

LABORATORY DATA CONSULTANTS, INC.

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

ERM

February 13, 2015

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

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

Dear Mr. Boggs,

Enclosed is the final validation report for the fraction listed below. This SDG was received on February 11, 2015. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #33715:

SDG

Fraction

5020323 (10-18)

Hexavalent Chromium

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

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

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

Christina Rink

Sincerely.

Project Manager/Chemist

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Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

Harbor Point, MD, Hexavalent Chromium Monitoring

Collection Date:

February 2, 2015

LDC Report Date:

February 12, 2015

Matrix:

Air

Parameters:

Hexavalent Chromium

Validation Level:

EPA Level IV

Laboratory:

Eastern Research Group

Sample Delivery Group (SDG): 5020323

Sample Identification

OAM 1

OAM 2

PAM-1

PAM-1D

PAM-2

PAM-3

PAM-4

PAM-21

PAM-31

PAM-1 DUP

PAM-1D DUP

Introduction

This data review covers 11 air samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per ASTM D7614 for Hexavalent Chromium.

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

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

The following are definitions of the data qualifiers:

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

I. Technical Holding Times

All technical holding time requirements were met.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met.

IV. Blanks

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

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

Sample PAM-21 was identified as a field blank. No hexavalent chromium was found.

V. Matrix Spike/Matrix Spike Duplicates

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

VI. Duplicates

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

VII. Laboratory Control Samples

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

VIII. Sample Result Verification

All sample result verifications were acceptable.

IX. Overall Assessment of Data

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

X. Field Duplicates

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

	Concentrati	ion (ng/m³)			
Analyte	PAM-1	PAM-1D	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.0406	0.0342	17 (≤20)	-	-

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

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

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

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

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

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

LDC #: 33715A6

VALIDATION COMPLETENESS WORKSHEET

Level IV

SDG #: 5020323(10-18) Laboratory: Eastern Research Group

Reviewer 2nd Reviewer:

METHOD: (Analyte) Hexavalent Chromium (ASTM D7614)

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

	Validation Area		Comments
l.	Sample receipt/Technical holding times	A	2/02/15
ti	Initial calibration	A	
III.	Calibration verification	A	
IV	Laboratory Blanks	A	
V	Field blanks	70	FB=(8) TB=(9)
VI.	Matrix Spike/Matrix Spike Duplicates	<i>i</i>	Not Required
VII.	Duplicate sample analysis	B	DUP
VIII.	Laboratory control samples	A	LOSIO
IX.	Field duplicates	SW	FD=(3,4)
Χ.	Sample result verification	A	<i>'</i>
LXL	Overall assessment of data	LA	

Note:

A = Acceptable

N = Not provided/applicable SW = See worksheet

ND = No compounds detected

R = Rinsate

FB = Field blank

D = Duplicate

TB = Trip blank EB = Equipment blank SB=Source blank OTHER:

	Client ID	Lab ID	Matrix	Date
1	OAM 1	5020323-10	Air	02/02/15
2	OAM 2	5020323-11	Air	02/02/15
3	PAM-1	5020323-12	Air	02/02/15
4	PAM-1D	5020323-13	Air	02/02/15
5	PAM-2	5020323-14	Air	02/02/15
6	PAM-3	5020323-15	Air	02/02/15
7	PAM-4	5020323-16	Air	02/02/15
8	PAM-21	5020323-17	Air	02/02/15
9	PAM-31	5020323-18	Air	02/02/15
10	PAM-1 DUP	5020323-12DUP	Air	02/02/15
11	PAM-1D DUP	5020323-13DUP	Air	02/02/15
12				
13				
14				
15				

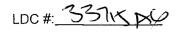
Notes:		 	
	_		
	-		

VALIDATION FINDINGS CHECKLIST

Page: of Z Reviewer: 50 2nd Reviewer: 2

Method:Inorganics (EPA Method Section)				
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?				
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 weters 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 anaylzed 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?				

Pars



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#<u>33715A6</u>

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Page: _	(of_\
Reviewer:	50
2nd Reviewer:	M

Inorganics: Method See Cover

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

 $\verb|\LDCFILESERVER|\Validation|\FIELD DUPLICATES|\FD_inorganic|\33715A6.wpd|$

LDC #: 33715A6

Validation Findings Worksheet Initial and Continuing Calibration Calculation Verification

Page:	of	
Reviewer	. <u>. : : : :</u> :	2
nd Revie	wer:	7

Method: Inorganics, MethodSee Cover	Metho	d: Inord	anics. Met	hod See	Cover
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The correlation coefficient (r) for the calibration of was recalculated. Calibration date: 205/15

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

%R = Found X 100

Where,

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

True

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

					Recalculated	Reported	Acceptable
Type of analysis	Analyte	Standard	Conc. (ng/ml)	Area	r or r ²	r or r ²	(Y/N)
Initial calibration		s1	0.05	0.0000145			
		s2	0.1	0.0000356	0.99975	0.99975	
	0 00	s3	0.2	0.0000786			
	CEID	s4	0.5	0.0002179			\mathcal{I}
		s5	1	0.0004203			
		s6	2	0.0008849			
JW 10128 Calibration verification	College	Found 0.5157 nalm	True O. Snajmi		103.19.R	10319.2	7)
CCU \\`27 Calibration verification	مرحی	0.5187rajm			1037%	1038/2	7
Calibration verification							

Comments: Refer to Calibration Verification findings worksheet for list of qualifications and associated samples when reported results do not agree withi	r
0.0% of the recalculated results.	

LDC#: 337/SAW

VALIDATION FINDINGS WORKSHEET Level IV Recalculation Worksheet

	Page:	_of_	<u> </u>
	Reviewer:	2	2
2nd	Reviewer:	<u> </u>	

		σ	\sim
METHOD: Inorganics,	Method	See	Lover

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

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

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:

 $RPD = \underline{|S-D|} \times 100$

Where,

S =

Original sample concentration

(S+D)/2

D =

Duplicate sample concentration

Sample ID	Type of Analysis	Element	Found / S (units)	True / D (units)	Recalculated %R / RPD	Reported %R / RPD	Acceptable (Y/N)
LCS 10:57	Laboratory control sample	Cxtx	1.0457 ng/m)	1.00 ng/ml	105%.P	105%R	7
N	Matrix spike sample		(SSR-SR)				
OUP	Duplicate sample	Crto	0.0460ng/m3	0.040kng/w3	12.5%	12.4%RB	J*

Comments: _	* Ronding	 _	 	 	
	J		 		

LDC #: 33715AX

VALIDATION FINDINGS WORKSHEET

Sample Calculation Verification

Page:_	1	_of_	<u> </u>
Reviewer:	_	21	\geq
2nd reviewer:			

METH	IOD: Inorganics, Metho	od Se Cover			-
Pleas Y N Y N Y N	N/A Have results N/A Are results w	ow for all questions answered "N". Not app been reported and calculated correctly? vithin the calibrated range of the instrumention limits below the CRQL?		e identified as "N/.	4".
Comp recalc	ound (analyte) results f ulated and verified usin	ig the following equation:	repo	rted with a positiv	e detect were
Concer	tration = $A-Co(C_1)$	$\frac{\sqrt{1-10}}{\sqrt{3}} = \frac{21.70}{\sqrt{30}}$ Recalculation: $\frac{30}{\sqrt{30}}$	000293)-(-19	<u>E-05</u>) _ n	1, 28U i
	-0.0000293 1 E-05	(right (cit) = rights	0.000440 0.000440 0.0884vglu	- U.	0004ng(m
	C) 1000044410	- W3)	(D.0884vglm	21.76m2	0.0406m
#	Sample ID	Analyte	Reported Concentration	Calculated Concentration (Vx\w ³)	Acceptable (Y/N)
	\	Cctb	4528.0	0.0335	7×
	3 4		0.0923	0.0923	y
	3		0.0406	D.0406	
ļ	4		0.0342	0.0342	
	5		0.030	0.0377	
	6		0.0344	D.0344	4
	7		10.0004	0.0403	5 *
	8		170	ND	3
	9	4	ND	NO .	
					,
Note:_	*Rounding				



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED: 02/11/15 09:30

Malvern, PA 19355

SUBMITTED:

m³

02/03/15

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

FAX: (410) 266-8912

SITE CODE:

Honeywell Hex Chrome Study

Description:

OAM 1

Lab ID:

5020323-10

Sampled: 02/02/15 14:53

Matrix:

Air

Sample Volume:

21.25

Received: 02/03/15 10:49 Analysis Date: 02/05/15 16:25

Comments:

Start Time 2/1/15 15:16

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

Analyte

CAS Number

ng/m³ Air

<u>Flaq</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0534

0.0036

FEB 1 2 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED: 02/11/15 09:30

Malvern, PA 19355

02/03/15 SUBMITTED:

ATTN: Mr. Jeff Boggs

AQS SITE

SITE CODE:

PHONE: (443) 803-8495

Honeywell Hex Chrome Study

Description:

Comments:

OAM 2

Lab ID:

5020323-11

21.36

Sampled: 02/02/15 15:12

Matrix:

Air

Start Time 2/1/15 15:28

Sample Volume:

m³

Received: 02/03/15 10:49

Analysis Date: 02/05/15 15:06

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

<u>Analyte</u>

CAS Number

FAX: (410) 266-8912

ng/m³ Air

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0923

0.0036

FEB 1 2 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

Matrix:

Comments:

PHONE: (443) 803-8495

Description: PAM-1

Air

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

FAX: (410) 266-8912

Lab ID:

5020323-12

Sample Volume: 21.76

m³

FILE #: 3926.00

REPORTED:

SUBMITTED: AQS SITE

CODE:

Honeywell Hex Chrome Study

Sampled: 02/02/15 16:22

Received: 02/03/15 10:49 Analysis Date: 02/05/15 16:35

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

02/11/15 09:30

02/03/15

Analyte

CAS Number

ng/m³ Air

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0406

0.0036

FEB 1 2 2015

Initials: CR

Eastern Research Group

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

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Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED: 02/11/15 09:30

Malvern, PA 19355

SUBMITTED:

02/03/15

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

FAX: (410) 266-8912

SITE CODE:

Honeywell Hex Chrome Study

Description:

PAM-1D

Lab ID:

5020323-13

Sampled: 02/02/15 16:25

Analysis Date: 02/05/15 12:47

Matrix:

Air

Sample Volume:

21.81

m³

Received: 02/03/15 10:49

Comments:

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

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

Analyte

CAS Number

ng/m³ Air

<u>Flaq</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0342

0.0036

FEB 1 2 2015

Initials: CR

Eastern Research Group

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

Page 6 of 13



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

Description:

Comments:

Hexavalent Chromium

Analyte

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Matrix:

FAX: (410) 266-8912

PAM-2 Air

Start Time 2/1/15 15:48

Lab ID:

5020323-14 Sample Volume:

21.9

m³

FILE #: 3926.00

SUBMITTED:

AQS SITE SITE CODE:

REPORTED: 02/11/15 09:30

Honeywell Hex Chrome Study

Sampled: 02/02/15 16:08

Received: 02/03/15 10:49 Analysis Date: 02/05/15 15:15

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

02/03/15

CAS Number

ng/m³ Air

Flag

ng/m³ Air

1854-02-99

0.0377

0.0036

FEB 1 2 2015

Initials: CR

Eastern Research Group

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

Page 7 of 13



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Matrix:

Comments:

Analyte

Description:

PAM-3

Air

FAX: (410) 266-8912

Lab ID:

5020323-15

Sample Volume:

21.84

m³

SUBMITTED:

AQS SITE SITE CODE:

FILE #: 3926.00

REPORTED: 02/11/15 09:30

Honeywell Hex Chrome Study

Sampled: 02/02/15 16:00

Received: 02/03/15 10:49 Analysis Date: 02/05/15 15:45

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

02/03/15

CAS Number Hexavalent Chromium

Start Time 2/1/15 15:43

1854-02-99

ng/m³ Air 0.0344

Flag

ng/m³ Air

0.0036

FEB 1 2 2015

Initials: CR

Eastern Research Group

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

Page 8 of 13



Environmental Resources Management, Inc.

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED: 02/11/15 09:30

Malvern, PA 19355

02/03/15 SUBMITTED:

AQS SITE

ATTN: Mr. Jeff Boggs

SITE CODE:

PHONE: (443) 803-8495

Honeywell Hex Chrome Study

Description:

PAM-4

Lab ID: 5020323-16 Sampled: 02/02/15 15:45

Matrix:

Air

Sample Volume:

m³

Received: 02/03/15 10:49 Analysis Date: 02/05/15 15:55

Comments:

Start Time 2/1/15 15:41

Hexavalent Chromium by SOP ERG-MOR-063

21.66

Results

MDL

Analyte

CAS Number

FAX: (410) 266-8912

ng/m³ Air

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0404

0.0036

FEB 1 2 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED:

02/11/15 09:30

Malvern, PA 19355

SUBMITTED:

m³

02/03/15

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

FAX: (410) 266-8912

SHE CODE:

Honeywell Hex Chrome Study

Description:

PAM-21

Lab ID:

5020323-17

Sampled: 02/02/15 00:00

Matrix:

Air

Sample Volume:

21.9

Received: 02/03/15 10:49

Comments:

Analysis Date: 02/05/15 16:05

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

Analyte

CAS Number

ng/m³ Air

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

ND

0.0036

FEB 1 2 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Înc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

Description:

Comments:

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Matrix:

Air

PAM-31

FAX: (410) 266-8912

Lab ID:

Sample Volume:

5020323-18

21.84

m³

FILE #: 3926.00

SUBMITTED:

AQS SITE SITE CODE:

REPORTED: 02/11/15 09:30

Honeywell Hex Chrome Study

Sampled: 02/02/15 00:00

Received: 02/03/15 10:49 Analysis Date: 02/05/15 16:15

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

02/03/15

Analyte Hexavalent Chromium **CAS Number**

ng/m3 Air

<u>Flaq</u>

ng/m3 Air

1854-02-99 ND 0.0036

FEB 1 2 2015

Initials: CR

Eastern Research Group

LABORATORY DATA CONSULTANTS, INC.

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

ERM

February 13, 2015

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

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

Dear Mr. Boggs,

Enclosed is the final validation report for the fraction listed below. This SDG was received on February 11, 2015. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #33722:

SDG

Fraction

5020424

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.

Christina Rink

Sincerely.

Project Manager/Chemist

	72 pages-SF	1 WEE	K TAT												Atta	chn	nent	1																					
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LDC	SDG#	DATE REC'D		Cr((VI) 614)		:																		:														
Matri	x: Air/Water/Soil	ı		A	S	W	s	W	s	w	s	W	s	W	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s	W	S	w	s	w	S	w	s	w	s
Α	5020424	02/11/15	02/19/15	9	20	-								<u> </u>		-			-			-						-				_				\vdash	\dashv	\dashv	\blacksquare
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Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: Harbor Point, MD, Hexavalent Chromium Monitoring

Collection Date: February 3, 2015

LDC Report Date: February 12, 2015

Matrix: Air

Parameters: Hexavalent Chromium

Validation Level: EPA Level IV

Laboratory: Eastern Research Group

Sample Delivery Group (SDG): 5020424

Sample Identification

OAM 1

OAM 2

PAM-1

PAM-1D

PAM-2

PAM-3

PAM-4

PAM-21

PAM-31

PAM-1 DUP

PAM-1D DUP

Introduction

This data review covers 11 air samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per ASTM D7614 for Hexavalent Chromium.

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

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

The following are definitions of the data qualifiers:

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

I. Technical Holding Times

All technical holding time requirements were met.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met.

IV. Blanks

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

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

Sample PAM-21 was identified as a field blank. No hexavalent chromium was found.

V. Matrix Spike/Matrix Spike Duplicates

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

VI. Duplicates

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

VII. Laboratory Control Samples

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

VIII. Sample Result Verification

All sample result verifications were acceptable.

IX. Overall Assessment of Data

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

X. Field Duplicates

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

	Concentrat	ion (ng/m³)			
Analyte	PAM-1	PAM-1D	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.0278	0.0285	2 (≤20)	-	-

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

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

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

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

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

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

LDC #: 33722A6 SDG #: 5020424

Laboratory: Eastern Research Group

VALIDATION COMPLETENESS WORKSHEET

Level IV

Reviewer: 2nd Reviewer: ou

METHOD: (Analyte) Hexavalent Chromium (ASTM D7614)

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

	Validation Area		Comments
1.	Sample receipt/Technical holding times	A	203/15
11	Initial calibration	A	
111.	Calibration verification	A	
IV	Laboratory Blanks	A	
V	Field blanks	<i>NO</i>	FB=18) TB=19)
VI.	Matrix Spike/Matrix Spike Duplicates	く	Not Required
VII.	Duplicate sample analysis	4	DUR -
VIII.	Laboratory control samples	Ã	icsto
IX.	Field duplicates	SW	FD=(3,4)
X.	Sample result verification	A	
xı	Overall assessment of data	A	

Note:

A = Acceptable

N = Not provided/applicable

SW = See worksheet

ND = No compounds detected

R = Rinsate

FB = Field blank

D = Duplicate

TB = Trip blank EB = Equipment blank SB=Source blank OTHER:

Matrix Client ID Lab ID Date 02/03/15 OAM 1 5020424-01 Air 2 OAM 2 5020424-02 Air 02/03/15 PAM-1 Air 02/03/15 3 5020424-03 Air PAM-1D 02/03/15 5020424-04 PAM-2 5020424-05 Air 02/03/15 5 PAM-3 5020424-06 Air 02/03/15 6 PAM-4 5020424-07 Air 02/03/15 PAM-21 8 5020424-08 Air 02/03/15 02/03/15 9 PAM-31 5020424-09 Air PAM-1 DUP 02/03/15 5020424-03DUP Air PAM-1D DUP 11 5020424-04DUP Air 02/03/15 12 13 14

Notes:			
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VALIDATION FINDINGS CHECKLIST

Page: _ of Z Reviewer: 50 2nd Reviewer: _____

Method: Inorganics (EPA Method See Lover)

metrod.morganics (Er A Metrod 30 000)				
Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	/			
Cooler temperature criteria was met.	/		<u> </u>	
II. Calibration				
Were all instruments calibrated daily, each set-up time?	/			
Were the proper number of standards used?	/		<u> </u>	
Were all initial calibration correlation coefficients ≥ 0.995?	/			
Were all initial and continuing calibration verification %Rs within the 90 110 % 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 anaylzed for this SDG?	1			
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?			1	
Were the performance evaluation (PE) samples within the acceptance limits?			1	

LDC #: 3372200

VALIDATION FINDINGS CHECKLIST

Page: Zof Z Reviewer: SO 2nd Reviewer: CV

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.			i i	

LDC# 33722A6

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Page: _	of
Reviewer:_	$\mathcal{O}\mathcal{Z}^{c}$
2nd Reviewer:	ÓV

Inorganics: Method See Cover

	Concentrati			
Analyte	3	4	RPD (≤20)	Qual.
Hexavalent Chromium	0.0278	0.0285	2	

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

LDC #: 333722AVO

Validation Findings Worksheet Initial and Continuing Calibration Calculation Verification

Page: 1 o	f <u>\</u>
Reviewer:	SO.
2nd Reviewer:	9

Method: Inorganics	, Method	See Cover	
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The correlation coefficient (r) for the calibration of was recalculated. Calibration date: 2/15/15

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

%R = Found X 100

Where,

Found = concentration of each analyte <u>measured</u> in the analysis of the ICV or CCV solution

True

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

					Recalculated	Reported	Acceptable
Type of analysis	Analyte	Standard	Conc. (ng/ml)	Area	r or r ²	r or r ²	(Y/N)
Initial calibration		s1	0.05	0.0000288			
		s2	0.1	0.0000679	0.99998	0.99998	
	4 510	s3	0.2	0.0001457			U.
	Cxsip	s4	0.5	0.0003678			
		s5	1	0.0007327			1
		s6	2	0.0014642			
ユン ハインハ Calibration verification	(1-40	Found 0.5090ng/ml	O. Siglm		101.8%.2	101.895	\ <u></u>
CCO 65-00 Calibration verification	C+40	0.5482 ng/ml	0.5 nglu)		109.6%R	-lan%	XX
Calibration verification							

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

* Panding

LDC#: 33722AVO

VALIDATION FINDINGS WORKSHEET Level IV Recalculation Worksheet

	Page:_\	_of\
	Reviewer:	QZ
2nd	Reviewer:_	9

METHOD: Inorganics,	Method	see Cover	
Percent recoveries (%	R) for a labora	tory control samp	ole and a matrix spike sample were recalculated using the following formula:
%R = <u>Found</u> x 100 True	Where,	Found = True = conc	concentration of each analyte <u>measured</u> in the analysis of the sample. For the matrix spike calculation, Found = SSR (spiked sample result) - SR (sample result). sentration of each analyte in the source.

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

 $RPD = \underline{[S-D]} \times 100$

Where,

S =

Original sample concentration

(S+D)/2

D=

Duplicate sample concentration

Sample ID	Type of Analysis	Element	Found / S (units)	True / D (units)	Recalculated %R / RPD	Reported %R / RPD	Acceptable (Y/N)
14:41	Laboratory control sample	Cxxo	1.039 mg/m)	1.00 mg/w/	104%e	104%	3
N	Matrix spike sample		(SSR-SR)				
DUR 16:30	Duplicate sample	Cxto	0.0237 ng/m3	0.0278 ng lm³	15.9%PPD	16.19/28PD	7

Comments:			
			Ξ

LDC#: 3372200

VALIDATION FINDINGS WORKSHEET

Sample Calculation Verification

Page:_	of_	
Reviewer:_	3	$\overline{\mathcal{O}}$
2nd reviewer:	_	

METH	IOD: Inorganics, Metho	d See Cover			-00-
Please Y N Y N Y N	N/A Have results N/A Are results w	ow for all questions answered "N". Not been reported and calculated correctly within the calibrated range of the instrum- tion limits below the CRQL?	/?	e identified as "N/	A".
Concer	ound (analyte) results for ulated and verified using tration =	g the following equation: Recalculation:	repo	orted with a positi	ve detect were
A= Co	0.0000337 =-3.69 E-06	g the following equation: W=(Ow) Recalculation: (Nalw) (W) W3 (Ow) (Nalw) (W)	0.000.00 0.000.00 1)X (m/gn8820)	2 () = ()	0.05088
#	Sample ID	Analyte	Reported Concentration	Calculated Concentration	Acceptable (Y/N)
	7	Crap	0.0069	0.0069	7
	2		0.0169	0.0169	
	<u> </u>		0.0285	0.0285	
	7		0.0180	0.0180	
	6		D:0087_	0.0082	
	7		0-0214	0.0214	
	8		ND	りり	
	9	4	ND	りり	4
					,
 					
Note:_				ı	



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED: 02/11/15 15:04

SUBMITTED:

02/04/15

Malvern, PA 19355 ATTN: Mr. Jeff Boggs

AQS SITE

SOPE CODE:

m³

PHONE: (443) 803-8495

5020424-01

Honeywell Hex Chrome Study

Description:

OAM 1

Lab ID:

Sampled: 02/03/15 14:54

Matrix:

Air

Sample Volume:

21.54

Received: 02/04/15 11:12 Analysis Date: 02/10/15 18:42

Comments:

Start Time 2/2/15 14:57

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL.

