b>Lab ID:</b> 5040306-05	<b>Sampled:</b> 04/02/15 15:57
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.58 m <sup>3</sup>	<b>Received:</b> 04/03/15 11:39
<b>Comments:</b> Start Time 4/1/15 15:58		<b>Analysis Date:</b> 04/06/15 16:34

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	0.0412		0.0038

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FILE #: 3926.00

REPORTED: 04/09/15 14:30

SUBMITTED: 04/02/15 to 04/03/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

<b>Description:</b> PAM-3	<b>Lab ID:</b> 5040306-06	<b>Sampled:</b> 04/02/15 15:40
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.51 m <sup>3</sup>	<b>Received:</b> 04/03/15 11:39
<b>Comments:</b> Start Time 4/1/15 15:46		<b>Analysis Date:</b> 04/06/15 16:45

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	0.0567		0.0038

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FILE #: 3926.00

REPORTED: 04/09/15 14:30

SUBMITTED: 04/02/15 to 04/03/15

AQS SITE

CODE: Honeywell Hex Chrome Study  
SITE CODE:

<b>Description:</b> PAM-4	<b>Lab ID:</b> 5040306-07	<b>Sampled:</b> 04/02/15 15:16
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.3 m <sup>3</sup>	<b>Received:</b> 04/03/15 11:39
<b>Comments:</b> Start Time 4/1/15 15:35		<b>Analysis Date:</b> 04/06/15 16:56

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	0.111		0.0038

APR 14 2015

Initials: ER

Eastern Research Group

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FILE #: 3926.00

REPORTED: 04/09/15 14:30

SUBMITTED: 04/02/15 to 04/03/15

AQS SITE

CODE: Honeywell Hex Chrome Study  
SITE CODE:

<b>Description:</b> PAM-21	<b>Lab ID:</b> 5040306-08	<b>Sampled:</b> 04/02/15 00:00
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.58 m <sup>3</sup>	<b>Received:</b> 04/03/15 11:39
<b>Comments:</b>		<b>Analysis Date:</b> 04/06/15 17:28

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0038

APR 14 2015

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FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 04/09/15 14:30

SUBMITTED: 04/02/15 to 04/03/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

<b>Description:</b> PAM-31	<b>Lab ID:</b> 5040306-09	<b>Sampled:</b> 04/02/15 00:00
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.51 m <sup>3</sup>	<b>Received:</b> 04/03/15 11:39
<b>Comments:</b>		<b>Analysis Date:</b> 04/06/15 17:38

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0038

APR 14 2015

Initials: *CR*

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**LABORATORY DATA CONSULTANTS, INC.**

2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

ERM  
5761 N. Church Street  
Glen Rock, PA 17327  
ATTN: Mr. Jeff Boggs

May 18, 2015

SUBJECT: Harbor Point, MD, Hexavalent Chromium Monitoring, Data Validation

Dear Mr. Boggs,

Enclosed is the final validation report for the fraction listed below. This SDG was received on May 14, 2015. Attachment 1 is a summary of the samples that were reviewed for each analysis.

**LDC Project #34284:**

<b><u>SDG</u></b>	<b><u>Fraction</u></b>
5050538/5050638	Hexavalent Chromium

The data validation was performed under EPA Level IV guidelines. The analyses were validated using the following documents, as applicable to each method:

- Air Monitoring Program Quality Assurance Project Plan, Area 1, Phase 1 Development, Version 1, Baltimore Works Site, Baltimore, Maryland, March 2014
- USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, January 2010

Please feel free to contact us if you have any questions.

Sincerely,

Christina Rink  
Project Manager/Chemist



## Laboratory Data Consultants, Inc. Data Validation Report

**Project/Site Name:** Harbor Point, MD, Hexavalent Chromium Monitoring  
**Collection Date:** May 1 through May 5, 2015  
**LDC Report Date:** May 18, 2015  
**Matrix:** Air  
**Parameters:** Hexavalent Chromium  
**Validation Level:** EPA Level IV  
**Laboratory:** Eastern Research Group  
**Sample Delivery Group (SDG):** 5050538/5050638

### Sample Identification

OAM 2 (05/01/15)	PAM-4 (05/05/15)
PAM-1 (05/01/15)	PAM-21 (05/05/15)
PAM-1D (05/01/15)	PAM-31 (05/05/15)
PAM-2 (05/01/15)	PAM-1 (05/01/15) DUP
PAM-3 (05/01/15)	PAM-1D (05/01/15) DUP
PAM-4 (05/01/15)	PAM-1 (05/04/15) DUP
PAM-21 (05/01/15)	PAM-1D(05/04/15)DUP
PAM-31 (05/01/15)	PAM-1 (05/05/15)DUP
OAM 2 (05/04/15)	PAM-1D (05/05/15)DUP
PAM-1 (05/04/15)	
PAM-1D (05/04/15)	
PAM-2 (05/04/15)	
PAM-4 (05/04/15)	
PAM-21 (05/04/15)	
PAM-31 (05/04/15)	
OAM 2 (05/05/15)	
PAM-1 (05/05/15)	
PAM-1D (05/05/15)	
PAM-2 (05/05/15)	
PAM-3 (05/05/15)	

The date was appended to the sample ID to differentiate between samples.

## Introduction

This data review covers 29 air samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per ASTM D7614 for Hexavalent Chromium.

This review follows the Air Monitoring Program Quality Assurance Project Plan, Area 1, Phase 1 Development, Version 1, Baltimore Works Site, Baltimore, Maryland (March 2014) and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

## **I. Technical Holding Times**

All technical holding time requirements were met.

## **II. Initial Calibration**

All criteria for the initial calibration were met.

## **III. Continuing Calibration**

Continuing calibration frequency and analysis criteria were met.

## **IV. Blanks**

Method blanks were reviewed for each matrix as applicable. No hexavalent chromium was found in the method blanks.

Samples PAM-31 (05/01/15), PAM-31 (05/04/15), and PAM-31 (05/05/15) were identified as trip blanks. No hexavalent chromium was found.

Samples PAM-21 (05/01/15), PAM-21 (05/04/15), and PAM-21 (05/05/15) were identified as field blanks. No hexavalent chromium was found.

## **V. Matrix Spike/Matrix Spike Duplicates**

Matrix spike (MS) and matrix spike duplicate (MSD) analysis was not required by the method.

## **VI. Duplicates**

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Relative percent differences (RPD) were within QC limits.

## **VII. Laboratory Control Samples**

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

## **VIII. Sample Result Verification**

All sample result verifications were acceptable.

## **IX. Overall Assessment of Data**

Data flags are summarized at the end of this report if data has been qualified.

## X. Field Duplicates

Samples PAM-1 (05/01/15) and PAM-1D (05/01/15), samples PAM-1 (05/04/15) and PAM-1D (05/04/15), and samples PAM-1 (05/05/15) and PAM-1D (05/05/15) were identified as field duplicates. No hexavalent chromium was detected in any of the samples with the following exceptions:

Analyte	Concentration (ng/m <sup>3</sup> )		RPD (Limits)	Flags	A or P
	PAM-1 (05/01/15)	PAM-1D (05/01/15)			
Hexavalent chromium	0.0110	0.0132	18 (≤20)	-	-

Analyte	Concentration (ng/m <sup>3</sup> )		RPD (Limits)	Flags	A or P
	PAM-1 (05/04/15)	PAM-1D (05/04/15)			
Hexavalent chromium	0.0458	0.0462	1 (≤20)	-	-

Analyte	Concentration (ng/m <sup>3</sup> )		RPD (Limits)	Flags	A or P
	PAM-1 (05/05/15)	PAM-1D (05/05/15)			
Hexavalent chromium	0.0389	0.0389	0 (≤20)	-	-

**Harbor Point, MD, Hexavalent Chromium Monitoring  
Hexavalent Chromium - Data Qualification Summary - SDG 5050538/5050638**

No Sample Data Qualified Due to QA/QC Exceedances in this SDG

**Harbor Point, MD, Hexavalent Chromium Monitoring  
Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG  
5050538/5050638**

No Sample Data Qualified Due to Laboratory Blank Contamination in this  
SDG

**Harbor Point, MD, Hexavalent Chromium Monitoring  
Hexavalent Chromium - Field Blank Data Qualification Summary - SDG  
5050538/5050638**

No Sample Data Qualified Due to Field Blank Contamination in this SDG

LDC #: 34284A6

## VALIDATION COMPLETENESS WORKSHEET

Date: 5/14/15

SDG #: 5050538/5050638

Level IV

Page: 1 of 2

Laboratory: Eastern Research Group

Reviewer: SD

2nd Reviewer: *av***METHOD: (Analyte) Hexavalent Chromium (ASTM D7614)**

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	5/1-5/15
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Laboratory Blanks	A	
V	Field blanks	ND	FB=(7)(14)(22) TB=(8)(15)(23)
VI.	Matrix Spike/Matrix Spike Duplicates	N	Not Required
VII.	Duplicate sample analysis	A	DUP
VIII.	Laboratory control samples	A	LCS/D
IX.	Field duplicates	SW	FD=(2,3) (10,11) (17,18)
X.	Sample result verification	A	
XI	Overall assessment of data	A	

Note: A = Acceptable  
N = Not provided/applicable  
SW = See worksheet

ND = No compounds detected  
R = Rinsate  
FB = Field blank

D = Duplicate  
TB = Trip blank  
EB = Equipment blank

SB=Source blank  
OTHER:

	Client ID	Lab ID	Matrix	Date
1	OAM 2 (05/01/15)	5050538-01	Air	05/01/15
2	PAM-1 (05/01/15)	5050538-02	Air	05/01/15
3	PAM-1D (05/01/15)	5050538-03	Air	05/01/15
4	PAM-2 (05/01/15)	5050538-04	Air	05/01/15
5	PAM-3 (05/01/15)	5050538-05	Air	05/01/15
6	PAM-4 (05/01/15)	5050538-06	Air	05/01/15
7	PAM-21 (05/01/15)	5050538-07	Air	05/01/15
8	PAM-31 (05/01/15)	5050538-08	Air	05/01/15
9	OAM 2 (05/04/15)	5050538-09	Air	05/04/15
10	PAM-1 (05/04/15)	5050538-10	Air	05/04/15
11	PAM-1D (05/04/15)	5050538-11	Air	05/04/15
12	PAM-2 (05/04/15)	5050538-12	Air	05/04/15
13	PAM-4 (05/04/15)	5050538-14	Air	05/04/15
14	PAM-21 (05/04/15)	5050538-15	Air	05/04/15
15	PAM-31 (05/04/15)	5050538-16	Air	05/04/15
16	OAM 2 (05/05/15)	5050638-01	Air	05/05/15
17	PAM-1 (05/05/15)	5050638-02	Air	05/05/15

LDC #: 34284A6

### VALIDATION COMPLETENESS WORKSHEET

Date: 5/14/15

SDG #: 5050538/5050638

Level IV

Page: 2 of 2

Laboratory: Eastern Research Group

Reviewer: [Signature]

2nd Reviewer: [Signature]

**METHOD: (Analyte) Hexavalent Chromium (ASTM D7614)**

	Client ID	Lab ID	Matrix	Date
18	PAM-1D (05/05/15)	5050638-03	Air	05/05/15
19	PAM-2 (05/05/15)	5050638-04	Air	05/05/15
20	PAM-3 (05/05/15)	5050638-05	Air	05/05/15
21	PAM-4 (05/05/15)	5050638-06	Air	05/05/15
22	PAM-21 (05/05/15)	5050638-07	Air	05/05/15
23	PAM-31 (05/05/15)	5050638-08	Air	05/05/15
24	PAM-1 (05/01/15) DUP	5050538-02DUP	Air	05/01/15
25	PAM-1D (05/01/15) DUP	5050538-03DUP	Air	05/01/15
26	PAM-1 (05/04/15) DUP	5050538-10DUP	Air	05/04/15
27	PAM-1D(05/04/15)DUP	5050538-11DUP	Air	05/04/15
28	PAM-1 (05/05/15)DUP	5050638-02DUP	Air	05/05/15
29	PAM-1D (05/05/15)DUP	5050638-03DUP	Air	05/05/15
30				
31				
32				
33				
34				
35				

Notes: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Method: Inorganics (EPA Method See lower)

Validation Area	Yes	No	NA	Findings/Comments
<b>I. Technical holding times</b>				
All technical holding times were met.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Cooler temperature criteria was met.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>II. Calibration</b>				
Were all instruments calibrated daily, each set-up time?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were the proper number of standards used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all initial calibration correlation coefficients > 0.995?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all initial and continuing calibration verification %Rs within the <del>90-110%</del> <u>85-115%</u> QC limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were titrant checks performed as required? (Level IV only)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Were balance checks performed as required? (Level IV only)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<b>III. Blanks</b>				
Was a method blank associated with every sample in this SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<b>IV. Matrix spike/Matrix spike duplicates and Duplicates</b>				
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<u>Airs</u> Were the MS/MSD or duplicate relative percent differences (RPD) ≤ 20% for <del>waters</del> and ≤ 35% for soil samples? A control limit of ≤ CRDL (≤ 2X CRDL for soil) was used for samples that were ≤ 5X the CRDL, including when only one of the duplicate sample values were ≤ 5X the CRDL.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>V. Laboratory control samples</b>				
Was an LCS analyzed for this SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was an LCS analyzed per extraction batch?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% (85-115% for Method 300.0) QC limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>VI. Regional Quality Assurance and Quality Control</b>				
Were performance evaluation (PE) samples performed?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Were the performance evaluation (PE) samples within the acceptance limits?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

LDC #: 34284 A80

VALIDATION FINDINGS CHECKLIST

Page 2 of 2  
 Reviewer: SS  
 2nd Reviewer: GW

Validation Area	Yes	No	NA	Findings/Comments
<b>VII. Sample Result Verification</b>				
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were detection limits < RL?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>VIII. Overall assessment of data</b>				
Overall assessment of data was found to be acceptable.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>IX. Field duplicates</b>				
Field duplicate pairs were identified in this SDG.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Target analytes were detected in the field duplicates.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>X. Field blanks</b>				
Field blanks were identified in this SDG.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Target analytes were detected in the field blanks.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

LDC# 34284A6

**VALIDATION FINDINGS WORKSHEET**  
**Field Duplicates**

Page: 1 of 1  
Reviewer: SD  
2nd Reviewer: W

Inorganics: Method See Cover

Analyte	Concentration (ng/m3)		RPD (≤20)	Qual.
	2	3		
Hexavalent Chromium	0.0110	0.0132	18	

Analyte	Concentration (ng/m3)		RPD (≤20)	Qual.
	10	11		
Hexavalent Chromium	0.0456	0.0462	1	

Analyte	Concentration (ng/m3)		RPD (≤20)	Qual.
	17	18		
Hexavalent Chromium	0.0389	0.0389	0	

\\LDCFILESERVER\Validation\FIELD DUPLICATES\FD\_inorganic\34284A6.wpd

LDC #: 34284A

**Validation Findings Worksheet**  
**Initial and Continuing Calibration Calculation Verification**

Page: 1 of 1  
 Reviewer: JD  
 2nd Reviewer: ca

Method: Inorganics, Method See Cover

The correlation coefficient (r) for the calibration of C<sup>+6</sup> was recalculated. Calibration date: 5/6/15

An initial or continuing calibration verification percent recovery (%R) was recalculated for each type of analysis using the following formula:

$$\%R = \frac{\text{Found} \times 100}{\text{True}}$$

Where,

Found = concentration of each analyte measured in the analysis of the ICV or CCV solution

True = concentration of each analyte in the ICV or CCV source

Type of analysis	Analyte	Standard	Conc. (ng/ml)	Area	Recalculated	Reported	Acceptable (Y/N)
					r or r <sup>2</sup>	r or r <sup>2</sup>	
Initial calibration	C <sup>+6</sup>	s1	0.05	0.0390853	0.99985	0.99985	Y
		s2	0.1	0.0936115			
		s3	0.2	0.1469033			
		s4	0.5	0.3869842			
		s5	1	0.7547653			
		s6	2	1.5396217			
ICV 11:18 Calibration verification	C <sup>+6</sup>	<u>Found</u> 0.5202 ng/ml	<u>True</u> 0.5 ng/ml		104%R	104%R	↓
CCV 12:23 Calibration verification	↓	0.5121 ng/ml	0.5 ng/ml		102.4%R	102.4%R	↓
Calibration verification							

Comments: Refer to Calibration Verification findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 3428446

**VALIDATION FINDINGS WORKSHEET**  
**Level IV Recalculation Worksheet**

Page: 1 of 1  
Reviewer: SD  
2nd Reviewer: Q

**METHOD:** Inorganics, Method See Cover

Percent recoveries (%R) for a laboratory control sample and a matrix spike sample were recalculated using the following formula:

$\%R = \frac{\text{Found}}{\text{True}} \times 100$       Where,      Found = concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation, Found = SSR (spiked sample result) - SR (sample result).  
True = concentration of each analyte in the source.

A sample and duplicate relative percent difference (RPD) was recalculated using the following formula:

$RPD = \frac{|S-D|}{(S+D)/2} \times 100$       Where,      S = Original sample concentration  
D = Duplicate sample concentration

Sample ID	Type of Analysis	Element	Found / S (units)	True / D (units)	Recalculated	Reported	Acceptable (Y/N)
					%R / RPD	%R / RPD	
LCS 11:51	Laboratory control sample	Cu <sup>2+</sup>	1.077 ng/ml	1 ng/ml	108% R	108% R	Y
N	Matrix spike sample	↓	(SSR-SR)				
DUP 12:54	Duplicate sample	↓	0.0098 ng/l <sup>3</sup>	0.0110 ng/l <sup>3</sup>	11.5% RPD	11.9% RPD	Y

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**VALIDATION FINDINGS WORKSHEET**  
**Sample Calculation Verification**

**METHOD:** Inorganics, Method See Cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

- Y N N/A Have results been reported and calculated correctly?
- Y N N/A Are results within the calibrated range of the instruments?
- Y N N/A Are all detection limits below the CRQL?

Compound (analyte) results for (13) Cr<sup>+6</sup> reported with a positive detect were recalculated and verified using the following equation:

Concentration =  $(A - C_0) / C_1$

Recalculation:  $\frac{0.1316208 - (2.24E-03)}{0.765599} = 0.169 \text{ ng/ml}$

$A = 0.1316208$   
 $C_0 = 2.24E-03$   
 $C_1 = 0.765599$

$V_f = 10 \text{ ml}$   
 $V_s = 21.86 \text{ ml}$

$\frac{(0.169 \text{ ng/ml}) (10 \text{ ml})}{21.86 \text{ ml}} = 0.077 \text{ ng/l}$

#	Sample ID	Analyte	Reported Concentration (ng/m <sup>3</sup> )	Calculated Concentration (ng/m <sup>3</sup> )	Acceptable (Y/N)
	1	Cr <sup>+6</sup>	0.0149	0.0149	Y
	2		0.0110	0.0110	Y
	3		0.0132	0.0132	Y
	4		0.0107	0.0107	Y
	5		0.0899	0.0899	Y
	6		0.0260	0.0260	Y
	7		ND	ND	Y
	8		ND	ND	Y
	9		0.0372	0.0372	Y
	10		0.0456	0.0456	Y
	11		0.0462	0.0462	Y
	12		0.0354	0.0355	Y*
	13		0.0773	0.0773	Y
	14		ND	ND	Y
	15		ND	ND	Y
	16		0.0462	0.0462	Y
	17		0.0389	0.0389	Y
	18		0.0389	0.0389	Y
	19		0.0256	0.0256	Y
	20		0.0292	0.0292	Y

Note: \* Boundary





# CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 05/12/15 15:32

SUBMITTED: 05/05/15 to 05/06/15

AQS SITE

CODE:  
SITE CODE:

Honeywell Hex Chrome Study

Description: OAM 2

Lab ID: 5050538-01

Sampled: 05/01/15 14:40

Matrix: Air

Sample Volume: 21.51 m<sup>3</sup>

Received: 05/05/15 11:32

Comments: Start Time 4/30/15 14:46

Analysis Date: 05/06/15 13:59

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u>	<u>Flag</u>	<u>MDL</u>
		<u>ng/m<sup>3</sup> Air</u>		<u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0149		0.0038

MAY 18 2015

Initials: CR

Eastern Research Group

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Malvern, PA 19355

FILE #: 3926.00  
REPORTED: 05/12/15 15:32  
SUBMITTED: 05/05/15 to 05/06/15  
AQS SITE  
CODE:  
SITE CODE: Honeywell Hex Chrome Study

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495 FAX: (410) 266-8912

<b>Description:</b> PAM-1	<b>Lab ID:</b> 5050538-02	<b>Sampled:</b> 05/01/15 15:20
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.08 m <sup>3</sup>	<b>Received:</b> 05/05/15 11:32
<b>Comments:</b> Col 1 Start Time 4/30/15 15:54		<b>Analysis Date:</b> 05/06/15 12:44

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0110		0.0038

**MAY 18 2015**

Initials: *ER*

Eastern Research Group

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REPORTED: 05/12/15 15:32

SUBMITTED: 05/05/15 to 05/06/15

AQS SITE

CODE:  
SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-1D

Lab ID: 5050538-03

Sampled: 05/01/15 15:18

Matrix: Air

Sample Volume: 21.06 m<sup>3</sup>

Received: 05/05/15 11:32

Comments: Col 2 Start Time 4/30/15 15:54

Analysis Date: 05/06/15 13:03

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u>	<u>Flag</u>	<u>MDL</u>
		<u>ng/m<sup>3</sup> Air</u>		<u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0132		0.0038

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REPORTED: 05/12/15 15:32

SUBMITTED: 05/05/15 to 05/06/15

AQS SITE

CODE:  
SITE CODE:

Honeywell Hex Chrome Study

<b>Description:</b> PAM-2	<b>Lab ID:</b> 5050538-04	<b>Sampled:</b> 05/01/15 15:10
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.29 m <sup>3</sup>	<b>Received:</b> 05/05/15 11:32
<b>Comments:</b> Start Time 4/30/15 15:31		<b>Analysis Date:</b> 05/06/15 14:10

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0107		0.0038

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REPORTED: 05/12/15 15:32

SUBMITTED: 05/05/15 to 05/06/15

AQS SITE

CODE:  
SITE CODE:

Honeywell Hex Chrome Study

<b>Description:</b> PAM-3	<b>Lab ID:</b> 5050538-05	<b>Sampled:</b> 05/01/15 15:02
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.28 m <sup>3</sup>	<b>Received:</b> 05/05/15 11:32
<b>Comments:</b> Start Time 4/30/15 15:23		<b>Analysis Date:</b> 05/06/15 14:42

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0819		0.0038

**MAY 18 2015**

Initials: *CR*

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**FILE #:** 3926.00  
**REPORTED:** 05/12/15 15:32  
**SUBMITTED:** 05/05/15 to 05/06/15

**ATTN:** Mr. Jeff Boggs

**AQS SITE CODE:**  
**SITE CODE:** Honeywell Hex Chrome Study

**PHONE:** (443) 803-8495 **FAX:** (410) 266-8912

<b>Description:</b> PAM-4	<b>Lab ID:</b> 5050538-06	<b>Sampled:</b> 05/01/15 14:53
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.42 m <sup>3</sup>	<b>Received:</b> 05/05/15 11:32
<b>Comments:</b> Start Time 4/30/15 15:05		<b>Analysis Date:</b> 05/06/15 14:53

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	0.0260		0.0038

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FILE #: 3926.00

REPORTED: 05/12/15 15:32

SUBMITTED: 05/05/15 to 05/06/15

AQS SITE

CODE:  
SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-21

Lab ID: 5050538-07

Sampled: 05/01/15 00:00

Matrix: Air

Sample Volume: 21.29 m<sup>3</sup>

Received: 05/05/15 11:32

Comments:

Analysis Date: 05/06/15 15:04

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u>	<u>Flag</u>	<u>MDL</u>
		<u>ng/m<sup>3</sup> Air</u>		<u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0038

MAY 18 2015

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FILE #: 3926.00

REPORTED: 05/12/15 15:32

SUBMITTED: 05/05/15 to 05/06/15

AQS SITE

CODE:  
SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-31

Lab ID: 5050538-08

Sampled: 05/01/15 00:00

Matrix: Air

Sample Volume: 21.28 m<sup>3</sup>

Received: 05/05/15 11:32

Comments:

Analysis Date: 05/06/15 15:14

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0038

MAY 18 2015

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FILE #: 3926.00

REPORTED: 05/12/15 15:32

SUBMITTED: 05/05/15 to 05/06/15

AQS SITE

CODE:  
SITE CODE:

Honeywell Hex Chrome Study

<b>Description:</b> OAM 2	<b>Lab ID:</b> 5050538-09	<b>Sampled:</b> 05/04/15 15:21
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.66 m <sup>3</sup>	<b>Received:</b> 05/05/15 11:32
<b>Comments:</b> Start Time 5/3/15 15:17		<b>Analysis Date:</b> 05/06/15 15:25

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	0.0372		0.0038

MAY 18 2015

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FILE #: 3926.00

REPORTED: 05/12/15 15:32

SUBMITTED: 05/05/15 to 05/06/15

AQS SITE

CODE:  
SITE CODE:

Honeywell Hex Chrome Study

<b>Description:</b> PAM-1	<b>Lab ID:</b> 5050538-10	<b>Sampled:</b> 05/04/15 16:42
<b>Matrix:</b> Air	<b>Sample Volume:</b> 22.2 m <sup>3</sup>	<b>Received:</b> 05/05/15 11:32
<b>Comments:</b> Col 1 Start Time 5/3/15 16:02		<b>Analysis Date:</b> 05/06/15 13:22

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0456		0.0038

MAY 18 2015

Initials: ER

Eastern Research Group

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75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 05/12/15 15:32

SUBMITTED: 05/05/15 to 05/06/15

AQS SITE

CODE:  
SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-1D

Lab ID: 5050538-11

Sampled: 05/04/15 16:41

Matrix: Air

Sample Volume: 22.2 m<sup>3</sup>

Received: 05/05/15 11:32

Comments: Col 2 Start Time 5/3/15 16:01

Analysis Date: 05/06/15 13:41

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u>	<u>Flag</u>	<u>MDL</u>
		<u>ng/m<sup>3</sup> Air</u>		<u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0462		0.0038

MAY 18 2015

Initials: ER

Eastern Research Group

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Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 05/12/15 15:32

SUBMITTED: 05/05/15 to 05/06/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

<b>Description:</b> PAM-2	<b>Lab ID:</b> 5050538-12	<b>Sampled:</b> 05/04/15 16:23
<b>Matrix:</b> Air	<b>Sample Volume:</b> 22.09 m <sup>3</sup>	<b>Received:</b> 05/05/15 11:32
<b>Comments:</b> Start Time 5/3/15 15:50		<b>Analysis Date:</b> 05/06/15 15:36

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0354		0.0038

MAY 18 2015

Initials: *CR*

Eastern Research Group

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FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 05/12/15 15:32

SUBMITTED: 05/05/15 to 05/06/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-4

Lab ID: 5050538-14

Sampled: 05/04/15 15:53

Matrix: Air

Sample Volume: 21.86 m<sup>3</sup>

Received: 05/05/15 11:32

Comments: Start Time 5/3/15 15:36

Analysis Date: 05/06/15 15:46

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u>	<u>Flag</u>	<u>MDL</u>
		<u>ng/m<sup>3</sup> Air</u>		<u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0773		0.0038

MAY 18 2015

Initials: ER

Eastern Research Group

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Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 05/12/15 15:32

SUBMITTED: 05/05/15 to 05/06/15

AQS SITE

CODE:  
SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-21

Lab ID: 5050538-15

Sampled: 05/04/15 00:00

Matrix: Air

Sample Volume: 22.09 m<sup>3</sup>

Received: 05/05/15 11:32

Comments:

Analysis Date: 05/06/15 15:57

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0038

**MAY 18 2015**

Initials: *ER*

Eastern Research Group

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PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 05/12/15 15:32

SUBMITTED: 05/05/15 to 05/06/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-31

Lab ID: 5050538-16

Sampled: 05/04/15 00:00

Matrix: Air

Sample Volume: 22.09 m<sup>3</sup>

Received: 05/05/15 11:32

Comments:

Analysis Date: 05/06/15 16:08

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u>	<u>Flag</u>	<u>MDL</u>
		<u>ng/m<sup>3</sup> Air</u>		<u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0038

MAY 18 2015

Initials: *CR*

Eastern Research Group

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PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 05/12/15 15:32

SUBMITTED: 05/05/15 to 05/06/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

<b>Description:</b> OAM 2	<b>Lab ID:</b> 5050638-01	<b>Sampled:</b> 05/05/15 15:40
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.78 m <sup>3</sup>	<b>Received:</b> 05/06/15 11:31
<b>Comments:</b> Start Time 5/4/15 15:28 Issues w/ delta cal, analyze per client.		<b>Analysis Date:</b> 05/07/15 13:05

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0462		0.0038

MAY 18 2015

Initials: *CR*

Eastern Research Group

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Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 05/12/15 15:32

SUBMITTED: 05/05/15 to 05/06/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-1

Lab ID: 5050638-02

Sampled: 05/05/15 17:46

Matrix: Air

Sample Volume: 22.44 m<sup>3</sup>

Received: 05/06/15 11:31

Comments: Col 1 Start Time 5/4/15 16:50

Analysis Date: 05/07/15 12:27

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u>	<u>Flag</u>	<u>MDL</u>
		<u>ng/m<sup>3</sup> Air</u>		<u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0389		0.0038

MAY 18 2015

Initials: *CR*

Eastern Research Group

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Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 05/12/15 15:32

SUBMITTED: 05/05/15 to 05/06/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-1D

Lab ID: 5050638-03

Sampled: 05/05/15 17:41

Matrix: Air

Sample Volume: 22.39 m<sup>3</sup>

Received: 05/06/15 11:31

Comments: Col 2 Start Time 5/4/15 16:49 Issues w/ delta cal, analyze per client.

Analysis Date: 05/07/15 12:46

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u>	<u>Flag</u>	<u>MDL</u>
		<u>ng/m<sup>3</sup> Air</u>		<u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0389		0.0038

MAY 18 2015

Initials: ER

Eastern Research Group

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Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 05/12/15 15:32

SUBMITTED: 05/05/15 to 05/06/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

<b>Description:</b> PAM-2	<b>Lab ID:</b> 5050638-04	<b>Sampled:</b> 05/05/15 17:09
<b>Matrix:</b> Air	<b>Sample Volume:</b> 22.23 m <sup>3</sup>	<b>Received:</b> 05/06/15 11:31
<b>Comments:</b> Start Time 5/4/15 16:27		<b>Analysis Date:</b> 05/07/15 13:16

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0256		0.0038

MAY 18 2015

Initials: *CR*



# CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc  
75 Valley Stream Parkway, Suite 400  
Malvern, PA 19355

FILE #: 3926.00  
REPORTED: 05/12/15 15:32  
SUBMITTED: 05/05/15 to 05/06/15

ATTN: Mr. Jeff Boggs

AQS SITE  
CODE:  
SITE CODE: Honeywell Hex Chrome Study

PHONE: (443) 803-8495 FAX: (410) 266-8912

<b>Description:</b> PAM-3	<b>Lab ID:</b> 5050638-05	<b>Sampled:</b> 05/05/15 16:50
<b>Matrix:</b> Air	<b>Sample Volume:</b> 22.2 m <sup>3</sup>	<b>Received:</b> 05/06/15 11:31
<b>Comments:</b> Start Time 5/4/15 16:10 Issues w/ delta cal, analyze per client.		<b>Analysis Date:</b> 05/07/15 13:27

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0292		0.0038

MAY 18 2015

Initials: CR

Eastern Research Group

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ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 05/12/15 15:32

SUBMITTED: 05/05/15 to 05/06/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

**Description:** PAM-4

**Lab ID:** 5050638-06

**Sampled:** 05/05/15 16:29

**Matrix:** Air

**Sample Volume:** 22.05 m<sup>3</sup>

**Received:** 05/06/15 11:31

**Comments:** Start Time 5/4/15 15:59 Issues w/ delta cal, analyze per client.

**Analysis Date:** 05/07/15 13:37

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u>	<u>Flag</u>	<u>MDL</u>
		<u>ng/m<sup>3</sup> Air</u>		<u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.162		0.0038

**MAY 18 2015**

Initials: *CR*

Eastern Research Group

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75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 05/12/15 15:32

SUBMITTED: 05/05/15 to 05/06/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-21

Lab ID: 5050638-07

Sampled: 05/05/15 00:00

Matrix: Air

Sample Volume: 22.23 m<sup>3</sup>

Received: 05/06/15 11:31

Comments:

Analysis Date: 05/07/15 13:48

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0038

MAY 18 2015

Initials: CR

Eastern Research Group

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Environmental Resources Management, Inc  
75 Valley Stream Parkway, Suite 400  
Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495 FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 05/12/15 15:32

SUBMITTED: 05/05/15 to 05/06/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

Description: PAM-31

Lab ID: 5050638-08

Sampled: 05/05/15 00:00

Matrix: Air

Sample Volume: 22.2 m<sup>3</sup>

Received: 05/06/15 11:31

Comments:

Analysis Date: 05/07/15 13:59

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0038

**MAY 18 2015**

Initials: *ER*

Eastern Research Group

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**LABORATORY DATA CONSULTANTS, INC.**

2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

ERM  
5761 N. Church Street  
Glen Rock, PA 17327  
ATTN: Mr. Jeff Boggs

May 7, 2015

SUBJECT: Harbor Point, MD, Hexavalent Chromium Monitoring, Data Validation

Dear Mr. Boggs,

Enclosed is the final validation report for the fraction listed below. This SDG was received on May 6, 2015. Attachment 1 is a summary of the samples that were reviewed for each analysis.

**LDC Project #34219:**

**SDG**

**Fraction**

5042920/5043012/5050103 Hexavalent Chromium

The data validation was performed under EPA Level IV guidelines. The analyses were validated using the following documents, as applicable to each method:

- Air Monitoring Program Quality Assurance Project Plan, Area 1, Phase 1 Development, Version 1, Baltimore Works Site, Baltimore, Maryland, March 2014
- USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, January 2010

Please feel free to contact us if you have any questions.

