



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

November 14, 2014

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 November 13, 2014. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #33083:

SDG

4110507

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: November 4, 2014
LDC Report Date: November 14, 2014
Matrix: Air
Parameters: Hexavalent Chromium
Validation Level: EPA Level IV
Laboratory: Eastern Research Group
Sample Delivery Group (SDG): 4110507

Sample Identification

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

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. 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) 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	0.0584	0.0627	7 (≤20)	-	-

**Harbor Point, MD, Hexavalent Chromium Monitoring
Hexavalent Chromium - Data Qualification Summary - SDG 4110507**

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
4110507**

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 4110507**

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

LDC #: 33083A6

VALIDATION COMPLETENESS WORKSHEET

Date: 11/13/14

SDG #: 4110507

Level IV

Page: 1 of 1

Laboratory: Eastern Research Group

Reviewer: *SD*

2nd Reviewer: *[Signature]*

METHOD: 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.	Technical holding times	A	Sampling dates: 11/04/14
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Blanks	A	
V	Matrix Spike/Matrix Spike Duplicates	N	Not Required
VI.	Duplicates	A	DUP
VII.	Laboratory control samples	A	LCS/D
VIII.	Sample result verification	A	
IX.	Overall assessment of data	A	
X.	Field duplicates	SW	FD = (3, 4)
XI	Field blanks	ND	FB = (8), TB = (9)

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

Validated Samples: *Air*

1	OAM 1	11	PAM-1DDUP	21		31	
2	OAM 2	12		22		32	
3	PAM-1	13		23		33	
4	PAM-1D	14		24		34	
5	PAM-2	15		25		35	
6	PAM-3	16		26		36	
7	PAM-4	17		27		37	
8	PAM-21	18		28		38	
9	PAM-31	19		29		39	
10	PAM-1DUP	20		30		40	

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 99-110% <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 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?			/	

LDC #: 33083A0

VALIDATION FINDINGS CHECKLIST

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

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# 33083A6

VALIDATION FINDINGS WORKSHEET
Field Duplicates

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

Inorganics: Method See Cover

Analyte	Concentration (ng/m3)		RPD (≤20)	Qual.
	3	4		
Hexavalent Chromium	0.0584	0.0627	7	

\\LDCFILESERVER\Validation\FIELD DUPLICATES\FD_inorganic\wettemp.WPD

LDC #: 33083A6

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

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

Method: Inorganics, Method See Cover

The correlation coefficient (r) for the calibration of Cr⁺⁶ was recalculated. Calibration date: 11/10/14

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	0.50	0.0000158	0.99999	0.99999	y
		s2	0.10	0.000033			
		s3	0.20	0.000079			
		s4	0.50	0.000204			
		s5	1.00	0.0004103			
		s6	2.00	0.000828			
ICV 11:55 Calibration verification	Cr ⁺⁶	<u>Found</u> 0.5093ng/ml	<u>True</u> 0.5ng/ml		101.9%R	101.9%R	↓
CCV 14:54 Calibration verification	Cr ⁺⁶	0.5276ng/ml	0.5ng/ml		105.5%R	105.5%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 #: 3508314

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

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

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 12:24	Laboratory control sample	Cr ⁺⁶	1.08 ng/ml	1.00 ng/ml	108%R	108%R	Y
	Matrix spike sample		(SSR-SR)				
Dup. 13:24	Duplicate sample	Cr ⁺⁶	0.0614 ng/m ³	0.0585 ng/m ³	4.84%RPD	5.00%RPD	Y

Comments: _____



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: 11/13/14 07:07

SUBMITTED: 11/05/14

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: OAM 1

Lab ID: 4110507-01

Sampled: 11/04/14 15:16

Matrix: Air

Sample Volume: 21.35 m³

Received: 11/05/14 10:53

Comments: Start Time 11/3/14 15:33

Analysis Date: 11/10/14 13:55

Hexavalent Chromium

Results

MDL

Analyte

CAS Number

ng/m³ Air

Flag

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0485

0.0036

NOV 13 2014

Initials: *CR*

Eastern Research Group

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FILE #: 3926.00

REPORTED: 11/13/14 07:07

SUBMITTED: 11/05/14

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: OAM 2

Lab ID: 4110507-02

Sampled: 11/04/14 15:48

Matrix: Air

Sample Volume: 21.54 m³

Received: 11/05/14 10:53

Comments: Start Time 11/3/14 15:52

Analysis Date: 11/10/14 14:05

Hexavalent Chromium

<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	0.0638		0.0036

NOV 13 2014

Initials: *CR*

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FILE #: 3926.00

REPORTED: 11/13/14 07:07

SUBMITTED: 11/05/14

AQS SITE

CODE:

SITE CODE: Honeywell Hex Chrome Study

Description: PAM-1	Lab ID: 4110507-03	Sampled: 11/04/14 17:06
Matrix: Air	Sample Volume: 21.68 m ³	Received: 11/05/14 10:53
Comments: Col 1 Start Time 11/3/14 17:01		Analysis Date: 11/10/14 13:14

Hexavalent Chromium

<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	0.0584		0.0036

NOV 13 2014

Initials: *ER*

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FILE #: 3926.00

REPORTED: 11/13/14 07:07

SUBMITTED: 11/05/14

AQS SITE

CODE: Honeywell Hex Chrome Study
SITE CODE:

Description: PAM-1D	Lab ID: 4110507-04	Sampled: 11/04/14 17:12
Matrix: Air	Sample Volume: 21.5 m ³	Received: 11/05/14 10:53
Comments: Col 2 Start Time 11/3/14 17:05		Analysis Date: 11/10/14 13:34

Hexavalent Chromium

<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	0.0627		0.0036

NOV 13 2014

Initials: *CR*

Eastern Research Group

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Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

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FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 11/13/14 07:07

SUBMITTED: 11/05/14

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

Description: PAM-2	Lab ID: 4110507-05	Sampled: 11/04/14 16:46
Matrix: Air	Sample Volume: 21.55 m ³	Received: 11/05/14 10:53
Comments: Start Time 11/3/14 16:49		Analysis Date: 11/10/14 14:15

Hexavalent Chromium

<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	0.0550		0.0036

NOV 13 2014

Initials: *ER*

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Malvern, PA 19355

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FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 11/13/14 07:07

SUBMITTED: 11/05/14

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-3	Lab ID: 4110507-06	Sampled: 11/04/14 16:34
Matrix: Air	Sample Volume: 21.55 m ³	Received: 11/05/14 10:53
Comments: Start Time 11/3/14 16:37		Analysis Date: 11/10/14 14:24

Hexavalent Chromium

<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	0.0539		0.0036

NOV 13 2014

Initials: *ER*

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Malvern, PA 19355

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FILE #: 3926.00

REPORTED: 11/13/14 07:07

SUBMITTED: 11/05/14

AQS SITE

CODE: Honeywell Hex Chrome Study
SITE CODE:

Description: PAM-4	Lab ID: 4110507-07	Sampled: 11/04/14 16:19
Matrix: Air	Sample Volume: 21.7 m ³	Received: 11/05/14 10:53
Comments: Start Time 11/3/14 16:12		Analysis Date: 11/10/14 14:34

Hexavalent Chromium

<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	0.192		0.0036

NOV 13 2014

Initials: *ER*

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: 11/13/14 07:07

SUBMITTED: 11/05/14

AQS SITE

CODE: Honeywell Hex Chrome Study
SITE CODE:

Description: PAM-21	Lab ID: 4110507-08	Sampled: 11/04/14 00:00
Matrix: Air	Sample Volume: 21.55 m ³	Received: 11/05/14 10:53
Comments:		Analysis Date: 11/10/14 14:44

Hexavalent Chromium

<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

NOV 13 2014

Initials: *ER*

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PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 11/13/14 07:07

SUBMITTED: 11/05/14

AQS SITE

CODE: Honeywell Hex Chrome Study
SITE CODE:

Description: PAM-31	Lab ID: 4110507-09	Sampled: 11/04/14 00:00
Matrix: Air	Sample Volume: 21.55 m ³	Received: 11/05/14 10:53
Comments:		Analysis Date: 11/10/14 15:25

Hexavalent Chromium

<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

NOV 13 2014

Initials: *CR*

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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

November 14, 2014

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 November 13, 2014. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #33091:

SDG

Fraction

4110607/4110710

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: November 5 through November 6, 2014
LDC Report Date: November 14, 2014
Matrix: Air
Parameters: Hexavalent Chromium
Validation Level: EPA Level IV
Laboratory: Eastern Research Group
Sample Delivery Group (SDG): 4110607/4110710

Sample Identification

OAM 1(11/05/14)	PAM-1(11/06/14)DUP
OAM 2(11/05/14)	PAM-1D(11/06/14)DUP
PAM-1(11/05/14)	
PAM-1D(11/05/14)	
PAM-2(11/05/14)	
PAM-3(11/05/14)	
PAM-4(11/05/14)	
PAM-21(11/05/14)	
PAM-31(11/05/14)	
OAM 1(11/06/14)	
OAM 2(11/06/14)	
PAM-1(11/06/14)	
PAM-1D(11/06/14)	
PAM-3(11/06/14)	
PAM-4(11/06/14)	
PAM-21(11/06/14)	
PAM-31(11/06/14)	
PAM-1(11/05/14)DUP	
PAM-1D(11/05/14)DUP	

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

Introduction

This data review covers 21 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(11/05/14) and PAM-31(11/06/14) were identified as trip blanks. No hexavalent chromium was found.

Samples PAM-21(11/05/14) and PAM-21(11/06/14) 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(11/05/14) and PAM-1D(11/05/14) and samples PAM-1(11/06/14) and PAM-1D(11/06/14) 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(11/05/14)	PAM-1D(11/05/14)			
Hexavalent chromium	0.0711	0.0762	7 (≤20)	-	-

Analyte	Concentration (ng/m ³)		RPD (Limits)	Flags	A or P
	PAM-1(11/06/14)	PAM-1D(11/06/14)			
Hexavalent chromium	0.0602	0.0604	0 (≤20)	-	-

**Harbor Point, MD, Hexavalent Chromium Monitoring
Hexavalent Chromium - Data Qualification Summary - SDG 4110607/4110710**

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
4110607/4110710**

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
4110607/4110710**

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

LDC #: 33091A6
 SDG #: 4110607/4110710
 Laboratory: Eastern Research Group

VALIDATION COMPLETENESS WORKSHEET

Level IV

Date: 11/13/14
 Page: 1 of 1
 Reviewer: JD
 2nd Reviewer: OL

METHOD: 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.	Technical holding times	A	Sampling dates: 11/05/14 - 11/06/14
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Blanks	A	
V	Matrix Spike/Matrix Spike Duplicates	N	Not Required
VI.	Duplicates	A	DUP
VII.	Laboratory control samples	A	LCSID
VIII.	Sample result verification	A	
IX.	Overall assessment of data	A	
X.	Field duplicates	SW	FD=(3,4) (12,13)
XI	Field blanks	ND	FB=(8),(17) TB=(9)(18)

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

Validated Samples: Airs

1	OAM 1(11/05/14)	11	OAM 2(11/06/14)	21	PAM-1(11/06/14)DUP	31
2	OAM 2(11/05/14)	12	PAM-1(11/06/14)	22	PAM-1D(11/06/14)DUP	32
3	PAM-1(11/05/14)	13	PAM-1D(11/06/14)	23		33
4	PAM-1D(11/05/14)	14	PAM-2(11/06/14) JD	24		34
5	PAM-2(11/05/14)	15	PAM-3(11/06/14)	25		35
6	PAM-3(11/05/14)	16	PAM-4(11/06/14)	26		36
7	PAM-4(11/05/14)	17	PAM-21(11/06/14)	27		37
8	PAM-21(11/05/14)	18	PAM-31(11/06/14)	28		38
9	PAM-31(11/05/14)	19	PAM-1(11/05/14)DUP	29		39
10	OAM 1(11/06/14)	20	PAM-1D(11/05/14)DUP	30		40

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) ≤ 20% for <u>waters</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# 33091A6

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	0.0711	0.0762	7	

Analyte	Concentration (ng/m3)		RPD (≤ 20)	Qual.
	12	13		
Hexavalent Chromium	0.0602	0.0604	0	

\\LDCFILESERVER\Validation\FIELD DUPLICATES\FD_inorganic\33091A6.wpd

LDC #: 33091A6

Validation Findings Worksheet
Initial and Continuing Calibration Calculation Verification

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

Method: Inorganics, Method See Cover

The correlation coefficient (r) for the calibration of Cr⁺⁶ was recalculated. Calibration date: 11/11/14

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	0.50	0.0000143	0.99975	0.99975	y
		s2	0.10	0.0000335			
		s3	0.20	0.0000714			
		s4	0.50	0.0002054			
		s5	1.00	0.0003829			
		s6	2.00	0.0007859			
ICV 10:51 Calibration verification	Cr ⁺⁶	<u>Found</u> 0.515 ng/ml	<u>True</u> 0.5 ng/ml		103%R	103%R	↓
CCV 11:50 Calibration verification	Cr ⁺⁶	0.543 ng/ml	0.5 ng/ml		108.6%R	108.5%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

LDC #: 33091A6

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

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

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 11:21	Laboratory control sample	C ⁺⁶	1.14 ng/ml	1.00 ng/ml	114%R	114%R	Y
	Matrix spike sample		(SSR-SR)				
DUP 12:20	Duplicate sample	C ⁺⁶	0.0718 ng/m ³	0.0711 ng/m ³	0.980%RPD	0.979%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 (b) Cr⁶⁺ 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: $(0.0000455 - (-4.3E-06)) / 0.0003946 = 0.1262 \text{ ng/ml}$
 $m^3 = 21.35$
 $A = 0.0000455$ $(V_f)(\text{ng/ml})$
 $C_0 = -4.3E-06$ $\frac{\quad}{m^3} = \text{ng/m}^3$
 $C_1 = 0.0003946$ $\frac{(0.1262 \text{ ng/ml})(10 \text{ ml})}{21.35 \text{ m}^3} = 0.0591 \text{ ng/m}^3$