Analyte

CAS Number

FAX: (410) 266-8912

ng/m³ Air

<u>Flaq</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0069

0.0036

FEB 1 2 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Air

Start Time 2/2/15 15:15

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

02/11/15 15:04

SUBMITTED: 02/04/15

AQS SITE

SUPE CODE:

Honeywell Hex Chrome Study

Description: Matrix:

Comments:

OAM 2

Lab ID:

Sample Volume:

5020424-02

m³

Sampled: 02/03/15 15:16

Received: 02/04/15 11:12

Analysis Date: 02/10/15 17:10

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

Analyte

CAS Number

ng/m³ Air

<u>Flag</u>

<u>ng/m³ Air</u>

Hexavalent Chromium

1854-02-99

0.0169

0.0036

FEB 1 2 2015

Initials: CR

Eastern Research Group

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Page 4 of 13



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

02/11/15 15:04

SUBMITTED: 02/04/15

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description:

PAM-1

Air

Lab ID:

Sample Volume:

5020424-03

m³

Sampled: 02/03/15 16:17

Analysis Date: 02/10/15 16:20

Received: 02/04/15 11:12

Matrix: Comments:

Col 1 Start Time 2/2/15 16:25

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

Analyte Hexavalent Chromium CAS Number

ng/m³ Air

<u>Flaq</u>

ng/m³ Air

1854-02-99

0.0278

0.0036

FEB 1 2 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Matrix:

Comments:

Description: PAM-1D

Air

Col 2 Start Time 2/2/15 16:28

FAX: (410) 266-8912

8912

Lab ID:

.

Sample Volume:

5020424-04

21,49

m³

FILE #: 3926.00

REPORTED:

SUBMITTED:

AQS SITE

SITE CODE:

Sampled: 02/03/15 16:21 Received: 02/04/15 11:12

Analysis Date: 02/10/15 16:40

Honeywell Hex Chrome Study

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

02/11/15 15:04

02/04/15

Analyte
Hexavalent Chromium

CAS Number 1854-02-99 <u>ng/m³ Air</u>

<u>Flaq</u>

<u>ng/m³ Air</u>

0.0285

0.0036

FEB 1 2 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

02/11/15 15:04

02/04/15 SUBMITTED:

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description: Matrix:

PAM-2

Lab ID:

Sample Volume:

5020424-05

m³

<u>Flaq</u>

Sampled: 02/03/15 16:02 Received: 02/04/15 11:12

Analysis Date: 02/10/15 17:20

Comments:

Start Time 2/2/15 16:12

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

Analyte

CAS Number

ng/m³ Air

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0180

0.0036

FEB 1 2 2015

Initials: CR

Eastern Research Group

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Page 7 of 13



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

Description:

Comments:

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Matrix:

PAM-3

Air

Start Time 2/2/15 16:02

FAX: (410) 266-8912

Lab ID:

5020424-06

Sample Volume:

21.5

m³

FILE #: 3926.00

REPORTED:

SUBMITTED:

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Sampled: 02/03/15 15:56

Received: 02/04/15 11:12 Analysis Date: 02/10/15 17:30

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

02/11/15 15:04

02/04/15

CAS Number

<u>ng/m³ Air</u>

Flag

<u>ng/m³ Air</u>

Hexavalent Chromium

Analyte

1854-02-99

0.0082

0.0036

FEB 1 2 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

Matrix:

Comments:

PHONE: (443) 803-8495

Description:

Air

PAM-4

Start Time 2/2/15 15:48

FAX: (410) 266-8912

Lab ID:

5020424-07

Sample Volume:

21,5

m³

FILE #: 3926.00

REPORTED:

SUBMITTED:

AQS SITE

SODE:

Honeywell Hex Chrome Study

Sampled: 02/03/15 15:42

Received: 02/04/15 11:12 Analysis Date: 02/10/15 17:40

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

02/11/15 15:04

02/04/15

ng/m³ Air

<u>Flaq</u>

ng/m³ Air

Hexavalent Chromium

Analyte

CAS Number 1854-02-99

0.0214

0.0036

FEB 1 2 2015

Initials: CR

Eastern Research Group

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

Page 9 of 13



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED: 02/11/15 15:04

SUBMITTED:

02/04/15

Malvern, PA 19355

AQS SITE

ATTN: Mr. Jeff Boggs

SITE CODE:

PHONE: (443) 803-8495

Air

5020424-08

Honeywell Hex Chrome Study

Description: Matrix: PAM-21

Lab ID:

m³

Sampled: 02/03/15 00:00 Received: 02/04/15 11:12

Comments:

Sample Volume: 21.46 Analysis Date: 02/10/15 17:50

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

Analyte

CAS Number

FAX: (410) 266-8912

ng/m³ Air

ng/m³ Air

Hexavalent Chromium

1854-02-99

ND

<u>Flag</u>

0.0036

FEB 1 2 2015

Initials: CR

Eastern Research Group

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

Page 10 of 13



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED:

02/11/15 15:04

Malvern, PA 19355

SUBMITTED:

02/04/15

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

FAX: (410) 266-8912

SITE CODE:

Honeywell Hex Chrome Study

Description:

Comments:

PAM-31

Lab ID:

5020424-09

Sampled: 02/03/15 00:00

Matrix:

Air

Sample Volume:

m³

Received: 02/04/15 11:12

Analysis Date: 02/10/15 18:19

Hexavalent Chromium by SOP ERG-MOR-063

21.5

Results

MDL

Analyte

CAS Number

ng/m³ Air

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

ND

u

0.0036

FEB 1 2 2015

Initials: CR

Eastern Research Group

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

Page 11 of 13



LABORATORY DATA CONSULTANTS, INC.

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

ERM

February 17, 2015

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

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

Dear Mr. Boggs,

Enclosed is the final validation report for the fraction listed below. This SDG was received on February 13, 2015. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #33733:

SDG

Fraction

5020607/5021026

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.

Christina Rink

Sincerely.

Project Manager/Chemist

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Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: Harbor Point, MD, Hexavalent Chromium Monitoring

Collection Date: February 5 through February 9, 2015

LDC Report Date: February 17, 2015

Matrix: Air

Parameters: Hexavalent Chromium

Validation Level: EPA Level IV

Laboratory: Eastern Research Group

Sample Delivery Group (SDG): 5020607/5021026

Sample Identification

OAM 1(2/05/15) PAM-1(2/09/15)DUP OAM 2(2/05/15) PAM-1D (2/09/15)DUP

PAM-1(2/05/15) PAM-1D (2/05/15)

PAM-2(2/05/15)

PAM-3(2/05/15)

PAM-4(2/05/15)

PAM-21(2/05/15)

PAM-31(2/05/15)

OAM 2(2/09/15)

OAM 2(2/09/15) PAM-1(2/09/15)

PAM-1D (2/09/15)

PAM-2(2/09/15)

PAM-3(2/09/15)

PAM-4(2/09/15)

PAM-21(2/09/15)

PAM-31(2/09/15)

PAM-1(2/05/15)DUP

PAM-1D (2/05/15)DUP

Introduction

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

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

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

The following are definitions of the data qualifiers:

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

I. Technical Holding Times

All technical holding time requirements were met.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met.

IV. Blanks

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

Samples PAM-31(2/05/15) and PAM-31(2/09/15) were identified as trip blanks. No hexavalent chromium was found.

Samples PAM-21(2/05/15) and PAM-21(2/09/15) were identified as field blanks. No hexavalent chromium was found.

V. Matrix Spike/Matrix Spike Duplicates

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

VI. Duplicates

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

VII. Laboratory Control Samples

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

VIII. Sample Result Verification

All sample result verifications were acceptable.

IX. Overall Assessment of Data

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

X. Field Duplicates

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

	Concentrati	ion (ng/m³)			
Analyte	PAM-1(2/05/15)	PAM-1D (2/05/15)	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.0327	0.0298	9 (≤20)	-	-

	Concentrati	ion (ng/m³)			
Analyte	PAM-1(2/09/15)	PAM-1D (2/09/15)	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.0630	0.0567	11 (≤20)	-	-

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

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

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

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

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

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

LDC #:_ 33733A6

VALIDATION COMPLETENESS WORKSHEET

Level IV

5020607/5021026 SDG #: Laboratory: Eastern Research Group 2nd Reviewer:

METHOD: (Analyte) Hexavalent Chromium (ASTM D7614)

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

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	2105-09/15
II	Initial calibration	A	
	Calibration verification	A	
IV	Laboratory Blanks	A	
V	Field blanks	NO	FR=(8)(0) TB=(4)(8)
VI.	Matrix Spike/Matrix Spike Duplicates	N	Not Required
VII.	Duplicate sample analysis	A	DUP
VIII.	Laboratory control samples	A	LCSID
IX.	Field duplicates	Sin	FD=(3,4) (12,13)
X.	Sample result verification	R	
xı_	Overall assessment of data	A	

Note:

A = Acceptable

N = Not provided/applicable SW = See worksheet

ND = No compounds detected

R = Rinsate

FB = Field blank

D = Duplicate

TB = Trip blank EB = Equipment blank SB=Source blank OTHER:

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

LDC #: 33733A6

VALIDATION COMPLETENESS WORKSHEET

Level IV

SDG #: 5020607/5021026 Laboratory: Eastern Research Group Date: 2(3(15)
Page: 2 of 2
Reviewer: 50
2nd Reviewer: ______

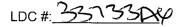
METHOD: (Analyte) <u>Hexavalent Chromium (ASTM D7614)</u>

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

No	tes:			
		 		- 380 00

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 <a> 0.995?	/			
Were all initial and continuing calibration verification %Rs within the \$99-110%-QC limits?	1			
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.	got.			30
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 anaylzed 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?				

WETC-EPA_2010.wpd version 1.0



VALIDATION FINDINGS CHECKLIST

Page: 2 of 2 Reviewer: 50 2nd Reviewer: 01

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.	1			
Target analytes were detected in the field blanks.		1		

LDC# 33733A6

VALIDATION FINDINGS WORKSHEET Field Duplicates

Page:	1	of_
Reviewer:	سـ	20
2nd Reviewer:	(V.

Inorganics: Method See Cover

	Concentrati			
Analyte	3	4	RPD (≤20)	Qual.
Hexavalent Chromium	0.0327	0.0298	9	

	Concentrat	ion (ng/m3)	200	01	
Analyte	12	13	RPD (≤20)	Qual.	
Hexavalent Chromium	0.0630	0.0567	11		

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

LDC #: 33733

Validation Findings Worksheet Initial and Continuing Calibration Calculation Verification

Page:	of	
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2nd Revie	wer:_	d

Method: Inorganics, Method See Cover

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

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

%R = Found X 100

Where,

Found = concentration of each analyte <u>measured</u> in the analysis of the ICV or CCV solution

True

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

					Recalculated	Reported	Acceptable
Type of analysis	Analyte	Standard	Conc. (ng/ml)	Area	r or r ²	r or r ²	(Y/N)
Initial calibration		s1	0.05	0.000025			
		s2	0.1	0.0000663	0.99988	0.99988	
	0 1/2	s3	0.2	0.000141			C)
	C	s4	0.5	0.0003469			
		s5	1	0.0007328			
		s6	2	0.0015014			
ICU 10:59	طلحي	Found	True		,		4
Calibration verification	C	0.5330g/ml	0.5 nghl		10000% B	40008R	
ce 11:58	1	h =700 1 1	15.01		102 09/0	107.8%R	
Calibration verification	<u> </u>	0.2250 major	O. Sveful		101.8%	10 1.0 (%	
Calibration verification	<u></u>	<u> </u>					

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 #: 33733AW

VALIDATION FINDINGS WORKSHEET Level IV Recalculation Worksheet

	Page: <u> </u>	_of\
	Reviewer:	<u> 20</u>
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	C!	
METHOD: Inorganics, Met	thod equ	_ were

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

 $%R = Found \times 100$ True

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:

 $RPD = \underline{[S-D]} \times 100$

Where,

S = D = Original sample concentration

(S+D)/2

Duplicate sample concentration

Sample ID	Type of Analysis	Element	Found / S (units)	True / D (units)	Recalculated %R / RPD	Reported %R / RPD	Acceptable (Y/N)
LCS 11:29	Laboratory control sample	C+10	1.085 nghul	1.00ng/ml	109%R	109 % R	J
N	Matrix spike sample		(SSR-SR)				
DUR 12:29	Duplicate sample	4	0.0346 ng/m3	0.0326 ng/m3	5.95%RPD	5.78720	7

Comments:	 	 	 	 				 	
	 	 	 	 	*	 	 	 •	

LDC #: 33733A/0

VALIDATION FINDINGS WORKSHEET

Sample Calculation Verification

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2nd reviewer:	α	

				2nd review	ver:					
METH	IOD: Inorganics, Metho	d See Cover								
Y N Y N	Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A". Y N N/A									
	ound (analyte) results foulded	g the following equation:	•	orted with a positiv						
Concer	ntration = (A-Co) (C	VEIONI Recalculation: (0.00) W3 - 21.07 (value) Vok) W3	000828 - C-	1.59(E-05))	0.13dor					
	10=1.59E-05 C(=0.000755	((industrik)	306)(10m)) '						
	A > 0.0000878	W ³	2107m	3 - 0.000	<i>x</i>					
#	Sample ID	Analyte	Reported Concentration (ಌೣೣೣನಿ)	Calculated Concentration (velv3)	Acceptable (Y/N)					
		1=+10	0.5292	0.0291	4*					
	2		0.0321	0.0321	7					
	3		0.0327	0.0326	¥*					
	4		0.0298	0.0298	3					
	2		0.0620	0.0620	Ì					
	6		0.0272	0.0272						
	7		0.0487	0.0487						
	&		20	00						
	9		PD	(N)	4					
	10		0.0766	0.0265	メと					
	11		0.0362	0.0362	5					
	12		0.0630	0.0630						
	13		0.0567	0.0567						
	14		0.127	0.127						
	15		0-0636	0.0636	4					
	16		0.0493	0.0492	7.x					
	17		00	ND	۷					
	18	\mathcal{L}		29	4					

Note:	



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

02/13/15 13:17

REPORTED: SUBMITTED:

02/06/15 to 02/10/15

Malvern, PA 19355

AQS SITE

PHONE: (443) 803-8495

ATTN: Mr. Jeff Boggs

FAX: (410) 266-8912

SITE CODE:

Honeywell Hex Chrome Study

Description:

Comments:

OAM 1

Start Time 2/4/15 15:17

Lab ID:

5020607-01

Sampled: 02/05/15 15:01

Matrix:

Sample Volume:

21.36

 m^3

Received: 02/06/15 10:57

Analysis Date: 02/12/15 13:40

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

Analyte

CAS Number

ng/m³ Air

<u>Flaq</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0292

0.0036

FEB 1 7 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED: 02/13/15 13:17

Malvern, PA 19355

SUBMITTED:

02/06/15 to 02/10/15

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

.....

FAX: (410) 266-8912

CODE: SITE CODE:

Honeywell Hex Chrome Study

Description:

OAM 2

Start Time 2/4/15 15:44

Lab ID:

5020607-02

Sampled: 02/05/15 15:23

Matrix:

Comments:

Air

Sample Volume:

21.27

Received: 02/06/15 10:57

. .

Analysis Date: 02/12/15 13:50

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

<u>Analyte</u>

CAS Number

ng/m³ Air

Flag

m³

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0321

0.0036

FEB 1 7 2015

Initials: CR

Eastern Research Group

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

Page 4 of 22



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED: 02/13/15 13:17

Malvern, PA 19355

SUBMITTED:

02/06/15 to 02/10/15

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

i. con bogge

FAX: (410) 266-8912

SITE CODE:

Honeywell Hex Chrome Study

Description:

PAM-1

Lab ID: 5020

5020607-03

Sampled: 02/05/15 16:20

Matrix:

Air

Sample Volume:

21.1

Received: 02/06/15 10:57 **Analysis Date:** 02/12/15 12:20

Comments:

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

Hexavalent Chromium by SOP ERG-MOR-063

<u>Results</u>

<u>MDL</u>

<u>Analyte</u>

CAS Number

<u>ng/m³ Air</u>

Flag

m³

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0327

0.0036

FEB 1 7 2015

Initials: CR

Eastern Research Group

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

Page 5 of 22



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

FILE #: 3926.00

REPORTED: 02/13/15 13:17

Malvern, PA 19355

SUBMITTED:

02/06/15 to 02/10/15

ATTN: Mr. Jeff Boggs

AQS SITE

CODE:

PHONE: (443) 803-8495

Description:

Lab ID:

5020607-04

Honeywell Hex Chrome Study Sampled: 02/05/15 16:21

Matrix:

PAM-1D

Sample Volume:

21.07

m³

Received: 02/06/15 10:57

Analysis Date: 02/12/15 12:39

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

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

Analyte

CAS Number

FAX: (410) 266-8912

ng/m³ Air

<u>Flaq</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0298

0.0036

FEB 1 7 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

02/13/15 13:17 REPORTED:

Malvern, PA 19355

SUBMITTED:

02/06/15 to 02/10/15

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

FAX: (410) 266-8912

SODE:

Honeywell Hex Chrome Study

Description:

PAM-2

Lab ID: 5020607-05 Sampled: 02/05/15 15:55

Matrix:

Air

Sample Volume:

 $\,m^3$

Received: 02/06/15 10:57 Analysis Date: 02/12/15 14:19

Comments:

Start Time 2/4/15 16:30

Hexavalent Chromium by SOP ERG-MOR-063

21.07

Results

MDL

Analyte

CAS Number

ng/m³ Air

<u>Flaq</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0620

0.0036

FEB 1 7 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED: 02/13/15 13:17

Malvern, PA 19355

SUBMITTED: 02/0

02/06/15 to 02/10/15

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

SITE CODE:

Honeywell Hex Chrome Study

Description:

PAM-3

Lab ID: 5020607-06

Sampled: 02/05/15 15:51

Matrix:

۸:-

Sample Volume:

21.14

Received: 02/06/15 10:57

Comments: Start Time 2/4/15 16:22

Analysis Date: 02/12/15 14:29

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

<u>Analyte</u>

CAS Number

FAX: (410) 266-8912

<u>ng/m³ Air</u>

Flag

 $\,m^3$

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0272

0.0036

FEB 1 7 2015

Initials: CR

Eastern Research Group

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

Page 8 of 22



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED: 02/13/15 13:17

Malvern, PA 19355

SUBMITTED:

02/06/15 to 02/10/15

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

FAX: (410) 266-8912

SITE CODE:

21.24

Honeywell Hex Chrome Study

Description:

Comments:

PAM-4

Start Time 2/4/15 16:11

Lab ID:

5020607-07

Sampled: 02/05/15 15:47

Matrix:

Air

Sample Volume:

m³

Received: 02/06/15 10:57

Analysis Date: 02/12/15 14:39

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

Analyte

CAS Number

ng/m³ Air

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0487

0.0036

FEB 1 7 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED: 02/13/15 13:17

Malvern, PA 19355

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

AQS SITE

ATTN: Mr. Jeff Boggs

SITE CODE:

m³

PHONE: (443) 803-8495

Air

5020607-08

Honeywell Hex Chrome Study

Description:

PAM-21

Lab ID:

Sampled: 02/05/15 00:00

Sample Volume:

21.07

Received: 02/06/15 10:57

Comments:

Matrix:

Analysis Date: 02/12/15 14:49

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

Analyte Hexavalent Chromium **CAS Number** 1854-02-99

FAX: (410) 266-8912

ng/m³ Air ND

<u>Flag</u>

ng/m³ Air 0.0036

FEB 1 7 2015

Initials: CR

Eastern Research Group

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

Page 10 of 22



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED: 02/13/15 13:17

Malvern, PA 19355

SUBMITTED:

m³

02/06/15 to 02/10/15

AQS SITE

ATTN: Mr. Jeff Boggs

SITE CODE:

PHONE: (443) 803-8495

Honeywell Hex Chrome Study

Description:

PAM-31

Lab ID:

5020607-09

Sampled: 02/05/15 00:00

Matrix: Air Sample Volume:

FAX: (410) 266-8912

21.14

Received: 02/06/15 10:57

Comments:

Analysis Date: 02/12/15 14:59

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

Analyte

CAS Number

ng/m³ Air

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

ND

0.0036

FEB 1 7 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED: 02/13/15 13:17

Malvern, PA 19355

SUBMITTED:

m³

02/06/15 to 02/10/15

ATTN: Mr. Jeff Boggs

AQS SITE

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

SITE CODE:

Honeywell Hex Chrome Study

Analysis Date: 02/12/15 15:09

Description:

OAM 1

Lab ID:

5021026-01

Sampled: 02/09/15 15:04

Matrix:

Sample Volume:

21.49

Received: 02/10/15 11:33

Comments:

Start Time 2/8/15 15:11

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

Analyte

CAS Number

ng/m³ Air

<u>Flaq</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0266

0.0036

FEB 1 7 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED: 02/13/15 13:17

Malvern, PA 19355

SUBMITTED:

02/06/15 to 02/10/15

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

Sample Volume:

SITE CODE:

Honeywell Hex Chrome Study

Description:

OAM 2

Air

Lab ID: 5021026-02

m³

Sampled: 02/09/15 15:29 Received: 02/10/15 11:33

Matrix: Comments:

Start Time 2/8/15 15:34

21.52

Analysis Date: 02/12/15 15:19

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

<u>Analyte</u> **Hexavalent Chromium** **CAS Number**

FAX: (410) 266-8912

ng/m³ Air

<u>Flag</u>

ng/m³ Air

1854-02-99

0.0362

0.0036

FEB 1 7 2015

Initials: CR



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

02/13/15 13:17 REPORTED:

Malvern, PA 19355

SUBMITTED:

02/06/15 to 02/10/15

AQS SITE

ATTN: Mr. Jeff Boggs

SITE CODE:

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

Honeywell Hex Chrome Study

Description:

PAM-1

Air

5021026-03 Lab ID: Sample Volume:

m³

Sampled: 02/09/15 16:17 Received: 02/10/15 11:33

Matrix: Comments:

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

21.47

Analysis Date: 02/12/15 12:59

Hexavalent Chromium by SOP ERG-MOR-063

<u>Results</u>

<u>MDL</u>

<u>Analyte</u>

CAS Number

ng/m³ Air

<u>Flag</u>

ng/m3 Air

Hexavalent Chromium

1854-02-99

0.0630

0.0036

FEB 1 7 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED: 02/13/15 13:17

Malvern, PA 19355

SUBMITTED:

02/06/15 to 02/10/15

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

SITE CODE:

Honeywell Hex Chrome Study

Description:

PAM-1D

Lab ID:

5021026-04

Sampled: 02/09/15 16:19

Matrix:

LWILLTE

Sample Volume:

21.4

m³

Received: 02/10/15 11:33

Comments: Col 2 Start Time 2/8/15 16:33

Analysis Date: 02/12/15 13:19

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

<u>Analyte</u>

CAS Number

FAX: (410) 266-8912

<u>ng/m³ Air</u>

<u>Flag</u>

<u>ng/m³ Air</u>

Hexavalent Chromium

1854-02-99

0.0567

0.0036

FEB 1 7 2015

Initials: CR

Eastern Research Group

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

Page 15 of 22



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED: 02/13/15 13:17

Malvern, PA 19355

SUBMITTED: 02

02/06/15 to 02/10/15

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

SITE CODE:

21.48

Honeywell Hex Chrome Study

Description:

Comments:

PAM-2

Start Time 2/8/15 16:09

Lab ID:

5021026-05

Sampled: 02/09/15 16:01

Matrix: /

Air

Sample Volume:

m³

Received: 02/10/15 11:33

Analysis Date: 02/12/15 15:29

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

<u>Analyte</u>

CAS Number

FAX: (410) 266-8912

ng/m³ Air

<u>Flag</u>

<u>nq/m³ Air</u>

Hexavalent Chromium

1854-02-99

0.127

0.0036

FEB 1 7 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED: 02/13/15 13:17

Malvern, PA 19355

SUBMITTED:

02/06/15 to 02/10/15

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

SITE CODE:

Honeywell Hex Chrome Study

Description:

PAM-3

Lab ID:

5021026-06

Sampled: 02/09/15 15:57

Matrix:

Air

Sample Volume:

21.45

Received: 02/10/15 11:33

FAX: (410) 266-8912

m³

Analysis Date: 02/12/15 15:38

Comments:

Start Time 2/8/15 16:02

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

Analyte

CAS Number

ng/m³ Air

<u>Flaq</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0636

0.0036

FEB 1 7 2015

Initials: CR

Eastern Research Group

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

Page 17 of 22



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED:

02/13/15 13:17

Malvern, PA 19355

SUBMITTED:

02/06/15 to 02/10/15

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

..... --- -

FAX: (410) 266-8912

SITE CODE:

Honeywell Hex Chrome Study

Description:

Comments:

PAM-4

Start Time 2/8/15 15:58

Lab ID: 5021026-07

Sampled: 02/09/15 15:48

Matrix:

A i.e.