Sincerely,

Christina Rink  
Project Manager/Chemist



## Laboratory Data Consultants, Inc. Data Validation Report

**Project/Site Name:** Harbor Point, MD, Hexavalent Chromium Monitoring  
**Collection Date:** April 27 through April 30, 2015  
**LDC Report Date:** May 7, 2015  
**Matrix:** Air  
**Parameters:** Hexavalent Chromium  
**Validation Level:** EPA Level IV  
**Laboratory:** Eastern Research Group  
**Sample Delivery Group (SDG):** 5042920/5043012/5050103

### Sample Identification

OAM 1(04/27/15)	PAM-1(04/29/15)
OAM 2(04/27/15)	PAM-2(04/29/15)
PAM-1(04/27/15)	PAM-3(04/29/15)
PAM-1D(04/27/15)	PAM-4(04/29/15)
PAM-2(04/27/15)	PAM-21(04/29/15)
PAM-3(04/27/15)	PAM-31(04/29/15)
PAM-4(04/27/15)	OAM 1(04/30/15)
PAM-21(04/27/15)	OAM 2(04/30/15)
PAM-31(04/27/15)	PAM-1(04/30/15)
OAM 1(04/28/15)	PAM-1D(04/30/15)
OAM 2(04/28/15)	PAM-2(04/30/15)
PAM-1(04/28/15)	PAM-3(04/30/15)
PAM-1D(04/28/15)	PAM-4(04/30/15)
PAM-2(04/28/15)	PAM-21(04/30/15)
PAM-3(04/28/15)	PAM-31(04/30/15)
PAM-4(04/28/15)	PAM-1(04/27/15)DUP
PAM-21(04/28/15)	PAM-1D(04/27/15)DUP
PAM-31(04/28/15)	PAM-1(04/28/15)DUP
OAM 1(04/29/15)	PAM-1D(04/28/15)DUP
OAM 2(04/29/15)	PAM-1(04/29/15)DUP
	PAM-1(04/30/15)DUP
	PAM-1D(04/30/15)DUP

The date was appended to the sample ID to differentiate between samples.

## Introduction

This data review covers 42 air samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per ASTM D7614 for Hexavalent Chromium.

This review follows the Air Monitoring Program Quality Assurance Project Plan, Area 1, Phase 1 Development, Version 1, Baltimore Works Site, Baltimore, Maryland (March 2014) and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

## **I. Technical Holding Times**

All technical holding time requirements were met.

## **II. Initial Calibration**

All criteria for the initial calibration were met.

## **III. Continuing Calibration**

Continuing calibration frequency and analysis criteria were met.

## **IV. Blanks**

Method blanks were reviewed for each matrix as applicable. No hexavalent chromium was found in the method blanks.

Samples PAM-31(04/27/15), PAM-31(04/28/15), PAM-31(04/29/15), and PAM-31(04/30/15) were identified as trip blanks. No hexavalent chromium was found.

Samples PAM-21(04/27/15), PAM-21(04/28/15), PAM-21(04/29/15), and PAM-21(04/30/15) were identified as field blanks. No hexavalent chromium was found.

## **V. Matrix Spike/Matrix Spike Duplicates**

Matrix spike (MS) and matrix spike duplicate (MSD) analysis was not required by the method.

## **VI. Duplicates**

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Relative percent differences (RPD) were within QC limits.

## **VII. Laboratory Control Samples**

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

## **VIII. Sample Result Verification**

All sample result verifications were acceptable.

## **IX. Overall Assessment of Data**

Data flags are summarized at the end of this report if data has been qualified.

## X. Field Duplicates

Samples PAM-1(04/27/15) and PAM-1D(04/27/15), samples PAM-1(04/28/15) and PAM-1D(04/28/15), samples PAM-1(04/29/15) and PAM-1D(04/29/15), and samples PAM-1(04/30/15) and PAM-1D(04/30/15) were identified as field duplicates. No hexavalent chromium was detected in any of the samples with the following exceptions:

Analyte	Concentration (ng/m <sup>3</sup> )		RPD (Limits)	Flags	A or P
	PAM-1(04/27/15)	PAM-1D(04/27/15)			
Hexavalent chromium	0.0567	0.0529	7 (≤20)	-	-

Analyte	Concentration (ng/m <sup>3</sup> )		RPD (Limits)	Flags	A or P
	PAM-1(04/28/15)	PAM-1D(04/28/15)			
Hexavalent chromium	0.0231	0.0092	86 (≤20)	NQ	-

Analyte	Concentration (ng/m <sup>3</sup> )		RPD (Limits)	Flags	A or P
	PAM-1(04/29/15)	PAM-1D(04/29/15)			
Hexavalent chromium	0.0387	0.0326	17 (≤20)	-	-

Analyte	Concentration (ng/m <sup>3</sup> )		RPD (Limits)	Flags	A or P
	PAM-1(04/30/15)	PAM-1D(04/30/15)			
Hexavalent chromium	0.0286	0.0320	11 (≤20)	-	-

NQ = One or both results were < 5x the minimum detection limit, therefore no data were qualified.

**Harbor Point, MD, Hexavalent Chromium Monitoring  
Hexavalent Chromium - Data Qualification Summary - SDG  
5042920/5043012/5050103**

No Sample Data Qualified Due to QA/QC Exceedances in this SDG

**Harbor Point, MD, Hexavalent Chromium Monitoring  
Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG  
5042920/5043012/5050103**

No Sample Data Qualified Due to Laboratory Blank Contamination in this  
SDG

**Harbor Point, MD, Hexavalent Chromium Monitoring  
Hexavalent Chromium - Field Blank Data Qualification Summary - SDG  
5042920/5043012/5050103**

No Sample Data Qualified Due to Field Blank Contamination in this SDG

**METHOD: (Analyte) Hexavalent Chromium (ASTM D7614)**

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	4/27-30/15
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Laboratory Blanks	A	
V	Field blanks	ND	FB=(8)(17)(25)(33) TB=(9)(18)(26)(31)
VI.	Matrix Spike/Matrix Spike Duplicates	N	Not Required
VII.	Duplicate sample analysis	A	DUP
VIII.	Laboratory control samples	A	LCSD
IX.	Field duplicates	SW	FD=(3,4)(12,13)(20,21)(28,29)
X.	Sample result verification	A	
XI	Overall assessment of data	A	

Note: A = Acceptable      ND = No compounds detected      D = Duplicate      SB=Source blank  
 N = Not provided/applicable      R = Rinsate      TB = Trip blank      OTHER:  
 SW = See worksheet      FB = Field blank      EB = Equipment blank

	Client ID	Lab ID	Matrix	Date
1	OAM 1 (04/27/15)	5042920-01	Air	04/27/15
2	OAM 2 (04/27/15)	5042920-02	Air	04/27/15
3	PAM-1 (04/27/15)	5042920-03	Air	04/27/15
4	PAM-1D (04/27/15)	5042920-04	Air	04/27/15
5	PAM-2 (04/27/15)	5042920-05	Air	04/27/15
6	PAM-3 (04/27/15)	5042920-06	Air	04/27/15
7	PAM-4 (04/27/15)	5042920-07	Air	04/27/15
8	PAM-21 (04/27/15)	5042920-08	Air	04/27/15
9	PAM-31 (04/27/15)	5042920-09	Air	04/27/15
10	OAM 1 (04/28/15)	5042920-10	Air	04/28/15
11	OAM 2 (04/28/15)	5042920-11	Air	04/28/15
12	PAM-1 (04/28/15)	5042920-12	Air	04/28/15
13	PAM-1D (04/28/15)	5042920-13	Air	04/28/15
14	PAM-2 (04/28/15)	5042920-14	Air	04/28/15
15	PAM-3 (04/28/15)	5042920-15	Air	04/28/15
16	PAM-4 (04/28/15)	5042920-16	Air	04/28/15
17	PAM-21 (04/28/15)	5042920-17	Air	04/28/15

LDC #: 34219A6

### VALIDATION COMPLETENESS WORKSHEET

Date: 5/6/15

SDG #: 5042920/5043012/5050103

Level IV

Page: 2 of 2

Laboratory: Eastern Research Group

Reviewer: [Signature]

2nd Reviewer: [Signature]

**METHOD: (Analyte) Hexavalent Chromium (ASTM D7614)**

	Client ID	Lab ID	Matrix	Date
18	PAM-31 (04/28/15)	5042920-18	Air	04/28/15
19	OAM 2 (04/29/15)	5043012-01	Air	04/29/19
20	PAM-1 (04/29/15)	5043012-02	Air	04/29/19
21	PAM-1D (04/29/15)	5043012-03	Air	04/29/19
22	PAM-2 (04/29/15)	5043012-04	Air	04/29/19
23	PAM-3 (04/29/15)	5043012-05	Air	04/29/19
24	PAM-4 (04/29/15)	5043012-06	Air	04/29/19
25	PAM-21 (04/29/15)	5043012-07	Air	04/29/19
26	PAM-31 (04/29/15)	5043012-08	Air	04/29/19
27	OAM 2 (04/30/15)	5050103-01	Air	04/30/15
28	PAM-1 (04/30/15)	5050103-02	Air	04/30/15
29	PAM-1D (04/30/15)	5050103-03	Air	04/30/15
30	PAM-2 (04/30/15)	5050103-04	Air	04/30/15
31	PAM-3 (04/30/15)	5050103-05	Air	04/30/15
32	PAM-4 (04/30/15)	5050103-06	Air	04/30/15
33	PAM-21 (04/30/15)	5050103-07	Air	04/30/15
34	PAM-31 (04/30/15)	5050103-08	Air	04/30/15
35	PAM-1 (04/27/15)DUP	5042920-03DUP	Air	04/27/15
36	PAM-1D (04/27/15)DUP	5042920-04DUP	Air	04/27/15
37	PAM-1 (04/28/15)DUP	5042920-12DUP	Air	04/28/15
38	PAM-1D (04/28/15)DUP	5042920-13DUP	Air	04/28/15
39	PAM-1 (04/29/15)DUP	5043012-02DUP	Air	04/29/19
40	PAM-1D (04/29/15)DUP	5043012-03DUP	Air	04/29/19
41	PAM-1 (04/30/15)DUP	5050103-02DUP	Air	04/30/15
42	PAM-1D (04/30/15)DUP	5050103-03DUP	Air	04/30/15
43				
44				
45				
46				
47				

Notes: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Method: Inorganics (EPA Method See Cover)

Validation Area	Yes	No	NA	Findings/Comments
<b>I. Technical holding times</b>				
All technical holding times were met.	/			
Cooler temperature criteria was met.	/			
<b>II. Calibration</b>				
Were all instruments calibrated daily, each set-up time?	/			
Were the proper number of standards used?	/			
Were all initial calibration correlation coefficients $\geq 0.995$ ?	/			
Were all initial and continuing calibration verification %Rs within the <del>90-110%</del> QC limits? <u>JD 85-115</u>	/			
Were titrant checks performed as required? (Level IV only)			/	
Were balance checks performed as required? (Level IV only)			/	
<b>III. Blanks</b>				
Was a method blank associated with every sample in this SDG?	/			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		/		
<b>IV. Matrix spike/Matrix spike duplicates and Duplicates</b>				
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	/			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.			/	
<u>Airs</u> Were the MS/MSD or duplicate relative percent differences (RPD) $\leq 20\%$ for <del>waters</del> and $\leq 35\%$ for soil samples? A control limit of $\leq CRDL$ ( $\leq 2X$ CRDL for soil) was used for samples that were $\leq 5X$ the CRDL, including when only one of the duplicate sample values were $\leq 5X$ the CRDL.	/			
<b>V. Laboratory control samples</b>				
Was an LCS analyzed for this SDG?	/			
Was an LCS analyzed per extraction batch?	/			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% (85-115% for Method 300.0) QC limits?	/			
<b>VI. Regional Quality Assurance and Quality Control</b>				
Were performance evaluation (PE) samples performed?			/	
Were the performance evaluation (PE) samples within the acceptance limits?			/	

VALIDATION FINDINGS CHECKLIST

Validation Area	Yes	No	NA	Findings/Comments
<b>VII. Sample Result Verification</b>				
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	/			
Were detection limits < RL?	/			
<b>VIII. Overall assessment of data</b>				
Overall assessment of data was found to be acceptable.	/			
<b>IX. Field duplicates</b>				
Field duplicate pairs were identified in this SDG.	/			
Target analytes were detected in the field duplicates.	/			
<b>X. Field blanks</b>				
Field blanks were identified in this SDG.	/	/		
Target analytes were detected in the field blanks.		/		

**VALIDATION FINDINGS WORKSHEET**  
**Field Duplicates**

**Inorganics:** Method See Cover

Analyte	Concentration (ng/m3)		RPD (≤20)	Qual.
	3	4		
Hexavalent Chromium	0.0567	0.0529	7	

Analyte	Concentration (ng/m3)		RPD (≤20)	Qual.
	12	13		
Hexavalent Chromium	0.0231	0.0092	86	NQ

Analyte	Concentration (ng/m3)		RPD (≤20)	Qual.
	20	21		
Hexavalent Chromium	0.0387	0.0326	17	

Analyte	Concentration (ng/m3)		RPD (≤20)	Qual.
	28	29		
Hexavalent Chromium	0.0286	0.0320	11	

NQ = No Qual. because one or both samples <5X MDL  
 \\LDCFILESERVER\Validation\FIELD DUPLICATES\FD\_inorganic\34219A6.wpd

LDC #: 3429AD

**Validation Findings Worksheet**  
**Initial and Continuing Calibration Calculation Verification**

Page: 1 of 1

Reviewer: SD

2nd Reviewer: [Signature]

**Method:** Inorganics, Method See Cover

The correlation coefficient (r) for the calibration of Cr<sup>+6</sup> was recalculated. Calibration date: 4/30/15

An initial or continuing calibration verification percent recovery (%R) was recalculated for each type of analysis using the following formula:

$$\%R = \frac{\text{Found} \times 100}{\text{True}}$$

Where,

Found = concentration of each analyte measured in the analysis of the ICV or CCV solution

True = concentration of each analyte in the ICV or CCV source

Type of analysis	Analyte	Standard	Conc. (ng/ml)	Area	Recalculated	Reported	Acceptable (Y/N)
					r or r <sup>2</sup>	r or r <sup>2</sup>	
Initial calibration	Cr <sup>+6</sup>	s1	0.05	0.0452923	0.99982	0.99982	Y
		s2	0.1	0.0980948			
		s3	0.2	0.1485923			
		s4	0.5	0.396203			
		s5	1	0.7651555			
		s6	2	1.5579079			
ICV 11:07 Calibration verification	Cr <sup>+6</sup>	<u>Found</u> 0.5069 ng/ml	<u>True</u> 0.5 ng/ml		101.4%R	101.4%R	Y
CCV 12:11 Calibration verification	Cr <sup>+6</sup>	0.5068 ng/ml	0.5 ng/ml		101.6%R	101.6%R	Y
Calibration verification							

Comments: Refer to Calibration Verification findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 3429A

**VALIDATION FINDINGS WORKSHEET**  
**Level IV Recalculation Worksheet**

Page: 1 of 1  
 Reviewer: JD  
 2nd Reviewer: [Signature]

**METHOD:** Inorganics, Method See Cover

Percent recoveries (%R) for a laboratory control sample and a matrix spike sample were recalculated using the following formula:

$\%R = \frac{\text{Found}}{\text{True}} \times 100$  Where, Found = concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation, Found = SSR (spiked sample result) - SR (sample result).  
 True = concentration of each analyte in the source.

A sample and duplicate relative percent difference (RPD) was recalculated using the following formula:

$RPD = \frac{|S-D|}{(S+D)/2} \times 100$  Where, S = Original sample concentration  
 D = Duplicate sample concentration

Sample ID	Type of Analysis	Element	Found / S (units)	True / D (units)	Recalculated	Reported	Acceptable (Y/N)
					%R / RPD	%R / RPD	
LCS 11:39	Laboratory control sample	Cu <sup>2+</sup>	1.08 ng/ml	1.00 ng/ml	108%R	108%R	Y
N	Matrix spike sample	↓	(SSR-SR)				
DUP 12:43	Duplicate sample	↓	0.0594 ng/m <sup>3</sup>	0.0567 ng/m <sup>3</sup>	4.65%RPD	4.57%RPD	Y*

Comments: \*Rounding

**VALIDATION FINDINGS WORKSHEET**  
**Sample Calculation Verification**

**METHOD:** Inorganics, Method See Cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

- Y N N/A Have results been reported and calculated correctly?
- Y N N/A Are results within the calibrated range of the instruments?
- Y N N/A Are all detection limits below the CRQL?

Compound (analyte) results for (1) Cr<sup>6+</sup> reported with a positive detect were recalculated and verified using the following equation:

Concentration =  $(A - C_0) / C_1$      $UF = 10 \text{ ml}$     Recalculation:  $\frac{0.0133997 - (5.99E-03)}{0.7728054} = 0.00959 \text{ ng/ml}$   
 $m^3 = 21.18$   
 $A = 0.0133997$   
 $C_0 = 5.99E-03$   
 $C_1 = 0.7728054$   
 $\frac{(ng/ml)(UF)}{m^3} = ng/m^3$      $\frac{(0.00959 \text{ ng/ml})(10 \text{ ml})}{21.18 \text{ m}^3} = 0.0045 \text{ ng/m}^3$

#	Sample ID	Analyte	Reported Concentration (ng/m <sup>3</sup> )	Calculated Concentration (ng/m <sup>3</sup> )	Acceptable (Y/N)	
	1	Cr <sup>6+</sup>	0.0045	0.0045	Y	
	2	↓	0.0117	0.0117	↓	
	3		0.0567	0.0567		
	4		0.0529	0.0529		
	5		0.0320	0.0320		
	6		0.0125	0.0125		
	7		0.306	0.306		
	8		ND	ND		
	9		ND	ND		
	10		ND	ND		
	11		0.0042	0.0042		
	12		0.0231	0.0231		
	13		0.0092	0.0092		
	14		0.0545	0.0545		
	15		0.0115	0.0115		
	16		0.240	0.240		
	17		ND	ND		
	18		ND	ND		
	19		0.0182	0.0182		
	20		0.0387	0.0387		↓

Note: \_\_\_\_\_

**VALIDATION FINDINGS WORKSHEET**  
**Sample Calculation Verification**

METHOD: Inorganics, Method See Cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

- Y N N/A Have results been reported and calculated correctly?
- Y N N/A Are results within the calibrated range of the instruments?
- Y N N/A Are all detection limits below the CRQL?

Compound (analyte) results for (22) Cr<sup>6+</sup> reported with a positive detect were recalculated and verified using the following equation:

Concentration =  $(A - C_0) / C_1$        $V_f = 10 \text{ ml}$       Recalculation:  $\frac{0.055281 - (8.47E-03)}{0.7680001} = 0.06095 \text{ ng/ml}$

$A = 0.055281$        $m^3 = 20.81$        $\frac{(0.06095 \text{ ng/ml})(10 \text{ ml})}{20.81 \text{ m}^3} = 0.0293 \text{ ng/m}^3$

$C_0 = 8.47E-03$

$C_1 = 0.7680001$

#	Sample ID	Analyte	Reported Concentration (ng/m <sup>3</sup> )	Calculated Concentration (ng/m <sup>3</sup> )	Acceptable (Y/N)
	21	Cr <sup>6+</sup>	0.0320	0.0320	Y
	22		0.0293	0.0293	↓
	23		0.0179	0.0179	
	24		0.234	0.234	
	25		ND	ND	
	26		ND	ND	
	27		0.0232	0.0232	
	28		0.0286	0.0286	
	29		0.0320	0.0320	↓
	30		0.0402	0.0401	Y*
	31		0.0446	0.0446	Y
	32		0.0493	0.0492	Y*
	33		ND	ND	Y
	34		ND	ND	↓

Note: \_\_\_\_\_



# CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 05/06/15 15:05

SUBMITTED: 04/29/15 to 05/01/15

AQS SITE

CODE:  
SITE CODE:

Honeywell Hex Chrome Study

Description: OAM 1

Lab ID: 5042920-01

Sampled: 04/27/15 16:14

Matrix: Air

Sample Volume: 21.18 m<sup>3</sup>

Received: 04/29/15 11:23

Comments: Start Time 4/25/15 17:09

Analysis Date: 04/30/15 14:00

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0045		0.0038

**MAY 07 2015**

Initials: *ER*

Eastern Research Group

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REPORTED: 05/06/15 15:05

SUBMITTED: 04/29/15 to 05/01/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: OAM 2

Lab ID: 5042920-02

Sampled: 04/27/15 16:47

Matrix: Air

Sample Volume: 20.8 m<sup>3</sup>

Received: 04/29/15 11:23

Comments: Start Time 4/25/15 17:40

Analysis Date: 04/30/15 14:10

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0117		0.0038

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REPORTED: 05/06/15 15:05

SUBMITTED: 04/29/15 to 05/01/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-1

Lab ID: 5042920-03

Sampled: 04/27/15 17:47

Matrix: Air

Sample Volume: 20.75 m<sup>3</sup>

Received: 04/29/15 11:23

Comments: Col 1 Start Time 4/25/15 18:44

Analysis Date: 04/30/15 12:32

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0567		0.0038

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REPORTED: 05/06/15 15:05

SUBMITTED: 04/29/15 to 05/01/15

AQS SITE

CODE:  
SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-1D

Lab ID: 5042920-04

Sampled: 04/27/15 17:48

Matrix: Air

Sample Volume: 20.72 m<sup>3</sup>

Received: 04/29/15 11:23

Comments: Col 2 Start Time 4/25/15 18:47

Analysis Date: 04/30/15 12:51

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u>	<u>Flag</u>	<u>MDL</u>
		<u>ng/m<sup>3</sup> Air</u>		<u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0529		0.0038

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REPORTED: 05/06/15 15:05

SUBMITTED: 04/29/15 to 05/01/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-2

Lab ID: 5042920-05

Sampled: 04/27/15 17:35

Matrix: Air

Sample Volume: 20.82 m<sup>3</sup>

Received: 04/29/15 11:23

Comments: Start Time 4/25/15 18:27

Analysis Date: 04/30/15 14:43

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u>	<u>Flag</u>	<u>MDL</u>
		<u>ng/m<sup>3</sup> Air</u>		<u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0320		0.0038

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REPORTED: 05/06/15 15:05

SUBMITTED: 04/29/15 to 05/01/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

<b>Description:</b> PAM-3	<b>Lab ID:</b> 5042920-06	<b>Sampled:</b> 04/27/15 17:24
<b>Matrix:</b> Air	<b>Sample Volume:</b> 20.83 m <sup>3</sup>	<b>Received:</b> 04/29/15 11:23
<b>Comments:</b> Start Time 4/25/15 18:16		<b>Analysis Date:</b> 04/30/15 14:53

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0125		0.0038

MAY 07 2015

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FILE #: 3926.00

REPORTED: 05/06/15 15:05

SUBMITTED: 04/29/15 to 05/01/15

AQS SITE

CODE:  
SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-4

Lab ID: 5042920-07

Sampled: 04/27/15 17:18

Matrix: Air

Sample Volume: 20.95 m<sup>3</sup>

Received: 04/29/15 11:23

Comments: Start Time 4/25/15 18:02

Analysis Date: 04/30/15 15:04

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.306		0.0038

**MAY 07 2015**

Initials: *CR*

Eastern Research Group

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FILE #: 3926.00

REPORTED: 05/06/15 15:05

SUBMITTED: 04/29/15 to 05/01/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-21

Lab ID: 5042920-08

Sampled: 04/27/15 00:00

Matrix: Air

Sample Volume: 20.82 m<sup>3</sup>

Received: 04/29/15 11:23

Comments:

Analysis Date: 04/30/15 15:15

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0038

**MAY 07 2015**

Initials: *ER*

Eastern Research Group

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FILE #: 3926.00

REPORTED: 05/06/15 15:05

SUBMITTED: 04/29/15 to 05/01/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-31

Lab ID: 5042920-09

Sampled: 04/27/15 00:00

Matrix: Air

Sample Volume: 20.83 m<sup>3</sup>

Received: 04/29/15 11:23

Comments:

Analysis Date: 04/30/15 15:25

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u>	<u>Flag</u>	<u>MDL</u>
		<u>ng/m<sup>3</sup> Air</u>		<u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0038

MAY 07 2015

Initials: *CR*

Eastern Research Group

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# CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 05/06/15 15:05

SUBMITTED: 04/29/15 to 05/01/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

<b>Description:</b> OAM 1	<b>Lab ID:</b> 5042920-10	<b>Sampled:</b> 04/28/15 15:16
<b>Matrix:</b> Air	<b>Sample Volume:</b> 20.71 m <sup>3</sup>	<b>Received:</b> 04/29/15 11:23
<b>Comments:</b> Start Time 4/27/15 16:17		<b>Analysis Date:</b> 04/30/15 15:36

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0014	U	0.0038

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FILE #: 3926.00

REPORTED: 05/06/15 15:05

SUBMITTED: 04/29/15 to 05/01/15

AQS SITE

CODE:  
SITE CODE:

Honeywell Hex Chrome Study

Description: OAM 2

Lab ID: 5042920-11

Sampled: 04/28/15 15:49

Matrix: Air

Sample Volume: 20.7 m<sup>3</sup>

Received: 04/29/15 11:23

Comments: Start Time 4/27/15 16:49

Analysis Date: 04/30/15 15:47

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0042		0.0038

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FILE #: 3926.00

REPORTED: 05/06/15 15:05

SUBMITTED: 04/29/15 to 05/01/15

AQS SITE

CODE:  
SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-1

Lab ID: 5042920-12

Sampled: 04/28/15 16:50

Matrix: Air

Sample Volume: 20.71 m<sup>3</sup>

Received: 04/29/15 11:23

Comments: Col 1 Start Time 4/27/15 17:50

Analysis Date: 04/30/15 13:10

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0231		0.0038

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FILE #: 3926.00

REPORTED: 05/06/15 15:05

SUBMITTED: 04/29/15 to 05/01/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-1D

Lab ID: 5042920-13

Sampled: 04/28/15 16:51

Matrix: Air

Sample Volume: 20.7 m<sup>3</sup>

Received: 04/29/15 11:23

Comments: Col 2 Start Time 4/27/15 17:51

Analysis Date: 04/30/15 13:29

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0092		0.0038

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FILE #: 3926.00

REPORTED: 05/06/15 15:05

SUBMITTED: 04/29/15 to 05/01/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-2

Lab ID: 5042920-14

Sampled: 04/28/15 16:38

Matrix: Air

Sample Volume: 20.7 m<sup>3</sup>

Received: 04/29/15 11:23

Comments: Start Time 4/27/15 17:38

Analysis Date: 04/30/15 15:57

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0545		0.0038

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REPORTED: 05/06/15 15:05

SUBMITTED: 04/29/15 to 05/01/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-3

Lab ID: 5042920-15

Sampled: 04/28/15 16:28

Matrix: Air

Sample Volume: 20.72 m<sup>3</sup>

Received: 04/29/15 11:23

Comments: Start Time 4/27/15 17:27

Analysis Date: 04/30/15 16:08

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u>	<u>Flag</u>	<u>MDL</u>
		<u>ng/m<sup>3</sup> Air</u>		<u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0115		0.0038

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FILE #: 3926.00

REPORTED: 05/06/15 15:05

SUBMITTED: 04/29/15 to 05/01/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-4

Lab ID: 5042920-16

Sampled: 04/28/15 16:22

Matrix: Air

Sample Volume: 20.7 m<sup>3</sup>

Received: 04/29/15 11:23

Comments: Start Time 4/27/15 17:22

Analysis Date: 04/30/15 16:19

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u>	<u>Flag</u>	<u>MDL</u>
		<u>ng/m<sup>3</sup> Air</u>		<u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.240		0.0038

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FILE #: 3926.00

REPORTED: 05/06/15 15:05

SUBMITTED: 04/29/15 to 05/01/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-21

Lab ID: 5042920-17

Sampled: 04/28/15 00:00

Matrix: Air

Sample Volume: 20.7 m<sup>3</sup>

Received: 04/29/15 11:23

Comments:

Analysis Date: 04/30/15 16:51

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0038

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FILE #: 3926.00

REPORTED: 05/06/15 15:05

SUBMITTED: 04/29/15 to 05/01/15

AQS SITE

CODE:  
SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-31

Lab ID: 5042920-18

Sampled: 04/28/15 00:00

Matrix: Air

Sample Volume: 20.72 m<sup>3</sup>

Received: 04/29/15 11:23

Comments:

Analysis Date: 04/30/15 17:02

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0038

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FILE #: 3926.00

REPORTED: 05/06/15 15:05

SUBMITTED: 04/29/15 to 05/01/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: OAM 2

Lab ID: 5043012-01

Sampled: 04/29/15 15:06

Matrix: Air

Sample Volume: 20.92 m<sup>3</sup>

Received: 04/30/15 10:56

Comments: Start Time 4/28/15 15:51

Analysis Date: 05/04/15 13:51

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u>	<u>Flag</u>	<u>MDL</u>
		<u>ng/m<sup>3</sup> Air</u>		<u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0182		0.0038

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FILE #: 3926.00

REPORTED: 05/06/15 15:05

SUBMITTED: 04/29/15 to 05/01/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-1

Lab ID: 5043012-02

Sampled: 04/29/15 15:59

Matrix: Air

Sample Volume: 20.82 m<sup>3</sup>

Received: 04/30/15 10:56

Comments: Col 1 Start Time 4/28/15 16:51

Analysis Date: 05/04/15 12:36

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u>	<u>Flag</u>	<u>MDL</u>
		<u>ng/m<sup>3</sup> Air</u>		<u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0387		0.0038

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FILE #: 3926.00

REPORTED: 05/06/15 15:05

SUBMITTED: 04/29/15 to 05/01/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

<b>Description:</b> PAM-1D	<b>Lab ID:</b> 5043012-03	<b>Sampled:</b> 04/29/15 16:01
<b>Matrix:</b> Air	<b>Sample Volume:</b> 20.82 m <sup>3</sup>	<b>Received:</b> 04/30/15 10:56
<b>Comments:</b> Col 2 Start Time 4/28/15 16:52		<b>Analysis Date:</b> 05/04/15 12:55

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	0.0326		0.0038

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FILE #: 3926.00

REPORTED: 05/06/15 15:05

SUBMITTED: 04/29/15 to 05/01/15

AQS SITE

CODE:  
SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-2

Lab ID: 5043012-04

Sampled: 04/29/15 15:46

Matrix: Air

Sample Volume: 20.81 m<sup>3</sup>

Received: 04/30/15 10:56

Comments: Start Time 4/28/15 16:39

Analysis Date: 05/04/15 14:02

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u>	<u>Flag</u>	<u>MDL</u>
		<u>ng/m<sup>3</sup> Air</u>		<u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0293		0.0038

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FILE #: 3926.00

REPORTED: 05/06/15 15:05

SUBMITTED: 04/29/15 to 05/01/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-3

Lab ID: 5043012-05

Sampled: 04/29/15 15:37

Matrix: Air

Sample Volume: 20.8 m<sup>3</sup>

Received: 04/30/15 10:56

Comments: Start Time 4/28/15 16:31

Analysis Date: 05/04/15 14:34

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0179		0.0038

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FILE #: 3926.00

REPORTED: 05/06/15 15:05

SUBMITTED: 04/29/15 to 05/01/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-4

Lab ID: 5043012-06

Sampled: 04/29/15 15:32

Matrix: Air

Sample Volume: 20.84 m<sup>3</sup>

Received: 04/30/15 10:56

Comments: Start Time 4/28/15 16:23

Analysis Date: 05/04/15 14:45

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.234		0.0038

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FILE #: 3926.00

REPORTED: 05/06/15 15:05

SUBMITTED: 04/29/15 to 05/01/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-21

Lab ID: 5043012-07

Sampled: 04/29/15 00:00

Matrix: Air

Sample Volume: 20.81 m<sup>3</sup>

Received: 04/30/15 10:56

Comments:

Analysis Date: 05/04/15 14:55

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0038

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FILE #: 3926.00

REPORTED: 05/06/15 15:05

SUBMITTED: 04/29/15 to 05/01/15

AQS SITE

CODE:  
SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-31

Lab ID: 5043012-08

Sampled: 04/29/15 00:00

Matrix: Air

Sample Volume: 20.8 m<sup>3</sup>

Received: 04/30/15 10:56

Comments:

Analysis Date: 05/04/15 15:06

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0038

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FILE #: 3926.00

REPORTED: 05/06/15 15:05

SUBMITTED: 04/29/15 to 05/01/15

AQS SITE

CODE: Honeywell Hex Chrome Study  
SITE CODE:

<b>Description:</b> OAM 2	<b>Lab ID:</b> 5050103-01	<b>Sampled:</b> 04/30/15 14:42
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.19 m <sup>3</sup>	<b>Received:</b> 05/01/15 10:49
<b>Comments:</b> Start Time 4/29/15 15:10		<b>Analysis Date:</b> 05/04/15 15:17

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0232		0.0038

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REPORTED: 05/06/15 15:05

SUBMITTED: 04/29/15 to 05/01/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-1

Lab ID: 5050103-02

Sampled: 04/30/15 15:52

Matrix: Air

Sample Volume: 21.42 m<sup>3</sup>

Received: 05/01/15 10:49

Comments: Col 1 Start Time 4/29/15 16:04

Analysis Date: 05/04/15 13:14

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0286		0.0038

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FILE #: 3926.00

REPORTED: 05/06/15 15:05

SUBMITTED: 04/29/15 to 05/01/15

AQS SITE

CODE: Honeywell Hex Chrome Study  
SITE CODE:

Description: PAM-1D

Lab ID: 5050103-03

Sampled: 04/30/15 15:51

Matrix: Air

Sample Volume: 21.39 m<sup>3</sup>

Received: 05/01/15 10:49

Comments: Col 2 Start Time 4/29/15 16:05

Analysis Date: 05/04/15 13:32

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0320		0.0038

MAY 07 2015

Initials: ER



# CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 05/06/15 15:05

SUBMITTED: 04/29/15 to 05/01/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-2

Lab ID: 5050103-04

Sampled: 04/30/15 15:28

Matrix: Air

Sample Volume: 21.27 m<sup>3</sup>

Received: 05/01/15 10:49

Comments: Start Time 4/29/15 15:50

Analysis Date: 05/04/15 15:28

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0402		0.0038

MAY 07 2015

Initials: *ER*



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Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 05/06/15 15:05

SUBMITTED: 04/29/15 to 05/01/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-3

Lab ID: 5050103-05

Sampled: 04/30/15 15:20

Matrix: Air

Sample Volume: 21.3 m<sup>3</sup>

Received: 05/01/15 10:49

Comments: Start Time 4/29/15 15:40

Analysis Date: 05/04/15 15:38

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0446		0.0038

MAY 07 2015

Initials: ER

Eastern Research Group

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FILE #: 3926.00

REPORTED: 05/06/15 15:05

SUBMITTED: 04/29/15 to 05/01/15

AQS SITE

CODE: Honeywell Hex Chrome Study  
SITE CODE:

<b>Description:</b> PAM-4	<b>Lab ID:</b> 5050103-06	<b>Sampled:</b> 04/30/15 15:02
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.09 m <sup>3</sup>	<b>Received:</b> 05/01/15 10:49
<b>Comments:</b> Start Time 4/29/15 15:36		<b>Analysis Date:</b> 05/04/15 15:49

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0493		0.0038

**MAY 07 2015**

Initials: *ER*

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Malvern, PA 19355

ATTN: Mr. Jeff Boggs

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FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 05/06/15 15:05

SUBMITTED: 04/29/15 to 05/01/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

**Description:** PAM-21

**Lab ID:** 5050103-07

**Sampled:** 04/30/15 00:00

**Matrix:** Air

**Sample Volume:** 21.27 m<sup>3</sup>

**Received:** 05/01/15 10:49

**Comments:**

**Analysis Date:** 05/04/15 16:00

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0038

**MAY 07 2015**

Initials: *ER*



# CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 05/06/15 15:05

SUBMITTED: 04/29/15 to 05/01/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

Description: PAM-31

Lab ID: 5050103-08

Sampled: 04/30/15 00:00

Matrix: Air

Sample Volume: 21.3 m<sup>3</sup>

Received: 05/01/15 10:49

Comments:

Analysis Date: 05/04/15 16:10

## Hexavalent Chromium by SOP ERG-MOR-063

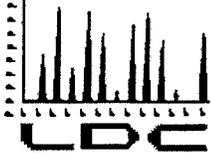
<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0038

MAY 07 2015

Initials: ER

Eastern Research Group

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**LABORATORY DATA CONSULTANTS, INC.**

2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

ERM  
5761 N. Church Street  
Glen Rock, PA 17327  
ATTN: Mr. Jeff Boggs

May 6, 2015

SUBJECT: Harbor Point, MD, Hexavalent Chromium Monitoring, Data Validation

Dear Mr. Boggs,

Enclosed is the final validation report for the fraction listed below. This SDG was received on May 5, 2015. Attachment 1 is a summary of the samples that were reviewed for each analysis.