#	Sample ID	Analyte	Reported Concentration (ng/m ³)	Calculated Concentration (ng/m ³)	Acceptable (Y/N)
	1	Cr ⁶⁺	0.0615	0.0616	Y*
	2	↓	0.0636	0.0636	Y
	3		0.0711	0.0711	↓
	4		0.0762	0.0763	Y*
	5		0.0710	0.0711	Y*
	6		0.0591	0.0591	Y
	7		0.339	0.339	Y
	8		ND	ND	↓
	9		ND	ND	
	10		0.0464	0.0464	↓
	11		0.145	0.145	
	12		0.0602	0.0602	
	13		0.0604	0.0605	Y*
	15		0.0480	0.0480	Y
	16		0.0745	0.0745	↓
	17		ND	ND	
	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: 11/13/14 13:10

SUBMITTED: 11/06/14 to 11/07/14

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: OAM 1

Lab ID: 4110607-01

Sampled: 11/05/14 15:11

Matrix: Air

Sample Volume: 21.4 m³

Received: 11/06/14 11:39

Comments: Start Time 11/4/14 15:24

Analysis Date: 11/11/14 13:31

Hexavalent Chromium

Results

MDL

<u>Analyte</u>	<u>CAS Number</u>	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0615		0.0036

NOV 13 2014
Initials: ER

Eastern Research Group

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REPORTED: 11/13/14 13:10

SUBMITTED: 11/06/14 to 11/07/14

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: OAM 2

Lab ID: 4110607-02

Sampled: 11/05/14 15:36

Matrix: Air

Sample Volume: 21.36 m³

Received: 11/06/14 11:39

Comments: Start Time 11/4/14 15:52

Analysis Date: 11/11/14 13:41

Hexavalent Chromium

Results

MDL

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

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Initials: *CR*

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REPORTED: 11/13/14 13:10

SUBMITTED: 11/06/14 to 11/07/14

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-1	Lab ID: 4110607-03	Sampled: 11/05/14 16:59
Matrix: Air	Sample Volume: 21.45 m ³	Received: 11/06/14 11:39
Comments: Col 1 Start Time 11/4/14 17:09		Analysis Date: 11/11/14 12:11

Hexavalent Chromium

<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	0.0711		0.0036

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SUBMITTED: 11/06/14 to 11/07/14

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-1D

Lab ID: 4110607-04

Sampled: 11/05/14 17:03

Matrix: Air

Sample Volume: 21.42 m³

Received: 11/06/14 11:39

Comments: Col 2 Start Time 11/4/14 17:15

Analysis Date: 11/11/14 12:30

Hexavalent Chromium

<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	0.0762		0.0036

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FILE #: 3926.00

REPORTED: 11/13/14 13:10

SUBMITTED: 11/06/14 to 11/07/14

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

Description: PAM-2	Lab ID: 4110607-05	Sampled: 11/05/14 16:34
Matrix: Air	Sample Volume: 21.31 m ³	Received: 11/06/14 11:39
Comments: Start Time 11/4/14 16:53		Analysis Date: 11/11/14 14:11

Hexavalent Chromium

<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	0.0710		0.0036

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Initials: *CR*

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REPORTED: 11/13/14 13:10

SUBMITTED: 11/06/14 to 11/07/14

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-3

Lab ID: 4110607-06

Sampled: 11/05/14 16:21

Matrix: Air

Sample Volume: 21.35 m³

Received: 11/06/14 11:39

Comments: Start Time 11/4/14 16:38

Analysis Date: 11/11/14 14:21

Hexavalent Chromium

Results

MDL

Analyte

CAS Number

ng/m³ Air

Flag

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0591

0.0036

NOV 13 2014

Initials: *CR*

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REPORTED: 11/13/14 13:10

SUBMITTED: 11/06/14 to 11/07/14

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-4

Lab ID: 4110607-07

Sampled: 11/05/14 16:07

Matrix: Air

Sample Volume: 21.35 m³

Received: 11/06/14 11:39

Comments: Start Time 11/4/14 16:24

Analysis Date: 11/11/14 14:31

Hexavalent Chromium

Results

MDL

<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	0.339		0.0036

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Initials: ER

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FILE #: 3926.00

REPORTED: 11/13/14 13:10

SUBMITTED: 11/06/14 to 11/07/14

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-21

Lab ID: 4110607-08

Sampled: 11/05/14 00:00

Matrix: Air

Sample Volume: 21.31 m³

Received: 11/06/14 11:39

Comments:

Analysis Date: 11/11/14 14:41

Hexavalent Chromium

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

NOV 13 2014

Initials: *CR*

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FILE #: 3926.00

REPORTED: 11/13/14 13:10

SUBMITTED: 11/06/14 to 11/07/14

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-31

Lab ID: 4110607-09

Sampled: 11/05/14 00:00

Matrix: Air

Sample Volume: 21.35 m³

Received: 11/06/14 11:39

Comments:

Analysis Date: 11/11/14 14:51

Hexavalent Chromium

Results

MDL

Analyte

CAS Number

ng/m³ Air

Flag

ng/m³ Air

Hexavalent Chromium

1854-02-99

ND

U

0.0036

NOV 13 2014

Initials: *CR*

Eastern Research Group

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FILE #: 3926.00

REPORTED: 11/13/14 13:10

SUBMITTED: 11/06/14 to 11/07/14

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: OAM 1

Lab ID: 4110710-01

Sampled: 11/06/14 15:01

Matrix: Air

Sample Volume: 21.35 m³

Received: 11/07/14 10:24

Comments: Start Time 11/5/14 15:17

Analysis Date: 11/11/14 15:08

Hexavalent Chromium

Results

MDL

<u>Analyte</u>	<u>CAS Number</u>	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0464		0.0036

NOV 13 2014

Initials: *ER*

Eastern Research Group

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FILE #: 3926.00

REPORTED: 11/13/14 13:10

SUBMITTED: 11/06/14 to 11/07/14

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: OAM 2

Lab ID: 4110710-02

Sampled: 11/06/14 15:27

Matrix: Air

Sample Volume: 21.33 m³

Received: 11/07/14 10:24

Comments: Start Time 11/5/14 15:45

Analysis Date: 11/11/14 15:18

Hexavalent Chromium

Results

MDL

Analyte	CAS Number	ng/m ³ Air	Flag	ng/m ³ Air
Hexavalent Chromium	1854-02-99	0.145		0.0036

NOV 13 2014

Initials: *CR*

Eastern Research Group

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FILE #: 3926.00

REPORTED: 11/13/14 13:10

SUBMITTED: 11/06/14 to 11/07/14

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-1

Lab ID: 4110710-03

Sampled: 11/06/14 16:57

Matrix: Air

Sample Volume: 21.43 m³

Received: 11/07/14 10:24

Comments: Col 1 Start Time 11/5/14 17:08

Analysis Date: 11/11/14 12:50

Hexavalent Chromium

Results

MDL

Analyte	CAS Number	ng/m ³ Air	Flag	ng/m ³ Air
Hexavalent Chromium	1854-02-99	0.0602		0.0036

NOV 13 2014

Initials: ER

Eastern Research Group

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

FILE #: 3926.00

REPORTED: 11/13/14 13:10

SUBMITTED: 11/06/14 to 11/07/14

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

Description: PAM-1D	Lab ID: 4110710-04	Sampled: 11/06/14 17:00
Matrix: Air	Sample Volume: 21.44 m ³	Received: 11/07/14 10:24
Comments: Col 2 Start Time 11/5/14 17:11		Analysis Date: 11/11/14 13:10

Hexavalent Chromium

<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	0.0604		0.0036

NOV 13 2014

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: 11/13/14 13:10

SUBMITTED: 11/06/14 to 11/07/14

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

Description: PAM-3	Lab ID: 4110710-06	Sampled: 11/06/14 16:09
Matrix: Air	Sample Volume: 21.33 m ³	Received: 11/07/14 10:24
Comments: Start Time 11/5/14 16:27		Analysis Date: 11/11/14 15:28

Hexavalent Chromium

<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	0.0480		0.0036

NOV 13 2014

Initials: *CR*

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FILE #: 3926.00

REPORTED: 11/13/14 13:10

SUBMITTED: 11/06/14 to 11/07/14

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-4

Lab ID: 4110710-07

Sampled: 11/06/14 15:55

Matrix: Air

Sample Volume: 21.33 m³

Received: 11/07/14 10:24

Comments: Start Time 11/5/14 16:13

Analysis Date: 11/11/14 15:38

Hexavalent Chromium

<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	0.0745		0.0036

NOV 13 2014

Initials: *CR*

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FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 11/13/14 13:10

SUBMITTED: 11/06/14 to 11/07/14

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

Description: PAM-21	Lab ID: 4110710-08	Sampled: 11/06/14 00:00
Matrix: Air	Sample Volume: 21.44 m ³	Received: 11/07/14 10:24
Comments:		Analysis Date: 11/11/14 15:48

Hexavalent Chromium

<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

NOV 13 2014

Initials: *CR*

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FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 11/13/14 13:10

SUBMITTED: 11/06/14 to 11/07/14

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-31

Lab ID: 4110710-09

Sampled: 11/06/14 00:00

Matrix: Air

Sample Volume: 21.33 m³

Received: 11/07/14 10:24

Comments:

Analysis Date: 11/11/14 16:18

Hexavalent Chromium

<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

NOV 13 2014

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

November 20, 2014

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 November 18, 2014. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #33119:

SDG

4111126/4111203

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: November 7 through November 11, 2014
LDC Report Date: November 19, 2014
Matrix: Air
Parameters: Hexavalent Chromium
Validation Level: EPA Level IV
Laboratory: Eastern Research Group
Sample Delivery Group (SDG): 4111126/4111203

Sample Identification

OAM 1 (11/07/14)	PAM-1D (11/11/14)
OAM 2 (11/07/14)	PAM-2 (11/11/14)
PAM-1 (11/07/14)	PAM-3 (11/11/14)
PAM-1D (11/07/14)	PAM-4 (11/11/14)
PAM-3 (11/07/14)	PAM-21 (11/11/14)
PAM-4 (11/07/14)	PAM-31 (11/11/14)
PAM-21 (11/07/14)	PAM-1 (11/07/14)DUP
PAM-31 (11/07/14)	PAM-1D (11/07/14)DUP
OAM 1 (11/10/14)	PAM-1 (11/10/14)DUP
OAM 2 (11/10/14)	PAM-1D (11/10/14)DUP
PAM-1 (11/10/14)	PAM-1 (11/11/14)DUP
PAM-1D (11/10/14)	PAM-1D (11/11/14)DUP
PAM-2 (11/10/14)	
PAM-3 (11/10/14)	
PAM-4 (11/10/14)	
PAM-21 (11/10/14)	
PAM-31 (11/10/14)	
OAM 1 (11/11/14)	
OAM 2 (11/11/14)	
PAM-1 (11/11/14)	

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

Introduction

This data review covers 32 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 (11/07/14), PAM-31 (11/10/14), and PAM-31 (11/11/14) were identified as trip blanks. No hexavalent chromium was found.

Samples PAM-21 (11/07/14), PAM-21 (11/10/14), and PAM-21 (11/11/14) 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 (11/07/14) and PAM-1D (11/07/14), samples PAM-1 (11/10/14) and PAM-1D (11/10/14), and samples PAM-1 (11/11/14) and PAM-1D (11/11/14) 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 (11/07/14)	PAM-1D (11/07/14)			
Hexavalent chromium	0.0485	0.0401	19 (≤20)	-	-

Analyte	Concentration (ng/m ³)		RPD (Limits)	Flags	A or P
	PAM-1 (11/10/14)	PAM-1D (11/10/14)			
Hexavalent chromium	0.0374	0.0339	10 (≤20)	-	-

Analyte	Concentration (ng/m ³)		RPD (Limits)	Flags	A or P
	PAM-1 (11/11/14)	PAM-1D (11/11/14)			
Hexavalent chromium	0.0266	0.0259	3 (≤20)	-	-

**Harbor Point, MD, Hexavalent Chromium Monitoring
Hexavalent Chromium - Data Qualification Summary - SDG 411126/4111203**

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
411126/4111203**

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
411126/4111203**

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

LDC #: 33119A6
 SDG #: 4111126/4111203
 Laboratory: Eastern Research Group

VALIDATION COMPLETENESS WORKSHEET

Level IV

Date: 11/19/14
 Page: 1 of 1
 Reviewer: JSD
 2nd Reviewer: CR

METHOD: 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.	Technical holding times	A	Sampling dates: 11/07 - 11/14
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Blanks	A	
V	Matrix Spike/Matrix Spike Duplicates	N	Not Required
VI.	Duplicates	A	DUP
VII.	Laboratory control samples	A	LCSID
VIII.	Sample result verification	A	
IX.	Overall assessment of data	A	
X.	Field duplicates	SW	FD = (3,4)(11,12)(20,21)
XI	Field blanks	ND	FB = (7)(16)(25) TB = (8)(17)(26)