Sample Volume:

21.45

m³

Received: 02/10/15 11:33

Analysis Date: 02/12/15 16:38

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

<u>Analyte</u>

CAS Number

ng/m³ Air

<u>Flag</u>

<u>ng/m³ Air</u>

Hexavalent Chromium

1854-02-99

0.0493

0.0036

FEB 1 7 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc.

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

Matrix:

Comments:

PHONE: (443) 803-8495

Description:

Air

PAM-21

FAX: (410) 266-8912

Lab ID:

Sample Volume:

5021026-08

21.48

m³

FILE #: 3926.00

REPORTED:

SUBMITTED: AQS SITE

SITE CODE:

02/13/15 13:17

02/06/15 to 02/10/15

Sampled: 02/09/15 00:00 Received: 02/10/15 11:33

Analysis Date: 02/12/15 16:18

Honeywell Hex Chrome Study

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

Analyte

CAS Number

ng/m³ Air

<u>Flaq</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

ND

0.0036

FEB 1 7 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED: 02/13/15 13:17

Malvern, PA 19355

SUBMITTED:

02/06/15 to 02/10/15

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

FAX: (410) 266-8912

CODE:

Honeywell Hex Chrome Study

Description:

Comments:

Matrix:

PAM-31

Air

Lab ID: 5021026-09 Sample Volume:

21.45

m³

Sampled: 02/09/15 00:00 Received: 02/10/15 11:33

Analysis Date: 02/12/15 16:28

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

Analyte

CAS Number

ng/m³ Air

Flag

ng/m³ Air

Hexavalent Chromium

1854-02-99

ND

0.0036

FEB 1 7 2015

Initials: CR

Eastern Research Group



LABORATORY DATA CONSULTANTS, INC.

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

ERM

February 26, 2015

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

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

Dear Mr. Boggs,

Enclosed is the final validation report for the fraction listed below. This SDG was received on February 25, 2015. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #33788:

SDG

Fraction

5021131/5021212

Hexavalent Chromium

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

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

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

Sincerely,

Christina Rink

Project Manager/Chemist

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Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: Harbor Point, MD, Hexavalent Chromium Monitoring

Collection Date: February 10 through February 11, 2015

LDC Report Date: February 26, 2015

Matrix: Air

Parameters: Hexavalent Chromium

Validation Level: EPA Level IV

Laboratory: Eastern Research Group

Sample Delivery Group (SDG): 5021131/5021212

Sample Identification

OAM 1(02/10/15) PAM-1(02/11/15)DUP OAM 2(02/10/15) PAM-1D (02/11/15)DUP

PAM-1(02/10/15)

PAM-1D (02/10/15)

PAM-2(02/10/15)

PAM-3(02/10/15)

PAM-4(02/10/15)

PAM-21(02/10/15)

PAM-31(02/10/15)

OAM 1(02/11/15)

OAM 2(02/11/15) PAM-1(02/11/15)

PAM-10 (02/11/15)

PAM-10 (02/11/15)

PAM-3(02/11/15)

PAM-4(02/11/15)

PAM-21(02/11/15)

PAM-31(02/11/15)

PAM-1(02/10/15)DUP

PAM-1D (02/10/15)DUP

Introduction

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

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

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

The following are definitions of the data qualifiers:

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

I. Technical Holding Times

All technical holding time requirements were met.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met.

IV. Blanks

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

Samples PAM-31(02/10/15) and PAM-31(02/11/15) were identified as trip blanks. No hexavalent chromium was found.

Samples PAM-21(02/10/15) and PAM-21(02/11/15) were identified as field blanks. No hexavalent chromium was found.

V. Matrix Spike/Matrix Spike Duplicates

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

VI. Duplicates

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

VII. Laboratory Control Samples

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

VIII. Sample Result Verification

All sample result verifications were acceptable.

IX. Overall Assessment of Data

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

X. Field Duplicates

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

	Concentrat	ion (ng/m³)	200		
Analyte	PAM-1(02/10/15)	PAM-1D (02/10/15)	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.0124	0.0120	3 (≤20)	•	-

	Concentrat	ion (ng/m³)	222		
Analyte	PAM-1(02/11/15)	PAM-1D (02/11/15)	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.0105	0.0096	9 (≤20)	-	-

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

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

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

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

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

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

LDC #: 33788A6

VALIDATION COMPLETENESS WORKSHEET

Level IV

SDG #: 5021131/5021212 Laboratory: Eastern Research Group 2nd Reviewer:

METHOD: (Analyte) Hexavalent Chromium (ASTM D7614)

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

	Validation Area		Comments
<u>l.</u>	Sample receipt/Technical holding times	A	2/10-11/15
- 11	Initial calibration	A	
III.	Calibration verification	A	
IV	Laboratory Blanks	A	
V	Field blanks	100	FB=(8)(17) TB=(9)(R)
VI.	Matrix Spike/Matrix Spike Duplicates	<i>N</i>	Not Required
VII.	Duplicate sample analysis	A	DUD ,
VIII.	Laboratory control samples	A	LCS/D
IX.	Field duplicates	Sw	FD=(3,4) (12,13)
X.	Sample result verification	A	
ΧI	Overall assessment of data	PX	

Note:

A = Acceptable

N = Not provided/applicable SW = See worksheet

ND = No compounds detected

R = Rinsate

FB = Field blank

D = Duplicate

TB = Trip blank EB = Equipment blank SB=Source blank OTHER:

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

LDC #: 33788A6

VALIDATION COMPLETENESS WORKSHEET

Level IV

Page: Zof Z Reviewer: SS 2nd Reviewer:

SDG #: 5021131/5021212 Laboratory: Eastern Research Group

METHOD: (Analyte) Hexavalent Chromium (ASTM D7614)

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

Notes:

VALIDATION FINDINGS CHECKLIST

Page: _\of _Z Reviewer: ____ 2nd Reviewer: ____

Method:Inorganics (EPA Method&ఒ(లులూ)				
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 90 146% 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 anaylzed 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

Page: Zof Z Reviewer: SO 2nd Reviewer:

Validation Area	Yes	No	NA	Findings/Comments
VII. Sample Result Verification			<u>. </u>	
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	/			
Were detection limits < RL?	1			
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#<u>33788A6</u>

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Page: ____of__ Reviewer:_____ 2nd Reviewer:_____

Inorganics: Method See Cover

	Concentrati			
Analyte	3	4	RPD (≤20)	Qual.
Hexavalent Chromium	0.0124	0.0120	3	

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

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

LDC #: 33788AW

Validation Findings Worksheet Initial and Continuing Calibration Calculation Verification

Page: \	of_	
Reviewer:_	2	7
nd Reviewe	er:	7

	Method:	Inorganics,	Method	See Cover
--	---------	-------------	--------	-----------

The correlation coefficient (r) for the calibration of was recalculated. Calibration date: 02/18/15

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

%R = <u>Found X 100</u>

Where,

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

True

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

	-				Recalculated	Reported	Acceptable
Type of analysis	Analyte	Standard	Conc. (ng/mL)	Area	r or r ²	r or r ²	(Y/N)
Initial calibration		s1	0.05	0.0000379			
		s2	0.1	0.0000779	0.99985	0.99985	
	A +6	s3	0.2	0.0001681			u
	Crib	s4	0.5	0.0004251			
		s5	1	0.000824			
		s6	2	0.0017087			
JW 11:33	C+20	tours	Troe O. Sralmi		2,5	105.0%2	Y
Calibration verification		0.5250rg/m	O. Svalmi		103.00	103.072	
CCO (2):32 Calibration verification	C++6	0.5294mg/ml	0.5mg/~1		105.9%	105,9%	7
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 #: 33788A

VALIDATION FINDINGS WORKSHEET Level IV Recalculation Worksheet

	Page:_	<u>\</u> of_\
	Reviewer:	OZ
2nd	Reviewer:	9

METHOD: Inorganics, Method See Cover

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

 $%R = Found \times 100$ True

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:

 $RPD = |S-D| \times 100$ (S+D)/2

Where,

S = D = Original sample concentration

Duplicate sample concentration

Sample ID	Type of Analysis	Element	Found / S (units)	True / D (units)	Recalculated %R / RPD	Reported %R / RPD	Acceptable (Y/N)
12:02	Laboratory control sample	Cxilo	1.079 ng/ml	1-00 ng/m/	108%	108%2	3
2	Matrix spike sample		(SSR-SR)				
DUP 14:21	Duplicate sample	Cxxx	0.0123 ng/m3	0.0124 ng/m³	0.81%18.0	1-13%	y

Comments	·	 	 	 	 	 	 	

LDC#: 33788460

VALIDATION FINDINGS WORKSHEET

Sample Calculation Verification

METH	IOD: Inorganics, Metho	od See Cover								
MW	N/A Have results N/A Are results w	ow for all questions answered "N". Not app been reported and calculated correctly? vithin the calibrated range of the instrumen tion limits below the CRQL?		e identified as "N/	A".					
V Comp recalc	Compound (analyte) results forreported with a positive detect were recalculated and verified using the following equation:									
Concen	tration = $(A-co)/C$	$\frac{1}{\sqrt{1 + 100}} \frac{\sqrt{1 + 100}}{\sqrt{1 + 100}} = \frac{1000}{\sqrt{1 + 100}}$	1,2-)-0410	4E-06))) 0230 ra					
4	7 = 1 = 1 = 1 = 1	m3 = 2/28 m3	7058000	_ \						
' ((1=0,000)(40 (0= -5 14E-	.ob (halm) (H)	(0.0230 mg)	~1)(10m2)	7 ~:-0					
_	C= 0.00083	S M3	21.45	5m3 =	0-010 lv					
#	Sample ID	Analyta	Reported Concentration (ᠬᠠᠠ)	Calculated Concentration (\(\(\) \(\) \(\)	Acceptable (Y/N)					
	l	Analyte	0.0107	0.0107	3					
	2		0.0117	0.0117						
	3		0.0124	0.0124						
	4		0.0120	0.000	9					
	2		0-0347	0.0343	<i>₩</i>					
	6		0.0096	1200.0	9*					
	7		0-0120	0.000	4					
	8		NO	20						
	q		NO	170						
	10		0.000	0.0077						
	11		0.0067	0.0067						
	12		0.0105	0.0105	4					
	13		0-0096	D.0095	<u>u</u> *					
	41		0-0287	0.0287	3					
	15		0.0067	0.0066	47					
	16		0.0109	P010.0	7					
	Ú		ND	24						
	18	4	ND	ND	1					
Note:_	* Randin	Δ								



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

FILE #: 3926.00

REPORTED:

02/25/15 13:14

Malvern, PA 19355

SUBMITTED:

02/11/15 to 02/12/15

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

FAX: (410) 266-8912

SUE CODE:

m³

Honeywell Hex Chrome Study

Description:

OAM 1

Lab ID:

5021131-01

Sampled: 02/10/15 15:01

Analysis Date: 02/20/15 13:41

Matrix:

Air

Sample Volume:

21.48

Received: 02/11/15 11:12

Comments:

Start Time 2/9/15 15:09

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

Analyte

CAS Number

ng/m³ Air

Flag

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0107

0.0036

FEB 2 6 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

FILE #: 3926.00

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ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

CODE:

Honeywell Hex Chrome Study

Description:

OAM 2

Lab ID:

5021131-02

Sampled: 02/10/15 15:32

Matrix:

Air

Sample Volume:

21.6

Received: 02/11/15 11:12 Analysis Date: 02/20/15 13:51

Comments:

Start Time 2/9/15 15:32

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

Analyte

CAS Number

FAX: (410) 266-8912

ng/m³ Air

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0117

0.0036

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Page 4 of 22



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Malvern, PA 19355

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02/11/15 to 02/12/15

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

FAX: (410) 266-8912

SITE CODE:

Honeywell Hex Chrome Study

Description:

PAM-1

Lab ID:

5021131-03

Sampled: 02/10/15 16:12

Matrix:

Air

Sample Volume:

21.49

Received: 02/11/15 11:12

Analysis Date: 02/18/15 12:52

Comments:

Col 1 Start Time 2/9/15 16:20

Hexavalent Chromium by SOP ERG-MOR-063

<u>Results</u>

<u>MDL</u>

<u>Anaiyte</u>

CAS Number

ng/m³ Air

Flag

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0124

0.0036

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Page 5 of 22



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75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495 Description:

Matrix:

Comments:

Air

PAM-1D

Col 2 Start Time 2/9/15 16:22

FAX: (410) 266-8912

Lab ID: 5021131-04

Sample Volume:

m³

FILE #: 3926.00

REPORTED:

SUBMITTED:

AQS SITE SHECODE:

Honeywell Hex Chrome Study

Sampled: 02/10/15 16:15

Received: 02/11/15 11:12

Analysis Date: 02/18/15 13:12

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

02/25/15 13:14

02/11/15 to 02/12/15

Analyte Hexavalent Chromium

CAS Number

ng/m³ Air

<u>Flaq</u>

ng/m³ Air

0.0120 1854-02-99

0.0036

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Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

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Malvern, PA 19355

EPURIED: UZI

02/11/15 to 02/12/15

ATTN: Mr. Jeff Boggs

AQS SITE

SUBMITTED:

PHONE: (443) 803-8495

CODE:

Honeywell Hex Chrome Study

Description:

PAM-2

Lab ID:

5021131-05

Sampled: 02/10/15 16:03

Matrix: Ai

Air

Sample Volume:

m³

Received: 02/11/15 11:12

Analysis Date: 02/18/15 16:13

Comments: Start Time 2/9/15 16:05

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

<u>Analyte</u>

CAS Number

FAX: (410) 266-8912

<u>ng/m³ Air</u>

<u>Flag</u>

<u>ng/m³ Air</u>

Hexavalent Chromium

1854-02-99

0.0342

0.0036

FEB 2 6 2015

A shrowing exacts.

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED: 02/25/15 13:14

Malvern, PA 19355

SUBMITTED:

02/11/15 to 02/12/15

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

CODE: SITE CODE:

Honeywell Hex Chrome Study

Description:

PAM-3

Lab ID: 5021131-06

Sampled: 02/10/15 15:57

Matrix: Air

Sample Volume:

FAX: (410) 266-8912

21.63 m³

Received: 02/11/15 11:12 **Analysis Date:** 02/20/15 14:01

Comments:

Start Time 2/9/15 15:55

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

<u>Analyte</u>

CAS Number

ng/m³ Air

Flag

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0096

0.0036

FEB 2 6 2015

The sales was the sales of the

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

Matrix:

PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

02/25/15 13:14

SUBMITTED:

m³

02/11/15 to 02/12/15

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description:

Comments:

PAM-4

Air

Lab ID:

Sample Volume:

5021131-07

21.62

Sampled: 02/10/15 15:52 Received: 02/11/15 11:12

Analysis Date: 02/20/15 15:50

Start Time 2/9/15 15:51

Hexavalent Chromium by SOP ERG-MOR-063 <u>Results</u>

MDL

Analyte

CAS Number

ng/m³ Air

Flag

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0120

0.0036

FEB 2 6 2015

Initials: CR

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Page 9 of 22



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Air

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

02/25/15 13:14

SUBMITTED:

02/11/15 to 02/12/15

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description: Matrix: PAM-21

Lab ID:

Sample Volume:

5021131-08

21.57

m³

Sampled: 02/10/15 00:00

Received: 02/11/15 11:12 **Analysis Date:** 02/20/15 14:21

Comments:

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

Analyte
Hexavalent Chromium

CAS Number 1854-02-99

ng/m³ Air ND

Flag

u

<u>ng/m³ Air</u>

0.0036

FEB 2 6 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

02/25/15 13:14

Malvern, PA 19355

REPORTED: SUBMITTED:

02/11/15 to 02/12/15

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

FAX: (410) 266-8912

SITE CODE:

m³

Honeywell Hex Chrome Study

Description:

Comments:

PAM-31

Lab ID:

5021131-09

Sampled: 02/10/15 00:00

Matrix: Air Sample Volume:

21.63

Received: 02/11/15 11:12 Analysis Date: 02/20/15 14:31

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

Analyte

CAS Number

ng/m³ Air

<u>Flaq</u>

<u>ng/m³ Air</u>

Hexavalent Chromium

1854-02-99

ND

0.0036

FEB 2 6 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED: 02/25/15 13:14

Malvern, PA 19355

SUBMITTED:

02/11/15 to 02/12/15

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

SITE CODE:

Air

5021212-01

Honeywell Hex Chrome Study Sampled: 02/11/15 14:53

Analysis Date: 02/20/15 14:40

Description: Matrix: OAM 1

Lab ID: Sample Volume:

Hexavalent Chromium by SOP ERG-MOR-063

21.44

m³

Received: 02/12/15 11:20

Comments:

Start Time 2/10/15 15:03

Results

MDL

Analyte

CAS Number

FAX: (410) 266-8912

ng/m³ Air

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0077

0.0036

FEB 2 6 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED: 02/25/15 13:14

Malvern, PA 19355

LFORTED. 02/20/

SUBMITTED:

02/11/15 to 02/12/15

ATTN: Mr. Jeff Boggs

AQS SITE CODE: SITE CODE:

PHONE: (443) 803-8495

FAX: (410) 266-8912

Honeywell Hex Chrome Study

Description:

OAM 2

Air

Lab ID:

Sample Volume:

5021212-02

m³

Sampled: 02/11/15 15:12 Received: 02/12/15 11:20

Matrix: Comments:

Start Time 2/10/15 15:35

21.25

Analysis Date: 02/20/15 14:50

Hexavalent Chromium by SOP ERG-MOR-063

<u>Results</u>

<u>MDL</u>

<u>Analyte</u>

CAS Number

<u>ng/m³ Air</u>

Flag

<u>ng/m³ Air</u>

Hexavalent Chromium

1854-02-99

0.0067

0.0036

FEB 2 6 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED:

02/25/15 13:14

Malvern, PA 19355

SUBMITTED:

02/11/15 to 02/12/15

ATTN: Mr. Jeff Boggs

AQS SITE SITE CODE:

PHONE: (443) 803-8495

FAX: (410) 266-8912

Honeywell Hex Chrome Study

Description:

PAM-1

Lab ID:

5021212-03

Sampled: 02/11/15 16:19

Matrix:

Air

Sample Volume:

m³

Received: 02/12/15 11:20 Analysis Date: 02/18/15 15:13

Comments:

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

Hexavalent Chromium by SOP ERG-MOR-063

21.64

<u>Results</u>

MDL

Analyte

CAS Number

ng/m³ Air

Flag

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0105

0.0036

FEB 2 6 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

02/25/15 13:14 REPORTED:

Malvern, PA 19355

SUBMITTED:

02/11/15 to 02/12/15

ATTN: Mr. Jeff Boggs

AQS SITE

SITE CODE:

PHONE: (443) 803-8495

5021212-04

Honeywell Hex Chrome Study

Description:

Comments:

PAM-1D

Lab ID:

Sampled: 02/11/15 16:23

Matrix: Air

Col 2 Start Time 2/10/15 16:18

Sample Volume:

21.67

Received: 02/12/15 11:20 Analysis Date: 02/18/15 13:52

Hexavalent Chromium by SOP ERG-MOR-063

m³

<u>Results</u>

MDL

Analyte

CAS Number

FAX: (410) 266-8912

ng/m³ Air

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0096

0.0036

FEB 2 6 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED:

m³

02/25/15 13:14

Malvern, PA 19355

SUBMITTED:

02/11/15 to 02/12/15

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

FAX: (410) 266-8912

SUPECODE:

Honeywell Hex Chrome Study

Description:

PAM-2

Lab ID:

5021212-05

Sampled: 02/11/15 16:03

Matrix: A

Air

Sample Volume:

21.55

Received: 02/12/15 11:20 **Analysis Date:** 02/20/15 15:00

Comments: Start Time 2/10/15 16:06

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

<u>Analyte</u>

CAS Number

ng/m³ Air

Flag

<u>ng/m³ Air</u>

Hexavalent Chromium

1854-02-99

0.0287

0.0036

FEB 2 6 2015

Initials: CR

Eastern Research Group

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

Page 16 of 22



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED:

02/25/15 13:14

Malvern, PA 19355

SUBMITTED:

02/11/15 to 02/12/15

ATTN: Mr. Jeff Boggs

AQS SITE SITE CODE:

PHONE: (443) 803-8495

FAX: (410) 266-8912

Honeywell Hex Chrome Study

Description:

PAM-3

5021212-06 Lab ID:

Sampled: 02/11/15 15:52

Matrix:

Air

Sample Volume:

m³

Received: 02/12/15 11:20 Analysis Date: 02/20/15 15:10

Comments:

Start Time 2/10/15 16:00

Hexavalent Chromium by SOP ERG-MOR-063

21.48

<u>Results</u>

MDL

Analyte

CAS Number

ng/m³ Air

<u>Flaq</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0067

0.0036

FEB 2 6 2015



Environmental Resources Management, Inc

PAM-4

Air

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

Description:

Comments:

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Matrix:

FAX: (410) 266-8912

Start Time 2/10/15 15:56

SITE CODE:

FILE #: 3926.00

REPORTED:

SUBMITTED:

 m^3

<u>Flag</u>

AQS SITE

5021212-07

Sample Volume:

Lab ID:

21.38

Honeywell Hex Chrome Study

Sampled: 02/11/15 15:41 Received: 02/12/15 11:20

Analysis Date: 02/20/15 15:40

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

02/25/15 13:14

02/11/15 to 02/12/15

Analyte Hexavalent Chromium **CAS Number** 1854-02-99

ng/m³ Air 0.0109

ng/m³ Air

0.0036

FEB 2 6 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

Description:

Comments:

ATTN: Mr. Jeff Boggs

Matrix:

PHONE: (443) 803-8495

Air

PAM-21

FAX: (410) 266-8912

Lab ID:

5021212-08

Sample Volume:

21.55

m³

SUBMITTED:

AQS SITE

SITE CODE:

FILE #: 3926.00

REPORTED: 02/25/15 13:14

Honeywell Hex Chrome Study

Sampled: 02/11/15 00:00

Received: 02/12/15 11:20

Analysis Date: 02/18/15 18:14

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

02/11/15 to 02/12/15

CAS Number

ng/m³ Air

ng/m³ Air **Analyte** <u>Flag</u> Hexavalent Chromium 1854-02-99 0.0036 ND

FEB 2 6 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED:

02/25/15 13:14

Malvern, PA 19355

SUBMITTED:

SITE CODE:

m³

02/11/15 to 02/12/15

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

FAX: (410) 266-8912

Honeywell Hex Chrome Study

Received: 02/12/15 11:20

Description:

PAM-31

Lab ID:

5021212-09

Sampled: 02/11/15 00:00

Matrix: Air Sample Volume:

21.48

Comments:

Analysis Date: 02/18/15 18:24

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

Analyte Hexavalent Chromium **CAS Number**

ng/m³ Air

<u>Flag</u>

ng/m³ Air

1854-02-99 0.0036 ND

FEB 2 6 2015

Initials: CR

Eastern Research Group



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

ERM

March 3, 2015

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

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

Dear Mr. Boggs,

Enclosed is the final validation report for the fraction listed below. This SDG was received on March 2, 2015. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #33810:

SDG

Fraction

5021325/5021836

Hexavalent Chromium

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

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

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

Christina Rink

Sincerely.