**LDC Project #34202:**

<b><u>SDG</u></b>	<b><u>Fraction</u></b>
5042839	Hexavalent Chromium

The data validation was performed under EPA Level IV guidelines. The analyses were validated using the following documents, as applicable to each method:

- Air Monitoring Program Quality Assurance Project Plan, Area 1, Phase 1 Development, Version 1, Baltimore Works Site, Baltimore, Maryland, March 2014
- USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, January 2010

Please feel free to contact us if you have any questions.

Sincerely,

Christina Rink  
Project Manager/Chemist



## Laboratory Data Consultants, Inc. Data Validation Report

**Project/Site Name:** Harbor Point, MD, Hexavalent Chromium Monitoring  
**Collection Date:** April 24 through April 25, 2014  
**LDC Report Date:** May 5, 2015  
**Matrix:** Air  
**Parameters:** Hexavalent Chromium  
**Validation Level:** EPA Level IV  
**Laboratory:** Eastern Research Group  
**Sample Delivery Group (SDG):** 5042839

### Sample Identification

OAM 1 (04/24/15)	PAM-1 (04/25/15) DUP
OAM 2 (04/24/15)	PAM-1D (04/25/15) DUP
PAM-1 (04/24/15)	
PAM-1D (04/24/15)	
PAM-2 (04/24/15)	
PAM-3 (04/24/15)	
PAM-4 (04/24/15)	
PAM-21 (04/24/15)	
PAM-31 (04/24/15)	
OAM 1 (04/25/15)	
OAM 2 (04/25/15)	
PAM-1 (04/25/15)	
PAM-1D (04/25/15)	
PAM-2 (04/25/15)	
PAM-3 (04/25/15)	
PAM-4 (04/25/15)	
PAM-21 (04/25/15)	
PAM-31 (04/25/15)	
PAM-1 (04/24/15) DUP	
PAM-1D (04/24/15) DUP	

The date was appended to the sample ID to differentiate between samples.

## Introduction

This data review covers 22 air samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per ASTM D7614 for Hexavalent Chromium.

This review follows the Air Monitoring Program Quality Assurance Project Plan, Area 1, Phase 1 Development, Version 1, Baltimore Works Site, Baltimore, Maryland (March 2014) and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

## **I. Technical Holding Times**

All technical holding time requirements were met.

## **II. Initial Calibration**

All criteria for the initial calibration were met.

## **III. Continuing Calibration**

Continuing calibration frequency and analysis criteria were met.

## **IV. Blanks**

Method blanks were reviewed for each matrix as applicable. No hexavalent chromium was found in the method blanks.

Samples PAM-31 (04/24/15) and PAM-31 (04/25/15) were identified as trip blanks. No hexavalent chromium was found.

Samples PAM-21 (04/24/15) and PAM-21 (04/25/15) were identified as field blanks. No hexavalent chromium was found.

## **V. Matrix Spike/Matrix Spike Duplicates**

Matrix spike (MS) and matrix spike duplicate (MSD) analysis was not required by the method.

## **VI. Duplicates**

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Relative percent differences (RPD) were within QC limits.

## **VII. Laboratory Control Samples**

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

## **VIII. Sample Result Verification**

All sample result verifications were acceptable.

## **IX. Overall Assessment of Data**

Data flags are summarized at the end of this report if data has been qualified.

## X. Field Duplicates

Samples PAM-1 (04/24/15) and PAM-1D (04/24/15) and samples PAM-1 (04/25/15) and PAM-1D (04/25/15) were identified as field duplicates. No hexavalent chromium was detected in any of the samples with the following exceptions:

Analyte	Concentration (ng/m <sup>3</sup> )		RPD (Limits)	Flags	A or P
	PAM-1 (04/24/15)	PAM-1D (04/24/15)			
Hexavalent chromium	0.0403	0.0448	11 (≤20)	-	-

Analyte	Concentration (ng/m <sup>3</sup> )		RPD (Limits)	Flags	A or P
	PAM-1 (04/25/15)	PAM-1D (04/25/15)			
Hexavalent chromium	0.0245	0.0144	52 (≤20)	NQ	-

NQ = One or both results were < 5x the reporting limit, therefore no data were qualified.

**Harbor Point, MD, Hexavalent Chromium Monitoring  
Hexavalent Chromium - Data Qualification Summary - SDG 5042839**

No Sample Data Qualified Due to QA/QC Exceedances in this SDG

**Harbor Point, MD, Hexavalent Chromium Monitoring  
Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG  
5042839**

No Sample Data Qualified Due to Laboratory Blank Contamination in this  
SDG

**Harbor Point, MD, Hexavalent Chromium Monitoring  
Hexavalent Chromium - Field Blank Data Qualification Summary - SDG 5042839**

No Sample Data Qualified Due to Field Blank Contamination in this SDG

LDC #: 34202A6

**VALIDATION COMPLETENESS WORKSHEET**

Date: 5/5/15

SDG #: 5042839

Level IV

Page: 1 of 2

Laboratory: Eastern Research Group

Reviewer: JS

2nd Reviewer: a

**METHOD: (Analyte) Hexavalent Chromium (ASTM D7614)**

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	4/24-25/15
II.	Initial calibration	A	
III.	Calibration verification	A	
IV.	Laboratory Blanks	A	
V.	Field blanks	NO	FB=(8)(17) TB=(9)(18)
VI.	Matrix Spike/Matrix Spike Duplicates	N	Not Required
VII.	Duplicate sample analysis	A	DUP
VIII.	Laboratory control samples	A	LCS/D
IX.	Field duplicates	SW	FD=(3,4)(12,13)
X.	Sample result verification	A	
XI.	Overall assessment of data	A	

Note: A = Acceptable  
N = Not provided/applicable  
SW = See worksheet

ND = No compounds detected  
R = Rinsate  
FB = Field blank

D = Duplicate  
TB = Trip blank  
EB = Equipment blank

SB=Source blank  
OTHER:

	Client ID	Lab ID	Matrix	Date
1	OAM 1 (04/24/15)	5042839-01	Air	04/24/15
2	OAM 2 (04/24/15)	5042839-02	Air	04/24/15
3	PAM-1 (04/24/15)	5042839-03	Air	04/24/15
4	PAM-1D (04/24/15)	5042839-04	Air	04/24/15
5	PAM-2 (04/24/15)	5042839-05	Air	04/24/15
6	PAM-3 (04/24/15)	5042839-06	Air	04/24/15
7	PAM-4 (04/24/15)	5042839-07	Air	04/24/15
8	PAM-21 (04/24/15)	5042839-08	Air	04/24/15
9	PAM-31 (04/24/15)	5042839-09	Air	04/24/15
10	OAM 1 (04/25/15)	5042839-10	Air	04/25/15
11	OAM 2 (04/25/15)	5042839-11	Air	04/25/15
12	PAM-1 (04/25/15)	5042839-12	Air	04/25/15
13	PAM-1D (04/25/15)	5042839-13	Air	04/25/15
14	PAM-2 (04/25/15)	5042839-14	Air	04/25/15
15	PAM-3 (04/25/15)	5042839-15	Air	04/25/15
16	PAM-4 (04/25/15)	5042839-16	Air	04/25/15
17	PAM-21 (04/25/15)	5042839-17	Air	04/25/15

LDC #: 34202A6

# VALIDATION COMPLETENESS WORKSHEET

SDG #: 5042839

Level IV

Laboratory: Eastern Research Group

Date: 5/5/15

Page: 2 of 2

Reviewer: SD

2nd Reviewer: [Signature]

**METHOD: (Analyte) Hexavalent Chromium (ASTM D7614)**

	Client ID	Lab ID	Matrix	Date
18	PAM-31 (04/25/15)	5042839-18	Air	04/25/15
19	PAM-1 (04/24/15)DUP	5042839-03DUP	Air	04/24/15
20	PAM-1D (04/24/15)DUP	5042839-04DUP	Air	04/24/15
21	PAM-1 (04/25/15)DUP	5042839-12DUP	Air	04/25/15
22	PAM-1D (04/25/15)DUP	5042839-13DUP	Air	04/25/15
23				
24				
25				
26				
27				

Notes: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Method: Inorganics (EPA Method See Cover)

Validation Area	Yes	No	NA	Findings/Comments
<b>I. Technical holding times</b>				
All technical holding times were met.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Cooler temperature criteria was met.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>II. Calibration</b>				
Were all instruments calibrated daily, each set-up time?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were the proper number of standards used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all initial calibration correlation coefficients $\geq 0.995$ ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all initial and continuing calibration verification %Rs within the 98-110% QC limits? <u>85-115</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were titrant checks performed as required? (Level IV only)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Were balance checks performed as required? (Level IV only)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<b>III. Blanks</b>				
Was a method blank associated with every sample in this SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<b>IV. Matrix spike/Matrix spike duplicates and Duplicates</b>				
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<u>Airs</u> Were the MS/MSD or duplicate relative percent differences (RPD) $\leq 20\%$ for <del>waters</del> and $\leq 35\%$ for soil samples? A control limit of $\leq \text{CRDL}$ ( $\leq 2\text{X CRDL}$ for soil) was used for samples that were $\leq 5\text{X}$ the CRDL, including when only one of the duplicate sample values were $< 5\text{X}$ the CRDL.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>V. Laboratory control samples</b>				
Was an LCS analyzed for this SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was an LCS analyzed per extraction batch?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% (85-115% for Method 300.0) QC limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>VI. Regional Quality Assurance and Quality Control</b>				
Were performance evaluation (PE) samples performed?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Were the performance evaluation (PE) samples within the acceptance limits?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

## VALIDATION FINDINGS CHECKLIST

Validation Area	Yes	No	NA	Findings/Comments
<b>VII. Sample Result Verification</b>				
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	/			
Were detection limits < RL?	/			
<b>VIII. Overall assessment of data</b>				
Overall assessment of data was found to be acceptable.	/			
<b>IX. Field duplicates</b>				
Field duplicate pairs were identified in this SDG.	/			
Target analytes were detected in the field duplicates.	/			
<b>X. Field blanks</b>				
Field blanks were identified in this SDG.	/			
Target analytes were detected in the field blanks.		/		

**VALIDATION FINDINGS WORKSHEET**  
**Field Duplicates**

Inorganics: Method See Cover

Analyte	Concentration (ng/m3)		RPD (≤20)	Qual.
	3	4		
Hexavalent Chromium	0.0403	0.0448	11	

Analyte	Concentration (ng/m3)		RPD (≤20)	Qual.
	12	13		
Hexavalent Chromium	0.0245	0.0144	52	NQ

NQ= No Qual. because one or both samples <5X MDL

\\LDCFILESERVER\Validation\FIELD DUPLICATES\FD\_inorganic\wtemp.WPD

LDC #: 34202AK

**Validation Findings Worksheet**  
**Initial and Continuing Calibration Calculation Verification**

Page: 1 of 1

Reviewer: JJD

2nd Reviewer: [Signature]

Method: Inorganics, Method See Cover

The correlation coefficient (r) for the calibration of Cr<sup>+6</sup> was recalculated. Calibration date: 4/21/15

An initial or continuing calibration verification percent recovery (%R) was recalculated for each type of analysis using the following formula:

$$\%R = \frac{\text{Found} \times 100}{\text{True}}$$

Where,

Found = concentration of each analyte measured in the analysis of the ICV or CCV solution

True = concentration of each analyte in the ICV or CCV source

Type of analysis	Analyte	Standard	Conc. (ng/ml)	Area	Recalculated	Reported	Acceptable (Y/N)
					r or r <sup>2</sup>	r or r <sup>2</sup>	
Initial calibration	Cr <sup>+6</sup>	s1	0.05	0.0441286	0.99985	0.99985	Y
		s2	0.1	0.0956635			
		s3	0.2	0.1512112			
		s4	0.5	0.3980303			
		s5	1	0.7652481			
		s6	2	1.5586494			
ICV 11:04 Calibration verification	Cr <sup>+6</sup>	<u>Found</u> 0.555ng/ml	<u>True</u> 0.5ng/ml		103.1%R	103.1%R	↓
CCV 12:08 Calibration verification	Cr <sup>+6</sup>	<u>Found</u> 0.508ng/ml	<u>True</u> 0.5ng/ml		101.7%R	101.7%R	
Calibration verification							

Comments: Refer to Calibration Verification findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 31202AP

**VALIDATION FINDINGS WORKSHEET**  
**Level IV Recalculation Worksheet**

Page: 1 of 1  
Reviewer: SD  
2nd Reviewer: Q

**METHOD:** Inorganics, Method See Cover

Percent recoveries (%R) for a laboratory control sample and a matrix spike sample were recalculated using the following formula:

$$\%R = \frac{\text{Found}}{\text{True}} \times 100$$
 Where, Found = concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation, Found = SSR (spiked sample result) - SR (sample result).  
True = concentration of each analyte in the source.

A sample and duplicate relative percent difference (RPD) was recalculated using the following formula:

$$RPD = \frac{|S-D|}{(S+D)/2} \times 100$$
 Where, S = Original sample concentration  
D = Duplicate sample concentration

Sample ID	Type of Analysis	Element	Found / S (units)	True / D (units)	Recalculated	Reported	Acceptable (Y/N)
					%R / RPD	%R / RPD	
LCS 11:36	Laboratory control sample	Cr <sup>+6</sup>	1.07 ng/ml	1.00 ng/ml	107%R	107%R	Y
N	Matrix spike sample	↓	(SSR-SR)				
DUP 12:35	Duplicate sample	↓	0.0411 ng/m <sup>3</sup>	0.0403 ng/m <sup>3</sup>	1.97%RPD	1.95%RPD	Y

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**VALIDATION FINDINGS WORKSHEET**  
Sample Calculation Verification

**METHOD:** Inorganics, Method See Cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

- Y N N/A Have results been reported and calculated correctly?
- Y N N/A Are results within the calibrated range of the instruments?
- Y N N/A Are all detection limits below the CRQL?

Compound (analyte) results for (11) Cr<sup>+6</sup> reported with a positive detect were recalculated and verified using the following equation:

Concentration =  $(A - C_0) / C_1$        $V_f = 10 \text{ ml}$       Recalculation:  $\frac{0.0550525 - 5.59E-03}{0.7733811} = 0.0636 \text{ ng/ml}$

$A = 0.0550525$        $m^3 = 21.78$

$C_0 = 5.59E-03$        $\frac{(ng/ml)(C_1 V_f)}{m^3} = ng/m^3$

$C_1 = 0.7733811$        $\frac{0.0636 \text{ ng/ml}(10 \text{ ml})}{21.78 \text{ m}^3} = 0.0292 \text{ ng/m}^3$

#	Sample ID	Analyte	Reported Concentration (ng/m <sup>3</sup> )	Calculated Concentration (ng/m <sup>3</sup> )	Acceptable (Y/N)
	1	Cr <sup>+6</sup>	ND	ND	Y
	2		0.0060	0.0060	↓
	3		0.0403	0.0403	↓
	4		0.0448	0.0448	↓
	5		0.0211	0.0210	Y*
	6		ND	ND	Y
	7		0.276	0.276	↓
	8		ND	ND	
	9		ND	ND	
	10		0.0162	0.0162	
	11		0.0292	0.0292	↓
	12		0.0245	0.0245	↓
	13		0.0144	0.0145	Y*
	14		0.0156	0.0156	↓
	15		0.0074	0.0074	↓
	16		0.0247	0.0247	↓
	17		ND	ND	
	18		ND	ND	↓

Note: \* Rounding



# CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495 FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 05/05/15 09:25

SUBMITTED: 04/28/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

<b>Description:</b> OAM 1	<b>Lab ID:</b> 5042839-01	<b>Sampled:</b> 04/24/15 14:44
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.53 m <sup>3</sup>	<b>Received:</b> 04/28/15 10:55
<b>Comments:</b> Start Time 4/23/15 14:48		<b>Analysis Date:</b> 04/29/15 13:45

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0020	U	0.0038

MAY 06 2015

Initials: *CR*



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Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED: 05/05/15 09:25

Malvern, PA 19355

SUBMITTED: 04/28/15

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495 FAX: (410) 266-8912

CODE: Honeywell Hex Chrome Study  
SITE CODE:

<b>Description:</b> OAM 2	<b>Lab ID:</b> 5042839-02	<b>Sampled:</b> 04/24/15 15:12
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.62 m <sup>3</sup>	<b>Received:</b> 04/28/15 10:55
<b>Comments:</b> Start Time 4/23/15 15:11		<b>Analysis Date:</b> 04/29/15 13:55

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0060		0.0038

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Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495 FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 05/05/15 09:25

SUBMITTED: 04/28/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

<b>Description:</b> PAM-1	<b>Lab ID:</b> 5042839-03	<b>Sampled:</b> 04/24/15 15:58
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.47 m <sup>3</sup>	<b>Received:</b> 04/28/15 10:55
<b>Comments:</b> Col 1 Start Time 4/23/15 16:06		<b>Analysis Date:</b> 04/29/15 12:29

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	0.0403		0.0038

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PHONE: (443) 803-8495 FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 05/05/15 09:25

SUBMITTED: 04/28/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

<b>Description:</b> PAM-1D	<b>Lab ID:</b> 5042839-04	<b>Sampled:</b> 04/24/15 15:58
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.47 m <sup>3</sup>	<b>Received:</b> 04/28/15 10:55
<b>Comments:</b> Col 2 Start Time 4/23/15 16:06		<b>Analysis Date:</b> 04/29/15 12:48

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0448		0.0038

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75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495 FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 05/05/15 09:25

SUBMITTED: 04/28/15

AQS SITE

CODE: Honeywell Hex Chrome Study  
SITE CODE:

<b>Description:</b> PAM-2	<b>Lab ID:</b> 5042839-05	<b>Sampled:</b> 04/24/15 15:43
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.52 m <sup>3</sup>	<b>Received:</b> 04/28/15 10:55
<b>Comments:</b> Start Time 4/23/15 15:48		<b>Analysis Date:</b> 04/29/15 14:27

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	0.0211		0.0038

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Initials: ER



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Environmental Resources Management, Inc  
75 Valley Stream Parkway, Suite 400  
Malvern, PA 19355

FILE #: 3926.00  
REPORTED: 05/05/15 09:25  
SUBMITTED: 04/28/15  
AQS SITE  
CODE:  
SITE CODE: Honeywell Hex Chrome Study

ATTN: Mr. Jeff Boggs  
PHONE: (443) 803-8495 FAX: (410) 266-8912

<b>Description:</b> PAM-3	<b>Lab ID:</b> 5042839-06	<b>Sampled:</b> 04/24/15 15:35
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.52 m <sup>3</sup>	<b>Received:</b> 04/28/15 10:55
<b>Comments:</b> Start Time 4/23/15 15:40		<b>Analysis Date:</b> 04/29/15 14:38

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0011	U	0.0038

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Environmental Resources Management, Inc  
75 Valley Stream Parkway, Suite 400  
Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495 FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 05/05/15 09:25

SUBMITTED: 04/28/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

<b>Description:</b> PAM-4	<b>Lab ID:</b> 5042839-07	<b>Sampled:</b> 04/24/15 15:28
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.65 m <sup>3</sup>	<b>Received:</b> 04/28/15 10:55
<b>Comments:</b> Start Time 4/23/15 15:25		<b>Analysis Date:</b> 04/29/15 14:49

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	0.276		0.0038

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Eastern Research Group

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75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495 FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 05/05/15 09:25

SUBMITTED: 04/28/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

<b>Description:</b> PAM-21	<b>Lab ID:</b> 5042839-08	<b>Sampled:</b> 04/24/15 00:00
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.52 m <sup>3</sup>	<b>Received:</b> 04/28/15 10:55
<b>Comments:</b>		<b>Analysis Date:</b> 04/29/15 15:00

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	ND	U	0.0038

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Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 05/05/15 09:25

SUBMITTED: 04/28/15

AQS SITE

CODE:  
SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-31

Lab ID: 5042839-09

Sampled: 04/24/15 00:00

Matrix: Air

Sample Volume: 21.52 m<sup>3</sup>

Received: 04/28/15 10:55

Comments:

Analysis Date: 04/29/15 15:10

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0038

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75 Valley Stream Parkway, Suite 400  
Malvern, PA 19355

FILE #: 3926.00  
REPORTED: 05/05/15 09:25  
SUBMITTED: 04/28/15  
AQS SITE  
CODE:  
SITE CODE: Honeywell Hex Chrome Study

ATTN: Mr. Jeff Boggs  
PHONE: (443) 803-8495 FAX: (410) 266-8912

<b>Description:</b> OAM 1	<b>Lab ID:</b> 5042839-10	<b>Sampled:</b> 04/25/15 14:58
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.77 m <sup>3</sup>	<b>Received:</b> 04/28/15 10:55
<b>Comments:</b> Start Time 4/24/15 14:47		<b>Analysis Date:</b> 04/29/15 15:21

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	0.0162		0.0038

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Environmental Resources Management, Inc  
75 Valley Stream Parkway, Suite 400  
Malvern, PA 19355

FILE #: 3926.00  
REPORTED: 05/05/15 09:25  
SUBMITTED: 04/28/15  
AQS SITE  
CODE:  
SITE CODE: Honeywell Hex Chrome Study

ATTN: Mr. Jeff Boggs  
PHONE: (443) 803-8495 FAX: (410) 266-8912

<b>Description:</b> OAM 2	<b>Lab ID:</b> 5042839-11	<b>Sampled:</b> 04/25/15 15:27
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.78 m <sup>3</sup>	<b>Received:</b> 04/28/15 10:55
<b>Comments:</b> Start Time 4/24/15 15:15		<b>Analysis Date:</b> 04/29/15 15:32

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0292		0.0038

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Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495 FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 05/05/15 09:25

SUBMITTED: 04/28/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

<b>Description:</b> PAM-1	<b>Lab ID:</b> 5042839-12	<b>Sampled:</b> 04/25/15 16:20
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.89 m <sup>3</sup>	<b>Received:</b> 04/28/15 10:55
<b>Comments:</b> Col 1 Start Time 4/24/15 16:01		<b>Analysis Date:</b> 04/29/15 13:07

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0245		0.0038

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Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495 FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 05/05/15 09:25

SUBMITTED: 04/28/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

<b>Description:</b> PAM-1D	<b>Lab ID:</b> 5042839-13	<b>Sampled:</b> 04/25/15 16:20
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.89 m <sup>3</sup>	<b>Received:</b> 04/28/15 10:55
<b>Comments:</b> Col 2 Start Time 4/24/15 16:00		<b>Analysis Date:</b> 04/29/15 13:26

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0144		0.0038

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Eastern Research Group

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75 Valley Stream Parkway, Suite 400  
Malvern, PA 19355

FILE #: 3926.00  
REPORTED: 05/05/15 09:25  
SUBMITTED: 04/28/15  
AQS SITE  
CODE:  
SITE CODE: Honeywell Hex Chrome Study

ATTN: Mr. Jeff Boggs  
PHONE: (443) 803-8495 FAX: (410) 266-8912

<b>Description:</b> PAM-2	<b>Lab ID:</b> 5042839-14	<b>Sampled:</b> 04/25/15 16:04
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.86 m <sup>3</sup>	<b>Received:</b> 04/28/15 10:55
<b>Comments:</b> Start Time 4/24/15 15:46		<b>Analysis Date:</b> 04/29/15 15:42

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	0.0156		0.0038

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ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 05/05/15 09:25

SUBMITTED: 04/28/15

AQS SITE

CODE:  
SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-3

Lab ID: 5042839-15

Sampled: 04/25/15 15:50

Matrix: Air

Sample Volume: 21.79 m<sup>3</sup>

Received: 04/28/15 10:55

Comments: Start Time 4/24/15 15:38

Analysis Date: 04/29/15 15:53

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u>	<u>Flag</u>	<u>MDL</u>
		<u>ng/m<sup>3</sup> Air</u>		<u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0074		0.0038

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75 Valley Stream Parkway, Suite 400  
Malvern, PA 19355

FILE #: 3926.00  
REPORTED: 05/05/15 09:25  
SUBMITTED: 04/28/15  
AQS SITE  
CODE:  
SITE CODE: Honeywell Hex Chrome Study

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495 FAX: (410) 266-8912

<b>Description:</b> PAM-4	<b>Lab ID:</b> 5042839-16	<b>Sampled:</b> 04/25/15 15:48
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.85 m <sup>3</sup>	<b>Received:</b> 04/28/15 10:55
<b>Comments:</b> Start Time 4/24/15 15:31		<b>Analysis Date:</b> 04/29/15 16:04

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	0.0247		0.0038

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Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495 FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 05/05/15 09:25

SUBMITTED: 04/28/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

Description: PAM-21 Lab ID: 5042839-17 Sampled: 04/25/15 00:00

Matrix: Air Sample Volume: 21.86 m<sup>3</sup> Received: 04/28/15 10:55

Comments: Analysis Date: 04/29/15 16:36

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0038

MAY 06 2015

Initials: *CR*



# CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED: 05/05/15 09:25

Malvern, PA 19355

SUBMITTED: 04/28/15

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

FAX: (410) 266-8912

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-31

Lab ID: 5042839-18

Sampled: 04/25/15 00:00

Matrix: Air

Sample Volume: 21.79 m<sup>3</sup>

Received: 04/28/15 10:55

Comments:

Analysis Date: 04/29/15 16:47

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	ND	U	0.0038

MAY 06 2015

Initials: *CR*



**LABORATORY DATA CONSULTANTS, INC.**

2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

ERM  
5761 N. Church Street  
Glen Rock, PA 17327  
ATTN: Mr. Jeff Boggs

May 1, 2015

SUBJECT: Harbor Point, MD, Hexavalent Chromium Monitoring, Data Validation

Dear Mr. Boggs,

Enclosed is the final validation report for the fraction listed below. This SDG was received on April 30, 2015. Attachment 1 is a summary of the samples that were reviewed for each analysis.

**LDC Project #34183:**

<b><u>SDG</u></b>	<b><u>Fraction</u></b>
5042311/5042406	Hexavalent Chromium

The data validation was performed under EPA Level IV guidelines. The analyses were validated using the following documents, as applicable to each method:

- Air Monitoring Program Quality Assurance Project Plan, Area 1, Phase 1 Development, Version 1, Baltimore Works Site, Baltimore, Maryland, March 2014
- USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, January 2010

Please feel free to contact us if you have any questions.

Sincerely,

Christina Rink  
Project Manager/Chemist



## Laboratory Data Consultants, Inc. Data Validation Report

**Project/Site Name:** Harbor Point, MD, Hexavalent Chromium Monitoring  
**Collection Date:** April 22 through April 23, 2014  
**LDC Report Date:** May 1, 2015  
**Matrix:** Air  
**Parameters:** Hexavalent Chromium  
**Validation Level:** EPA Level IV  
**Laboratory:** Eastern Research Group  
**Sample Delivery Group (SDG):** 5042311/5042406

### Sample Identification

OAM 1 (04/22/15)	PAM-1 (04/23/15) DUP
OAM 2 (04/22/15)	PAM-1D (04/23/15) DUP
PAM-1 (04/22/15)	
PAM-1D (04/22/15)	
PAM-2 (04/22/15)	
PAM-3 (04/22/15)	
PAM-4 (04/22/15)	
PAM-21 (04/22/15)	
PAM-31 (04/22/15)	
OAM 1 (04/23/15)	
OAM 2 (04/23/15)	
PAM-1 (04/23/15)	
PAM-1D (04/23/15)	
PAM-2 (04/23/15)	
PAM-3 (04/23/15)	
PAM-4 (04/23/15)	
PAM-21 (04/23/15)	
PAM-31 (04/23/15)	
PAM-1 (04/22/15) DUP	
PAM-1D (04/22/15) DUP	

The date was appended to the sample ID to differentiate between samples.

## Introduction

This data review covers 22 air samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per ASTM D7614 for Hexavalent Chromium.

This review follows the Air Monitoring Program Quality Assurance Project Plan, Area 1, Phase 1 Development, Version 1, Baltimore Works Site, Baltimore, Maryland (March 2014) and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

## **I. Technical Holding Times**

All technical holding time requirements were met.

## **II. Initial Calibration**

All criteria for the initial calibration were met.

## **III. Continuing Calibration**

Continuing calibration frequency and analysis criteria were met.

## **IV. Blanks**

Method blanks were reviewed for each matrix as applicable. No hexavalent chromium was found in the method blanks.

Samples PAM-31 (04/22/15) and PAM-31 (04/23/15) were identified as trip blanks. No hexavalent chromium was found.

Samples PAM-21 (04/22/15) and PAM-21 (04/23/15) were identified as field blanks. No hexavalent chromium was found.

## **V. Matrix Spike/Matrix Spike Duplicates**

Matrix spike (MS) and matrix spike duplicate (MSD) analysis was not required by the method.

## **VI. Duplicates**

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Relative percent differences (RPD) were within QC limits.

## **VII. Laboratory Control Samples**

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

## **VIII. Sample Result Verification**

All sample result verifications were acceptable.

## **IX. Overall Assessment of Data**

Data flags are summarized at the end of this report if data has been qualified.