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

Validated Samples: Airs

1	OAM 1 (11/07/14)	11	PAM-1 (11/10/14)	21	PAM-1D (11/11/14)	31	PAM-1 (11/11/14)DUP
2	OAM 2 (11/07/14)	12	PAM-1D (11/10/14)	22	PAM-2 (11/11/14)	32	PAM-1D (11/11/14)DUP
3	PAM-1 (11/07/14)	13	PAM-2 (11/10/14)	23	PAM-3 (11/11/14)	33	
4	PAM-1D (11/07/14)	14	PAM-3 (11/10/14)	24	PAM-4 (11/11/14)	34	
5	PAM-3 (11/07/14)	15	PAM-4 (11/10/14)	25	PAM-21 (11/11/14)	35	
6	PAM-4 (11/07/14)	16	PAM-21 (11/10/14)	26	PAM-31 (11/11/14)	36	
7	PAM-21 (11/07/14)	17	PAM-31 (11/10/14)	27	PAM-1 (11/07/14)DUP	37	
8	PAM-31 (11/07/14)	18	OAM 1 (11/11/14)	28	PAM-1D (11/07/14)DUP	38	
9	OAM 1 (11/10/14)	19	OAM 2 (11/11/14)	29	PAM-1 (11/10/14)DUP	39	
10	OAM 2 (11/10/14)	20	PAM-1 (11/11/14)	30	PAM-1D (11/10/14)DUP	40	

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.			/	
<u>Air</u> Were the MS/MSD or duplicate relative percent differences (RPD) \leq 20% for waters and \leq 35% for soil samples? A control limit of \leq CRDL (\leq 2X CRDL for soil) was used for samples that were \leq 5X the CRDL, including when only one of the duplicate sample values were \leq 5X the CRDL.	/			
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?			/	

LDC #: 3319A6

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2
 Reviewer: SP
 2nd Reviewer: A

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	0.0485	0.0401	19	

Analyte	Concentration (ng/m3)		RPD (≤20)	Qual.
	11	12		
Hexavalent Chromium	0.0374	0.0339	10	

Analyte	Concentration (ng/m3)		RPD (≤20)	Qual.
	20	21		
Hexavalent Chromium	0.0266	0.0259	3	

LDC #: 3319AB

**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 C¹⁰ was recalculated. Calibration date: 11/2/14

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 ¹⁰	s1	0.05	0.000011	0.99979	0.99979	Y
		s2	0.10	0.0000338			
		s3	0.20	0.0000759			
		s4	0.50	0.0002023			
		s5	1.00	0.000396			
		s6	2.00	0.0008333			
ICV 11:12 Calibration verification	C ¹⁰	<u>Found</u> 0.5105ng/ml	<u>True</u> 0.5ng/ml		102.1%R	102.1%R	Y
CCV 12:28 Calibration verification	C ¹⁰	0.4897ng/ml	0.5ng/ml		97.9%R	97.9%R	
ICV 11:39 Calibration verification	C ¹⁰	0.5080ng/ml	0.5ng/ml		101.6%R	101.6%R	

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 #: 3319AB

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

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

METHOD: Inorganics, Method See Lower

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	Laboratory control sample	C ⁺⁶	1.04 ng/ml	1 ng/ml	104%R	104%R	y
N	Matrix spike sample		(SSR-SR)				
Dup	Duplicate sample	C ⁺⁶	0.0460 ng/l ³	0.0485 ng/l ³	5.29%RPD	5.31%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 (14) Cr⁺⁶ reported with a positive detect were recalculated and verified using the following equation:

Concentration =
$$\frac{A - (-1.02E-05)}{0.000419}$$

Recalculation:
$$\frac{0.000209 - (-1.02E-05)}{0.000419} = 0.0742 \text{ ng/L}$$

$$A = 0.0000209$$

$$\frac{V_f = 10 \text{ mL}}{m^3 = 21.16} \times \frac{(ng/mL)(V_f)}{m^3} = ng/m^3$$

$$\frac{(0.0742 \text{ ng/L})(10 \text{ mL})}{21.16 \text{ m}^3} = 0.0351$$

#	Sample ID	Analyte	Reported Concentration (ng/m ³)	Calculated Concentration (ng/m ³)	Acceptable (Y/N)
	1	Cr ⁺⁶	0.0180	0.0180	Y
	2		ND	ND	
	3		0.0485	0.0485	
	4		0.0401	0.0401	
	5		ND	ND	
	6		0.0523	0.0523	
	7		ND	ND	
	8		ND	ND	
	9		0.0441	0.0441	
	10		0.0310	0.0310	Y
	11		0.0374	0.0375	Y*
	12		0.0339	0.0340	Y*
	13		0.0433	0.0434	Y*
	14		0.0351	0.0351	Y
	15		0.0497	0.0497	
	16		ND	ND	
	17		ND	ND	
	18		0.0225	0.0226	Y*
	19		0.0393	0.0393	Y
	20		0.0266	0.0267	Y*

Note: *Rounding



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FILE #: 3926.00

REPORTED: 11/18/14 13:10

SUBMITTED: 11/11/14 to 11/12/14

AQS SITE

CODE:
SITE CODE:

Honeywell Hex Chrome Study

Description: OAM 1

Lab ID: 4111126-01

Sampled: 11/07/14 15:04

Matrix: Air

Sample Volume: 21.49 m³

Received: 11/11/14 11:14

Comments: Start Time 11/6/14 15:12

Analysis Date: 11/12/14 14:11

Hexavalent Chromium

<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	0.0180		0.0036

11/19/14
KK



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FILE #: 3926.00

REPORTED: 11/18/14 13:10

SUBMITTED: 11/11/14 to 11/12/14

AQS SITE

CODE:

SITE CODE: Honeywell Hex Chrome Study

Description: OAM 2

Lab ID: 4111126-02

Sampled: 11/07/14 15:26

Matrix: Air

Sample Volume: 21.47 m³

Received: 11/11/14 11:14

Comments: Start Time 11/6/14 15:34

Analysis Date: 11/12/14 14:21

Hexavalent Chromium

<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	ND	U	0.0036

11/19/14
KE

Eastern Research Group

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FILE #: 3926.00

REPORTED: 11/18/14 13:10

SUBMITTED: 11/11/14 to 11/12/14

AQS SITE

CODE:
SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-1

Lab ID: 4111126-03

Sampled: 11/07/14 16:36

Matrix: Air

Sample Volume: 21.12 m³

Received: 11/11/14 11:14

Comments: Col 1 Start Time 11/6/14 17:08

Analysis Date: 11/12/14 12:48

Hexavalent Chromium

<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	0.0485		0.0036

11/19/14 KK

Eastern Research Group

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FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 11/18/14 13:10

SUBMITTED: 11/11/14 to 11/12/14

AQS SITE

CODE:
SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-1D

Lab ID: 4111126-04

Sampled: 11/07/14 16:39

Matrix: Air

Sample Volume: 21.12 m³

Received: 11/11/14 11:14

Comments: Col 2 Start Time 11/6/14 17:11

Analysis Date: 11/12/14 13:08

Hexavalent Chromium

<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	0.0401		0.0036

11/19/14
Kc



CERTIFICATE OF ANALYSIS

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Malvern, PA 19355

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

FILE #: 3926.00

REPORTED: 11/18/14 13:10

SUBMITTED: 11/11/14 to 11/12/14

AQS SITE

CODE SITE CODE: Honeywell Hex Chrome Study

Description: PAM-3	Lab ID: 4111126-06	Sampled: 11/07/14 16:10
Matrix: Air	Sample Volume: 21.51 m ³	Received: 11/11/14 11:14
Comments: Start Time 11/6/14 16:15		Analysis Date: 11/12/14 14:50

Hexavalent Chromium

<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

11/19/14
KK

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REPORTED: 11/18/14 13:10

SUBMITTED: 11/11/14 to 11/12/14

AQS SITE

CODE:
SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-4

Lab ID: 4111126-07

Sampled: 11/07/14 15:52

Matrix: Air

Sample Volume: 21.45 m³

Received: 11/11/14 11:14

Comments: Start Time 11/6/14 16:01

Analysis Date: 11/12/14 15:00

Hexavalent Chromium

<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	0.0523		0.0036

11/19/14
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FILE #: 3926.00

REPORTED: 11/18/14 13:10

SUBMITTED: 11/11/14 to 11/12/14

AQS SITE

CODE: Honeywell Hex Chrome Study
SITE CODE:

Description: PAM-21	Lab ID: 4111126-08	Sampled: 11/07/14 00:00
Matrix: Air	Sample Volume: 21.51 m ³	Received: 11/11/14 11:14
Comments:		Analysis Date: 11/12/14 15:09

Hexavalent Chromium

<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

11/19/14
KK



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FILE #: 3926.00

REPORTED: 11/18/14 13:10

SUBMITTED: 11/11/14 to 11/12/14

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

Description: PAM-31	Lab ID: 4111126-09	Sampled: 11/07/14 00:00
Matrix: Air	Sample Volume: 21.51 m ³	Received: 11/11/14 11:14
Comments:		Analysis Date: 11/12/14 15:41

Hexavalent Chromium

<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

11/19/14
EK



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FILE #: 3926.00

REPORTED: 11/18/14 13:10

SUBMITTED: 11/11/14 to 11/12/14

AQS SITE

CODE:
SITE CODE:

Honeywell Hex Chrome Study

Description: OAM 1

Lab ID: 4111126-10

Sampled: 11/10/14 15:14

Matrix: Air

Sample Volume: 21.11 m³

Received: 11/11/14 11:14

Comments: Start Time 11/9/14 15:46

Analysis Date: 11/12/14 15:51

Hexavalent Chromium

<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	0.0441		0.0036

11/19/14
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FILE #: 3926.00

REPORTED: 11/18/14 13:10

SUBMITTED: 11/11/14 to 11/12/14

AQS SITE

CODE:
SITE CODE:

Honeywell Hex Chrome Study

Description: OAM 2

Lab ID: 4111126-11

Sampled: 11/10/14 15:33

Matrix: Air

Sample Volume: 21.13 m³

Received: 11/11/14 11:14

Comments: Start Time 11/9/14 16:04

Analysis Date: 11/12/14 16:01

Hexavalent Chromium

<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	0.0310		0.0036

11/19/14
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FILE #: 3926.00

REPORTED: 11/18/14 13:10

SUBMITTED: 11/11/14 to 11/12/14

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

Description: PAM-1	Lab ID: 4111126-12	Sampled: 11/10/14 16:44
Matrix: Air	Sample Volume: 21.31 m ³	Received: 11/11/14 11:14
Comments: Col 1 Start Time 11/9/14 17:03		Analysis Date: 11/12/14 13:28

Hexavalent Chromium

<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	0.0374		0.0036

11/19/14
FK

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FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 11/18/14 13:10

SUBMITTED: 11/11/14 to 11/12/14

AQS SITE

CODE:
SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-1D

Lab ID: 4111126-13

Sampled: 11/10/14 16:49

Matrix: Air

Sample Volume: 21.36 m³

Received: 11/11/14 11:14

Comments: Col 2 Start Time 11/9/14 17:05

Analysis Date: 11/12/14 13:48

Hexavalent Chromium

<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	0.0339		0.0036

11/19/14
KF

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FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 11/18/14 13:10

SUBMITTED: 11/11/14 to 11/12/14

AQS SITE

CODE:
SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-2

Lab ID: 4111126-14

Sampled: 11/10/14 16:18

Matrix: Air

Sample Volume: 21.23 m³

Received: 11/11/14 11:14

Comments: Start Time 11/9/14 16:43

Analysis Date: 11/12/14 16:11

Hexavalent Chromium

<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	0.0433		0.0036

11/19/14
FK

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FILE #: 3926.00

REPORTED: 11/18/14 13:10

SUBMITTED: 11/11/14 to 11/12/14

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

Description: PAM-4	Lab ID: 4111126-16	Sampled: 11/10/14 15:53
Matrix: Air	Sample Volume: 21.06 m ³	Received: 11/11/14 11:14
Comments: Start Time 11/9/14 16:29		Analysis Date: 11/12/14 16:37

Hexavalent Chromium

<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	0.0497		0.0036

11/19/14
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FILE #: 3926.00

REPORTED: 11/18/14 13:10

SUBMITTED: 11/11/14 to 11/12/14

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

Description: PAM-21	Lab ID: 4111126-17	Sampled: 11/10/14 00:00
Matrix: Air	Sample Volume: 21.23 m ³	Received: 11/11/14 11:14
Comments:		Analysis Date: 11/12/14 16:47

Hexavalent Chromium

<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

11/19/14
KJC

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FILE #: 3926.00

REPORTED: 11/18/14 13:10

SUBMITTED: 11/11/14 to 11/12/14

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

Description: PAM-31	Lab ID: 4111126-18	Sampled: 11/10/14 00:00
Matrix: Air	Sample Volume: 21.16 m ³	Received: 11/11/14 11:14
Comments:		Analysis Date: 11/12/14 17:17

Hexavalent Chromium

<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

11/19/14
KK

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FILE #: 3926.00

REPORTED: 11/18/14 13:10

SUBMITTED: 11/11/14 to 11/12/14

AQS SITE

CODE:
SITE CODE:

Honeywell Hex Chrome Study

Description: OAM 1

Lab ID: 4111203-01

Sampled: 11/11/14 15:06

Matrix: Air

Sample Volume: 21.42 m³

Received: 11/12/14 10:38

Comments: Start Time 11/10/14 15:18

Analysis Date: 11/13/14 13:39

Hexavalent Chromium

<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	0.0225		0.0036

11/19/14

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FILE #: 3926.00

REPORTED: 11/18/14 13:10

SUBMITTED: 11/11/14 to 11/12/14

AQS SITE

CODE:
SITE CODE:

Honeywell Hex Chrome Study

Description: OAM 2

Lab ID: 4111203-02

Sampled: 11/11/14 15:31

Matrix: Air

Sample Volume: 21.51 m³

Received: 11/12/14 10:38

Comments: Start Time 11/10/14 15:37

Analysis Date: 11/13/14 13:49

Hexavalent Chromium

<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	0.0393		0.0036

11/19/14
KK

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FILE #: 3926.00

REPORTED: 11/18/14 13:10

SUBMITTED: 11/11/14 to 11/12/14

AQS SITE

CODE:
SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-1

Lab ID: 4111203-03

Sampled: 11/11/14 16:44

Matrix: Air

Sample Volume: 21.54 m³

Received: 11/12/14 10:38

Comments: Col 1 Start Time 11/10/14 16:48

Analysis Date: 11/13/14 12:59

Hexavalent Chromium

<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	0.0266		0.0036

11/19/14
kk



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FILE #: 3926.00

REPORTED: 11/18/14 13:10

SUBMITTED: 11/11/14 to 11/12/14

AQS SITE

CODE:
SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-1D

Lab ID: 4111203-04

Sampled: 11/11/14 16:47

Matrix: Air

Sample Volume: 21.52 m³

Received: 11/12/14 10:38

Comments: Col 2 Start Time 11/10/14 16:52

Analysis Date: 11/13/14 13:19

Hexavalent Chromium

<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	0.0259		0.0036

11/19/14
KK

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FILE #: 3926.00

REPORTED: 11/18/14 13:10

SUBMITTED: 11/11/14 to 11/12/14

AQS SITE

CODE:
SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-2

Lab ID: 4111203-05

Sampled: 11/11/14 16:26

Matrix: Air

Sample Volume: 21.65 m³

Received: 11/12/14 10:38

Comments: Start Time 11/10/14 16:22

Analysis Date: 11/13/14 13:59

Hexavalent Chromium

<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	0.0269		0.0036

11/19/14
KK

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FILE #: 3926.00

REPORTED: 11/18/14 13:10

SUBMITTED: 11/11/14 to 11/12/14

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

Description: PAM-3	Lab ID: 4111203-06	Sampled: 11/11/14 16:12
Matrix: Air	Sample Volume: 21.63 m ³	Received: 11/12/14 10:38
Comments: Start Time 11/10/14 16:10		Analysis Date: 11/13/14 14:08

Hexavalent Chromium

<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	0.0269		0.0036

KE
11/19/14

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FILE #: 3926.00

REPORTED: 11/18/14 13:10

SUBMITTED: 11/11/14 to 11/12/14

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

Description: PAM-4	Lab ID: 4111203-07	Sampled: 11/11/14 15:58
Matrix: Air	Sample Volume: 21.61 m ³	Received: 11/12/14 10:38
Comments: Start Time 11/10/14 15:57		Analysis Date: 11/13/14 14:18

Hexavalent Chromium

<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	0.0313		0.0036

11/19/14
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FILE #: 3926.00

REPORTED: 11/18/14 13:10

SUBMITTED: 11/11/14 to 11/12/14

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

Description: PAM-21	Lab ID: 4111203-08	Sampled: 11/11/14 00:00
Matrix: Air	Sample Volume: 21.65 m ³	Received: 11/12/14 10:38
Comments:		Analysis Date: 11/13/14 14:28

Hexavalent Chromium

<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

11/19/14
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FILE #: 3926.00

REPORTED: 11/18/14 13:10

SUBMITTED: 11/11/14 to 11/12/14

AQS SITE

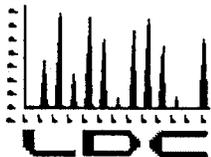
CODE: SITE CODE: Honeywell Hex Chrome Study

Description: PAM-31	Lab ID: 4111203-09	Sampled: 11/11/14 00:00
Matrix: Air	Sample Volume: 21.63 m ³	Received: 11/12/14 10:38
Comments:		Analysis Date: 11/13/14 14:58

Hexavalent Chromium

<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

11/19/14
KK



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

November 25, 2014

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 November 20, 2014. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #33142:

SDG

41113111/411412

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: November 12 through November 13, 2014
LDC Report Date: November 21, 2014
Matrix: Air
Parameters: Hexavalent Chromium
Validation Level: EPA Level IV
Laboratory: Eastern Research Group
Sample Delivery Group (SDG): 4111311/4111412

Sample Identification

OAM 1 (11/12/14)	PAM-1 (11/13/14)DUP
OAM 2 (11/12/14)	PAM-1D (11/13/14)DUP
PAM-1 (11/12/14)	
PAM-1D (11/12/14)	
PAM-2 (11/12/14)	
PAM-3 (11/12/14)	
PAM-4 (11/12/14)	
PAM-21 (11/12/14)	
PAM-31 (11/12/14)	
OAM 1 (11/13/14)	
OAM 2 (11/13/14)	
PAM-1 (11/13/14)	
PAM-1D (11/13/14)	
PAM-2 (11/13/14)	
PAM-3 (11/13/14)	
PAM-4 (11/13/14)	
PAM-21 (11/13/14)	
PAM-31 (11/13/14)	
PAM-1 (11/12/14)DUP	
PAM-1D (11/12/14)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 (11/12/14) and PAM-31 (11/13/14) were identified as trip blanks. No hexavalent chromium was found.

Samples PAM-21 (11/12/14) and PAM-21 (11/13/14) 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 (11/12/14) and PAM-1D (11/12/14) and samples PAM-1 (11/13/14) and PAM-1D (11/13/14) 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 (11/12/14)	PAM-1D (11/12/14)			
Hexavalent chromium	0.0632	0.0623	1 (≤20)	-	-

Analyte	Concentration (ng/m ³)		RPD (Limits)	Flags	A or P
	PAM-1 (11/13/14)	PAM-1D (11/13/14)			
Hexavalent chromium	0.0391	0.0473	19 (≤20)	-	-

**Harbor Point, MD, Hexavalent Chromium Monitoring
Hexavalent Chromium - Data Qualification Summary - SDG 4111311/4111412**

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
4111311/4111412**

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
4111311/4111412**

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

LDC #: 3342
33119A6
 SDG #: 4111311/4111412
 Laboratory: Eastern Research Group

VALIDATION COMPLETENESS WORKSHEET

Level IV

Date: 11/21/14
 Page: 1 of 1
 Reviewer: [Signature]
 2nd Reviewer: [Signature]

METHOD: 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.	Technical holding times	A	Sampling dates: 11/12-13/14
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Blanks	A	
V	Matrix Spike/Matrix Spike Duplicates	N	Not Required
VI.	Duplicates	A	DUP
VII.	Laboratory control samples	A	LCS/D
VIII.	Sample result verification	A	
IX.	Overall assessment of data	A	
X.	Field duplicates	SW	FD = (3.4) (12.13)
XI	Field blanks	ND	FB = (8)(17), TB = (9)(18)

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

Validated Samples: Airs

1	OAM 1 (11/12/14)	11	OAM 2 (11/13/14)	21	PAM-1 (11/13/14)DUP	31	
2	OAM 2 (11/12/14)	12	PAM-1 (11/13/14)	22	PAM-1D (11/13/14)DUP	32	
3	PAM-1 (11/12/14)	13	PAM-1D (11/13/14)	23		33	
4	PAM-1D (11/12/14)	14	PAM-2 (11/13/14)	24		34	
5	PAM-2 (11/12/14)	15	PAM-3 (11/13/14)	25		35	
6	PAM-3 (11/12/14)	16	PAM-4 (11/13/14)	26		36	
7	PAM-4 (11/12/14)	17	PAM-21 (11/13/14)	27		37	
8	PAM-21 (11/12/14)	18	PAM-31 (11/13/14)	28		38	
9	PAM-31 (11/12/14)	19	PAM-1 (11/12/14)DUP	29		39	
10	OAM 1 (11/13/14)	20	PAM-1D (11/12/14)DUP	30		40	

Notes: _____

LDC #: 33142
33142
3D

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
 Reviewer: 30
 2nd Reviewer: a

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 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?			/	

Airs

LDC #: 33142A6

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2
 Reviewer: SD
 2nd Reviewer: R

(5)

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# 33142A6

VALIDATION FINDINGS WORKSHEET
Field Duplicates

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

Inorganics: Method See Cover

Analyte	Concentration (ng/m3)		RPD (≤ 20)	Qual.
	3	4		
Hexavalent Chromium	0.0632	0.0623	1	

Analyte	Concentration (ng/m3)		RPD (≤ 20)	Qual.
	12	13		
Hexavalent Chromium	0.0391	0.0473	19	

\\LDCFILESERVER\Validation\FIELD DUPLICATES\FD_inorganic\33142A6.wpd

LDC #: ⁴² ~~3317716~~
30

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

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

METHOD: Inorganics, Method See Lower

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	Laboratory control sample	C ₆ H ₆	1.09 ng/l	1.00 ng/l	109%R	109%R	Y
N	Matrix spike sample	↓	(SSR-SR)				
Dup	Duplicate sample	↓	0.0648 ng/l ³	0.0632 ng/l ³	2.50%RPD	2.47%RPD	Y*

Comments: _____

* Rounding

LDC #: ⁴²3317A6
30

Validation Findings Worksheet
Initial and Continuing Calibration Calculation Verification

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

Method: Inorganics, Method See Cover

The correlation coefficient (r) for the calibration of Cr⁺⁶ was recalculated. Calibration date: 11/18/14

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

%R = $\frac{\text{Found X 100}}{\text{True}}$ 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	0.0000146	0.99991	0.99991	Y
		s2	0.10	0.0000333			
		s3	0.20	0.0000716			
		s4	0.50	0.0001992			
		s5	1.00	0.0003872			
		s6	2.00	0.0007962			
ICV 11.07 Calibration verification	Cr ⁺⁶	<u>Found</u> 0.4965ng/ml	<u>True</u> 0.5ng/ml		98.1%R	98.1%R	Y
Calibration verification		0.5067ng/ml	0.5ng/ml		101.3%R	101.3%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 #: 33142
30

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

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

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 (14) Cr⁺⁶ reported with a positive detect were recalculated and verified using the following equation:

Concentration = $(A - C_0) / C_1$ $V_f = 10 \text{ ml}$ $m^3 = 21.03$ Recalculation: $\frac{0.0000557 - (-6.53E-06)}{0.0004003} = 0.1555 \text{ ng/ml}$

$A = 0.0000557$ $(\text{ng/ml})(V_f)$
 $C_0 = -6.53E-06$ $\frac{\phantom{0.1555 \text{ ng/ml}} (10 \text{ ml})}{21.03 \text{ m}^3} = \text{ng/m}^3$
 $C_1 = 0.0004003$ $\frac{(0.1555 \text{ ng/ml})(10 \text{ ml})}{21.03 \text{ m}^3} = 0.0739 \text{ ng/m}^3$

#	Sample ID	Analyte	Reported Concentration (ng/m ³)	Calculated Concentration (ng/m ³)	Acceptable (Y/N)
	1	Cr ⁺⁶	ND	ND	Y
	2	↓	ND	ND	↓
	3		0.0632	0.0632	↓
	4		0.0623	0.0622	Y*
	5		0.0271	0.0270	Y*
	6		ND	ND	Y
	7		0.332	0.332	↓
	8		ND	ND	↓
	9		ND	ND	↓
	10		0.059	0.0457 ¹⁶⁰ ₅₀	Y*
	11		0.0208	0.0208	Y
	12		0.0391	0.0391	↓
	13		0.0473	0.0473	↓
	14		0.0739	0.0739	↓
	15		0.0149	0.0148	Y*
	16		0.223	0.223	Y
	17		ND	ND	↓
	18		ND	ND	↓

Note: _____



CERTIFICATE OF ANALYSIS

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ATTN: Mr. Jeff Boggs

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FILE #: 3926.00

REPORTED: 11/20/14 15:28

SUBMITTED: 11/13/14 to 11/14/14

AQS SITE

CODE:
SITE CODE:

Honeywell Hex Chrome Study

Description: OAM 1

Lab ID: 4111311-01

Sampled: 11/12/14 15:19

Matrix: Air

Sample Volume: 21.71 m³

Received: 11/13/14 10:07

Comments: Start Time 11/11/14 15:12

Analysis Date: 11/18/14 13:48

Hexavalent Chromium

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

NOV 24 2014

Initials: CR

Eastern Research Group

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REPORTED: 11/20/14 15:28

SUBMITTED: 11/13/14 to 11/14/14

AQS SITE

CODE:

SITE CODE: Honeywell Hex Chrome Study

Description: OAM 2

Lab ID: 4111311-02

Sampled: 11/12/14 15:39

Matrix: Air

Sample Volume: 21.6 m³

Received: 11/13/14 10:07

Comments: Start Time 11/11/14 15:39

Analysis Date: 11/18/14 13:58

Hexavalent Chromium

<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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AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

Description: PAM-1	Lab ID: 4111311-03	Sampled: 11/12/14 16:47
Matrix: Air	Sample Volume: 21.51 m ³	Received: 11/13/14 10:07
Comments: Col 1 Start Time 11/11/14 16:52		Analysis Date: 11/18/14 12:27

Hexavalent Chromium

<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	0.0632		0.0036

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AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

Description: PAM-1D	Lab ID: 4111311-04	Sampled: 11/12/14 16:50
Matrix: Air	Sample Volume: 21.54 m ³	Received: 11/13/14 10:07
Comments: Col 2 Start Time 11/11/14 16:54		Analysis Date: 11/18/14 12:47