Project Manager/Chemist

Attachment 1 111 pages-SF 1 WEEK TAT LDC #33810 (ERM - Morrisville, NC / Harbor Point, MD, Hexavalent Chromium Monitoring) Level IV DATE DATE Cr(VI) LDC SDG# REC'D DUE (D7614) Matrix: Air/Water/Soil 03/02/15 03/23/15 18 0 5021325/5021836 Total A/CR

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: Harbor Point, MD, Hexavalent Chromium Monitoring

Collection Date: February 12 through February 13, 2015

LDC Report Date: March 3, 2015

Matrix: Air

Parameters: Hexavalent Chromium

Validation Level: EPA Level IV

Laboratory: Eastern Research Group

Sample Delivery Group (SDG): 5021325/5021836

Sample Identification

OAM 1(02/12/15) PAM-1(02/13/15)DUP OAM 2(02/12/15) PAM-1D (02/13/15)DUP

PAM-1(02/12/15)

PAM-1D (02/12/15)

PAM-2(02/12/15)

PAM-3(02/12/15)

PAM-4(02/12/15)

PAM-21(02/12/15) PAM-31(02/12/15)

OAM 1(02/13/15)

OAM 2(02/13/15)

PAM-1(02/13/15)

PAM-1D (02/13/15)

PAM-2(02/13/15)

PAM-3(02/13/15)

PAM-4(02/13/15)

PAM-21(02/13/15)

PAM-31(02/13/15) PAM-1(02/12/15)DUP

PAM-1D (02/12/15)DUP

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

Introduction

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

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

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

The following are definitions of the data qualifiers:

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

I. Technical Holding Times

All technical holding time requirements were met.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met.

IV. Blanks

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

Samples PAM-31(02/12/15) and PAM-31(02/13/15) were identified as trip blanks. No hexavalent chromium was found.

Samples PAM-21(02/12/15) and PAM-21(02/13/15) were identified as field blanks. No hexavalent chromium was found.

V. Matrix Spike/Matrix Spike Duplicates

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

VI. Duplicates

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

VII. Laboratory Control Samples

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

VIII. Sample Result Verification

All sample result verifications were acceptable.

IX. Overall Assessment of Data

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

X. Field Duplicates

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

	Concentrati	ion (ng/m³)			
Analyte	PAM-1(02/12/15)	PAM-1D (02/12/15)	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.0208	0.0241	15 (≤20)	-	-

	Concentrati	on (ng/m³)				
Analyte PAM-1(02/13/15)		PAM-1D (02/13/15)	RPD (Limits)	Flags	A or P	
Hexavalent chromium	0.0162	0.0154	5 (≤20)	-	-	

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

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

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

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

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

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

LDC #: 33810A6

VALIDATION COMPLETENESS WORKSHEET

SDG #: 5021325/5021836

Level IV

Laboratory: Eastern Research Group

Date: 2/2/15
Page: of 2
Reviewer: 30
2nd Reviewer: 0

METHOD: (Analyte) Hexavalent Chromium (ASTM D7614)

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

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	02/12-13/15
II	Initial calibration	A	
111.	Calibration verification	A	
IV	Laboratory Blanks	A	
<u>v</u>	Field blanks	100	FB=(8)(n) TB=(9)(18)
VI.	Matrix Spike/Matrix Spike Duplicates	1)	Not Regulado
VII.	Duplicate sample analysis	A	DUR
VIII.	Laboratory control samples	A	Leslo
IX.	Field duplicates	SW	FD=(3,4) (12,13)
X.	Sample result verification	A	
LxL	Overall assessment of data	LA	

Note:

A = Acceptable

N = Not provided/applicable

SW = See worksheet

ND = No compounds detected

R = Rinsate

FB = Field blank

D = Duplicate

TB = Trip blank EB = Equipment blank SB=Source blank OTHER:

Matrix Date Client ID Lab ID 02/12/15 OAM 1(02/12/15) 5021325-01 Air Air 02/12/15 OAM 2 (02/12/15) 5021325-02 Air 02/12/15 3 PAM-1 (02/12/15) 5021325-03 PAM-1D (02/12/15) 5021325-04 Air 02/12/15 PAM-2 (02/12/15) 5021325-05 Air 02/12/15 6 PAM-3 (02/12/15) 5021325-06 Air 02/12/15 Air PAM-4 (02/12/15) 5021325-07 02/12/15 8 PAM-21 (02/12/15) Air 02/12/15 5021325-08 9 PAM-31 (02/12/15) Air 5021325-09 02/12/15 10 OAM 1(02/13/15) Air 02/13/15 5021836-01 OAM 2 (02/13/15) 5021836-02 Air 02/13/15 12 PAM-1 (02/13/15) 5021836-03 Air 02/13/15 PAM-1D (02/13/15) 13 5021836-04 Air 02/13/15 PAM-2 (02/13/15) Air 02/13/15 5021836-05 Air 15 PAM-3 (02/13/15) 5021836-06 02/13/15 16 PAM-4 (02/13/15) 5021836-07 Air 02/13/15 PAM-21 (02/13/15) 02/13/15 5021836-08

LDC #: 33810A6

VALIDATION COMPLETENESS WORKSHEET

Level IV

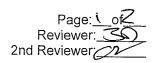
SDG #: 5021325/5021836 Laboratory: Eastern Research Group

Reviewer: 2nd Reviewer: 6

METHOD: (Analyte) Hexavalent Chromium (ASTM D7614)

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

30			
Notes	: <u> </u>		
 			

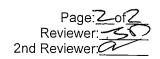


Method: Inorganics (EPA Method Yes No Findings/Comments Validation Area I. Technical holding times All technical holding times were met. Cooler temperature criteria was met. II. Calibration Were all instruments calibrated daily, each set-up time? Were the proper number of standards used? Were all initial calibration correlation coefficients > 0.995? Were all initial and continuing calibration verification %Rs within the 90-410% 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) < 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?



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#<u>33810A6</u>

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Page: <u>\</u>	_ of \
Reviewer:_	30
2nd Reviewer:_	N

Inorganics: Method See Cover

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

	Concentrat			
Analyte	12	13	RPD (≤20)	Qual.
Hexavalent Chromium	0.0162	0.0154	5	

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

LDC #: 338/04/0

Validation Findings Worksheet Initial and Continuing Calibration Calculation Verification

Page:_\	_ of _	7
Reviewer:_	3	\geq
2nd Review	er:⊆	₹_

wiethod: inorganics, wiethodSe	e Cover	
The correlation coefficient (r) for the calib	ration of C	was recalculated.Calibration date: 2\73\15
An initial or continuing calibration verifica	ition percent re	covery (%R) was recalculated for each type of analysis using the following formula:
%R = Found X 100_	Where,	Found = concentration of each analyte <u>measured</u> in the analysis of the ICV or CCV solution

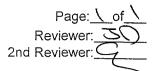
True = concentration of each analyte in the ICV or CCV source

					Recalculated	Reported	Acceptable
Type of analysis	Analyte	Standard	Conc. (ng/ml)	Area	r or r ²	r or r ²	(Y/N)
Initial calibration		s1	0.05	0.0000382			
		s2	0.1	0.000074	0.99999	0.99999	
	0 110	s3	0.2	0.0001621			$\dot{\mathcal{L}}$
	Crxx	s4	0.5	0.000405			(
		s5	1	0.0008102			
		s6	2	0.0016357			
プロン ハンハー Calibration verification	C420	Forend D. Szmalal	0.5 ng/ml		105:57,2	105.5%	
CCO \2`3\ Calibration verification	C<**		0. Snafral		102.5%R	102.5ZR	- +
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#: 33810AV

VALIDATION FINDINGS WORKSHEET Level IV Recalculation Worksheet



METHOD: Inorganics,	Method	se lover	
Percent recoveries (%	R) for a labora	atory control samp	ple and a matrix spike sample were recalculated using the following formula:
$%R = \frac{Found}{True} \times 100$	Where,	Found = True = cond	concentration of each analyte <u>measured</u> in the analysis of the sample. For the matrix spike calculation Found = SSR (spiked sample result) - SR (sample result). centration of each analyte in the source.

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

 $RPD = |S-D| \times 100$ Where, S = Original sample concentration <math>D = Original sample concentration

			Found / S	True / D	Recalculated	Reported	Acceptable
Sample ID	Type of Analysis	Element	(units)	(units)	%R / RPD	%R / RPD	(Y/N)
LC5	Laboratory control sample	صدح	1.06 ng/ml	1.00 ng/m/	106%	106%	7
N	Matrix spike sample		(SSR-SR)				
pre	Duplicate sample	Cx*10	0.0224 ng/m³	0.0208 mg/m	7.41 % 870	7.147/290	J*

Comments: _	* Roundi	my	 	 	 	
		2				
			 _	 _		

LDC#: 33810A60

VALIDATION FINDINGS WORKSHEET

Sample Calculation Verification

Page: of Reviewer: Order

					Zilu leviev	ver	
METH	HOD: Inorganics, Metho	d See Cover					
Please Y N Y N Y N	N/A Have results N/A Are results w	bow for all questions answered "been reported and calculated ithin the calibrated range of the tion limits below the CRQL?	correctly? e instrument		e identified as "N/.	A".	
	ound (analyte) results f	or		repo	orted with a positiv	ve detect were	!
	A	Uf-10 W Recalculation	1: 0,0	D00051 - (-4.	86E-06)		
	m=2171 = 0.022 ng/m						
	20,000893 = 0,000893	(nglul)(C) m3 = ngh	3 ().0122 rg/m/)(10ml) = C),0056 no	ζĺ
#	Sample ID	Analyte		Reported Concentration (ハム レス・)	Calculated Concentration	Acceptable (Y/N)	
	\	Cetto		0.0226	0.0220	Z	
	2			0.0186	0.0185	YX.	
	3			0.0208	0.0208	3	
	4			0-0241	0.0241		
	2			0.0125	0.0125		
	6			0-0164	0.0164		

3	1		0.0208	8050.0	3
Y			0-024	0.0241	1
2			0.0125	0.0125	
6			0-0164	20169	
٦			0.0292	0.0292	
8			CO	ND	
9			NO.	P>	
lo			0.0056	0.0056	
. ()			ND	20	
12			0.0162	0.0162	Ψ
13			0.0154	0.0155	J*
14			0-121	0.121	٦
12			NO	DD	
lb			0.0342	0,0342	
()			ND	クク	
18		4	ND	$\mathcal{C}\mathcal{C}$	Ţ
_					

Note:	* Rounding	



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

Matrix:

PHONE: (443) 803-8495

Comments:

OAM 1 **Description:**

Air

Start Time 2/11/15 14:56

FAX: (410) 266-8912

Lab ID:

5021325-01

Sample Volume:

21.41

m³

<u>Flaq</u>

SUBMITTED:

SITE CODE:

AQS SITE CODE:

FILE #: 3926.00

REPORTED: 03/02/15 12:37

Honeywell Hex Chrome Study

Sampled: 02/12/15 14:43

Received: 02/13/15 11:19 Analysis Date: 02/23/15 14:54

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

02/13/15 to 02/18/15

CAS Number

ng/m³ Air

ng/m³ Air

Hexavalent Chromium

Analyte

1854-02-99

0.0226

0.0036

MAR 0 3 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED: 03/02/15 12:37

Malvern, PA 19355

SUBMITTED:

02/13/15 to 02/18/15

ATTN: Mr. Jeff Boggs

AQS SITE CODE:

m³

PHONE: (443) 803-8495

_ _

FAX: (410) 266-8912

SITE CODE:

Honeywell Hex Chrome Study

Description:

OAM 2

Lab ID:

5021325-02

Sampled: 02/12/15 15:05

Matrix:

۸:..

Sample Volume:

21.44

Received: 02/13/15 11:19

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

Analysis Date: 02/23/15 15:04

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

<u>Analyte</u>

CAS Number

<u>ng/m³ Air</u>

<u>Flag</u>

<u>ng/m³ Air</u>

Hexavalent Chromium

1854-02-99

0.0186

0.0036

MAR 0 3 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

Matrix:

Comments:

PHONE: (443) 803-8495

Description: PAM-1

Air

803-8495 **FAX:** (41

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

FAX: (410) 266-8912

Lab ID:

5021325-03

5021325-03

Sample Volume:

21.42

FILE #: 3926.00

SUBMITTED:

SITE CODE:

 m^3

<u>Flag</u>

AQS SITE CODE:

REPORTED: 03/02/15 12:37

Honeywell Hex Chrome Study

Sampled: 02/12/15 16:12

Received: 02/13/15 11:19 **Analysis Date:** 02/23/15 12:51

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

02/13/15 to 02/18/15

CAS Number

<u>ng/m³ Air</u>

ng/m³ Air

Hexavalent Chromium

Analyte

1854-02-99

0.0208

0.0036

MAR 0 3 2015

Initials: €R

Eastern Research Group



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495 Description:

Matrix:

Comments:

Analyte

Air

PAM-1D

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

FAX: (410) 266-8912

Lab ID:

Sample Volume:

21.45

5021325-04

FILE #: 3926.00

SUBMITTED:

SITE CODE:

m³

AQS SITE CODE:

REPORTED: 03/02/15 12:37

Honeywell Hex Chrome Study

Sampled: 02/12/15 16:16 Received: 02/13/15 11:19

Analysis Date: 02/23/15 13:11

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

02/13/15 to 02/18/15

CAS Number Hexavalent Chromium

1854-02-99

ng/m³ Air 0.0241

Flag

ng/m³ Air

0.0036

MAR 03 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

Description:

Comments:

ATTN: Mr. Jeff Boggs

Matrix:

PHONE: (443) 803-8495

PAM-2

Start Time 2/11/15 16:07

Air

FAX: (410) 266-8912

Lab ID:

Sample Volume:

5021325-05

21.49

FILE #: 3926.00

SUBMITTED:

SITE CODE:

m³

AQS SITE CODE:

REPORTED: 03/02/15 12:37

Honeywell Hex Chrome Study

Sampled: 02/12/15 16:00

Received: 02/13/15 11:19 Analysis Date: 02/23/15 18:04

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

02/13/15 to 02/18/15

CAS Number

ng/m³ Air

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

Analyte

1854-02-99

0.0125

0.0036

Initials: OR

Eastern Research Group



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

Description:

Comments:

Hexavalent Chromium

Analyte

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Matrix:

PAM-3

Air

FAX: (410) 266-8912

Lab ID:

5021325-06

Sample Volume:

21.57

m³

FILE #: 3926.00

SUBMITTED:

SITE CODE:

AQS SITE CODE:

REPORTED: 03/02/15 12:37

Honeywell Hex Chrome Study

Sampled: 02/12/15 15:53 Received: 02/13/15 11:19

Analysis Date: 02/23/15 15:24

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

02/13/15 to 02/18/15

Start Time 2/11/15 15:55

CAS Number

ng/m³ Air

<u>Flag</u>

ng/m3 Air

1854-02-99

0.0164

0.0036

MAR 0 3 2015



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Matrix:

Comments:

Description: PAM-4

Air

Start Time 2/11/15 15:44

FAX: (410) 266-8912

Lab ID: 5021325-07

Sample Volume:

21.3

m³

Flag

SUBMITTED:

SITE CODE:

AQS SITE CODE:

FILE #: 3926.00

REPORTED: 03/02/15 12:37

Honeywell Hex Chrome Study

Sampled: 02/12/15 15:24

Received: 02/13/15 11:19 Analysis Date: 02/23/15 15:34

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

02/13/15 to 02/18/15

Analyte Hexavalent Chromium **CAS Number** 1854-02-99

ng/m³ Air

0.0292

ng/m³ Air

0.0036

MAR 0 3 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

Description:

Comments:

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Matrix:

Air

PAM-21

FAX: (410) 266-8912

Lab ID:

Sample Volume:

5021325-08

21.49

m³

SUBMITTED:

SITE CODE:

AQS SITE CODE:

FILE #: 3926.00

REPORTED: 03/02/15 12:37

Honeywell Hex Chrome Study

Sampled: 02/12/15 00:00

Received: 02/13/15 11:19 Analysis Date: 02/23/15 15:44

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

02/13/15 to 02/18/15

Analyte Hexavalent Chromium **CAS Number** 1854-02-99

ng/m³ Air

ng/m³ Air

Flag ND U 0.0036

MAR 0 3 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Matrix:

Comments:

Air

Description: PAM-31

FAX: (410) 266-8912

Lab ID:

5021325-09 Sample Volume:

21.57

m³

FILE #: 3926.00

SUBMITTED:

SITE CODE:

AQS SITE CODE:

REPORTED: 03/02/15 12:37

02/13/15 to 02/18/15

Honeywell Hex Chrome Study

Sampled: 02/12/15 00:00 Received: 02/13/15 11:19

Analysis Date: 02/23/15 15:54

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

Analyte Hexavalent Chromium **CAS Number** 1854-02-99

ng/m³ Air ND

Flag

ng/m³ Air

0.0036

MAR 0 3 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

Description:

Comments:

ATTN: Mr. Jeff Boggs

Matrix:

PHONE: (443) 803-8495

FAX: (410) 266-8912

OAM 1

Start Time 2/12/15 14:46

Sample Volume:

Lab ID:

21.71

m³

<u>Flaq</u>

SUBMITTED:

SITE CODE:

AQS SITE CODE:

FILE #: 3926.00

REPORTED: 03/02/15 12:37

Honeywell Hex Chrome Study

02/13/15 to 02/18/15

Sampled: 02/13/15 14:54

Received: 02/18/15 15:11 Analysis Date: 02/23/15 16:04

Hexavalent Chromium by SOP ERG-MOR-063

5021836-01

Results

MDL

CAS Number

ng/m³ Air

ng/m³ Air

Hexavalent Chromium

Analyte

1854-02-99

0.0056

0.0038

MAR 0 3 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

Matrix:

Comments:

PHONE: (443) 803-8495

Description: OAM 2

Air

Start Time 2/12/15 15:08

FAX: (410) 266-8912

Lab ID:

5021836-02

Sample Volume:

21.67

AQS SITE CODE:

FILE #: 3926.00

SUBMITTED:

SITE CODE:

m³

REPORTED: 03/02/15 12:37

Honeywell Hex Chrome Study

Sampled: 02/13/15 15:12

Received: 02/18/15 15:11 Analysis Date: 02/23/15 18:14

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

02/13/15 to 02/18/15

Analyte Hexavalent Chromium **CAS Number** 1854-02-99

ng/m³ Air ND

<u>Flag</u>

ng/m³ Air 0.0038

MAR 0 3 2015



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

Matrix:

PHONE: (443) 803-8495 **Description:**

Comments:

PAM-1

Air

FAX: (410) 266-8912

Col 1 Start Time 2/12/15 16:16

Lab ID:

Sample Volume:

21.14

m³

FILE #: 3926.00

SUBMITTED:

SITE CODE:

AQS SITE CODE:

REPORTED: 03/02/15 12:37

Honeywell Hex Chrome Study

Sampled: 02/13/15 15:46

Received: 02/18/15 15:11 Analysis Date: 02/23/15 14:15

Hexavalent Chromium by SOP ERG-MOR-063

5021836-03

Results

MDL

02/13/15 to 02/18/15

CAS Number

ng/m³ Air

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

Analyte

1854-02-99

0.0162

0.0038

MAR 0 3 2015



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Matrix:

Comments:

Description:

PAM-1D

Col 2 Start Time 2/12/15 16:19

FAX: (410) 266-8912

Lab ID:

Sample Volume:

5021836-04

21.11

m³

FILE #: 3926.00

SUBMITTED:

SITE CODE:

AQS SITE CODE:

REPORTED: 03/02/15 12:37

02/13/15 to 02/18/15

Sampled: 02/13/15 15:47

Received: 02/18/15 15:11

Analysis Date: 02/23/15 13:51

Honeywell Hex Chrome Study

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

Analyte Hexavalent Chromium **CAS Number** 1854-02-99

ng/m³ Air 0.0154

<u>Flaq</u>

ng/m³ Air 0.0038

MAR 0 3 2015



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

Matrix:

Description:

Comments:

Hexavalent Chromium

Analyte

PHONE: (443) 803-8495

PAM-2

Start Time 2/12/15 16:03

FAX: (410) 266-8912

Lab ID:

Sample Volume:

5021836-05

21.18

 $\,m^3$

SITE CODE:

FILE #: 3926.00

SUBMITTED:

AQS SITE CODE:

REPORTED: 03/02/15 12:37

Honeywell Hex Chrome Study

Sampled: 02/13/15 15:36

Received: 02/18/15 15:11 Analysis Date: 02/23/15 16:23

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

02/13/15 to 02/18/15

CAS Number 1854-02-99

ng/m³ Air 0.121

<u>Flaq</u>

ng/m³ Air

0.0038

MAR 0 3 2015

The state of the state of the same

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Matrix:

Description:

Comments:

Start Time 2/12/15 15:55

PAM-3

Air

FAX: (410) 266-8912

Lab ID:

5021836-06

Sample Volume:

21.23

m³

FILE #: 3926.00

SUBMITTED:

SITE CODE:

AQS SITE CODE:

REPORTED: 03/02/15 12:37

Honeywell Hex Chrome Study

Sampled: 02/13/15 15:31

Received: 02/18/15 15:11 Analysis Date: 02/23/15 17:15

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

02/13/15 to 02/18/15

Analyte Hexavalent Chromium **CAS Number** 1854-02-99

ng/m³ Air ND

Flag

ng/m³ Air 0.0038

MAR 0 3 2015

a escapa

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

Description:

Comments:

ATTN: Mr. Jeff Boggs

Matrix:

PHONE: (443) 803-8495

Start Time 2/12/15 15:27

FAX: (410) 266-8912

Lab ID:

5021836-07

Sample Volume:

21.62

 $\,m^3$

FILE #: 3926.00

SUBMITTED:

SITE CODE:

AQS SITE CODE:

REPORTED: 03/02/15 12:37

Honeywell Hex Chrome Study

Sampled: 02/13/15 15:28

Received: 02/18/15 15:11 Analysis Date: 02/23/15 18:24

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

02/13/15 to 02/18/15

Analyte Hexavalent Chromium **CAS Number**

ng/m³ Air

Flag

ng/m³ Air

1854-02-99

0.0342

0.0038

MAR 0 3 2015



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

Matrix:

Description:

Comments:

Air

PHONE: (443) 803-8495 PAM-21

FAX: (410) 266-8912

Lab ID:

Sample Volume:

5021836-08

21.18

m³

FILE #: 3926.00

SUBMITTED:

SITE CODE:

AQS SITE CODE:

REPORTED: 03/02/15 12:37

Honeywell Hex Chrome Study

Sampled: 02/13/15 00:00

Received: 02/18/15 15:11 Analysis Date: 02/23/15 17:35

Hexavalent Chromium by SOP ERG-MOR-063

Results

ND

MDL

02/13/15 to 02/18/15

Analyte Hexavalent Chromium **CAS Number** 1854-02-99

ng/m³ Air

Flag

ng/m³ Air 0.0038

MAR 0 3 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

Matrix:

Comments:

PHONE: (443) 803-8495

Description: PAM-31

Air

FAX: (410) 266-8912

Lab ID:

Sample Volume:

21.23

m³

SITE CODE:

FILE #: 3926.00

SUBMITTED: AQS SITE CODE:

REPORTED: 03/02/15 12:37

Honeywell Hex Chrome Study

Sampled: 02/13/15 00:00 Received: 02/18/15 15:11

Analysis Date: 02/23/15 17:44

Hexavalent Chromium by SOP ERG-MOR-063

5021836-09

Results

MDL

02/13/15 to 02/18/15

CAS Number

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

Analyte

1854-02-99

ng/m³ Air ND

0.0038

MAR 0 3 2015

the state measurement

Initials: CR

Eastern Research Group



LABORATORY DATA CONSULTANTS, INC.