## X. Field Duplicates

Samples PAM-1 (04/22/15) and PAM-1D (04/22/15) and samples PAM-1 (04/23/15) and PAM-1D (04/23/15) were identified as field duplicates. No hexavalent chromium was detected in any of the samples with the following exceptions:

Analyte	Concentration (ng/m <sup>3</sup> )		RPD (Limits)	Flags	A or P
	PAM-1 (04/22/15)	PAM-1D (04/22/15)			
Hexavalent chromium	0.0443	0.0473	7 (≤20)	-	-

Analyte	Concentration (ng/m <sup>3</sup> )		RPD (Limits)	Flags	A or P
	PAM-1 (04/23/15)	PAM-1D (04/23/15)			
Hexavalent chromium	0.0355	0.0418	16 (≤20)	-	-

**Harbor Point, MD, Hexavalent Chromium Monitoring  
Hexavalent Chromium - Data Qualification Summary - SDG 5042311/5042406**

No Sample Data Qualified Due to QA/QC Exceedances in this SDG

**Harbor Point, MD, Hexavalent Chromium Monitoring  
Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG  
5042311/5042406**

No Sample Data Qualified Due to Laboratory Blank Contamination in this  
SDG

**Harbor Point, MD, Hexavalent Chromium Monitoring  
Hexavalent Chromium - Field Blank Data Qualification Summary - SDG  
5042311/5042406**

No Sample Data Qualified Due to Field Blank Contamination in this SDG

LDC #: 34183A6

**VALIDATION COMPLETENESS WORKSHEET**

Date: 4/23/15

SDG #: 5042311/5042406

Level IV

Page: 1 of 2

Laboratory: Eastern Research Group

Reviewer: SD

2nd Reviewer: [Signature]

**METHOD: (Analyte) Hexavalent Chromium (ASTM D7614)**

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	4/22-23/15
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Laboratory Blanks	A	
V	Field blanks	ND	FB=(8)(1-7) TB=(9)(8)
VI.	Matrix Spike/Matrix Spike Duplicates	N	Not Required
VII.	Duplicate sample analysis	A	DUP
VIII.	Laboratory control samples	A	LCS(0)
IX.	Field duplicates	SW	FD=(3,4) (12,13)
X.	Sample result verification	A	
XI.	Overall assessment of data	A	

Note: A = Acceptable  
N = Not provided/applicable  
SW = See worksheet

ND = No compounds detected  
R = Rinsate  
FB = Field blank

D = Duplicate  
TB = Trip blank  
EB = Equipment blank

SB=Source blank  
OTHER:

	Client ID	Lab ID	Matrix	Date
1	OAM 1 (4/22/15)	5042311-01	Air	04/22/15
2	OAM 2 (4/22/15)	5042311-02	Air	04/22/15
3	PAM-1 (4/22/15)	5042311-03	Air	04/22/15
4	PAM-1D (4/22/15)	5042311-04	Air	04/22/15
5	PAM-2 (4/22/15)	5042311-05	Air	04/22/15
6	PAM-3 (4/22/15)	5042311-06	Air	04/22/15
7	PAM-4 (4/22/15)	5042311-07	Air	04/22/15
8	PAM-21 (4/22/15)	5042311-08	Air	04/22/15
9	PAM-31 (4/22/15)	5042311-09	Air	04/22/15
10	OAM 1 (4/23/15)	5042406-01	Air	04/23/15
11	OAM 2 (4/23/15)	5042406-02	Air	04/23/15
12	PAM-1 (4/23/15)	5042406-03	Air	04/23/15
13	PAM-1D (4/23/15)	5042406-04	Air	04/23/15
14	PAM-2 (4/23/15)	5042406-05	Air	04/23/15
15	PAM-3 (4/23/15)	5042406-06	Air	04/23/15
16	PAM-4 (4/23/15)	5042406-07	Air	04/23/15
17	PAM-21 (4/23/15)	5042406-08	Air	04/23/15

LDC #: 34183A6

# VALIDATION COMPLETENESS WORKSHEET

Date: 4/23/15

SDG #: 5042311/5042406

Level IV

Page: 2 of 2

Laboratory: Eastern Research Group

Reviewer: JS

2nd Reviewer: a

**METHOD: (Analyte) Hexavalent Chromium (ASTM D7614)**

	Client ID	Lab ID	Matrix	Date
18	PAM-31 (4/23/15)	5042406-09	Air	04/23/15
19	PAM-1 (4/22/15)DUP	5042311-03DUP	Air	04/22/15
20	PAM-1D (4/22/15)DUP	5042311-04DUP	Air	04/22/15
21	PAM-1 (4/23/15)DUP	5042406-03DUP	Air	04/23/15
22	PAM-1D (4/23/15)DUP	5042406-04DUP	Air	04/23/15
23				
24				
25				
26				
27				
28				
29				
30				

Notes: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Method: Inorganics (EPA Method See LOVM)

Validation Area	Yes	No	NA	Findings/Comments
<b>I. Technical holding times</b>				
All technical holding times were met.	/			
Cooler temperature criteria was met.	/			
<b>II. Calibration</b>				
Were all instruments calibrated daily, each set-up time?	/			
Were the proper number of standards used?	/			
Were all initial calibration correlation coefficients $\geq 0.995$ ?	/			
Were all initial and continuing calibration verification %Rs within the <u>90-110% QC</u> limits? <u>85-115</u>	/			
Were titrant checks performed as required? (Level IV only)			/	
Were balance checks performed as required? (Level IV only)			/	
<b>III. Blanks</b>				
Was a method blank associated with every sample in this SDG?	/			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		/		
<b>IV. Matrix spike/Matrix spike duplicates and Duplicates</b>				
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	/			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.			/	
<u>As is</u> Were the MS/MSD or duplicate relative percent differences (RPD) $\leq 20\%$ for <del>waters</del> and $\leq 35\%$ for soil samples? A control limit of $\leq \text{CRDL}$ ( $\leq 2\text{X CRDL}$ for soil) was used for samples that were $\leq 5\text{X}$ the CRDL, including when only one of the duplicate sample values were $\leq 5\text{X}$ the CRDL.	/			
<b>V. Laboratory control samples</b>				
Was an LCS analyzed for this SDG?	/			
Was an LCS analyzed per extraction batch?	/			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% (85-115% for Method 300.0) QC limits?	/			
<b>VI. Regional Quality Assurance and Quality Control</b>				
Were performance evaluation (PE) samples performed?			/	
Were the performance evaluation (PE) samples within the acceptance limits?			/	

VALIDATION FINDINGS CHECKLIST

Validation Area	Yes	No	NA	Findings/Comments
<b>VII. Sample Result Verification</b>				
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	/			
Were detection limits < RL?	/			
<b>VIII. Overall assessment of data</b>				
Overall assessment of data was found to be acceptable.	/			
<b>IX. Field duplicates</b>				
Field duplicate pairs were identified in this SDG.	/			
Target analytes were detected in the field duplicates.	/			
<b>X. Field blanks</b>				
Field blanks were identified in this SDG.	/			
Target analytes were detected in the field blanks.		/		

**VALIDATION FINDINGS WORKSHEET**  
**Field Duplicates**

**Inorganics:** Method See Cover

Analyte	Concentration (ng/m3)		RPD (≤20)	Qual.
	3	4		
Hexavalent Chromium	0.0443	0.0473	7	

Analyte	Concentration (ng/m3)		RPD (≤20)	Qual.
	12	13		
Hexavalent Chromium	0.0355	0.0418	16	

LDC #: 3418340

**Validation Findings Worksheet**  
**Initial and Continuing Calibration Calculation Verification**

Page: 1 of 1  
 Reviewer: SD  
 2nd Reviewer: G

Method: Inorganics, Method See Cover

The correlation coefficient (r) for the calibration of C<sub>6</sub><sup>+</sup> was recalculated. Calibration date: 4/27/15

An initial or continuing calibration verification percent recovery (%R) was recalculated for each type of analysis using the following formula:

$$\%R = \frac{\text{Found} \times 100}{\text{True}}$$

Where, Found = concentration of each analyte measured in the analysis of the ICV or CCV solution  
 True = concentration of each analyte in the ICV or CCV source

Type of analysis	Analyte	Standard	Conc. (ng/ml)	Area	Recalculated	Reported	Acceptable (Y/N)
					r or r <sup>2</sup>	r or r <sup>2</sup>	
Initial calibration	C <sub>6</sub> <sup>+</sup>	s1	0.05	0.0468863	0.99988	0.99988	Y
		s2	0.1	0.0994898			
		s3	0.2	0.1510643			
		s4	0.5	0.4026839			
		s5	1	0.7754967			
		s6	2	1.5532649			
ICV (1:3) Calibration verification	C <sub>6</sub> <sup>+</sup>	Found 0.5260 ng/ml	True 0.5 ng/ml		105.2%R	105.2%R	Y
CCV 12:35 Calibration verification	C <sub>6</sub> <sup>+</sup>	0.5214 ng/ml	0.5 ng/ml		104.3%R	104.3%R	Y
Calibration verification							

Comments: Refer to Calibration Verification findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 34183AB

**VALIDATION FINDINGS WORKSHEET**  
**Level IV Recalculation Worksheet**

Page: 1 of 1  
Reviewer: SD  
2nd Reviewer: 9

**METHOD:** Inorganics, Method See Cover

Percent recoveries (%R) for a laboratory control sample and a matrix spike sample were recalculated using the following formula:

$$\%R = \frac{\text{Found}}{\text{True}} \times 100$$
 Where, Found = concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation, Found = SSR (spiked sample result) - SR (sample result).  
True = concentration of each analyte in the source.

A sample and duplicate relative percent difference (RPD) was recalculated using the following formula:

$$RPD = \frac{|S-D|}{(S+D)/2} \times 100$$
 Where, S = Original sample concentration  
D = Duplicate sample concentration

Sample ID	Type of Analysis	Element	Found / S (units)	True / D (units)	Recalculated	Reported	Acceptable (Y/N)
					%R / RPD	%R / RPD	
LCS 12:03	Laboratory control sample	Cr <sup>10</sup>	1.077 ng/ml	1.00 ng/ml	108%R	108%R	Y
N	Matrix spike sample	↓	(SSR-SR)				
DUP 13:07	Duplicate sample	↓	0.0446 ng/ml <sup>3</sup>	0.0443 ng/ml <sup>3</sup>	0.675%RPD	0.749%RPD	Y

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

LDC #: 34183A

**VALIDATION FINDINGS WORKSHEET**  
**Sample Calculation Verification**

Page: 1 of 1  
 Reviewer: JD  
 2nd reviewer: al

METHOD: Inorganics, Method See Cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

- Y  N  N/A Have results been reported and calculated correctly?
- Y  N  N/A Are results within the calibrated range of the instruments?
- Y  N  N/A Are all detection limits below the CRQL?

Compound (analyte) results for \_\_\_\_\_ reported with a positive detect were recalculated and verified using the following equation:

Concentration =  $(A - C_0) / C_1$   $V_f = 10ml$  Recalculation:  $\frac{0.0447163 - 1.04E-02}{0.7705774} = 0.0445ngl$   
 $m^3 = 21.15$   
 $A = 0.0447163$   
 $C_0 = 1.04E-02$   
 $C_1 = 0.7705774$   
 $\frac{(ng/ml)(V_f)}{m^3} = ng/m^3$   $\frac{(0.0445ng/ml)(10ml)}{21.15m^3} = 0.0211ng$

#	Sample ID	Analyte	Reported Concentration (ng/m <sup>3</sup> )	Calculated Concentration (ng/m <sup>3</sup> )	Acceptable (Y/N)
	1	← + ↓	0.0211	0.0211	Y
	2		0.0295	0.0295	Y
	3		0.0443	0.0443	Y
	4		0.0473	0.0473	Y
	5		0.0332	0.0331	Y*
	6		0.0328	0.0328	Y
	7		0.231	0.231	Y
	8		ND	ND	Y
	9		ND	ND	Y
	10		0.0052	0.0051	Y*
	11		0.0115	0.0115	Y
	12		0.0355	0.0355	Y
	13		0.0418	0.0418	Y
	14		0.0093	0.0093	Y
	15 (ND)		0.00073	0.00072	Y*
	16		0.263	0.263	Y
	17		ND	ND	Y
	18		ND	ND	Y

Note: \*Rounding

# 15 / 30 = Flagged "U"



# CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 04/30/15 11:53

SUBMITTED: 04/23/15 to 04/24/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: OAM 1

Lab ID: 5042311-01

Sampled: 04/22/15 14:30

Matrix: Air

Sample Volume: 21.15 m<sup>3</sup>

Received: 04/23/15 10:58

Comments: Start Time 4/21/15 15:00

Analysis Date: 04/27/15 14:12

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0211		0.0038

MAY 01 2015

Initials: *CR*

Eastern Research Group

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FILE #: 3926.00

REPORTED: 04/30/15 11:53

SUBMITTED: 04/23/15 to 04/24/15

AQS SITE

CODE:  
SITE CODE:

Honeywell Hex Chrome Study

**Description:** OAM 2

**Lab ID:** 5042311-02

**Sampled:** 04/22/15 14:50

**Matrix:** Air

**Sample Volume:** 21.1 m<sup>3</sup>

**Received:** 04/23/15 10:58

**Comments:** Start Time 4/21/15 15:23

**Analysis Date:** 04/27/15 14:23

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0295		0.0038

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FILE #: 3926.00

REPORTED: 04/30/15 11:53

SUBMITTED: 04/23/15 to 04/24/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

<b>Description:</b> PAM-1	<b>Lab ID:</b> 5042311-03	<b>Sampled:</b> 04/22/15 15:36
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.03 m <sup>3</sup>	<b>Received:</b> 04/23/15 10:58
<b>Comments:</b> Col 1 Start Time 4/21/15 16:14		<b>Analysis Date:</b> 04/27/15 12:57

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0443		0.0038

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FILE #: 3926.00

REPORTED: 04/30/15 11:53

SUBMITTED: 04/23/15 to 04/24/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

<b>Description:</b> PAM-1D	<b>Lab ID:</b> 5042311-04	<b>Sampled:</b> 04/22/15 15:36
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.03 m <sup>3</sup>	<b>Received:</b> 04/23/15 10:58
<b>Comments:</b> Col 2 Start Time 4/21/15 16:14		<b>Analysis Date:</b> 04/27/15 13:16

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0473		0.0038

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REPORTED: 04/30/15 11:53

SUBMITTED: 04/23/15 to 04/24/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-2

Lab ID: 5042311-05

Sampled: 04/22/15 15:20

Matrix: Air

Sample Volume: 20.97 m<sup>3</sup>

Received: 04/23/15 10:58

Comments: Start Time 4/21/15 16:01

Analysis Date: 04/27/15 14:55

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u>	<u>Flag</u>	<u>MDL</u>
		<u>ng/m<sup>3</sup> Air</u>		<u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0332		0.0038

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FILE #: 3926.00

REPORTED: 04/30/15 11:53

SUBMITTED: 04/23/15 to 04/24/15

AQS SITE

CODE: Honeywell Hex Chrome Study  
SITE CODE:

<b>Description:</b> PAM-3	<b>Lab ID:</b> 5042311-06	<b>Sampled:</b> 04/22/15 15:12
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.03 m <sup>3</sup>	<b>Received:</b> 04/23/15 10:58
<b>Comments:</b> Start Time 4/21/15 15:50		<b>Analysis Date:</b> 04/27/15 15:05

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0328		0.0038

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FILE #: 3926.00

REPORTED: 04/30/15 11:53

SUBMITTED: 04/23/15 to 04/24/15

AQS SITE

CODE: Honeywell Hex Chrome Study  
SITE CODE:

<b>Description:</b> PAM-4	<b>Lab ID:</b> 5042311-07	<b>Sampled:</b> 04/22/15 15:09
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.1 m <sup>3</sup>	<b>Received:</b> 04/23/15 10:58
<b>Comments:</b> Start Time 4/21/15 15:42		<b>Analysis Date:</b> 04/27/15 15:16

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	0.231		0.0038

MAY 01 2015

Initials: *ER*

Eastern Research Group

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# CERTIFICATE OF ANALYSIS

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FILE #: 3926.00

REPORTED: 04/30/15 11:53

SUBMITTED: 04/23/15 to 04/24/15

AQS SITE

CODE: Honeywell Hex Chrome Study  
SITE CODE:

Description: PAM-21

Lab ID: 5042311-08

Sampled: 04/22/15 00:00

Matrix: Air

Sample Volume: 20.97 m<sup>3</sup>

Received: 04/23/15 10:58

Comments:

Analysis Date: 04/27/15 15:27

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u>	<u>Flag</u>	<u>MDL</u>
		<u>ng/m<sup>3</sup> Air</u>		<u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0038

MAY 01 2015

Initials: *CR*

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FILE #: 3926.00

REPORTED: 04/30/15 11:53

SUBMITTED: 04/23/15 to 04/24/15

AQS SITE

CODE: Honeywell Hex Chrome Study  
SITE CODE:

Description: PAM-31

Lab ID: 5042311-09

Sampled: 04/22/15 00:00

Matrix: Air

Sample Volume: 21.03 m<sup>3</sup>

Received: 04/23/15 10:58

Comments:

Analysis Date: 04/27/15 15:38

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u>	<u>Flag</u>	<u>MDL</u>
		<u>ng/m<sup>3</sup> Air</u>		<u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0038

MAY 01 2015

Initials: *CR*

Eastern Research Group

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# CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 04/30/15 11:53

SUBMITTED: 04/23/15 to 04/24/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: OAM 1

Lab ID: 5042406-01

Sampled: 04/23/15 14:45

Matrix: Air

Sample Volume: 21.78 m<sup>3</sup>

Received: 04/24/15 10:47

Comments: Start Time 4/22/15 14:33

Analysis Date: 04/27/15 15:48

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0052		0.0038

MAY 01 2015

Initials: *CR*

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FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 04/30/15 11:53

SUBMITTED: 04/23/15 to 04/24/15

AQS SITE

CODE: Honeywell Hex Chrome Study  
SITE CODE:

<b>Description:</b> OAM 2	<b>Lab ID:</b> 5042406-02	<b>Sampled:</b> 04/23/15 15:08
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.82 m <sup>3</sup>	<b>Received:</b> 04/24/15 10:47
<b>Comments:</b> Start Time 4/22/15 14:53		<b>Analysis Date:</b> 04/27/15 15:59

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0115		0.0038

MAY 01 2015

Initials: *CR*



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PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 04/30/15 11:53

SUBMITTED: 04/23/15 to 04/24/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-1

Lab ID: 5042406-03

Sampled: 04/23/15 16:03

Matrix: Air

Sample Volume: 21.96 m<sup>3</sup>

Received: 04/24/15 10:47

Comments: Col 1 Start Time 4/22/15 15:39

Analysis Date: 04/27/15 13:34

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u>	<u>Flag</u>	<u>MDL</u>
		<u>ng/m<sup>3</sup> Air</u>		<u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0355		0.0038

MAY 01 2015

Initials: ER

Eastern Research Group

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Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 04/30/15 11:53

SUBMITTED: 04/23/15 to 04/24/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

<b>Description:</b> PAM-1D	<b>Lab ID:</b> 5042406-04	<b>Sampled:</b> 04/23/15 16:03
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.96 m <sup>3</sup>	<b>Received:</b> 04/24/15 10:47
<b>Comments:</b> Col 2 Start Time 4/22/15 15:39		<b>Analysis Date:</b> 04/27/15 13:53

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	0.0418		0.0038

MAY 01 2015

Initials: ER

Eastern Research Group

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ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 04/30/15 11:53

SUBMITTED: 04/23/15 to 04/24/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

<b>Description:</b> PAM-2	<b>Lab ID:</b> 5042406-05	<b>Sampled:</b> 04/23/15 15:46
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.94 m <sup>3</sup>	<b>Received:</b> 04/24/15 10:47
<b>Comments:</b> Start Time 4/22/15 15:23		<b>Analysis Date:</b> 04/27/15 16:10

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	0.0093		0.0038

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FILE #: 3926.00

REPORTED: 04/30/15 11:53

SUBMITTED: 04/23/15 to 04/24/15

AQS SITE

CODE: Honeywell Hex Chrome Study  
SITE CODE:

<b>Description:</b> PAM-3	<b>Lab ID:</b> 5042406-06	<b>Sampled:</b> 04/23/15 15:36
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.92 m <sup>3</sup>	<b>Received:</b> 04/24/15 10:47
<b>Comments:</b> Start Time 4/22/15 15:15		<b>Analysis Date:</b> 04/27/15 16:20

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.00073	U	0.0038

MAY 01 2015

Initials: ER

Eastern Research Group

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FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 04/30/15 11:53

SUBMITTED: 04/23/15 to 04/24/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-4

Lab ID: 5042406-07

Sampled: 04/23/15 15:22

Matrix: Air

Sample Volume: 21.76 m<sup>3</sup>

Received: 04/24/15 10:47

Comments: Start Time 4/22/15 15:11

Analysis Date: 04/27/15 16:31

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u>	<u>Flag</u>	<u>MDL</u>
		<u>ng/m<sup>3</sup> Air</u>		<u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.263		0.0038

MAY 01 2015

Initials: CR

Eastern Research Group

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FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 04/30/15 11:53

SUBMITTED: 04/23/15 to 04/24/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

Description: PAM-21

Lab ID: 5042406-08

Sampled: 04/23/15 00:00

Matrix: Air

Sample Volume: 21.94 m<sup>3</sup>

Received: 04/24/15 10:47

Comments:

Analysis Date: 04/27/15 17:03

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u>	<u>Flag</u>	<u>MDL</u>
		<u>ng/m<sup>3</sup> Air</u>		<u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0038

MAY 01 2015

Initials: *CR*

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FILE #: 3926.00

REPORTED: 04/30/15 11:53

SUBMITTED: 04/23/15 to 04/24/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-31

Lab ID: 5042406-09

Sampled: 04/23/15 00:00

Matrix: Air

Sample Volume: 21.92 m<sup>3</sup>

Received: 04/24/15 10:47

Comments:

Analysis Date: 04/27/15 17:14

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0038

MAY 01 2015

Initials: *ER*

Eastern Research Group

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**LABORATORY DATA CONSULTANTS, INC.**

2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

ERM  
5761 N. Church Street  
Glen Rock, PA 17327  
ATTN: Mr. Jeff Boggs

April 29, 2015

SUBJECT: Harbor Point, MD, Hexavalent Chromium Monitoring, Data Validation

Dear Mr. Boggs,

Enclosed is the final validation report for the fraction listed below. This SDG was received on April 28, 2015. Attachment 1 is a summary of the samples that were reviewed for each analysis.

**LDC Project #34170:**

<b><u>SDG</u></b>	<b><u>Fraction</u></b>
5042117/5042220	Hexavalent Chromium

The data validation was performed under EPA Level IV guidelines. The analyses were validated using the following documents, as applicable to each method:

- Air Monitoring Program Quality Assurance Project Plan, Area 1, Phase 1 Development, Version 1, Baltimore Works Site, Baltimore, Maryland, March 2014
- USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, January 2010

Please feel free to contact us if you have any questions.

Sincerely,

Christina Rink  
Project Manager/Chemist



## Laboratory Data Consultants, Inc. Data Validation Report

**Project/Site Name:** Harbor Point, MD, Hexavalent Chromium Monitoring  
**Collection Date:** April 17 through April 21, 2015  
**LDC Report Date:** April 29, 2015  
**Matrix:** Air  
**Parameters:** Hexavalent Chromium  
**Validation Level:** EPA Level IV  
**Laboratory:** Eastern Research Group  
**Sample Delivery Group (SDG):** 5042117/5042220

### Sample Identification

OAM 1(04/18/15)	PAM-1(04/21/15)
OAM 2(04/18/15)	PAM-1D(04/21/15)
PAM-1(04/18/15)	PAM-2(04/21/15)
PAM-1D(04/18/15)	PAM-3(04/21/15)
PAM-2(04/18/15)	PAM-4(04/21/15)
PAM-3(04/18/15)	PAM-21(04/21/15)
PAM-4(04/18/15)	PAM-31(04/21/15)
PAM-21(04/18/15)	PAM-1(04/18/15)DUP
PAM-31(04/18/15)	PAM-1D(04/18/15)DUP
OAM 1(04/17/15)	PAM-1(04/17/15)DUP
OAM 2(04/17/15)	PAM-1D(04/17/15)DUP
PAM-1(04/17/15)	PAM-1(04/21/15)DUP
PAM-1D(04/17/15)	PAM-1D(04/21/15)DUP
PAM-2(04/17/15)	
PAM-3(04/17/15)	
PAM-4(04/17/15)	
PAM-21(04/17/15)	
PAM-31(04/17/15)	
OAM 1(04/21/15)	
OAM 2(04/21/15)	

The date was appended to the sample ID to differentiate between samples.

## Introduction

This data review covers 33 air samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per ASTM D7614 for Hexavalent Chromium.

This review follows the Air Monitoring Program Quality Assurance Project Plan, Area 1, Phase 1 Development, Version 1, Baltimore Works Site, Baltimore, Maryland (March 2014) and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

## **I. Technical Holding Times**

All technical holding time requirements were met.

## **II. Initial Calibration**

All criteria for the initial calibration were met.

## **III. Continuing Calibration**

Continuing calibration frequency and analysis criteria were met.

## **IV. Blanks**

Method blanks were reviewed for each matrix as applicable. No hexavalent chromium was found in the method blanks.

Samples PAM-31(04/18/15), PAM-31(04/17/15), and PAM-31(04/21/15) were identified as trip blanks. No hexavalent chromium was found.

Samples PAM-21(04/18/15), PAM-21(04/17/15), and PAM-21(04/21/15) were identified as field blanks. No hexavalent chromium was found.

## **V. Matrix Spike/Matrix Spike Duplicates**

Matrix spike (MS) and matrix spike duplicate (MSD) analysis was not required by the method.

## **VI. Duplicates**

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Relative percent differences (RPD) were within QC limits.

## **VII. Laboratory Control Samples**

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

## **VIII. Sample Result Verification**

All sample result verifications were acceptable.

## **IX. Overall Assessment of Data**

Data flags are summarized at the end of this report if data has been qualified.

## X. Field Duplicates

Samples PAM-1(04/18/15) and PAM-1D(04/18/15), samples PAM-1(04/17/15) and PAM-1D(04/17/15), and samples PAM-1(04/21/15) and PAM-1D(04/21/15) were identified as field duplicates. No hexavalent chromium was detected in any of the samples with the following exceptions:

Analyte	Concentration (ng/m <sup>3</sup> )		RPD (Limits)	Flags	A or P
	PAM-1(04/18/15)	PAM-1D(04/18/15)			
Hexavalent chromium	0.0202	0.0175	14 (≤20)	-	-

Analyte	Concentration (ng/m <sup>3</sup> )		RPD (Limits)	Flags	A or P
	PAM-1(04/17/15)	PAM-1D(04/17/15)			
Hexavalent chromium	0.0197	0.0147	29 (≤20)	NQ	-

Analyte	Concentration (ng/m <sup>3</sup> )		RPD (Limits)	Flags	A or P
	PAM-1(04/21/15)	PAM-1D(04/21/15)			
Hexavalent chromium	0.0312	0.0305	5 (≤20)	-	-

NQ = One or both results were < 5X the reporting limit, therefore no data were qualified.

**Harbor Point, MD, Hexavalent Chromium Monitoring  
Hexavalent Chromium - Data Qualification Summary - SDG 5042117/5042220**

No Sample Data Qualified Due to QA/QC Exceedances in this SDG

**Harbor Point, MD, Hexavalent Chromium Monitoring  
Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG  
5042117/5042220**

No Sample Data Qualified Due to Laboratory Blank Contamination in this  
SDG

**Harbor Point, MD, Hexavalent Chromium Monitoring  
Hexavalent Chromium - Field Blank Data Qualification Summary - SDG  
5042117/5042220**

No Sample Data Qualified Due to Field Blank Contamination in this SDG

LDC #: 34170A6

## VALIDATION COMPLETENESS WORKSHEET

Date: 4-28-15

SDG #: 5042117/5042220

Level IV

Page: 1 of 2

Laboratory: Eastern Research Group

Reviewer: SD2nd Reviewer: oz**METHOD: (Analyte) Hexavalent Chromium (ASTM D7614)**

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	4/17-21/15
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Laboratory Blanks	A	
V	Field blanks	ND	FB=(8)(17)(26) TB=(9)(18)(22)
VI.	Matrix Spike/Matrix Spike Duplicates	N	Not Required
VII.	Duplicate sample analysis	A	DUP
VIII.	Laboratory control samples	A	LCSID
IX.	Field duplicates	SW	FD=(3,4)(12,13)(21,22)
X.	Sample result verification	A	
XI	Overall assessment of data	A	

Note: A = Acceptable  
N = Not provided/applicable  
SW = See worksheet

ND = No compounds detected  
R = Rinsate  
FB = Field blank

D = Duplicate  
TB = Trip blank  
EB = Equipment blank

SB=Source blank  
OTHER:

	Client ID	Lab ID	Matrix	Date
1	OAM 1 (04/18/15)	5042117-01	Air	04/18/15
2	OAM 2 (04/18/15)	5042117-02	Air	04/18/15
3	PAM-1 (04/18/15)	5042117-03	Air	04/18/15
4	PAM-1D (04/18/15)	5042117-04	Air	04/18/15
5	PAM-2 (04/18/15)	5042117-05	Air	04/18/15
6	PAM-3 (04/18/15)	5042117-06	Air	04/18/15
7	PAM-4 (04/18/15)	5042117-07	Air	04/18/15
8	PAM-21 (04/18/15)	5042117-08	Air	04/18/15
9	PAM-31 (04/18/15)	5042117-09	Air	04/18/15
10	OAM 1 (04/17/15)	5042117-10	Air	04/17/15
11	OAM 2 (04/17/15)	5042117-11	Air	04/17/15
12	PAM-1 (04/17/15)	5042117-12	Air	04/17/15
13	PAM-1D (04/17/15)	5042117-13	Air	04/17/15
14	PAM-2 (04/17/15)	5042117-14	Air	04/17/15
15	PAM-3 (04/17/15)	5042117-15	Air	04/17/15
16	PAM-4 (04/17/15)	5042117-16	Air	04/17/15
17	PAM-21 (04/17/15)	5042117-17	Air	04/17/15

LDC #: 34170A6

# VALIDATION COMPLETENESS WORKSHEET

Date: 4/28/15

SDG #: 5042117/5042220

Level IV

Page: 2 of 2

Laboratory: Eastern Research Group

Reviewer: SD

2nd Reviewer: an

**METHOD: (Analyte)** Hexavalent Chromium (ASTM D7614)

	Client ID	Lab ID	Matrix	Date
18	PAM-31 (04/17/15)	5042117-18	Air	04/17/15
19	OAM 1 (04/21/15)	5042220-01	Air	04/21/15
20	OAM 2 (04/21/15)	5042220-02	Air	04/21/15
21	PAM-1 (04/21/15)	5042220-03	Air	04/21/15
22	PAM-1D (04/21/15)	5042220-04	Air	04/21/15
23	PAM-2 (04/21/15)	5042220-05	Air	04/21/15
24	PAM-3 (04/21/15)	5042220-06	Air	04/21/15
25	PAM-4 (04/21/15)	5042220-07	Air	04/21/15
26	PAM-21 (04/21/15)	5042220-08	Air	04/21/15
27	PAM-31 (04/21/15)	5042220-09	Air	04/21/15
28	PAM-1 (04/18/15)DUP	5042117-03DUP	Air	04/18/15
29	PAM-1D (04/18/15)DUP	5042117-04DUP	Air	04/18/15
30	PAM-1 (04/17/15)DUP	5042117-12DUP	Air	04/17/15
31	PAM-1D (04/17/15)DUP	5042117-13DUP	Air	04/17/15
32	PAM-1 (04/21/15)DUP	5042220-03DUP	Air	04/21/15
33	PAM-1D (04/21/15)DUP	5042220-04DUP	Air	04/21/15
34				
35				
36				
37				
38				

Notes: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Method: Inorganics (EPA Method See Lab)

Validation Area	Yes	No	NA	Findings/Comments
<b>I. Technical holding times</b>				
All technical holding times were met.	/			
Cooler temperature criteria was met.	/			
<b>II. Calibration</b>				
Were all instruments calibrated daily, each set-up time?	/			
Were the proper number of standards used?	/			
Were all initial calibration correlation coefficients $\geq 0.995$ ?	/			
Were all initial and continuing calibration verification %Rs within the <del>80-110%</del> QC limits? <u>85-115</u>	/			
Were titrant checks performed as required? (Level IV only)			/	
Were balance checks performed as required? (Level IV only)			/	
<b>III. Blanks</b>				
Was a method blank associated with every sample in this SDG?	/			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		/		
<b>IV. Matrix spike/Matrix spike duplicates and Duplicates</b>				
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	/			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.			/	
<u>AUS</u> Were the MS/MSD or duplicate relative percent differences (RPD) $\leq 20\%$ for <del>waters</del> and $\leq 35\%$ for soil samples? A control limit of $\leq CRDL$ ( $\leq 2X$ CRDL for soil) was used for samples that were $\leq 5X$ the CRDL, including when only one of the duplicate sample values were $\leq 5X$ the CRDL.	/			
<b>V. Laboratory control samples</b>				
Was an LCS analyzed for this SDG?	/			
Was an LCS analyzed per extraction batch?	/			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% (85-115% for Method 300.0) QC limits?	/			
<b>VI. Regional Quality Assurance and Quality Control</b>				
Were performance evaluation (PE) samples performed?			/	
Were the performance evaluation (PE) samples within the acceptance limits?			/	

VALIDATION FINDINGS CHECKLIST

Validation Area	Yes	No	NA	Findings/Comments
<b>VII. Sample Result Verification</b>				
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were detection limits < RL?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>VIII. Overall assessment of data</b>				
Overall assessment of data was found to be acceptable.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>IX. Field duplicates</b>				
Field duplicate pairs were identified in this SDG.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Target analytes were detected in the field duplicates.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>X. Field blanks</b>				
Field blanks were identified in this SDG.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Target analytes were detected in the field blanks.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

**VALIDATION FINDINGS WORKSHEET**  
**Field Duplicates**

**Inorganics:** Method See Cover

Analyte	Concentration (ng/m3)		RPD ( $\leq 20$ )	Qual.
	3	4		
Hexavalent Chromium	0.0202	0.0175	14	

Analyte	Concentration (ng/m3)		RPD ( $\leq 20$ )	Qual.
	12	13		
Hexavalent Chromium	0.0197	0.0147	29	NQ

Analyte	Concentration (ng/m3)		RPD ( $\leq 20$ )	Qual.
	21	22		
Hexavalent Chromium	0.0321	0.0305	5	

 NQ = No Qual. because one or both samples  $< 5X$  MDL

\\LDCFILESERVER\Validation\FIELD DUPLICATES\FD\_inorganic\34170A6.wpd

LDC #: 34170AD

**Validation Findings Worksheet**  
**Initial and Continuing Calibration Calculation Verification**

Page: 1 of 1  
 Reviewer: SD  
 2nd Reviewer: E

**Method:** Inorganics, Method See Cover

The correlation coefficient (r) for the calibration of Cr<sup>6+</sup> was recalculated. Calibration date: 4/22/15

An initial or continuing calibration verification percent recovery (%R) was recalculated for each type of analysis using the following formula:

$$\%R = \frac{\text{Found} \times 100}{\text{True}}$$
 Where, Found = concentration of each analyte measured in the analysis of the ICV or CCV solution  
 True = concentration of each analyte in the ICV or CCV source

Type of analysis	Analyte	Standard	Conc. (ng/ml)	Area	Recalculated	Reported	Acceptable (Y/N)
					r or r <sup>2</sup>	r or r <sup>2</sup>	
Initial calibration	Cr <sup>6+</sup>	s1	0.05	0.0443198	0.99982	0.99982	Y
		s2	0.1	0.0991108			
		s3	0.2	0.151763			
		s4	0.5	0.4040308			
		s5	1	0.7761015			
		s6	2	1.5829665			
SCV 11:02 Calibration verification	Cr <sup>6+</sup>	<u>Found</u> 0.527ng/ml	<u>True</u> 0.5ng/ml		105.9%R	105.9%R	Y
CCV 12:00 Calibration verification	Cr <sup>6+</sup>	0.595ng/ml	0.5ng/ml		103.9%R	103.9%R	
Calibration verification							

Comments: Refer to Calibration Verification findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 34170AP

**VALIDATION FINDINGS WORKSHEET**  
**Level IV Recalculation Worksheet**

Page: 1 of 1  
 Reviewer: [Signature]  
 2nd Reviewer: [Signature]

**METHOD:** Inorganics, Method See Cover

Percent recoveries (%R) for a laboratory control sample and a matrix spike sample were recalculated using the following formula:

$\%R = \frac{\text{Found}}{\text{True}} \times 100$  Where, Found = concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation, Found = SSR (spiked sample result) - SR (sample result).  
 True = concentration of each analyte in the source.