Hexavalent Chromium

<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	0.0623		0.0036

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REPORTED: 11/20/14 15:28

SUBMITTED: 11/13/14 to 11/14/14

AQS SITE

CODE:
SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-2

Lab ID: 4111311-05

Sampled: 11/12/14 16:35

Matrix: Air

Sample Volume: 21.64 m³

Received: 11/13/14 10:07

Comments: Start Time 11/11/14 16:32

Analysis Date: 11/18/14 14:28

Hexavalent Chromium

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u>		<u>MDL</u>
		<u>ng/m³ Air</u>	<u>Flag</u>	
Hexavalent Chromium	1854-02-99	0.0271		0.0036

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Initials: *CR*

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REPORTED: 11/20/14 15:28

SUBMITTED: 11/13/14 to 11/14/14

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

Description: PAM-3	Lab ID: 4111311-06	Sampled: 11/12/14 16:21
Matrix: Air	Sample Volume: 21.65 m ³	Received: 11/13/14 10:07
Comments: Start Time 11/11/14 16:18		Analysis Date: 11/18/14 14:37

Hexavalent Chromium

<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

NOV 24 2014

Initials: *ER*



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FILE #: 3926.00

REPORTED: 11/20/14 15:28

SUBMITTED: 11/13/14 to 11/14/14

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

Description: PAM-4	Lab ID: 4111311-07	Sampled: 11/12/14 16:09
Matrix: Air	Sample Volume: 21.67 m ³	Received: 11/13/14 10:07
Comments: Start Time 11/11/14 16:04		Analysis Date: 11/18/14 14:47

Hexavalent Chromium

<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	0.332		0.0036

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FILE #: 3926.00

REPORTED: 11/20/14 15:28

SUBMITTED: 11/13/14 to 11/14/14

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

Description: PAM-21	Lab ID: 4111311-08	Sampled: 11/12/14 00:00
Matrix: Air	Sample Volume: 21.64 m ³	Received: 11/13/14 10:07
Comments:		Analysis Date: 11/18/14 14:57

Hexavalent Chromium

<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

NOV 24 2014

Initials: *CR*



CERTIFICATE OF ANALYSIS

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FILE #: 3926.00

REPORTED: 11/20/14 15:28

SUBMITTED: 11/13/14 to 11/14/14

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

Description: PAM-31	Lab ID: 4111311-09	Sampled: 11/12/14 00:00
Matrix: Air	Sample Volume: 21.65 m ³	Received: 11/13/14 10:07
Comments:		Analysis Date: 11/18/14 15:07

Hexavalent Chromium

<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

NOV 24 2014

Initials: ER



CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc
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PHONE: (443) 803-8495 FAX: (410) 266-8912

FILE #: 3926.00
REPORTED: 11/20/14 15:28
SUBMITTED: 11/13/14 to 11/14/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: OAM 1	Lab ID: 4111412-01	Sampled: 11/13/14 15:05
Matrix: Air	Sample Volume: 21.33 m ³	Received: 11/14/14 10:48
Comments: Start Time 11/12/14 15:23		Analysis Date: 11/18/14 15:17

Hexavalent Chromium

<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	0.0159		0.0036

NOV 24 2014

Initials: *CR*

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REPORTED: 11/20/14 15:28

SUBMITTED: 11/13/14 to 11/14/14

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

Description: OAM 2	Lab ID: 4111412-02	Sampled: 11/13/14 15:23
Matrix: Air	Sample Volume: 21.3 m ³	Received: 11/14/14 10:48
Comments: Start Time 11/12/14 15:43		Analysis Date: 11/18/14 15:27

Hexavalent Chromium

<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

NOV 24 2014

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: 11/20/14 15:28

SUBMITTED: 11/13/14 to 11/14/14

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

Description: PAM-1	Lab ID: 4111412-03	Sampled: 11/13/14 16:11
Matrix: Air	Sample Volume: 21.02 m ³	Received: 11/14/14 10:48
Comments: Col 1 Start Time 11/12/14 16:50		Analysis Date: 11/18/14 13:07

Hexavalent Chromium

<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	0.0391		0.0036

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FILE #: 3926.00

REPORTED: 11/20/14 15:28

SUBMITTED: 11/13/14 to 11/14/14

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

Description: PAM-1D	Lab ID: 4111412-04	Sampled: 11/13/14 16:15
Matrix: Air	Sample Volume: 21.02 m ³	Received: 11/14/14 10:48
Comments: Col 2 Start Time 11/12/14 16:54		Analysis Date: 11/18/14 13:27

Hexavalent Chromium

<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	0.0473		0.0036

NOV 24 2014

Initials: *CR*



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

FILE #: 3926.00

REPORTED: 11/20/14 15:28

SUBMITTED: 11/13/14 to 11/14/14

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

Description: PAM-2	Lab ID: 4111412-05	Sampled: 11/13/14 16:01
Matrix: Air	Sample Volume: 21.03 m ³	Received: 11/14/14 10:48
Comments: Start Time 11/12/14 16:39		Analysis Date: 11/18/14 15:37

Hexavalent Chromium

<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	0.0739		0.0036

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FILE #: 3926.00

REPORTED: 11/20/14 15:28

SUBMITTED: 11/13/14 to 11/14/14

AQS SITE

CODE:
SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-3

Lab ID: 4111412-06

Sampled: 11/13/14 15:52

Matrix: Air

Sample Volume: 21.1 m³

Received: 11/14/14 10:48

Comments: Start Time 11/12/14 16:25

Analysis Date: 11/18/14 15:47

Hexavalent Chromium

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u>		<u>MDL</u>
		<u>ng/m³ Air</u>	<u>Flag</u>	
Hexavalent Chromium	1854-02-99	0.0149		0.0036

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FILE #: 3926.00

REPORTED: 11/20/14 15:28

SUBMITTED: 11/13/14 to 11/14/14

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-4

Lab ID: 4111412-07

Sampled: 11/13/14 15:42

Matrix: Air

Sample Volume: 21.14 m³

Received: 11/14/14 10:48

Comments: Start Time 11/12/14 16:13

Analysis Date: 11/18/14 15:57

Hexavalent Chromium

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u>		<u>MDL</u>
		<u>ng/m³ Air</u>	<u>Flag</u>	
Hexavalent Chromium	1854-02-99	0.223		0.0036

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FILE #: 3926.00

REPORTED: 11/20/14 15:28

SUBMITTED: 11/13/14 to 11/14/14

AQS SITE

CODE:
SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-21

Lab ID: 4111412-08

Sampled: 11/13/14 00:00

Matrix: Air

Sample Volume: 21.03 m³

Received: 11/14/14 10:48

Comments:

Analysis Date: 11/18/14 16:26

Hexavalent Chromium

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

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FILE #: 3926.00

REPORTED: 11/20/14 15:28

SUBMITTED: 11/13/14 to 11/14/14

AQS SITE

CODE:

SITE CODE: Honeywell Hex Chrome Study

Description: PAM-31

Lab ID: 4111412-09

Sampled: 11/13/14 00:00

Matrix: Air

Sample Volume: 21.1 m³

Received: 11/14/14 10:48

Comments:

Analysis Date: 11/18/14 16:36

Hexavalent Chromium

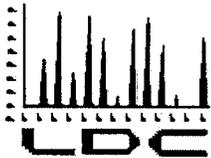
<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u> <u>ng/m³ Air</u>	<u>Flag</u>	<u>MDL</u> <u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0036

NOV 24 2014

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

November 26, 2014

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 November 25, 2014. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #33168:

SDG

4111833/4111920

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: November 14 through November 18, 2014
LDC Report Date: November 25, 2014
Matrix: Air
Parameters: Hexavalent Chromium
Validation Level: EPA Level IV
Laboratory: Eastern Research Group
Sample Delivery Group (SDG): 4111833/4111920

Sample Identification

OAM 1(11/14/14)	PAM-1(11/18/14)DUP
OAM 2(11/14/14)	PAM-1D(11/18/14)DUP
PAM-1(11/14/14)	
PAM-1D(11/14/14)	
PAM-2(11/14/14)	
PAM-3(11/14/14)	
PAM-4(11/14/14)	
PAM-21(11/14/14)	
PAM-31(11/14/14)	
OAM 1(11/18/14)	
OAM 2(11/18/14)	
PAM-1(11/18/14)	
PAM-1D(11/18/14)	
PAM-2(11/18/14)	
PAM-3(11/18/14)	
PAM-4(11/18/14)	
PAM-21(11/18/14)	
PAM-31(11/18/14)	
PAM-1(11/14/14)DUP	
PAM-1D(11/14/14)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(11/14/14) and PAM-31(11/18/14) were identified as trip blanks. No hexavalent chromium was found.

Samples PAM-21(11/14/14) and PAM-21(11/18/14) 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(11/14/14) and PAM-1D(11/14/14) and samples PAM-1(11/18/14) and PAM-1D(11/18/14) 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(11/14/14)	PAM-1D(11/14/14)			
Hexavalent chromium	0.0160	0.0163	2 (≤20)	-	-

Analyte	Concentration (ng/m ³)		RPD (Limits)	Flags	A or P
	PAM-1(11/18/14)	PAM-1D(11/18/14)			
Hexavalent chromium	0.0574	0.0695	19 (≤20)	-	-

**Harbor Point, MD, Hexavalent Chromium Monitoring
Hexavalent Chromium - Data Qualification Summary - SDG 4111833/4111920**

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
4111833/4111920**

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
4111833/4111920**

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

LDC #: 33168A6

VALIDATION COMPLETENESS WORKSHEET

Date: 11/25/14

SDG #: 4111833/4111920

Level IV

Page: 1 of 1

Laboratory: Eastern Research Group

Reviewer: SD

2nd Reviewer: [Signature]

METHOD: 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.	Technical holding times	A	Sampling dates: 11/14-18/14
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Blanks	A	
V	Matrix Spike/Matrix Spike Duplicates	N	Not Required
VI.	Duplicates	A	DUP
VII.	Laboratory control samples	A	LCS/D
VIII.	Sample result verification	A	
IX.	Overall assessment of data	A	
X.	Field duplicates	SW	FD = (3,4) (12,13)
XI	Field blanks	ND	FB = (8)(17) TB = (9)(18)

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

Validated Samples: Airs

1	OAM 1(11/14/14)	11	OAM 2(11/18/14)	21	PAM-1(11/18/14)DUP	31
2	OAM 2(11/14/14)	12	PAM-1(11/18/14)	22	PAM-1D(11/18/14)DUP	32
3	PAM-1(11/14/14)	13	PAM-1D(11/18/14)	23		33
4	PAM-1D(11/14/14)	14	PAM-2(11/18/14)	24		34
5	PAM-2(11/14/14)	15	PAM-3(11/18/14)	25		35
6	PAM-3(11/14/14)	16	PAM-4(11/18/14)	26		36
7	PAM-4(11/14/14)	17	PAM-21(11/18/14)	27		37
8	PAM-21(11/14/14)	18	PAM-31(11/18/14)	28		38
9	PAM-31(11/14/14)	19	PAM-1(11/14/14)DUP	29		39
10	OAM 1(11/18/14)	20	PAM-1D(11/14/14)DUP	30		40

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>85-110</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?			/	

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.		/		

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Inorganics: Method See Cover

Analyte	Concentration (ng/m3)		RPD (≤20)	Qual.
	3	4		
Hexavalent Chromium	0.0160	0.0163	2	

Analyte	Concentration (ng/m3)		RPD (≤20)	Qual.
	12	13		
Hexavalent Chromium	0.0574	0.0695	19	

LDC #: 3316816

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: 11/19/14

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	0.0000137	0.99993	0.99993	Y
		s2	0.10	0.0000334			
		s3	0.20	0.0000718			
		s4	0.50	0.0001841			
		s5	1.00	0.0003726			
		s6	2.00	0.0007331			
ICV 11:40 Calibration verification	C ⁺⁶	<u>Found</u> 0.5129 ng/ml	<u>True</u> 0.5 ng/ml		102.6%R	102.6%R	Y
CCV 12:39 Calibration verification	C ⁺⁶	0.5243 ng/ml	0.5 ng/ml		104.9%R	104.9%R	Y
ICV 10:50 Calibration verification	C ⁺⁶	0.5052 ng/ml	0.5 ng/ml		101.0%R	101.0%R	Y

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 #: 33168AD

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 12:09	Laboratory control sample	Cr ⁺⁶	1.10 ng/ml	1 ng/ml	110%R	110%R	Y
N	Matrix spike sample		(SSR-SR)				
DUP- 13:11	Duplicate sample	Cr ⁺⁶	0.0163 ng/l ³	0.0160 0.0345 ng/l ³	1.86 % RPD	1.44 % RPD	Y

Comments: _____



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FILE #: 3926.00

REPORTED: 11/25/14 09:40

SUBMITTED: 11/18/14 to 11/19/14

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: OAM 1

Lab ID: 4111833-01

Sampled: 11/14/14 15:06

Matrix: Air

Sample Volume: 21.57 m³

Received: 11/18/14 11:15

Comments: Start Time 11/13/14 15:08

Analysis Date: 11/19/14 13:41

Hexavalent Chromium

Results

MDL

<u>Analyte</u>	<u>CAS Number</u>	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0104		0.0036

NOV 26 2014

Initials: *CR*



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FILE #: 3926.00

REPORTED: 11/25/14 09:40

SUBMITTED: 11/18/14 to 11/19/14

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: OAM 2

Lab ID: 4111833-02

Sampled: 11/14/14 15:24

Matrix: Air

Sample Volume: 21.57 m³

Received: 11/18/14 11:15

Comments: Start Time 11/13/14 15:26

Analysis Date: 11/19/14 13:51

Hexavalent Chromium

Results

MDL

Analyte

CAS Number

ng/m³ Air

Flag

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0124

0.0036

NOV 26 2014

Initials: CR

Eastern Research Group

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FILE #: 3926.00

REPORTED: 11/25/14 09:40

SUBMITTED: 11/18/14 to 11/19/14

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

Description: PAM-1	Lab ID: 4111833-03	Sampled: 11/14/14 16:08
Matrix: Air	Sample Volume: 21.51 m ³	Received: 11/18/14 11:15
Comments: Col 1 Start Time 11/13/14 16:14		Analysis Date: 11/19/14 13:01