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

ERM

March 4, 2015

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

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

Dear Mr. Boggs,

Enclosed is the final validation report for the fraction listed below. This SDG was received on March 3, 2015. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #33817:

SDG

Fraction

5021836

Hexavalent Chromium

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

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

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

Christina Rink

Sincerely,

Project Manager/Chemist

	102 pages-SF	1 WEE														chm		_																					
	Level IV	L	DC #33	81	7 (E	:RN	/ -	Мо	rris	svil	le,	NC	7	Ha	rbo	r P	oir	ıt, I	ИD	, Н	exa	ava	len	t C	hro	mi	um	M	oni	itor	ing)) <u> </u>							
LDC	SDG#	DATE REC'D		Cr((D7	(VI) 614)																																		
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Total	A/CR			18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: Harbor Point, MD, Hexavalent Chromium Monitoring

Collection Date: February 16 through February 17, 2015

LDC Report Date: March 4, 2015

Matrix: Air

Parameters: Hexavalent Chromium

Validation Level: EPA Level IV

Laboratory: Eastern Research Group

Sample Delivery Group (SDG): 5021836

Sample Identification

OAM 1(02/16/15) PAM-1(02/17/15)DUP OAM 2(02/16/15) PAM-1D (02/17/15)DUP

PAM-1(02/16/15)

PAM-1D (02/16/15)

PAM-2(02/16/15)

PAM-3(02/16/15)

PAM-4(02/16/15)

PAM-21(02/16/15)

PAM-31(02/16/15)

OAM 1(02/17/15)

OAM 2(02/17/15)

PAM-1(02/17/15)

PAM-1D (02/17/15)

PAM-2(02/17/15)

PAM-3(02/17/15)

PAM-4(02/17/15)

PAM-21(02/17/15)

PAM-31(02/17/15) PAM-1(02/16/15)DUP

PAM-1D (02/16/15)DUP

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

Introduction

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

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

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

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met.

IV. Blanks

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

Samples PAM-31(02/16/15) and PAM-31(02/17/15) were identified as trip blanks. No hexavalent chromium was found.

Samples PAM-21(02/16/15) and PAM-21(02/17/15) were identified as field blanks. No hexavalent chromium was found.

V. Matrix Spike/Matrix Spike Duplicates

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

VI. Duplicates

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

VII. Laboratory Control Samples

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

VIII. Sample Result Verification

All sample result verifications were acceptable.

IX. Overall Assessment of Data

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

X. Field Duplicates

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

	Concentrati	ion (ng/m³)			
Analyte	PAM-1(02/16/15)	PAM-1D (02/16/15)	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.0101	0.0091	10 (≤20)	<u>-</u>	-

	Concentrat	ion (ng/m³)			
Analyte	PAM-1(02/17/15)	PAM-1D (02/17/15)	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.0156	0.0164	5 (≤20)	-	-

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

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

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

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

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

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

LDC #: 33817A6 SDG #: 5021836

VALIDATION COMPLETENESS WORKSHEET

Level IV

Laboratory: Eastern Research Group

Date: 3/3/15
Page: _\ of _\
Reviewer: _\
2nd Reviewer: _\

METHOD: (Analyte) Hexavalent Chromium (ASTM D7614)

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

	Validation Area		Comments
1.	Sample receipt/Technical holding times	A	02/10-17/15
11	Initial calibration	A	
111.	Calibration verification	A	
IV	Laboratory Blanks	A	
V	Field blanks	ND	FB=(8)(n) TB=(9)(18)
VI.	Matrix Spike/Matrix Spike Duplicates	N	Not Required
VII.	Duplicate sample analysis	A	DD = OK by diff
VIII.	Laboratory control samples	A	icslo
IX.	Field duplicates	SW	FD=(3.4)(12,13)
Χ.	Sample result verification	A	, ,
xı_	Overall assessment of data		

Note:

A = Acceptable

N = Not provided/applicable SW = See worksheet ND = No compounds detected

R = Rinsate FB = Field blank D = Duplicate TB = Trip blank

EB = Equipment blank

SB=Source blank OTHER:

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

LDC #: 33817A6 SDG #: 5021836

VALIDATION COMPLETENESS WORKSHEET

Level IV

Laboratory: Eastern Research Group

Page: Zof Z Reviewer: SD 2nd Reviewer: A

METHOD: (Analyte) Hexavalent Chromium (ASTM D7614)

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

29		_	 _		 	
30			 	 		
Notes:			 			
			 	 _		

LDC #: 33817P

Page: _of_ Reviewer: _ 2nd Reviewer: \(\lambda \)

Method:Inorganics (EPA Method ১০০ (১১৮৮				
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 20-110% QC limits?	1			
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 anaylzed 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?			_	

1/45



VALIDATION FINDINGS CHECKLIST

Page: 2 of 2 Reviewer: 50 2nd Reviewer: 0

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.		1		

LDC# 33817A6

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Page: .	<u></u> of
Reviewer:	\bigcirc
2nd Reviewer:	a

Inorganics: Method See Cover

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

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

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

LDC #: 33817AV

Validation Findings Worksheet Initial and Continuing Calibration Calculation Verification

Page: 1	_ of	$\overline{\lambda}$
Reviewer:	3	Ω
2nd Reviev	ver:_	9
	_	$\overline{}$

Method: inorganics, Me	hod See Cover
------------------------	---------------

The correlation coefficient (r) for the calibration of was recalculated. Calibration date: ZZS IS

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

%R = Found X 100

Where,

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

True

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

					Recalculated	Reported	Acceptable
Type of analysis	Analyte	Standard	Conc. (ng/ml)	Area	r or r ²	r or r ²	(Y/N)
Initial calibration		s1	0.05	0.0000264			
	کد و	s2	0.1	0.000063	0.99998	0.99998	9
	CxxX	s3	0.2		\mathcal{A}		
		s4	0.5	0.0003709			
		s5	1	0.0007355			
		s6	2	0.0014882			
ブン 13、29 Calibration verification	Cx	Found 0.5202m/ml	True O. Snajmi		104.0%R	- 104.0%P	7
Calibration verification	C<240	0.5321 mg/ml	0.Sng/ml		106,4%	106.4%2	7
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 #: 33817 PM

VALIDATION FINDINGS WORKSHEET Level IV Recalculation Worksheet

Page: <u> </u> of_	<u>\</u>
Reviewer:	\geq
2nd Reviewer:	_

METHOD: Inorganics,	Method S	200 (2006	· -
			<u> </u>

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

%R = <u>Found</u> x 100 True 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:

 $RPD = \underline{|S-D|} \times 100$

Where,

S =

Original sample concentration

(S+D)/2

D =

Duplicate sample concentration

Sample ID	Type of Analysis	Element	Found / S (units)	True / D (units)	Recalculated %R / RPD	Reported %R / RPD	Acceptable (Y/N)
LCS 13:54	Laboratory control sample	C<->	1.11 ng/m)	1.00 rajul	111%2	111%	7
N	Matrix spike sample		(SSR-SR)				
14:24 100	Duplicate sample	Cerre	0.0130vg/m3	0.0101mg/m3	25.1%RD	24.9%	3×

Comments: **Rounding	 		

LDC #: 33817A6

VALIDATION FINDINGS WORKSHEET

Sample Calculation Verification

Page: _\of_\
Reviewer: _\O
2nd reviewer: _\O

					0 0
METH	IOD: Inorganics, Metho	d See Cover			
Please Y N Y N Y N	N/A Have results	bw for all questions answered "N". Not apple been reported and calculated correctly? within the calibrated range of the instrument tion limits below the CRQL?		e identified as "N/	A".
	ound (analyte) results fulated and verified usin	for	repo	orted with a positi	ve detect were
	tration = $\left(\begin{array}{c} \\ \\ \\ \end{array} \right)$		1-)-P4100C	,03E-05))
A -	= 0,0000149 = -1,03E-05	m3 = 21-7	0.0007	491	= 0.038
	= -1,03E-05 = 0,000749		(0.0336	ng/m1) (10	<u>wl)</u> = 0.0
#	Sample ID	Analyte	Reported Concentration (va)w?)	Calculated Concentration (NC (MP)	Acceptable (Y/N)
<u> </u>	\	(+ + >	0.0110	0.00	3*
	2		0.0095	Z200.0	4
	3		0.0101	0.0101	4
	4		0.0091	0.0090	42
	5		0.0144	0.043	3*
	6		ND	QU	2
	7		0.0155	0.0155	
	8		N D	200	
	9		100	ND	
	lo		0.0182	0.0182	
	()		0.0267	0.0267	
	12		0.0156	0.0156	
	13		0.0164	4010.0	4
	14		0.0203	0-0504	3*
	15		0.0176	0.0176	4
	16		0.0206	0.0200	
	17		ND	NO	
	- 18	<u> </u>	100	NS	
Ll Note:	*Randin	<u>a</u>	L	<u> </u>	



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

Description:

Comments:

Hexavalent Chromium

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Matrix:

Air

OAM 1

Start Time 2/15/15 14:40

FAX: (410) 266-8912

Lab ID:

Sample Volume:

5021836-10

m³

FILE #: 3926.00

REPORTED:

SUBMITTED:

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Sampled: 02/16/15 15:13

Received: 02/18/15 15:11

Analysis Date: 02/25/15 16:17

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

03/03/15 15:23

02/18/15

Analyte

CAS Number 1854-02-99

ng/m³ Air

0.0110

<u>Flag</u>

ng/m³ Air

0.0038

MAR 0 4 2015



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

Matrix:

Comments:

Hexavalent Chromium

PHONE: (443) 803-8495

Analyte

Description: OAM 2

Start Time 2/15/15 15:04

FAX: (410) 266-8912

5021836-11

Sample Volume:

Lab ID:

21.98

FILE #: 3926.00

REPORTED:

SUBMITTED:

AQS SITE SODE:

Honeywell Hex Chrome Study

Sampled: 02/16/15 15:29 Received: 02/18/15 15:11

Analysis Date: 02/25/15 16:27

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

03/03/15 15:23

02/18/15

CAS Number

ng/m³ Air

<u>Flaq</u>

ng/m³ Air

1854-02-99

0.0095

0.0038

MAR 0 4 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

03/03/15 15:23

02/18/15 SUBMITTED:

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description:

PAM-1

Air

Lab ID:

5021836-12

Sampled: 02/16/15 16:07 Received: 02/18/15 15:11

Matrix: Comments:

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

21.54

 m^3

Analysis Date: 02/25/15 14:44

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

Analyte Hexavalent Chromium **CAS Number** 1854-02-99

Flag

ng/m³ Air

ng/m³ Air

Sample Volume:

0.0101

0.0038

MAR 0 4 2015

Initials: CR

Eastern Research Group

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

Page 5 of 22



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

Description:

Comments:

ATTN: Mr. Jeff Boggs

Matrix:

PHONE: (443) 803-8495

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

PAM-1D

FAX: (410) 266-8912

Lab ID:

5021836-13

Sample Volume:

21.54

m³

FILE #: 3926.00

REPORTED:

SUBMITTED:

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Sampled: 02/16/15 16:10

Received: 02/18/15 15:11 Analysis Date: 02/25/15 15:04

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

03/03/15 15:23

02/18/15

CAS Number

ng/m³ Air

<u>Flag</u>

ng/m3 Air

Analyte Hexavalent Chromium

1854-02-99

0.0091

A-01

0.0038

MAR 0 4 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED:

03/03/15 15:23

Malvern, PA 19355

SUBMITTED:

02/18/15

ATTN: Mr. Jeff Boggs

AQS SITE SITE CODE:

PHONE: (443) 803-8495

FAX: (410) 266-8912

Honeywell Hex Chrome Study

Description:

PAM-2

Lab ID: 5021836-14

Sampled: 02/16/15 15:55 Received: 02/18/15 15:11

Matrix: Comments:

Air Start Time 2/15/15 15:55 Sample Volume:

21.6

Analysis Date: 02/25/15 16:57

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

Analyte

CAS Number

<u>ng/m³ Air</u>

<u>Flaq</u>

m³

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0144

0.0038

MAR 0 4 2015

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Page 7 of 22



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Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

03/03/15 15:23 02/18/15

SUBMITTED:

AQS SITE

SITE CODE:

m³

Honeywell Hex Chrome Study

Description:

PAM-3

Air

Lab ID:

Sample Volume:

5021836-15

21.66

Sampled: 02/16/15 15:47

Received: 02/18/15 15:11 Analysis Date: 02/25/15 17:07

Matrix: Comments:

Start Time 2/15/15 15:43

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

Analyte

CAS Number

ng/m³ Air

<u>Flaq</u>

<u>ng/m³ Air</u>

Hexavalent Chromium

1854-02-99

ND

0.0038

MAR 0 4 2015



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

Matrix:

PHONE: (443) 803-8495

Air

Start Time 2/15/15 15:37

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

03/03/15 15:23

SUBMITTED:

02/18/15

AQS SITE

SUPECODE:

Honeywell Hex Chrome Study

Description:

Comments:

PAM-4

Lab ID:

5021836-16

21.7

m³

Sampled: 02/16/15 15:44 Received: 02/18/15 15:11

Analysis Date: 02/25/15 17:17

Hexavalent Chromium by SOP ERG-MOR-063

Sample Volume:

Results

MDL

Analyte Hexavalent Chromium **CAS Number**

ng/m³ Air

<u>Flag</u>

ng/m³ Air

1854-02-99

0.0155

0.0038

MAR 0 4 2015

Initials: CR

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Page 9 of 22



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

Matrix:

Comments:

PHONE: (443) 803-8495

Description:

Air

PAM-21

FAX: (410) 266-8912

Lab ID:

Sample Volume:

5021836-17

m³

FILE #: 3926.00

REPORTED:

SUBMITTED:

AQS SITE SITE CODE:

Honeywell Hex Chrome Study

Sampled: 02/16/15 00:00

Received: 02/18/15 15:11 Analysis Date: 02/25/15 17:27

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

03/03/15 15:23

02/18/15

<u>Analyte</u> Hexavalent Chromium

CAS Number 1854-02-99

ng/m³ Air ND

<u>Flag</u>

ng/m³ Air

0.0038

MAR 0 4 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

Matrix:

Comments:

PHONE: (443) 803-8495 Description:

Air

PAM-31

FAX: (410) 266-8912

Lab ID:

5021836-18

Sample Volume:

21.66

m³

FILE #: 3926.00

REPORTED:

SUBMITTED:

AQS SITE SITE CODE:

Honeywell Hex Chrome Study

Sampled: 02/16/15 00:00 Received: 02/18/15 15:11

Analysis Date: 02/25/15 17:37

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

03/03/15 15:23

02/18/15

Analyte Hexavalent Chromium **CAS Number**

ng/m³ Air

ng/m³ Air

Flag 1854-02-99 0.0038 ND

MAR 0 4 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

03/03/15 15:23

SUBMITTED: 02/18/15

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description:

Comments:

Hexavalent Chromium

OAM 1

Lab ID:

5021836-19

Sampled: 02/17/15 14:57

Matrix:

Start Time 2/16/15 15:16

Sample Volume:

21.31

 m^3

Received: 02/18/15 15:11 Analysis Date: 02/25/15 17:46

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

Analyte

CAS Number

ng/m³ Air

<u>Flaq</u>

ng/m³ Air

1854-02-99

0.0182

0.0038

MAR 0 4 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED:

03/03/15 15:23

Malvern, PA 19355

SUBMITTED:

02/18/15

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

SITE CODE:

Honeywell Hex Chrome Study

Description:

Comments:

OAM 2

Start Time 2/16/15 15:32

Lab ID:

5021836-20

Sampled: 02/17/15 15:17

Matrix:

Sample Volume:

21.37

m³

Received: 02/18/15 15:11

Analysis Date: 02/25/15 17:56

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

Analyte

CAS Number

FAX: (410) 266-8912

ng/m³ Air

<u>Flaq</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0267

0.0038

MAR 0 4 2015



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

03/03/15 15:23 02/18/15

SUBMITTED:

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description:

PAM-1

Lab ID:

Sample Volume:

5021836-21

Sampled: 02/17/15 16:16

Received: 02/18/15 15:11 Analysis Date: 02/25/15 15:24

Comments:

Matrix:

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

Hexavalent Chromium by SOP ERG-MOR-063

21.69

Results

MDL

Analyte

CAS Number

ng/m³ Air

<u>Flag</u>

 m^3

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0156

0.0038

MAR 0 4 2015



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Matrix:

Air

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

FAX: (410) 266-8912

FILE #: 3926.00 REPORTED: SUBMITTED:

03/03/15 15:23

02/18/15

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description:

Comments:

PAM-1D

Lab ID:

Sample Volume:

5021836-22

21.69

 $\,m^3$

Sampled: 02/17/15 16:19 Received: 02/18/15 15:11

Analysis Date: 02/25/15 15:43

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

<u>Analyte</u>

CAS Number

ng/m³ Air

Flag

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0164

0.0038

MAR 0 4 2015



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

Matrix:

PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

03/03/15 15:23

SUBMITTED: 02/18/15

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description:

Comments:

PAM-2

Start Time 2/16/15 15:58

Lab ID:

Sample Volume:

5021836-23

21.48

m³

Sampled: 02/17/15 15:51 Received: 02/18/15 15:11

Analysis Date: 02/25/15 18:06

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

Analyte

CAS Number

<u>Flag</u>

ng/m³ Air

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0203

0.0038

MAR 0 4 2015



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED:

03/03/15 15:23

Malvern, PA 19355

SUBMITTED:

02/18/15

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

FAX: (410) 266-8912

SHE CODE:

Honeywell Hex Chrome Study

Description:

PAM-3

Lab ID:

5021836-24

Sampled: 02/17/15 15:42

Matrix:

Air

Sample Volume:

21.49

m³

Received: 02/18/15 15:11 Analysis Date: 02/25/15 18:16

Comments:

Start Time 2/16/15 15:50

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

Analyte

CAS Number

ng/m³ Air

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0176

0.0038

MAR 0 4 2015



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Matrix:

Air

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

03/03/15 15:23

02/18/15 SUBMITTED:

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description:

Comments:

PAM-4

Start Time 2/16/15 15:46

Lab ID:

Sample Volume:

5021836-25

21.42

m³

Sampled: 02/17/15 15:35 Received: 02/18/15 15:11

Analysis Date: 02/25/15 18:26

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

Analyte

CAS Number

ng/m³ Air

<u>Flaq</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0206

0.0038

MAR 0 4 2015



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Matrix:

Air

FAX: (410) 266-8912

SUBMITTED: AQS SITE

REPORTED:

FILE #: 3926.00

SITE CODE:

Honeywell Hex Chrome Study

Description:

Comments:

PAM-21

Lab ID:

Sample Volume:

5021836-26

21.48

m³

Sampled: 02/17/15 00:00 Received: 02/18/15 15:11

Analysis Date: 02/25/15 18:56

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

03/03/15 15:23

02/18/15

Analyte

CAS Number

ng/m³ Air

<u>Flaq</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

ND

0.0038

MAR 0 4 2015



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED:

03/03/15 15:23

Malvern, PA 19355

SUBMITTED:

02/18/15

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

FAX: (410) 266-8912

SITE CODE:

Honeywell Hex Chrome Study

Description:

PAM-31

Lab ID:

5021836-27

Sampled: 02/17/15 00:00 Received: 02/18/15 15:11

Matrix: Air Sample Volume:

m³

Analysis Date: 02/25/15 19:06

Comments:

Hexavalent Chromium by SOP ERG-MOR-063

21.49

Results

MDL

Analyte

CAS Number

ng/m³ Air

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

ND

0.0038

MAR 0 4 2015

Initials: CR

Eastern Research Group

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

Page 20 of 22

LABORATORY DATA CONSULTANTS, INC.

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

ERM March 5, 2015

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

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

Dear Mr. Boggs,

Enclosed is the final validation report for the fraction listed below. This SDG was received on March 4, 2015. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #33827:

SDG Fraction

5021917/5022018/5022541 Hexavalent Chromium

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

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

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

Sincerely,

Christina Rink

Project Manager/Chemist

	199 pages-SF	1 WEE	EK TAT		Attachment 1 827 (ERM - Morrisville, NC / Harbor Point, MD, Hexavalent Chromium Monitoring)																																		
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Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: Harbor Point, MD, Hexavalent Chromium Monitoring

Collection Date: February 18 through February 23, 2015

LDC Report Date: March 5, 2015

Matrix: Air

Parameters: Hexavalent Chromium

Validation Level: EPA Level IV

Laboratory: Eastern Research Group

Sample Delivery Group (SDG): 5021917/5022018/5022547

Sample Identification

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

Introduction

This data review covers 43 air samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per ASTM D7614 for Hexavalent Chromium.

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

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

The following are definitions of the data qualifiers:

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

I. Technical Holding Times

All technical holding time requirements were met.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met.

IV. Blanks

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

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

Samples PAM-21 (02/18/15), PAM-21 (02/19/15), PAM-21 (02/21/15), and PAM-21 (02/23/15) were identified as field blanks. No hexavalent chromium was found.

V. Matrix Spike/Matrix Spike Duplicates

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

VI. Duplicates

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

VII. Laboratory Control Samples

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

VIII. Sample Result Verification

All sample result verifications were acceptable.