A sample and duplicate relative percent difference (RPD) was recalculated using the following formula:

$RPD = \frac{|S-D|}{(S+D)/2} \times 100$  Where, S = Original sample concentration  
 D = Duplicate sample concentration

Sample ID	Type of Analysis	Element	Found / S (units)	True / D (units)	Recalculated	Reported	Acceptable (Y/N)
					%R / RPD	%R / RPD	
LCS 11:34	Laboratory control sample	$Cr^{+6}$	1.067 ng/ml	1.00 ng/ml	107%R	107%R	Y
N	Matrix spike sample	↓	(SSR-SR)				
DUP 12:37	Duplicate sample	↓	0.0187 ng/m <sup>3</sup>	0.0202 ng/m <sup>3</sup>	7.71%RPD	7.84%RPD	Y

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**VALIDATION FINDINGS WORKSHEET**  
Sample Calculation Verification

METHOD: Inorganics, Method See Convex

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

- Y/N/N/A Have results been reported and calculated correctly?
- Y/N/N/A Are results within the calibrated range of the instruments?
- Y/N/N/A Are all detection limits below the CRQL?

Compound (analyte) results for (1) Cr<sup>+6</sup> reported with a positive detect were recalculated and verified using the following equation:

Concentration  $(A-C)/C$        $wt = 10ml$       Recalculation:  $0.0466083 - 5.79E-03$   
 $m^3 = 21.07 m^3$

$$A = 0.0466083$$

$$C = 5.79E-03$$

$$C = 0.7853319$$

$$\frac{(ng/ml)(ul)}{m^3} = ng/m^3$$

$$\frac{0.7853319}{21.07 m^3} = 0.03727 ng/m^3$$

$$\frac{(0.0520 ng/ml)(10 ml)}{21.07 m^3} = 0.0247 ng/m^3$$

#	Sample ID	Analyte	Reported Concentration (ng/m <sup>3</sup> )	Calculated Concentration (ng/m <sup>3</sup> )	Acceptable (Y/N)
	1	Cr <sup>+6</sup>	0.0247	0.0247	Y
	2		0.0212	0.0212	
	3		0.0202	0.0202	
	4		0.0175	0.0175	
	5		0.0203	0.0203	
	6		0.0252	0.0253	Y*
	7		0.0219	0.0219	Y
	8		ND	ND	
	9		ND	ND	
	10		0.0137	0.0137	
	11		0.0313	0.0313	
	12		0.0197	0.0197	
	13		0.0147	0.0147	
	14		0.0230	0.0230	
	15		0.0133	0.0133	
	16		0.0657	0.0657	
	17		ND	ND	
	18		ND	ND	
	19		0.0081	0.0081	
	20		0.0114	0.0114	Y

Note: \_\_\_\_\_

**VALIDATION FINDINGS WORKSHEET**  
**Sample Calculation Verification**

**METHOD:** Inorganics, Method See Log

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

- Y N N/A Have results been reported and calculated correctly?
- Y N N/A Are results within the calibrated range of the instruments?
- Y N N/A Are all detection limits below the CRQL?

Compound (analyte) results for (25) Cr<sup>+6</sup> reported with a positive detect were recalculated and verified using the following equation:

Concentration =  $(A - C_0) \cdot C_1$

$A = 0.6805568$   
 $C_0 = 4.44E-03$   
 $C_1 = 0.780531$

$V_f = (10 \text{ ml})$  Recalculation:  $\frac{0.6805568 - 4.44E-03}{0.780531} = 0.866 \text{ ng/ml}$   
 $m^3 = 21.75$   
 $\frac{(0.866 \text{ ng/ml}) \cdot (10 \text{ ml})}{21.75 \text{ m}^3} = \text{ng/m}^3$

$\frac{(0.866 \text{ ng/ml}) \cdot (10 \text{ ml})}{21.75 \text{ m}^3} = 0.398 \text{ ng/m}^3$

#	Sample ID	Analyte	Reported Concentration (ng/m <sup>3</sup> )	Calculated Concentration (ng/m <sup>3</sup> )	Acceptable (Y/N)	
	21	Cr <sup>+6</sup>	0.0321	0.0321	Y	
	22	↓	0.0305	0.0305	↓	
	23		0.0061	0.0061		
	24		0.0050	0.0050		
	25		0.398	0.398		
	26		ND	ND		
	27		ND	ND		Y

Note: \_\_\_\_\_



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FILE #: 3926.00

REPORTED: 04/28/15 10:50

SUBMITTED: 04/21/15 to 04/22/15

AQS SITE

CODE:

SITE CODE: Honeywell Hex Chrome Study

Description: OAM 1

Lab ID: 5042117-01

Sampled: 04/18/15 14:41

Matrix: Air

Sample Volume: 21.07 m<sup>3</sup>

Received: 04/21/15 11:06

Comments: Start Time 4/17/15 14:05

Analysis Date: 04/22/15 14:07

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u>	<u>Flag</u>	<u>MDL</u>
		<u>ng/m<sup>3</sup> Air</u>		<u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0247		0.0038

APR 29 2015

Initials: *CR*

Eastern Research Group

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REPORTED: 04/28/15 10:50

SUBMITTED: 04/21/15 to 04/22/15

AQS SITE

CODE:

SITE CODE: Honeywell Hex Chrome Study

Description: OAM 2

Lab ID: 5042117-02

Sampled: 04/18/15 14:35

Matrix: Air

Sample Volume: 21.24 m<sup>3</sup>

Received: 04/21/15 11:06

Comments: Start Time 4/17/15 14:59

Analysis Date: 04/22/15 14:30

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u>	<u>Flag</u>	<u>MDL</u>
		<u>ng/m<sup>3</sup> Air</u>		<u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0212		0.0038

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AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

<b>Description:</b> PAM-1	<b>Lab ID:</b> 5042117-03	<b>Sampled:</b> 04/18/15 15:29
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21 m <sup>3</sup>	<b>Received:</b> 04/21/15 11:06
<b>Comments:</b> Col 1 Start Time 4/17/15 16:09		<b>Analysis Date:</b> 04/22/15 12:27

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	0.0202		0.0038

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AQS SITE

CODE:

SITE CODE: Honeywell Hex Chrome Study

Description: PAM-1D

Lab ID: 5042117-04

Sampled: 04/18/15 15:29

Matrix: Air

Sample Volume: 20.98 m<sup>3</sup>

Received: 04/21/15 11:06

Comments: Col 2 Start Time 4/17/15 16:10

Analysis Date: 04/22/15 13:00

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u>	<u>Flag</u>	<u>MDL</u>
		<u>ng/m<sup>3</sup> Air</u>		<u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0175		0.0038

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SUBMITTED: 04/21/15 to 04/22/15

AQS SITE

CODE:

SITE CODE: Honeywell Hex Chrome Study

Description: PAM-2

Lab ID: 5042117-05

Sampled: 04/18/15 15:12

Matrix: Air

Sample Volume: 20.97 m<sup>3</sup>

Received: 04/21/15 11:06

Comments: Start Time 4/17/15 15:54

Analysis Date: 04/22/15 15:02

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u>	<u>Flag</u>	<u>MDL</u>
		<u>ng/m<sup>3</sup> Air</u>		<u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0203		0.0038

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REPORTED: 04/28/15 10:50

SUBMITTED: 04/21/15 to 04/22/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

<b>Description:</b> PAM-3	<b>Lab ID:</b> 5042117-06	<b>Sampled:</b> 04/18/15 15:02
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.03 m <sup>3</sup>	<b>Received:</b> 04/21/15 11:06
<b>Comments:</b> Start Time 4/17/15 15:40		<b>Analysis Date:</b> 04/22/15 15:25

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0252		0.0038

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REPORTED: 04/28/15 10:50

SUBMITTED: 04/21/15 to 04/22/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

<b>Description:</b> PAM-4	<b>Lab ID:</b> 5042117-07	<b>Sampled:</b> 04/18/15 14:53
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.21 m <sup>3</sup>	<b>Received:</b> 04/21/15 11:06
<b>Comments:</b> Start Time 4/17/15 15:19		<b>Analysis Date:</b> 04/22/15 15:35

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	0.0219		0.0038

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FILE #: 3926.00

REPORTED: 04/28/15 10:50

SUBMITTED: 04/21/15 to 04/22/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-21

Lab ID: 5042117-08

Sampled: 04/18/15 00:00

Matrix: Air

Sample Volume: 20.97 m<sup>3</sup>

Received: 04/21/15 11:06

Comments:

Analysis Date: 04/22/15 15:46

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u>	<u>Flag</u>	<u>MDL</u>
		<u>ng/m<sup>3</sup> Air</u>		<u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0038

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REPORTED: 04/28/15 10:50

SUBMITTED: 04/21/15 to 04/22/15

AQS SITE

CODE:

SITE CODE: Honeywell Hex Chrome Study

Description: PAM-31

Lab ID: 5042117-09

Sampled: 04/18/15 00:00

Matrix: Air

Sample Volume: 21.03 m<sup>3</sup>

Received: 04/21/15 11:06

Comments:

Analysis Date: 04/22/15 15:57

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u>		<u>MDL</u>
		<u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0038

APR 29 2015

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Environmental Resources Management, Inc  
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FILE #: 3926.00  
REPORTED: 04/28/15 10:50  
SUBMITTED: 04/21/15 to 04/22/15

ATTN: Mr. Jeff Boggs

AQS SITE  
CODE:  
SITE CODE: Honeywell Hex Chrome Study

PHONE: (443) 803-8495 FAX: (410) 266-8912

<b>Description:</b> OAM 1	<b>Lab ID:</b> 5042117-10	<b>Sampled:</b> 04/17/15 14:38
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.46 m <sup>3</sup>	<b>Received:</b> 04/21/15 11:06
<b>Comments:</b> Start Time 4/16/15 14:47		<b>Analysis Date:</b> 04/22/15 16:07

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	0.0137		0.0038

APR 29 2015

Initials: CR



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FILE #: 3926.00

REPORTED: 04/28/15 10:50

SUBMITTED: 04/21/15 to 04/22/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

<b>Description:</b> OAM 2	<b>Lab ID:</b> 5042117-11	<b>Sampled:</b> 04/17/15 14:56
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.44 m <sup>3</sup>	<b>Received:</b> 04/21/15 11:06
<b>Comments:</b> Start Time 4/16/15 15:07		<b>Analysis Date:</b> 04/22/15 16:18

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	0.0313		0.0038

APR 29 2015

Initials: *ER*



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FILE #: 3926.00

REPORTED: 04/28/15 10:50

SUBMITTED: 04/21/15 to 04/22/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

<b>Description:</b> PAM-1	<b>Lab ID:</b> 5042117-12	<b>Sampled:</b> 04/17/15 16:06
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.58 m <sup>3</sup>	<b>Received:</b> 04/21/15 11:06
<b>Comments:</b> Col 1 Start Time 4/16/15 16:07		<b>Analysis Date:</b> 04/22/15 13:19

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0197		0.0038

APR 29 2015

Initials: *CR*



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FILE #: 3926.00

REPORTED: 04/28/15 10:50

SUBMITTED: 04/21/15 to 04/22/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

<b>Description:</b> PAM-1D	<b>Lab ID:</b> 5042117-13	<b>Sampled:</b> 04/17/15 16:07
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.6 m <sup>3</sup>	<b>Received:</b> 04/21/15 11:06
<b>Comments:</b> Col 2 Start Time 4/16/15 16:07		<b>Analysis Date:</b> 04/22/15 13:48

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u>	<u>Flag</u>	<u>MDL</u>
		<u>ng/m<sup>3</sup> Air</u>		<u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0147		0.0038

APR 29 2015

Initials: CR



# CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 04/28/15 10:50

SUBMITTED: 04/21/15 to 04/22/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

<b>Description:</b> PAM-2	<b>Lab ID:</b> 5042117-14	<b>Sampled:</b> 04/17/15 15:51
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.68 m <sup>3</sup>	<b>Received:</b> 04/21/15 11:06
<b>Comments:</b> Start Time 4/16/15 15:46		<b>Analysis Date:</b> 04/22/15 16:29

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	0.0230		0.0038

APR 29 2015

Initials: CR

Eastern Research Group

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AQS SITE

CODE:

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<b>Description:</b> PAM-3	<b>Lab ID:</b> 5042117-15	<b>Sampled:</b> 04/17/15 15:36
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.57 m <sup>3</sup>	<b>Received:</b> 04/21/15 11:06
<b>Comments:</b> Start Time 4/16/15 15:38		<b>Analysis Date:</b> 04/22/15 17:34

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	0.0133		0.0038

APR 29 2015

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REPORTED: 04/28/15 10:50

SUBMITTED: 04/21/15 to 04/22/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

<b>Description:</b> PAM-4	<b>Lab ID:</b> 5042117-16	<b>Sampled:</b> 04/17/15 15:16
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.46 m <sup>3</sup>	<b>Received:</b> 04/21/15 11:06
<b>Comments:</b> Start Time 4/16/15 15:25		<b>Analysis Date:</b> 04/22/15 16:50

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	0.0657		0.0038

APR 29 2015

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FILE #: 3926.00

REPORTED: 04/28/15 10:50

SUBMITTED: 04/21/15 to 04/22/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-21

Lab ID: 5042117-17

Sampled: 04/17/15 00:00

Matrix: Air

Sample Volume: 21.68 m<sup>3</sup>

Received: 04/21/15 11:06

Comments:

Analysis Date: 04/22/15 17:22

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u>	<u>Flag</u>	<u>MDL</u>
		<u>ng/m<sup>3</sup> Air</u>		<u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0038

APR 29 2015

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REPORTED: 04/28/15 10:50

SUBMITTED: 04/21/15 to 04/22/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

Description: PAM-31

Lab ID: 5042117-18

Sampled: 04/17/15 00:00

Matrix: Air

Sample Volume: 21.57 m<sup>3</sup>

Received: 04/21/15 11:06

Comments:

Analysis Date: 04/22/15 17:45

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u>	<u>Flag</u>	<u>MDL</u>
		<u>ng/m<sup>3</sup> Air</u>		<u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0038

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FILE #: 3926.00

REPORTED: 04/28/15 10:50

SUBMITTED: 04/21/15 to 04/22/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

<b>Description:</b> OAM 1	<b>Lab ID:</b> 5042220-01	<b>Sampled:</b> 04/21/15 14:56
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.67 m <sup>3</sup>	<b>Received:</b> 04/22/15 10:32
<b>Comments:</b> Start Time 4/20/15 14:52		<b>Analysis Date:</b> 04/23/15 13:25

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	0.0081		0.0038

APR 29 2015

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FILE #: 3926.00

REPORTED: 04/28/15 10:50

SUBMITTED: 04/21/15 to 04/22/15

AQS SITE

CODE:

SITE CODE: Honeywell Hex Chrome Study

<b>Description:</b> OAM 2	<b>Lab ID:</b> 5042220-02	<b>Sampled:</b> 04/21/15 15:20
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.7 m <sup>3</sup>	<b>Received:</b> 04/22/15 10:32
<b>Comments:</b> Start Time 4/20/15 15:13		<b>Analysis Date:</b> 04/23/15 13:36

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	0.0114		0.0038

APR 29 2015

Initials: CR



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FILE #: 3926.00

REPORTED: 04/28/15 10:50

SUBMITTED: 04/21/15 to 04/22/15

AQS SITE

CODE: Honeywell Hex Chrome Study  
SITE CODE:

<b>Description:</b> PAM-1	<b>Lab ID:</b> 5042220-03	<b>Sampled:</b> 04/21/15 16:11
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.77 m <sup>3</sup>	<b>Received:</b> 04/22/15 10:32
<b>Comments:</b> Col 1 Start Time 4/20/15 15:59		<b>Analysis Date:</b> 04/23/15 12:47

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	0.0321		0.0038

APR 29 2015

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FILE #: 3926.00

REPORTED: 04/28/15 10:50

SUBMITTED: 04/21/15 to 04/22/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

<b>Description:</b> PAM-1D	<b>Lab ID:</b> 5042220-04	<b>Sampled:</b> 04/21/15 16:11
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.81 m <sup>3</sup>	<b>Received:</b> 04/22/15 10:32
<b>Comments:</b> Col 2 Start Time 4/20/15 15:57		<b>Analysis Date:</b> 04/23/15 13:06

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	0.0305		0.0038

APR 29 2015

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FILE #: 3926.00

REPORTED: 04/28/15 10:50

SUBMITTED: 04/21/15 to 04/22/15

AQS SITE

CODE: Honeywell Hex Chrome Study  
SITE CODE:

<b>Description:</b> PAM-2	<b>Lab ID:</b> 5042220-05	<b>Sampled:</b> 04/21/15 15:58
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.8 m <sup>3</sup>	<b>Received:</b> 04/22/15 10:32
<b>Comments:</b> Start Time 4/20/15 15:45		<b>Analysis Date:</b> 04/23/15 13:46

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	0.0061		0.0038

APR 29 2015

Initials: CR

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FILE #: 3926.00

REPORTED: 04/28/15 10:50

SUBMITTED: 04/21/15 to 04/22/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

<b>Description:</b> PAM-3	<b>Lab ID:</b> 5042220-06	<b>Sampled:</b> 04/21/15 15:47
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.82 m <sup>3</sup>	<b>Received:</b> 04/22/15 10:32
<b>Comments:</b> Start Time 4/20/15 15:32		<b>Analysis Date:</b> 04/23/15 14:09

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	0.0050		0.0038

APR 29 2015

Initials: ER



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PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 04/28/15 10:50

SUBMITTED: 04/21/15 to 04/22/15

AQS SITE

CODE:

SITE CODE: Honeywell Hex Chrome Study

<b>Description:</b> PAM-4	<b>Lab ID:</b> 5042220-07	<b>Sampled:</b> 04/21/15 15:39
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.75 m <sup>3</sup>	<b>Received:</b> 04/22/15 10:32
<b>Comments:</b> Start Time 4/20/15 15:29		<b>Analysis Date:</b> 04/23/15 14:19

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.398		0.0038

**APR 29 2015**

Initials: *CR*



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FILE #: 3926.00

REPORTED: 04/28/15 10:50

SUBMITTED: 04/21/15 to 04/22/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

<b>Description:</b> PAM-21	<b>Lab ID:</b> 5042220-08	<b>Sampled:</b> 04/21/15 00:00
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.8 m <sup>3</sup>	<b>Received:</b> 04/22/15 10:32
<b>Comments:</b>		<b>Analysis Date:</b> 04/23/15 14:30

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	ND	U	0.0038

APR 29 2015

Initials: *CR*

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FILE #: 3926.00

REPORTED: 04/28/15 10:50

SUBMITTED: 04/21/15 to 04/22/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

Description: PAM-31

Lab ID: 5042220-09

Sampled: 04/21/15 00:00

Matrix: Air

Sample Volume: 21.82 m<sup>3</sup>

Received: 04/22/15 10:32

Comments:

Analysis Date: 04/23/15 15:02

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u>	<u>Flag</u>	<u>MDL</u>
		<u>ng/m<sup>3</sup> Air</u>		<u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0038

APR 29 2015

Initials: ER



**LABORATORY DATA CONSULTANTS, INC.**

2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

ERM  
5761 N. Church Street  
Glen Rock, PA 17327  
ATTN: Mr. Jeff Boggs

April 24, 2015

SUBJECT: Harbor Point, MD, Hexavalent Chromium Monitoring, Data Validation

Dear Mr. Boggs,

Enclosed is the final validation report for the fraction listed below. This SDG was received on April 23, 2015. Attachment 1 is a summary of the samples that were reviewed for each analysis.

**LDC Project #34127:**

<b><u>SDG</u></b>	<b><u>Fraction</u></b>
5041614/5041709	Hexavalent Chromium

The data validation was performed under EPA Level IV guidelines. The analyses were validated using the following documents, as applicable to each method:

- Air Monitoring Program Quality Assurance Project Plan, Area 1, Phase 1 Development, Version 1, Baltimore Works Site, Baltimore, Maryland, March 2014
- USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, January 2010

Please feel free to contact us if you have any questions.

Sincerely,

Christina Rink  
Project Manager/Chemist



## Laboratory Data Consultants, Inc. Data Validation Report

**Project/Site Name:** Harbor Point, MD, Hexavalent Chromium Monitoring  
**Collection Date:** April 15 through April 16, 2015  
**LDC Report Date:** April 24, 2015  
**Matrix:** Air  
**Parameters:** Hexavalent Chromium  
**Validation Level:** EPA Level IV  
**Laboratory:** Eastern Research Group  
**Sample Delivery Group (SDG):** 5041614/5041709

### Sample Identification

OAM 1 (04/15/15)  
OAM 2 (04/15/15)  
PAM-1 (04/15/15)  
PAM-1D (04/15/15)  
PAM-2 (04/15/15)  
PAM-3 (04/15/15)  
PAM-4 (04/15/15)  
PAM-21 (04/15/15)  
PAM-31 (04/15/15)  
OAM 1 (04/16/15)  
OAM 2 (04/16/15)  
PAM-1 (04/16/15)  
PAM-1D (04/16/15)  
PAM-2 (04/16/15)  
PAM-3 (04/16/15)  
PAM-4 (04/16/15)  
PAM-21 (04/16/15)  
PAM-31 (04/16/15)  
PAM-1 (04/15/15) DUP  
PAM-1D (04/15/15) DUP  
PAM-1 (04/16/15) DUP  
PAM-1D (04/16/15) DUP

The date was appended to the sample ID to differentiate between samples.

## Introduction

This data review covers 22 air samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per ASTM D7614 for Hexavalent Chromium.

This review follows the Air Monitoring Program Quality Assurance Project Plan, Area 1, Phase 1 Development, Version 1, Baltimore Works Site, Baltimore, Maryland (March 2014) and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

## **I. Technical Holding Times**

All technical holding time requirements were met.

## **II. Initial Calibration**

All criteria for the initial calibration were met.

## **III. Continuing Calibration**

Continuing calibration frequency and analysis criteria were met.

## **IV. Blanks**

Method blanks were reviewed for each matrix as applicable. No hexavalent chromium was found in the method blanks.

Samples PAM-31 (04/15/15) and PAM-31 (04/16/15) were identified as trip blanks. No hexavalent chromium was found.

Samples PAM-21 (04/15/15) and PAM-21 (04/16/15) were identified as field blanks. No hexavalent chromium was found.

## **V. Matrix Spike/Matrix Spike Duplicates**

Matrix spike (MS) and matrix spike duplicate (MSD) analysis was not required by the method.

## **VI. Duplicates**

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits.

## **VII. Laboratory Control Samples**

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

## **VIII. Sample Result Verification**

All sample result verifications were acceptable.

## **IX. Overall Assessment of Data**

Data flags are summarized at the end of this report if data has been qualified.

**X. Field Duplicates**

Samples PAM-1 (04/15/15) and PAM-1D (04/15/15) and samples PAM-1 (04/16/15) and PAM-1D (04/16/15) were identified as field duplicates. No hexavalent chromium was detected in any of the samples with the following exceptions:

Analyte	Concentration (ng/m <sup>3</sup> )		RPD (Limits)	Flags	A or P
	PAM-1 (04/15/15)	PAM-1D (04/15/15)			
Hexavalent chromium	0.0124	0.0109	13 (≤20)	-	-

Analyte	Concentration (ng/m <sup>3</sup> )		RPD (Limits)	Flags	A or P
	PAM-1 (04/16/15)	PAM-1D (04/16/15)			
Hexavalent chromium	0.0347	0.0345	1 (≤20)	-	-

**Harbor Point, MD, Hexavalent Chromium Monitoring  
Hexavalent Chromium - Data Qualification Summary - SDG 5041614/5041709**

No Sample Data Qualified Due to QA/QC Exceedances in this SDG

**Harbor Point, MD, Hexavalent Chromium Monitoring  
Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG  
5041614/5041709**

No Sample Data Qualified Due to Laboratory Blank Contamination in this  
SDG

**Harbor Point, MD, Hexavalent Chromium Monitoring  
Hexavalent Chromium - Field Blank Data Qualification Summary - SDG  
5041614/5041709**

No Sample Data Qualified Due to Field Blank Contamination in this SDG

LDC #: 34127A6

## VALIDATION COMPLETENESS WORKSHEET

Date: 4/23/15

SDG #: 5041614/5041709

Level IV

Page: 1 of 2

Laboratory: Eastern Research Group

Reviewer: SD

2nd Reviewer: CR

**METHOD: (Analyte) Hexavalent Chromium (ASTM D7614)**

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	4/15-16/15
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Laboratory Blanks	A	
V	Field blanks	ND	FB=(8)(17) TB=(9)(18)
VI.	Matrix Spike/Matrix Spike Duplicates	N	Not Required
VII.	Duplicate sample analysis	A	DUP
VIII.	Laboratory control samples	A	LCSID
IX.	Field duplicates	SW	FD=(3,4) (12,13)
X.	Sample result verification	A	
XI	Overall assessment of data	A	

Note: A = Acceptable  
N = Not provided/applicable  
SW = See worksheet

ND = No compounds detected  
R = Rinsate  
FB = Field blank

D = Duplicate  
TB = Trip blank  
EB = Equipment blank

SB=Source blank  
OTHER:

	Client ID	Lab ID	Matrix	Date
1	OAM 1(04/15/15)	5041614-01	Air	04/15/15
2	OAM 2(04/15/15)	5041614-02	Air	04/15/15
3	PAM-1(04/15/15)	5041614-03	Air	04/15/15
4	PAM-1D(04/15/15)	5041614-04	Air	04/15/15
5	PAM-2(04/15/15)	5041614-05	Air	04/15/15
6	PAM-3(04/15/15)	5041614-06	Air	04/15/15
7	PAM-4(04/15/15)	5041614-07	Air	04/15/15
8	PAM-21(04/15/15)	5041614-08	Air	04/15/15
9	PAM-31(04/15/15)	5041614-09	Air	04/15/15
10	OAM 1(04/16/15)	5041709-01	Air	04/16/15
11	OAM 2(04/16/15)	5041709-02	Air	04/16/15
12	PAM-1(04/16/15)	5041709-03	Air	04/16/15
13	PAM-1D(04/16/15)	5041709-04	Air	04/16/15
14	PAM-2(04/16/15)	5041709-05	Air	04/16/15
15	PAM-3(04/16/15)	5041709-06	Air	04/16/15
16	PAM-4(04/16/15)	5041709-07	Air	04/16/15
17	PAM-21(04/16/15)	5041709-08	Air	04/16/15

LDC #: 34127A6

# VALIDATION COMPLETENESS WORKSHEET

Date: 4/23/15

SDG #: 5041614/5041709

Level IV

Page: 2 of 2

Laboratory: Eastern Research Group

Reviewer: [Signature]

2nd Reviewer: [Signature]

**METHOD: (Analyte) Hexavalent Chromium (ASTM D7614)**

	Client ID	Lab ID	Matrix	Date
18	PAM-31(04/16/15)	5041709-09	Air	04/16/15
19	PAM-1(04/15/15)DUP	5041614-03DUP	Air	04/15/15
20	PAM-1D(04/15/15)DUP	5041614-04DUP	Air	04/15/15
21	PAM-1(04/16/15)DUP	5041709-03DUP	Air	04/16/15
22	PAM-1D(04/16/15)DUP	5041709-04DUP	Air	04/16/15
23				
24				
25				
26				
27				

Notes: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Method: Inorganics (EPA Method See below)

Validation Area	Yes	No	NA	Findings/Comments
<b>I. Technical holding times</b>				
All technical holding times were met.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Cooler temperature criteria was met.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>II. Calibration</b>				
Were all instruments calibrated daily, each set-up time?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were the proper number of standards used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all initial calibration correlation coefficients $\geq 0.995$ ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all initial and continuing calibration verification %Rs within the 90-110% QC limits? <u>85-115</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were titrant checks performed as required? (Level IV only)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Were balance checks performed as required? (Level IV only)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<b>III. Blanks</b>				
Was a method blank associated with every sample in this SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<b>IV. Matrix spike/Matrix spike duplicates and Duplicates</b>				
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<u>Air</u> Were the MS/MSD or duplicate relative percent differences (RPD) $\leq 20\%$ for waters and $\leq 35\%$ for soil samples? A control limit of $\leq CRDL$ ( $\leq 2X$ CRDL for soil) was used for samples that were $\leq 5X$ the CRDL, including when only one of the duplicate sample values were $\leq 5X$ the CRDL.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>V. Laboratory control samples</b>				
Was an LCS analyzed for this SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was an LCS analyzed per extraction batch?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% (85-115% for Method 300.0) QC limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>VI. Regional Quality Assurance and Quality Control</b>				
Were performance evaluation (PE) samples performed?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Were the performance evaluation (PE) samples within the acceptance limits?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

VALIDATION FINDINGS CHECKLIST

Validation Area	Yes	No	NA	Findings/Comments
<b>VII. Sample Result Verification</b>				
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were detection limits < RL?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>VIII. Overall assessment of data</b>				
Overall assessment of data was found to be acceptable.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>IX. Field duplicates</b>				
Field duplicate pairs were identified in this SDG.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Target analytes were detected in the field duplicates.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>X. Field blanks</b>				
Field blanks were identified in this SDG.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Target analytes were detected in the field blanks.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

**VALIDATION FINDINGS WORKSHEET**  
**Field Duplicates**Inorganics: Method See Cover

Analyte	Concentration (ng/m3)		RPD ( $\leq 20$ )	Qual.
	3	4		
Hexavalent Chromium	0.0124	0.0109	13	

Analyte	Concentration (ng/m3)		RPD ( $\leq 20$ )	Qual.
	12	13		
Hexavalent Chromium	0.0347	0.0345	1	

\\LDCFILESERVER\Validation\FIELD DUPLICATES\FD\_inorganic\34127A6.wpd



LDC #: 34127A0

**VALIDATION FINDINGS WORKSHEET**  
**Level IV Recalculation Worksheet**

Page: 1 of 1  
 Reviewer: SO  
 2nd Reviewer: Q

**METHOD:** Inorganics, Method See Cover

Percent recoveries (%R) for a laboratory control sample and a matrix spike sample were recalculated using the following formula:

$$\%R = \frac{\text{Found}}{\text{True}} \times 100$$
 Where, Found = concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation, Found = SSR (spiked sample result) - SR (sample result).  
 True = concentration of each analyte in the source.

A sample and duplicate relative percent difference (RPD) was recalculated using the following formula:

$$RPD = \frac{|S-D|}{(S+D)/2} \times 100$$
 Where, S = Original sample concentration  
 D = Duplicate sample concentration

Sample ID	Type of Analysis	Element	Found / S (units)	True / D (units)	Recalculated	Reported	Acceptable (Y/N)
					%R / RPD	%R / RPD	
<u>LCS</u> <u>11:41</u>	Laboratory control sample	<u>C<sup>2+</sup></u> ↓	<u>1.07 ng/ml</u>	<u>1.00 ng/ml</u>	<u>107%R</u>	<u>107%R</u>	<u>Y</u>
<u>N</u>	Matrix spike sample		(SSR-SR)				
<u>DUP</u> <u>13:21</u>	Duplicate sample		<u>0.0130 ng/L<sup>3</sup></u>	<u>0.0109 ng/L<sup>3</sup></u>	<u>17.6%RPD</u>	<u>17.8%RPD</u>	<u>Y*</u>

Comments: \*Rounding

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**VALIDATION FINDINGS WORKSHEET**  
 Sample Calculation Verification

METHOD: Inorganics, Method See Cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

- N N/A Have results been reported and calculated correctly?
- N N/A Are results within the calibrated range of the instruments?
- N N/A Are all detection limits below the CRQL?