Hexavalent Chromium

<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	0.0160		0.0036

NOV 26 2014

Initials: *ER*



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75 Valley Stream Parkway, Suite 400
Malvern, PA 19355

ATTN: Mr. Jeff Boggs

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

FILE #: 3926.00

REPORTED: 11/25/14 09:40

SUBMITTED: 11/18/14 to 11/19/14

AQS SITE

CODE: Honeywell Hex Chrome Study
SITE CODE:

Description: PAM-1D	Lab ID: 4111833-04	Sampled: 11/14/14 16:10
Matrix: Air	Sample Volume: 21.48 m ³	Received: 11/18/14 11:15
Comments: Col 2 Start Time 11/13/14 16:18		Analysis Date: 11/19/14 13:20

Hexavalent Chromium

<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	0.0163		0.0036

NOV 26 2014

Initials: *ER*



CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc
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FILE #: 3926.00

REPORTED: 11/25/14 09:40

SUBMITTED: 11/18/14 to 11/19/14

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

Description: PAM-2	Lab ID: 4111833-05	Sampled: 11/14/14 16:00
Matrix: Air	Sample Volume: 21.53 m ³	Received: 11/18/14 11:15
Comments: Start Time 11/13/14 16:05		Analysis Date: 11/19/14 14:01

Hexavalent Chromium

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u>		<u>MDL</u>
		<u>ng/m³ Air</u>	<u>Flag</u>	
Hexavalent Chromium	1854-02-99	0.0137		0.0036

NOV 26 2014

Initials: *ER*



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REPORTED: 11/25/14 09:40

SUBMITTED: 11/18/14 to 11/19/14

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-3

Lab ID: 4111833-06

Sampled: 11/14/14 15:51

Matrix: Air

Sample Volume: 21.54 m³

Received: 11/18/14 11:15

Comments: Start Time 11/13/14 15:55

Analysis Date: 11/19/14 14:11

Hexavalent Chromium

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u>		<u>MDL</u>
		<u>ng/m³ Air</u>	<u>Flag</u>	
Hexavalent Chromium	1854-02-99	0.0091		0.0036

NOV 26 2014

Initials: *CR*

Eastern Research Group

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FILE #: 3926.00

REPORTED: 11/25/14 09:40

SUBMITTED: 11/18/14 to 11/19/14

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-4	Lab ID: 4111833-07	Sampled: 11/14/14 15:42
Matrix: Air	Sample Volume: 21.54 m ³	Received: 11/18/14 11:15
Comments: Start Time 11/13/14 15:46		Analysis Date: 11/19/14 14:21

Hexavalent Chromium

<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	0.0732		0.0036

NOV 26 2014

Initials: *CR*

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FILE #: 3926.00

REPORTED: 11/25/14 09:40

SUBMITTED: 11/18/14 to 11/19/14

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-21

Lab ID: 4111833-08

Sampled: 11/14/14 00:00

Matrix: Air

Sample Volume: 21.53 m³

Received: 11/18/14 11:15

Comments:

Analysis Date: 11/19/14 14:31

Hexavalent Chromium

Results

MDL

Analyte

CAS Number

ng/m³ Air

Flag

ng/m³ Air

Hexavalent Chromium

1854-02-99

ND

U

0.0036

NOV 26 2014

Initials: *ER*

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FILE #: 3926.00

REPORTED: 11/25/14 09:40

SUBMITTED: 11/18/14 to 11/19/14

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

Description: PAM-31	Lab ID: 4111833-09	Sampled: 11/14/14 00:00
Matrix: Air	Sample Volume: 21.54 m ³	Received: 11/18/14 11:15
Comments:		Analysis Date: 11/19/14 15:01

Hexavalent Chromium

<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

NOV 26 2014

Initials: *ER*



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FILE #: 3926.00

REPORTED: 11/25/14 09:40

SUBMITTED: 11/18/14 to 11/19/14

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: OAM 1	Lab ID: 4111920-01	Sampled: 11/18/14 15:16
Matrix: Air	Sample Volume: 21.56 m ³	Received: 11/19/14 11:26
Comments: Start Time 11/17/14 15:18		Analysis Date: 11/20/14 12:52

Hexavalent Chromium

<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	ND	U	0.0036

NOV 26 2014

Initials: ER

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FILE #: 3926.00

REPORTED: 11/25/14 09:40

SUBMITTED: 11/18/14 to 11/19/14

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: OAM 2

Lab ID: 4111920-02

Sampled: 11/18/14 15:46

Matrix: Air

Sample Volume: 21.73 m³

Received: 11/19/14 11:26

Comments: Start Time 11/17/14 15:38

Analysis Date: 11/20/14 13:01

Hexavalent Chromium

<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	0.0193		0.0036

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Initials: *CR*

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FILE #: 3926.00

REPORTED: 11/25/14 09:40

SUBMITTED: 11/18/14 to 11/19/14

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-1	Lab ID: 4111920-03	Sampled: 11/18/14 17:06
Matrix: Air	Sample Volume: 21.93 m ³	Received: 11/19/14 11:26
Comments: Col 1 Start Time 11/17/14 16:44		Analysis Date: 11/20/14 12:09

Hexavalent Chromium

<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	0.0574		0.0036

NOV 26 2014

Initials: ER



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FILE #: 3926.00

REPORTED: 11/25/14 09:40

SUBMITTED: 11/18/14 to 11/19/14

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-1D

Lab ID: 4111920-04

Sampled: 11/18/14 17:13

Matrix: Air

Sample Volume: 22.01 m³

Received: 11/19/14 11:26

Comments: Col 2 Start Time 11/17/14 16:45

Analysis Date: 11/20/14 12:29

Hexavalent Chromium

Results

MDL

Analyte

CAS Number

ng/m³ Air

Flag

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0695

0.0036

NOV 26 2014

Initials: *ER*

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FILE #: 3926.00

REPORTED: 11/25/14 09:40

SUBMITTED: 11/18/14 to 11/19/14

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

Description: PAM-2	Lab ID: 4111920-05	Sampled: 11/18/14 16:46
Matrix: Air	Sample Volume: 21.98 m ³	Received: 11/19/14 11:26
Comments: Start Time 11/17/14 16:21		Analysis Date: 11/20/14 13:11

Hexavalent Chromium

<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	0.0157		0.0036

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Malvern, PA 19355

FILE #: 3926.00
REPORTED: 11/25/14 09:40
SUBMITTED: 11/18/14 to 11/19/14
AQS SITE
CODE:
SITE CODE: Honeywell Hex Chrome Study

ATTN: Mr. Jeff Boggs

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

Description: PAM-3	Lab ID: 4111920-06	Sampled: 11/18/14 16:30
Matrix: Air	Sample Volume: 21.88 m ³	Received: 11/19/14 11:26
Comments: Start Time 11/17/14 16:11		Analysis Date: 11/20/14 13:21

Hexavalent Chromium

<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

NOV 26 2014

Initials: *ER*



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ATTN: Mr. Jeff Boggs

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FILE #: 3926.00

REPORTED: 11/25/14 09:40

SUBMITTED: 11/18/14 to 11/19/14

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

Description: PAM-4	Lab ID: 4111920-07	Sampled: 11/18/14 16:13
Matrix: Air	Sample Volume: 21.77 m ³	Received: 11/19/14 11:26
Comments: Start Time 11/17/14 16:02		Analysis Date: 11/20/14 13:31

Hexavalent Chromium

<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	0.0506		0.0036

NOV 26 2014

Initials: *ER*



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ATTN: Mr. Jeff Boggs

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FILE #: 3926.00

REPORTED: 11/25/14 09:40

SUBMITTED: 11/18/14 to 11/19/14

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-21

Lab ID: 4111920-08

Sampled: 11/18/14 00:00

Matrix: Air

Sample Volume: 21.98 m³

Received: 11/19/14 11:26

Comments:

Analysis Date: 11/20/14 13:41

Hexavalent Chromium

Results

MDL

Analyte

CAS Number

ng/m³ Air

Flag

ng/m³ Air

Hexavalent Chromium

1854-02-99

ND

U

0.0036

NOV 26 2014

Initials: ER

Eastern Research Group

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FILE #: 3926.00

REPORTED: 11/25/14 09:40

SUBMITTED: 11/18/14 to 11/19/14

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

Description: PAM-31	Lab ID: 4111920-09	Sampled: 11/18/14 00:00
Matrix: Air	Sample Volume: 21.88 m ³	Received: 11/19/14 11:26
Comments:		Analysis Date: 11/20/14 14:11

Hexavalent Chromium

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

NOV 26 2014

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

December 2, 2014

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 November 26, 2014. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #33183:

SDG

4112009/4112125

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: November 19 through November 20, 2014
LDC Report Date: December 1, 2014
Matrix: Air
Parameters: Hexavalent Chromium
Validation Level: EPA Level IV
Laboratory: Eastern Research Group
Sample Delivery Group (SDG): 4112009/4112125

Sample Identification

OAM 1(11/19/14)	PAM-1(11/20/14)DUP
OAM 2(11/19/14)	PAM-1D(11/20/14)DUP
PAM-1(11/19/14)	
PAM-1D(11/19/14)	
PAM-2(11/19/14)	
PAM-3(11/19/14)	
PAM-4(11/19/14)	
PAM-21(11/19/14)	
PAM-31(11/19/14)	
OAM 1(11/20/14)	
OAM 2(11/20/14)	
PAM-1(11/20/14)	
PAM-1D(11/20/14)	
PAM-2(11/20/14)	
PAM-3(11/20/14)	
PAM-4(11/20/14)	
PAM-21(11/20/14)	
PAM-31(11/20/14)	
PAM-1(11/19/14)DUP	
PAM-1D(11/19/14)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(11/19/14) and PAM-31(11/20/14) were identified as trip blanks. No hexavalent chromium was found.

Samples PAM-21(11/19/14) and PAM-21(11/20/14) 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(11/19/14) and PAM-1D(11/19/14) and samples PAM-1(11/20/14) and PAM-1D(11/20/14) 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(11/19/14)	PAM-1D(11/19/14)			
Hexavalent chromium	0.0186	0.0173	7 (≤20)	-	-

Analyte	Concentration (ng/m ³)		RPD (Limits)	Flags	A or P
	PAM-1(11/20/14)	PAM-1D(11/20/14)			
Hexavalent chromium	0.0687	0.0730	6 (≤20)	-	-

**Harbor Point, MD, Hexavalent Chromium Monitoring
Hexavalent Chromium - Data Qualification Summary - SDG 4112009/4112125**

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
4112009/4112125**

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
4112009/4112125**

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

LDC #: 33183A6
 SDG #: 4112009/4112125
 Laboratory: Eastern Research Group

VALIDATION COMPLETENESS WORKSHEET
 Level IV

Date: 12/14
 Page: 1 of 1
 Reviewer: SD
 2nd Reviewer: a

METHOD: 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.	Technical holding times	A	Sampling dates: 11/19-20/14
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Blanks	A	
V	Matrix Spike/Matrix Spike Duplicates	N	Not Required
VI.	Duplicates	A	DUP
VII.	Laboratory control samples	A	LCSID
VIII.	Sample result verification	A	
IX.	Overall assessment of data	A	
X.	Field duplicates	SW	FD = (3,4) (12,13)
XI	Field blanks	ND	FB = (8)(17) TB = (9)(18)

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

Validated Samples: Airs

1	OAM 1(11/19/14)	11	OAM 2(11/20/14)	21	PAM-1(11/20/14)DUP	31	
2	OAM 2(11/19/14)	12	PAM-1(11/20/14)	22	PAM-1D(11/20/14)DUP	32	
3	PAM-1(11/19/14)	13	PAM-1D(11/20/14)	23		33	
4	PAM-1D(11/19/14)	14	PAM-2(11/20/14)	24		34	
5	PAM-2(11/19/14)	15	PAM-3(11/20/14)	25		35	
6	PAM-3(11/19/14)	16	PAM-4(11/20/14)	26		36	
7	PAM-4(11/19/14)	17	PAM-21(11/20/14)	27		37	
8	PAM-21(11/19/14)	18	PAM-31(11/20/14)	28		38	
9	PAM-31(11/19/14)	19	PAM-1(11/19/14)DUP	29		39	
10	OAM 1(11/20/14)	20	PAM-1D(11/19/14)DUP	30		40	

Notes: _____

Method: Inorganics (EPA Method See. (over))

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?			/	

A/S

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# 33183A6

VALIDATION FINDINGS WORKSHEET
Field Duplicates

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

Inorganics: Method See Cover

Analyte	Concentration (ng/m3)		RPD (≤ 20)	Qual.
	3	4		
Hexavalent Chromium	0.0186	0.0173	7	

Analyte	Concentration (ng/m3)		RPD (≤ 20)	Qual.
	12	13		
Hexavalent Chromium	0.0687	0.0730	6	

\\LDCFILESERVER\Validation\FIELD DUPLICATES\FD_inorganic\33183A6.wpd

LDC #: 33183AG

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

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

Method: Inorganics, Method See Cover

The correlation coefficient (r) for the calibration of Cr⁺⁶ was recalculated. Calibration date: 11/24/14

