



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

February 13, 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 February 11, 2015. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #33715:

SDG

Fraction

5020323 (10-18)

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: February 2, 2015
LDC Report Date: February 12, 2015
Matrix: Air
Parameters: Hexavalent Chromium
Validation Level: EPA Level IV
Laboratory: Eastern Research Group
Sample Delivery Group (SDG): 5020323

Sample Identification

OAM 1
OAM 2
PAM-1
PAM-1D
PAM-2
PAM-3
PAM-4
PAM-21
PAM-31
PAM-1 DUP
PAM-1D DUP

Introduction

This data review covers 11 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.

Sample PAM-31 was identified as a trip blank. No hexavalent chromium was found.

Sample PAM-21 was identified as a field blank. 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 and PAM-1D were identified as field duplicates. No hexavalent chromium was detected in any of the samples with the following exceptions:

Analyte	Concentration (ng/m ³)		RPD (Limits)	Flags	A or P
	PAM-1	PAM-1D			
Hexavalent chromium	0.0406	0.0342	17 (≤20)	-	-

**Harbor Point, MD, Hexavalent Chromium Monitoring
Hexavalent Chromium - Data Qualification Summary - SDG 5020323**

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
5020323**

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 5020323**

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

LDC #: 33715A6

VALIDATION COMPLETENESS WORKSHEET

Date: 2/11/15

SDG #: 5020323(10-18)

Level IV

Page: 1 of 1

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	2/02/15
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Laboratory Blanks	A	
V	Field blanks	ND	FB=(8) TB=(9)
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)
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	5020323-10	Air	02/02/15
2	OAM 2	5020323-11	Air	02/02/15
3	PAM-1	5020323-12	Air	02/02/15
4	PAM-1D	5020323-13	Air	02/02/15
5	PAM-2	5020323-14	Air	02/02/15
6	PAM-3	5020323-15	Air	02/02/15
7	PAM-4	5020323-16	Air	02/02/15
8	PAM-21	5020323-17	Air	02/02/15
9	PAM-31	5020323-18	Air	02/02/15
10	PAM-1 DUP	5020323-12DUP	Air	02/02/15
11	PAM-1D DUP	5020323-13DUP	Air	02/02/15
12				
13				
14				
15				

Notes:

Method: Inorganics (EPA Method Sa Lovent)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	/			
Cooler temperature criteria was met.	/			
II. Calibration				
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 90-110% QC limits? <u>85-115</u>	/			
Were titrant checks performed as required? (Level IV only)			/	
Were balance checks performed as required? (Level IV only)			/	
III. Blanks				
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.		/		
IV. Matrix spike/Matrix spike duplicates and Duplicates				
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 <u>AKS</u> waters and $\leq 35\%$ for soil samples? A control limit of $\leq 2X$ 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.	/			
V. Laboratory control samples				
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?	/			
VI. Regional Quality Assurance and Quality Control				
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
VII. Sample Result Verification				
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"/>	
VIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
IX. Field duplicates				
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"/>	
X. Field blanks				
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# 33715A6

VALIDATION FINDINGS WORKSHEET
Field Duplicates

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

Inorganics: Method See Cover

Analyte	Concentration (ng/m3)		RPD (≤20)	Qual.
	3	4		
Hexavalent Chromium	0.0406	0.0342	17	

\\LDCFILESERVER\Validation\FIELD DUPLICATES\FD_inorganic\33715A6.wpd

LDC #: 3371516

Validation Findings Worksheet
Initial and Continuing Calibration Calculation Verification

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

Method: Inorganics, Method See Cover

The correlation coefficient (r) for the calibration of C_{Cr+6} was recalculated. Calibration date: 2/05/15

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 ²	r or r ²	
Initial calibration	C _{Cr+6}	s1	0.05	0.0000145	0.99975	0.99975	Y
		s2	0.1	0.0000356			
		s3	0.2	0.0000786			
		s4	0.5	0.0002179			
		s5	1	0.0004203			
		s6	2	0.0008849			
ICV 10:28 Calibration verification	C _{Cr+6}	<u>Found</u> 0.5157ng/ml	<u>True</u> 0.5ng/ml		103.10%R	103.10%R	Y
CCV 11:27 Calibration verification	C _{Cr+6}	0.5187ng/ml	0.5ng/ml		103.70%R	103.80%R	N
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 #: 3371SAW

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

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

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 10:57	Laboratory control sample	Cr ⁶⁺	1.0457ng/ml	1.00ng/ml	105%R	105%R	Y
N	Matrix spike sample		(SSR-SR)				
DUP	Duplicate sample	Cr ⁶⁺	0.0460ng/ml ³	0.040ng/ml ³	12.5%RPD	12.4%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 (3) Cr⁺⁶ reported with a positive detect were recalculated and verified using the following equation:

Concentration = $A - C_0 / C_1$
 $A = 0.0000293$
 $C_0 = -1 E-05$
 $C_1 = 0.000440$

$V = 10 \text{ ml}$
 $m^3 = 21.76$
 $(\text{ng/ml}) \times V = \text{ng}$
 $\frac{\text{ng}}{m^3} = \text{ng}/m^3$

Recalculation: $\frac{0.0000293 - (-1E-05)}{0.000440} = 0.0884 \text{ ng/ml}$
 $\frac{(0.0884 \text{ ng/ml})(10 \text{ ml})}{21.76 \text{ m}^3} = 0.0406 \text{ ng}/\text{m}^3$

#	Sample ID	Analyte	Reported Concentration (ng/m ³)	Calculated Concentration (ng/m ³)	Acceptable (Y/N)
	1	Cr ⁺⁶	0.0534	0.0535	Y*
	2	↓	0.0923	0.0923	Y
	3		0.0406	0.0406	↓
	4		0.0342	0.0342	↓
	5		0.0377	0.0377	↓
	6		0.0344	0.0344	↓
	7		0.0404	0.0403	Y*
	8		ND	ND	Y
	9		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: 02/11/15 09:30

SUBMITTED: 02/03/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: OAM 1

Lab ID: 5020323-10

Sampled: 02/02/15 14:53

Matrix: Air

Sample Volume: 21.25 m³

Received: 02/03/15 10:49

Comments: Start Time 2/1/15 15:16

Analysis Date: 02/05/15 16:25

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0534		0.0036

FEB 12 2015

Initials: *CR*

Eastern Research Group

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FILE #: 3926.00

REPORTED: 02/11/15 09:30

SUBMITTED: 02/03/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: OAM 2

Lab ID: 5020323-11

Sampled: 02/02/15 15:12

Matrix: Air

Sample Volume: 21.36 m³

Received: 02/03/15 10:49

Comments: Start Time 2/1/15 15:28

Analysis Date: 02/05/15 15:06

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0923		0.0036

FEB 12 2015

Initials: *ER*

Eastern Research Group

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FILE #: 3926.00

REPORTED: 02/11/15 09:30

SUBMITTED: 02/03/15

AQS SITE

CODE: Honeywell Hex Chrome Study
SITE CODE:

Description: PAM-1	Lab ID: 5020323-12	Sampled: 02/02/15 16:22
Matrix: Air	Sample Volume: 21.76 m ³	Received: 02/03/15 10:49
Comments: Col 1 Start Time 2/1/15 16:11		Analysis Date: 02/05/15 16:35

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0406		0.0036

FEB 12 2015

Initials: *CR*

Eastern Research Group

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FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 02/11/15 09:30

SUBMITTED: 02/03/15

AQS SITE

CODE:
SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-1D	Lab ID: 5020323-13	Sampled: 02/02/15 16:25
Matrix: Air	Sample Volume: 21.81 m ³	Received: 02/03/15 10:49
Comments: Col 2 Start Time 2/1/15 16:11		Analysis Date: 02/05/15 12:47

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0342		0.0036

FEB 12 2015

Initials: *CR*

Eastern Research Group

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Environmental Resources Management, Inc
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FILE #: 3926.00

REPORTED: 02/11/15 09:30

SUBMITTED: 02/03/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

Description: PAM-2	Lab ID: 5020323-14	Sampled: 02/02/15 16:08
Matrix: Air	Sample Volume: 21.9 m ³	Received: 02/03/15 10:49
Comments: Start Time 2/1/15 15:48		Analysis Date: 02/05/15 15:15

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0377		0.0036

FEB 12 2015

Initials: *CR*

Eastern Research Group

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Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

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FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 02/11/15 09:30

SUBMITTED: 02/03/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-3

Lab ID: 5020323-15

Sampled: 02/02/15 16:00

Matrix: Air

Sample Volume: 21.84 m³

Received: 02/03/15 10:49

Comments: Start Time 2/1/15 15:43

Analysis Date: 02/05/15 15:45

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0344		0.0036

FEB 12 2015

Initials: *CR*

Eastern Research Group

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FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 02/11/15 09:30

SUBMITTED: 02/03/15

AQS SITE

CODE: Honeywell Hex Chrome Study
SITE CODE:

Description: PAM-4	Lab ID: 5020323-16	Sampled: 02/02/15 15:45
Matrix: Air	Sample Volume: 21.66 m ³	Received: 02/03/15 10:49
Comments: Start Time 2/1/15 15:41		Analysis Date: 02/05/15 15:55

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0404		0.0036

FEB 12 2015

Initials: ER

Eastern Research Group

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FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 02/11/15 09:30

SUBMITTED: 02/03/15

AQS SITE

CODE: Honeywell Hex Chrome Study
SITE CODE:

Description: PAM-21	Lab ID: 5020323-17	Sampled: 02/02/15 00:00
Matrix: Air	Sample Volume: 21.9 m ³	Received: 02/03/15 10:49
Comments:		Analysis Date: 02/05/15 16:05

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m ³ Air	<u>Flag</u>	<u>MDL</u> ng/m ³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

FEB 12 2015

Initials: *CR*

Eastern Research Group

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FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 02/11/15 09:30

SUBMITTED: 02/03/15

AQS SITE

CODE:
SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-31

Lab ID: 5020323-18

Sampled: 02/02/15 00:00

Matrix: Air

Sample Volume: 21.84 m³

Received: 02/03/15 10:49

Comments:

Analysis Date: 02/05/15 16:15

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0036

FEB 12 2015

Initials: ER

Eastern Research Group

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

February 13, 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 February 11, 2015. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #33722:

SDG

5020424

Fraction

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: February 3, 2015
LDC Report Date: February 12, 2015
Matrix: Air
Parameters: Hexavalent Chromium
Validation Level: EPA Level IV
Laboratory: Eastern Research Group
Sample Delivery Group (SDG): 5020424

Sample Identification

OAM 1
OAM 2
PAM-1
PAM-1D
PAM-2
PAM-3
PAM-4
PAM-21
PAM-31
PAM-1 DUP
PAM-1D DUP

Introduction

This data review covers 11 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.

Sample PAM-31 was identified as a trip blank. No hexavalent chromium was found.

Sample PAM-21 was identified as a field blank. 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 and PAM-1D were identified as field duplicates. No hexavalent chromium was detected in any of the samples with the following exceptions:

Analyte	Concentration (ng/m ³)		RPD (Limits)	Flags	A or P
	PAM-1	PAM-1D			
Hexavalent chromium	0.0278	0.0285	2 (≤20)	-	-

**Harbor Point, MD, Hexavalent Chromium Monitoring
Hexavalent Chromium - Data Qualification Summary - SDG 5020424**

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
5020424**

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 5020424**

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

LDC #: 33722A6

VALIDATION COMPLETENESS WORKSHEET

Date: 2/11/15

SDG #: 5020424

Level IV

Page: 1 of 1

Laboratory: Eastern Research Group

Reviewer: JD

2nd Reviewer: RL

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	2/03/15
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Laboratory Blanks	A	
V	Field blanks	ND	FB=(8) TB=(9)
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)
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	5020424-01	Air	02/03/15
2	OAM 2	5020424-02	Air	02/03/15
3	PAM-1	5020424-03	Air	02/03/15
4	PAM-1D	5020424-04	Air	02/03/15
5	PAM-2	5020424-05	Air	02/03/15
6	PAM-3	5020424-06	Air	02/03/15
7	PAM-4	5020424-07	Air	02/03/15
8	PAM-21	5020424-08	Air	02/03/15
9	PAM-31	5020424-09	Air	02/03/15
10	PAM-1 DUP	5020424-03DUP	Air	02/03/15
11	PAM-1D DUP	5020424-04DUP	Air	02/03/15
12				
13				
14				
15				

Notes:

Method: Inorganics (EPA Method See Cover)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	/			
Cooler temperature criteria was met.	/			
II. Calibration				
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 90-110% QC limits? <u>85-115</u>	/			
Were titrant checks performed as required? (Level IV only)			/	
Were balance checks performed as required? (Level IV only)			/	
III. Blanks				
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.		/		
IV. Matrix spike/Matrix spike duplicates and Duplicates				
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 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.	/			
V. Laboratory control samples				
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?	/			
VI. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?			/	
Were the performance evaluation (PE) samples within the acceptance limits?			/	

AKS

VALIDATION FINDINGS CHECKLIST

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

LDC# 33722A6

VALIDATION FINDINGS WORKSHEET
Field Duplicates

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

Inorganics: Method See Cover

Analyte	Concentration (ng/m3)		RPD (≤ 20)	Qual.
	3	4		
Hexavalent Chromium	0.0278	0.0285	2	

\\LDCFILESERVER\Validation\FIELD DUPLICATES\FD_inorganic\337722A6.wpd

LDC #: 33722AD

Validation Findings Worksheet
Initial and Continuing Calibration Calculation Verification

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

Method: Inorganics, Method See Cover

The correlation coefficient (r) for the calibration of Cr⁺⁶ was recalculated. Calibration date: 2/10/15

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 ²	r or r ²	
Initial calibration	Cr ⁺⁶	s1	0.05	0.0000288	0.99998	0.99998	Y
		s2	0.1	0.0000679			
		s3	0.2	0.0001457			
		s4	0.5	0.0003678			
		s5	1	0.0007327			
		s6	2	0.0014642			
ICV 14:11 Calibration verification	Cr ⁺⁶	<u>Found</u> 0.5090ng/ml	<u>True</u> 0.51ng/ml		101.8%R	101.8%R	Y
CCV 16:00 Calibration verification	Cr ⁺⁶	0.5482ng/ml	0.5ng/ml		109.6%R	109.7%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.

*Rounding

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 4:41	Laboratory control sample	Cr^{+6}	1.039 ng/l	1.00 ng/l	104%R	104%R	Y
N	Matrix spike sample		(SSR-SR)				
DUP 16:30	Duplicate sample	Cr^{+6}	0.0237 ng/l ³	0.0278 ng/l ³	15.9%RPD	16.1%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 (3) Cr⁺⁶ reported with a positive detect were recalculated and verified using the following equation:

Concentration = $(A - C_0) / C_1$ $uf = (low)$
 $m^3 = 21.48$ Recalculation: $(0.0000337 - (-3.69E-06))$
 $A = 0.0000337$ $(ng/ml)(uf)$ $\frac{0.0007349}{0.0007349} = 0.05088 ng/l$
 $C_0 = -3.69E-06$ $\frac{(0.0588 ng/ml)(10 ml)}{21.48 m^3} = 0.0278 ng/m^3$
 $C_1 = 0.0007349$ m^3

#	Sample ID	Analyte	Reported Concentration (ng/m ³)	Calculated Concentration (ng/m ³)	Acceptable (Y/N)
	1	Cr ⁺⁶	0.0069	0.0069	Y
	2	↓	0.0169	0.0169	↓
	3		0.0278	0.0278	
	4		0.0285	0.0285	
	5		0.0180	0.0180	
	6		0.0082	0.0082	
	7		0.0214	0.0214	
	8		ND	ND	
	9		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: 02/11/15 15:04

SUBMITTED: 02/04/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: OAM 1

Lab ID: 5020424-01

Sampled: 02/03/15 14:54

Matrix: Air

Sample Volume: 21.54 m³

Received: 02/04/15 11:12

Comments: Start Time 2/2/15 14:57

Analysis Date: 02/10/15 18:42

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/m³ Air</u>		<u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0069		0.0036

FEB 12 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

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FILE #: 3926.00

REPORTED: 02/11/15 15:04

SUBMITTED: 02/04/15

AQS SITE

CODE: Honeywell Hex Chrome Study
SITE CODE:

Description: OAM 2	Lab ID: 5020424-02	Sampled: 02/03/15 15:16
Matrix: Air	Sample Volume: 21.62 m ³	Received: 02/04/15 11:12
Comments: Start Time 2/2/15 15:15		Analysis Date: 02/10/15 17:10

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m ³ Air	<u>Flag</u>	<u>MDL</u> ng/m ³ Air
Hexavalent Chromium	1854-02-99	0.0169		0.0036

FEB 12 2015

Initials: *CR*

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FILE #: 3926.00

REPORTED: 02/11/15 15:04

SUBMITTED: 02/04/15

AQS SITE

CODE: Honeywell Hex Chrome Study
SITE CODE:

Description: PAM-1	Lab ID: 5020424-03	Sampled: 02/03/15 16:17
Matrix: Air	Sample Volume: 21.48 m ³	Received: 02/04/15 11:12
Comments: Col 1 Start Time 2/2/15 16:25		Analysis Date: 02/10/15 16:20

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m ³ Air	<u>Flag</u>	<u>MDL</u> ng/m ³ Air
Hexavalent Chromium	1854-02-99	0.0278		0.0036

FEB 12 2015

Initials: *ER*

Eastern Research Group

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Environmental Resources Management, Inc

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Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 02/11/15 15:04

SUBMITTED: 02/04/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-1D	Lab ID: 5020424-04	Sampled: 02/03/15 16:21
Matrix: Air	Sample Volume: 21.49 m ³	Received: 02/04/15 11:12
Comments: Col 2 Start Time 2/2/15 16:28		Analysis Date: 02/10/15 16:40

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m ³ Air	<u>Flag</u>	<u>MDL</u> ng/m ³ Air
Hexavalent Chromium	1854-02-99	0.0285		0.0036

FEB 12 2015

Initials: *CR*

Eastern Research Group

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Environmental Resources Management, Inc

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Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 02/11/15 15:04

SUBMITTED: 02/04/15

AQS SITE

CODE: Honeywell Hex Chrome Study
SITE CODE:

Description: PAM-2	Lab ID: 5020424-05	Sampled: 02/03/15 16:02
Matrix: Air	Sample Volume: 21.46 m ³	Received: 02/04/15 11:12
Comments: Start Time 2/2/15 16:12		Analysis Date: 02/10/15 17:20

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m ³ Air	<u>Flag</u>	<u>MDL</u> ng/m ³ Air
Hexavalent Chromium	1854-02-99	0.0180		0.0036

FEB 12 2015

Initials: *CR*

Eastern Research Group

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FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 02/11/15 15:04

SUBMITTED: 02/04/15

AQS SITE

CODE:
SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-3	Lab ID: 5020424-06	Sampled: 02/03/15 15:56
Matrix: Air	Sample Volume: 21.5 m ³	Received: 02/04/15 11:12
Comments: Start Time 2/2/15 16:02		Analysis Date: 02/10/15 17:30

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/m³ Air</u>		<u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0082		0.0036

FEB 12 2015

Initials: ER

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: 02/11/15 15:04

SUBMITTED: 02/04/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-4	Lab ID: 5020424-07	Sampled: 02/03/15 15:42
Matrix: Air	Sample Volume: 21.5 m ³	Received: 02/04/15 11:12
Comments: Start Time 2/2/15 15:48		Analysis Date: 02/10/15 17:40

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/m³ Air</u>		<u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0214	-	0.0036

FEB 12 2015

Initials: *ER*

Eastern Research Group

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Malvern, PA 19355

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FILE #: 3926.00

REPORTED: 02/11/15 15:04

SUBMITTED: 02/04/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-21

Lab ID: 5020424-08

Sampled: 02/03/15 00:00

Matrix: Air

Sample Volume: 21.46 m³

Received: 02/04/15 11:12

Comments:

Analysis Date: 02/10/15 17:50

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0036

FEB 12 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: 02/11/15 15:04

SUBMITTED: 02/04/15

AQS SITE

CODE: Honeywell Hex Chrome Study
SITE CODE:

Description: PAM-31

Lab ID: 5020424-09

Sampled: 02/03/15 00:00

Matrix: Air

Sample Volume: 21.5 m³

Received: 02/04/15 11:12

Comments:

Analysis Date: 02/10/15 18:19

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0036

FEB 12 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

February 17, 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 February 13, 2015. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #33733:

SDG

5020607/5021026

Fraction

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: February 5 through February 9, 2015
LDC Report Date: February 17, 2015
Matrix: Air
Parameters: Hexavalent Chromium
Validation Level: EPA Level IV
Laboratory: Eastern Research Group
Sample Delivery Group (SDG): 5020607/5021026

Sample Identification

OAM 1(2/05/15)	PAM-1(2/09/15)DUP
OAM 2(2/05/15)	PAM-1D (2/09/15)DUP
PAM-1(2/05/15)	
PAM-1D (2/05/15)	
PAM-2(2/05/15)	
PAM-3(2/05/15)	
PAM-4(2/05/15)	
PAM-21(2/05/15)	
PAM-31(2/05/15)	
OAM 1(2/09/15)	
OAM 2(2/09/15)	
PAM-1(2/09/15)	
PAM-1D (2/09/15)	
PAM-2(2/09/15)	
PAM-3(2/09/15)	
PAM-4(2/09/15)	
PAM-21(2/09/15)	
PAM-31(2/09/15)	
PAM-1(2/05/15)DUP	
PAM-1D (2/05/15)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(2/05/15) and PAM-31(2/09/15) were identified as trip blanks. No hexavalent chromium was found.