Compound (analyte) results for (1) Cr<sup>+6</sup> reported with a positive detect were recalculated and verified using the following equation:

Concentration =  $(A - C_0) / C_1$   $\times$   $\frac{V_f = 10 \text{ ml}}{m^3 = 21.73}$  Recalculation:  $\frac{0.0209967 - 4.98E-03}{0.7889287} = 0.0203 \text{ ng/ml}$

$A = 0.0209967$   
 $C_0 = 4.98E-03$   
 $C_1 = 0.7889287$

$\frac{(\text{ng/ml})(\text{ml})}{m^3} = \text{ng/m}^3$   $\frac{(0.0203 \text{ ng/ml})(10 \text{ ml})}{21.73 m^3} = 0.0093 \text{ ng/m}^3$

#	Sample ID	Analyte	Reported Concentration (ng/m <sup>3</sup> )	Calculated Concentration (ng/m <sup>3</sup> )	Acceptable (Y/N)	
	1	Cr <sup>+6</sup>	0.0093	0.0093	Y	
	2	↓	0.0124	0.0124	↓	
	3		0.0109	0.0109		
	4		0.0145	0.0145		
	5		0.0461	0.0461		
	6		0.0096	0.0096		
	7		0.0125	0.0125		
	8		ND	ND		
	9		ND	ND		
	10		0.0484	0.0484		
	11		0.0246	0.0246		
	12		0.0347	0.0347		
	13		0.0345	0.0345		
	14		0.0297	0.0297		Y
	15		0.0267	0.0266		Y*
	16		0.0384	0.0384		Y
	17		ND	ND		↓
	18		ND	ND		↓

Note: \*Rounding



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FILE #: 3926.00

REPORTED: 04/23/15 08:42

SUBMITTED: 04/16/15 to 04/17/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

<b>Description:</b> OAM 1	<b>Lab ID:</b> 5041614-01	<b>Sampled:</b> 04/15/15 14:53
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.73 m <sup>3</sup>	<b>Received:</b> 04/16/15 11:52
<b>Comments:</b> Start Time 4/14/15 14:45		<b>Analysis Date:</b> 04/20/15 14:26

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0093		0.0038

APR 24 2015

Initials: *CR*

Eastern Research Group

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REPORTED: 04/23/15 08:42

SUBMITTED: 04/16/15 to 04/17/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

<b>Description:</b> OAM 2	<b>Lab ID:</b> 5041614-02	<b>Sampled:</b> 04/15/15 15:12
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.63 m <sup>3</sup>	<b>Received:</b> 04/16/15 11:52
<b>Comments:</b> Start Time 4/14/15 15:10		<b>Analysis Date:</b> 04/20/15 14:37

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0124		0.0038

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REPORTED: 04/23/15 08:42

SUBMITTED: 04/16/15 to 04/17/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

<b>Description:</b> PAM-1	<b>Lab ID:</b> 5041614-03	<b>Sampled:</b> 04/15/15 16:05
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.65 m <sup>3</sup>	<b>Received:</b> 04/16/15 11:52
<b>Comments:</b> Col 1 Start Time 4/14/15 16:02		<b>Analysis Date:</b> 04/20/15 13:11

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	0.0109		0.0038

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REPORTED: 04/23/15 08:42

SUBMITTED: 04/16/15 to 04/17/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

<b>Description:</b> PAM-1D	<b>Lab ID:</b> 5041614-04	<b>Sampled:</b> 04/15/15 16:06
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.64 m <sup>3</sup>	<b>Received:</b> 04/16/15 11:52
<b>Comments:</b> Col 2 Start Time 4/14/15 16:03		<b>Analysis Date:</b> 04/20/15 13:29

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	0.0145		0.0038

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FILE #: 3926.00

REPORTED: 04/23/15 08:42

SUBMITTED: 04/16/15 to 04/17/15

AQS SITE

CODE: Honeywell Hex Chrome Study  
SITE CODE:

<b>Description:</b> PAM-2	<b>Lab ID:</b> 5041614-05	<b>Sampled:</b> 04/15/15 15:48
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.64 m <sup>3</sup>	<b>Received:</b> 04/16/15 11:52
<b>Comments:</b> Start Time 4/14/15 15:46		<b>Analysis Date:</b> 04/20/15 15:20

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	0.0461		0.0038

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REPORTED: 04/23/15 08:42

SUBMITTED: 04/16/15 to 04/17/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

<b>Description:</b> PAM-3	<b>Lab ID:</b> 5041614-06	<b>Sampled:</b> 04/15/15 15:39
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.71 m <sup>3</sup>	<b>Received:</b> 04/16/15 11:52
<b>Comments:</b> Start Time 4/14/15 15:32		<b>Analysis Date:</b> 04/20/15 15:31

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	0.0096		0.0038

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REPORTED: 04/23/15 08:42

SUBMITTED: 04/16/15 to 04/17/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

<b>Description:</b> PAM-4	<b>Lab ID:</b> 5041614-07	<b>Sampled:</b> 04/15/15 15:33
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.72 m <sup>3</sup>	<b>Received:</b> 04/16/15 11:52
<b>Comments:</b> Start Time 4/14/15 15:25		<b>Analysis Date:</b> 04/20/15 15:41

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	0.0125		0.0038

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FILE #: 3926.00

REPORTED: 04/23/15 08:42

SUBMITTED: 04/16/15 to 04/17/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

Description: PAM-21

Lab ID: 5041614-08

Sampled: 04/15/15 00:00

Matrix: Air

Sample Volume: 21.64 m<sup>3</sup>

Received: 04/16/15 11:52

Comments:

Analysis Date: 04/20/15 15:52

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u>	<u>Flag</u>	<u>MDL</u>
		<u>ng/m<sup>3</sup> Air</u>		<u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0038

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FILE #: 3926.00

REPORTED: 04/23/15 08:42

SUBMITTED: 04/16/15 to 04/17/15

AQS SITE

CODE: Honeywell Hex Chrome Study  
SITE CODE:

<b>Description:</b> PAM-31	<b>Lab ID:</b> 5041614-09	<b>Sampled:</b> 04/15/15 00:00
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.71 m <sup>3</sup>	<b>Received:</b> 04/16/15 11:52
<b>Comments:</b>		<b>Analysis Date:</b> 04/20/15 16:03

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	ND	U	0.0038

APR 24 2015

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FILE #: 3926.00

REPORTED: 04/23/15 08:42

SUBMITTED: 04/16/15 to 04/17/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

<b>Description:</b> OAM 1	<b>Lab ID:</b> 5041709-01	<b>Sampled:</b> 04/16/15 14:45
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.43 m <sup>3</sup>	<b>Received:</b> 04/17/15 10:56
<b>Comments:</b> Start Time 4/15/15 14:56		<b>Analysis Date:</b> 04/20/15 16:26

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	0.0484		0.0038

APR 24 2015

Initials: ER

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FILE #: 3926.00

REPORTED: 04/23/15 08:42

SUBMITTED: 04/16/15 to 04/17/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

<b>Description:</b> OAM 2	<b>Lab ID:</b> 5041709-02	<b>Sampled:</b> 04/16/15 15:03
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.43 m <sup>3</sup>	<b>Received:</b> 04/17/15 10:56
<b>Comments:</b> Start Time 4/15/15 15:15		<b>Analysis Date:</b> 04/20/15 16:36

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	0.0246		0.0038

APR 24 2015

Initials: *ER*

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FILE #: 3926.00

REPORTED: 04/23/15 08:42

SUBMITTED: 04/16/15 to 04/17/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

<b>Description:</b> PAM-1	<b>Lab ID:</b> 5041709-03	<b>Sampled:</b> 04/16/15 16:03
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.53 m <sup>3</sup>	<b>Received:</b> 04/17/15 10:56
<b>Comments:</b> Col 1 Start Time 4/15/15 16:08		<b>Analysis Date:</b> 04/20/15 13:48

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	0.0347		0.0038

APR 24 2015

Initials: *CR*

Eastern Research Group

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# CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 04/23/15 08:42

SUBMITTED: 04/16/15 to 04/17/15

AQS SITE

CODE: Honeywell Hex Chrome Study  
SITE CODE:

<b>Description:</b> PAM-1D	<b>Lab ID:</b> 5041709-04	<b>Sampled:</b> 04/16/15 16:04
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.53 m <sup>3</sup>	<b>Received:</b> 04/17/15 10:56
<b>Comments:</b> Col 2 Start Time 4/15/15 16:09		<b>Analysis Date:</b> 04/20/15 14:07

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	0.0345		0.0038

APR 24 2015

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FILE #: 3926.00

REPORTED: 04/23/15 08:42

SUBMITTED: 04/16/15 to 04/17/15

AQS SITE

CODE: Honeywell Hex Chrome Study  
SITE CODE:

<b>Description:</b> PAM-2	<b>Lab ID:</b> 5041709-05	<b>Sampled:</b> 04/16/15 15:43
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.49 m <sup>3</sup>	<b>Received:</b> 04/17/15 10:56
<b>Comments:</b> Start Time 4/15/15 15:51		<b>Analysis Date:</b> 04/20/15 16:47

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	0.0297		0.0038

APR 24 2015

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REPORTED: 04/23/15 08:42

SUBMITTED: 04/16/15 to 04/17/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

<b>Description:</b> PAM-3	<b>Lab ID:</b> 5041709-06	<b>Sampled:</b> 04/16/15 15:35
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.56 m <sup>3</sup>	<b>Received:</b> 04/17/15 10:56
<b>Comments:</b> Start Time 4/15/15 15:41		<b>Analysis Date:</b> 04/20/15 16:58

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	0.0267		0.0038

APR 24 2015

Initials: *CR*



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ATTN: Mr. Jeff Boggs

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FILE #: 3926.00

REPORTED: 04/23/15 08:42

SUBMITTED: 04/16/15 to 04/17/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

<b>Description:</b> PAM-4	<b>Lab ID:</b> 5041709-07	<b>Sampled:</b> 04/16/15 15:22
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.39 m <sup>3</sup>	<b>Received:</b> 04/17/15 10:56
<b>Comments:</b> Start Time 4/15/15 15:37		<b>Analysis Date:</b> 04/20/15 17:08

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	0.0384		0.0038

APR 24 2015

Initials: CR

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FILE #: 3926.00

REPORTED: 04/23/15 08:42

SUBMITTED: 04/16/15 to 04/17/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

<b>Description:</b> PAM-21	<b>Lab ID:</b> 5041709-08	<b>Sampled:</b> 04/16/15 00:00
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.49 m <sup>3</sup>	<b>Received:</b> 04/17/15 10:56
<b>Comments:</b>		<b>Analysis Date:</b> 04/20/15 17:41

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	ND	U	0.0038

APR 24 2015

Initials: ER

Eastern Research Group

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FILE #: 3926.00

REPORTED: 04/23/15 08:42

SUBMITTED: 04/16/15 to 04/17/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

Description: PAM-31

Lab ID: 5041709-09

Sampled: 04/16/15 00:00

Matrix: Air

Sample Volume: 21.56 m<sup>3</sup>

Received: 04/17/15 10:56

Comments:

Analysis Date: 04/20/15 17:51

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0038

APR 24 2015

Initials: *CR*

Eastern Research Group

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**LABORATORY DATA CONSULTANTS, INC.**

2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

ERM  
5761 N. Church Street  
Glen Rock, PA 17327  
ATTN: Mr. Jeff Boggs

April 24, 2015

SUBJECT: Harbor Point, MD, Hexavalent Chromium Monitoring, Data Validation

Dear Mr. Boggs,

Enclosed is the final validation report for the fraction listed below. This SDG was received on April 21, 2015. Attachment 1 is a summary of the samples that were reviewed for each analysis.

**LDC Project #34110:**

<b><u>SDG</u></b>	<b><u>Fraction</u></b>
5041425/5041421	Hexavalent Chromium

The data validation was performed under EPA Level IV guidelines. The analyses were validated using the following documents, as applicable to each method:

- Air Monitoring Program Quality Assurance Project Plan, Area 1, Phase 1 Development, Version 1, Baltimore Works Site, Baltimore, Maryland, March 2014
- USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, January 2010

Please feel free to contact us if you have any questions.

Sincerely,

Christina Rink  
Project Manager/Chemist



## Laboratory Data Consultants, Inc. Data Validation Report

**Project/Site Name:** Harbor Point, MD, Hexavalent Chromium Monitoring  
**Collection Date:** April 10 through April 14, 2015  
**LDC Report Date:** April 27, 2015  
**Matrix:** Air  
**Parameters:** Hexavalent Chromium  
**Validation Level:** EPA Level IV  
**Laboratory:** Eastern Research Group  
**Sample Delivery Group (SDG):** 5041425/5041421

### Sample Identification

OAM 1(04/10/15)	PAM-2(04/13/15)	PAM-1D(041515)DUP
OAM 2(04/10/15)	PAM-3(04/13/15)	
PAM-1(04/10/15)	PAM-4(04/13/15)	
PAM-1D(04/10/15)	PAM-21(04/13/15)	
PAM-2(04/10/15)	PAM-31(04/13/15)	
PAM-3(04/10/15)	OAM 1(04/14/15)	
PAM-4(04/10/15)	OAM 2(04/14/15)	
PAM-21(04/10/15)	PAM-1(04/14/15)	
PAM-31(04/10/15)	PAM-1D(04/14/15)	
OAM 1(04/11/15)	PAM-2(04/14/15)	
PAM-1D(04/11/15)	PAM-3(04/14/15)	
PAM-2(04/11/15)	PAM-4(04/14/15)	
PAM-3(04/11/15)	PAM-21(04/14/15)	
PAM-4(04/11/15)	PAM-31(04/14/15)	
PAM-21(04/11/15)	PAM-1(04/10/15)DUP	
PAM-31(04/11/15)	PAM-1D(04/10/15)DUP	
OAM 1(04/13/15)	PAM-1D(04/11/15)DUP	
OAM 2(04/13/15)	PAM-1(04/13/15)DUP	
PAM-1(04/13/15)	PAM-1D(04/13/15)DUP	
PAM-1D(04/13/15)	PAM-1(04/14/15)DUP	

The date was appended to the sample ID to differentiate between samples.

## Introduction

This data review covers 41 air samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per ASTM D7614 for Hexavalent Chromium.

This review follows the Air Monitoring Program Quality Assurance Project Plan, Area 1, Phase 1 Development, Version 1, Baltimore Works Site, Baltimore, Maryland (March 2014) and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

## **I. Technical Holding Times**

All technical holding time requirements were met.

## **II. Initial Calibration**

All criteria for the initial calibration were met.

## **III. Continuing Calibration**

Continuing calibration frequency and analysis criteria were met.

## **IV. Blanks**

Method blanks were reviewed for each matrix as applicable. No hexavalent chromium was found in the method blanks.

Samples PAM-31 (04/10/15), PAM-31 (04/11/15), PAM-31 (04/13/15), and PAM-31 (04/14/15) were identified as trip blanks. No hexavalent chromium was found.

Samples PAM-21 (04/10/15), PAM-21 (04/11/15), PAM-21 (04/13/15), and PAM-21 (04/14/15) were identified as field blanks. No hexavalent chromium was found.

## **V. Matrix Spike/Matrix Spike Duplicates**

Matrix spike (MS) and matrix spike duplicate (MSD) analysis was not required by the method.

## **VI. Duplicates**

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Relative percent differences (RPD) were within QC limits.

## **VII. Laboratory Control Samples**

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

## **VIII. Sample Result Verification**

All sample result verifications were acceptable.

Samples OAM-2 (4/11/15) and PAM-1 (4/11/15) were voided by the laboratory because they were out of range.

## **IX. Overall Assessment of Data**

Data flags are summarized at the end of this report if data has been qualified.

## X. Field Duplicates

Samples PAM-1 (04/10/15) and PAM-1D (04/10/15), samples PAM-1 (04/13/15) and PAM-1D (04/13/15), and samples PAM-1 (04/14/15) and PAM-1D (04/14/15) were identified as field duplicates. No hexavalent chromium was detected in any of the samples with the following exceptions:

Analyte	Concentration (ng/m <sup>3</sup> )		RPD (Limits)	Flags	A or P
	PAM-1 (04/10/15)	PAM-1D (04/10/15)			
Hexavalent chromium	0.0203	0.0219	8 (≤20)	-	-

Analyte	Concentration (ng/m <sup>3</sup> )		RPD (Limits)	Flags	A or P
	PAM-1 (04/13/15)	PAM-1D (04/13/15)			
Hexavalent chromium	0.0154	0.0162	5 (≤20)	-	-

Analyte	Concentration (ng/m <sup>3</sup> )		RPD (Limits)	Flags	A or P
	PAM-1 (04/14/15)	PAM-1D (04/14/15)			
Hexavalent chromium	0.0704	0.0763	8 (≤20)	-	-

**Harbor Point, MD, Hexavalent Chromium Monitoring  
Hexavalent Chromium - Data Qualification Summary - SDG 5041425/5041421**

No Sample Data Qualified Due to QA/QC Exceedances in this SDG

**Harbor Point, MD, Hexavalent Chromium Monitoring  
Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG  
5041425/5041421**

No Sample Data Qualified Due to Laboratory Blank Contamination in this  
SDG

**Harbor Point, MD, Hexavalent Chromium Monitoring  
Hexavalent Chromium - Field Blank Data Qualification Summary - SDG  
5041425/5041421**

No Sample Data Qualified Due to Field Blank Contamination in this SDG

LDC #: 34110A6

## VALIDATION COMPLETENESS WORKSHEET

Date: 4/22/15

SDG #: 5041425/5041421

Level IV

Page: 1 of 2

Laboratory: Eastern Research Group

Reviewer: SD

2nd Reviewer: a

**METHOD: (Analyte) Hexavalent Chromium (ASTM D7614)**

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	4/10-14/15
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Laboratory Blanks	A	
V	Field blanks	ND	FB=(8)(15)(24)(33) TB=(9)(16)(25)(34)
VI.	Matrix Spike/Matrix Spike Duplicates	N	Not Required
VII.	Duplicate sample analysis	A	DW
VIII.	Laboratory control samples	A	LS10
IX.	Field duplicates	SW	FD=(3,4)(19,20)(28,29)
X.	Sample result verification	A	
XI	Overall assessment of data	A	

Note: A = Acceptable  
N = Not provided/applicable  
SW = See worksheet

ND = No compounds detected  
R = Rinsate  
FB = Field blank

D = Duplicate  
TB = Trip blank  
EB = Equipment blank

SB=Source blank  
OTHER:

	Client ID	Lab ID	Matrix	Date
1	OAM 1(04/10/15)	5041425-01	Air	04/10/15
2	OAM 2(04/10/15)	5041425-02	Air	04/10/15
3	PAM-1(04/10/15)	5041425-03	Air	04/10/15
4	PAM-1D(04/10/15)	5041425-04	Air	04/10/15
5	PAM-2(04/10/15)	5041425-05	Air	04/10/15
6	PAM-3(04/10/15)	5041425-06	Air	04/10/15
7	PAM-4(04/10/15)	5041425-07	Air	04/10/15
8	PAM-21(04/10/15)	5041425-08	Air	04/10/15
9	PAM-31(04/10/15)	5041425-09	Air	04/10/15
10	OAM 1(04/11/15)	5041425-10	Air	04/11/15
11	PAM-1D(04/11/15)	5041425-13	Air	04/11/15
12	PAM-2(04/11/15)	5041425-14	Air	04/11/15
13	PAM-3(04/11/15)	5041425-15	Air	04/11/15
14	PAM-4(04/11/15)	5041425-16	Air	04/11/15
15	PAM-21(04/11/15)	5041425-17	Air	04/11/15
16	PAM-31(04/11/15)	5041425-18	Air	04/11/15
17	OAM 1(04/13/15)	5041425-19	Air	04/13/15

LDC #: 34110A6

VALIDATION COMPLETENESS WORKSHEET

Date: 4/22/15

SDG #: 5041425/5041421

Level IV

Page: 2 of 2

Laboratory: Eastern Research Group

Reviewer: SD

2nd Reviewer: OR

METHOD: (Analyte) Hexavalent Chromium (ASTM D7614)

	Client ID	Lab ID	Matrix	Date
18	OAM 2(04/13/15)	5041425-20	Air	04/13/15
19	PAM-1(04/13/15)	5041425-21	Air	04/13/15
20	PAM-1D(04/13/15)	5041425-22	Air	04/13/15
21	PAM-2(04/13/15)	5041425-23	Air	04/13/15
22	PAM-3(04/13/15)	5041425-24	Air	04/13/15
23	PAM-4(04/13/15)	5041425-25	Air	04/13/15
24	PAM-21(04/13/15)	5041425-26	Air	04/13/15
25	PAM-31(04/13/15)	5041425-27	Air	04/13/15
26	OAM 1(04/14/15)	5041521-01	Air	04/14/15
27	OAM 2(04/14/15)	5041521-02	Air	04/14/15
28	PAM-1(04/14/15)	5041521-03	Air	04/14/15
29	PAM-1D(04/14/15)	5041521-04	Air	04/14/15
30	PAM-2(04/14/15)	5041521-05	Air	04/14/15
31	PAM-3(04/14/15)	5041521-06	Air	04/14/15
32	PAM-4(04/14/15)	5041521-07	Air	04/14/15
33	PAM-21(04/14/15)	5041521-08	Air	04/14/15
34	PAM-31(04/14/15)	5041521-09	Air	04/14/15
35	PAM-1(04/10/15)DUP	5041425-03DUP	Air	04/10/15
36	PAM-1D(04/10/15)DUP	5041425-04DUP	Air	04/10/15
37	PAM-1D(04/11/15)DUP	5041425-13DUP	Air	04/11/15
38	PAM-1(04/13/15)DUP	5041425-21DUP	Air	04/13/15
39	PAM-1D(04/13/15)DUP	5041425-22DUP	Air	04/13/15
40	PAM-1(04/14/15)DUP	5041521-03DUP	Air	04/14/15
41	PAM-1D(04/14/15)DUP	5041521-04DUP	Air	04/14/15
42				
43				
44				
45				

Notes: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Method: Inorganics (EPA Method See cover)

Validation Area	Yes	No	NA	Findings/Comments
<b>I. Technical holding times</b>				
All technical holding times were met.	/			
Cooler temperature criteria was met.	/			
<b>II. Calibration</b>				
Were all instruments calibrated daily, each set-up time?	/			
Were the proper number of standards used?	/			
Were all initial calibration correlation coefficients $\geq 0.995$ ?	/			
Were all initial and continuing calibration verification %Rs within the <del>90-110%</del> QC limits? <u>85-115</u>	/			
Were titrant checks performed as required? (Level IV only)			/	
Were balance checks performed as required? (Level IV only)			/	
<b>III. Blanks</b>				
Was a method blank associated with every sample in this SDG?	/			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		/		
<b>IV. Matrix spike/Matrix spike duplicates and Duplicates</b>				
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	/			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.			/	
<del>MS</del> Were the MS/MSD or duplicate relative percent differences (RPD) $\leq 20\%$ for <del>waters</del> and $\leq 35\%$ for soil samples? A control limit of $\leq CRDL$ ( $\leq 2X$ CRDL for soil) was used for samples that were $\leq 5X$ the CRDL, including when only one of the duplicate sample values were $\leq 5X$ the CRDL.	/			
<b>V. Laboratory control samples</b>				
Was an LCS analyzed for this SDG?	/			
Was an LCS analyzed per extraction batch?	/			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% (85-115% for Method 300.0) QC limits?	/			
<b>VI. Regional Quality Assurance and Quality Control</b>				
Were performance evaluation (PE) samples performed?			/	
Were the performance evaluation (PE) samples within the acceptance limits?			/	

Validation Area	Yes	No	NA	Findings/Comments
<b>VII. Sample Result Verification</b>				
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	/			
Were detection limits < RL?	/			
<b>VIII. Overall assessment of data</b>				
Overall assessment of data was found to be acceptable.	/			
<b>IX. Field duplicates</b>				
Field duplicate pairs were identified in this SDG.	/			
Target analytes were detected in the field duplicates.	/			
<b>X. Field blanks</b>				
Field blanks were identified in this SDG.	/			
Target analytes were detected in the field blanks.		/		

**VALIDATION FINDINGS WORKSHEET**  
**Field Duplicates**Inorganics: Method See Cover

Analyte	Concentration (ng/m3)		RPD ( $\leq 20$ )	Qual.
	3	4		
Hexavalent Chromium	0.0203	0.0219	8	

Analyte	Concentration (ng/m3)		RPD ( $\leq 20$ )	Qual.
	19	20		
Hexavalent Chromium	0.0154	0.0162	5	

Analyte	Concentration (ng/m3)		RPD ( $\leq 20$ )	Qual.
	28	29		
Hexavalent Chromium	0.0704	0.0763	8	

LDC #: 3410AB

**Validation Findings Worksheet**  
**Initial and Continuing Calibration Calculation Verification**

Page: 1 of 1  
 Reviewer: [Signature]  
 2nd Reviewer: [Signature]

**Method:** Inorganics, Method See Cover

The correlation coefficient (r) for the calibration of Cr<sup>+6</sup> was recalculated. Calibration date: 4/15/15

An initial or continuing calibration verification percent recovery (%R) was recalculated for each type of analysis using the following formula:

$$\%R = \frac{\text{Found} \times 100}{\text{True}}$$

Where, Found = concentration of each analyte measured in the analysis of the ICV or CCV solution  
 True = concentration of each analyte in the ICV or CCV source

Type of analysis	Analyte	Standard	Conc. (ng/ml)	Area	Recalculated	Reported	Acceptable (Y/N)
					r or r <sup>2</sup>	r or r <sup>2</sup>	
Initial calibration	<u>Cr<sup>+6</sup></u>	s1	0.05	0.039394	0.99987	0.99987	Y
		s2	0.1	0.0921893			
		s3	0.2	0.1464514			
		s4	0.5	0.3965918			
		s5	1	0.7726321			
		s6	2	1.5691062			
<u>3CW 11:01</u> Calibration verification	<u>Cr<sup>+6</sup></u>	<u>Found</u> 0.5265ng/ml	<u>True</u> 0.5ng/ml		105.3% <u>R</u>	105.3% <u>R</u>	↓
<u>CCV 12:05</u> Calibration verification	<u>Cr<sup>+6</sup></u>	0.525ng/ml	0.5ng/ml		105.0% <u>R</u>	105.0% <u>R</u>	
Calibration verification							

Comments: Refer to Calibration Verification findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

**VALIDATION FINDINGS WORKSHEET**  
**Level IV Recalculation Worksheet**

**METHOD:** Inorganics, Method See Cover

Percent recoveries (%R) for a laboratory control sample and a matrix spike sample were recalculated using the following formula:

$$\%R = \frac{\text{Found}}{\text{True}} \times 100$$
 Where, Found = concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation, Found = SSR (spiked sample result) - SR (sample result). True = concentration of each analyte in the source.

A sample and duplicate relative percent difference (RPD) was recalculated using the following formula:

$$RPD = \frac{|S-D|}{(S+D)/2} \times 100$$
 Where, S = Original sample concentration  
D = Duplicate sample concentration

Sample ID	Type of Analysis	Element	Found / S (units)	True / D (units)	Recalculated	Reported	Acceptable (Y/N)
					%R / RPD	%R / RPD	
LCS 11:33	Laboratory control sample	Cr <sup>+6</sup> ↓	1.07ng/ml	1.00ng/ml	107%R	107%R	Y
N	Matrix spike sample		(SSR-SR)				
DUP 12:37	Duplicate sample		0.0183ng/ml <sup>3</sup>	0.0203ng/ml <sup>3</sup>	10.4%RPD	10.6%RPD	Y*

Comments: \* Rounding

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**VALIDATION FINDINGS WORKSHEET**  
Sample Calculation Verification

METHOD: Inorganics, Method See Context

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

- Y  N  N/A Have results been reported and calculated correctly?
- Y  N  N/A Are results within the calibrated range of the instruments?
- Y  N  N/A Are all detection limits below the CRQL?

Compound (analyte) results for (14) Cr<sup>+6</sup> reported with a positive detect were recalculated and verified using the following equation:

Concentration =  $(A - C_0) / C_1$   
 $A = 0.0564929$   
 $C_0 = 1.07E-03$   
 $C_1 = 0.7817985$

Recalculation:  $\frac{0.0564929 - 1.07E-03}{0.7817985} = 0.07089 \text{ ng/ml}$

$V = 10 \text{ ml}$   
 $m^3 = 21.54$   
 $\frac{(\text{ng/ml})(V)}{m^3} = \text{ng/m}^3$   
 $\frac{(0.07089 \text{ ng/ml})(10 \text{ ml})}{21.54 \text{ m}^3} = 0.0329 \text{ ng/m}^3$

#	Sample ID	Analyte	Reported Concentration (ng/m <sup>3</sup> )	Calculated Concentration (ng/m <sup>3</sup> )	Acceptable (Y/N)
	1	Cr <sup>+6</sup>	0.0357	0.0357	Y
	2		0.0620	0.0620	↓
	3		0.0203	0.0203	↓
	4		0.0219	0.0220	Y*
	5		0.0309	0.0309	Y
	6		0.0344	0.0344	↓
	7		0.0292	0.0292	↓
	8		ND	ND	↓
	9		ND	ND	↓
	10		ND	ND	↓
	11		0.0208	0.0208	↓
	12		0.0194	0.0193	Y*
	13		ND	ND	Y
	14		0.0329	0.0329	↓
	15		ND	ND	↓
	16		ND	ND	↓
	17		0.0183	0.0182	Y*
	18		0.0247	0.0247	Y
	19		0.0154	0.0154	↓
	20		0.0162	0.0162	↓

Note: \*Rounding

**VALIDATION FINDINGS WORKSHEET**  
**Sample Calculation Verification**

**METHOD:** Inorganics, Method See Cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

- Y/N/N/A Have results been reported and calculated correctly?  
 Y/N/N/A Are results within the calibrated range of the instruments?  
 Y/N/N/A Are all detection limits below the CRQL?

Compound (analyte) results for (21) Cr<sup>+6</sup> reported with a positive detect were recalculated and verified using the following equation:

Concentration =  $(A - C_0) / C_1 \times V_f$  Recalculation:  $\frac{0.0580007 - 1.85E-04}{0.7811745} = 0.0740 \text{ ng/l}$   
 $V_f = 10 \text{ ml}$   
 $m^3 = 20.84$   
 $A = 0.0580007$   
 $C_0 = 1.85E-04$   
 $C_1 = 0.7811745$   
 $\frac{(0.0740 \text{ ng/ml})(10 \text{ ml})}{20.84 \text{ m}^3} = 0.0355 \text{ ng/m}^3$

#	Sample ID	Analyte	Reported Concentration (ng/m <sup>3</sup> )	Calculated Concentration (ng/m <sup>3</sup> )	Acceptable (Y/N)
	21	Cr <sup>+6</sup>	0.0355	0.0355	Y
	22	↓	0.0249	0.0250	Y*
	23		0.0311	0.0311	Y
	24		ND	ND	↓
	25		ND	ND	
	26		0.0680	0.0680	
	27		0.117	0.117	
	28		0.0704	0.0704	
	29		0.0763	0.0763	
	30		0.0945	0.0945	
	31		0.0781	0.0781	
	32		0.109	0.109	
	33		ND	ND	
	34		ND	ND	

Note: \*Rounding



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FILE #: 3926.00

REPORTED: 04/21/15 14:43

SUBMITTED: 04/14/15 to 04/15/15

AQS SITE

CODE:  
SITE CODE:

Honeywell Hex Chrome Study

<b>Description:</b> OAM 1	<b>Lab ID:</b> 5041425-01	<b>Sampled:</b> 04/10/15 14:13
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.15 m <sup>3</sup>	<b>Received:</b> 04/14/15 10:52
<b>Comments:</b> Start Time 4/9/15 14:43		<b>Analysis Date:</b> 04/15/15 13:35

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0357		0.0038

APR 24 2015

Initials: CR

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REPORTED: 04/21/15 14:43

SUBMITTED: 04/14/15 to 04/15/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: OAM 2

Lab ID: 5041425-02

Sampled: 04/10/15 14:47

Matrix: Air

Sample Volume: 21.63 m<sup>3</sup>

Received: 04/14/15 10:52

Comments: Start Time 4/9/15 15:12

Analysis Date: 04/15/15 13:46

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u>	<u>Flag</u>	<u>MDL</u>
		<u>ng/m<sup>3</sup> Air</u>		<u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0620		0.0038

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REPORTED: 04/21/15 14:43

SUBMITTED: 04/14/15 to 04/15/15

AQS SITE

CODE:  
SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-1

Lab ID: 5041425-03

Sampled: 04/10/15 16:14

Matrix: Air

Sample Volume: 21.56 m<sup>3</sup>

Received: 04/14/15 10:52

Comments: Col 1 Start Time 4/9/15 16:26

Analysis Date: 04/15/15 12:27

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u>	<u>Flag</u>	<u>MDL</u>
		<u>ng/m<sup>3</sup> Air</u>		<u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0203		0.0038

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Initials: *CR*



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REPORTED: 04/21/15 14:43

SUBMITTED: 04/14/15 to 04/15/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

<b>Description:</b> PAM-1D	<b>Lab ID:</b> 5041425-04	<b>Sampled:</b> 04/10/15 16:13
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.2 m <sup>3</sup>	<b>Received:</b> 04/14/15 10:52
<b>Comments:</b> Col 2 Start Time 4/9/15 16:28		<b>Analysis Date:</b> 04/15/15 12:57

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0219		0.0038

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FILE #: 3926.00

REPORTED: 04/21/15 14:43

SUBMITTED: 04/14/15 to 04/15/15

AQS SITE

CODE: Honeywell Hex Chrome Study  
SITE CODE:

<b>Description:</b> PAM-2	<b>Lab ID:</b> 5041425-05	<b>Sampled:</b> 04/10/15 15:51
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.3 m <sup>3</sup>	<b>Received:</b> 04/14/15 10:52
<b>Comments:</b> Start Time 4/9/15 16:13		<b>Analysis Date:</b> 04/15/15 13:57

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	0.0309		0.0038

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REPORTED: 04/21/15 14:43

SUBMITTED: 04/14/15 to 04/15/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-3

Lab ID: 5041425-06

Sampled: 04/10/15 15:26

Matrix: Air

Sample Volume: 21.31 m<sup>3</sup>

Received: 04/14/15 10:52

Comments: Start Time 4/9/15 15:49

Analysis Date: 04/15/15 14:08

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u>	<u>Flag</u>	<u>MDL</u>
		<u>ng/m<sup>3</sup> Air</u>		<u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0344		0.0038

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REPORTED: 04/21/15 14:43

SUBMITTED: 04/14/15 to 04/15/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-4

Lab ID: 5041425-07

Sampled: 04/10/15 15:13

Matrix: Air

Sample Volume: 21.18 m<sup>3</sup>

Received: 04/14/15 10:52

Comments: Start Time 4/9/15 15:40

Analysis Date: 04/15/15 14:40

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u>	<u>Flag</u>	<u>MDL</u>
		<u>ng/m<sup>3</sup> Air</u>		<u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0292		0.0038

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FILE #: 3926.00

REPORTED: 04/21/15 14:43

SUBMITTED: 04/14/15 to 04/15/15

AQS SITE

CODE: Honeywell Hex Chrome Study  
SITE CODE:

Description: PAM-21

Lab ID: 5041425-08

Sampled: 04/10/15 00:00

Matrix: Air

Sample Volume: 21.3 m<sup>3</sup>

Received: 04/14/15 10:52

Comments:

Analysis Date: 04/15/15 14:50

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u>	<u>Flag</u>	<u>MDL</u>
		<u>ng/m<sup>3</sup> Air</u>		<u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0038

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Initials: ER

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FILE #: 3926.00

REPORTED: 04/21/15 14:43

SUBMITTED: 04/14/15 to 04/15/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

Description: PAM-31

Lab ID: 5041425-09

Sampled: 04/10/15 00:00

Matrix: Air

Sample Volume: 21.31 m<sup>3</sup>

Received: 04/14/15 10:52

Comments:

Analysis Date: 04/15/15 15:01

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u>	<u>Flag</u>	<u>MDL</u>
		<u>ng/m<sup>3</sup> Air</u>		<u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0038