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. (<u>ng/ml</u>)	Area	Recalculated	Reported	Acceptable (Y/N)
					r or r ²	r or r ²	
Initial calibration	<u>Cr⁺⁶</u>	s1	0.05	0.0000171	0.99993	0.99993	y ↓
		s2	0.10	0.0000388			
		s3	0.20	0.0000811			
		s4	0.50	0.0002169			
		s5	1.00	0.000418			
		s6	2.00	0.0008429			
ICV 11:23 Calibration verification	<u>Cr⁺⁶</u>	<u>Found</u> 0.5041 ng/ml	<u>True</u> 0.5 ng/ml		100.8%R	100.8%R	↓
CCV 12:22 Calibration verification	<u>Cr⁺⁶</u>	0.587 ng/ml	0.5 ng/ml		103.7%R	103.8%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

LDC #: 33183A6

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

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

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	
LLS 11:53	Laboratory control sample	C ⁺⁶	1.11ug/l	1.00ug/l	111%R	111%R	Y
N	Matrix spike sample		(SSR-SR)				
DUP 12:53	Duplicate sample	C ⁺⁶	0.0194ug/l ³	0.0186ug/l ³	4.21%RPD	4.24%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 (16) 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: $\frac{(0.0002593 - (-2.07E-06))}{0.0004227} = 0.6183 \text{ ng/ml}$
 $C_0 = -2.07E-06$ $m^3 = 21.49$
 $C_1 = 0.0004227$ $\frac{(\text{ng/ml})(V_f)}{m^3}$ $\frac{(0.6183 \text{ ng/ml})(10 \text{ ml})}{21.49 \text{ m}^3} = 0.288 \text{ ng/m}^3$

#	Sample ID	Analyte	Reported Concentration (ng/m ³)	Calculated Concentration (ng/m ³)	Acceptable (Y/N)
	1	Cr ⁺⁶	ND	ND	Y
	2	↓	ND	ND	↓
	3		0.0186	0.0186	↓
	4		0.0173	0.0172	Y*
	5		ND	ND	Y
	6		ND	ND	↓
	7		0.0927	0.0927	↓
	8		ND	ND	↓
	9		ND	ND	↓
	10		0.0154	0.0154	↓
	11		0.0149	0.0149	↓
	12		0.0687	0.0687	↓
	13		0.0730	0.0730	↓
	14		0.0534	0.0534	↓
	15		0.0127	0.0127	↓
	16		0.288	0.288	↓
	17		ND	ND	↓
	18		ND	ND	↓

Note: *Rounding



CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc

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ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 11/26/14 14:31

SUBMITTED: 11/20/14 to 11/21/14

AQS SITE

CODE:
SITE CODE:

Honeywell Hex Chrome Study

Description: OAM 1

Lab ID: 4112009-01

Sampled: 11/19/14 15:07

Matrix: Air

Sample Volume: 21.36 m³

Received: 11/20/14 10:24

Comments: Start Time 11/18/14 15:23

Analysis Date: 11/24/14 14:04

Hexavalent Chromium

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

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Initials: *ER*

Eastern Research Group

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REPORTED: 11/26/14 14:31

SUBMITTED: 11/20/14 to 11/21/14

AQS SITE

CODE:
SITE CODE:

Honeywell Hex Chrome Study

Description: OAM 2

Lab ID: 4112009-02

Sampled: 11/19/14 15:34

Matrix: Air

Sample Volume: 21.35 m³

Received: 11/20/14 10:24

Comments: Start Time 11/18/14 15:51

Analysis Date: 11/24/14 14:13

Hexavalent Chromium

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

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REPORTED: 11/26/14 14:31

SUBMITTED: 11/20/14 to 11/21/14

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

Description: PAM-1	Lab ID: 4112009-03	Sampled: 11/19/14 16:34
Matrix: Air	Sample Volume: 21.03 m ³	Received: 11/20/14 10:24
Comments: Col 1 Start Time 11/18/14 17:12		Analysis Date: 11/24/14 12:44

Hexavalent Chromium

<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	0.0186		0.0036

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REPORTED: 11/26/14 14:31

SUBMITTED: 11/20/14 to 11/21/14

AQS SITE

CODE:
SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-1D

Lab ID: 4112009-04

Sampled: 11/19/14 16:37

Matrix: Air

Sample Volume: 20.98 m³

Received: 11/20/14 10:24

Comments: Col 2 Start Time 11/18/14 17:18

Analysis Date: 11/24/14 13:03

Hexavalent Chromium

<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	0.0173		0.0036

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REPORTED: 11/26/14 14:31

SUBMITTED: 11/20/14 to 11/21/14

AQS SITE

CODE: Honeywell Hex Chrome Study
SITE CODE:

Description: PAM-2	Lab ID: 4112009-05	Sampled: 11/19/14 16:20
Matrix: Air	Sample Volume: 21.14 m ³	Received: 11/20/14 10:24
Comments: Start Time 11/18/14 16:51		Analysis Date: 11/24/14 14:43

Hexavalent Chromium

<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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REPORTED: 11/26/14 14:31

SUBMITTED: 11/20/14 to 11/21/14

AQS SITE

CODE: Honeywell Hex Chrome Study
SITE CODE:

Description: PAM-3	Lab ID: 4112009-06	Sampled: 11/19/14 16:08
Matrix: Air	Sample Volume: 21.21 m ³	Received: 11/20/14 10:24
Comments: Start Time 11/18/14 16:34		Analysis Date: 11/24/14 14:53

Hexavalent Chromium

<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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REPORTED: 11/26/14 14:31

SUBMITTED: 11/20/14 to 11/21/14

AQS SITE

CODE:
SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-4

Lab ID: 4112009-07

Sampled: 11/19/14 15:55

Matrix: Air

Sample Volume: 21.27 m³

Received: 11/20/14 10:24

Comments: Start Time 11/18/14 16:17

Analysis Date: 11/24/14 15:03

Hexavalent Chromium

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u>		<u>MDL</u>
		<u>ng/m³ Air</u>	<u>Flag</u>	
Hexavalent Chromium	1854-02-99	0.0927		0.0036

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REPORTED: 11/26/14 14:31

SUBMITTED: 11/20/14 to 11/21/14

AQS SITE

CODE:
SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-21

Lab ID: 4112009-08

Sampled: 11/19/14 00:00

Matrix: Air

Sample Volume: 21.14 m³

Received: 11/20/14 10:24

Comments:

Analysis Date: 11/24/14 15:13

Hexavalent Chromium

<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: 11/26/14 14:31

SUBMITTED: 11/20/14 to 11/21/14

AQS SITE

CODE:
SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-31

Lab ID: 4112009-09

Sampled: 11/19/14 00:00

Matrix: Air

Sample Volume: 21.21 m³

Received: 11/20/14 10:24

Comments:

Analysis Date: 11/24/14 15:23

Hexavalent Chromium

<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	ND	U	0.0036	

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REPORTED: 11/26/14 14:31

SUBMITTED: 11/20/14 to 11/21/14

AQS SITE

CODE:

SITE CODE: Honeywell Hex Chrome Study

Description: OAM 1

Lab ID: 4112125-01

Sampled: 11/20/14 15:09

Matrix: Air

Sample Volume: 21.59 m³

Received: 11/21/14 11:07

Comments: Start Time 11/19/14 15:10

Analysis Date: 11/24/14 15:33

Hexavalent Chromium

<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	0.0154		0.0036

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REPORTED: 11/26/14 14:31

SUBMITTED: 11/20/14 to 11/21/14

AQS SITE

CODE:
SITE CODE:

Honeywell Hex Chrome Study

Description: OAM 2

Lab ID: 4112125-02

Sampled: 11/20/14 15:28

Matrix: Air

Sample Volume: 21.45 m³

Received: 11/21/14 11:07

Comments: Start Time 11/19/14 15:38

Analysis Date: 11/24/14 15:43

Hexavalent Chromium

<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	0.0149		0.0036

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FILE #: 3926.00

REPORTED: 11/26/14 14:31

SUBMITTED: 11/20/14 to 11/21/14

AQS SITE

CODE:
SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-1

Lab ID: 4112125-03

Sampled: 11/20/14 16:37

Matrix: Air

Sample Volume: 21.61 m³

Received: 11/21/14 11:07

Comments: Col 1 Start Time 11/19/14 16:36

Analysis Date: 11/24/14 13:23

Hexavalent Chromium

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u>		<u>MDL</u>
		<u>ng/m³ Air</u>	<u>Flag</u>	
Hexavalent Chromium	1854-02-99	0.0687		0.0036

DEC 01 2014

Initials: CR

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FILE #: 3926.00

REPORTED: 11/26/14 14:31

SUBMITTED: 11/20/14 to 11/21/14

AQS SITE

CODE:
SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-1D

Lab ID: 4112125-04

Sampled: 11/20/14 16:24

Matrix: Air

Sample Volume: 21.59 m³

Received: 11/21/14 11:07

Comments: Col 2 Start Time 11/19/14 16:24

Analysis Date: 11/24/14 13:43

Hexavalent Chromium

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u>		<u>MDL</u>
		<u>ng/m³ Air</u>	<u>Flag</u>	
Hexavalent Chromium	1854-02-99	0.0730		0.0036

DEC 01 2014

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FILE #: 3926.00

REPORTED: 11/26/14 14:31

SUBMITTED: 11/20/14 to 11/21/14

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-2

Lab ID: 4112125-05

Sampled: 11/20/14 00:00

Matrix: Air

Sample Volume: 21.6 m³

Received: 11/21/14 11:07

Comments: Start Time 11/19/14 16:51

Analysis Date: 11/24/14 15:53

Hexavalent Chromium

<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

DEC 01 2014

Initials: *ER*

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FILE #: 3926.00

REPORTED: 11/26/14 14:31

SUBMITTED: 11/20/14 to 11/21/14

AQS SITE

CODE:
SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-3

Lab ID: 4112125-06

Sampled: 11/20/14 16:05

Matrix: Air

Sample Volume: 21.52 m³

Received: 11/21/14 11:07

Comments: Start Time 11/19/14 16:10

Analysis Date: 11/24/14 16:02

Hexavalent Chromium

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u>		<u>MDL</u>
		<u>ng/m³ Air</u>	<u>Flag</u>	
Hexavalent Chromium	1854-02-99	0.0127		0.0036

DEC 01 2014

Initials: *ER*

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FILE #: 3926.00

REPORTED: 11/26/14 14:31

SUBMITTED: 11/20/14 to 11/21/14

AQS SITE

CODE:
SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-4

Lab ID: 4112125-07

Sampled: 11/20/14 15:52

Matrix: Air

Sample Volume: 21.49 m³

Received: 11/21/14 11:07

Comments: Start Time 11/19/14 15:59

Analysis Date: 11/24/14 16:12

Hexavalent Chromium

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u>		<u>MDL</u>
		<u>ng/m³ Air</u>	<u>Flag</u>	
Hexavalent Chromium	1854-02-99	0.288		0.0036

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Initials: ER

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REPORTED: 11/26/14 14:31

SUBMITTED: 11/20/14 to 11/21/14

AQS SITE

CODE:
SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-21

Lab ID: 4112125-08

Sampled: 11/20/14 00:00

Matrix: Air

Sample Volume: 21.6 m³

Received: 11/21/14 11:07

Comments:

Analysis Date: 11/24/14 16:42

Hexavalent Chromium

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

DEC 01 2014

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FILE #: 3926.00

REPORTED: 11/26/14 14:31

SUBMITTED: 11/20/14 to 11/21/14

AQS SITE

CODE:
SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-31

Lab ID: 4112125-09

Sampled: 11/20/14 00:00

Matrix: Air

Sample Volume: 21.52 m³

Received: 11/21/14 11:07

Comments:

Analysis Date: 11/24/14 16:52

Hexavalent Chromium

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

DEC 01 2014

Initials: ER

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.



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

December 3, 2014

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 December 2, 2014. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #33195:

SDG

4112521

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: November 21 through November 24, 2014
LDC Report Date: December 3, 2014
Matrix: Air
Parameters: Hexavalent Chromium
Validation Level: EPA Level IV
Laboratory: Eastern Research Group
Sample Delivery Group (SDG): 4112521

Sample Identification

OAM 1(11/21/14)	PAM-1(11/24/14)DUP
OAM 2(11/21/14)	PAM-1D(11/24/14)DUP
PAM-1(11/21/14)	
PAM-1D(11/21/14)	
PAM-2(11/21/14)	
PAM-3(11/21/14)	
PAM-4(11/21/14)	
PAM-21(11/21/14)	
PAM-31(11/21/14)	
OAM 1(11/24/14)	
OAM 2(11/24/14)	
PAM-1(11/24/14)	
PAM-1D(11/24/14)	
PAM-2(11/24/14)	
PAM-3(11/24/14)	
PAM-4(11/24/14)	
PAM-21(11/24/14)	
PAM-31(11/24/14)	
PAM-1(11/21/14)DUP	
PAM-1D(11/21/14)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(11/21/14) and PAM-31(11/24/14) were identified as trip blanks. No hexavalent chromium was found.