Samples PAM-21(2/05/15) and PAM-21(2/09/15) 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(2/05/15) and PAM-1D (2/05/15) and samples PAM-1(2/09/15) and PAM-1D (2/09/15) were identified as field duplicates. No hexavalent chromium was detected in any of the samples with the following exceptions:

Analyte	Concentration (ng/m ³)		RPD (Limits)	Flags	A or P
	PAM-1(2/05/15)	PAM-1D (2/05/15)			
Hexavalent chromium	0.0327	0.0298	9 (≤20)	-	-

Analyte	Concentration (ng/m ³)		RPD (Limits)	Flags	A or P
	PAM-1(2/09/15)	PAM-1D (2/09/15)			
Hexavalent chromium	0.0630	0.0567	11 (≤20)	-	-

**Harbor Point, MD, Hexavalent Chromium Monitoring
Hexavalent Chromium - Data Qualification Summary - SDG 5020607/5021026**

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
5020607/5021026**

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
5020607/5021026**

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

LDC #: 33733A6

VALIDATION COMPLETENESS WORKSHEET

Date: 2/13/15

SDG #: 5020607/5021026

Level IV

Page: 1 of 2

Laboratory: Eastern Research Group

Reviewer: JD

2nd Reviewer: RL

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	2/05-09/15
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	LCS10
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 (02/05/15)	5020607-01	Air	02/05/15
2	OAM 2 (02/05/15)	5020607-02	Air	02/05/15
3	PAM-1 (02/05/15)	5020607-03	Air	02/05/15
4	PAM-1D (02/05/15)	5020607-04	Air	02/05/15
5	PAM-2 (02/05/15)	5020607-05	Air	02/05/15
6	PAM-3 (02/05/15)	5020607-06	Air	02/05/15
7	PAM-4 (02/05/15)	5020607-07	Air	02/05/15
8	PAM-21 (02/05/15)	5020607-08	Air	02/05/15
9	PAM-31 (02/05/15)	5020607-09	Air	02/05/15
10	OAM 1 (02/09/15)	5021026-01	Air	02/09/15
11	OAM 2 (02/09/15)	5021026-02	Air	02/09/15
12	PAM-1 (02/09/15)	5021026-03	Air	02/09/15
13	PAM-1D (02/09/15)	5021026-04	Air	02/09/15
14	PAM-2 (02/09/15)	5021026-05	Air	02/09/15
15	PAM-3 (02/09/15)	5021026-06	Air	02/09/15
16	PAM-4 (02/09/15)	5021026-07	Air	02/09/15
17	PAM-21 (02/09/15)	5021026-08	Air	02/09/15

LDC #: 33733A6

VALIDATION COMPLETENESS WORKSHEET

SDG #: 5020607/5021026

Level IV

Laboratory: Eastern Research Group

Date: 2/3/15

Page: 2 of 2

Reviewer: SO

2nd Reviewer: or

METHOD: (Analyte) Hexavalent Chromium (ASTM D7614)

	Client ID	Lab ID	Matrix	Date
18	PAM-31 (02/09/15)	5021026-09	Air	02/09/15
19	PAM-1 (02/05/15) DUP	5020607-03DUP	Air	02/05/15
20	PAM-1D (02/05/15) DUP	5020607-04DUP	Air	02/05/15
21	PAM-1 (02/09/15) DUP	5021026-03DUP	Air	02/09/15
22	PAM-1D (02/09/15) DUP	5021026-04DUP	Air	02/09/15
23				
24				
25				
26				
27				
28				
29				
30				

Notes: _____

Method: Inorganics (EPA Method See Lab)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	/			
Cooler temperature criteria was met.	/			
II. Calibration				
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 90-110% QC limits? <u>85-117</u>	/			
Were titrant checks performed as required? (Level IV only)			/	
Were balance checks performed as required? (Level IV only)			/	
III. Blanks				
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.		/		
IV. Matrix spike/Matrix spike duplicates and Duplicates				
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>SD</u>
Were the MS/MSD or duplicate relative percent differences (RPD) ≤ 20% for water <u>Air</u> 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.	/			
V. Laboratory control samples				
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?	/			
VI. Regional Quality Assurance and Quality Control				
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
VII. Sample Result Verification				
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	/			
Were detection limits < RL?	/			
VIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	/			
IX. Field duplicates				
Field duplicate pairs were identified in this SDG.	/			
Target analytes were detected in the field duplicates.	/			
X. Field blanks				
Field blanks were identified in this SDG.	/			
Target analytes were detected in the field blanks.		/		

LDC# 33733A6

VALIDATION FINDINGS WORKSHEET
Field Duplicates

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

Inorganics: Method See Cover

Analyte	Concentration (ng/m3)		RPD (≤ 20)	Qual.
	3	4		
Hexavalent Chromium	0.0327	0.0298	9	

Analyte	Concentration (ng/m3)		RPD (≤ 20)	Qual.
	12	13		
Hexavalent Chromium	0.0630	0.0567	11	

\\LDCFILESERVER\Validation\FIELD DUPLICATES\FD_inorganic\33733A6.wpd

LDC #: 33733A0

Validation Findings Worksheet
Initial and Continuing Calibration Calculation Verification

Page: 1 of 1
 Reviewer: SO
 2nd Reviewer: al

Method: Inorganics, Method See Cover

The correlation coefficient (r) for the calibration of C_{r+6} was recalculated. Calibration date: 2/12/15

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 ²	r or r ²	
Initial calibration	<u>C_{r+6}</u>	s1	0.05	0.000025	0.99988	0.99988	Y
		s2	0.1	0.0000663			
		s3	0.2	0.000141			
		s4	0.5	0.0003469			
		s5	1	0.0007328			
		s6	2	0.0015014			
ICV 10:59 Calibration verification	<u>C_{r+6}</u>	<u>Found</u> 0.5330 ng/ml	<u>True</u> 0.5 ng/ml		106.6%R	106.6%R	Y
CCV 11:58 Calibration verification	<u>↓</u>	0.5390 ng/ml	0.5 ng/ml		107.8%R	107.8%R	<u>↓</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.

LDC #: 33733A10

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

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

METHOD: Inorganics, Method Sea 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 11:29	Laboratory control sample	Cu ²⁺	1.085 ng/ml	1.000 ng/ml	109%R	109%R	Y
N	Matrix spike sample	↓	(SSR-SR)				
DUP 12:29	Duplicate sample	↓	0.0346 ng/m ³	0.0326 ng/m ³	5.95%RPD	5.78%RPD	Y

Comments: _____

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 = $(A - C_0) / C_1$

$C_0 = 1.59E-05$
 $C_1 = 0.0007556$
 $A = 0.0000828$

$V = 10 \text{ ml}$
 $\text{m}^3 = 21.07$
 $(\text{ng/ml}) / (\text{lit})$
 m^3

Recalculation: $(0.0000828 - 1.59E-05) / 0.0007556 = 0.1306 \text{ ng/L}$

$(0.1306) (10 \text{ ml}) / 21.07 \text{ m}^3 = 0.0620$

#	Sample ID	Analyte	Reported Concentration (ng/m ³)	Calculated Concentration (ng/m ³)	Acceptable (Y/N)
	1	CS ⁺ 6 ↓	0.0292	0.0291	Y*
	2		0.0321	0.0321	Y
	3		0.0327	0.0320	Y*
	4		0.0298	0.0298	Y
	5		0.0620	0.0620	↓
	6		0.0272	0.0272	↓
	7		0.0487	0.0487	↓
	8		ND	ND	↓
	9		ND	ND	↓
	10		0.0266	0.0265	Y*
	11		0.0362	0.0362	Y
	12		0.0630	0.0630	↓
	13		0.0567	0.0567	↓
	14		0.127	0.127	↓
	15		0.0636	0.0636	Y
	16		0.0493	0.0492	Y*
	17		ND	ND	Y
	18		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: 02/13/15 13:17

SUBMITTED: 02/06/15 to 02/10/15

AQS SITE

CODE: Honeywell Hex Chrome Study
SITE CODE:

Description: OAM 1	Lab ID: 5020607-01	Sampled: 02/05/15 15:01
Matrix: Air	Sample Volume: 21.36 m ³	Received: 02/06/15 10:57
Comments: Start Time 2/4/15 15:17		Analysis Date: 02/12/15 13:40

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0292		0.0036

FEB 17 2015

Initials: *CR*

Eastern Research Group

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FILE #: 3926.00

REPORTED: 02/13/15 13:17

SUBMITTED: 02/06/15 to 02/10/15

AQS SITE

CODE: Honeywell Hex Chrome Study
SITE CODE:

Description: OAM 2	Lab ID: 5020607-02	Sampled: 02/05/15 15:23
Matrix: Air	Sample Volume: 21.27 m ³	Received: 02/06/15 10:57
Comments: Start Time 2/4/15 15:44		Analysis Date: 02/12/15 13:50

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0321		0.0036

FEB 17 2015

Initials: *ER*

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REPORTED: 02/13/15 13:17

SUBMITTED: 02/06/15 to 02/10/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-1

Lab ID: 5020607-03

Sampled: 02/05/15 16:20

Matrix: Air

Sample Volume: 21.1 m³

Received: 02/06/15 10:57

Comments: Col 1 Start Time 2/4/15 16:53

Analysis Date: 02/12/15 12:20

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0327		0.0036

FEB 17 2015

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FILE #: 3926.00

REPORTED: 02/13/15 13:17

SUBMITTED: 02/06/15 to 02/10/15

AQS SITE

CODE:
SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-1D

Lab ID: 5020607-04

Sampled: 02/05/15 16:21

Matrix: Air

Sample Volume: 21.07 m³

Received: 02/06/15 10:57

Comments: Col 2 Start Time 2/4/15 16:56

Analysis Date: 02/12/15 12:39

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0298		0.0036

FEB 17 2015

Initials: *CR*

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FILE #: 3926.00

REPORTED: 02/13/15 13:17

SUBMITTED: 02/06/15 to 02/10/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-2

Lab ID: 5020607-05

Sampled: 02/05/15 15:55

Matrix: Air

Sample Volume: 21.07 m³

Received: 02/06/15 10:57

Comments: Start Time 2/4/15 16:30

Analysis Date: 02/12/15 14:19

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0620		0.0036

FEB 17 2015

Initials: CR

Eastern Research Group

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FILE #: 3926.00

REPORTED: 02/13/15 13:17

SUBMITTED: 02/06/15 to 02/10/15

AQS SITE

CODE: Honeywell Hex Chrome Study
SITE CODE:

Description: PAM-3	Lab ID: 5020607-06	Sampled: 02/05/15 15:51
Matrix: Air	Sample Volume: 21.14 m ³	Received: 02/06/15 10:57
Comments: Start Time 2/4/15 16:22		Analysis Date: 02/12/15 14:29

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0272		0.0036

FEB 17 2015

Initials: ER

Eastern Research Group

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FILE #: 3926.00

REPORTED: 02/13/15 13:17

SUBMITTED: 02/06/15 to 02/10/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-4

Lab ID: 5020607-07

Sampled: 02/05/15 15:47

Matrix: Air

Sample Volume: 21.24 m³

Received: 02/06/15 10:57

Comments: Start Time 2/4/15 16:11

Analysis Date: 02/12/15 14:39

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0487		0.0036

FEB 17 2015

Initials: *CR*

Eastern Research Group

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FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 02/13/15 13:17

SUBMITTED: 02/06/15 to 02/10/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-21

Lab ID: 5020607-08

Sampled: 02/05/15 00:00

Matrix: Air

Sample Volume: 21.07 m³

Received: 02/06/15 10:57

Comments:

Analysis Date: 02/12/15 14:49

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0036

FEB 17 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: 02/13/15 13:17

SUBMITTED: 02/06/15 to 02/10/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-31

Lab ID: 5020607-09

Sampled: 02/05/15 00:00

Matrix: Air

Sample Volume: 21.14 m³

Received: 02/06/15 10:57

Comments:

Analysis Date: 02/12/15 14:59

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0036

FEB 17 2015

Initials: *CR*

Eastern Research Group

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FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 02/13/15 13:17

SUBMITTED: 02/06/15 to 02/10/15

AQS SITE

CODE:
SITE CODE:

Honeywell Hex Chrome Study

Description: OAM 1	Lab ID: 5021026-01	Sampled: 02/09/15 15:04
Matrix: Air	Sample Volume: 21.49 m ³	Received: 02/10/15 11:33
Comments: Start Time 2/8/15 15:11		Analysis Date: 02/12/15 15:09

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0266		0.0036

FEB 17 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: 02/13/15 13:17

SUBMITTED: 02/06/15 to 02/10/15

AQS SITE

CODE: Honeywell Hex Chrome Study
SITE CODE:

Description: OAM 2	Lab ID: 5021026-02	Sampled: 02/09/15 15:29
Matrix: Air	Sample Volume: 21.52 m ³	Received: 02/10/15 11:33
Comments: Start Time 2/8/15 15:34		Analysis Date: 02/12/15 15:19

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0362		0.0036

FEB 17 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: 02/13/15 13:17

SUBMITTED: 02/06/15 to 02/10/15

AQS SITE

CODE:
SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-1

Lab ID: 5021026-03

Sampled: 02/09/15 16:17

Matrix: Air

Sample Volume: 21.47 m³

Received: 02/10/15 11:33

Comments: Col 1 Start Time 2/8/15 16:26

Analysis Date: 02/12/15 12:59

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0630		0.0036

FEB 17 2015

Initials: *ER*

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REPORTED: 02/13/15 13:17

SUBMITTED: 02/06/15 to 02/10/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-1D	Lab ID: 5021026-04	Sampled: 02/09/15 16:19
Matrix: Air	Sample Volume: 21.4 m ³	Received: 02/10/15 11:33
Comments: Col 2 Start Time 2/8/15 16:33		Analysis Date: 02/12/15 13:19

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m ³ Air	<u>Flag</u>	<u>MDL</u> ng/m ³ Air
Hexavalent Chromium	1854-02-99	0.0567		0.0036

FEB 17 2015

Initials: *CR*

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FILE #: 3926.00

REPORTED: 02/13/15 13:17

SUBMITTED: 02/06/15 to 02/10/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-2

Lab ID: 5021026-05

Sampled: 02/09/15 16:01

Matrix: Air

Sample Volume: 21.48 m³

Received: 02/10/15 11:33

Comments: Start Time 2/8/15 16:09

Analysis Date: 02/12/15 15:29

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.127		0.0036

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REPORTED: 02/13/15 13:17

SUBMITTED: 02/06/15 to 02/10/15

AQS SITE

CODE: Honeywell Hex Chrome Study
SITE CODE:

Description: PAM-3	Lab ID: 5021026-06	Sampled: 02/09/15 15:57
Matrix: Air	Sample Volume: 21.45 m ³	Received: 02/10/15 11:33
Comments: Start Time 2/8/15 16:02		Analysis Date: 02/12/15 15:38

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0636		0.0036

FEB 17 2015

Initials: *ER*

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FILE #: 3926.00

REPORTED: 02/13/15 13:17

SUBMITTED: 02/06/15 to 02/10/15

AQS SITE

CODE: Honeywell Hex Chrome Study
SITE CODE:

Description: PAM-4	Lab ID: 5021026-07	Sampled: 02/09/15 15:48
Matrix: Air	Sample Volume: 21.45 m ³	Received: 02/10/15 11:33
Comments: Start Time 2/8/15 15:58		Analysis Date: 02/12/15 16:38

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m ³ Air	<u>Flag</u>	<u>MDL</u> ng/m ³ Air
Hexavalent Chromium	1854-02-99	0.0493		0.0036

FEB 17 2015

Initials: *ER*

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FILE #: 3926.00

REPORTED: 02/13/15 13:17

SUBMITTED: 02/06/15 to 02/10/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-21

Lab ID: 5021026-08

Sampled: 02/09/15 00:00

Matrix: Air

Sample Volume: 21.48 m³

Received: 02/10/15 11:33

Comments:

Analysis Date: 02/12/15 16:18

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0036

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FILE #: 3926.00

REPORTED: 02/13/15 13:17

SUBMITTED: 02/06/15 to 02/10/15

AQS SITE

CODE: Honeywell Hex Chrome Study
SITE CODE:

Description: PAM-31	Lab ID: 5021026-09	Sampled: 02/09/15 00:00
Matrix: Air	Sample Volume: 21.45 m ³	Received: 02/10/15 11:33
Comments:		Analysis Date: 02/12/15 16:28

Hexavalent Chromium by SOP ERG-MOR-063

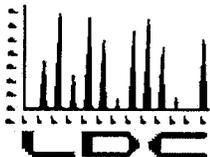
<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m ³ Air	<u>Flag</u>	<u>MDL</u> ng/m ³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

FEB 17 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

February 26, 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 February 25, 2015. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #33788:

SDG

Fraction

5021131/5021212

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: February 10 through February 11, 2015
LDC Report Date: February 26, 2015
Matrix: Air
Parameters: Hexavalent Chromium
Validation Level: EPA Level IV
Laboratory: Eastern Research Group
Sample Delivery Group (SDG): 5021131/5021212

Sample Identification

OAM 1(02/10/15)	PAM-1(02/11/15)DUP
OAM 2(02/10/15)	PAM-1D (02/11/15)DUP
PAM-1(02/10/15)	
PAM-1D (02/10/15)	
PAM-2(02/10/15)	
PAM-3(02/10/15)	
PAM-4(02/10/15)	
PAM-21(02/10/15)	
PAM-31(02/10/15)	
OAM 1(02/11/15)	
OAM 2(02/11/15)	
PAM-1(02/11/15)	
PAM-1D (02/11/15)	
PAM-2(02/11/15)	
PAM-3(02/11/15)	
PAM-4(02/11/15)	
PAM-21(02/11/15)	
PAM-31(02/11/15)	
PAM-1(02/10/15)DUP	
PAM-1D (02/10/15)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(02/10/15) and PAM-31(02/11/15) were identified as trip blanks. No hexavalent chromium was found.