IX. Overall Assessment of Data

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

X. Field Duplicates

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

Concentration (ng/m³)						
Analyte	PAM-1 (02/18/15)	PAM-1D (02/18/15)	RPD (Limits)	Flags	A or P	
Hexavalent chromium	0.0252	0.0307	20 (≤20)	-	-	

	Concentration (ng/m³) lyte PAM-1 (02/19/15) PAM-1D (02/19/15)				A or P	
Analyte			RPD (Limits)	Flags		
Hexavalent chromium	0.0173	0.0149	15 (≤20)	-	-	

	Concentrat	ion (ng/m³)			
Analyte	PAM-1 (02/21/15)	PAM-1D (02/21/15)	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.0199	0.0238	18 (≤20)	-	-

	Concentrat	ion (ng/m³)				
Analyte	Analyte PAM-1 (02/23/15) PAM-1D (02/		RPD (Limits)	Flags	A or P	
Hexavalent chromium	0.0218	0.0210	4 (≤20)	-	-	

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

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

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

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

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

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

LDC #: 33827A6 VALIDATION COMPLETENESS WORKSHEET SDG #: 5021917/5022018/5022547 Level IV Laboratory: Eastern Research Group Revie

Page: of 2
Reviewer: 202

METHOD: (Analyte) Hexavalent Chromium (ASTM D7614)

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

	Validation Area		Comments
1.	Sample receipt/Technical holding times	A	2/18-23/15
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Laboratory Blanks	A	
V	Field blanks	20	FB=(8)(1)(25/34) TB=(9)(18)(26)(35)
VI.	Matrix Spike/Matrix Spike Duplicates	2	FB=(8)(17)(25)(34) TB=(9)(18)(26)(35) Not Regulard
VII.	Duplicate sample analysis	A	DUP
VIII.	Laboratory control samples	A	LUSID
IX.	Field duplicates	SW	FD=(3.4) (12.13)(20121) (29.30)
X.	Sample result verification	A	
xı	Overall assessment of data	A	

Note: A = Acceptable N = Not provided/applicable SW = See worksheet ND = No compounds detected R = Rinsate

FB = Field blank

D = Duplicate
TB = Trip blank
EB = Equipment blank

SB=Source blank

OTHER:

	Client ID	Lab ID	Matrix	Date
1_	OAM 1 (02/18/15)	5021917-01	Air	02/18/15
2	OAM 2 (02/18/15)	5021917-02	Air	02/18/15
3	PAM-1 (02/18/15)	5021917-03	Air	02/18/15
4	PAM-1D (02/18/15)	5021917-04	Air	02/18/15
5	PAM-2 (02/18/15)	5021917-05	Air	02/18/15
6	PAM-3 (02/18/15)	5021917-06	Air	02/18/15
7	PAM-4 (02/18/15)	5021917-07	Air	02/18/15
8	PAM-21 (02/18/15)	5021917-08	Air	02/18/15
9	PAM-31 (02/18/15)	5021917-09	Air	02/18/15
10	OAM 1 (02/19/15)	5022018-01	Air	02/19/15
11	OAM 2 (02/19/15)	5022018-02	Air	02/19/15
12	PAM-1 (02/19/15)	5022018-03	Air	02/19/15
13	PAM-1D (02/19/15)	5022018-04	Air	02/19/15
14	PAM-2 (02/19/15)	5022018-05	Air	02/19/15
15	PAM-3 (02/19/15)	5022018-06	Air	02/19/15
16	PAM-4 (02/19/15)	5022018-07	Air	02/19/15
17	PAM-21 (02/19/15)	5022018-08	Air	02/19/15

LDC #: 33827A6 VALIDATION COMPLETENESS WORKSHEET

SDG #: 5021917/5022018/5022547 Laboratory: Eastern Research Group Level IV

Page: 3515

Page: 2ef 2

Reviewer: 350

2nd Reviewer: 0

METHOD: (Analyte) Hexavalent Chromium (ASTM D7614)

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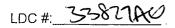
VALIDATION FINDINGS CHECKLIST

Page: of Z Reviewer: 200 2nd Reviewer: 200

Method: Inorganics (EPA Method & Lover)

Method:Inorganics (EPA Method 🗽 (പാല്)								
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 <u>></u> 0.995?	/							
Were all initial and continuing calibration verification %Rs within the 9 0-110 % 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 anaylzed 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#<u>33827A6</u>

VALIDATION FINDINGS WORKSHEET Field Duplicates

Page: ____ of ___ Reviewer: ____ __ 2nd Reviewer: ____ \&

Inorganics: Method See Cover

	Concentrati			
Analyte			RPD (≤20)	Qual.
Hexavalent Chromium	0.0252	0.0307	20	

	Concentra			
Analyte	12	13	RPD (≤20)	Qual.
Hexavalent Chromium	0.0173	0.0149	15	

	Concentrati			
Analyte	20	21	RPD (≤20)	Qual.
Hexavalent Chromium	0.0199	0.0238	18	

	Concentrati			
Analyte	29	30	RPD (≤20)	Qual.
Hexavalent Chromium	0.0218	0.0210	4	

\\LDCFILESERVER\\Validation\FIELD DUPLICATES\FD_inorganic\33827A6.wpd

LDC #: 33821Pio

Validation Findings Worksheet Initial and Continuing Calibration Calculation Verification

Page: _ of _
Reviewer: 30
2nd Reviewer:

Wethou: morganics, wethou see cover	Method: Inorganics, Method See Cover	
--	--------------------------------------	--

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

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

%R = Found X 100

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

					Recalculated	Reported	Acceptable
Type of analysis	Analyte	Standard	Conc. (ng/ml)	Area	r or r ²	r or r²	(Y/N)
Initial calibration		s1	0.05	0.0000306			
		s2	0.1	0.0000648	0.99999	0.99999	
	صحر	s3	0.2	0.0001397			t û
		s4	0.5	0.0003628			9
		s5	1	0.0007412)
		s6	2	0.0014969			
IW 12:01	صدح	Found	True		100 000		
Calibration verification		0.5397 ng/m/	0.5 ralun		101,932	107.9%R	
CW 13:01	Cxx	2 = 3 = 1 \	05 11		01		
Calibration verification		0.500 nglml	0.5vglml		10374	103.5%R	<u> </u>
Calibration verification							

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

LDC#: 33827A6

VALIDATION FINDINGS WORKSHEET Level IV Recalculation Worksheet

Page: <u> </u> of <u> </u>	
Reviewer:	
2nd Reviewer:	

METHOD: Inorganics, Method See Cover

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

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

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:

 $RPD = \underline{[S-D]} \times 100$

Where,

S =

Original sample concentration

(S+D)/2

D =

Duplicate sample concentration

Sample ID	Type of Analysis	Elemen t	Found / S (units)	True / D (units)	Recalculated	Reported	Acceptable (Y/N)
LLS	Laboratory control sample	Lioniene	(unics)	(units)	%R / RPD	%R / RPD	(111)
123	Laboratory Control Sample	(2 46	1,078 ng/m/	Lactoria	1087,2	1-0.2	6.1
12:31			1,010 Ng/m1	(200)	100/5	108%2	
	Matrix spike sample		(SSR-SR)				
\sim							
DUP	Duplicate sample	1 26	2 2251	0.0257.13	<u> </u>	A 0000 0000	4*
13:32			0.0254 ng/m	0.0252 ng/m	0.718R8D	0.50288D	

Comments: * Rounding			 	 	
		· · · · · · · · · · · · · · · · · · ·	 	 	
	···		 	 	$\overline{}$

LDC #: 33827A6

VALIDATION FINDINGS WORKSHEET

Sample Calculation Verification

Page: of Z
Reviewer: 20
2nd reviewer: 0

METH	IOD: Inorganics, Metho	od See Case	٠,			
Please Y N Y N Y N	N/A Have results when the N/A Have results w	ow for all questions ans been reported and cale vithin the calibrated rang tion limits below the CF	culated correctly ge of the instrum	?	∍ identified as "N//	A".
	ound (analyte) results f		Cr*6		orted with a positiv	
recalc	ulated and verified usin	ig the following equation احمدا	n: (.		\ \	
Concen	$tration = (A-C_0)$	$-1 m^3 = 2156^{Rec}$	calculation: ()	DODOS37-(-1.	02E-02)	- h 0589
À	= 0.0000335	(1)(0)		0.000753	,	_ 0.030
(.	= 1.05 E-05	ing the following equation $\sqrt{100000000000000000000000000000000000$	valua 3	(0.0584 ng/m	1) (com);	> >>>1
<u> </u>	0.000753	m3 -	7,	21.56	= (JOSHM
#	Sample ID	Analy	vte	Reported Concentration ()	Calculated Concentration	Acceptable (Y/N)
	\		+6	00	120	9
	2			0.0255	0.0250	9×
-	3			0-0252	0.0252	y
	4			0.0307	0.0307	
	7			0.0307	0.0307	1
	6			0.0280	0.0281	44
	٦			0.027	0.0271	3)
	8			NO	NO	
	٩			70 70	NO	
	lò			0.0127	0.0127	
	<u>U</u>			1510.0	0.0131	
II————	\2_			0.0173	0.0173	
	13			0.0149	0.0149	4
	14			0-0146	0.0140	2# 20
	15			0-0131	0.0132	y*
	16			0.0167	8010.0	3×
	7			120	<i>N</i> 2	2
	18			NO	ND	4
	19			0.0216	0.0217	74

Note: *Roundira	

0-0199

0.0199

LDC #: 33827A6

VALIDATION FINDINGS WORKSHEET

Sample Calculation Verification

Page: 2	_ of 2_
Reviewer:_	_

				Zila leviel	wer:	
METH	OD: Inorganics, Metho	d See Cover				
Please Y N Y N Y N	N/A Have results N/A Are results w	w for all questions answered "l been reported and calculated of ithin the calibrated range of the ion limits below the CRQL?		e identified as "N/	A".	
/ Compo recalco	ound (analyte) results fullated and verified using	or 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2		orted with a positiv		
Concen	tration = $\left(\begin{array}{c} A - C_{0} \end{array} \right)$	いた= lowl こ、 M³ = こんし Recalculation	(0.0000001-(-1.2	3E05))	0.0212	
Co	=-1.23E-05	(nglu1)(cf)	3 (0.0515	nat Mon	\	
recalculated and verified using the following equation: Concentration = $A - C_0 +$			(0.03.)	21.61 m3 = 0.07		
#	Sample ID	Analyte	Reported Concentration (٣٩/٣٤)	Calculated Concentration (Valu3)	Acceptable (Y/N)	
	2\	Cr+4	0.0238	0.0238	7	
	72		0.0193	0.093	ب	
	23		420.0	0.0RS	3×	
	24		0.0265	0,0265	3	
	25		N/O	ND		
	26		QU	ND		
	27		0.0282	0.0282	4	
	28		0.0290	0.0289	9×	
	29		0-028	850.0	9	
	30		0.0210	0.0210		
	31		0.0334	0.0334		
	32		0.0243	0.0243		
	33 34 35		0-0261	0.0261		
	34		00	170 170		
	35	4	no ou	ND	4	
	· · · · · · · · · · · · · · · · · · ·					
Note:	*Roundi					



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED: 03/04/15 14:45

Malvern, PA 19355

SUBMITTED:

02/19/15 to 02/25/15

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

FAX: (410) 266-8912

Start Time 2/17/15 15:01

SITE CODE:

Honeywell Hex Chrome Study

Description:

Comments:

OAM 1

Lab ID:

5021917-01

Sampled: 02/18/15 14:58

Matrix:

Air

Sample Volume:

21.56

m³

Received: 02/19/15 14:06

Analysis Date: 03/02/15 14:42

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

<u>Analyte</u>

CAS Number

ng/m³ Air

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

ND

0.0038

MAR 0 5 2015

Initials: CR

Eastern Research Group

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

Page 4 of 40



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

Matrix:

PHONE: (443) 803-8495

Description:

Comments:

OAM 2

Air

FAX: (410) 266-8912

Lab ID:

5021917-02

Sample Volume:

21.56

m³

SUBMITTED:

AQS SITE

SITE CODE:

FILE #: 3926.00

REPORTED: 03/04/15 14:45

Honeywell Hex Chrome Study

Sampled: 02/18/15 15:17

Received: 02/19/15 14:06 Analysis Date: 03/02/15 14:52

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

02/19/15 to 02/25/15

Analyte CAS Number Hexavalent Chromium

Start Time 2/17/15 15:20

ng/m³ Air

<u>Flag</u>

<u>ng/m³ Air</u>

1854-02-99 0.0255 0.0038

MAR 0 5 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED:

m³

03/04/15 14:45

Malvern, PA 19355

SUBMITTED:

02/19/15 to 02/25/15

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

FAX: (410) 266-8912

SITE CODE:

Honeywell Hex Chrome Study

Description:

PAM-1

Lab ID:

5021917-03

Sampled: 02/18/15 16:20

Analysis Date: 03/02/15 13:22

Matrix:

Air

Sample Volume:

21.42

Received: 02/19/15 14:06

Comments:

Col 1 Start Time 2/17/15 16:20

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

Analyte

CAS Number

ng/m³ Air

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0252

0.0038

MAR 0 5 2015

Initials: CR

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Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED: 03/04/15 14:45

Malvern, PA 19355

02/19/15 to 02/25/15

ATTN: Mr. Jeff Boggs

AQS SITE

SUBMITTED:

PHONE: (443) 803-8495

FAX: (410) 266-8912

CODE:

m³

Honeywell Hex Chrome Study

Description:

PAM-1D

Lab ID:

5021917-04

Sampled: 02/18/15 16:11

Matrix:

Air

Sample Volume:

21.43

Received: 02/19/15 14:06 Analysis Date: 03/02/15 13:42

Comments:

Col 2 Start Time 2/17/15 16:22

Hexavalent Chromium by SOP ERG-MOR-063

Resuits

<u>MDL</u>

<u>Analyte</u>

CAS Number

ng/m³ Air

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0307

0.0038

MAR 0 5 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

Description:

Comments:

ATTN: Mr. Jeff Boggs

Matrix:

PHONE: (443) 803-8495

PAM-2

Air

Start Time 2/17/15 15:54

FAX: (410) 266-8912

Lab ID:

Sample Volume:

5021917-05

21.59

m³

SUBMITTED:

AQS SITE

SHE CODE:

FILE #: 3926.00

REPORTED: 03/04/15 14:45

Honeywell Hex Chrome Study

Sampled: 02/18/15 15:53

Received: 02/19/15 14:06 Analysis Date: 03/02/15 15:22

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

02/19/15 to 02/25/15

Analyte

CAS Number

<u>ng/m³ Air</u>

<u>Flag</u>

<u>ng/m³ Air</u>

Hexavalent Chromium

1854-02-99

0.0307

0.0038

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Initials: CR

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Page 8 of 40



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED: 03/04/15 14:45

Malvern, PA 19355

SUBMITTED:

02/19/15 to 02/25/15

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

FAX: (410) 266-8912

SITE CODE:

21.62

Honeywell Hex Chrome Study

Description:

PAM-3

Lab ID:

5021917-06

Sampled: 02/18/15 15:47

Matrix:

Air

Sample Volume:

m³

Received: 02/19/15 14:06 Analysis Date: 03/02/15 15:32

Comments:

Start Time 2/17/15 15:45

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

Analyte

CAS Number

ng/m³ Air

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0280

0.0038

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Initials: CR

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Page 9 of 40



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Matrix:

Comments:

Description:

Start Time 2/17/15 15:37

FAX: (410) 266-8912

Lab ID:

5021917-07

Sample Volume:

21.56

m³

FILE #: 3926.00

REPORTED: SUBMITTED:

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Sampled: 02/18/15 15:35

Received: 02/19/15 14:06 Analysis Date: 03/02/15 15:42

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

03/04/15 14:45

02/19/15 to 02/25/15

Analyte Hexavalent Chromium **CAS Number**

ng/m³ Air

<u>Flaq</u>

ng/m3 Air

1854-02-99

0.0271

0.0038

MAR 0 5 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED:

03/04/15 14:45

Malvern, PA 19355

SUBMITTED:

02/19/15 to 02/25/15

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

.....

FAX: (410) 266-8912

SHECODE:

Honeywell Hex Chrome Study

Description:

PAM-21

Lab ID:

5021917-08

Sampled: 02/18/15 00:00

Matrix: Air

Sample Volume:

m³

Received: 02/19/15 14:06

Comments:

Analysis Date: 03/02/15 15:52

Hexavalent Chromium by SOP ERG-MOR-063

21.59

Results

MDL.

<u>Analyte</u>

CAS Number

ng/m³ Air

<u>Flag</u>

<u>ng/m³ Air</u>

Hexavalent Chromium

1854-02-99

ND

U

0.0038

MAR 0 5 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED: 03/04/15 14:45

Malvern, PA 19355

SUBMITTED:

02/19/15 to 02/25/15

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

FAX: (410) 266-8912

SITE CODE:

Honeywell Hex Chrome Study

Analysis Date: 03/02/15 16:02

Description:

Comments:

PAM-31

Lab ID:

5021917-09

Sampled: 02/18/15 00:00

Matrix:

Air

Sample Volume:

21.62

Received: 02/19/15 14:06

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

Analyte

CAS Number

ng/m³ Air

Flag

<u>ng/m³ Air</u>

Hexavalent Chromium

1854-02-99

ND

m³

0.0038

MAR 0 5 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED: 03/04/15 14:45

Malvern, PA 19355

SUBMITTED:

02/19/15 to 02/25/15

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

FAX: (410) 266-8912

SITE CODE:

Honeywell Hex Chrome Study

Description:

OAM 1

Lab ID:

5022018-01

Sampled: 02/19/15 15:01

Matrix:

Air

Sample Volume:

m³

21.41

Received: 02/20/15 14:58

Analysis Date: 03/02/15 16:11

Comments:

Start Time 2/18/15 15:01

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

Analyte

CAS Number

ng/m³ Air

Flag

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0127

0.0038

MAR 0 5 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED: 03/04/15 14:45

Malvern, PA 19355

SUBMITTED:

02/19/15 to 02/25/15

ATTN: Mr. Jeff Boggs

AQS SITE CODE:

PHONE: (443) 803-8495

FAX: (410) 266-8912

21.43

Honeywell Hex Chrome Study

Description:

OAM 2

Lab ID:

5022018-02

Sampled: 02/19/15 15:08

Matrix:

Air

Sample Volume:

m³

Received: 02/20/15 14:58 Analysis Date: 03/02/15 16:21

Comments:

Start Time 2/18/15 15:19

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

Analyte

CAS Number

ng/m³ Air

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0131

0.0038

MAR 0 5 2015

Initials: CR

Eastern Research Group

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

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Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED:

03/04/15 14:45

Malvern, PA 19355

SUBMITTED:

02/19/15 to 02/25/15

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

FAX: (410) 266-8912

SITE CODE:

Honeywell Hex Chrome Study

Description:

Comments:

PAM-1

Col 1 Start Time 2/18/15 16:13

Lab ID:

5022018-03

Sampled: 02/19/15 16:14

Matrix:

Air

Sample Volume:

21.62

m³

Received: 02/20/15 14:58

Analysis Date: 03/02/15 14:02

Hexavalent Chromium by SOP ERG-MOR-063

<u>Results</u>

<u>MDL</u>

Analyte

CAS Number

ng/m³ Air

Flag

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0173

0.0038

MAR 0 5 2015

Initials: CR

Eastern Research Group

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

Page 15 of 40



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

Description:

Comments:

Hexavalent Chromium

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Matrix:

Air

PAM-1D

Col 2 Start Time 2/18/15 16:14

FAX: (410) 266-8912

Lab ID:

5022018-04

Sample Volume:

m³

Honeywell Hex Chrome Study

Sampled: 02/19/15 16:20

Received: 02/20/15 14:58

Analysis Date: 03/02/15 14:22

Hexavalent Chromium by SOP ERG-MOR-063

21.69

Results

MDL

03/04/15 14:45

02/19/15 to 02/25/15

Analyte

CAS Number

ng/m³ Air

<u>Flag</u>

FILE #: 3926.00

REPORTED:

SUBMITTED:

AQS SITE SITE CODE:

ng/m³ Air

1854-02-99

0.0149

0.0038

MAR 0 5 2015

Initials: CR

Eastern Research Group

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

Page 16 of 40



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

Description:

Comments:

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Matrix:

PAM-2

Air

Start Time 2/18/15 15:57

FAX: (410) 266-8912

Lab ID: Sample Volume:

5022018-05

21.67

m³

FILE #: 3926.00

REPORTED:

SUBMITTED:

AQS SITE CODE:

Honeywell Hex Chrome Study

Sampled: 02/19/15 16:01

Received: 02/20/15 14:58 Analysis Date: 03/02/15 16:31

Hexavalent Chromium by SOP ERG-MOR-063

<u>Results</u>

<u>MDL</u>

03/04/15 14:45

02/19/15 to 02/25/15

Analyte

CAS Number

ng/m³ Air

<u>Flag</u>

<u>ng/m³ Air</u>

Hexavalent Chromium

1854-02-99

0.0146

0.0038

MAR 0 5 2015

Initials: CR



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Matrix:

Air

FAX: (410) 266-8912

REPORTED: 03/04/15 14:45

SUBMITTED:

m³

<u>Flag</u>

FILE #: 3926.00

02/19/15 to 02/25/15

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Analysis Date: 03/02/15 16:41

Description:

PAM-3

Lab ID:

Sample Volume:

5022018-06

21.58

Sampled: 02/19/15 15:48 Received: 02/20/15 14:58

Comments:

Hexavalent Chromium

Start Time 2/18/15 15:50

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

Analyte

CAS Number 1854-02-99

ng/m³ Air

ng/m³ Air

0.0131

0.0038

MAR 0 5 2015

Initials: CR

Eastern Research Group

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

Page 18 of 40



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

Description:

Comments:

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Matrix:

Air

PAM-4

Start Time 2/18/15 15:37

FAX: (410) 266-8912

Lab ID:

Sample Volume:

5022018-07

21.46

m³

FILE#: 3926.00

REPORTED:

SUBMITTED:

AQS SITE SHE CODE:

Honeywell Hex Chrome Study

Sampled: 02/19/15 15:28

Received: 02/20/15 14:58

Analysis Date: 03/02/15 16:51

Hexavalent Chromium by SOP ERG-MOR-063

<u>Results</u>

MDL

03/04/15 14:45

02/19/15 to 02/25/15

Analyte

CAS Number

ng/m³ Air

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0167

0.0038

MAR 0 5 2015

Initials: CR

Eastern Research Group

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

Page 19 of 40



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

Matrix:

Comments:

PHONE: (443) 803-8495

Description: PAM-21

Air

FAX: (410) 266-8912

Lab ID:

5022018-08

Sample Volume:

21.67

 m^3

FILE #: 3926.00

REPORTED:

SUBMITTED:

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Sampled: 02/19/15 00:00

Received: 02/20/15 14:58 Analysis Date: 03/02/15 17:21

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

CAS Number

ng/m³ Air

<u>Flag</u>

ng/m³ Air

<u>Analyte</u> Hexavalent Chromium

1854-02-99

ND

0.0038

03/04/15 14:45

02/19/15 to 02/25/15

MAR 0 5 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

03/04/15 14:45

Malvern, PA 19355

REPORTED: SUBMITTED:

02/19/15 to 02/25/15

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

CODE:

21.58

Honeywell Hex Chrome Study

Description:

PAM-31

Air

Lab ID:

Sample Volume:

5022018-09

m³

Sampled: 02/19/15 00:00 Received: 02/20/15 14:58

Comments:

Matrix:

Analysis Date: 03/02/15 17:31

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

Analyte

CAS Number

FAX: (410) 266-8912

ng/m³ Air

Flag

ng/m³ Air

Hexavalent Chromium

1854-02-99

ND

0.0038

MAR 0 5 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED:

m³

03/04/15 14:45

Malvern, PA 19355

SUBMITTED:

02/19/15 to 02/25/15

ATTN: Mr. Jeff Boggs

AQS SITE SITE CODE:

PHONE: (443) 803-8495

FAX: (410) 266-8912

Honeywell Hex Chrome Study

Analysis Date: 03/03/15 13:58

Description:

OAM 1

Lab ID:

5022547-01

Sampled: 02/21/15 15:20

Matrix:

Air

Sample Volume:

21.9

Received: 02/25/15 10:59

Comments:

Start Time 2/20/15 14:59

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

Analyte

CAS Number

ng/m³ Air

<u>Flag</u>

<u>ng/m³ Air</u>

Hexavalent Chromium

1854-02-99

0.0216

0.0038

MAR 0 5 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED:

03/04/15 14:45

Malvern, PA 19355

SUBMITTED:

02/19/15 to 02/25/15

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

FAX: (410) 266-8912

SITE CODE:

Honeywell Hex Chrome Study

Description:

PAM-1

Lab ID:

5022547-03

Sampled: 02/21/15 16:42

Analysis Date: 03/03/15 12:33

Matrix:

Air

Sample Volume:

21.48

Received: 02/25/15 10:59

Comments:

Col 1 Start Time 2/20/15 16:43

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

<u>Analyte</u>

CAS Number

ng/m³ Air

Flag

m³

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0199

0.0038

MAR 0 5 2015

Initials: CR

Eastern Research Group

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

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Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED: 03/04/15 14:45