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REPORTED: 04/21/15 14:43

SUBMITTED: 04/14/15 to 04/15/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

<b>Description:</b> OAM 1	<b>Lab ID:</b> 5041425-10	<b>Sampled:</b> 04/11/15 14:22
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.61 m <sup>3</sup>	<b>Received:</b> 04/14/15 10:52
<b>Comments:</b> Start Time 4/10/15 14:22		<b>Analysis Date:</b> 04/15/15 15:12

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	ND	U	0.0038

APR 24 2015

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FILE #: 3926.00

REPORTED: 04/21/15 14:43

SUBMITTED: 04/14/15 to 04/15/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-1D

Lab ID: 5041425-13

Sampled: 04/11/15 16:02

Matrix: Air

Sample Volume: 21.35 m<sup>3</sup>

Received: 04/14/15 10:52

Comments: Col 2 Start Time 4/10/15 16:18

Analysis Date: 04/15/15 13:17

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u>	<u>Flag</u>	<u>MDL</u>
		<u>ng/m<sup>3</sup> Air</u>		<u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0208		0.0038

APR 24 2015

Initials: *ER*

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FILE #: 3926.00

REPORTED: 04/21/15 14:43

SUBMITTED: 04/14/15 to 04/15/15

AQS SITE

CODE: Honeywell Hex Chrome Study  
SITE CODE:

<b>Description:</b> PAM-2	<b>Lab ID:</b> 5041425-14	<b>Sampled:</b> 04/11/15 15:45
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.43 m <sup>3</sup>	<b>Received:</b> 04/14/15 10:52
<b>Comments:</b> Start Time 4/10/15 15:56		<b>Analysis Date:</b> 04/15/15 15:22

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0194		0.0038

APR 24 2015

Initials: CR

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FILE #: 3926.00

REPORTED: 04/21/15 14:43

SUBMITTED: 04/14/15 to 04/15/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-3

Lab ID: 5041425-15

Sampled: 04/11/15 15:19

Matrix: Air

Sample Volume: 21.46 m<sup>3</sup>

Received: 04/14/15 10:52

Comments: Start Time 4/10/15 15:28

Analysis Date: 04/15/15 15:33

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u>	<u>Flag</u>	<u>MDL</u>
		<u>ng/m<sup>3</sup> Air</u>		<u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0038

APR 24 2015

Initials: *CR*

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FILE #: 3926.00

REPORTED: 04/21/15 14:43

SUBMITTED: 04/14/15 to 04/15/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-4

Lab ID: 5041425-16

Sampled: 04/11/15 15:11

Matrix: Air

Sample Volume: 21.54 m<sup>3</sup>

Received: 04/14/15 10:52

Comments: Start Time 4/10/15 15:15

Analysis Date: 04/15/15 15:44

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u>	<u>Flag</u>	<u>MDL</u>
		<u>ng/m<sup>3</sup> Air</u>		<u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0329		0.0038

APR 24 2015

Initials: *CR*



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FILE #: 3926.00

REPORTED: 04/21/15 14:43

SUBMITTED: 04/14/15 to 04/15/15

AQS SITE

CODE:  
SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-21

Lab ID: 5041425-17

Sampled: 04/11/15 00:00

Matrix: Air

Sample Volume: 21.43 m<sup>3</sup>

Received: 04/14/15 10:52

Comments:

Analysis Date: 04/15/15 15:55

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0038

APR 24 2015

Initials: *ER*

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FILE #: 3926.00

REPORTED: 04/21/15 14:43

SUBMITTED: 04/14/15 to 04/15/15

AQS SITE

CODE:  
SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-31

Lab ID: 5041425-18

Sampled: 04/11/15 00:00

Matrix: Air

Sample Volume: 21.46 m<sup>3</sup>

Received: 04/14/15 10:52

Comments:

Analysis Date: 04/15/15 16:05

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u>	<u>Flag</u>	<u>MDL</u>
		<u>ng/m<sup>3</sup> Air</u>		<u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0038

APR 24 2015

Initials: ER

Eastern Research Group

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# CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 04/21/15 14:43

SUBMITTED: 04/14/15 to 04/15/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: OAM 1

Lab ID: 5041425-19

Sampled: 04/13/15 14:36

Matrix: Air

Sample Volume: 21.09 m<sup>3</sup>

Received: 04/14/15 10:52

Comments: Start Time 4/12/15 15:10

Analysis Date: 04/16/15 13:54

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u>	<u>Flag</u>	<u>MDL</u>
		<u>ng/m<sup>3</sup> Air</u>		<u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0183		0.0038

APR 24 2015

Initials: *CR*

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FILE #: 3926.00

REPORTED: 04/21/15 14:43

SUBMITTED: 04/14/15 to 04/15/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: OAM 2

Lab ID: 5041425-20

Sampled: 04/13/15 14:56

Matrix: Air

Sample Volume: 21.02 m<sup>3</sup>

Received: 04/14/15 10:52

Comments: Start Time 4/12/15 15:35

Analysis Date: 04/16/15 14:05

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0247		0.0038

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FILE #: 3926.00

REPORTED: 04/21/15 14:43

SUBMITTED: 04/14/15 to 04/15/15

AQS SITE

CODE: Honeywell Hex Chrome Study  
SITE CODE:

<b>Description:</b> PAM-1	<b>Lab ID:</b> 5041425-21	<b>Sampled:</b> 04/13/15 15:52
<b>Matrix:</b> Air	<b>Sample Volume:</b> 20.9 m <sup>3</sup>	<b>Received:</b> 04/14/15 10:52
<b>Comments:</b> Col 1 Start Time 4/12/15 16:39		<b>Analysis Date:</b> 04/16/15 14:37

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0154		0.0038

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FILE #: 3926.00

REPORTED: 04/21/15 14:43

SUBMITTED: 04/14/15 to 04/15/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

<b>Description:</b>	PAM-1D	<b>Lab ID:</b>	5041425-22	<b>Sampled:</b>	04/13/15 15:53
<b>Matrix:</b>	Air	<b>Sample Volume:</b>	20.9 m <sup>3</sup>	<b>Received:</b>	04/14/15 10:52
<b>Comments:</b>	Col 2 Start Time 4/12/15 16:40			<b>Analysis Date:</b>	04/16/15 12:57

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0162		0.0038

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FILE #: 3926.00

REPORTED: 04/21/15 14:43

SUBMITTED: 04/14/15 to 04/15/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-2

Lab ID: 5041425-23

Sampled: 04/13/15 15:32

Matrix: Air

Sample Volume: 20.84 m<sup>3</sup>

Received: 04/14/15 10:52

Comments: Start Time 4/12/15 16:23

Analysis Date: 04/16/15 14:57

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0355		0.0038

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FILE #: 3926.00

REPORTED: 04/21/15 14:43

SUBMITTED: 04/14/15 to 04/15/15

AQS SITE

CODE:  
SITE CODE:

Honeywell Hex Chrome Study

**Description:** PAM-3

**Lab ID:** 5041425-24

**Sampled:** 04/13/15 15:21

**Matrix:** Air

**Sample Volume:** 20.86 m<sup>3</sup>

**Received:** 04/14/15 10:52

**Comments:** Start Time 4/12/15 16:10

**Analysis Date:** 04/16/15 15:07

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u>	<u>Flag</u>	<u>MDL</u>
		<u>ng/m<sup>3</sup> Air</u>		<u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0249		0.0038

APR 24 2015

Initials: *CR*

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FILE #: 3926.00

REPORTED: 04/21/15 14:43

SUBMITTED: 04/14/15 to 04/15/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

Description: PAM-4

Lab ID: 5041425-25

Sampled: 04/13/15 15:13

Matrix: Air

Sample Volume: 20.96 m<sup>3</sup>

Received: 04/14/15 10:52

Comments: Start Time 4/12/15 15:56

Analysis Date: 04/16/15 15:18

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u>	<u>Flag</u>	<u>MDL</u>
		<u>ng/m<sup>3</sup> Air</u>		<u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0311		0.0038

APR 24 2015

Initials: CR

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FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 04/21/15 14:43

SUBMITTED: 04/14/15 to 04/15/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

<b>Description:</b> PAM-21	<b>Lab ID:</b> 5041425-26	<b>Sampled:</b> 04/13/15 00:00
<b>Matrix:</b> Air	<b>Sample Volume:</b> 20.84 m <sup>3</sup>	<b>Received:</b> 04/14/15 10:52
<b>Comments:</b>		<b>Analysis Date:</b> 04/16/15 15:29

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0038

APR 24 2015

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FILE #: 3926.00

REPORTED: 04/21/15 14:43

SUBMITTED: 04/14/15 to 04/15/15

AQS SITE

CODE:  
SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-31

Lab ID: 5041425-27

Sampled: 04/13/15 00:00

Matrix: Air

Sample Volume: 20.86 m<sup>3</sup>

Received: 04/14/15 10:52

Comments:

Analysis Date: 04/16/15 15:40

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0038

APR 24 2015

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FILE #: 3926.00

REPORTED: 04/21/15 14:43

SUBMITTED: 04/14/15 to 04/15/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

<b>Description:</b> OAM 1	<b>Lab ID:</b> 5041521-01	<b>Sampled:</b> 04/14/15 14:41
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.64 m <sup>3</sup>	<b>Received:</b> 04/15/15 10:59
<b>Comments:</b> Start Time 4/13/15 14:39		<b>Analysis Date:</b> 04/16/15 15:50

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	0.0680		0.0038

APR 24 2015

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FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 04/21/15 14:43

SUBMITTED: 04/14/15 to 04/15/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: OAM 2

Lab ID: 5041521-02

Sampled: 04/14/15 15:07

Matrix: Air

Sample Volume: 21.72 m<sup>3</sup>

Received: 04/15/15 10:59

Comments: Start Time 4/13/15 14:59

Analysis Date: 04/16/15 16:01

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.117		0.0038

APR 24 2015

Initials: ER

Eastern Research Group

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ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 04/21/15 14:43

SUBMITTED: 04/14/15 to 04/15/15

AQS SITE

CODE:  
SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-1

Lab ID: 5041521-03

Sampled: 04/14/15 15:59

Matrix: Air

Sample Volume: 21.65 m<sup>3</sup>

Received: 04/15/15 10:59

Comments: Col 1 Start Time 4/13/15 15:56

Analysis Date: 04/16/15 13:16

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u>	<u>Flag</u>	<u>MDL</u>
		<u>ng/m<sup>3</sup> Air</u>		<u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0704		0.0038

APR 24 2015

Initials: CR



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FILE #: 3926.00

REPORTED: 04/21/15 14:43

SUBMITTED: 04/14/15 to 04/15/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

<b>Description:</b> PAM-1D	<b>Lab ID:</b> 5041521-04	<b>Sampled:</b> 04/14/15 16:00
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.63 m <sup>3</sup>	<b>Received:</b> 04/15/15 10:59
<b>Comments:</b> Col 2 Start Time 4/13/15 15:58		<b>Analysis Date:</b> 04/16/15 13:35

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0763		0.0038

APR 24 2015

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FILE #: 3926.00

REPORTED: 04/21/15 14:43

SUBMITTED: 04/14/15 to 04/15/15

AQS SITE

CODE:  
SITE CODE:

Honeywell Hex Chrome Study

<b>Description:</b> PAM-2	<b>Lab ID:</b> 5041521-05	<b>Sampled:</b> 04/14/15 15:42
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.7 m <sup>3</sup>	<b>Received:</b> 04/15/15 10:59
<b>Comments:</b> Start Time 4/13/15 15:36		<b>Analysis Date:</b> 04/16/15 16:12

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0945		0.0038

APR 24 2015

Initials: ER

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FILE #: 3926.00

REPORTED: 04/21/15 14:43

SUBMITTED: 04/14/15 to 04/15/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-3

Lab ID: 5041521-06

Sampled: 04/14/15 15:29

Matrix: Air

Sample Volume: 21.67 m<sup>3</sup>

Received: 04/15/15 10:59

Comments: Start Time 4/13/15 15:24

Analysis Date: 04/16/15 16:22

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u>	<u>Flag</u>	<u>MDL</u>
		<u>ng/m<sup>3</sup> Air</u>		<u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0781		0.0038

APR 24 2015

Initials: *ER*

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FILE #: 3926.00

REPORTED: 04/21/15 14:43

SUBMITTED: 04/14/15 to 04/15/15

AQS SITE

CODE: Honeywell Hex Chrome Study  
SITE CODE:

Description: PAM-4

Lab ID: 5041521-07

Sampled: 04/14/15 15:22

Matrix: Air

Sample Volume: 21.69 m<sup>3</sup>

Received: 04/15/15 10:59

Comments: Start Time 4/13/15 15:16

Analysis Date: 04/16/15 16:33

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u>		<u>MDL</u>
		<u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.109		0.0038

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FILE #: 3926.00

REPORTED: 04/21/15 14:43

SUBMITTED: 04/14/15 to 04/15/15

AQS SITE

CODE:  
SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-21

Lab ID: 5041521-08

Sampled: 04/14/15 00:00

Matrix: Air

Sample Volume: 21.7 m<sup>3</sup>

Received: 04/15/15 10:59

Comments:

Analysis Date: 04/16/15 17:05

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0038

APR 24 2015

Initials: *ER*

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FILE #: 3926.00

REPORTED: 04/21/15 14:43

SUBMITTED: 04/14/15 to 04/15/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

Description: PAM-31

Lab ID: 5041521-09

Sampled: 04/14/15 00:00

Matrix: Air

Sample Volume: 21.67 m<sup>3</sup>

Received: 04/15/15 10:59

Comments:

Analysis Date: 04/16/15 17:16

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0038

APR 24 2015

Initials: *CR*

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**LABORATORY DATA CONSULTANTS, INC.**

2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

ERM  
5761 N. Church Street  
Glen Rock, PA 17327  
ATTN: Mr. Jeff Boggs

April 22, 2015

SUBJECT: Harbor Point, MD, Hexavalent Chromium Monitoring, Data Validation

Dear Mr. Boggs,

Enclosed is the final validation report for the fraction listed below. This SDG was received on April 16, 2015. Attachment 1 is a summary of the samples that were reviewed for each analysis.

**LDC Project #34090:**

<b><u>SDG</u></b>	<b><u>Fraction</u></b>
5040914/5041020	Hexavalent Chromium

The data validation was performed under EPA Level IV guidelines. The analyses were validated using the following documents, as applicable to each method:

- Air Monitoring Program Quality Assurance Project Plan, Area 1, Phase 1 Development, Version 1, Baltimore Works Site, Baltimore, Maryland, March 2014
- USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, January 2010

Please feel free to contact us if you have any questions.

Sincerely,

Christina Rink  
Project Manager/Chemist



## Laboratory Data Consultants, Inc. Data Validation Report

**Project/Site Name:** Harbor Point, MD, Hexavalent Chromium Monitoring  
**Collection Date:** April 8 through April 9, 2015  
**LDC Report Date:** April 17, 2015  
**Matrix:** Air  
**Parameters:** Hexavalent Chromium  
**Validation Level:** EPA Level IV  
**Laboratory:** Eastern Research Group  
**Sample Delivery Group (SDG):** 5040914/5041020

### Sample Identification

OAM 1 (04/08/15)  
OAM 2 (04/08/15)  
PAM-1 (04/08/15)  
PAM-1D (04/08/15)  
PAM-2 (04/08/15)  
PAM-3 (04/08/15)  
PAM-4 (04/08/15)  
PAM-21 (04/08/15)  
PAM-31 (04/08/15)  
OAM 1 (04/09/15)  
OAM 2 (04/09/15)  
PAM-1 (04/09/15)  
PAM-1D (04/09/15)  
PAM-2 (04/09/15)  
PAM-3 (04/09/15)  
PAM-4 (04/09/15)  
PAM-21 (04/09/15)  
PAM-31 (04/09/15)  
PAM-1 (04/08/15) DUP  
PAM-1D (04/08/15) DUP  
PAM-1 (04/09/15) DUP  
PAM-1D (04/09/15) DUP

The date was appended to the sample ID to differentiate between samples.

## Introduction

This data review covers 22 air samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per ASTM D7614 for Hexavalent Chromium.

This review follows the Air Monitoring Program Quality Assurance Project Plan, Area 1, Phase 1 Development, Version 1, Baltimore Works Site, Baltimore, Maryland (March 2014) and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

## **I. Technical Holding Times**

All technical holding time requirements were met.

## **II. Initial Calibration**

All criteria for the initial calibration were met.

## **III. Continuing Calibration**

Continuing calibration frequency and analysis criteria were met.

## **IV. Blanks**

Method blanks were reviewed for each matrix as applicable. No hexavalent chromium was found in the method blanks.

Samples PAM-31 (04/08/15) and PAM-31 (04/09/15) were identified as trip blanks. No hexavalent chromium was found.

Samples PAM-21 (04/08/15) and PAM-21 (04/09/15) were identified as field blanks. No hexavalent chromium was found.

## **V. Matrix Spike/Matrix Spike Duplicates**

Matrix spike (MS) and matrix spike duplicate (MSD) analysis was not required by the method.

## **VI. Duplicates**

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits.

## **VII. Laboratory Control Samples**

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

## **VIII. Sample Result Verification**

All sample result verifications were acceptable.

## **IX. Overall Assessment of Data**

Data flags are summarized at the end of this report if data has been qualified.

## X. Field Duplicates

Samples PAM-1 (04/08/15) and PAM-1D (04/08/15) and samples PAM-1 (04/09/15) and PAM-1D (04/09/15) were identified as field duplicates. No hexavalent chromium was detected in any of the samples with the following exceptions:

Analyte	Concentration (ng/m <sup>3</sup> )		RPD (Limits)	Flags	A or P
	PAM-1 (04/08/15)	PAM-1D (04/08/15)			
Hexavalent chromium	0.0458	0.0454	1 (≤20)	-	-

Analyte	Concentration (ng/m <sup>3</sup> )		RPD (Limits)	Flags	A or P
	PAM-1 (04/09/15)	PAM-1D (04/09/15)			
Hexavalent chromium	0.0144	0.0105	31 (≤20)	NQ	-

NQ = One or both results were < 5x the reporting limit, therefore no data were qualified.

**Harbor Point, MD, Hexavalent Chromium Monitoring  
Hexavalent Chromium - Data Qualification Summary - SDG 5040914/5041020**

No Sample Data Qualified Due to QA/QC Exceedances in this SDG

**Harbor Point, MD, Hexavalent Chromium Monitoring  
Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG  
5040914/5041020**

No Sample Data Qualified Due to Laboratory Blank Contamination in this  
SDG

**Harbor Point, MD, Hexavalent Chromium Monitoring  
Hexavalent Chromium - Field Blank Data Qualification Summary - SDG  
5040914/5041020**

No Sample Data Qualified Due to Field Blank Contamination in this SDG

LDC #: 34090A6

## VALIDATION COMPLETENESS WORKSHEET

Date: 4/16/15

SDG #: 5040914/5041020

Level IV

Page: 1 of 2

Laboratory: Eastern Research Group

Reviewer: SD2nd Reviewer: an**METHOD: (Analyte) Hexavalent Chromium (ASTM D7614)**

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	4/08 - 09/15
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Laboratory Blanks	A	
V	Field blanks	ND	FB=(8)(17) TB=(9)(18)
VI.	Matrix Spike/Matrix Spike Duplicates	N	Not Required
VII.	Duplicate sample analysis	A	DUP
VIII.	Laboratory control samples	A	LCSD
IX.	Field duplicates	SW	FD=(3,4)(12,13)
X.	Sample result verification	A	
XI	Overall assessment of data	A	

Note: A = Acceptable  
N = Not provided/applicable  
SW = See worksheet

ND = No compounds detected  
R = Rinsate  
FB = Field blank

D = Duplicate  
TB = Trip blank  
EB = Equipment blank

SB=Source blank  
OTHER:

	Client ID	Lab ID	Matrix	Date
1	OAM 1(04/08/15)	5040914-01	Air	04/08/15
2	OAM 2(04/08/15)	5040914-02	Air	04/08/15
3	PAM-1(04/08/15)	5040914-03	Air	04/08/15
4	PAM-1D(04/08/15)	5040914-04	Air	04/08/15
5	PAM-2(04/08/15)	5040914-05	Air	04/08/15
6	PAM-3(04/08/15)	5040914-06	Air	04/08/15
7	PAM-4(04/08/15)	5040914-07	Air	04/08/15
8	PAM-21(04/08/15)	5040914-08	Air	04/08/15
9	PAM-31(04/08/15)	5040914-09	Air	04/08/15
10	OAM 1(04/09/15)	5041020-01	Air	04/09/15
11	OAM 2(04/09/15)	5041020-02	Air	04/09/15
12	PAM-1 (04/09/15)	5041020-03	Air	04/09/15
13	PAM-1D (04/09/15)	5041020-04	Air	04/09/15
14	PAM-2(04/09/15)	5041020-05	Air	04/09/15
15	PAM-3(04/09/15)	5041020-06	Air	04/09/15
16	PAM-4(04/09/15)	5041020-07	Air	04/09/15
17	PAM-21(04/09/15)	5041020-08	Air	04/09/15

LDC #: 34090A6

# VALIDATION COMPLETENESS WORKSHEET

Date: 4/16/15

SDG #: 5040914/5041020

Level IV

Page: 2 of 3

Laboratory: Eastern Research Group

Reviewer: SD

2nd Reviewer: [Signature]

**METHOD:** (Analyte) Hexavalent Chromium (ASTM D7614)

	Client ID	Lab ID	Matrix	Date
18	PAM-31(04/09/15)	5041020-09	Air	04/09/15
19	PAM-1(04/08/15)DUP	5040914-03DUP	Air	04/08/15
20	PAM-1D(04/08/15)DUP	5040914-04DUP	Air	04/08/15
21	PAM-1 (04/09/15)DUP	5041020-03DUP	Air	04/09/15
22	PAM-1D (04/09/15)DUP	5041020-04DUP	Air	04/09/15
23				
24				
25				

Notes: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Method: Inorganics (EPA Method See Cover)

Validation Area	Yes	No	NA	Findings/Comments
<b>I. Technical holding times</b>				
All technical holding times were met.	/			
Cooler temperature criteria was met.	/			
<b>II. Calibration</b>				
Were all instruments calibrated daily, each set-up time?	/			
Were the proper number of standards used?	/			
Were all initial calibration correlation coefficients $\geq 0.995$ ?	/			
Were all initial and continuing calibration verification %Rs within the <del>90-110%</del> <u>85-115%</u> QC limits?	/			
Were titrant checks performed as required? (Level IV only)			/	
Were balance checks performed as required? (Level IV only)			/	
<b>III. Blanks</b>				
Was a method blank associated with every sample in this SDG?	/			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		/		
<b>IV. Matrix spike/Matrix spike duplicates and Duplicates</b>				
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	/			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.			/	
<u>Air</u> Were the MS/MSD or duplicate relative percent differences (RPD) $\leq 20\%$ for waters and $\leq 35\%$ for soil samples? A control limit of $\leq$ CRDL ( $\leq 2X$ CRDL for soil) was used for samples that were $\leq 5X$ the CRDL, including when only one of the duplicate sample values were $\leq 5X$ the CRDL.	/			
<b>V. Laboratory control samples</b>				
Was an LCS analyzed for this SDG?	/			
Was an LCS analyzed per extraction batch?	/			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% (85-115% for Method 300.0) QC limits?	/			
<b>VI. Regional Quality Assurance and Quality Control</b>				
Were performance evaluation (PE) samples performed?			/	
Were the performance evaluation (PE) samples within the acceptance limits?			/	

**VALIDATION FINDINGS CHECKLIST**

Validation Area	Yes	No	NA	Findings/Comments
<b>VII. Sample Result Verification</b>				
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	/			
Were detection limits < RL?	/			
<b>VIII. Overall assessment of data</b>				
Overall assessment of data was found to be acceptable.	/			
<b>IX. Field duplicates</b>				
Field duplicate pairs were identified in this SDG.	/			
Target analytes were detected in the field duplicates.	/			
<b>X. Field blanks</b>				
Field blanks were identified in this SDG.	/			
Target analytes were detected in the field blanks.		/		

**VALIDATION FINDINGS WORKSHEET**  
Field Duplicates

Inorganics: Method See Cover

Analyte	Concentration (ng/m3)		RPD (≤20)	Qual.
	3	4		
Hexavalent Chromium	0.0458	0.0454	1	

Analyte	Concentration (ng/m3)		RPD (≤20)	Qual.
	12	13		
Hexavalent Chromium	0.0144	0.0105	31	NQ

NQ= No Qual. Because one or both samples <5X RL  
 \\LDCFILESERVER\Validation\FIELD DUPLICATES\FD\_inorganic\34090A6.wpd



LDC #: 319002

**VALIDATION FINDINGS WORKSHEET**  
**Level IV Recalculation Worksheet**

Page: 1 of 1  
 Reviewer: SD  
 2nd Reviewer: [Signature]

**METHOD:** Inorganics, Method See Cover

Percent recoveries (%R) for a laboratory control sample and a matrix spike sample were recalculated using the following formula:

$\%R = \frac{\text{Found}}{\text{True}} \times 100$  Where, Found = concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation, Found = SSR (spiked sample result) - SR (sample result).  
 True = concentration of each analyte in the source.

A sample and duplicate relative percent difference (RPD) was recalculated using the following formula:

$RPD = \frac{|S-D|}{(S+D)/2} \times 100$  Where, S = Original sample concentration  
 D = Duplicate sample concentration

Sample ID	Type of Analysis	Element	Found / S (units)	True / D (units)	Recalculated	Reported	Acceptable (Y/N)
					%R / RPD	%R / RPD	
LCS 12:15	Laboratory control sample	Cr <sup>+6</sup>	1.08 ng/ml	1.00 ng/ml	108%R	108%R	Y
N	Matrix spike sample		(SSR-SR)				
DUP 13:19	Duplicate sample		0.0458 ng/ml <sup>3</sup>	0.0458 ng/ml <sup>3</sup>	0.218%RPD	0.204%RPD	Y

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**VALIDATION FINDINGS WORKSHEET**  
**Sample Calculation Verification**

**METHOD:** Inorganics, Method See Cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

- Y  N  N/A Have results been reported and calculated correctly?
- Y  N  N/A Are results within the calibrated range of the instruments?
- Y  N  N/A Are all detection limits below the CRQL?

Compound (analyte) results for (1)  $C_5^{+P}$  reported with a positive detect were recalculated and verified using the following equation:

Concentration =  $(A - C_0) / C_1$        $uf = 10ml$       Recalculation:  $\frac{0.0842980 - (8.11E-03)}{0.7731848} = 0.0985 \text{ ng/ml}$

$A = 0.0842980$        $m^3 = 21.37$   
 $C_0 = 8.11E-03$        $(\text{ng/ml})(uf)$   
 $C_1 = 0.7731848$        $\frac{\quad}{m^3} = \text{ng/m}^3$        $\frac{(0.0985 \text{ ng/ml})(10ml)}{21.37 m^3} = 0.046 \text{ ng}$

#	Sample ID	Analyte	Reported Concentration (ng/m <sup>3</sup> )	Calculated Concentration (ng/m <sup>3</sup> )	Acceptable (Y/N)
	1	$C_5^{+P}$	0.0461	0.0461	Y
	2		0.103	0.103	
	3		0.0458	0.0458	
	4		0.0454	0.0454	
	5		0.0359	0.0359	
	6		0.0377	0.0377	
	7		0.0438	0.0438	
	8		ND	ND	
	9		ND	ND	
	10		0.0054	0.0054	
	11		0.0163	0.0163	
	12		0.0144	0.0144	
	13		0.0105	0.0105	
	14		0.0087	0.0087	
	15		0.0134	0.0134	
	16		0.0122	0.0122	
	17		ND	ND	
	18		ND	ND	

Note: \_\_\_\_\_



# CERTIFICATE OF ANALYSIS

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Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 04/16/15 14:21

SUBMITTED: 04/09/15 to 04/10/15

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

<b>Description:</b> OAM 1	<b>Lab ID:</b> 5040914-01	<b>Sampled:</b> 04/08/15 14:23
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.37 m <sup>3</sup>	<b>Received:</b> 04/09/15 11:27
<b>Comments:</b> Start Time 4/7/15 14:39		<b>Analysis Date:</b> 04/13/15 14:24

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	0.0461		0.0038

APR 17 2015

Initials: CR

Eastern Research Group

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REPORTED: 04/16/15 14:21

SUBMITTED: 04/09/15 to 04/10/15

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: OAM 2

Lab ID: 5040914-02

Sampled: 04/08/15 14:42

Matrix: Air

Sample Volume: 21.36 m<sup>3</sup>

Received: 04/09/15 11:27

Comments: Start Time 4/7/15 14:58

Analysis Date: 04/13/15 14:35

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.103		0.0038

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Initials: ER

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REPORTED: 04/16/15 14:21

SUBMITTED: 04/09/15 to 04/10/15

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

<b>Description:</b> PAM-1	<b>Lab ID:</b> 5040914-03	<b>Sampled:</b> 04/08/15 15:40
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.44 m <sup>3</sup>	<b>Received:</b> 04/09/15 11:27
<b>Comments:</b> Col 1 Start Time 4/7/15 15:51		<b>Analysis Date:</b> 04/13/15 13:09

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	0.0458		0.0038

APR 17 2015

Initials: CR

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REPORTED: 04/16/15 14:21

SUBMITTED: 04/09/15 to 04/10/15

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-1D

Lab ID: 5040914-04

Sampled: 04/08/15 15:42

Matrix: Air

Sample Volume: 21.47 m<sup>3</sup>

Received: 04/09/15 11:27

Comments: Col 2 Start Time 4/7/15 15:51

Analysis Date: 04/13/15 13:28

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u>	<u>Flag</u>	<u>MDL</u>
		<u>ng/m<sup>3</sup> Air</u>		<u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0454		0.0038

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Initials: *CR*

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REPORTED: 04/16/15 14:21

SUBMITTED: 04/09/15 to 04/10/15

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

<b>Description:</b> PAM-2	<b>Lab ID:</b> 5040914-05	<b>Sampled:</b> 04/08/15 15:23
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.36 m <sup>3</sup>	<b>Received:</b> 04/09/15 11:27
<b>Comments:</b> Start Time 4/7/15 15:38		<b>Analysis Date:</b> 04/13/15 15:40

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0359		0.0038

APR 17 2015

Initials: ER

Eastern Research Group

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FILE #: 3926.00

REPORTED: 04/16/15 14:21

SUBMITTED: 04/09/15 to 04/10/15

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-3

Lab ID: 5040914-06

Sampled: 04/08/15 15:15

Matrix: Air

Sample Volume: 21.45 m<sup>3</sup>

Received: 04/09/15 11:27

Comments: Start Time 4/7/15 15:25

Analysis Date: 04/13/15 15:51

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	0.0377		0.0038

APR 17 2015

Initials: *CR*

Eastern Research Group

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FILE #: 3926.00

REPORTED: 04/16/15 14:21

SUBMITTED: 04/09/15 to 04/10/15

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-4

Lab ID: 5040914-07

Sampled: 04/08/15 15:00

Matrix: Air

Sample Volume: 21.42 m<sup>3</sup>

Received: 04/09/15 11:27

Comments: Start Time 4/7/15 15:12

Analysis Date: 04/13/15 16:01

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0438		0.0038

APR 17 2015

Initials: *ER*

Eastern Research Group

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FILE #: 3926.00

REPORTED: 04/16/15 14:21

SUBMITTED: 04/09/15 to 04/10/15

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-21

Lab ID: 5040914-08

Sampled: 04/08/15 00:00

Matrix: Air

Sample Volume: 21.36 m<sup>3</sup>

Received: 04/09/15 11:27

Comments:

Analysis Date: 04/13/15 16:12

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u>	<u>Flag</u>	<u>MDL</u>
		<u>ng/m<sup>3</sup> Air</u>		<u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0038

APR 17 2015

Initials: *CR*

Eastern Research Group

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FILE #: 3926.00

REPORTED: 04/16/15 14:21

SUBMITTED: 04/09/15 to 04/10/15

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-31

Lab ID: 5040914-09

Sampled: 04/08/15 00:00

Matrix: Air

Sample Volume: 21.45 m<sup>3</sup>

Received: 04/09/15 11:27

Comments:

Analysis Date: 04/13/15 16:23

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0038

APR 17 2015

Initials: *CR*



# CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 04/16/15 14:21

SUBMITTED: 04/09/15 to 04/10/15

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: OAM 1

Lab ID: 5041020-01

Sampled: 04/09/15 14:39

Matrix: Air

Sample Volume: 21.79 m<sup>3</sup>

Received: 04/10/15 12:19

Comments: Start Time 4/8/15 14:26

Analysis Date: 04/13/15 16:33

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u>	<u>Flag</u>	<u>MDL</u>
		<u>ng/m<sup>3</sup> Air</u>		<u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0054		0.0038

APR 17 2015

Initials: ER

Eastern Research Group

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Malvern, PA 19355

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FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 04/16/15 14:21

SUBMITTED: 04/09/15 to 04/10/15

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

**Description:** OAM 2

**Lab ID:** 5041020-02

**Sampled:** 04/09/15 15:08

**Matrix:** Air

**Sample Volume:** 21.95 m<sup>3</sup>

**Received:** 04/10/15 12:19

**Comments:** Start Time 4/8/15 14:45

**Analysis Date:** 04/13/15 16:44

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u>	<u>Flag</u>	<u>MDL</u>
		<u>ng/m<sup>3</sup> Air</u>		<u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0163		0.0038

APR 17 2015

Initials: *CR*

Eastern Research Group

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FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 04/16/15 14:21

SUBMITTED: 04/09/15 to 04/10/15

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

<b>Description:</b> PAM-1	<b>Lab ID:</b> 5041020-03	<b>Sampled:</b> 04/09/15 16:22
<b>Matrix:</b> Air	<b>Sample Volume:</b> 22.17 m <sup>3</sup>	<b>Received:</b> 04/10/15 12:19
<b>Comments:</b> Col 1 Start Time 4/8/15 15:44		<b>Analysis Date:</b> 04/13/15 13:47

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	0.0144		0.0038

APR 17 2015

Initials: *ER*

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Malvern, PA 19355

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PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 04/16/15 14:21

SUBMITTED: 04/09/15 to 04/10/15

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

<b>Description:</b> PAM-1D	<b>Lab ID:</b> 5041020-04	<b>Sampled:</b> 04/09/15 16:24
<b>Matrix:</b> Air	<b>Sample Volume:</b> 22.19 m <sup>3</sup>	<b>Received:</b> 04/10/15 12:19
<b>Comments:</b> Col 2 Start Time 4/8/15 15:45		<b>Analysis Date:</b> 04/13/15 14:05

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0105		0.0038

APR 17 2015

Initials: ER

Eastern Research Group

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PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 04/16/15 14:21

SUBMITTED: 04/09/15 to 04/10/15

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

<b>Description:</b> PAM-2	<b>Lab ID:</b> 5041020-05	<b>Sampled:</b> 04/09/15 16:09
<b>Matrix:</b> Air	<b>Sample Volume:</b> 22.25 m <sup>3</sup>	<b>Received:</b> 04/10/15 12:19
<b>Comments:</b> Start Time 4/8/15 15:26		<b>Analysis Date:</b> 04/13/15 16:55

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	0.0087		0.0038

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FILE #: 3926.00

REPORTED: 04/16/15 14:21

SUBMITTED: 04/09/15 to 04/10/15

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-3

Lab ID: 5041020-06

Sampled: 04/09/15 15:44

Matrix: Air

Sample Volume: 21.99 m<sup>3</sup>

Received: 04/10/15 12:19

Comments: Start Time 4/8/15 15:18

Analysis Date: 04/13/15 17:06

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u>	<u>Flag</u>	<u>MDL</u>
		<u>ng/m<sup>3</sup> Air</u>		<u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0134		0.0038

APR 17 2015

Initials: ER

Eastern Research Group

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Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 04/16/15 14:21

SUBMITTED: 04/09/15 to 04/10/15

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

<b>Description:</b> PAM-4	<b>Lab ID:</b> 5041020-07	<b>Sampled:</b> 04/09/15 15:26
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.94 m <sup>3</sup>	<b>Received:</b> 04/10/15 12:19
<b>Comments:</b> Start Time 4/8/15 15:03		<b>Analysis Date:</b> 04/13/15 17:16

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	0.0122		0.0038

APR 17 2015

Initials: *ER*

Eastern Research Group

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ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 04/16/15 14:21

SUBMITTED: 04/09/15 to 04/10/15

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-21

Lab ID: 5041020-08

Sampled: 04/09/15 00:00

Matrix: Air

Sample Volume: 22.25 m<sup>3</sup>

Received: 04/10/15 12:19

Comments:

Analysis Date: 04/13/15 17:48

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0038

APR 17 2015

Initials: CR

Eastern Research Group

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FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 04/16/15 14:21

SUBMITTED: 04/09/15 to 04/10/15

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-31

Lab ID: 5041020-09

Sampled: 04/09/15 00:00

Matrix: Air

Sample Volume: 21.99 m<sup>3</sup>

Received: 04/10/15 12:19

Comments:

Analysis Date: 04/13/15 17:59

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u>	<u>Flag</u>	<u>MDL</u>
		<u>ng/m<sup>3</sup> Air</u>		<u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0038

APR 17 2015

Initials: ER

Eastern Research Group

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**LABORATORY DATA CONSULTANTS, INC.**

2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

ERM  
5761 N. Church Street  
Glen Rock, PA 17327  
ATTN: Mr. Jeff Boggs

April 15, 2015

SUBJECT: Harbor Point, MD, Hexavalent Chromium Monitoring, Data Validation

Dear Mr. Boggs,

Enclosed is the final validation report for the fraction listed below. This SDG was received on April 14, 2015. Attachment 1 is a summary of the samples that were reviewed for each analysis.