Samples PAM-21(02/10/15) and PAM-21(02/11/15) 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(02/10/15) and PAM-1D (02/10/15) and samples PAM-1(02/11/15) and PAM-1D (02/11/15) were identified as field duplicates. No hexavalent chromium was detected in any of the samples with the following exceptions:

Analyte	Concentration (ng/m ³)		RPD (Limits)	Flags	A or P
	PAM-1(02/10/15)	PAM-1D (02/10/15)			
Hexavalent chromium	0.0124	0.0120	3 (≤20)	-	-

Analyte	Concentration (ng/m ³)		RPD (Limits)	Flags	A or P
	PAM-1(02/11/15)	PAM-1D (02/11/15)			
Hexavalent chromium	0.0105	0.0096	9 (≤20)	-	-

**Harbor Point, MD, Hexavalent Chromium Monitoring
Hexavalent Chromium - Data Qualification Summary - SDG 5021131/5021212**

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
5021131/5021212**

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
5021131/5021212**

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

LDC #: 33788A6

VALIDATION COMPLETENESS WORKSHEET

Date: 2/26/15

SDG #: 5021131/5021212

Level IV

Page: 1 of 2

Laboratory: Eastern Research Group

Reviewer: JD

2nd Reviewer: OL

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	2/10-11/15
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(02/10/15)	5021131-01	Air	02/10/15
2	OAM 2 (02/10/15)	5021131-02	Air	02/10/15
3	PAM-1 (02/10/15)	5021131-03	Air	02/10/15
4	PAM-1D (02/10/15)	5021131-04	Air	02/10/15
5	PAM-2 (02/10/15)	5021131-05	Air	02/10/15
6	PAM-3 (02/10/15)	5021131-06	Air	02/10/15
7	PAM-4 (02/10/15)	5021131-07	Air	02/10/15
8	PAM-21 (02/10/15)	5021131-08	Air	02/10/15
9	PAM-31 (02/10/15)	5021131-09	Air	02/10/15
10	OAM 1 (02/11/15)	5021212-01	Air	02/11/15
11	OAM 2 (02/11/15)	5021212-02	Air	02/11/15
12	PAM-1 (02/11/15)	5021212-03	Air	02/11/15
13	PAM-1D (02/11/15)	5021212-04	Air	02/11/15
14	PAM-2 (02/11/15)	5021212-05	Air	02/11/15
15	PAM-3 (02/11/15)	5021212-06	Air	02/11/15
16	PAM-4 (02/11/15)	5021212-07	Air	02/11/15
17	PAM-21 (02/11/15)	5021212-08	Air	02/11/15

LDC #: 33788A6

VALIDATION COMPLETENESS WORKSHEET

Date: 2/26/15

SDG #: 5021131/5021212

Level IV

Page: 2 of 2

Laboratory: Eastern Research Group

Reviewer: SD

2nd Reviewer: AL

METHOD: (Analyte) Hexavalent Chromium (ASTM D7614)

	Client ID	Lab ID	Matrix	Date
18	PAM-31 (02/11/15)	5021212-09	Air	02/11/15
19	PAM-1 (02/10/15)DUP	5021131-03DUP	Air	02/10/15
20	PAM-1D (02/10/15)DUP	5021131-04DUP	Air	02/10/15
21	PAM-1 (02/11/15)DUP	5021212-03DUP	Air	02/11/15
22	PAM-1D (02/11/15)DUP	5021212-04DUP	Air	02/11/15
23				
24				
25				
26				
27				

Notes: _____

Method: Inorganics (EPA Method See lower)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	/			
Cooler temperature criteria was met.	/			
II. Calibration				
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 90-110% QC limits? <u>85-115</u>	/			
Were titrant checks performed as required? (Level IV only)			/	
Were balance checks performed as required? (Level IV only)			/	
III. Blanks				
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.		/		
IV. Matrix spike/Matrix spike duplicates and Duplicates				
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 waters 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.	/			
V. Laboratory control samples				
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?	/			
VI. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?			/	
Were the performance evaluation (PE) samples within the acceptance limits?			/	

Ars

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

LDC# 33788A6

VALIDATION FINDINGS WORKSHEET
Field Duplicates

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

Inorganics: Method See Cover

Analyte	Concentration (ng/m3)		RPD (≤ 20)	Qual.
	3	4		
Hexavalent Chromium	0.0124	0.0120	3	

Analyte	Concentration (ng/m3)		RPD (≤ 20)	Qual.
	12	13		
Hexavalent Chromium	0.0105	0.0096	9	

\\LDCFILESERVER\validation\FIELD DUPLICATES\FD_inorganic\33788A6.wpd

LDC #: 33788A

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

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

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 12:02	Laboratory control sample	Cr ⁺⁶	1.079 ng/ml	1.00 ng/ml	108%R	108%R	Y
N	Matrix spike sample		(SSR-SR)				
DUP 14:21	Duplicate sample	Cr ⁺⁶	0.0123 ng/m ³	0.0124 ng/m ³	0.81%RPD	1.13%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) Cr⁺⁶ reported with a positive detect were recalculated and verified using the following equation:

Concentration = $(A - C_0) / C_1$ $V_f = 10 \mu\text{l}$ Recalculation: $\frac{(0.0000140 - (-5.14E-06))}{0.0008305} = 0.0230 \text{ ng/l}$
 $\text{m}^3 = 21.48 \text{ m}^3$
 $\frac{(\text{ng/l})(\mu\text{l})}{\text{m}^3} = \text{ng/m}^3$ $\frac{(0.0230 \text{ ng/l})(10 \mu\text{l})}{21.48 \text{ m}^3} = 0.0107 \text{ ng/l}$

A = 0.0000140
 C₀ = -5.14E-06
 C₁ = 0.0008305

#	Sample ID	Analyte	Reported Concentration (ng/m ³)	Calculated Concentration (ng/m ³)	Acceptable (Y/N)
	1	Cr ⁺⁶	0.0107	0.0107	Y
	2		0.0117	0.0117	Y
	3		0.0124	0.0124	Y
	4		0.0120	0.0120	Y
	5		0.0342	0.0343	Y*
	6		0.0096	0.0097	Y*
	7		0.0120	0.0120	Y
	8		ND	ND	Y
	9		ND	ND	Y
	10		0.0077	0.0077	Y
	11		0.0067	0.0067	Y
	12		0.0105	0.0105	Y
	13		0.0096	0.0095	Y*
	14		0.0287	0.0287	Y
	15		0.0067	0.0066	Y*
	16		0.0109	0.0109	Y
	17		ND	ND	Y
	18		ND	ND	Y

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: 02/25/15 13:14

SUBMITTED: 02/11/15 to 02/12/15

AQS SITE

CODE: Honeywell Hex Chrome Study
SITE CODE:

Description: OAM 1	Lab ID: 5021131-01	Sampled: 02/10/15 15:01
Matrix: Air	Sample Volume: 21.48 m ³	Received: 02/11/15 11:12
Comments: Start Time 2/9/15 15:09		Analysis Date: 02/20/15 13:41

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m ³ Air	<u>Flag</u>	<u>MDL</u> ng/m ³ Air
Hexavalent Chromium	1854-02-99	0.0107		0.0036

FEB 26 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: 02/25/15 13:14

SUBMITTED: 02/11/15 to 02/12/15

AQS SITE

CODE: Honeywell Hex Chrome Study
SITE CODE:

Description: OAM 2	Lab ID: 5021131-02	Sampled: 02/10/15 15:32
Matrix: Air	Sample Volume: 21.6 m ³	Received: 02/11/15 11:12
Comments: Start Time 2/9/15 15:32		Analysis Date: 02/20/15 13:51

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m ³ Air	<u>Flag</u>	<u>MDL</u> ng/m ³ Air
Hexavalent Chromium	1854-02-99	0.0117		0.0036

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Initials: *ER*

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FILE #: 3926.00

REPORTED: 02/25/15 13:14

SUBMITTED: 02/11/15 to 02/12/15

AQS SITE

CODE: Honeywell Hex Chrome Study
SITE CODE:

Description: PAM-1	Lab ID: 5021131-03	Sampled: 02/10/15 16:12
Matrix: Air	Sample Volume: 21.49 m ³	Received: 02/11/15 11:12
Comments: Col 1 Start Time 2/9/15 16:20		Analysis Date: 02/18/15 12:52

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m ³ Air	<u>Flag</u>	<u>MDL</u> ng/m ³ Air
Hexavalent Chromium	1854-02-99	0.0124		0.0036

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FILE #: 3926.00

REPORTED: 02/25/15 13:14

SUBMITTED: 02/11/15 to 02/12/15

AQS SITE

CODE: Honeywell Hex Chrome Study
SITE CODE:

Description: PAM-1D	Lab ID: 5021131-04	Sampled: 02/10/15 16:15
Matrix: Air	Sample Volume: 21.5 m ³	Received: 02/11/15 11:12
Comments: Col 2 Start Time 2/9/15 16:22		Analysis Date: 02/18/15 13:12

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0120		0.0036

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FILE #: 3926.00

REPORTED: 02/25/15 13:14

SUBMITTED: 02/11/15 to 02/12/15

AQS SITE

CODE: Honeywell Hex Chrome Study
SITE CODE:

Description: PAM-2	Lab ID: 5021131-05	Sampled: 02/10/15 16:03
Matrix: Air	Sample Volume: 21.57 m ³	Received: 02/11/15 11:12
Comments: Start Time 2/9/15 16:05		Analysis Date: 02/18/15 16:13

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m ³ Air	<u>Flag</u>	<u>MDL</u> ng/m ³ Air
Hexavalent Chromium	1854-02-99	0.0342		0.0036

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FILE #: 3926.00

REPORTED: 02/25/15 13:14

SUBMITTED: 02/11/15 to 02/12/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-3

Lab ID: 5021131-06

Sampled: 02/10/15 15:57

Matrix: Air

Sample Volume: 21.63 m³

Received: 02/11/15 11:12

Comments: Start Time 2/9/15 15:55

Analysis Date: 02/20/15 14:01

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0096		0.0036

.....

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FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 02/25/15 13:14

SUBMITTED: 02/11/15 to 02/12/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-4

Lab ID: 5021131-07

Sampled: 02/10/15 15:52

Matrix: Air

Sample Volume: 21.62 m³

Received: 02/11/15 11:12

Comments: Start Time 2/9/15 15:51

Analysis Date: 02/20/15 15:50

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0120		0.0036

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FILE #: 3926.00

REPORTED: 02/25/15 13:14

SUBMITTED: 02/11/15 to 02/12/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-21

Lab ID: 5021131-08

Sampled: 02/10/15 00:00

Matrix: Air

Sample Volume: 21.57 m³

Received: 02/11/15 11:12

Comments:

Analysis Date: 02/20/15 14:21

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/m³ Air</u>		<u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0036

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Initials: *CR*

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FILE #: 3926.00

REPORTED: 02/25/15 13:14

SUBMITTED: 02/11/15 to 02/12/15

AQS SITE

CODE: Honeywell Hex Chrome Study
SITE CODE:

Description: PAM-31	Lab ID: 5021131-09	Sampled: 02/10/15 00:00
Matrix: Air	Sample Volume: 21.63 m ³	Received: 02/11/15 11:12
Comments:		Analysis Date: 02/20/15 14:31

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m ³ Air	<u>Flag</u>	<u>MDL</u> ng/m ³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

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FILE #: 3926.00

REPORTED: 02/25/15 13:14

SUBMITTED: 02/11/15 to 02/12/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

Description: OAM 1	Lab ID: 5021212-01	Sampled: 02/11/15 14:53
Matrix: Air	Sample Volume: 21.44 m ³	Received: 02/12/15 11:20
Comments: Start Time 2/10/15 15:03		Analysis Date: 02/20/15 14:40

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m ³ Air	<u>Flag</u>	<u>MDL</u> ng/m ³ Air
Hexavalent Chromium	1854-02-99	0.0077		0.0036

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Initials: *ER*



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PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 02/25/15 13:14

SUBMITTED: 02/11/15 to 02/12/15

AQS SITE

CODE:
SITE CODE:

Honeywell Hex Chrome Study

Description: OAM 2

Lab ID: 5021212-02

Sampled: 02/11/15 15:12

Matrix: Air

Sample Volume: 21.25 m³

Received: 02/12/15 11:20

Comments: Start Time 2/10/15 15:35

Analysis Date: 02/20/15 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/m³ Air</u>		<u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0067		0.0036

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FILE #: 3926.00

REPORTED: 02/25/15 13:14

SUBMITTED: 02/11/15 to 02/12/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-1

Lab ID: 5021212-03

Sampled: 02/11/15 16:19

Matrix: Air

Sample Volume: 21.64 m³

Received: 02/12/15 11:20

Comments: Col 1 Start Time 2/10/15 16:16

Analysis Date: 02/18/15 15:13

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/m³ Air</u>		<u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0105		0.0036

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FILE #: 3926.00

REPORTED: 02/25/15 13:14

SUBMITTED: 02/11/15 to 02/12/15

AQS SITE

CODE: Honeywell Hex Chrome Study
SITE CODE:

Description: PAM-1D	Lab ID: 5021212-04	Sampled: 02/11/15 16:23
Matrix: Air	Sample Volume: 21.67 m ³	Received: 02/12/15 11:20
Comments: Col 2 Start Time 2/10/15 16:18		Analysis Date: 02/18/15 13:52

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m ³ Air	<u>Flag</u>	<u>MDL</u> ng/m ³ Air
Hexavalent Chromium	1854-02-99	0.0096		0.0036

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Initials: *ER*

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75 Valley Stream Parkway, Suite 400

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ATTN: Mr. Jeff Boggs

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FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 02/25/15 13:14

SUBMITTED: 02/11/15 to 02/12/15

AQS SITE

CODE: Honeywell Hex Chrome Study
SITE CODE:

Description: PAM-2	Lab ID: 5021212-05	Sampled: 02/11/15 16:03
Matrix: Air	Sample Volume: 21.55 m ³	Received: 02/12/15 11:20
Comments: Start Time 2/10/15 16:06		Analysis Date: 02/20/15 15:00

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m ³ Air	<u>Flag</u>	<u>MDL</u> ng/m ³ Air
Hexavalent Chromium	1854-02-99	0.0287		0.0036

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FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 02/25/15 13:14

SUBMITTED: 02/11/15 to 02/12/15

AQS SITE

CODE:
SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-3

Lab ID: 5021212-06

Sampled: 02/11/15 15:52

Matrix: Air

Sample Volume: 21.48 m³

Received: 02/12/15 11:20

Comments: Start Time 2/10/15 16:00

Analysis Date: 02/20/15 15:10

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0067		0.0036

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FILE #: 3926.00

REPORTED: 02/25/15 13:14

SUBMITTED: 02/11/15 to 02/12/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-4

Lab ID: 5021212-07

Sampled: 02/11/15 15:41

Matrix: Air

Sample Volume: 21.38 m³

Received: 02/12/15 11:20

Comments: Start Time 2/10/15 15:56

Analysis Date: 02/20/15 15:40

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/m³ Air</u>		<u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0109		0.0036

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FILE #: 3926.00

REPORTED: 02/25/15 13:14

SUBMITTED: 02/11/15 to 02/12/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-21

Lab ID: 5021212-08

Sampled: 02/11/15 00:00

Matrix: Air

Sample Volume: 21.55 m³

Received: 02/12/15 11:20

Comments:

Analysis Date: 02/18/15 18:14

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0036

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FILE #: 3926.00

REPORTED: 02/25/15 13:14

SUBMITTED: 02/11/15 to 02/12/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

Description: PAM-31

Lab ID: 5021212-09

Sampled: 02/11/15 00:00

Matrix: Air

Sample Volume: 21.48 m³

Received: 02/12/15 11:20

Comments:

Analysis Date: 02/18/15 18:24

Hexavalent Chromium by SOP ERG-MOR-063

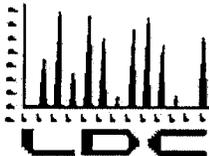
<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0036

FEB 26 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

March 3, 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 March 2, 2015. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #33810:

<u>SDG</u>	<u>Fraction</u>
5021325/5021836	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: February 12 through February 13, 2015
LDC Report Date: March 3, 2015
Matrix: Air
Parameters: Hexavalent Chromium
Validation Level: EPA Level IV
Laboratory: Eastern Research Group
Sample Delivery Group (SDG): 5021325/5021836

Sample Identification

OAM 1(02/12/15)	PAM-1(02/13/15)DUP
OAM 2(02/12/15)	PAM-1D (02/13/15)DUP
PAM-1(02/12/15)	
PAM-1D (02/12/15)	
PAM-2(02/12/15)	
PAM-3(02/12/15)	
PAM-4(02/12/15)	
PAM-21(02/12/15)	
PAM-31(02/12/15)	
OAM 1(02/13/15)	
OAM 2(02/13/15)	
PAM-1(02/13/15)	
PAM-1D (02/13/15)	
PAM-2(02/13/15)	
PAM-3(02/13/15)	
PAM-4(02/13/15)	
PAM-21(02/13/15)	
PAM-31(02/13/15)	
PAM-1(02/12/15)DUP	
PAM-1D (02/12/15)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(02/12/15) and PAM-31(02/13/15) were identified as trip blanks. No hexavalent chromium was found.

Samples PAM-21(02/12/15) and PAM-21(02/13/15) 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(02/12/15) and PAM-1D (02/12/15) and samples PAM-1(02/13/15) and PAM-1D (02/13/15) were identified as field duplicates. No hexavalent chromium was detected in any of the samples with the following exceptions:

Analyte	Concentration (ng/m ³)		RPD (Limits)	Flags	A or P
	PAM-1(02/12/15)	PAM-1D (02/12/15)			
Hexavalent chromium	0.0208	0.0241	15 (≤20)	-	-

Analyte	Concentration (ng/m ³)		RPD (Limits)	Flags	A or P
	PAM-1(02/13/15)	PAM-1D (02/13/15)			
Hexavalent chromium	0.0162	0.0154	5 (≤20)	-	-

**Harbor Point, MD, Hexavalent Chromium Monitoring
Hexavalent Chromium - Data Qualification Summary - SDG 5021325/5021836**

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
5021325/5021836**

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
5021325/5021836**

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

LDC #: 33810A6

VALIDATION COMPLETENESS WORKSHEET

Date: 2/2/15

SDG #: 5021325/5021836

Level IV

Page: 1 of 2

Laboratory: Eastern Research Group

Reviewer: SD

2nd Reviewer: OR

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	02/12-13/15
II.	Initial calibration	A	
III.	Calibration verification	A	
IV.	Laboratory Blanks	A	
V.	Field blanks	ND	FB=(8)(11) 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(02/12/15)	5021325-01	Air	02/12/15
2	OAM 2 (02/12/15)	5021325-02	Air	02/12/15
3	PAM-1 (02/12/15)	5021325-03	Air	02/12/15
4	PAM-1D (02/12/15)	5021325-04	Air	02/12/15
5	PAM-2 (02/12/15)	5021325-05	Air	02/12/15
6	PAM-3 (02/12/15)	5021325-06	Air	02/12/15
7	PAM-4 (02/12/15)	5021325-07	Air	02/12/15
8	PAM-21 (02/12/15)	5021325-08	Air	02/12/15
9	PAM-31 (02/12/15)	5021325-09	Air	02/12/15
10	OAM 1(02/13/15)	5021836-01	Air	02/13/15
11	OAM 2 (02/13/15)	5021836-02	Air	02/13/15
12	PAM-1 (02/13/15)	5021836-03	Air	02/13/15
13	PAM-1D (02/13/15)	5021836-04	Air	02/13/15
14	PAM-2 (02/13/15)	5021836-05	Air	02/13/15
15	PAM-3 (02/13/15)	5021836-06	Air	02/13/15
16	PAM-4 (02/13/15)	5021836-07	Air	02/13/15
17	PAM-21 (02/13/15)	5021836-08	Air	02/13/15

LDC #: 33810A6

VALIDATION COMPLETENESS WORKSHEET

Date: 3/3/15

SDG #: 5021325/5021836

Level IV

Page: 2 of 2

Laboratory: Eastern Research Group

Reviewer: SD

2nd Reviewer: [Signature]

METHOD: (Analyte) Hexavalent Chromium (ASTM D7614)

	Client ID	Lab ID	Matrix	Date
18	PAM-31 (02/13/15)	5021836-09	Air	02/13/15
19	PAM-1 (02/12/15)DUP	5021325-03DUP	Air	02/12/15
20	PAM-1D (02/12/15)DUP	5021325-04DUP	Air	02/12/15
21	PAM-1 (02/13/15)DUP	5021836-03DUP	Air	02/13/15
22	PAM-1D (02/13/15)DUP	5021836-04DUP	Air	02/13/15
23				
24				
25				
26				
27				
28				
29				
30				

Notes: _____

Method: Inorganics (EPA Method See Cover)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	/			
Cooler temperature criteria was met.	/			
II. Calibration				
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 90-110% <u>85-115</u> QC limits?	/			
Were titrant checks performed as required? (Level IV only)			/	
Were balance checks performed as required? (Level IV only)			/	
III. Blanks				
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.		/		
IV. Matrix spike/Matrix spike duplicates and Duplicates				
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 waters <u>Air</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 $< 5X$ the CRDL.	/			
V. Laboratory control samples				
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?	/			
VI. Regional Quality Assurance and Quality Control				
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
VII. Sample Result Verification				
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	/			
Were detection limits < RL?	/			
VIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	/			
IX. Field duplicates				
Field duplicate pairs were identified in this SDG.	/			
Target analytes were detected in the field duplicates.	/			
X. Field blanks				
Field blanks were identified in this SDG.	/			
Target analytes were detected in the field blanks.		/		

LDC# 33810A6

VALIDATION FINDINGS WORKSHEET
Field Duplicates

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

Inorganics: Method See Cover

Analyte	Concentration (ng/m3)		RPD (≤ 20)	Qual.
	3	4		
Hexavalent Chromium	0.0208	0.0241	15	

Analyte	Concentration (ng/m3)		RPD (≤ 20)	Qual.
	12	13		
Hexavalent Chromium	0.0162	0.0154	5	

\\LDCFILESERVER\Validation\FIELD DUPLICATES\FD_inorganic\33810A6.wpd

LDC #: 3380A

Validation Findings Worksheet
Initial and Continuing Calibration Calculation Verification

Page: 1 of 1

Reviewer: SD

2nd Reviewer: Q

Method: Inorganics, Method See Cover

The correlation coefficient (r) for the calibration of C⁺⁶ was recalculated. Calibration date: 2/23/15