Samples PAM-21(11/21/14) and PAM-21(11/24/14) 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(11/21/14) and PAM-1D(11/21/14) and samples PAM-1(11/24/14) and PAM-1D(11/24/14) 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(11/21/14)	PAM-1D(11/21/14)			
Hexavalent chromium	0.0429	0.0352	20 (≤20)	-	-

Analyte	Concentration (ng/m ³)		RPD (Limits)	Flags	A or P
	PAM-1(11/24/14)	PAM-1D(11/24/14)			
Hexavalent chromium	0.0154	0.0169	9 (≤20)	-	-

**Harbor Point, MD, Hexavalent Chromium Monitoring
Hexavalent Chromium - Data Qualification Summary - SDG 4112521**

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
4112521**

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 4112521**

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

LDC #: 33195A6

VALIDATION COMPLETENESS WORKSHEET

Date: 12/2/14

SDG #: 4112521

Level IV

Page: 1 of 1

Laboratory: Eastern Research Group

Reviewer: SD

2nd Reviewer: a

METHOD: 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.	Technical holding times	A	Sampling dates: 11/21-24/14
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Blanks	A	
V	Matrix Spike/Matrix Spike Duplicates	N	Not Required
VI.	Duplicates	A	DUP
VII.	Laboratory control samples	A	LCSID
VIII.	Sample result verification	A	
IX.	Overall assessment of data	A	
X.	Field duplicates	SW	FD = (3,4) (12,13)
XI	Field blanks	ND	FB = (8)(17) TB = (9)(18)

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

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

D = Duplicate
 TB = Trip blank
 EB = Equipment blank

Validated Samples: Airs

1	OAM 1(11/21/14)	11	OAM 2(11/24/14)	21	PAM-1(11/24/14)DUP	31	
2	OAM 2(11/21/14)	12	PAM-1(11/24/14)	22	PAM-1D(11/24/14)DUP	32	
3	PAM-1(11/21/14)	13	PAM-1D(11/24/14)	23		33	
4	PAM-1D(11/21/14)	14	PAM-2(11/24/14)	24		34	
5	PAM-2(11/21/14)	15	PAM-3(11/24/14)	25		35	
6	PAM-3(11/21/14)	16	PAM-4(11/24/14)	26		36	
7	PAM-4(11/21/14)	17	PAM-21(11/24/14)	27		37	
8	PAM-21(11/21/14)	18	PAM-31(11/24/14)	28		38	
9	PAM-31(11/21/14)	19	PAM-1(11/21/14)DUP	29		39	
10	OAM 1(11/24/14)	20	PAM-1D(11/21/14)DUP	30		40	

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.			/	
<i>Airs</i> 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?			/	

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# 33195A6

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	0.0429	0.0352	20	

Analyte	Concentration (ng/m3)		RPD (≤20)	Qual.
	12	13		
Hexavalent Chromium	0.0154	0.0169	9	

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LDC #: 3395A6

Validation Findings Worksheet
Initial and Continuing Calibration Calculation Verification

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

Method: Inorganics, Method See Cover

The correlation coefficient (r) for the calibration of Cr⁺⁶ was recalculated. Calibration date: 11/26/14

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	30 ng/ml Conc. (ug/L)	Area	Recalculated	Reported	Acceptable (Y/N)
					r or r ²	r or r ²	
Initial calibration	Cr ⁺⁶	s1	0.1	0.0000152	0.99994	0.99994	Y
		s2	0.1	0.0000349			
		s3	0.2	0.0000838			
		s4	0.5	0.0002167			
		s5	1	0.0004372			
		s6	2	0.0008666			
ICV 11.17 Calibration verification	Cr ⁺⁶	<u>Found</u> 0.5291ng/ml	<u>True</u> 0.5ng/ml		105.82%	105.82%	↓
CCV 12.17 Calibration verification	Cr ⁺⁶	0.5381ng/ml	0.5ng/ml		107.62%	107.62%	↓
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 #: 3395A6

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

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

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	Laboratory control sample	Cr ⁺⁶	1.09 ng/ml	1.00 ng/ml	109%R	109%R	Y
N	Matrix spike sample		(SSR-SR)				
DUP	Duplicate sample	Cr ⁺⁶	0.03886 ng/lm ³	0.0428 ng/lm ³	9.65%RPD	9.72%RPD	Y*

Comments: *Rounding

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

METHOD: Inorganics, Method See Cover

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

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

Compound (analyte) results for (4) Cr⁺⁶ reported with a positive detect were recalculated and verified using the following equation:

Concentration = $(A - L) / C$ $V_f = 10 \text{ ml}$ Recalculation: $\frac{(0.0000282 - (-4.84E-06))}{0.0004372} = 0.07557 \text{ ng/ml}$
 $m^3 = 21.47$
 $A = 0.0000282$ $\frac{(V_f)(\text{ng/ml})}{m^3} \text{ ng/m}^3$ $\frac{(10)(0.07557 \text{ ng/ml})}{21.47 \text{ m}^3} = 0.0352 \text{ ng/m}^3$
 $L = -4.84E-06$
 $C = 0.0004372$

#	Sample ID	Analyte	Reported Concentration (ng/m ³)	Calculated Concentration (ng/m ³)	Acceptable (Y/N)
	1	Cr ⁺⁶	0.0160	0.0160	Y
	2		0.0150	0.0150	↓
	3		0.0429	0.0428	Y*
	4		0.0352	0.0352	Y
	5		0.0244	0.0245	Y*
	6		ND	ND	Y
	7		0.0513	0.0513	↓
	8		ND	ND	↓
	9		ND	ND	↓
	10		0.075	0.075	Y
	11		0.0228	0.0229	Y*
	12		0.0154	0.0154	Y
	13		0.0169	0.0169	↓
	14		0.0711	0.0710	Y*
	15		0.0143	0.0143	Y
	16		0.0258	0.0259	Y*
	17		ND	ND	Y
	18		ND	ND	↓

Note: *Rounding



CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 12/02/14 15:35

SUBMITTED: 11/25/14

AQS SITE

CODE:
SITE CODE:

Honeywell Hex Chrome Study

Description: OAM 1

Lab ID: 4112521-01

Sampled: 11/21/14 15:11

Matrix: Air

Sample Volume: 21.58 m³

Received: 11/25/14 11:38

Comments: Start Time 11/20/14 15:12

Analysis Date: 11/26/14 13:57

Hexavalent Chromium

<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	0.0160		0.0036

DEC 03 2014

Initials: *ER*



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FILE #: 3926.00

REPORTED: 12/02/14 15:35

SUBMITTED: 11/25/14

AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

Description: OAM 2	Lab ID: 4112521-02	Sampled: 11/21/14 15:26
Matrix: Air	Sample Volume: 21.53 m ³	Received: 11/25/14 11:38
Comments: Start Time 11/20/14 15:30		Analysis Date: 11/26/14 14:06

Hexavalent Chromium

<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	0.0150		0.0036

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Initials: *ER*



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FILE #: 3926.00

REPORTED: 12/02/14 15:35

SUBMITTED: 11/25/14

AQS SITE

CODE:
SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-1

Lab ID: 4112521-03

Sampled: 11/21/14 16:26

Matrix: Air

Sample Volume: 21.39 m³

Received: 11/25/14 11:38

Comments: Col 1 Start Time 11/20/14 16:40

Analysis Date: 11/26/14 12:37

Hexavalent Chromium

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u>		<u>MDL</u>
		<u>ng/m³ Air</u>	<u>Flag</u>	
Hexavalent Chromium	1854-02-99	0.0429		0.0036

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Initials: ER



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FILE #: 3926.00

REPORTED: 12/02/14 15:35

SUBMITTED: 11/25/14

AQS SITE

CODE:
SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-1D

Lab ID: 4112521-04

Sampled: 11/21/14 16:31

Matrix: Air

Sample Volume: 21.47 m³

Received: 11/25/14 11:38

Comments: Col 2 Start Time 11/20/14 16:43

Analysis Date: 11/26/14 12:57

Hexavalent Chromium

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u>		<u>MDL</u>
		<u>ng/m³ Air</u>	<u>Flag</u>	
Hexavalent Chromium	1854-02-99	0.0352		0.0036

DEC 03 2014

Initials: *CR*

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FILE #: 3926.00

REPORTED: 12/02/14 15:35

SUBMITTED: 11/25/14

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-2

Lab ID: 4112521-05

Sampled: 11/21/14 16:12

Matrix: Air

Sample Volume: 21.35 m³

Received: 11/25/14 11:38

Comments: Start Time 11/20/14 16:29

Analysis Date: 11/26/14 14:36

Hexavalent Chromium

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u>		<u>MDL</u>
		<u>ng/m³ Air</u>	<u>Flag</u>	
Hexavalent Chromium	1854-02-99	0.0244		0.0036

DEC 03 2014

Initials: *ER*



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FILE #: 3926.00

REPORTED: 12/02/14 15:35

SUBMITTED: 11/25/14

AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-3

Lab ID: 4112521-06

Sampled: 11/21/14 16:01

Matrix: Air

Sample Volume: 21.48 m³

Received: 11/25/14 11:38

Comments: Start Time 11/20/14 16:09

Analysis Date: 11/26/14 14:46

Hexavalent Chromium

<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	ND	U	0.0036	

DEC 03 2014

Initials: CR

Eastern Research Group

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FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 12/02/14 15:35

SUBMITTED: 11/25/14

AQS SITE

CODE:

SITE CODE: Honeywell Hex Chrome Study

Description: PAM-4

Lab ID: 4112521-07

Sampled: 11/21/14 15:50

Matrix: Air

Sample Volume: 21.5 m³

Received: 11/25/14 11:38

Comments: Start Time 11/20/14 15:57

Analysis Date: 11/26/14 14:56

Hexavalent Chromium

<u>Analyte</u>	<u>CAS Number</u>	<u>Results</u>		<u>MDL</u>
		<u>ng/m³ Air</u>	<u>Flag</u>	
Hexavalent Chromium	1854-02-99	0.0513		0.0036

DEC 03 2014

Initials: ER

Eastern Research Group

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FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 12/02/14 15:35

SUBMITTED: 11/25/14

AQS SITE

CODE:
SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-21

Lab ID: 4112521-08

Sampled: 11/21/14 00:00

Matrix: Air

Sample Volume: 21.35 m³

Received: 11/25/14 11:38

Comments:

Analysis Date: 11/26/14 15:06

Hexavalent Chromium

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

DEC 03 2014

Initials: *CR*



CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 12/02/14 15:35

SUBMITTED: 11/25/14

AQS SITE

CODE:
SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-31

Lab ID: 4112521-09

Sampled: 11/21/14 00:00

Matrix: Air

Sample Volume: 21.48 m³

Received: 11/25/14 11:38

Comments:

Analysis Date: 11/26/14 15:16

Hexavalent Chromium

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

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CERTIFICATE OF ANALYSIS

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FILE #: 3926.00

REPORTED: 12/02/14 15:35

SUBMITTED: 11/25/14

AQS SITE

CODE: Honeywell Hex Chrome Study
SITE CODE:

Description: OAM 1	Lab ID: 4112521-10	Sampled: 11/24/14 14:47
Matrix: Air	Sample Volume: 20.86 m ³	Received: 11/25/14 11:38
Comments: Start Time 11/23/14 15:36		Analysis Date: 11/26/14 15:26

Hexavalent Chromium

<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	0.0175		0.0036

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AQS SITE

CODE:
SITE CODE:

Honeywell Hex Chrome Study

Description: OAM 2

Lab ID: 4112521-11

Sampled: 11/24/14 15:04

Matrix: Air

Sample Volume: 20.95 m³

Received: 11/25/14 11:38

Comments: Start Time 11/23/14 15:48

Analysis Date: 11/26/14 15:36

Hexavalent Chromium

<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	0.0228		0.0036

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AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

Description: PAM-1	Lab ID: 4112521-12	Sampled: 11/24/14 16:03
Matrix: Air	Sample Volume: 21.28 m ³	Received: 11/25/14 11:38
Comments: Col 1 Start Time 11/23/14 16:24		Analysis Date: 11/26/14 13:16

Hexavalent Chromium

<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	0.0154		0.0036

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AQS SITE

CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-1D

Lab ID: 4112521-13

Sampled: 11/24/14 16:07

Matrix: Air

Sample Volume: 21.33 m³

Received: 11/25/14 11:38

Comments: Col 2 Start Time 11/23/14 16:25

Analysis Date: 11/26/14 13:35

Hexavalent Chromium

<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	0.0169		0.0036

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AQS SITE

CODE:
SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-2

Lab ID: 4112521-14

Sampled: 11/24/14 15:52

Matrix: Air

Sample Volume: 21.26 m³

Received: 11/25/14 11:38

Comments: Start Time 11/23/14 16:14

Analysis Date: 11/26/14 15:45

Hexavalent Chromium

<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	0.0711		0.0036

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AQS SITE

CODE:

SITE CODE: Honeywell Hex Chrome Study

Description: PAM-3

Lab ID: 4112521-15

Sampled: 11/24/14 15:41

Matrix: Air

Sample Volume: 21.18 m³

Received: 11/25/14 11:38

Comments: Start Time 11/23/14 16:09

Analysis Date: 11/26/14 15:55

Hexavalent Chromium

<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	0.0143		0.0036

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AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

Description: PAM-4	Lab ID: 4112521-16	Sampled: 11/24/14 15:28
Matrix: Air	Sample Volume: 21.09 m ³	Received: 11/25/14 11:38
Comments: Start Time 11/23/14 16:02		Analysis Date: 11/26/14 16:05

Hexavalent Chromium

<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		0.0036

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AQS SITE

CODE SITE CODE: Honeywell Hex Chrome Study

Description: PAM-21	Lab ID: 4112521-17	Sampled: 11/24/14 00:00
Matrix: Air	Sample Volume: 21.26 m ³	Received: 11/25/14 11:38
Comments:		Analysis Date: 11/26/14 16:35

Hexavalent Chromium

<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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AQS SITE

CODE: SITE CODE: Honeywell Hex Chrome Study

Description: PAM-31	Lab ID: 4112521-18	Sampled: 11/24/14 00:00
Matrix: Air	Sample Volume: 21.18 m ³	Received: 11/25/14 11:38
Comments:		Analysis Date: 11/26/14 16:45

Hexavalent Chromium

<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	ND	U	0.0036

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