**LDC Project #34069:**

<b><u>SDG</u></b>	<b><u>Fraction</u></b>
5040727/5040833	Hexavalent Chromium

The data validation was performed under EPA Level IV guidelines. The analyses were validated using the following documents, as applicable to each method:

- Air Monitoring Program Quality Assurance Project Plan, Area 1, Phase 1 Development, Version 1, Baltimore Works Site, Baltimore, Maryland, March 2014
- USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, January 2010

Please feel free to contact us if you have any questions.

Sincerely,

Christina Rink  
Project Manager/Chemist



## Laboratory Data Consultants, Inc. Data Validation Report

**Project/Site Name:** Harbor Point, MD, Hexavalent Chromium Monitoring  
**Collection Date:** April 3 through April 7, 2015  
**LDC Report Date:** April 15, 2015  
**Matrix:** Air  
**Parameters:** Hexavalent Chromium  
**Validation Level:** EPA Level IV  
**Laboratory:** Eastern Research Group  
**Sample Delivery Group (SDG):** 5040727/5040833

### Sample Identification

OAM 1(04/03/15)	PAM-1(04/07/15)
OAM 2(04/03/15)	PAM-1D(04/07/15)
PAM-1(04/03/15)	PAM-2(04/07/15)
PAM-1D(04/03/15)	PAM-3(04/07/15)
PAM-2(04/03/15)	PAM-4(04/07/15)
PAM-3(04/03/15)	PAM-21(04/07/15)
PAM-4(04/03/15)	PAM-31(04/07/15)
PAM-21(04/03/15)	PAM-1(04/04/15)DUP
PAM-31(04/03/15)	PAM-1D(04/04/15)DUP
OAM 1(04/06/15)	PAM-1(04/06/15)DUP
OAM 2(04/06/15)	PAM-1D(04/06/15)DUP
PAM-1(04/06/15)	PAM-1(04/07/15)DUP
PAM-1D(04/06/15)	PAM-1D(04/07/15)DUP
PAM-2(04/06/15)	
PAM-3(04/06/15)	
PAM-4(04/06/15)	
PAM-21(04/06/15)	
PAM-31(04/06/15)	
OAM 1(04/07/15)	
OAM 2(04/07/15)	

The date was appended to the sample ID to differentiate between samples.

## Introduction

This data review covers 33 air samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per ASTM D7614 for Hexavalent Chromium.

This review follows the Air Monitoring Program Quality Assurance Project Plan, Area 1, Phase 1 Development, Version 1, Baltimore Works Site, Baltimore, Maryland (March 2014) and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

## **I. Technical Holding Times**

All technical holding time requirements were met.

## **II. Initial Calibration**

All criteria for the initial calibration were met.

## **III. Continuing Calibration**

Continuing calibration frequency and analysis criteria were met.

## **IV. Blanks**

Method blanks were reviewed for each matrix as applicable. No hexavalent chromium was found in the method blanks.

Samples PAM-31(04/03/15), PAM-31(04/06/15), and PAM-31(04/07/15) were identified as trip blanks. No hexavalent chromium was found.

Samples PAM-21(04/03/15), PAM-21(04/06/15), and PAM-21(04/07/15) were identified as field blanks. No hexavalent chromium was found.

## **V. Matrix Spike/Matrix Spike Duplicates**

Matrix spike (MS) and matrix spike duplicate (MSD) analysis was not required by the method.

## **VI. Duplicates**

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Relative percent differences (RPD) were within QC limits.

## **VII. Laboratory Control Samples**

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

## **VIII. Sample Result Verification**

All sample result verifications were acceptable.

## **IX. Overall Assessment of Data**

Data flags are summarized at the end of this report if data has been qualified.

## X. Field Duplicates

Samples PAM-1(04/03/15) and PAM-1D(04/03/15), samples PAM-1(04/06/15) and PAM-1D(04/06/15), and samples PAM-1(04/07/15) and PAM-1D(04/07/15) were identified as field duplicates. No hexavalent chromium was detected in any of the samples with the following exceptions:

Analyte	Concentration (ng/m <sup>3</sup> )		RPD (Limits)	Flags	A or P
	PAM-1(04/03/15)	PAM-1D(04/03/15)			
Hexavalent chromium	0.0491	0.0464	6 (≤20)	-	-

Analyte	Concentration (ng/m <sup>3</sup> )		RPD (Limits)	Flags	A or P
	PAM-1(04/06/15)	PAM-1D(04/06/15)			
Hexavalent chromium	0.0299	0.0286	4 (≤20)	-	-

Analyte	Concentration (ng/m <sup>3</sup> )		RPD (Limits)	Flags	A or P
	PAM-1(04/07/15)	PAM-1D(04/07/15)			
Hexavalent chromium	0.0523	0.0434	19 (≤20)	-	-

**Harbor Point, MD, Hexavalent Chromium Monitoring  
Hexavalent Chromium - Data Qualification Summary - SDG 5040727/5040833**

No Sample Data Qualified Due to QA/QC Exceedances in this SDG

**Harbor Point, MD, Hexavalent Chromium Monitoring  
Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG  
5040727/5040833**

No Sample Data Qualified Due to Laboratory Blank Contamination in this  
SDG

**Harbor Point, MD, Hexavalent Chromium Monitoring  
Hexavalent Chromium - Field Blank Data Qualification Summary - SDG  
5040727/5040833**

No Sample Data Qualified Due to Field Blank Contamination in this SDG

LDC #: 34069A6

## VALIDATION COMPLETENESS WORKSHEET

Date: 4/14/15

SDG #: 5040727/5040833

Level IV

Page: 1 of 2

Laboratory: Eastern Research Group

Reviewer: SD

2nd Reviewer: a

**METHOD: (Analyte) Hexavalent Chromium (ASTM D7614)**

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	04/03/15 - 04/08/15
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Laboratory Blanks	A	
V	Field blanks	ND	FB=(8)(17)(26) TB=(9)(18)(27)
VI.	Matrix Spike/Matrix Spike Duplicates	N	Not Required
VII.	Duplicate sample analysis	A	DUP
VIII.	Laboratory control samples	A	LCS/D
IX.	Field duplicates	SW	FD=(3,4)(12,13)(21,22)
X.	Sample result verification	A	
XI	Overall assessment of data	A	

Note: A = Acceptable  
N = Not provided/applicable  
SW = See worksheet

ND = No compounds detected  
R = Rinsate  
FB = Field blank

D = Duplicate  
TB = Trip blank  
EB = Equipment blank

SB=Source blank  
OTHER:

	Client ID	Lab ID	Matrix	Date
1	OAM 1 (04/03/15)	5040727-01	Air	04/03/15
2	OAM 2 (04/03/15)	5040727-02	Air	04/03/15
3	PAM-1 (04/03/15)	5040727-03	Air	04/03/15
4	PAM-1D (04/03/15)	5040727-04	Air	04/03/15
5	PAM-2 (04/03/15)	5040727-05	Air	04/03/15
6	PAM-3 (04/03/15)	5040727-06	Air	04/03/15
7	PAM-4 (04/03/15)	5040727-07	Air	04/03/15
8	PAM-21 (04/03/15)	5040727-08	Air	04/03/15
9	PAM-31 (04/03/15)	5040727-09	Air	04/03/15
10	OAM 1 (04/06/15)	5040727-10	Air	04/06/15
11	OAM 2 (04/06/15)	5040727-11	Air	04/06/15
12	PAM-1 (04/06/15)	5040727-12	Air	04/06/15
13	PAM-1D (04/06/15)	5040727-13	Air	04/06/15
14	PAM-2 (04/06/15)	5040727-14	Air	04/06/15
15	PAM-3 (04/06/15)	5040727-15	Air	04/06/15
16	PAM-4 (04/06/15)	5040727-16	Air	04/06/15
17	PAM-21 (04/06/15)	5040727-17	Air	04/06/15

LDC #: 34069A6

# VALIDATION COMPLETENESS WORKSHEET

Date: 4/14/15

SDG #: 5040727/5040833

Level IV

Page: 2 of 2

Laboratory: Eastern Research Group

Reviewer: JD

2nd Reviewer: [Signature]

**METHOD: (Analyte) Hexavalent Chromium (ASTM D7614)**

	Client ID	Lab ID	Matrix	Date
18	PAM-31 (04/06/15)	5040727-18	Air	04/06/15
19	OAM 1 (04/07/15)	5040833-01	Air	04/07/15
20	OAM 2 (04/07/15)	5040833-02	Air	04/07/15
21	PAM-1 (04/07/15)	5040833-03	Air	04/07/15
22	PAM-1D (04/07/15)	5040833-04	Air	04/07/15
23	PAM-2 (04/07/15)	5040833-05	Air	04/07/15
24	PAM-3 (04/07/15)	5040833-06	Air	04/07/15
25	PAM-4 (04/07/15)	5040833-07	Air	04/07/15
26	PAM-21 (04/07/15)	5040833-08	Air	04/07/15
27	PAM-31 (04/07/15)	5040833-09	Air	04/07/15
28	PAM-1 (04/03/15)DUP	5040727-03DUP	Air	04/03/15
29	PAM-1D (04/03/15)DUP	5040727-04DUP	Air	04/03/15
30	PAM-1 (04/06/15)DUP	5040727-12DUP	Air	04/06/15
31	PAM-1D (04/06/15)DUP	5040727-13DUP	Air	04/06/15
32	PAM-1 (04/07/15)DUP	5040833-03DUP	Air	04/07/15
33	PAM-1D (04/07/15)DUP	5040833-04DUP	Air	04/07/15
34				
35				
36				
37				
38				

Notes: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Method: Inorganics (EPA Method See Cover)

Validation Area	Yes	No	NA	Findings/Comments
<b>I. Technical holding times</b>				
All technical holding times were met.	/			
Cooler temperature criteria was met.	/			
<b>II. Calibration</b>				
Were all instruments calibrated daily, each set-up time?	/			
Were the proper number of standards used?	/			
Were all initial calibration correlation coefficients > 0.995?	/			
Were all initial and continuing calibration verification %Rs within the <del>90-110%</del> <u>85-115</u> QC limits?	/			
Were titrant checks performed as required? (Level IV only)			/	
Were balance checks performed as required? (Level IV only)			/	
<b>III. Blanks</b>				
Was a method blank associated with every sample in this SDG?	/			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		/		
<b>IV. Matrix spike/Matrix spike duplicates and Duplicates</b>				
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	/			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.			/	
Were the MS/MSD or duplicate relative percent differences (RPD) $\leq 20\%$ for <del>waters</del> <u>waters</u> and $\leq 35\%$ for soil samples? A control limit of $\leq CRDL$ ( $\leq 2X CRDL$ for soil) was used for samples that were $\leq 5X$ the CRDL, including when only one of the duplicate sample values were $\leq 5X$ the CRDL.	/			
<b>V. Laboratory control samples</b>				
Was an LCS analyzed for this SDG?	/			
Was an LCS analyzed per extraction batch?	/			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% (85-115% for Method 300.0) QC limits?	/			
<b>VI. Regional Quality Assurance and Quality Control</b>				
Were performance evaluation (PE) samples performed?			/	
Were the performance evaluation (PE) samples within the acceptance limits?			/	

**VALIDATION FINDINGS CHECKLIST**

Validation Area	Yes	No	NA	Findings/Comments
<b>VII. Sample Result Verification</b>				
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	/			
Were detection limits < RL?	/			
<b>VIII. Overall assessment of data</b>				
Overall assessment of data was found to be acceptable.	/			
<b>IX. Field duplicates</b>				
Field duplicate pairs were identified in this SDG.	/			
Target analytes were detected in the field duplicates.	/			
<b>X. Field blanks</b>				
Field blanks were identified in this SDG.	/			
Target analytes were detected in the field blanks.		/		

**VALIDATION FINDINGS WORKSHEET**  
Field Duplicates

Inorganics: Method See Cover

Analyte	Concentration (ng/m3)		RPD (≤20)	Qual.
	3	4		
Hexavalent Chromium	0.0491	0.0464	6	

Analyte	Concentration (ng/m3)		RPD (≤20)	Qual.
	12	13		
Hexavalent Chromium	0.0299	0.0286	4	

Analyte	Concentration (ng/m3)		RPD (≤20)	Qual.
	21	22		
Hexavalent Chromium	0.0523	0.0434	19	

LDC #: 34059AB

**Validation Findings Worksheet**  
**Initial and Continuing Calibration Calculation Verification**

Page: 1 of 1

Reviewer: SD

2nd Reviewer: OL

**Method:** Inorganics, Method See Cover

The correlation coefficient (r) for the calibration of Cr<sup>+6</sup> was recalculated. Calibration date: 4/8/15

An initial or continuing calibration verification percent recovery (%R) was recalculated for each type of analysis using the following formula:

$$\%R = \frac{\text{Found} \times 100}{\text{True}}$$

Where, Found = concentration of each analyte measured in the analysis of the ICV or CCV solution  
 True = concentration of each analyte in the ICV or CCV source

Type of analysis	Analyte	Standard	Conc. (ng/mL)	Area	Recalculated	Reported	Acceptable (Y/N)
					r or r <sup>2</sup>	r or r <sup>2</sup>	
Initial calibration	Cr <sup>+6</sup>	s1	0.05	0.0356853	0.99993	0.99993	Y
		s2	0.1	0.0714999			
		s3	0.2	0.1493408			
		s4	0.5	0.3848126			
		s5	1	0.7636246			
		s6	2	1.5696606			
ICV 10:47 Calibration verification	Cr <sup>+6</sup>	<u>Found</u> 0.5266 ng/ml	<u>True</u> 5 ng/ml		105.3%R	105.3%R	↓
CCV 11:51 Calibration verification	Cr <sup>+6</sup>	0.5259 ng/ml	5 ng/ml		105.2%R	105.2%R	
Calibration verification							

Comments: Refer to Calibration Verification findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 34069AB

**VALIDATION FINDINGS WORKSHEET**  
**Level IV Recalculation Worksheet**

Page: 1 of 1  
 Reviewer: JJD  
 2nd Reviewer: [Signature]

**METHOD:** Inorganics, Method See Context

Percent recoveries (%R) for a laboratory control sample and a matrix spike sample were recalculated using the following formula:

$\%R = \frac{\text{Found}}{\text{True}} \times 100$  Where, Found = concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation, Found = SSR (spiked sample result) - SR (sample result).  
 True = concentration of each analyte in the source.

A sample and duplicate relative percent difference (RPD) was recalculated using the following formula:

$RPD = \frac{|S-D|}{(S+D)/2} \times 100$  Where, S = Original sample concentration  
 D = Duplicate sample concentration

Sample ID	Type of Analysis	Element	Found / S (units)	True / D (units)	Recalculated	Reported	Acceptable (Y/N)
					%R / RPD	%R / RPD	
LCS 11:19	Laboratory control sample	Cr <sup>+6</sup> ↓	1.08 ng/ml	1.00 ng/ml	108%R	108%R	Y
N	Matrix spike sample		(SSR-SR)				
DUP 12:23	Duplicate sample		0.0490 ng/ml <sup>3</sup>	0.0491 ng/ml <sup>3</sup>	0.0204%RPD	0.293%RPD	Y*

Comments: \* Rounding

**VALIDATION FINDINGS WORKSHEET**  
Sample Calculation Verification

**METHOD:** Inorganics, Method See Cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

- Y N N/A Have results been reported and calculated correctly?
- Y N N/A Are results within the calibrated range of the instruments?
- Y N N/A Are all detection limits below the CRQL?

Compound (analyte) results for (4) Cr<sup>+6</sup> reported with a positive detect were recalculated and verified using the following equation:

Concentration =  $(A - C_0) / C_1$   
 A = 0.067614  
 C<sub>0</sub> = -8.45E-03  
 C<sub>1</sub> = 0.7857952

Recalculation:  $\frac{0.067614 - (-8.45E-03)}{0.7857952} = 0.0968 \text{ ng/ml}$

$\frac{(0.0968 \text{ ng/ml})(10 \text{ ml})}{20.85 \text{ m}^3} = 0.0464 \text{ ng/m}^3$

$\frac{(\text{ng/ml})(\text{ul})}{\text{m}^3} = \text{ng/m}^3$

#	Sample ID	Analyte	Reported Concentration (ng/m <sup>3</sup> )	Calculated Concentration (ng/m <sup>3</sup> )	Acceptable (Y/N)
	1	Cr <sup>+6</sup>	0.0426	0.0426	Y
	2		0.0715	0.0715	
	3		0.0491	0.0491	
	4		0.0464	0.0464	
	5		0.0379	0.0379	
	6		0.0357	0.0357	
	7		0.132	0.132	
	8		ND	ND	
	9		ND	ND	
	10		0.0502	0.0502	
	11		0.0657	0.0657	
	12		0.0299	0.0299	
	13		0.0286	0.0286	
	14		0.0342	0.0342	
	15		0.0375	0.0375	
	16		0.0515	0.0514	
	17		ND	ND	
	18		ND	ND	
	19		0.0471	0.0471	
	20		0.0440	0.0440	Y

Note: \_\_\_\_\_





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Environmental Resources Management, Inc

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ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 04/14/15 08:51

SUBMITTED: 04/07/15 to 04/08/15

AQS SITE

CODE: Honeywell Hex Chrome Study  
SITE CODE:

<b>Description:</b> OAM 1	<b>Lab ID:</b> 5040727-01	<b>Sampled:</b> 04/03/15 14:15
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.72 m <sup>3</sup>	<b>Received:</b> 04/07/15 10:55
<b>Comments:</b> Start Time 4/2/15 14:36		<b>Analysis Date:</b> 04/08/15 13:28

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0426		0.0038

APR 15 2015

Initials: *ER*

Eastern Research Group

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REPORTED: 04/14/15 08:51

SUBMITTED: 04/07/15 to 04/08/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

<b>Description:</b> OAM 2	<b>Lab ID:</b> 5040727-02	<b>Sampled:</b> 04/03/15 14:37
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.32 m <sup>3</sup>	<b>Received:</b> 04/07/15 10:55
<b>Comments:</b> Start Time 4/2/15 14:56		<b>Analysis Date:</b> 04/08/15 13:39

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	0.0715		0.0038

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AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

<b>Description:</b> PAM-1	<b>Lab ID:</b> 5040727-03	<b>Sampled:</b> 04/03/15 15:27
<b>Matrix:</b> Air	<b>Sample Volume:</b> 20.87 m <sup>3</sup>	<b>Received:</b> 04/07/15 10:55
<b>Comments:</b> Col 1 Start Time 4/2/15 16:15		<b>Analysis Date:</b> 04/08/15 12:13

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	0.0491		0.0038

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AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-1D

Lab ID: 5040727-04

Sampled: 04/03/15 15:27

Matrix: Air

Sample Volume: 20.85 m<sup>3</sup>

Received: 04/07/15 10:55

Comments: Col 2 Start Time 4/2/15 16:17

Analysis Date: 04/08/15 12:31

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0464		0.0038

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SUBMITTED: 04/07/15 to 04/08/15

AQS SITE

CODE: Honeywell Hex Chrome Study  
SITE CODE:

<b>Description:</b> PAM-2	<b>Lab ID:</b> 5040727-05	<b>Sampled:</b> 04/03/15 15:19
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.54 m <sup>3</sup>	<b>Received:</b> 04/07/15 10:55
<b>Comments:</b> Start Time 4/2/15 16:00		<b>Analysis Date:</b> 04/08/15 14:11

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0379		0.0038

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SUBMITTED: 04/07/15 to 04/08/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

<b>Description:</b> PAM-3	<b>Lab ID:</b> 5040727-06	<b>Sampled:</b> 04/03/15 15:13
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.15 m <sup>3</sup>	<b>Received:</b> 04/07/15 10:55
<b>Comments:</b> Start Time 4/2/15 15:43		<b>Analysis Date:</b> 04/08/15 14:21

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	0.0357		0.0038

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SUBMITTED: 04/07/15 to 04/08/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

<b>Description:</b> PAM-4	<b>Lab ID:</b> 5040727-07	<b>Sampled:</b> 04/03/15 15:00
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.32 m <sup>3</sup>	<b>Received:</b> 04/07/15 10:55
<b>Comments:</b> Start Time 4/2/15 15:19		<b>Analysis Date:</b> 04/08/15 14:32

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	0.132		0.0038

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REPORTED: 04/14/15 08:51

SUBMITTED: 04/07/15 to 04/08/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

<b>Description:</b> PAM-21	<b>Lab ID:</b> 5040727-08	<b>Sampled:</b> 04/03/15 00:00
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.54 m <sup>3</sup>	<b>Received:</b> 04/07/15 10:55
<b>Comments:</b>		<b>Analysis Date:</b> 04/08/15 14:43

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0038

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SUBMITTED: 04/07/15 to 04/08/15

AQS SITE

CODE: Honeywell Hex Chrome Study  
SITE CODE:

<b>Description:</b> PAM-31	<b>Lab ID:</b> 5040727-09	<b>Sampled:</b> 04/03/15 00:00
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.15 m <sup>3</sup>	<b>Received:</b> 04/07/15 10:55
<b>Comments:</b>		<b>Analysis Date:</b> 04/08/15 14:54

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0038

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REPORTED: 04/14/15 08:51

SUBMITTED: 04/07/15 to 04/08/15

AQS SITE

CODE: Honeywell Hex Chrome Study  
SITE CODE:

<b>Description:</b> OAM 1	<b>Lab ID:</b> 5040727-10	<b>Sampled:</b> 04/06/15 14:44
<b>Matrix:</b> Air	<b>Sample Volume:</b> 20.76 m <sup>3</sup>	<b>Received:</b> 04/07/15 10:55
<b>Comments:</b> Start Time 4/5/15 15:40		<b>Analysis Date:</b> 04/08/15 15:04

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	0.0502		0.0038

APR 15 2015

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FILE #: 3926.00

REPORTED: 04/14/15 08:51

SUBMITTED: 04/07/15 to 04/08/15

AQS SITE

CODE: Honeywell Hex Chrome Study  
SITE CODE:

<b>Description:</b> OAM 2	<b>Lab ID:</b> 5040727-11	<b>Sampled:</b> 04/06/15 15:17
<b>Matrix:</b> Air	<b>Sample Volume:</b> 20.95 m <sup>3</sup>	<b>Received:</b> 04/07/15 10:55
<b>Comments:</b> Start Time 4/5/15 16:00		<b>Analysis Date:</b> 04/08/15 15:15

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	0.0657		0.0038

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FILE #: 3926.00

REPORTED: 04/14/15 08:51

SUBMITTED: 04/07/15 to 04/08/15

AQS SITE

CODE: Honeywell Hex Chrome Study  
SITE CODE:

<b>Description:</b> PAM-1	<b>Lab ID:</b> 5040727-12	<b>Sampled:</b> 04/06/15 16:19
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.44 m <sup>3</sup>	<b>Received:</b> 04/07/15 10:55
<b>Comments:</b> Col 1 Start Time 4/5/15 16:30		<b>Analysis Date:</b> 04/08/15 12:50

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0299		0.0038

APR 15 2015

Initials: ER

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REPORTED: 04/14/15 08:51

SUBMITTED: 04/07/15 to 04/08/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

<b>Description:</b> PAM-1D	<b>Lab ID:</b> 5040727-13	<b>Sampled:</b> 04/06/15 16:21
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.5 m <sup>3</sup>	<b>Received:</b> 04/07/15 10:55
<b>Comments:</b> Col 2 Start Time 4/5/15 16:28		<b>Analysis Date:</b> 04/08/15 13:09

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0286		0.0038

APR 15 2015

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REPORTED: 04/14/15 08:51

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AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

<b>Description:</b> PAM-2	<b>Lab ID:</b> 5040727-14	<b>Sampled:</b> 04/06/15 16:00
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.28 m <sup>3</sup>	<b>Received:</b> 04/07/15 10:55
<b>Comments:</b> Start Time 4/5/15 16:21		<b>Analysis Date:</b> 04/08/15 15:26

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	0.0342		0.0038

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AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

<b>Description:</b> PAM-3	<b>Lab ID:</b> 5040727-15	<b>Sampled:</b> 04/06/15 15:47
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.14 m <sup>3</sup>	<b>Received:</b> 04/07/15 10:55
<b>Comments:</b> Start Time 4/5/15 16:17		<b>Analysis Date:</b> 04/08/15 15:36

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	0.0375		0.0038

APR 15 2015

Initials: CR

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# CERTIFICATE OF ANALYSIS

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FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 04/14/15 08:51

SUBMITTED: 04/07/15 to 04/08/15

AQS SITE

CODE: Honeywell Hex Chrome Study  
SITE CODE:

<b>Description:</b> PAM-4	<b>Lab ID:</b> 5040727-16	<b>Sampled:</b> 04/06/15 15:33
<b>Matrix:</b> Air	<b>Sample Volume:</b> 20.97 m <sup>3</sup>	<b>Received:</b> 04/07/15 10:55
<b>Comments:</b> Start Time 4/5/15 16:15		<b>Analysis Date:</b> 04/08/15 15:47

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	0.0515		0.0038

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AQS SITE

CODE: Honeywell Hex Chrome Study  
SITE CODE:

<b>Description:</b> PAM-21	<b>Lab ID:</b> 5040727-17	<b>Sampled:</b> 04/06/15 00:00
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.28 m <sup>3</sup>	<b>Received:</b> 04/07/15 10:55
<b>Comments:</b>		<b>Analysis Date:</b> 04/08/15 16:19

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	ND	U	0.0038

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REPORTED: 04/14/15 08:51

SUBMITTED: 04/07/15 to 04/08/15

AQS SITE

CODE: Honeywell Hex Chrome Study  
SITE CODE:

Description: PAM-31

Lab ID: 5040727-18

Sampled: 04/06/15 00:00

Matrix: Air

Sample Volume: 21.14 m<sup>3</sup>

Received: 04/07/15 10:55

Comments:

Analysis Date: 04/08/15 16:30

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0038

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AQS SITE

CODE:  
SITE CODE:

Honeywell Hex Chrome Study

Description: OAM 1

Lab ID: 5040833-01

Sampled: 04/07/15 14:35

Matrix: Air

Sample Volume: 21.41 m<sup>3</sup>

Received: 04/08/15 11:18

Comments: Start Time 4/6/15 14:48

Analysis Date: 04/09/15 13:04

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u>	<u>Flag</u>	<u>MDL</u>
		<u>ng/m<sup>3</sup> Air</u>		<u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0471		0.0038

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REPORTED: 04/14/15 08:51

SUBMITTED: 04/07/15 to 04/08/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

<b>Description:</b> OAM 2	<b>Lab ID:</b> 5040833-02	<b>Sampled:</b> 04/07/15 14:55
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.23 m <sup>3</sup>	<b>Received:</b> 04/08/15 11:18
<b>Comments:</b> Start Time 4/6/15 15:20		<b>Analysis Date:</b> 04/09/15 13:15

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0440		0.0038

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SUBMITTED: 04/07/15 to 04/08/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

<b>Description:</b> PAM-1	<b>Lab ID:</b> 5040833-03	<b>Sampled:</b> 04/07/15 15:48
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.06 m <sup>3</sup>	<b>Received:</b> 04/08/15 11:18
<b>Comments:</b> Col 1 Start Time 4/6/15 16:24		<b>Analysis Date:</b> 04/09/15 12:27

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0523		0.0038

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REPORTED: 04/14/15 08:51

SUBMITTED: 04/07/15 to 04/08/15

AQS SITE

CODE: Honeywell Hex Chrome Study  
SITE CODE:

<b>Description:</b> PAM-1D	<b>Lab ID:</b> 5040833-04	<b>Sampled:</b> 04/07/15 15:48
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.05 m <sup>3</sup>	<b>Received:</b> 04/08/15 11:18
<b>Comments:</b> Col 2 Start Time 4/6/15 16:25		<b>Analysis Date:</b> 04/09/15 15:05

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	0.0434		0.0038

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AQS SITE

CODE: Honeywell Hex Chrome Study  
SITE CODE:

<b>Description:</b> PAM-2	<b>Lab ID:</b> 5040833-05	<b>Sampled:</b> 04/07/15 15:36
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.2 m <sup>3</sup>	<b>Received:</b> 04/08/15 11:18
<b>Comments:</b> Start Time 4/6/15 16:03		<b>Analysis Date:</b> 04/09/15 13:26

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	0.0458		0.0038

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AQS SITE

CODE: Honeywell Hex Chrome Study  
SITE CODE:

<b>Description:</b> PAM-3	<b>Lab ID:</b> 5040833-06	<b>Sampled:</b> 04/07/15 15:22
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.19 m <sup>3</sup>	<b>Received:</b> 04/08/15 11:18
<b>Comments:</b> Start Time 4/6/15 15:49		<b>Analysis Date:</b> 04/09/15 13:36

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	0.0432		0.0038

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AQS SITE

CODE: Honeywell Hex Chrome Study  
SITE CODE:

<b>Description:</b> PAM-4	<b>Lab ID:</b> 5040833-07	<b>Sampled:</b> 04/07/15 15:09
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.19 m <sup>3</sup>	<b>Received:</b> 04/08/15 11:18
<b>Comments:</b> Start Time 4/6/15 15:36		<b>Analysis Date:</b> 04/09/15 13:47

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m<sup>3</sup> Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	0.0607		0.0038

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REPORTED: 04/14/15 08:51

SUBMITTED: 04/07/15 to 04/08/15

AQS SITE

CODE: Honeywell Hex Chrome Study  
SITE CODE:

<b>Description:</b> PAM-21	<b>Lab ID:</b> 5040833-08	<b>Sampled:</b> 04/07/15 00:00
<b>Matrix:</b> Air	<b>Sample Volume:</b> 21.2 m <sup>3</sup>	<b>Received:</b> 04/08/15 11:18
<b>Comments:</b>		<b>Analysis Date:</b> 04/09/15 13:58

### Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m <sup>3</sup> Air	<u>Flag</u>	<u>MDL</u> ng/m <sup>3</sup> Air
Hexavalent Chromium	1854-02-99	ND	U	0.0038

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REPORTED: 04/14/15 08:51

SUBMITTED: 04/07/15 to 04/08/15

AQS SITE

CODE:  
SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-31

Lab ID: 5040833-09

Sampled: 04/07/15 00:00

Matrix: Air

Sample Volume: 21.19 m<sup>3</sup>

Received: 04/08/15 11:18

Comments:

Analysis Date: 04/09/15 14:30

## Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u>	<u>Flag</u>	<u>MDL</u>
		<u>ng/m<sup>3</sup> Air</u>		<u>ng/m<sup>3</sup> Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0038

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