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 ²	r or r ²	
Initial calibration	C ⁺⁶	s1	0.05	0.0000382	0.99999	0.99999	Y
		s2	0.1	0.000074			
		s3	0.2	0.0001621			
		s4	0.5	0.000405			
		s5	1	0.0008102			
		s6	2	0.0016357			
ICV 11:11 Calibration verification	C ⁺⁶	<u>Found</u> 0.5277ng/ml	<u>True</u> 0.5ng/ml		105.5%R	105.5%R	Y
CCV 12:31 Calibration verification	C ⁺⁶	0.5125ng/ml	0.5ng/ml		102.5%R	102.5%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 #: 33810A

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 11-41	Laboratory control sample	Cr ⁺⁶	1.06 ng/ml	1.00 ng/ml	106%R	106%R	Y
N	Matrix spike sample		(SSR-SR)				
DUP	Duplicate sample	Cr ⁺⁶	0.0224 ng/ml ³	0.0208 ng/ml ³	7.41 %RPD	7.14 %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 (10) Cr⁺⁶ 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: $\frac{0.0000051 - (-4.86E-06)}{0.000893} = 0.022 \text{ ng/ml}$

$A = 0.0000051$
 $C_0 = -4.86E-06$
 $C_1 = 0.000893$

$\frac{(ng/ml)(V_f)}{m^3} = ng/m^3$
 $\frac{(0.022 \text{ ng/ml})(10 \text{ ml})}{21.71 \text{ m}^3} = 0.0056 \text{ ng/m}^3$

#	Sample ID	Analyte	Reported Concentration (ng/m ³)	Calculated Concentration (ng/m ³)	Acceptable (Y/N)
	1	Cr ⁺⁶	0.0220	0.0220	Y
	2	↓	0.0180	0.0185	Y*
	3		0.0208	0.0208	Y
	4		0.0241	0.0241	↓
	5		0.0125	0.0125	↓
	6		0.0164	0.0164	↓
	7		0.0292	0.0292	↓
	8		ND	ND	↓
	9		ND	ND	↓
	10		0.0056	0.0056	↓
	11		ND	ND	↓
	12		0.0162	0.0162	↓
	13		0.0154	0.0155	Y*
	14		0.121	0.121	Y
	15		ND	ND	↓
	16		0.0342	0.0342	↓
	17		ND	ND	↓
	18		ND	ND	↓

Note: * Rounding



CERTIFICATE OF ANALYSIS

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75 Valley Stream Parkway, Suite 400

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ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 03/02/15 12:37

SUBMITTED: 02/13/15 to 02/18/15

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: OAM 1	Lab ID: 5021325-01	Sampled: 02/12/15 14:43
Matrix: Air	Sample Volume: 21.41 m ³	Received: 02/13/15 11:19
Comments: Start Time 2/11/15 14:56		Analysis Date: 02/23/15 14:54

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0226		0.0036

MAR 03 2015

Initials: CR

Eastern Research Group

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REPORTED: 03/02/15 12:37

SUBMITTED: 02/13/15 to 02/18/15

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: OAM 2	Lab ID: 5021325-02	Sampled: 02/12/15 15:05
Matrix: Air	Sample Volume: 21.44 m ³	Received: 02/13/15 11:19
Comments: Start Time 2/11/15 15:15		Analysis Date: 02/23/15 15:04

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m ³ Air	<u>Flag</u>	<u>MDL</u> ng/m ³ Air
Hexavalent Chromium	1854-02-99	0.0186		0.0036

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REPORTED: 03/02/15 12:37

SUBMITTED: 02/13/15 to 02/18/15

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-1

Lab ID: 5021325-03

Sampled: 02/12/15 16:12

Matrix: Air

Sample Volume: 21.42 m³

Received: 02/13/15 11:19

Comments: Col 1 Start Time 2/11/15 16:24

Analysis Date: 02/23/15 12:51

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0208		0.0036

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REPORTED: 03/02/15 12:37

SUBMITTED: 02/13/15 to 02/18/15

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-1D

Lab ID: 5021325-04

Sampled: 02/12/15 16:16

Matrix: Air

Sample Volume: 21.45 m³

Received: 02/13/15 11:19

Comments: Col 2 Start Time 2/11/15 16:26

Analysis Date: 02/23/15 13:11

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0241		0.0036

MAR 03 2015

Initials: *ER*

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REPORTED: 03/02/15 12:37

SUBMITTED: 02/13/15 to 02/18/15

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-2	Lab ID: 5021325-05	Sampled: 02/12/15 16:00
Matrix: Air	Sample Volume: 21.49 m ³	Received: 02/13/15 11:19
Comments: Start Time 2/11/15 16:07		Analysis Date: 02/23/15 18:04

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0125		0.0036

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REPORTED: 03/02/15 12:37

SUBMITTED: 02/13/15 to 02/18/15

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-3

Lab ID: 5021325-06

Sampled: 02/12/15 15:53

Matrix: Air

Sample Volume: 21.57 m³

Received: 02/13/15 11:19

Comments: Start Time 2/11/15 15:55

Analysis Date: 02/23/15 15:24

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0164		0.0036

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REPORTED: 03/02/15 12:37

SUBMITTED: 02/13/15 to 02/18/15

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-4	Lab ID: 5021325-07	Sampled: 02/12/15 15:24
Matrix: Air	Sample Volume: 21.3 m ³	Received: 02/13/15 11:19
Comments: Start Time 2/11/15 15:44		Analysis Date: 02/23/15 15:34

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0292		0.0036

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Initials: *CR*

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FILE #: 3926.00

REPORTED: 03/02/15 12:37

SUBMITTED: 02/13/15 to 02/18/15

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-21

Lab ID: 5021325-08

Sampled: 02/12/15 00:00

Matrix: Air

Sample Volume: 21.49 m³

Received: 02/13/15 11:19

Comments:

Analysis Date: 02/23/15 15:44

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0036

MAR 03 2015

Initials: *CR*

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FILE #: 3926.00

REPORTED: 03/02/15 12:37

SUBMITTED: 02/13/15 to 02/18/15

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-31

Lab ID: 5021325-09

Sampled: 02/12/15 00:00

Matrix: Air

Sample Volume: 21.57 m³

Received: 02/13/15 11:19

Comments:

Analysis Date: 02/23/15 15:54

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0036

MAR 03 2015

Initials: *CR*

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FILE #: 3926.00

REPORTED: 03/02/15 12:37

SUBMITTED: 02/13/15 to 02/18/15

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: OAM 1

Lab ID: 5021836-01

Sampled: 02/13/15 14:54

Matrix: Air

Sample Volume: 21.71 m³

Received: 02/18/15 15:11

Comments: Start Time 2/12/15 14:46

Analysis Date: 02/23/15 16:04

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0056		0.0038

MAR 03 2015

Initials: *ER*

Eastern Research Group

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FILE #: 3926.00

REPORTED: 03/02/15 12:37

SUBMITTED: 02/13/15 to 02/18/15

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: OAM 2	Lab ID: 5021836-02	Sampled: 02/13/15 15:12
Matrix: Air	Sample Volume: 21.67 m ³	Received: 02/18/15 15:11
Comments: Start Time 2/12/15 15:08		Analysis Date: 02/23/15 18:14

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0038

MAR 03 2015

Initials: *CR*

Eastern Research Group

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FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 03/02/15 12:37

SUBMITTED: 02/13/15 to 02/18/15

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-1	Lab ID: 5021836-03	Sampled: 02/13/15 15:46
Matrix: Air	Sample Volume: 21.14 m ³	Received: 02/18/15 15:11
Comments: Col 1 Start Time 2/12/15 16:16		Analysis Date: 02/23/15 14:15

Hexavalent Chromium by SOP ERG-MOR-063

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

MAR 03 2015

Initials: CR

Eastern Research Group

The results in this report apply only to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



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: 03/02/15 12:37

SUBMITTED: 02/13/15 to 02/18/15

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-1D	Lab ID: 5021836-04	Sampled: 02/13/15 15:47
Matrix: Air	Sample Volume: 21.11 m ³	Received: 02/18/15 15:11
Comments: Col 2 Start Time 2/12/15 16:19		Analysis Date: 02/23/15 13:51

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0154	LK	0.0038

MAR 03 2015

Initials: ER

Eastern Research Group

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FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 03/02/15 12:37

SUBMITTED: 02/13/15 to 02/18/15

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-2	Lab ID: 5021836-05	Sampled: 02/13/15 15:36
Matrix: Air	Sample Volume: 21.18 m ³	Received: 02/18/15 15:11
Comments: Start Time 2/12/15 16:03		Analysis Date: 02/23/15 16:23

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m ³ Air	<u>Flag</u>	<u>MDL</u> ng/m ³ Air
Hexavalent Chromium	1854-02-99	0.121		0.0038

MAR 03 2015

Initials: *ER*

Eastern Research Group

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FILE #: 3926.00

REPORTED: 03/02/15 12:37

SUBMITTED: 02/13/15 to 02/18/15

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-3

Lab ID: 5021836-06

Sampled: 02/13/15 15:31

Matrix: Air

Sample Volume: 21.23 m³

Received: 02/18/15 15:11

Comments: Start Time 2/12/15 15:55

Analysis Date: 02/23/15 17:15

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0038

MAR 03 2015

Initials: *CR*

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FILE #: 3926.00

REPORTED: 03/02/15 12:37

SUBMITTED: 02/13/15 to 02/18/15

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-4	Lab ID: 5021836-07	Sampled: 02/13/15 15:28
Matrix: Air	Sample Volume: 21.62 m ³	Received: 02/18/15 15:11
Comments: Start Time 2/12/15 15:27		Analysis Date: 02/23/15 18:24

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0342		0.0038

MAR 03 2015

Initials: *CR*

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Environmental Resources Management, Inc

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FILE #: 3926.00

REPORTED: 03/02/15 12:37

SUBMITTED: 02/13/15 to 02/18/15

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-21	Lab ID: 5021836-08	Sampled: 02/13/15 00:00
Matrix: Air	Sample Volume: 21.18 m ³	Received: 02/18/15 15:11
Comments:		Analysis Date: 02/23/15 17:35

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0038

MAR 03 2015

Initials: *CR*

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FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 03/02/15 12:37

SUBMITTED: 02/13/15 to 02/18/15

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-31	Lab ID: 5021836-09	Sampled: 02/13/15 00:00
Matrix: Air	Sample Volume: 21.23 m ³	Received: 02/18/15 15:11
Comments:		Analysis Date: 02/23/15 17:44

Hexavalent Chromium by SOP ERG-MOR-063

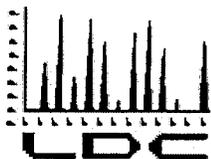
<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0038

MAR 03 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

March 4, 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 March 3, 2015. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #33817:

SDG

Fraction

5021836

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: February 16 through February 17, 2015
LDC Report Date: March 4, 2015
Matrix: Air
Parameters: Hexavalent Chromium
Validation Level: EPA Level IV
Laboratory: Eastern Research Group
Sample Delivery Group (SDG): 5021836

Sample Identification

OAM 1(02/16/15)	PAM-1(02/17/15)DUP
OAM 2(02/16/15)	PAM-1D (02/17/15)DUP
PAM-1(02/16/15)	
PAM-1D (02/16/15)	
PAM-2(02/16/15)	
PAM-3(02/16/15)	
PAM-4(02/16/15)	
PAM-21(02/16/15)	
PAM-31(02/16/15)	
OAM 1(02/17/15)	
OAM 2(02/17/15)	
PAM-1(02/17/15)	
PAM-1D (02/17/15)	
PAM-2(02/17/15)	
PAM-3(02/17/15)	
PAM-4(02/17/15)	
PAM-21(02/17/15)	
PAM-31(02/17/15)	
PAM-1(02/16/15)DUP	
PAM-1D (02/16/15)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(02/16/15) and PAM-31(02/17/15) were identified as trip blanks. No hexavalent chromium was found.

Samples PAM-21(02/16/15) and PAM-21(02/17/15) 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(02/16/15) and PAM-1D (02/16/15) and samples PAM-1(02/17/15) and PAM-1D (02/17/15) were identified as field duplicates. No hexavalent chromium was detected in any of the samples with the following exceptions:

Analyte	Concentration (ng/m ³)		RPD (Limits)	Flags	A or P
	PAM-1(02/16/15)	PAM-1D (02/16/15)			
Hexavalent chromium	0.0101	0.0091	10 (≤20)	-	-

Analyte	Concentration (ng/m ³)		RPD (Limits)	Flags	A or P
	PAM-1(02/17/15)	PAM-1D (02/17/15)			
Hexavalent chromium	0.0156	0.0164	5 (≤20)	-	-

**Harbor Point, MD, Hexavalent Chromium Monitoring
Hexavalent Chromium - Data Qualification Summary - SDG 5021836**

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
5021836**

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 5021836**

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

LDC #: 33817A6

VALIDATION COMPLETENESS WORKSHEET

Date: 3/3/15

SDG #: 5021836

Level IV

Page: 1 of 1

Laboratory: Eastern Research Group

Reviewer: JD

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	02/16-17/15
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 = ok by diff
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 (02/16/15)	501836-10	Air	02/16/15
2	OAM 2 (02/16/15)	501836-11	Air	02/16/15
3	PAM-1 (02/16/15)	501836-12	Air	02/16/15
4	PAM-1D (02/16/15)	501836-13	Air	02/16/15
5	PAM-2 (02/16/15)	501836-14	Air	02/16/15
6	PAM-3 (02/16/15)	501836-15	Air	02/16/15
7	PAM-4 (02/16/15)	501836-16	Air	02/16/15
8	PAM-21 (02/16/15)	501836-17	Air	02/16/15
9	PAM-31 (02/16/15)	501836-18	Air	02/16/15
10	OAM 1 (02/17/15)	501836-19	Air	02/17/15
11	OAM 2 (02/17/15)	501836-20	Air	02/17/15
12	PAM-1 (02/17/15)	501836-21	Air	02/17/15
13	PAM-1D (02/17/15)	501836-22	Air	02/17/15
14	PAM-2 (02/17/15)	501836-23	Air	02/17/15
15	PAM-3 (02/17/15)	501836-24	Air	02/17/15
16	PAM-4 (02/17/15)	501836-25	Air	02/17/15
17	PAM-21 (02/17/15)	501836-26	Air	02/17/15

LDC #: 33817A6

VALIDATION COMPLETENESS WORKSHEET

Date: 3/3/15

SDG #: 5021836

Level IV

Page: 2 of 2

Laboratory: Eastern Research Group

Reviewer: SD

2nd Reviewer: A

METHOD: (Analyte) Hexavalent Chromium (ASTM D7614)

	Client ID	Lab ID	Matrix	Date
18	PAM-31 (02/17/15)	501836-27	Air	02/17/15
19	PAM-1 (02/16/15)DUP	501836-12DUP	Air	02/16/15
20	PAM-1D (02/16/15)DUP	501836-13DUP	Air	02/16/15
21	PAM-1 (02/17/15)DUP	501836-21DUP	Air	02/17/15
22	PAM-1D (02/17/15)DUP	501836-22DUP	Air	02/17/15
23				
24				
25				
26				
27				
28				
29				
30				

Notes: _____

Method: Inorganics (EPA Method See Cover)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
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"/>	
II. Calibration				
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 80-110% 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"/>	
III. Blanks				
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"/>	
IV. Matrix spike/Matrix spike duplicates and Duplicates				
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"/>	
Were the MS/MSD or duplicate relative percent differences (RPD) $\leq 20\%$ for <u>ACS</u> 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"/>	
V. Laboratory control samples				
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"/>	
VI. Regional Quality Assurance and Quality Control				
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
VII. Sample Result Verification				
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"/>	
VIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
IX. Field duplicates				
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"/>	
X. Field blanks				
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# 33817A6

VALIDATION FINDINGS WORKSHEET
Field Duplicates

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

Inorganics: Method See Cover

Analyte	Concentration (ng/m3)		RPD (≤20)	Qual.
	3	4		
Hexavalent Chromium	0.0101	0.0091	10	

Analyte	Concentration (ng/m3)		RPD (≤20)	Qual.
	12	13		
Hexavalent Chromium	0.0156	0.0164	5	

\\LDCFILESERVER\Validation\FIELD DUPLICATES\FD_inorganic\33817A6.wpd

LDC #: 33817A0

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 Cr⁺⁶ was recalculated. Calibration date: 2/25/15

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 ²	r or r ²	
Initial calibration	Cr ⁺⁶	s1	0.05	0.0000264	0.99998	0.99998	y
		s2	0.1	0.000063			
		s3	0.2	0.0001385			
		s4	0.5	0.0003709			
		s5	1	0.0007355			
		s6	2	0.0014882			
ICV 13:24 Calibration verification	Cr ⁺⁶	<u>Found</u> 0.5202ng/ml	<u>True</u> 0.5ng/ml		104.0%R	104.0%R	y
CCV 14:24 Calibration verification	Cr ⁺⁶	0.5321ng/ml	0.5ng/ml		106.4%R	106.4%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 #: 3387AV

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 13:54	Laboratory control sample	Cr^{+6}	1.11 ng/ml	1.00 ng/ml	111%R	111%R	Y
N	Matrix spike sample		(SSR-SR)				
DUP 14:54	Duplicate sample	Cr^{+6}	0.0130 ng/ml ³	0.0101 ng/ml ³	25.1%RPD	24.9%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 (7) Cr⁶⁺ reported with a positive detect were recalculated and verified using the following equation:

Concentration = $(A - C_0) / C_1$

Recalculation: $(0.0000149 - (-1.03E-05)) / 0.0007491 = 0.0336 \text{ ng/l}$

$(0.0336 \text{ ng/l}) (10 \text{ ml}) / 21.7 \text{ m}^3 = 0.0155 \text{ ng}$

Handwritten notes:
 $v_f = 10 \text{ ml}$
 $\text{m}^3 = 21.7$
 $(\text{ng/l})(v_f) / \text{m}^3 = \text{ng/m}^3$

#	Sample ID	Analyte	Reported Concentration (ng/m ³)	Calculated Concentration (ng/m ³)	Acceptable (Y/N)
	1	Cr ⁶⁺	0.0110	0.0109	Y*
	2		0.0095	0.0095	Y
	3		0.0101	0.0101	Y
	4		0.0091	0.0090	Y*
	5		0.0144	0.0143	Y*
	6		ND	ND	Y
	7		0.0155	0.0155	
	8		ND	ND	
	9		ND	ND	
	10		0.0182	0.0182	
	11		0.0267	0.0267	
	12		0.0156	0.0156	
	13		0.0164	0.0164	↓
	14		0.0203	0.0204	Y*
	15		0.0176	0.0176	Y
	16		0.0206	0.0206	
	17		ND	ND	
	18		ND	ND	↓

Note: *Rounding



CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc
75 Valley Stream Parkway, Suite 400
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ATTN: Mr. Jeff Boggs

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

FILE #: 3926.00

REPORTED: 03/03/15 15:23

SUBMITTED: 02/18/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

Description: OAM 1	Lab ID: 5021836-10	Sampled: 02/16/15 15:13
Matrix: Air	Sample Volume: 22 m ³	Received: 02/18/15 15:11
Comments: Start Time 2/15/15 14:40		Analysis Date: 02/25/15 16:17

Hexavalent Chromium by SOP ERG-MOR-063

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

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Initials: CR



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FILE #: 3926.00

REPORTED: 03/03/15 15:23

SUBMITTED: 02/18/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

Description: OAM 2	Lab ID: 5021836-11	Sampled: 02/16/15 15:29
Matrix: Air	Sample Volume: 21.98 m ³	Received: 02/18/15 15:11
Comments: Start Time 2/15/15 15:04		Analysis Date: 02/25/15 16:27

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m ³ Air	<u>Flag</u>	<u>MDL</u> ng/m ³ Air
Hexavalent Chromium	1854-02-99	0.0095		0.0038

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FILE #: 3926.00

REPORTED: 03/03/15 15:23

SUBMITTED: 02/18/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-1

Lab ID: 5021836-12

Sampled: 02/16/15 16:07

Matrix: Air

Sample Volume: 21.54 m³

Received: 02/18/15 15:11

Comments: Col 1 Start Time 2/15/15 16:11

Analysis Date: 02/25/15 14:44

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/m³ Air</u>		<u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0101		0.0038

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REPORTED: 03/03/15 15:23

SUBMITTED: 02/18/15

AQS SITE

CODE:
SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-1D

Lab ID: 5021836-13

Sampled: 02/16/15 16:10

Matrix: Air

Sample Volume: 21.54 m³

Received: 02/18/15 15:11

Comments: Col 2 Start Time 2/15/15 16:13

Analysis Date: 02/25/15 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/m³ Air</u>		<u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0091	A-01	0.0038

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Initials: *ER*

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Environmental Resources Management, Inc

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FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 03/03/15 15:23

SUBMITTED: 02/18/15

AQS SITE

CODE:
SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-2

Lab ID: 5021836-14

Sampled: 02/16/15 15:55

Matrix: Air

Sample Volume: 21.6 m³

Received: 02/18/15 15:11

Comments: Start Time 2/15/15 15:55

Analysis Date: 02/25/15 16:57

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/m³ Air</u>		<u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0144		0.0038

MAR 04 2015

Initials: ER



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FILE #: 3926.00

REPORTED: 03/03/15 15:23

SUBMITTED: 02/18/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

Description: PAM-3	Lab ID: 5021836-15	Sampled: 02/16/15 15:47
Matrix: Air	Sample Volume: 21.66 m ³	Received: 02/18/15 15:11
Comments: Start Time 2/15/15 15:43		Analysis Date: 02/25/15 17:07

Hexavalent Chromium by SOP ERG-MOR-063

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

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FILE #: 3926.00

REPORTED: 03/03/15 15:23

SUBMITTED: 02/18/15

AQS SITE

CODE:
SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-4

Lab ID: 5021836-16

Sampled: 02/16/15 15:44

Matrix: Air

Sample Volume: 21.7 m³

Received: 02/18/15 15:11

Comments: Start Time 2/15/15 15:37

Analysis Date: 02/25/15 17:17

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/m³ Air</u>		<u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0155		0.0038

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FILE #: 3926.00

REPORTED: 03/03/15 15:23

SUBMITTED: 02/18/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

Description: PAM-21	Lab ID: 5021836-17	Sampled: 02/16/15 00:00
Matrix: Air	Sample Volume: 21.6 m ³	Received: 02/18/15 15:11
Comments:		Analysis Date: 02/25/15 17:27

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0038

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FILE #: 3926.00

REPORTED: 03/03/15 15:23

SUBMITTED: 02/18/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

Description: PAM-31

Lab ID: 5021836-18

Sampled: 02/16/15 00:00

Matrix: Air

Sample Volume: 21.66 m³

Received: 02/18/15 15:11

Comments:

Analysis Date: 02/25/15 17:37

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/m³ Air</u>		<u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0038

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Initials: *CR*

Eastern Research Group

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FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 03/03/15 15:23

SUBMITTED: 02/18/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: OAM 1

Lab ID: 5021836-19

Sampled: 02/17/15 14:57

Matrix: Air

Sample Volume: 21.31 m³

Received: 02/18/15 15:11

Comments: Start Time 2/16/15 15:16

Analysis Date: 02/25/15 17:46

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u>		<u>MDL</u>
		<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0182		0.0038

MAR 04 2015

Initials: ER



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FILE #: 3926.00

REPORTED: 03/03/15 15:23

SUBMITTED: 02/18/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: OAM 2

Lab ID: 5021836-20

Sampled: 02/17/15 15:17

Matrix: Air

Sample Volume: 21.37 m³

Received: 02/18/15 15:11

Comments: Start Time 2/16/15 15:32

Analysis Date: 02/25/15 17:56

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/m³ Air</u>		<u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0267		0.0038

MAR 04 2015

Initials: *CR*



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FILE #: 3926.00

REPORTED: 03/03/15 15:23

SUBMITTED: 02/18/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

Description: PAM-1	Lab ID: 5021836-21	Sampled: 02/17/15 16:16
Matrix: Air	Sample Volume: 21.69 m ³	Received: 02/18/15 15:11
Comments: Col 1 Start Time 2/16/15 16:10		Analysis Date: 02/25/15 15:24

Hexavalent Chromium by SOP ERG-MOR-063

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

MAR 04 2015

Initials: ER



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FILE #: 3926.00

REPORTED: 03/03/15 15:23

SUBMITTED: 02/18/15

AQS SITE

CODE:

SITE CODE: Honeywell Hex Chrome Study

Description: PAM-1D

Lab ID: 5021836-22

Sampled: 02/17/15 16:19

Matrix: Air

Sample Volume: 21.69 m³

Received: 02/18/15 15:11

Comments: Col 2 Start Time 2/16/15 16:13

Analysis Date: 02/25/15 15:43

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0164		0.0038

MAR 04 2015

Initials: *ER*



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FILE #: 3926.00

REPORTED: 03/03/15 15:23

SUBMITTED: 02/18/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-2

Lab ID: 5021836-23

Sampled: 02/17/15 15:51

Matrix: Air

Sample Volume: 21.48 m³

Received: 02/18/15 15:11

Comments: Start Time 2/16/15 15:58

Analysis Date: 02/25/15 18:06

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u>		<u>MDL</u>
		<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0203		0.0038

MAR 04 2015

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ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 03/03/15 15:23

SUBMITTED: 02/18/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-3

Lab ID: 5021836-24

Sampled: 02/17/15 15:42

Matrix: Air

Sample Volume: 21.49 m³

Received: 02/18/15 15:11

Comments: Start Time 2/16/15 15:50

Analysis Date: 02/25/15 18:16

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/m³ Air</u>		<u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0176		0.0038

MAR 04 2015

Initials: ER



CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc

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ATTN: Mr. Jeff Boggs

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FILE #: 3926.00

REPORTED: 03/03/15 15:23

SUBMITTED: 02/18/15

AQS SITE

CODE:
SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-4

Lab ID: 5021836-25

Sampled: 02/17/15 15:35

Matrix: Air

Sample Volume: 21.42 m³

Received: 02/18/15 15:11

Comments: Start Time 2/16/15 15:46

Analysis Date: 02/25/15 18:26

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/m³ Air</u>		<u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0206		0.0038

MAR 04 2015

Initials: *CR*



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ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 03/03/15 15:23

SUBMITTED: 02/18/15

AQS SITE

CODE:
SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-21

Lab ID: 5021836-26

Sampled: 02/17/15 00:00

Matrix: Air

Sample Volume: 21.48 m³

Received: 02/18/15 15:11

Comments:

Analysis Date: 02/25/15 18:56

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/m³ Air</u>		<u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0038

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Initials: *CR*



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FILE #: 3926.00

REPORTED: 03/03/15 15:23

SUBMITTED: 02/18/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

Description: PAM-31	Lab ID: 5021836-27	Sampled: 02/17/15 00:00
Matrix: Air	Sample Volume: 21.49 m ³	Received: 02/18/15 15:11
Comments:		Analysis Date: 02/25/15 19:06

Hexavalent Chromium by SOP ERG-MOR-063

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

MAR 04 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

March 5, 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 March 4, 2015. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #33827:

SDG

Fraction

5021917/5022018/5022541 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: February 18 through February 23, 2015
LDC Report Date: March 5, 2015
Matrix: Air
Parameters: Hexavalent Chromium
Validation Level: EPA Level IV
Laboratory: Eastern Research Group
Sample Delivery Group (SDG): 5021917/5022018/5022547

Sample Identification

OAM 1 (02/18/15)	PAM-3 (02/21/15)
OAM 2 (02/18/15)	PAM-4 (02/21/15)
PAM-1 (02/18/15)	PAM-21 (02/21/15)
PAM-1D (02/18/15)	PAM-31 (02/21/15)
PAM-2 (02/18/15)	OAM 1 (02/23/15)
PAM-3 (02/18/15)	OAM 2 (02/23/15)
PAM-4 (02/18/15)	PAM-1 (02/23/15)
PAM-21 (02/18/15)	PAM-1D (02/23/15)
PAM-31 (02/18/15)	PAM-2 (02/23/15)
OAM 1 (02/19/15)	PAM-3 (02/23/15)
OAM 2 (02/19/15)	PAM-4 (02/23/15)
PAM-1 (02/19/15)	PAM-21 (02/23/15)
PAM-1D (02/19/15)	PAM-31 (02/23/15)
PAM-3 (02/19/15)	PAM-1 (02/18/15)DUP
PAM-4 (02/19/15)	PAM-1D (02/18/15)DUP
PAM-21 (02/19/15)	PAM-1 (02/19/15)DUP
PAM-31 (02/19/15)	PAM-1D (02/19/15)DUP
OAM 1 (02/21/15)	PAM-1 (02/21/15)DUP
OAM2 (02/21/15)	PAM-1D (02/21/15)DUP
PAM-1 (02/21/15)	PAM-1 (02/23/15)DUP
PAM-1D (02/21/15)	PAM-1D (02/23/15)DUP
PAM-2 (02/21/15)	

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

Introduction

This data review covers 43 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 (02/18/15), PAM-31 (02/19/15), PAM-31 (02/21/15), and PAM-31 (02/23/15) were identified as trip blanks. No hexavalent chromium was found.

Samples PAM-21 (02/18/15), PAM-21 (02/19/15), PAM-21 (02/21/15), and PAM-21 (02/23/15) 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 (02/18/15) and PAM-1D (02/18/15), samples PAM-1 (02/19/15) and PAM-1D (02/19/15), samples PAM-1 (02/21/15) and PAM-1D (02/21/15), and samples PAM-1 (02/23/15) and PAM-1D (02/23/15) were identified as field duplicates. No hexavalent chromium was detected in any of the samples with the following exceptions:

Analyte	Concentration (ng/m ³)		RPD (Limits)	Flags	A or P
	PAM-1 (02/18/15)	PAM-1D (02/18/15)			
Hexavalent chromium	0.0252	0.0307	20 (≤20)	-	-

Analyte	Concentration (ng/m ³)		RPD (Limits)	Flags	A or P
	PAM-1 (02/19/15)	PAM-1D (02/19/15)			
Hexavalent chromium	0.0173	0.0149	15 (≤20)	-	-

Analyte	Concentration (ng/m ³)		RPD (Limits)	Flags	A or P
	PAM-1 (02/21/15)	PAM-1D (02/21/15)			
Hexavalent chromium	0.0199	0.0238	18 (≤20)	-	-

Analyte	Concentration (ng/m ³)		RPD (Limits)	Flags	A or P
	PAM-1 (02/23/15)	PAM-1D (02/23/15)			
Hexavalent chromium	0.0218	0.0210	4 (≤20)	-	-

**Harbor Point, MD, Hexavalent Chromium Monitoring
Hexavalent Chromium - Data Qualification Summary - SDG
5021917/5022018/5022547**

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
5021917/5022018/5022547**

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
5021917/5022018/5022547**

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

LDC #: 33827A6

VALIDATION COMPLETENESS WORKSHEET

Date: 3/5/15

SDG #: 5021917/5022018/5022547

Level IV

Page: 1 of 2

Laboratory: Eastern Research Group

Reviewer: JSD

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	2/18-23/15
II.	Initial calibration	A	
III.	Calibration verification	A	
IV.	Laboratory Blanks	A	
V.	Field blanks	ND	FB=(8)(17)(25)(34) TB=(9)(18)(26)(35)
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) (20,21) (29,30)
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 (02/18/15)	5021917-01	Air	02/18/15
2	OAM 2 (02/18/15)	5021917-02	Air	02/18/15
3	PAM-1 (02/18/15)	5021917-03	Air	02/18/15
4	PAM-1D (02/18/15)	5021917-04	Air	02/18/15
5	PAM-2 (02/18/15)	5021917-05	Air	02/18/15
6	PAM-3 (02/18/15)	5021917-06	Air	02/18/15
7	PAM-4 (02/18/15)	5021917-07	Air	02/18/15
8	PAM-21 (02/18/15)	5021917-08	Air	02/18/15
9	PAM-31 (02/18/15)	5021917-09	Air	02/18/15
10	OAM 1 (02/19/15)	5022018-01	Air	02/19/15
11	OAM 2 (02/19/15)	5022018-02	Air	02/19/15
12	PAM-1 (02/19/15)	5022018-03	Air	02/19/15
13	PAM-1D (02/19/15)	5022018-04	Air	02/19/15
14	PAM-2 (02/19/15)	5022018-05	Air	02/19/15
15	PAM-3 (02/19/15)	5022018-06	Air	02/19/15
16	PAM-4 (02/19/15)	5022018-07	Air	02/19/15
17	PAM-21 (02/19/15)	5022018-08	Air	02/19/15

LDC #: 33827A6

VALIDATION COMPLETENESS WORKSHEET

Date: 3/5/15

SDG #: 5021917/5022018/5022547

Level IV

Page: 2 of 2

Laboratory: Eastern Research Group

Reviewer: SD

2nd Reviewer: [Signature]

METHOD: (Analyte) Hexavalent Chromium (ASTM D7614)

	Client ID	Lab ID	Matrix	Date
18	PAM-31 (02/19/15)	5022018-09	Air	02/19/15
19	OAM 1 (02/21/15)	5022547-01	Air	02/21/15
20	PAM-1 (02/21/15)	5022547-03	Air	02/21/15
21	PAM-1D (02/21/15)	5022547-04	Air	02/21/15
22	PAM-2 (02/21/15)	5022547-05	Air	02/21/15
23	PAM-3 (02/21/15)	5022547-06	Air	02/21/15
24	PAM-4 (02/21/15)	5022547-07	Air	02/21/15
25	PAM-21 (02/21/15)	5022547-08	Air	02/21/15
26	PAM-31 (02/21/15)	5022547-09	Air	02/21/15
27	OAM 1 (02/23/15)	5022547-10	Air	02/23/15
28	OAM 2 (02/23/15)	5022547-11	Air	02/23/15
29	PAM-1 (02/23/15)	5022547-12	Air	02/23/15
30	PAM-1D (02/23/15)	5022547-13	Air	02/23/15
31	PAM-2 (02/23/15)	5022547-14	Air	02/23/15
32	PAM-3 (02/23/15)	5022547-15	Air	02/23/15
33	PAM-4 (02/23/15)	5022547-16	Air	02/23/15
34	PAM-21 (02/23/15)	5022547-17	Air	02/23/15
35	PAM-31 (02/23/15)	5022547-18	Air	02/23/15
36	PAM-1 (02/18/15)DUP	5021917-03DUP	Air	02/18/15
37	PAM-1D (02/18/15)DUP	5021917-04DUP	Air	02/18/15
38	PAM-1 (02/19/15)DUP	5022018-03DUP	Air	02/19/15
39	PAM-1D (02/19/15)DUP	5022018-04DUP	Air	02/19/15
40	PAM-1 (02/21/15)DUP	5022547-03DUP	Air	02/21/15
41	PAM-1D (02/21/15)DUP	5022547-04DUP	Air	02/21/15
42	PAM-1 (02/23/15)DUP	5022547-12DUP	Air	02/23/15
43	PAM-1D (02/23/15)DUP	5022547-13DUP	Air	02/23/15
44				
45				
46				
47				
48				

Notes:

Method: Inorganics (EPA Method See Lower)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	/			
Cooler temperature criteria was met.	/			
II. Calibration				
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 90-110% QC limits? <u>85-115</u>	/			
Were titrant checks performed as required? (Level IV only)			/	
Were balance checks performed as required? (Level IV only)			/	
III. Blanks				
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.		/		
IV. Matrix spike/Matrix spike duplicates and Duplicates				
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) ≤ 20% for waters 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.	/			
V. Laboratory control samples				
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?	/			
VI. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?			/	
Were the performance evaluation (PE) samples within the acceptance limits?			/	

Air
30

LDC #: 33827A0

VALIDATION FINDINGS CHECKLIST

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

Validation Area	Yes	No	NA	Findings/Comments
VII. Sample Result Verification				
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	/			
Were detection limits < RL?	/			
VIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	/			
IX. Field duplicates				
Field duplicate pairs were identified in this SDG.	/			
Target analytes were detected in the field duplicates.	/			
X. Field blanks				
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	0.0252	0.0307	20	

Analyte	Concentration (ng/m3)		RPD (≤20)	Qual.
	12	13		
Hexavalent Chromium	0.0173	0.0149	15	

Analyte	Concentration (ng/m3)		RPD (≤20)	Qual.
	20	21		
Hexavalent Chromium	0.0199	0.0238	18	

Analyte	Concentration (ng/m3)		RPD (≤20)	Qual.
	29	30		
Hexavalent Chromium	0.0218	0.0210	4	

LDC #: 33821A

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

Page: 1 of 1

Reviewer: JD

2nd Reviewer: g

Method: Inorganics, Method See Cover

The correlation coefficient (r) for the calibration of Cr⁺⁶ was recalculated. Calibration date: 03/02/15

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 ²	r or r ²	
Initial calibration	Cr ⁺⁶	s1	0.05	0.0000306	0.99999	0.99999	y
		s2	0.1	0.0000648			
		s3	0.2	0.0001397			
		s4	0.5	0.0003628			
		s5	1	0.0007412			
		s6	2	0.0014969			
ICV 12:01 Calibration verification	Cr ⁺⁶	<u>Found</u> 0.5397 ng/ml	<u>True</u> 0.5 ng/ml		107.9%R	107.9%R	↓
CCV 13:01 Calibration verification	Cr ⁺⁶	0.517 ng/ml	0.5 ng/ml		103.5%R	103.5%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 #: 33827AC6

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 12:31	Laboratory control sample	Cr ⁺⁶	1.078 ng/ml	1.00 ng/ml	108%R	108%R	Y
N	Matrix spike sample		(SSR-SR)				
DUP 13:32	Duplicate sample	Cr ⁺⁶	0.0254 ng/l ³	0.0252 ng/l ³	0.71%RPD	0.922%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 (7) Cr⁺⁶ reported with a positive detect were recalculated and verified using the following equation:

Concentration = $(A - C_0) / C_1$ $uf = 10ml$ $m^3 = 21.56$ Recalculation: $(0.0000335 - (-1.05E-05)) / 0.000753 = 0.0584mg$

$A = 0.0000335$ $C_0 = -1.05E-05$ $C_1 = 0.000753$ $(0.0584mg/ml)(10ml) / 21.56m^3 = 0.0271mg/m^3$

$(ng/ml)(uf) / m^3 = ng/m^3$

#	Sample ID	Analyte	Reported Concentration (ng/m ³)	Calculated Concentration (ng/m ³)	Acceptable (Y/N)
	1	Cr ⁺⁶	ND	ND	Y
	2		0.0255	0.0256	Y*
	3		0.0252	0.0252	Y
	4		0.0307	0.0307	↓
	5		0.0307	0.0307	↓
	6		0.0280	0.0281	Y*
	7		0.0271	0.0271	Y
	8		ND	ND	↓
	9		ND	ND	↓
	10		0.0127	0.0127	↓
	11		0.0131	0.0131	↓
	12		0.0173	0.0173	↓
	13		0.0149	0.0149	↓
	14		0.0146	0.0146	Y* 30
	15		0.0131	0.0132	Y*
	16		0.0167	0.0168	Y*
	17		ND	ND	Y
	18		ND	ND	↓
	19		0.0216	0.0217	Y*
	20		0.0199	0.0199	Y

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: 03/04/15 14:45

SUBMITTED: 02/19/15 to 02/25/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

Description: OAM 1	Lab ID: 5021917-01	Sampled: 02/18/15 14:58
Matrix: Air	Sample Volume: 21.56 m ³	Received: 02/19/15 14:06
Comments: Start Time 2/17/15 15:01		Analysis Date: 03/02/15 14:42

Hexavalent Chromium by SOP ERG-MOR-063

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

MAR 05 2015

Initials: CR

Eastern Research Group

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REPORTED: 03/04/15 14:45

SUBMITTED: 02/19/15 to 02/25/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

Description: OAM 2	Lab ID: 5021917-02	Sampled: 02/18/15 15:17
Matrix: Air	Sample Volume: 21.56 m ³	Received: 02/19/15 14:06
Comments: Start Time 2/17/15 15:20		Analysis Date: 03/02/15 14:52

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0255		0.0038

MAR 05 2015

Initials: *CR*

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REPORTED: 03/04/15 14:45

SUBMITTED: 02/19/15 to 02/25/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

Description: PAM-1	Lab ID: 5021917-03	Sampled: 02/18/15 16:20
Matrix: Air	Sample Volume: 21.42 m ³	Received: 02/19/15 14:06
Comments: Col 1 Start Time 2/17/15 16:20		Analysis Date: 03/02/15 13:22

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m ³ Air	<u>Flag</u>	<u>MDL</u> ng/m ³ Air
Hexavalent Chromium	1854-02-99	0.0252		0.0038

MAR 05 2015

Initials: ER

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REPORTED: 03/04/15 14:45

SUBMITTED: 02/19/15 to 02/25/15

AQS SITE

CODE: Honeywell Hex Chrome Study
SITE CODE:

Description: PAM-1D	Lab ID: 5021917-04	Sampled: 02/18/15 16:11
Matrix: Air	Sample Volume: 21.43 m ³	Received: 02/19/15 14:06
Comments: Col 2 Start Time 2/17/15 16:22		Analysis Date: 03/02/15 13:42

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m ³ Air	<u>Flag</u>	<u>MDL</u> ng/m ³ Air
Hexavalent Chromium	1854-02-99	0.0307		0.0038

MAR 05 2015

Initials: *CR*

Eastern Research Group

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FILE #: 3926.00

REPORTED: 03/04/15 14:45

SUBMITTED: 02/19/15 to 02/25/15

AQS SITE

CODE: Honeywell Hex Chrome Study
SITE CODE:

Description: PAM-2	Lab ID: 5021917-05	Sampled: 02/18/15 15:53
Matrix: Air	Sample Volume: 21.59 m ³	Received: 02/19/15 14:06
Comments: Start Time 2/17/15 15:54		Analysis Date: 03/02/15 15:22

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m ³ Air	<u>Flag</u>	<u>MDL</u> ng/m ³ Air
Hexavalent Chromium	1854-02-99	0.0307		0.0038

MAR 05 2015

Initials: *ER*

Eastern Research Group

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FILE #: 3926.00

REPORTED: 03/04/15 14:45

SUBMITTED: 02/19/15 to 02/25/15

AQS SITE

CODE: Honeywell Hex Chrome Study
SITE CODE:

Description: PAM-3	Lab ID: 5021917-06	Sampled: 02/18/15 15:47
Matrix: Air	Sample Volume: 21.62 m ³	Received: 02/19/15 14:06
Comments: Start Time 2/17/15 15:45		Analysis Date: 03/02/15 15:32

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0280		0.0038

MAR 05 2015

Initials: *CR*

Eastern Research Group

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REPORTED: 03/04/15 14:45

SUBMITTED: 02/19/15 to 02/25/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-4	Lab ID: 5021917-07	Sampled: 02/18/15 15:35
Matrix: Air	Sample Volume: 21.56 m ³	Received: 02/19/15 14:06
Comments: Start Time 2/17/15 15:37		Analysis Date: 03/02/15 15:42

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0271		0.0038

MAR 05 2015

Initials: CR

Eastern Research Group

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FILE #: 3926.00

REPORTED: 03/04/15 14:45

SUBMITTED: 02/19/15 to 02/25/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-21

Lab ID: 5021917-08

Sampled: 02/18/15 00:00

Matrix: Air

Sample Volume: 21.59 m³

Received: 02/19/15 14:06

Comments:

Analysis Date: 03/02/15 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/m³ Air</u>		<u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0038

MAR 05 2015

Initials: ER

Eastern Research Group

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Environmental Resources Management, Inc

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FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 03/04/15 14:45

SUBMITTED: 02/19/15 to 02/25/15

AQS SITE

CODE: Honeywell Hex Chrome Study
SITE CODE:

Description: PAM-31	Lab ID: 5021917-09	Sampled: 02/18/15 00:00
Matrix: Air	Sample Volume: 21.62 m ³	Received: 02/19/15 14:06
Comments:		Analysis Date: 03/02/15 16:02

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0038

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Initials: *CR*

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CERTIFICATE OF ANALYSIS

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FILE #: 3926.00

REPORTED: 03/04/15 14:45

SUBMITTED: 02/19/15 to 02/25/15

AQS SITE

CODE:
SITE CODE:

Honeywell Hex Chrome Study

Description: OAM 1	Lab ID: 5022018-01	Sampled: 02/19/15 15:01
Matrix: Air	Sample Volume: 21.41 m ³	Received: 02/20/15 14:58
Comments: Start Time 2/18/15 15:01		Analysis Date: 03/02/15 16:11

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m ³ Air	<u>Flag</u>	<u>MDL</u> ng/m ³ Air
Hexavalent Chromium	1854-02-99	0.0127		0.0038

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REPORTED: 03/04/15 14:45

SUBMITTED: 02/19/15 to 02/25/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: OAM 2	Lab ID: 5022018-02	Sampled: 02/19/15 15:08
Matrix: Air	Sample Volume: 21.43 m ³	Received: 02/20/15 14:58
Comments: Start Time 2/18/15 15:19		Analysis Date: 03/02/15 16:21

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m ³ Air	<u>Flag</u>	<u>MDL</u> ng/m ³ Air
Hexavalent Chromium	1854-02-99	0.0131		0.0038

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REPORTED: 03/04/15 14:45

SUBMITTED: 02/19/15 to 02/25/15

AQS SITE

CODE: Honeywell Hex Chrome Study
SITE CODE:

Description: PAM-1	Lab ID: 5022018-03	Sampled: 02/19/15 16:14
Matrix: Air	Sample Volume: 21.62 m ³	Received: 02/20/15 14:58
Comments: Col 1 Start Time 2/18/15 16:13		Analysis Date: 03/02/15 14:02

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m ³ Air	<u>Flag</u>	<u>MDL</u> ng/m ³ Air
Hexavalent Chromium	1854-02-99	0.0173		0.0038

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REPORTED: 03/04/15 14:45

SUBMITTED: 02/19/15 to 02/25/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-1D	Lab ID: 5022018-04	Sampled: 02/19/15 16:20
Matrix: Air	Sample Volume: 21.69 m ³	Received: 02/20/15 14:58
Comments: Col 2 Start Time 2/18/15 16:14		Analysis Date: 03/02/15 14:22

Hexavalent Chromium by SOP ERG-MOR-063

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

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REPORTED: 03/04/15 14:45

SUBMITTED: 02/19/15 to 02/25/15

AQS SITE

CODE: Honeywell Hex Chrome Study
SITE CODE:

Description: PAM-2	Lab ID: 5022018-05	Sampled: 02/19/15 16:01
Matrix: Air	Sample Volume: 21.67 m ³	Received: 02/20/15 14:58
Comments: Start Time 2/18/15 15:57		Analysis Date: 03/02/15 16:31

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m ³ Air	<u>Flag</u>	<u>MDL</u> ng/m ³ Air
Hexavalent Chromium	1854-02-99	0.0146		0.0038

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REPORTED: 03/04/15 14:45

SUBMITTED: 02/19/15 to 02/25/15

AQS SITE

CODE: Honeywell Hex Chrome Study
SITE CODE:

Description: PAM-3	Lab ID: 5022018-06	Sampled: 02/19/15 15:48
Matrix: Air	Sample Volume: 21.58 m ³	Received: 02/20/15 14:58
Comments: Start Time 2/18/15 15:50		Analysis Date: 03/02/15 16:41

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0131		0.0038

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REPORTED: 03/04/15 14:45

SUBMITTED: 02/19/15 to 02/25/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

Description: PAM-4	Lab ID: 5022018-07	Sampled: 02/19/15 15:28
Matrix: Air	Sample Volume: 21.46 m ³	Received: 02/20/15 14:58
Comments: Start Time 2/18/15 15:37		Analysis Date: 03/02/15 16:51

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m ³ Air	<u>Flag</u>	<u>MDL</u> ng/m ³ Air
Hexavalent Chromium	1854-02-99	0.0167		0.0038

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REPORTED: 03/04/15 14:45

SUBMITTED: 02/19/15 to 02/25/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-21

Lab ID: 5022018-08

Sampled: 02/19/15 00:00

Matrix: Air

Sample Volume: 21.67 m³

Received: 02/20/15 14:58

Comments:

Analysis Date: 03/02/15 17:21

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0038

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REPORTED: 03/04/15 14:45

SUBMITTED: 02/19/15 to 02/25/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-31

Lab ID: 5022018-09

Sampled: 02/19/15 00:00

Matrix: Air

Sample Volume: 21.58 m³

Received: 02/20/15 14:58

Comments:

Analysis Date: 03/02/15 17:31

Hexavalent Chromium by SOP ERG-MOR-063

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

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FILE #: 3926.00

REPORTED: 03/04/15 14:45

SUBMITTED: 02/19/15 to 02/25/15

AQS SITE

CODE: Honeywell Hex Chrome Study
SITE CODE:

Description: OAM 1	Lab ID: 5022547-01	Sampled: 02/21/15 15:20
Matrix: Air	Sample Volume: 21.9 m ³	Received: 02/25/15 10:59
Comments: Start Time 2/20/15 14:59		Analysis Date: 03/03/15 13:58

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m ³ Air	<u>Flag</u>	<u>MDL</u> ng/m ³ Air
Hexavalent Chromium	1854-02-99	0.0216		0.0038

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REPORTED: 03/04/15 14:45

SUBMITTED: 02/19/15 to 02/25/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

Description: PAM-1	Lab ID: 5022547-03	Sampled: 02/21/15 16:42
Matrix: Air	Sample Volume: 21.48 m ³	Received: 02/25/15 10:59
Comments: Col 1 Start Time 2/20/15 16:43		Analysis Date: 03/03/15 12:33

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m ³ Air	<u>Flag</u>	<u>MDL</u> ng/m ³ Air
Hexavalent Chromium	1854-02-99	0.0199		0.0038

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FILE #: 3926.00

REPORTED: 03/04/15 14:45

SUBMITTED: 02/19/15 to 02/25/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

Description: PAM-1D	Lab ID: 5022547-04	Sampled: 02/21/15 16:46
Matrix: Air	Sample Volume: 21.61 m ³	Received: 02/25/15 10:59
Comments: Col 2 Start Time 2/20/15 16:46		Analysis Date: 03/03/15 12:53

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m ³ Air	<u>Flag</u>	<u>MDL</u> ng/m ³ Air
Hexavalent Chromium	1854-02-99	0.0238		0.0038

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FILE #: 3926.00

REPORTED: 03/04/15 14:45

SUBMITTED: 02/19/15 to 02/25/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

Description: PAM-2	Lab ID: 5022547-05	Sampled: 02/21/15 16:18
Matrix: Air	Sample Volume: 21.48 m ³	Received: 02/25/15 10:59
Comments: Start Time 2/20/15 16:26		Analysis Date: 03/03/15 14:08

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0193		0.0038

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FILE #: 3926.00

REPORTED: 03/04/15 14:45

SUBMITTED: 02/19/15 to 02/25/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

Description: PAM-3	Lab ID: 5022547-06	Sampled: 02/21/15 16:06
Matrix: Air	Sample Volume: 21.42 m ³	Received: 02/25/15 10:59
Comments: Start Time 2/20/15 16:18		Analysis Date: 03/03/15 14:37

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0194		0.0038

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FILE #: 3926.00

REPORTED: 03/04/15 14:45

SUBMITTED: 02/19/15 to 02/25/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-4	Lab ID: 5022547-07	Sampled: 02/21/15 15:53
Matrix: Air	Sample Volume: 21.77 m ³	Received: 02/25/15 10:59
Comments: Start Time 2/20/15 15:42		Analysis Date: 03/03/15 14:47

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m ³ Air	<u>Flag</u>	<u>MDL</u> ng/m ³ Air
Hexavalent Chromium	1854-02-99	0.0265		0.0038

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SUBMITTED: 02/19/15 to 02/25/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

Description: PAM-21

Lab ID: 5022547-08

Sampled: 02/21/15 00:00

Matrix: Air

Sample Volume: 21.48 m³

Received: 02/25/15 10:59

Comments:

Analysis Date: 03/03/15 14:57

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0038

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REPORTED: 03/04/15 14:45

SUBMITTED: 02/19/15 to 02/25/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-31

Lab ID: 5022547-09

Sampled: 02/21/15 00:00

Matrix: Air

Sample Volume: 21.42 m³

Received: 02/25/15 10:59

Comments:

Analysis Date: 03/03/15 15:07

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0038

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REPORTED: 03/04/15 14:45

SUBMITTED: 02/19/15 to 02/25/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: OAM 1	Lab ID: 5022547-10	Sampled: 02/23/15 14:54
Matrix: Air	Sample Volume: 21.54 m ³	Received: 02/25/15 10:59
Comments: Start Time 2/22/15 14:59		Analysis Date: 03/03/15 15:17

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m ³ Air	<u>Flag</u>	<u>MDL</u> ng/m ³ Air
Hexavalent Chromium	1854-02-99	0.0282		0.0038

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REPORTED: 03/04/15 14:45

SUBMITTED: 02/19/15 to 02/25/15

AQS SITE

CODE: Honeywell Hex Chrome Study
SITE CODE:

Description: OAM 2	Lab ID: 5022547-11	Sampled: 02/23/15 15:15
Matrix: Air	Sample Volume: 21.31 m ³	Received: 02/25/15 10:59
Comments: Start Time 2/22/15 15:30		Analysis Date: 03/03/15 15:27

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0290		0.0038

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REPORTED: 03/04/15 14:45

SUBMITTED: 02/19/15 to 02/25/15

AQS SITE

CODE:
SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-1

Lab ID: 5022547-12

Sampled: 02/23/15 16:29

Matrix: Air

Sample Volume: 21.17 m³

Received: 02/25/15 10:59

Comments: Col 1 Start Time 2/22/15 16:57

Analysis Date: 03/03/15 13:13

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/m³ Air</u>		<u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0218		0.0038

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REPORTED: 03/04/15 14:45

SUBMITTED: 02/19/15 to 02/25/15

AQS SITE

CODE: Honeywell Hex Chrome Study
SITE CODE:

Description: PAM-1D

Lab ID: 5022547-13

Sampled: 02/23/15 16:31

Matrix: Air

Sample Volume: 21.01 m³

Received: 02/25/15 10:59

Comments: Col 2 Start Time 2/22/15 17:10

Analysis Date: 03/03/15 13:33

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/m³ Air</u>		<u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0210		0.0038

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REPORTED: 03/04/15 14:45

SUBMITTED: 02/19/15 to 02/25/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-2

Lab ID: 5022547-14

Sampled: 02/23/15 16:11

Matrix: Air

Sample Volume: 21.14 m³

Received: 02/25/15 10:59

Comments: Start Time 2/22/15 16:42

Analysis Date: 03/03/15 15:37

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/m³ Air</u>		<u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0334		0.0038

MAR 05 2015

Initials: *CR*

Eastern Research Group

The results in this report apply only to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



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: 03/04/15 14:45

SUBMITTED: 02/19/15 to 02/25/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-3

Lab ID: 5022547-15

Sampled: 02/23/15 15:53

Matrix: Air

Sample Volume: 21.04 m³

Received: 02/25/15 10:59

Comments: Start Time 2/22/15 16:30

Analysis Date: 03/03/15 15:47

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0243		0.0038

MAR 05 2015

Initials: ER

Eastern Research Group

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Environmental Resources Management, Inc

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Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 03/04/15 14:45

SUBMITTED: 02/19/15 to 02/25/15

AQS SITE

CODE:
SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-4

Lab ID: 5022547-16

Sampled: 02/23/15 15:41

Matrix: Air

Sample Volume: 21.03 m³

Received: 02/25/15 10:59

Comments: Start Time 2/22/15 16:19

Analysis Date: 03/03/15 15:56

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/m³ Air</u>		<u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0261		0.0038

MAR 05 2015

Initials: *CR*

Eastern Research Group

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Malvern, PA 19355

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PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 03/04/15 14:45

SUBMITTED: 02/19/15 to 02/25/15

AQS SITE

CODE:
SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-21

Lab ID: 5022547-17

Sampled: 02/23/15 00:00

Matrix: Air

Sample Volume: 21.14 m³

Received: 02/25/15 10:59

Comments:

Analysis Date: 03/03/15 16:06

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0038

MAR 05 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: 03/04/15 14:45

SUBMITTED: 02/19/15 to 02/25/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

Description: PAM-31

Lab ID: 5022547-18

Sampled: 02/23/15 00:00

Matrix: Air

Sample Volume: 21.04 m³

Received: 02/25/15 10:59

Comments:

Analysis Date: 03/03/15 16:36

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/m³ Air</u>		<u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0038

MAR 05 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

March 17, 2015

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

Dear Mr. Boggs,

Enclosed are the final validation reports for the fraction listed below. These SDGs were received on March 16, 2015. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #33882:

SDG

Fraction

5022547/5022727/5030213, 5031028/5031123 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

Level IV

LDC #33882 (ERM - Morrisville, NC / Harbor Point, MD, Hexavalent Chromium Monitoring)

LDC	SDG#	DATE REC'D	(3) DATE DUE	Cr(VI) (D7614)																																				
				A	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S			
Matrix: Air/Water/Soil				A	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	
A	5022547/ 5022727/5030213	03/16/15	03/23/15	36	0																																			
B	5031028/5031123	03/16/15	03/23/15	18	0																																			
Total				54	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	54

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: Harbor Point, MD, Hexavalent Chromium Monitoring
Collection Date: February 20 through February 26, 2014
LDC Report Date: March 16, 2015
Matrix: Air
Parameters: Hexavalent Chromium
Validation Level: EPA Level IV
Laboratory: Eastern Research Group
Sample Delivery Group (SDG): 5022547/5022727/5030213

Sample Identification

OAM 1 (02/20/15)	PAM-1 (02/25/15)	PAM-1 (02/25/15)DUP
OAM 2 (02/20/15)	PAM-1D (02/25/15)	PAM-1D (02/25/15)DUP
PAM-1 (02/20/15)	PAM-2 (02/25/15)	PAM-1 (02/26/15)DUP
PAM-1D (02/20/15)	PAM-3 (02/25/15)	PAM-1D (02/26/15)DUP
PAM-2 (02/20/15)	PAM-4 (02/25/15)	
PAM-3 (02/20/15)	PAM-21 (02/25/15)	
PAM-4 (02/20/15)	PAM-31 (02/25/15)	
PAM-21 (02/20/15)	OAM 1 (02/26/15)	
PAM-31 (02/20/15)	OAM 2 (02/26/15)	
OAM 1 (02/24/15)	PAM-1 (02/26/15)	
OAM 2 (02/24/15)	PAM-1D (02/26/15)	
PAM-1 (02/24/15)	PAM-2 (02/26/15)	
PAM-1D (02/24/15)	PAM-3 (02/26/15)	
PAM-2 (02/24/15)	PAM-4 (02/26/15)	
PAM-3 (02/24/15)	PAM-21 (02/26/15)	
PAM-4 (02/24/15)	PAM-31 (02/26/15)	
PAM-21 (02/24/15)	PAM-1 (02/20/15)DUP	
PAM-31 (02/24/15)	PAM-1D (02/20/15)DUP	
OAM 1 (02/25/15)	PAM-1 (02/24/15)DUP	
OAM 2 (02/25/15)	PAM-1D (02/24/15)DUP	

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

Introduction

This data review covers 44 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(02/20/15), PAM-31(02/24/15), PAM-31(02/25/15), and PAM-31(02/26/15) were identified as trip blanks. No hexavalent chromium was found.

Samples PAM-21(02/20/15), PAM-21(02/24/15), PAM-21(02/25/15), and PAM-21(02/26/15) 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(02/20/15) and PAM-1D(02/20/15), samples PAM-1(02/24/15) and PAM-1D(02/24/15), samples PAM-1(02/25/15) and PAM-1D(02/25/15), and PAM-1(02/26/15) and PAM-1D(02/26/15) were identified as field duplicates. No hexavalent chromium was detected in any of the samples with the following exceptions:

Analyte	Concentration (ng/m ³)		RPD (Limits)	Flags	A or P
	PAM-1(02/20/15)	PAM-1D(02/20/15)			
Hexavalent chromium	0.0170	0.0146	15 (≤20)	-	-

Analyte	Concentration (ng/m ³)		RPD (Limits)	Flags	A or P
	PAM-1(02/24/15)	PAM-1D(02/24/15)			
Hexavalent chromium	0.0117	0.0132	12 (≤20)	-	-

Analyte	Concentration (ng/m ³)		RPD (Limits)	Flags	A or P
	PAM-1(02/25/15)	PAM-1D(02/25/15)			
Hexavalent chromium	0.0386	0.0352	9 (≤20)	-	-

Analyte	Concentration (ng/m ³)		RPD (Limits)	Flags	A or P
	PAM-1(02/26/15)	PAM-1D(09/30/14)			
Hexavalent chromium	0.0361	0.0437	19 (≤20)	-	-

**Harbor Point, MD, Hexavalent Chromium Monitoring
Hexavalent Chromium - Data Qualification Summary - SDG
5022547/5022727/5030213**

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
5022547/5022727/5030213**

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
5022547/5022727/5030213**

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

LDC #: 33882A6

VALIDATION COMPLETENESS WORKSHEET

Date: 3/10/15

SDG #: 5022547/5022727/5030213

Level IV

Page: 1 of 2

Laboratory: Eastern Research Group

Reviewer: SD

2nd Reviewer: **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	02/20/15 - 02/26/15
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Laboratory Blanks	A	
V	Field blanks	ND	FB=(8)(17)(26)(35) TB=(9)(18)(27)(36)
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) (30,31)
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 (02/20/15)	5022547-19	Air	02/20/15
2	OAM 2 (02/20/15)	5022547-20	Air	02/20/15
3	PAM-1 (02/20/15)	5022547-21	Air	02/20/15
4	PAM-1D (02/20/15)	5022547-22	Air	02/20/15
5	PAM-2 (02/20/15)	5022547-23	Air	02/20/15
6	PAM-3 (02/20/15)	5022547-24	Air	02/20/15
7	PAM-4 (02/20/15)	5022547-25	Air	02/20/15
8	PAM-21 (02/20/15)	5022547-26	Air	02/20/15
9	PAM-31 (02/20/15)	5022547-27	Air	02/20/15
10	OAM 1 (02/24/15)	5022547-28	Air	02/24/15
11	OAM 2 (02/24/15)	5022547-29	Air	02/24/15
12	PAM-1 (02/24/15)	5022547-30	Air	02/24/15
13	PAM-1D (02/24/15)	5022547-31	Air	02/24/15
14	PAM-2 (02/24/15)	5022547-32	Air	02/24/15
15	PAM-3 (02/24/15)	5022547-33	Air	02/24/15
16	PAM-4 (02/24/15)	5022547-34	Air	02/24/15
17	PAM-21 (02/24/15)	5022547-35	Air	02/24/15

LDC #: 33882A6

VALIDATION COMPLETENESS WORKSHEET

Date: 3/16/15

SDG #: 5022547/5022727/5030213

Level IV

Page: 2 of 2

Laboratory: Eastern Research Group

Reviewer: 35

2nd Reviewer: 02

METHOD: (Analyte) Hexavalent Chromium (ASTM D7614)

	Client ID	Lab ID	Matrix	Date
18	PAM-31 (02/24/15)	5022547-36	Air	02/24/15
19	OAM 1 (02/25/15)	5022727-01	Air	02/25/15
20	OAM 2 (02/25/15)	5022727-02	Air	02/25/15
21	PAM-1 (02/25/15)	5022727-03	Air	02/25/15
22	PAM-1D (02/25/15)	5022727-04	Air	02/25/15
23	PAM-2 (02/25/15)	5022727-05	Air	02/25/15
24	PAM-3 (02/25/15)	5022727-06	Air	02/25/15
25	PAM-4 (02/25/15)	5022727-07	Air	02/25/15
26	PAM-21 (02/25/15)	5022727-08	Air	02/25/15
27	PAM-31 (02/25/15)	5022727-09	Air	02/25/15
28	OAM 1 (02/26/15)	5030213-01	Air	02/26/15
29	OAM 2 (02/26/15)	5030213-02	Air	02/26/15
30	PAM-1 (02/26/15)	5030213-03	Air	02/26/15
31	PAM-1D (02/26/15)	5030213-04	Air	02/26/15
32	PAM-2 (02/26/15)	5030213-05	Air	02/26/15
33	PAM-3 (02/26/15)	5030213-06	Air	02/26/15
34	PAM-4 (02/26/15)	5030213-07	Air	02/26/15
35	PAM-21 (02/26/15)	5030213-08	Air	02/26/15
36	PAM-31 (02/26/15)	5030213-09	Air	02/26/15
37	PAM-1 (02/20/15)DUP	5022547-21DUP	Air	02/20/15
38	PAM-1D (02/20/15)DUP	5022547-22DUP	Air	02/20/15
39	PAM-1 (02/24/15)DUP	5022547-30DUP	Air	02/24/15
40	PAM-1D (02/24/15)DUP	5022547-31DUP	Air	02/24/15
41	PAM-1 (02/25/15)DUP	5022727-03 DUP	Air	02/25/15
42	PAM-1D (02/25/15)DUP	5022727-04 DUP	Air	02/25/15
43	PAM-1 (02/26/15)DUP	5030213-03 DUP	Air	02/26/15
44	PAM-1D (02/26/15)DUP	5030213-04 DUP	Air	02/26/15
45				
46				
47				
48				
49				

Notes:

Method: Inorganics (EPA Method See Cover)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	/			
Cooler temperature criteria was met.	/			
II. Calibration				
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 90-110% QC limits? <u>85-115</u>	/			
Were titrant checks performed as required? (Level IV only)			/	
Were balance checks performed as required? (Level IV only)			/	
III. Blanks				
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.		/		
IV. Matrix spike/Matrix spike duplicates and Duplicates				
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 <u>water</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.	/			
V. Laboratory control samples				
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?	/			
VI. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?			/	
Were the performance evaluation (PE) samples within the acceptance limits?			/	

Validation Area	Yes	No	NA	Findings/Comments
VII. Sample Result Verification				
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	/			
Were detection limits < RL?	/			
VIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	/			
IX. Field duplicates				
Field duplicate pairs were identified in this SDG.	/			
Target analytes were detected in the field duplicates.	/			
X. Field blanks				
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	0.0170	0.0146	15	

Analyte	Concentration (ng/m3)		RPD (≤20)	Qual.
	12	13		
Hexavalent Chromium	0.0117	0.0132	12	

Analyte	Concentration (ng/m3)		RPD (≤20)	Qual.
	21	22		
Hexavalent Chromium	0.0386	0.0352	9	

Analyte	Concentration (ng/m3)		RPD (≤20)	Qual.
	30	31		
Hexavalent Chromium	0.0361	0.0437	19	

LDC #: 33882A10

Validation Findings Worksheet
Initial and Continuing Calibration Calculation Verification

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

Method: Inorganics, Method See Cover

The correlation coefficient (r) for the calibration of C⁺⁶ was recalculated. Calibration date: 03/04/15

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 ²	r or r ²	
Initial calibration	C ⁺⁶	s1	0.05	0.0000257	0.99997	0.99997	Y
		s2	0.1	0.0000645			
		s3	0.2	0.0001399			
		s4	0.5	0.0003732			
		s5	1	0.0007363			
		s6	2	0.0014859			
ICV 10:43 Calibration verification	C ⁺⁶	Found 0.5300 ng/ml	True 0.5 ng/ml		106.0%R	106.0%R	↓
CCV 11:43 Calibration verification	C ⁺⁶	0.5310 ng/ml	0.5 ng/ml		106.2%R	106.2%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 #: 33882AY

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

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

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>LC5</u> <u>11:13</u>	Laboratory control sample	<u>Cr⁶⁺</u>	<u>0.993 ng/ml</u>	<u>1.00 ng/ml</u>	<u>99.3%R</u>	<u>99.3%R</u>	<u>Y</u>
<u>N</u>	Matrix spike sample	<u>↓</u>	(SSR-SR)				
<u>DUP</u> <u>12:14</u>	Duplicate sample	<u>↓</u>	<u>0.0177 ng/m³</u>	<u>0.0170 ng/m³</u>	<u>4.04%RPD</u>	<u>4.47%RPD</u>	<u>Y*</u>

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".

- 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 (14) Cr⁶⁺ reported with a positive detect were recalculated and verified using the following equation:

Concentration = $(A - C_0) / C_1$

$A = 0.0000263$
 $C_0 = -8.81E-06$
 $C_1 = 0.0007476$

$VF = 10ml$
 $m^3 = 21.52$

Recalculation: $(0.0000263 - (-8.81E-06)) \times 10ml / 21.52 m^3 = 0.04696 ng/l$
 $(0.04696 ng/ml) (10ml) / 21.52 m^3 = 0.0218 ng/m^3$

#	Sample ID	Analyte	Reported Concentration (ng/m ³)	Calculated Concentration (ng/m ³)	Acceptable (Y/N)
	1	Cr ⁶⁺	0.0107	0.0107	Y
	2		0.0122	0.0123	Y*
	3		0.0170	0.0170	Y
	4		0.0146	0.0146	
	5		0.0129	0.0129	
	6		0.0102	0.0102	
	7		0.0141	0.0141	
	8		ND	ND	
	9		ND	ND	
	10		0.0116	0.0116	
	11		0.0158	0.0158	
	12		0.0117	0.0117	
	13		0.0132	0.0132	
	14		0.0218	0.0218	
	15		0.0122	0.0122	
	16		0.0144	0.0144	
	17		ND	ND	
	18		ND	ND	
	19		ND	ND	Y
	20		0.0175	0.0174	Y*

Note: *Rounding



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ATTN: Mr. Jeff Boggs

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

FILE #: 3926.00

REPORTED: 03/06/15 15:27

SUBMITTED: 02/25/15 to 03/02/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

Description: OAM 1	Lab ID: 5022547-19	Sampled: 02/20/15 14:56
Matrix: Air	Sample Volume: 21.67 m ³	Received: 02/25/15 10:59
Comments: Start Time 2/19/15 14:51		Analysis Date: 03/04/15 13:31

Hexavalent Chromium by SOP ERG-MOR-063

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

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Initials: ER

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SUBMITTED: 02/25/15 to 03/02/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: OAM 2

Lab ID: 5022547-20

Sampled: 02/20/15 15:20

Matrix: Air

Sample Volume: 21.74 m³

Received: 02/25/15 10:59

Comments: Start Time 2/19/15 15:11

Analysis Date: 03/04/15 13:41

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0122		0.0038

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REPORTED: 03/06/15 15:27

SUBMITTED: 02/25/15 to 03/02/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

Description: PAM-1	Lab ID: 5022547-21	Sampled: 02/20/15 16:40
Matrix: Air	Sample Volume: 21.94 m ³	Received: 02/25/15 10:59
Comments: Col 1 Start Time 2/19/15 16:17		Analysis Date: 03/04/15 12:04

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/m³ Air</u>		<u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0170		0.0038

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REPORTED: 03/06/15 15:27

SUBMITTED: 02/25/15 to 03/02/15

AQS SITE

CODE:
SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-1D

Lab ID: 5022547-22

Sampled: 02/20/15 16:43

Matrix: Air

Sample Volume: 21.9 m³

Received: 02/25/15 10:59

Comments: Col 2 Start Time 2/19/15 16:23

Analysis Date: 03/04/15 12:23

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0146		0.0038

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REPORTED: 03/06/15 15:27

SUBMITTED: 02/25/15 to 03/02/15

AQS SITE

CODE: Honeywell Hex Chrome Study
SITE CODE:

Description: PAM-2	Lab ID: 5022547-23	Sampled: 02/20/15 16:24
Matrix: Air	Sample Volume: 21.89 m ³	Received: 02/25/15 10:59
Comments: Start Time 2/19/15 16:04		Analysis Date: 03/04/15 14:11

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m ³ Air	<u>Flag</u>	<u>MDL</u> ng/m ³ Air
Hexavalent Chromium	1854-02-99	0.0129		0.0038

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REPORTED: 03/06/15 15:27

SUBMITTED: 02/25/15 to 03/02/15

AQS SITE

CODE: Honeywell Hex Chrome Study
SITE CODE:

Description: PAM-3	Lab ID: 5022547-24	Sampled: 02/20/15 16:15
Matrix: Air	Sample Volume: 21.96 m ³	Received: 02/25/15 10:59
Comments: Start Time 2/19/15 15:51		Analysis Date: 03/04/15 14:21

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0102		0.0038

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REPORTED: 03/06/15 15:27

SUBMITTED: 02/25/15 to 03/02/15

AQS SITE

CODE: Honeywell Hex Chrome Study
SITE CODE:

Description: PAM-4	Lab ID: 5022547-25	Sampled: 02/20/15 15:39
Matrix: Air	Sample Volume: 21.72 m ³	Received: 02/25/15 10:59
Comments: Start Time 2/19/15 15:31		Analysis Date: 03/04/15 14:31

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0141		0.0038

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REPORTED: 03/06/15 15:27

SUBMITTED: 02/25/15 to 03/02/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

Description: PAM-21	Lab ID: 5022547-26	Sampled: 02/20/15 00:00
Matrix: Air	Sample Volume: 21.89 m ³	Received: 02/25/15 10:59
Comments:		Analysis Date: 03/04/15 14:40

Hexavalent Chromium by SOP ERG-MOR-063

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

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REPORTED: 03/06/15 15:27

SUBMITTED: 02/25/15 to 03/02/15

AQS SITE

CODE: Honeywell Hex Chrome Study
SITE CODE:

Description: PAM-31

Lab ID: 5022547-27

Sampled: 02/20/15 00:00

Matrix: Air

Sample Volume: 21.96 m³

Received: 02/25/15 10:59

Comments:

Analysis Date: 03/04/15 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/m³ Air</u>		<u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0038

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REPORTED: 03/06/15 15:27

SUBMITTED: 02/25/15 to 03/02/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: OAM 1

Lab ID: 5022547-28

Sampled: 02/24/15 14:54

Matrix: Air

Sample Volume: 21.55 m³

Received: 02/25/15 10:59

Comments: Start Time 2/23/15 14:57

Analysis Date: 03/04/15 15:00

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0116		0.0038

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REPORTED: 03/06/15 15:27

SUBMITTED: 02/25/15 to 03/02/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: OAM 2	Lab ID: 5022547-29	Sampled: 02/24/15 15:17
Matrix: Air	Sample Volume: 21.57 m ³	Received: 02/25/15 10:59
Comments: Start Time 2/23/15 15:19		Analysis Date: 03/04/15 15:10

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m ³ Air	<u>Flag</u>	<u>MDL</u> ng/m ³ Air
Hexavalent Chromium	1854-02-99	0.0158		0.0038

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REPORTED: 03/06/15 15:27

SUBMITTED: 02/25/15 to 03/02/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-1	Lab ID: 5022547-30	Sampled: 02/24/15 16:22
Matrix: Air	Sample Volume: 21.45 m ³	Received: 02/25/15 10:59
Comments: Col 1 Start Time 2/23/15 16:31		Analysis Date: 03/04/15 12:43

Hexavalent Chromium by SOP ERG-MOR-063

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

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Initials: *CR*

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REPORTED: 03/06/15 15:27

SUBMITTED: 02/25/15 to 03/02/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

Description: PAM-1D	Lab ID: 5022547-31	Sampled: 02/24/15 16:24
Matrix: Air	Sample Volume: 21.46 m ³	Received: 02/25/15 10:59
Comments: Col 2 Start Time 2/23/15 16:33		Analysis Date: 03/04/15 13:03

Hexavalent Chromium by SOP ERG-MOR-063

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

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FILE #: 3926.00

REPORTED: 03/06/15 15:27

SUBMITTED: 02/25/15 to 03/02/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-2

Lab ID: 5022547-32

Sampled: 02/24/15 16:10

Matrix: Air

Sample Volume: 21.52 m³

Received: 02/25/15 10:59

Comments: Start Time 2/23/15 16:15

Analysis Date: 03/04/15 15:20

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0218		0.0038

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REPORTED: 03/06/15 15:27

SUBMITTED: 02/25/15 to 03/02/15

AQS SITE

CODE: Honeywell Hex Chrome Study
SITE CODE:

Description: PAM-3	Lab ID: 5022547-33	Sampled: 02/24/15 16:00
Matrix: Air	Sample Volume: 21.66 m ³	Received: 02/25/15 10:59
Comments: Start Time 2/23/15 15:56		Analysis Date: 03/04/15 15:30

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m ³ Air	<u>Flag</u>	<u>MDL</u> ng/m ³ Air
Hexavalent Chromium	1854-02-99	0.0122		0.0038

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REPORTED: 03/06/15 15:27

SUBMITTED: 02/25/15 to 03/02/15

AQS SITE

CODE: Honeywell Hex Chrome Study
SITE CODE:

Description: PAM-4	Lab ID: 5022547-34	Sampled: 02/24/15 15:41
Matrix: Air	Sample Volume: 21.55 m ³	Received: 02/25/15 10:59
Comments: Start Time 2/23/15 15:44		Analysis Date: 03/04/15 15:40

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0144		0.0038

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REPORTED: 03/06/15 15:27

SUBMITTED: 02/25/15 to 03/02/15

AQS SITE

CODE: Honeywell Hex Chrome Study
SITE CODE:

Description: PAM-21	Lab ID: 5022547-35	Sampled: 02/24/15 00:00
Matrix: Air	Sample Volume: 21.52 m ³	Received: 02/25/15 10:59
Comments:		Analysis Date: 03/04/15 16:10

Hexavalent Chromium by SOP ERG-MOR-063

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

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REPORTED: 03/06/15 15:27

SUBMITTED: 02/25/15 to 03/02/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

Description: PAM-31	Lab ID: 5022547-36	Sampled: 02/24/15 00:00
Matrix: Air	Sample Volume: 21.66 m ³	Received: 02/25/15 10:59
Comments:		Analysis Date: 03/04/15 16:30

Hexavalent Chromium by SOP ERG-MOR-063

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

MAR 17 2015

Initials: ER

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FILE #: 3926.00

REPORTED: 03/06/15 15:27

SUBMITTED: 02/25/15 to 03/02/15

AQS SITE

CODE: Honeywell Hex Chrome Study
SITE CODE:

Description: OAM 1

Lab ID: 5022727-01

Sampled: 02/25/15 15:00

Matrix: Air

Sample Volume: 21.65 m³

Received: 02/27/15 13:45

Comments: Start Time 2/24/15 14:56

Analysis Date: 03/05/15 13:57

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0038

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Initials: ER

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REPORTED: 03/06/15 15:27

SUBMITTED: 02/25/15 to 03/02/15

AQS SITE

CODE: Honeywell Hex Chrome Study
SITE CODE:

Description: OAM 2	Lab ID: 5022727-02	Sampled: 02/25/15 15:27
Matrix: Air	Sample Volume: 21.71 m ³	Received: 02/27/15 13:45
Comments: Start Time 2/24/15 15:20		Analysis Date: 03/05/15 14:07

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m ³ Air	<u>Flag</u>	<u>MDL</u> ng/m ³ Air
Hexavalent Chromium	1854-02-99	0.0175		0.0038

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CODE: Honeywell Hex Chrome Study
SITE CODE:

Description: PAM-1	Lab ID: 5022727-03	Sampled: 02/25/15 16:35
Matrix: Air	Sample Volume: 21.74 m ³	Received: 02/27/15 13:45
Comments: Col 1 Start Time 2/24/15 16:25		Analysis Date: 03/05/15 12:37

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m ³ Air	<u>Flag</u>	<u>MDL</u> ng/m ³ Air
Hexavalent Chromium	1854-02-99	0.0386		0.0038

MAR 17 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: 03/06/15 15:27
SUBMITTED: 02/25/15 to 03/02/15
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-1D	Lab ID: 5022727-04	Sampled: 02/25/15 16:38
Matrix: Air	Sample Volume: 21.76 m ³	Received: 02/27/15 13:45
Comments: Col 2 Start Time 2/24/15 16:27		Analysis Date: 03/05/15 12:56

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m ³ Air	<u>Flag</u>	<u>MDL</u> ng/m ³ Air
Hexavalent Chromium	1854-02-99	0.0352		0.0038

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FILE #: 3926.00

REPORTED: 03/06/15 15:27

SUBMITTED: 02/25/15 to 03/02/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

Description: PAM-2	Lab ID: 5022727-05	Sampled: 02/25/15 16:03
Matrix: Air	Sample Volume: 21.45 m ³	Received: 02/27/15 13:45
Comments: Start Time 2/24/15 16:13		Analysis Date: 03/05/15 14:37

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m ³ Air	<u>Flag</u>	<u>MDL</u> ng/m ³ Air
Hexavalent Chromium	1854-02-99	0.0258		0.0038

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FILE #: 3926.00

REPORTED: 03/06/15 15:27

SUBMITTED: 02/25/15 to 03/02/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

Description: PAM-3	Lab ID: 5022727-06	Sampled: 02/25/15 15:55
Matrix: Air	Sample Volume: 21.48 m ³	Received: 02/27/15 13:45
Comments: Start Time 2/24/15 16:03		Analysis Date: 03/05/15 14:46

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m ³ Air	<u>Flag</u>	<u>MDL</u> ng/m ³ Air
Hexavalent Chromium	1854-02-99	0.0201		0.0038

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FILE #: 3926.00

REPORTED: 03/06/15 15:27

SUBMITTED: 02/25/15 to 03/02/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-4

Lab ID: 5022727-07

Sampled: 02/25/15 15:49

Matrix: Air

Sample Volume: 21.68 m³

Received: 02/27/15 13:45

Comments: Start Time 2/24/15 15:44

Analysis Date: 03/05/15 14:56

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0390		0.0038

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FILE #: 3926.00

REPORTED: 03/06/15 15:27

SUBMITTED: 02/25/15 to 03/02/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-21

Lab ID: 5022727-08

Sampled: 02/25/15 00:00

Matrix: Air

Sample Volume: 21.45 m³

Received: 02/27/15 13:45

Comments:

Analysis Date: 03/05/15 15:06

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0038

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FILE #: 3926.00

REPORTED: 03/06/15 15:27

SUBMITTED: 02/25/15 to 03/02/15

AQS SITE

CODE: Honeywell Hex Chrome Study
SITE CODE:

Description: PAM-31

Lab ID: 5022727-09

Sampled: 02/25/15 00:00

Matrix: Air

Sample Volume: 21.48 m³

Received: 02/27/15 13:45

Comments:

Analysis Date: 03/05/15 15:16

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0038

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FILE #: 3926.00

REPORTED: 03/06/15 15:27

SUBMITTED: 02/25/15 to 03/02/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

Description: OAM 1	Lab ID: 5030213-01	Sampled: 02/26/15 15:00
Matrix: Air	Sample Volume: 21.58 m ³	Received: 03/02/15 10:19
Comments: Start Time 2/25/15 15:02		Analysis Date: 03/05/15 15:26

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m ³ Air	<u>Flag</u>	<u>MDL</u> ng/m ³ Air
Hexavalent Chromium	1854-02-99	0.0228		0.0038

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FILE #: 3926.00

REPORTED: 03/06/15 15:27

SUBMITTED: 02/25/15 to 03/02/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: OAM 2

Lab ID: 5030213-02

Sampled: 02/26/15 15:27

Matrix: Air

Sample Volume: 21.55 m³

Received: 03/02/15 10:19

Comments: Start Time 2/25/15 15:30

Analysis Date: 03/05/15 15:36

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0245		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: 03/06/15 15:27

SUBMITTED: 02/25/15 to 03/02/15

AQS SITE

CODE: Honeywell Hex Chrome Study
SITE CODE:

Description: PAM-1	Lab ID: 5030213-03	Sampled: 02/26/15 16:12
Matrix: Air	Sample Volume: 21.19 m ³	Received: 03/02/15 10:19
Comments: Col 1 Start Time 2/25/15 16:39		Analysis Date: 03/05/15 13:16

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0361		0.0038

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FILE #: 3926.00

REPORTED: 03/06/15 15:27

SUBMITTED: 02/25/15 to 03/02/15

AQS SITE

CODE: Honeywell Hex Chrome Study
SITE CODE:

Description: PAM-1D	Lab ID: 5030213-04	Sampled: 02/26/15 16:14
Matrix: Air	Sample Volume: 21.2 m ³	Received: 03/02/15 10:19
Comments: Col 2 Start Time 2/25/15 16:41		Analysis Date: 03/05/15 13:36

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m ³ Air	<u>Flag</u>	<u>MDL</u> ng/m ³ Air
Hexavalent Chromium	1854-02-99	0.0437		0.0038

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FILE #: 3926.00

REPORTED: 03/06/15 15:27

SUBMITTED: 02/25/15 to 03/02/15

AQS SITE

CODE:
SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-2	Lab ID: 5030213-05	Sampled: 02/26/15 16:02
Matrix: Air	Sample Volume: 21.54 m ³	Received: 03/02/15 10:19
Comments: Start Time 2/25/15 16:06		Analysis Date: 03/05/15 15:46

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0869		0.0038

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FILE #: 3926.00

REPORTED: 03/06/15 15:27

SUBMITTED: 02/25/15 to 03/02/15

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

Description: PAM-3	Lab ID: 5030213-06	Sampled: 02/26/15 15:55
Matrix: Air	Sample Volume: 21.57 m ³	Received: 03/02/15 10:19
Comments: Start Time 2/25/15 15:57		Analysis Date: 03/05/15 15:56

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m ³ Air	<u>Flag</u>	<u>MDL</u> ng/m ³ Air
Hexavalent Chromium	1854-02-99	0.0274		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: 03/06/15 15:27

SUBMITTED: 02/25/15 to 03/02/15

AQS SITE

CODE: Honeywell Hex Chrome Study
SITE CODE:

Description: PAM-4	Lab ID: 5030213-07	Sampled: 02/26/15 15:43
Matrix: Air	Sample Volume: 21.46 m ³	Received: 03/02/15 10:19
Comments: Start Time 2/25/15 15:52		Analysis Date: 03/05/15 16:06

Hexavalent Chromium by SOP ERG-MOR-063

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

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FILE #: 3926.00

REPORTED: 03/06/15 15:27

SUBMITTED: 02/25/15 to 03/02/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-21

Lab ID: 5030213-08

Sampled: 02/26/15 00:00

Matrix: Air

Sample Volume: 21.54 m³

Received: 03/02/15 10:19

Comments:

Analysis Date: 03/05/15 16:35

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0038

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REPORTED: 03/06/15 15:27

SUBMITTED: 02/25/15 to 03/02/15

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-31

Lab ID: 5030213-09

Sampled: 02/26/15 00:00

Matrix: Air

Sample Volume: 21.57 m³

Received: 03/02/15 10:19

Comments:

Analysis Date: 03/05/15 16:45

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0038

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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

March 11, 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 March 10, 2015. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #33860:

<u>SDG</u>	<u>Fraction</u>
5030333	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: February 27 through February 28, 2015
LDC Report Date: March 11, 2015
Matrix: Air
Parameters: Hexavalent Chromium
Validation Level: EPA Level IV
Laboratory: Eastern Research Group
Sample Delivery Group (SDG): 5030333

Sample Identification

OAM 1(02/27/15)	PAM-1(02/28/15)DUP
OAM 2(02/27/15)	PAM-1D (02/28/15)DUP
PAM-1(02/27/15)	
PAM-1D (02/27/15)	
PAM-2(02/27/15)	
PAM-3(02/27/15)	
PAM-4(02/27/15)	
PAM-21(02/27/15)	
PAM-31(02/27/15)	
OAM 1(02/28/15)	
OAM 2(02/28/15)	
PAM-1(02/28/15)	
PAM-1D (02/28/15)	
PAM-2(02/28/15)	
PAM-3(02/28/15)	
PAM-4(02/28/15)	
PAM-21(02/28/15)	
PAM-31(02/28/15)	
PAM-1(02/27/15)DUP	
PAM-1D (02/27/15)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(02/27/15) and PAM-31(02/28/15) were identified as trip blanks. No hexavalent chromium was found.

Samples PAM-21(02/27/15) and PAM-21(02/28/15) 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(02/27/15) and PAM-1D (02/27/15) and samples PAM-1(02/28/15) and PAM-1D (02/28/15) were identified as field duplicates. No hexavalent chromium was detected in any of the samples with the following exceptions:

Analyte	Concentration (ng/m ³)		RPD (Limits)	Flags	A or P
	PAM-1(02/27/15)	PAM-1D (02/27/15)			
Hexavalent chromium	0.0249	0.0237	5 (≤20)	-	-

Analyte	Concentration (ng/m ³)		RPD (Limits)	Flags	A or P
	PAM-1(02/28/15)	PAM-1D (02/28/15)			
Hexavalent chromium	0.0182	0.0220	19 (≤20)	-	-

**Harbor Point, MD, Hexavalent Chromium Monitoring
Hexavalent Chromium - Data Qualification Summary - SDG 5030333**

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
5030333**

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 5030333**

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

LDC #: 33860A6

VALIDATION COMPLETENESS WORKSHEET

Date: 3/11/15

SDG #: 5030333

Level IV

Page: 1 of 2

Laboratory: Eastern Research Group

Reviewer: JD

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	2/27-28/15
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 (02/27/15)	5030333-01	Air	02/27/15
2	OAM 2 (02/27/15)	5030333-02	Air	02/27/15
3	PAM-1 (02/27/15)	5030333-03	Air	02/27/15
4	PAM-1D (02/27/15)	5030333-04	Air	02/27/15
5	PAM-2 (02/27/15)	5030333-05	Air	02/27/15
6	PAM-3 (02/27/15)	5030333-06	Air	02/27/15
7	PAM-4 (02/27/15)	5030333-07	Air	02/27/15
8	PAM-21 (02/27/15)	5030333-08	Air	02/27/15
9	PAM-31 (02/27/15)	5030333-09	Air	02/27/15
10	OAM 1 (02/28/15)	5030333-10	Air	02/28/15
11	OAM 2 (02/28/15)	5030333-11	Air	02/28/15
12	PAM-1 (02/28/15)	5030333-12	Air	02/28/15
13	PAM-1D (02/28/15)	5030333-13	Air	02/28/15
14	PAM-2 (02/28/15)	5030333-14	Air	02/28/15
15	PAM-3 (02/28/15)	5030333-15	Air	02/28/15
16	PAM-4 (02/28/15)	5030333-16	Air	02/28/15
17	PAM-21 (02/28/15)	5030333-17	Air	02/28/15

LDC #: 33860A6

VALIDATION COMPLETENESS WORKSHEET

Date: 3/11/15

SDG #: 5030333

Level IV

Page: 2 of 2

Laboratory: Eastern Research Group

Reviewer: SS

2nd Reviewer: CA

METHOD: (Analyte) Hexavalent Chromium (ASTM D7614)

	Client ID	Lab ID	Matrix	Date
18	PAM-31 (02/28/15)	5030333-18	Air	02/28/15
19	PAM-1 (02/27/15)DUP	5030333-03DUP	Air	02/27/15
20	PAM-1D (02/27/15)DUP	5030333-04DUP	Air	02/27/15
21	PAM-1 (02/28/15)DUP	5030333-12DUP	Air	02/28/15
22	PAM-1D (02/28/15)DUP	5030333-13DUP	Air	02/28/15
23				
24				
25				
26				
27				
28				
29				
30				

Notes: _____

Method: Inorganics (EPA Method See Cover)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	/			
Cooler temperature criteria was met.	/			
II. Calibration				
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 90-110% <u>85-115</u> QC limits?	/			
Were titrant checks performed as required? (Level IV only)			/	
Were balance checks performed as required? (Level IV only)			/	
III. Blanks				
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.		/		
IV. Matrix spike/Matrix spike duplicates and Duplicates				
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 waters <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 $< 5X$ the CRDL.	/			
V. Laboratory control samples				
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?	/			
VI. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?			/	
Were the performance evaluation (PE) samples within the acceptance limits?			/	

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

LDC# 33860A6

VALIDATION FINDINGS WORKSHEET
Field Duplicates

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

Inorganics: Method See Cover

Analyte	Concentration (ng/m3)		RPD (≤ 20)	Qual.
	3	4		
Hexavalent Chromium	0.0249	0.0237	5	

Analyte	Concentration (ng/m3)		RPD (≤ 20)	Qual.
	12	13		
Hexavalent Chromium	0.0182	0.0220	19	

\\LDCFILESERVER\Validation\FIELD DUPLICATES\FD_inorganic\33860A6.wpd

LDC #: 33860A

Validation Findings Worksheet
Initial and Continuing Calibration Calculation Verification

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

Method: Inorganics, Method See Cover

The correlation coefficient (r) for the calibration of C_{Cr+V} was recalculated. Calibration date: 03/09/15

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 ²	r or r ²	
Initial calibration	C _{Cr+V}	s1	0.05	0.0000311	0.99996	0.99996	Y
		s2	0.1	0.0000712			
		s3	0.2	0.0001467			
		s4	0.5	0.0003777			
		s5	1	0.0007449			
		s6	2	0.0015188			
ICV 11:28 Calibration verification	C _{Cr+V}	<u>Found</u> 0.5233ng/ml	<u>True</u> 0.5ng/ml		104.7%R	104.7%R	↓
CCV 12:27 Calibration verification	C _{Cr+V}	0.5118ng/ml	0.5ng/ml		102.4%R	102.3%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 #: 33800

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 11:57	Laboratory control sample	Cr ⁺⁶	1.08 ng/ml	1.00 ng/ml	108%R	108%R	Y
N	Matrix spike sample		(SSR-SR)				
DUP 12:57	Duplicate sample	Cr ⁺⁶	0.0265 ng/ml ³	0.0249 ng/ml ³	6.23%RPD	6.38%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".

- 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 (4) Cr⁺⁶ 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: $\frac{0.0000331 - (-6.45E-06)}{0.0007608} = 0.05198 \text{ ng/l}$

$A = 0.0000331$ $m^3 = 21.92$

$C_0 = -6.45E-06$ $\frac{(\text{ng/ml}) \times (\text{ul})}{m^3} = \text{ng/m}^3$ $\frac{(0.05198 \text{ ng/ml}) (10 \text{ ml})}{21.92 m^3} = 0.0237 \text{ ng/m}^3$

$C_1 = 0.0007608$

#	Sample ID	Analyte	Reported Concentration (ng/m ³)	Calculated Concentration (ng/m ³)	Acceptable (Y/N)
	1	Cr ⁺⁶	0.0193	0.0193	Y
	2		0.0177	0.0177	↓
	3		0.0249	0.0249	↓
	4		0.0237	0.0237	↓
	5		0.0390	0.0391	Y*
	6		0.0229	0.0229	Y
	7		0.0387	0.0387	↓
	8		ND	ND	↓
	9		ND	ND	↓
	10		0.0137	0.0137	↓
	11		0.0155	0.0155	↓
	12		0.0182	0.0181	Y*
	13		0.0220	0.0220	Y
	14		0.0302	0.0302	↓
	15		0.0210	0.0210	↓
	16		0.0249	0.0249	↓
	17		ND	ND	↓
	18		ND	ND	Y

Note: *Rounding



CERTIFICATE OF ANALYSIS

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FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 03/10/15 14:47

SUBMITTED: 03/03/15

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: OAM 1	Lab ID: 5030333-01	Sampled: 02/27/15 15:35
Matrix: Air	Sample Volume: 22.07 m ³	Received: 03/03/15 10:58
Comments: Start Time 2/26/15 15:04		Analysis Date: 03/09/15 14:08

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0193		0.0038

MAR 11 2015

Initials: *CR*

Eastern Research Group

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REPORTED: 03/10/15 14:47

SUBMITTED: 03/03/15

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: OAM 2	Lab ID: 5030333-02	Sampled: 02/27/15 15:56
Matrix: Air	Sample Volume: 22 m ³	Received: 03/03/15 10:58
Comments: Start Time 2/26/15 15:29		Analysis Date: 03/09/15 14:18

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0177		0.0038

MAR 11 2015

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SUBMITTED: 03/03/15

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-1	Lab ID: 5030333-03	Sampled: 02/27/15 16:36
Matrix: Air	Sample Volume: 21.91 m ³	Received: 03/03/15 10:58
Comments: Col 1 Start Time 2/26/15 16:15		Analysis Date: 03/09/15 12:48

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0249		0.0038

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REPORTED: 03/10/15 14:47

SUBMITTED: 03/03/15

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-1D	Lab ID: 5030333-04	Sampled: 02/27/15 16:38
Matrix: Air	Sample Volume: 21.92 m ³	Received: 03/03/15 10:58
Comments: Col 2 Start Time 2/26/15 16:16		Analysis Date: 03/09/15 13:07

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0237		0.0038

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REPORTED: 03/10/15 14:47

SUBMITTED: 03/03/15

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-2	Lab ID: 5030333-05	Sampled: 02/27/15 16:24
Matrix: Air	Sample Volume: 21.89 m ³	Received: 03/03/15 10:58
Comments: Start Time 2/26/15 16:08		Analysis Date: 03/09/15 14:48

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0390		0.0038

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REPORTED: 03/10/15 14:47

SUBMITTED: 03/03/15

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-3	Lab ID: 5030333-06	Sampled: 02/27/15 16:19
Matrix: Air	Sample Volume: 21.91 m ³	Received: 03/03/15 10:58
Comments: Start Time 2/26/15 15:58		Analysis Date: 03/09/15 14:58

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0229		0.0038

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REPORTED: 03/10/15 14:47

SUBMITTED: 03/03/15

AQS SITE CODE:

SITE CODE: Honeywell Hex Chrome Study

Description: PAM-4	Lab ID: 5030333-07	Sampled: 02/27/15 16:15
Matrix: Air	Sample Volume: 22.04 m ³	Received: 03/03/15 10:58
Comments: Start Time 2/26/15 15:46		Analysis Date: 03/09/15 15:07

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0387		0.0038

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FILE #: 3926.00

REPORTED: 03/10/15 14:47

SUBMITTED: 03/03/15

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-21	Lab ID: 5030333-08	Sampled: 02/27/15 00:00
Matrix: Air	Sample Volume: 21.89 m ³	Received: 03/03/15 10:58
Comments:		Analysis Date: 03/09/15 15:17

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0038

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REPORTED: 03/10/15 14:47

SUBMITTED: 03/03/15

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-31	Lab ID: 5030333-09	Sampled: 02/27/15 00:00
Matrix: Air	Sample Volume: 21.91 m ³	Received: 03/03/15 10:58
Comments:		Analysis Date: 03/09/15 15:27

Hexavalent Chromium by SOP ERG-MOR-063

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

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REPORTED: 03/10/15 14:47

SUBMITTED: 03/03/15

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: OAM 1	Lab ID: 5030333-10	Sampled: 02/28/15 15:02
Matrix: Air	Sample Volume: 21.04 m ³	Received: 03/03/15 10:58
Comments: Start Time 2/27/15 15:39		Analysis Date: 03/09/15 15:37

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0137		0.0038

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REPORTED: 03/10/15 14:47

SUBMITTED: 03/03/15

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: OAM 2	Lab ID: 5030333-11	Sampled: 02/28/15 15:25
Matrix: Air	Sample Volume: 21.1 m ³	Received: 03/03/15 10:58
Comments: Start Time 2/27/15 15:58		Analysis Date: 03/09/15 15:47

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0155		0.0038

MAR 11 2015

Initials: *ER*

Eastern Research Group

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FILE #: 3926.00

REPORTED: 03/10/15 14:47

SUBMITTED: 03/03/15

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-1	Lab ID: 5030333-12	Sampled: 02/28/15 16:12
Matrix: Air	Sample Volume: 21.19 m ³	Received: 03/03/15 10:58
Comments: Col 1 Start Time 2/27/15 16:39		Analysis Date: 03/09/15 13:27

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0182		0.0038

MAR 11 2015

Initials: *CR*

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FILE #: 3926.00

REPORTED: 03/10/15 14:47

SUBMITTED: 03/03/15

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-1D	Lab ID: 5030333-13	Sampled: 02/28/15 16:14
Matrix: Air	Sample Volume: 21.18 m ³	Received: 03/03/15 10:58
Comments: Col 2 Start Time 2/27/15 16:42		Analysis Date: 03/09/15 13:47

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> ng/m ³ Air	<u>Flag</u>	<u>MDL</u> ng/m ³ Air
Hexavalent Chromium	1854-02-99	0.0220		0.0038

MAR 11 2015

Initials: *ER*

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FILE #: 3926.00

REPORTED: 03/10/15 14:47

SUBMITTED: 03/03/15

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-2	Lab ID: 5030333-14	Sampled: 02/28/15 15:49
Matrix: Air	Sample Volume: 21.02 m ³	Received: 03/03/15 10:58
Comments: Start Time 2/27/15 16:27		Analysis Date: 03/09/15 15:57

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0302		0.0038

MAR 11 2015

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REPORTED: 03/10/15 14:47

SUBMITTED: 03/03/15

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-3	Lab ID: 5030333-15	Sampled: 02/28/15 15:41
Matrix: Air	Sample Volume: 21 m ³	Received: 03/03/15 10:58
Comments: Start Time 2/27/15 16:21		Analysis Date: 03/09/15 16:07

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0210		0.0038

MAR 11 2015

Initials: *CR*

Eastern Research Group

The results in this report apply only to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



CERTIFICATE OF ANALYSIS

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FILE #: 3926.00

REPORTED: 03/10/15 14:47

SUBMITTED: 03/03/15

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-4	Lab ID: 5030333-16	Sampled: 02/28/15 15:39
Matrix: Air	Sample Volume: 21.02 m ³	Received: 03/03/15 10:58
Comments: Start Time 2/27/15 16:18		Analysis Date: 03/09/15 16:17

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0249		0.0038

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REPORTED: 03/10/15 14:47

SUBMITTED: 03/03/15

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-21	Lab ID: 5030333-17	Sampled: 02/28/15 00:00
Matrix: Air	Sample Volume: 21.02 m ³	Received: 03/03/15 10:58
Comments:		Analysis Date: 03/09/15 16:47

Hexavalent Chromium by SOP ERG-MOR-063

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

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Initials: *ER*

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CERTIFICATE OF ANALYSIS

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FILE #: 3926.00

REPORTED: 03/10/15 14:47

SUBMITTED: 03/03/15

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-31	Lab ID: 5030333-18	Sampled: 02/28/15 00:00
Matrix: Air	Sample Volume: 21 m ³	Received: 03/03/15 10:58
Comments:		Analysis Date: 03/09/15 16:56

Hexavalent Chromium by SOP ERG-MOR-063

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0038

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Initials: *CR*

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