Malvern, PA 19355

SUBMITTED:

02/19/15 to 02/25/15

ATTN: Mr. Jeff Boggs

AQS SITE SITE CODE:

PHONE: (443) 803-8495

Honeywell Hex Chrome Study

Description:

PAM-1D

Lab ID:

5022547-04

Sampled: 02/21/15 16:46

Matrix:

Sample Volume:

21.61

Received: 02/25/15 10:59 Analysis Date: 03/03/15 12:53

Comments:

Col 2 Start Time 2/20/15 16:46

FAX: (410) 266-8912

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

Analyte

CAS Number

ng/m³ Air

<u>Flag</u>

m³

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0238

0.0038

MAR 0 5 2015

Initials: CR

Eastern Research Group

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

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Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED: 03/04/15 14:45

Malvern, PA 19355

SUBMITTED:

02/19/15 to 02/25/15

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

FAX: (410) 266-8912

SITE CODE:

Honeywell Hex Chrome Study

Description:

PAM-2

Lab ID:

5022547-05

Sampled: 02/21/15 16:18

Analysis Date: 03/03/15 14:08

Matrix:

Air

Sample Volume:

21.48

m³

Received: 02/25/15 10:59

Comments:

Start Time 2/20/15 16:26

Hexavalent Chromium by SOP ERG-MOR-063
Results

MDL

<u>Analyte</u>

CAS Number

ng/m³ Air

Flag

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0193

0.0038

MAR 0 5 2015

Initials: *€*₹

Eastern Research Group



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

Matrix:

Comments:

Hexavalent Chromium

Analyte

PHONE: (443) 803-8495

Description: PAM-3

Air

FAX: (410) 266-8912

Lab ID:

Sample Volume:

5022547-06

21.42

m³

FILE #: 3926.00

REPORTED:

SUBMITTED:

AQS SITE SITE CODE:

Honeywell Hex Chrome Study

Sampled: 02/21/15 16:06

Received: 02/25/15 10:59 Analysis Date: 03/03/15 14:37

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

03/04/15 14:45

02/19/15 to 02/25/15

Start Time 2/20/15 16:18

CAS Number

ng/m³ Air

<u>Flag</u>

ng/m³ Air

1854-02-99

0.0194

0.0038

MAR 0 5 2015

Initials: CR

Eastern Research Group

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

Page 26 of 40



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Air

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

03/04/15 14:45

SUBMITTED:

02/19/15 to 02/25/15

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description:

PAM-4

Lab ID:

Sample Volume:

5022547-07

m³

Flag

Sampled: 02/21/15 15:53

Received: 02/25/15 10:59 Analysis Date: 03/03/15 14:47

Matrix: Comments:

Start Time 2/20/15 15:42

Hexavalent Chromium by SOP ERG-MOR-063

<u>Results</u>

MDL

Analyte

Hexavalent Chromium

CAS Number

ng/m³ Air

21.77

<u>ng/m³ Air</u>

1854-02-99

0.0265

0.0038

MAR 0 5 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

Description:

Comments:

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Matrix:

Air

PAM-21

FAX: (410) 266-8912

5022547-08

Sample Volume:

Lab ID:

21.48

m³

SUBMITTED:

AQS SITE SITE CODE:

FILE #: 3926.00

REPORTED: 03/04/15 14:45

Honeywell Hex Chrome Study

Sampled: 02/21/15 00:00 Received: 02/25/15 10:59

Analysis Date: 03/03/15 14:57

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

02/19/15 to 02/25/15

<u>Analyte</u> Hexavalent Chromium **CAS Number** 1854-02-99

ng/m³ Air ND

Flag

ng/m³ Air

0.0038

MAR 0 5 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED:

03/04/15 14:45

Malvern, PA 19355

SUBMITTED:

02/19/15 to 02/25/15

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

FAX: (410) 266-8912

SITE CODE:

Honeywell Hex Chrome Study

Description:

PAM-31

Lab ID:

5022547-09

Sampled: 02/21/15 00:00

Matrix: Air Sample Volume:

21.42

Received: 02/25/15 10:59 Analysis Date: 03/03/15 15:07

Comments:

Hexavalent Chromium by SOP ERG-MOR-063

Resuits

MDL

<u>Analyte</u>

CAS Number

ng/m³ Air

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

ND

m³

0.0038

MAR 0 5 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

Matrix:

Comments:

PHONE: (443) 803-8495 Description:

OAM 1

Air

Start Time 2/22/15 14:59

FAX: (410) 266-8912

Lab ID:

5022547-10

Sample Volume:

21.54

m³

SUBMITTED:

AQS SITE SITE CODE:

FILE #: 3926.00

REPORTED: 03/04/15 14:45

Honeywell Hex Chrome Study

Sampled: 02/23/15 14:54

Received: 02/25/15 10:59 Analysis Date: 03/03/15 15:17

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

02/19/15 to 02/25/15

CAS Number

ng/m³ Air

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

Analyte

1854-02-99

0.0282

0.0038

MAR 0 5 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

Matrix:

Comments:

Description: OAM 2

PHONE: (443) 803-8495

Start Time 2/22/15 15:30

FAX: (410) 266-8912

5022547-11

Sample Volume:

21.31

m³

FILE #: 3926.00

REPORTED:

SUBMITTED: **AQS SITE**

SITE CODE:

Honeywell Hex Chrome Study

Sampled: 02/23/15 15:15

Received: 02/25/15 10:59 Analysis Date: 03/03/15 15:27

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

03/04/15 14:45

02/19/15 to 02/25/15

Analyte Hexavalent Chromium **CAS Number**

ng/m³ Air

<u>Flag</u>

ng/m3 Air

1854-02-99

Lab ID:

0.0290

0.0038

MAR 0 5 2015

Initials: CR

Eastern Research Group

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

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Environmental Resources Management, Inc.

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

03/04/15 14:45

SUBMITTED:

02/19/15 to 02/25/15

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description:

Comments:

PAM-1

Lab ID:

Sample Volume:

5022547-12

m³

Sampled: 02/23/15 16:29

Matrix: Air

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

21.17

Received: 02/25/15 10:59 Analysis Date: 03/03/15 13:13

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

Analyte

CAS Number

ng/m³ Air

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0218

0.0038

MAR 0 5 2015

Initials: CR

Eastern Research Group

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

Page 32 of 40



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED:

03/04/15 14:45

Malvern, PA 19355

SUBMITTED:

02/19/15 to 02/25/15

ATTN: Mr. Jeff Boggs

AQS SITE SITE CODE:

PHONE: (443) 803-8495

FAX: (410) 266-8912

21.01

Honeywell Hex Chrome Study

Description:

Comments:

PAM-1D

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

Lab ID:

5022547-13

Sampled: 02/23/15 16:31

Matrix:

Air

Sample Volume:

m³

Received: 02/25/15 10:59

Analysis Date: 03/03/15 13:33

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

Analyte

CAS Number

ng/m³ Air

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0210

0.0038

MAR 0 5 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Matrix:

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

03/04/15 14:45

02/19/15 to 02/25/15

SUBMITTED:

AQS SITE

SITE CODE:

m³

Honeywell Hex Chrome Study

Description:

Comments:

PAM-2

Air

Lab ID:

Sample Volume:

5022547-14

21.14

Sampled: 02/23/15 16:11 Received: 02/25/15 10:59

Analysis Date: 03/03/15 15:37

Start Time 2/22/15 16:42

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

Analyte Hexavalent Chromium **CAS Number**

ng/m³ Air

Flag

ng/m³ Air

1854-02-99 0.0334

0.0038

MAR 0 5 2015

Initials: CR

Eastern Research Group

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

Page 34 of 40



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Matrix:

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

03/04/15 14:45

SUBMITTED:

02/19/15 to 02/25/15

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description:

Comments:

PAM-3

Air

Lab ID:

5022547-15

21.04

Sampled: 02/23/15 15:53 Received: 02/25/15 10:59

Analysis Date: 03/03/15 15:47

Start Time 2/22/15 16:30

Hexavalent Chromium by SOP ERG-MOR-063 Results

Sample Volume:

MDL

m³

CAS Number

ng/m³ Air

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

Analyte

1854-02-99

0.0243

0.0038

MAR 0 5 2015

Initials: CR



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Matrix:

FAX: (410) 266-8912

Start Time 2/22/15 16:19

FILE #: 3926.00

REPORTED:

03/04/15 14:45

SUBMITTED:

02/19/15 to 02/25/15

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description:

Comments:

PAM-4

Air

Lab ID:

Sample Volume:

5022547-16

21.03

m³

Sampled: 02/23/15 15:41 Received: 02/25/15 10:59

Analysis Date: 03/03/15 15:56

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

Analyte

CAS Number

ng/m³ Air

Flag

ng/m³ Air

0.0038

Hexavalent Chromium

1854-02-99

0.0261

MAR 0 5 2015

Initials: CR

Eastern Research Group

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

Page 36 of 40



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

03/04/15 14:45

Malvern, PA 19355

REPORTED:

SUBMITTED:

02/19/15 to 02/25/15

ATTN: Mr. Jeff Boggs

AQS SITE SITE CODE:

PHONE: (443) 803-8495

FAX: (410) 266-8912

Honeywell Hex Chrome Study

Description:

PAM-21

Lab ID:

5022547-17

Sampled: 02/23/15 00:00

Matrix:

Air

Sample Volume:

21.14

m³

Received: 02/25/15 10:59 Analysis Date: 03/03/15 16:06

Comments:

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

CAS Number

ng/m³ Air

ng/m³ Air 0.0038

Analyte Flag 1854-02-99 ND Hexavalent Chromium

MAR 0 5 2015

Initials: CR

Eastern Research Group

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

Page 37 of 40



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED:

03/04/15 14:45

Malvern, PA 19355

SUBMITTED:

02/19/15 to 02/25/15

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

FAX: (410) 266-8912

SITE CODE:

Honeywell Hex Chrome Study

Description:

PAM-31

Lab ID:

5022547-18

Sampled: 02/23/15 00:00

Matrix: Air Sample Volume:

m³

Received: 02/25/15 10:59

Comments:

Analysis Date: 03/03/15 16:36

Hexavalent Chromium by SOP ERG-MOR-063

21.04

Results

MDL

Analyte

CAS Number

ng/m³ Air

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

ND

0.0038

MAR 0 5 2015

Initials: CR

Eastern Research Group

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

Page 38 of 40



LABORATORY DATA CONSULTANTS, INC.

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

ERM March 17, 2015

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

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

Dear Mr. Boggs,

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

LDC Project #33882:

<u>SDG</u> <u>Fraction</u>

5022547/5022727/5030213, 5031028/5031123 Hexavalent Chromium

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

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

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

Christina Rink

Sincerely,

Project Manager/Chemist

Attachment 1 1 WEEK TAT 303 pages-SF LDC #33882 (ERM - Morrisville, NC / Harbor Point, MD, Hexavalent Chromium Monitoring) Level IV DÀTE Cr(VI) DATE LDC SDG# REC'D DUE (D7614) Matrix: Air/Water/Soil 03/16/15 03/23/15 5022547/ 5022727/5030213 03/16/15 03/23/15 18 0 В 5031028/5031123 Total T/CR

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: Harbor Point, MD, Hexavalent Chromium Monitoring

Collection Date: February 20 through February 26, 2014

LDC Report Date: March 16, 2015

Matrix: Air

Parameters: Hexavalent Chromium

Validation Level: EPA Level IV

Laboratory: Eastern Research Group

Sample Delivery Group (SDG): 5022547/5022727/5030213

Sample Identification

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

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

Introduction

This data review covers 44 air samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per ASTM D7614 for Hexavalent Chromium.

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

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

The following are definitions of the data qualifiers:

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

I. Technical Holding Times

All technical holding time requirements were met.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met.

IV. Blanks

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

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

Samples PAM-21(02/20/15), PAM-21(02/24/15), PAM-21(02/25/15), and PAM-21(02/26/15) were identified as field blanks. No hexavalent chromium was found.

V. Matrix Spike/Matrix Spike Duplicates

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

VI. Duplicates

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

VII. Laboratory Control Samples

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

VIII. Sample Result Verification

All sample result verifications were acceptable.

IX. Overall Assessment of Data

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

X. Field Duplicates

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

-	Concentrati	on (ng/m³)	555		
Analyte	PAM-1(02/20/15)	PAM-1D(02/20/15)	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.0170	0.0146	15 (≤20)	-	<u>-</u>

	Concentrat	ncentration (ng/m³)			
Analyte	PAM-1(02/24/15)	PAM-1D(02/24/15)	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.0117	0.0132	12 (≤20)	-	-

	Concentrat	ion (ng/m³)	555	_	
Analyte	PAM-1(02/25/15)	PAM-1D(02/25/15)	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.0386	0.0352	9 (≤20)	-	-

	Concentrat	ion (ng/m³)	222		
Analyte	PAM-1(02/26/15)	PAM-1D(09/30/14	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.0361	0.0437	19 (≤20)	-	-

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

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

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

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

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

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

LDC #: 33882A6 VALIDATION COMPLETENESS WORKSHEET

SDG #: 5022547/5022727/5030213 Laboratory: Eastern Research Group Level IV

Page: _of_Z Reviewer: ___ 2nd Reviewer: ___

METHOD: (Analyte) Hexavalent Chromium (ASTM D7614)

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

	Validation Area		Comments
l.	Sample receipt/Technical holding times	A	02/20/15 - 02/26/15
	Initial calibration	A	` ` `
III.	Calibration verification	LA	
IV	Laboratory Blanks	IA	
V	Field blanks	ND	FB=(8)(17)(26)(35) TB=(9)(8)(27)(36)
VI.	Matrix Spike/Matrix Spike Duplicates	N .	FB=(8)(17)(26)(35) TB=(9)(18)(27)(36) Not Required
VII.	Duplicate sample analysis	A	DUP ,
VIII.	Laboratory control samples	A	Listo
IX.	Field duplicates	SW	FD=(3.4) (12,13) (21,22) (30,31)
Χ	Sample result verification	A	
xı	Overall assessment of data	P	

Note:

A = Acceptable

N = Not provided/applicable

SW = See worksheet

ND = No compounds detected

R = Rinsate

FB = Field blank

D = Duplicate

TB = Trip blank EB = Equipment blank SB=Source blank OTHER:

	Client ID	Lab ID	Matrix	Date
1	OAM 1 (02/20/15)	5022547-19	Air	02/20/15
2	OAM 2 (02/20/15)	5022547-20	Air	02/20/15
3	PAM-1 (02/20/15)	5022547-21	Air	02/20/15
4	PAM-1D (02/20/15)	5022547-22	Air	02/20/15
5	PAM-2 (02/20/15)	5022547-23	Air	02/20/15
6	PAM-3 (02/20/15)	5022547-24	Air	02/20/15
7	PAM-4 (02/20/15)	5022547-25	Air	02/20/15
8	PAM-21 (02/20/15)	5022547-26	Air	02/20/15
9	PAM-31 (02/20/15)	5022547-27	Air	02/20/15
10	OAM 1 (02/24/15)	5022547-28	Air	02/24/15
11	OAM 2 (02/24/15)	5022547-29	Air	02/24/15
12	PAM-1 (02/24/15)	5022547-30	Air	02/24/15
13	PAM-1D (02/24/15)	5022547-31	Air	02/24/15
14	PAM-2 (02/24/15)	5022547-32	Air	02/24/15
15	PAM-3 (02/24/15)	5022547-33	Air	02/24/15
16	PAM-4 (02/24/15)	5022547-34	Air	02/24/15
17	PAM-21 (02/24/15)	5022547-35	Air	02/24/15

LDC #: 33882A6

VALIDATION COMPLETENESS WORKSHEET

Level IV

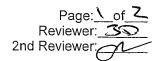
SDG #: 5022547/5022727/5030213 Laboratory: Eastern Research Group

Reviewer: 30 2nd Reviewer: 02

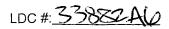
METHOD: (Analyte) Hexavalent Chromium (ASTM D7614)

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

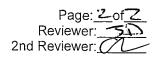
VALIDATION FINDINGS CHECKLIST



Method:Inorganics (EPA Method (EPA Method)							
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?	/						
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 anaylzed 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	1			· · · · · · · · · · · · · · · · · · ·
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#<u>33882A6</u>

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Page:	<u>\</u> of
Reviewer:	<u> </u>
2nd Reviewer:	_

Inorganics: Method See Cover

	Concentra	tion (ng/m3)		
Analyte	3	4	RPD (≤20)	Qual.
Hexavalent Chromium	0.0170	0.0146	15	

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

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

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

 $\verb|\LDCFILESERVER|\Validation|\FIELD DUPLICATES|\FD_inorganic|\33882A6.wpd|$

LDC #: 3382040

Validation Findings Worksheet Initial and Continuing Calibration Calculation Verification

Page: \ of \	
Reviewer: <u>SSS</u>	
nd Reviewer:	

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

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

%R = <u>Found X 100</u>

Where,

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

True

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

					Recalculated	Reported	Acceptable
Type of analysis	Analyte	Standard	Conc. (ng/ml)	Area	r or r ²	r or r ²	(Y/N)
Initial calibration		s1	0.05	0.0000257			
		s2	0.1	0.0000645	0.99997	0.99997	
		s3	0.2	0.0001399			
	صد م	s4	0.5	0.0003732	į		9
		s5	1	0.0007363			
		s6	2	0.0014859			·
Jev 10:43	0 110	Found	True				
Calibration verification	Con	0.530m/m	O. Snelled		106:0%	106.0%	_
CCO 11:U3 Calibration verification	Carp	0.531012/ml	0.5 reful		106.2%	106.278	- 4
Calibration verification							

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

LDC#: 358200

VALIDATION FINDINGS WORKSHEET Level IV Recalculation Worksheet

Page: __of __ Reviewer: ______ 2nd Reviewer: ______

METHOD In a service	N A - 411	C_{n}	\int_{0}^{7}
METHOD: Inorganics,	Method	<u> </u>	120cm

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

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

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:

 $RPD = |S-D| \times 100$

Where,

S =

Original sample concentration

(S+D)/2

D =

Duplicate sample concentration

Sample ID	Type of Analysis	Element	Found / S (units)	True / D (units)	Recalculated %R / RPD	Reported %R / RPD	Acceptable (Y/N)
145 11.13	Laboratory control sample	CF	0.993 ng/ml	1.00mg/ml	99.3%R	99.3%	3
N	Matrix spike sample		(SSR-SR)				
DUR 12:14	Duplicate sample	J	0.017ng/m3	0.0170 ng/m³	4,04%,230	4,47% R8D	Y*

Comments:	* Roundina		 		
)			

LDC #: 3392App

VALIDATION FINDINGS WORKSHEET

Sample Calculation Verification

					····
METH	IOD: Inorganics, Metho	d See Carer			
Y N Y N Y N Comporecalc	N/A Have results WA/A Are results was N/A Are all detect ound (analyte) results fulated and verified usin	g the following equation:	y? ments? repo	orted with a positiv	
Concen	tration = (A-co) ($\frac{\sqrt{12}}{\sqrt{12}} = \frac{\sqrt{12}}{\sqrt{12}} = \frac{\sqrt{12}}{\sqrt$	0000263-(-8	3.81E-06)	P340, O=
(: (:	= 0.00017110 = -8.8/E-06	(neglm) (21.52 (0.0) m3 = 21.52 (0.0) m3 = 21.52 (0.0)	246964gm1)(11 21.52	0mi) = 1	n 8150.0
#	Sample ID	Analyte	Reported Concentration (બ્લોન્ટ)	Calculated Concentration (~~\dagger^3)	Acceptable (Y/N)
	į	Cr**	0.0107	0.0107	3
	2		0.0122	0.023	534
	3		0.0170	0.000	3
	4		0.0146	0.0146	
	5		0.0129	0.0129	
11	,]	N = 103	100000	

		0.00	0.00	
7		0.0122	0.023	37
B		0.0170	0.000	7
Ť		0.0146	0.0146	
IJ		0,0129	0.0129	
تغ		0.0102	0.0102	
Ţ		0-0141	0.0(4)	
8		<i>PD</i>	00	
٩		OU	ND	
10		0.0110	0.0116	
		8210.0	8210,0	
12		0-0117	0.0117	
13		0.0132	0.0132	
14		D.0218	D.0218	
15		0.0122	0.0122	
16		0.0144	D.0144	
(7		<i>C4</i>	NO .	
81		C4	とり	
iq		ND	ろひ	4
20	<u> </u>	0.015	0.0176	5+

Note: * RWi	rdire		
	\		

LDC#:3382A6

VALIDATION FINDINGS WORKSHEET

Sample Calculation Verification

Page: 2 of 2
Reviewer: 50
2nd reviewer: 6

METH	IOD: Inorganics, Metho	d_See Cover_						
Please Y N Y N Y N	N/A Have results N/A Are results w	bw for all questions answered "N". Not been reported and calculated correctly within the calibrated range of the instruc- tion limits below the CRQL?	y?	e identified as "N/,	4 ".			
	Compound (analyte) results forreported with a positive detect were recalculated and verified using the following equation:							
Concen	tration = (A-Lo) (C	g the following equation: $ UA=(Du) _{Recalculation:} $ $ V_{3}=21.46 $ $ V_{3}=21.46 $ $ V_{3}=21.46 $ $ V_{3}=21.46 $ $ V_{3}=21.46 $ $ V_{3}=21.46 $ $ V_{3}=21.46 $ $ V_{3}=21.46 $ $ V_{4}=$	CCO5053-(-1	SSE-05))	0 08i4v			
Α: Co	0.0000503	(ng/m1)(J2)	0-000761	+				
Ċ,	= 0.0007614	m3 = ng/m3 (0.0804ng/m1)(10ml) = 0.	0403 mg)			
#	Sample ID	Analyte	Reported Concentration (\va\n^3)	Calculated Concentration (いくいろ)	Acceptable (Y/N)			
	21	Cric	0.0386	0.0386	4			
	22_	\	0.0352	0.0352				
	23		0.0228	0.0228				
	24		0.0201	0.0201				
	Z5		0.0390	0.0390				
	26		20	20				
	27		ND	20	4			
	28		0.0228	0.0227	9×			
	29		0.0245	0.0246	4×			
	<u></u> 30		0.0361	0.036	7			
	31		0.0437	0.0437				
	32		0-0869	0.0869				
	33		0-0274	0.0274				
	34		0,0403	0.0403				
	35		20	C0				
	36	4	NO	ND	Ţ			
Note:_								



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

Description:

Comments:

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Matrix:

Air

Start Time 2/19/15 14:51

OAM 1

FAX: (410) 266-8912

Lab ID:

5022547-19

Sample Volume:

m³

FILE #: 3926.00

REPORTED:

SUBMITTED:

AQS SITE

SHECODE:

Honeywell Hex Chrome Study

Analysis Date: 03/04/15 13:31

Sampled: 02/20/15 14:56

Received: 02/25/15 10:59

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

03/06/15 15:27

02/25/15 to 03/02/15

CAS Number

ng/m³ Air

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

Analyte

1854-02-99

0.0107

0.0038

MAR 1 7 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Start Time 2/19/15 15:11

FAX: (410) 266-8912

SUBMITTED:

AQS SITE SITE CODE:

REPORTED:

Honeywell Hex Chrome Study

Description: Matrix:

Comments:

OAM 2

Air

Lab ID:

Sample Volume:

5022547-20

m³

FILE #: 3926.00

Sampled: 02/20/15 15:20 Received: 02/25/15 10:59

Analysis Date: 03/04/15 13:41

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

03/06/15 15:27

02/25/15 to 03/02/15

Analyte

CAS Number

ng/m³ Air

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0122

0.0038

MAR 1 7 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Matrix:

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

03/06/15 15:27

SUBMITTED:

02/25/15 to 03/02/15

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description:

PAM-1

Air

Lab ID:

Sample Volume:

5022547-21

m³

Sampled: 02/20/15 16:40 Received: 02/25/15 10:59

Analysis Date: 03/04/15 12:04

Comments: Col 1 Start Time 2/19/15 16:17

Hexavalent Chromium by SOP ERG-MOR-063

21.94

<u>Results</u>

MDL

<u>Analyte</u>

CAS Number

ng/m³ Air

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0170

0.0038

MAR 1 7 2015

Initials: CR

Eastern Research Group

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

Page 6 of 41



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Matrix:

i. Jeli bogga

3) 803-8495 FAX

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

03/06/15 15:27

SUBMITTED:

02/25/15 to 03/02/15

AQS SITE

SUE CODE:

Honeywell Hex Chrome Study

Description:

PAM-1D

Air

Lab ID:

Sample Volume:

5022547-22

21.9 m³

Sampled: 02/20/15 16:43 Received: 02/25/15 10:59

Analysis Date: 03/04/15 12:23

Comments:

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

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

<u>Analyte</u>

CAS Number

ng/m³ Air

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0146

0.0038

MAR 1 7 2015

Initials: CR

Eastern Research Group

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

Page 7 of 41



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

Matrix:

Comments:

PHONE: (443) 803-8495

PAM-2 **Description:**

Air

Start Time 2/19/15 16:04

FAX: (410) 266-8912

Lab ID:

Sample Volume:

m³

Flag

FILE #: 3926.00

REPORTED:

SUBMITTED:

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Sampled: 02/20/15 16:24

Received: 02/25/15 10:59 Analysis Date: 03/04/15 14:11

Hexavalent Chromium by SOP ERG-MOR-063

5022547-23

Results

MDL

03/06/15 15:27

02/25/15 to 03/02/15

Analyte Hexavalent Chromium **CAS Number**

ng/m³ Air

21.89

ng/m³ Air

1854-02-99

0.0129

0.0038

MAR 1 7 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED:

03/06/15 15:27

Malvern, PA 19355

SUBMITTED:

02/25/15 to 03/02/15

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

FAX: (410) 266-8912

SITE CODE:

Honeywell Hex Chrome Study

Description:

PAM-3

Lab ID:

5022547-24

Sampled: 02/20/15 16:15

Matrix:

Air

Sample Volume:

21.96

m³

Received: 02/25/15 10:59 Analysis Date: 03/04/15 14:21

Comments: Start Time 2/19/15 15:51

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

Analyte

CAS Number

ng/m³ Air

Flag

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0102

0.0038

MAR 1 7 2015

Initials: CR

Eastern Research Group

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Page 9 of 41



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED:

03/06/15 15:27

Malvern, PA 19355

SUBMITTED:

02/25/15 to 03/02/15

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

FAX: (410) 266-8912

SITE CODE:

Honeywell Hex Chrome Study

Description:

PAM-4

5022547-25 Lab ID:

Sampled: 02/20/15 15:39 Received: 02/25/15 10:59

Matrix:

Air

Sample Volume:

21.72

Comments:

m³

Analysis Date: 03/04/15 14:31

Start Time 2/19/15 15:31

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

Analyte

CAS Number

ng/m³ Air

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0141

0.0038

MAR 1 7 2015

Initials: CR



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

ORTED: 03/06/15 15:27

•

REPORTED: SUBMITTED:

02/25/15 to 03/02/15

Malvern, PA 19355

AQS SITE

ATTN: Mr. Jeff Boggs **PHONE:** (443) 803-8495

SITE CODE:

Honeywell Hex Chrome Study

Description:

PAM-21

Lab ID:

5022547-26

Sampled: 02/20/15 00:00

Matrix: Air

Sample Volume:

21.89

Received: 02/25/15 10:59

Comments:

FAX: (410) 266-8912

m³

Analysis Date: 03/04/15 14:40

Comments.

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

Analyte
Hexavalent Chromium

CAS Number 1854-02-99

ng/m³ Air ND

<u>Flag</u>

ng/m³ Air 0.0038

MAR 1 7 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED:

03/06/15 15:27

Malvern, PA 19355

SUBMITTED:

02/25/15 to 03/02/15

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

. con bogge

FAX: (410) 266-8912

SITE CODE:

Honeywell Hex Chrome Study

Analysis Date: 03/04/15 14:50

Description:

PAM-31

Lab ID:

5022547-27

Hexavalent Chromium by SOP ERG-MOR-063

Sampled: 02/20/15 00:00

Matrix: Air

Sample Volume:

21.96

m³

Received: 02/25/15 10:59

Comments:

Results

<u>MDL</u>

<u>Analyte</u>

CAS Number

ng/m³ Air

<u>Flag</u>

<u>ng/m³ Air</u>

Hexavalent Chromium

1854-02-99

ND

U

0.0038

MAR 1 7 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED:

03/06/15 15:27

Malvern, PA 19355

SUBMITTED:

02/25/15 to 03/02/15

ATTN: Mr. Jeff Boggs

AQS SITE

SITE CODE:

PHONE: (443) 803-8495

FAX: (410) 266-8912

5022547-28

Honeywell Hex Chrome Study

Analysis Date: 03/04/15 15:00

Description: Matrix:

OAM 1

Air

Lab ID:

Sample Volume:

Hexavalent Chromium by SOP ERG-MOR-063

21.55

m³

Sampled: 02/24/15 14:54 Received: 02/25/15 10:59

Comments:

Start Time 2/23/15 14:57

Results

MDL

Analyte

CAS Number

<u>nq/m³ Air</u>

Flag

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0116

0.0038

MAR 1 7 2015

Initials: €₹



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

Description:

Comments:

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Matrix:

OAM 2

Air

Start Time 2/23/15 15:19

FAX: (410) 266-8912

Lab ID:

5022547-29

Sample Volume: 21.57 m³

<u>Flag</u>

FILE #:

REPORTED:

SUBMITTED:

AQS SITE

SITE CODE:

3926.00

Honeywell Hex Chrome Study

Sampled: 02/24/15 15:17

Received: 02/25/15 10:59

Analysis Date: 03/04/15 15:10

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

03/06/15 15:27

02/25/15 to 03/02/15

Analyte Hexavalent Chromium **CAS Number**

ng/m³ Air

ng/m³ Air

1854-02-99

0.0158

0.0038

MAR 1 7 2015

Initials: CR



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

Description:

Comments:

ATTN: Mr. Jeff Boggs

Matrix:

PHONE: (443) 803-8495

Air

PAM-1

Col 1 Start Time 2/23/15 16:31

FAX: (410) 266-8912

Lab ID:

5022547-30

Sample Volume:

21.45

m³

FILE #: 3926.00

REPORTED: SUBMITTED:

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Sampled: 02/24/15 16:22

Received: 02/25/15 10:59 Analysis Date: 03/04/15 12:43

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

03/06/15 15:27

02/25/15 to 03/02/15

Analyte

CAS Number

<u>ng/m³ Air</u>

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0117

0.0038

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Initials: CR

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Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED:

03/06/15 15:27

Malvern, PA 19355

SUBMITTED:

02/25/15 to 03/02/15

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

- -

FAX: (410) 266-8912

SITE CODE:

Honeywell Hex Chrome Study

Analysis Date: 03/04/15 13:03

Description:

PAM-1D

Lab ID:

5022547-31

Sampled: 02/24/15 16:24

Matrix:

Air

Sample Volume:

21.46

Received: 02/25/15 10:59

Comments:

Col 2 Start Time 2/23/15 16:33

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

<u>Analyte</u>

CAS Number

ng/m³ Air

Flag

m³

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0132

0.0038

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Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

Matrix:

Description:

Comments:

PHONE: (443) 803-8495

75 Valley Stream Parkway, Suite 400

Air

PAM-2

Start Time 2/23/15 16:15

FAX: (410) 266-8912

Lab ID:

5022547-32

Sample Volume:

21.52

FILE #: 3926.00

REPORTED:

SUBMITTED:

m³

<u>Flag</u>

AQS SITE SITE CODE:

Honeywell Hex Chrome Study

Sampled: 02/24/15 16:10

Received: 02/25/15 10:59 Analysis Date: 03/04/15 15:20

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

03/06/15 15:27

02/25/15 to 03/02/15

CAS Number

ng/m³ Air

ng/m³ Air

Hexavalent Chromium

Analyte

1854-02-99

0.0218

0.0038

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Initials: CR

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Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED:

03/06/15 15:27

Malvern, PA 19355

SUBMITTED:

02/25/15 to 03/02/15

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

00

FAX: (410) 266-8912

SODE:

m³

Honeywell Hex Chrome Study

Description:

PAM-3

Lab ID:

5022547-33

Sampled: 02/24/15 16:00

Matrix:

Air

Sample Volume:

21.66

. . .

Received: 02/25/15 10:59 **Analysis Date:** 03/04/15 15:30

Comments:

Start Time 2/23/15 15:56

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

<u>Analyte</u>

CAS Number

ng/m³ Air

<u>Flag</u>

<u>ng/m³ Air</u>

Hexavalent Chromium

1854-02-99

0.0122

0.0038

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FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED:

03/06/15 15:27

Malvern, PA 19355

SUBMITTED:

02/25/15 to 03/02/15

ATTN: Mr. Jeff Boggs

AQS SITE

SUPECODE:

PHONE: (443) 803-8495

FAX: (410) 266-8912

Honeywell Hex Chrome Study

Description:

PAM-4

Air

Lab ID:

5022547-34

Sampled: 02/24/15 15:41

Received: 02/25/15 10:59

Matrix: Comments:

Start Time 2/23/15 15:44

Sample Volume:

m³

Analysis Date: 03/04/15 15:40

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

<u>Analyte</u>

CAS Number

<u>ng/m³ Air</u>

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0144

0.0038

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Page 19 of 41



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FILE #: 3926.00

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REPORTED:

03/06/15 15:27

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02/25/15 to 03/02/15

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

FAX: (410) 266-8912

SITE CODE:

Honeywell Hex Chrome Study

Description:

Comments:

PAM-21

Lab ID:

5022547-35

Sampled: 02/24/15 00:00

Matrix: A

Air

Sample Volume:

21.52

m³

Received: 02/25/15 10:59

Analysis Date: 03/04/15 16:10

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

<u>Analyte</u>

CAS Number

<u>ng/m³ Air</u>

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

ND

U

0.0038

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Page 20 of 41



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

Description:

Comments:

ATTN: Mr. Jeff Boggs

Matrix:

PHONE: (443) 803-8495

PAM-31

FAX: (410) 266-8912

Lab ID:

Sample Volume:

21.66

m³

FILE #: 3926.00

REPORTED:

SUBMITTED: AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Sampled: 02/24/15 00:00

Received: 02/25/15 10:59 Analysis Date: 03/04/15 16:30

Hexavalent Chromium by SOP ERG-MOR-063

5022547-36

Results

<u>MDL</u>

03/06/15 15:27

02/25/15 to 03/02/15

<u>Analyte</u> Hexavalent Chromium **CAS Number** 1854-02-99

ng/m³ Air ND

<u>Flag</u>

ng/m³ Air 0.0038

MAR 1 7 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

FILE #: 3926.00

03/06/15 15:27

Malvern, PA 19355

REPORTED: SUBMITTED:

02/25/15 to 03/02/15

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

75 Valley Stream Parkway, Suite 400

FAX: (410) 266-8912

SITE CODE:

Honeywell Hex Chrome Study

Description:

OAM 1

Lab ID:

5022727-01

Sampled: 02/25/15 15:00

Matrix:

Air

Sample Volume:

Received: 02/27/15 13:45 Analysis Date: 03/05/15 13:57

Comments:

Start Time 2/24/15 14:56

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

<u>Analyte</u>

CAS Number

ng/m³ Air

Flag

ng/m³ Air

Hexavalent Chromium

1854-02-99

ND

m³

0.0038

MAR 1 7 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Matrix:

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

03/06/15 15:27

02/25/15 to 03/02/15

SUBMITTED:

AQS SITE

CODE:

Honeywell Hex Chrome Study

Description:

OAM 2

Air

Lab ID:

Sample Volume:

5022727-02

Sampled: 02/25/15 15:27 Received: 02/27/15 13:45

Analysis Date: 03/05/15 14:07

Comments: Start Time 2/24/15 15:20

Hexavalent Chromium by SOP ERG-MOR-063

Resuits

MDL

Analyte

CAS Number

ng/m³ Air

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0175

0.0038

MAR 1 7 2015

Initials: CR



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

Matrix:

Comments:

PHONE: (443) 803-8495

Description:

Air

PAM-1

Col 1 Start Time 2/24/15 16:25

FAX: (410) 266-8912

Lab ID: Sample Volume:

5022727-03

21.74

m³

FILE #: 3926.00

REPORTED:

SUBMITTED:

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study Sampled: 02/25/15 16:35

Received: 02/27/15 13:45

Analysis Date: 03/05/15 12:37

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

03/06/15 15:27

02/25/15 to 03/02/15

<u>Analyte</u>

CAS Number

ng/m³ Air

Flag

ng/m3 Air

Hexavalent Chromium

1854-02-99

0.0386

0.0038

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Initials: CR

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Page 24 of 41



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

Matrix:

PHONE: (443) 803-8495

Air

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 03/06/15 15:27

02/25/15 to 03/02/15

SUBMITTED:

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description:

PAM-1D

Lab ID:

Sample Volume:

5022727-04

21.76 m³ Sampled: 02/25/15 16:38

Received: 02/27/15 13:45 Analysis Date: 03/05/15 12:56

Comments:

Col 2 Start Time 2/24/15 16:27

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

Analyte

CAS Number

ng/m³ Air

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0352

0.0038

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Page 25 of 41



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

Matrix:

PHONE: (443) 803-8495

Air

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: SUBMITTED: 03/06/15 15:27

02/25/15 to 03/02/15

AQS SITE

SUPECODE:

m³

Honeywell Hex Chrome Study

Analysis Date: 03/05/15 14:37

Description:

PAM-2

Lab ID:

Sample Volume:

5022727-05

21.45

Sampled: 02/25/15 16:03

Received: 02/27/15 13:45

Comments:

Start Time 2/24/15 16:13

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

Analyte

CAS Number

ng/m³ Air

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0258

0.0038

MAR 1 7 2015

Initials: CR

Eastern Research Group

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

Page 26 of 41



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED: 0

03/06/15 15:27

Malvern, PA 19355

SUBMITTED:

SITE CODE:

m³

02/25/15 to 03/02/15

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

Honeywell Hex Chrome Study

Description:

PAM-3

Lab ID:

5022727-06

Sampled: 02/25/15 15:55

Matrix: Air

..

Sample Volume:

21.48

Received: 02/27/15 13:45 **Analysis Date:** 03/05/15 14:46

Comments:

Start Time 2/24/15 16:03

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

<u>Analyte</u>

CAS Number

FAX: (410) 266-8912

<u>ng/m³ Air</u>

<u>Flag</u>

<u>ng/m³ Air</u>

Hexavalent Chromium

1854-02-99

0.0201

0.0038

MAR 1 7 2015

Initials: CR

Eastern Research Group

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

Page 27 of 41



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

Description:

Comments:

Hexavalent Chromium

Analyte

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Matrix:

FAX: (410) 266-8912

PAM-4 Air

Start Time 2/24/15 15:44

FILE #: 3926.00

REPORTED:

03/06/15 15:27

02/25/15 to 03/02/15

SUBMITTED:

m³

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Sampled: 02/25/15 15:49

Received: 02/27/15 13:45

Analysis Date: 03/05/15 14:56

Hexavalent Chromium by SOP ERG-MOR-063

21.68

Results

5022727-07

<u>MDL</u>

CAS Number

Lab ID:

Sample Volume:

ng/m³ Air

Flag

ng/m³ Air

1854-02-99

0.0390

0.0038

MAR 1 7 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED:

03/06/15 15:27

Malvern, PA 19355

SUBMITTED:

02/25/15 to 03/02/15

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

FAX: (410) 266-8912

SITE CODE:

Honeywell Hex Chrome Study

Description:

PAM-21

Lab ID: 5022727-08

m³

Sampled: 02/25/15 00:00 Received: 02/27/15 13:45

Matrix: Air Sample Volume:

21.45

Analysis Date: 03/05/15 15:06

Comments:

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

Analyte

CAS Number

ng/m³ Air

Flag

ng/m³ Air

Hexavalent Chromium

1854-02-99

ND

0.0038

MAR 1 7 2015

Initials: CZ

Eastern Research Group



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED:

03/06/15 15:27

Malvern, PA 19355

SUBMITTED:

02/25/15 to 03/02/15

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

Sample Volume:

SITE CODE:

21.48

Honeywell Hex Chrome Study

Description:

Comments:

Matrix:

PAM-31

Air

Lab ID:

5022727-09

m³

Sampled: 02/25/15 00:00 Received: 02/27/15 13:45

Analysis Date: 03/05/15 15:16

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

<u>Analyte</u>

CAS Number

FAX: (410) 266-8912

ng/m³ Air

<u>Flag</u>

<u>ng/m³ Air</u>

Hexavalent Chromium

1854-02-99

ND

U

0.0038

MAR 1 7 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED:

03/06/15 15:27

Malvern, PA 19355

SUBMITTED:

02/25/15 to 03/02/15

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

င်ပည

CODE:

Honeywell Hex Chrome Study

Analysis Date: 03/05/15 15:26

Description:

OAM 1

Lab ID:

5030213-01

Sampled: 02/26/15 15:00

Matrix:

Air

Sample Volume:

21.58

m³

Received: 03/02/15 10:19

Comments:

Start Time 2/25/15 15:02

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

Analyte

CAS Number

FAX: (410) 266-8912

ng/m³ Air

Flag

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0228

0.0038

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Initials: CR

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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.

Page 31 of 41



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

(440) 000 010

FAX: (410) 266-8912

111111111111

FILE #: 3926.00

REPORTED:

03/06/15 15:27

02/25/15 to 03/02/15

SUBMITTED:

AQS SITE

STECODE:

Honeywell Hex Chrome Study

Description:

OAM 2

Lab ID:

Sample Volume:

5030213-02

. --

m³

Sampled: 02/26/15 15:27

Received: 03/02/15 10:19 **Analysis Date:** 03/05/15 15:36

Comments:

Matrix:

Start Time 2/25/15 15:30

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

<u>Analyte</u>

CAS Number

ng/m³ Air

<u>Flag</u>

<u>ng/m³ Air</u>

Hexavalent Chromium

1854-02-99

0.0245

0.0038

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Initials: CR



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

Description:

Comments:

ATTN: Mr. Jeff Boggs

Matrix:

PHONE: (443) 803-8495

PAM-1

Air

Col 1 Start Time 2/25/15 16:39

FAX: (410) 266-8912

Lab ID:

5030213-03

Sample Volume:

m³

FILE #: 3926.00

REPORTED: SUBMITTED:

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Sampled: 02/26/15 16:12

Received: 03/02/15 10:19 Analysis Date: 03/05/15 13:16

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

03/06/15 15:27

02/25/15 to 03/02/15

Analyte

CAS Number

ng/m³ Air

Flag

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0361

0.0038

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Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

Matrix:

Comments:

PHONE: (443) 803-8495

Description:

Air

PAM-1D

Col 2 Start Time 2/25/15 16:41

FAX: (410) 266-8912

Lab ID:

5030213-04

Sample Volume:

FILE #: 3926.00

REPORTED:

SUBMITTED:

m³

AQS SITE SITE CODE:

Honeywell Hex Chrome Study

Sampled: 02/26/15 16:14

Received: 03/02/15 10:19 Analysis Date: 03/05/15 13:36

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

03/06/15 15:27

02/25/15 to 03/02/15

<u>Analyte</u>

CAS Number

ng/m³ Air

<u>Flaq</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0437

0.0038

MAR 1 7 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc.

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

Description:

Comments:

ATTN: Mr. Jeff Boggs

Matrix:

PHONE: (443) 803-8495

PAM-2

FAX: (410) 266-8912

Lab ID:

5030213-05

Sample Volume:

21.54

 $\,m^3$

FILE #: 3926.00

REPORTED:

SUBMITTED: AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Sampled: 02/26/15 16:02

Received: 03/02/15 10:19 Analysis Date: 03/05/15 15:46

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

03/06/15 15:27

02/25/15 to 03/02/15

Analyte CAS Number

Start Time 2/25/15 16:06

1854-02-99

ng/m³ Air

<u>Flaq</u>

ng/m³ Air

Hexavalent Chromium

0.0869

0.0038

MAR 1 7 2015

Initials: CR

Eastern Research Group

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

Page 35 of 41



Environmental Resources Management, Inc.

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

03/06/15 15:27

SUBMITTED:

02/25/15 to 03/02/15

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description:

PAM-3

Air

Lab ID:

Sample Volume:

5030213-06

m³

Sampled: 02/26/15 15:55

Received: 03/02/15 10:19 Analysis Date: 03/05/15 15:56

Matrix: Comments:

Start Time 2/25/15 15:57

Hexavalent Chromium by SOP ERG-MOR-063

21.57

Results

MDL

Analyte

CAS Number

ng/m³ Air

<u>Flaq</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0274

0.0038

MAR 1 7 2015

Initials: CR

Eastern Research Group

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

Page 36 of 41



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

03/06/15 15:27 REPORTED:

SUBMITTED:

02/25/15 to 03/02/15

ATTN: Mr. Jeff Boggs

AQS SITE SITE CODE:

PHONE: (443) 803-8495

Malvern, PA 19355

Honeywell Hex Chrome Study

Description:

PAM-4

5030213-07 Lab ID:

Sampled: 02/26/15 15:43

Matrix:

Air

Sample Volume:

m³

Received: 03/02/15 10:19

Comments: Start Time 2/25/15 15:52 Analysis Date: 03/05/15 16:06

Hexavalent Chromium by SOP ERG-MOR-063

21.46

Results

<u>MDL</u>

Analyte

CAS Number

FAX: (410) 266-8912

<u>ng/m³ Air</u>

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0403

0.0038

MAR 1 7 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED:

03/06/15 15:27

Malvern, PA 19355

SUBMITTED:

SITE CODE:

m³

02/25/15 to 03/02/15

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

FAX: (410) 266-8912

Hexavalent Chromium by SOP ERG-MOR-063

Honeywell Hex Chrome Study

Description:

PAM-21

Lab ID:

5030213-08

Sampled: 02/26/15 00:00

Matrix:

Air

Sample Volume:

21.54

Received: 03/02/15 10:19 Analysis Date: 03/05/15 16:35

Comments:

Results

<u>MDL</u>

Analyte

CAS Number

ng/m³ Air

Flag

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0038

MAR 1 7 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED:

03/06/15 15:27

Malvern, PA 19355

SUBMITTED:

02/25/15 to 03/02/15

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

FAX: (410) 266-8912

SITE CODE:

Honeywell Hex Chrome Study

Description:

Comments:

PAM-31

Lab ID:

5030213-09

Sampled: 02/26/15 00:00

Matrix:

Air

Sample Volume:

21.57

m³

Received: 03/02/15 10:19

Analysis Date: 03/05/15 16:45

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

Analyte

CAS Number

ng/m³ Air

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

ND

0.0038

MAR 1 7 2015

Initials: CR

Eastern Research Group

LABORATORY DATA CONSULTANTS, INC.

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

ERM

March 11, 2015

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

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

Dear Mr. Boggs,

Enclosed is the final validation report for the fraction listed below. This SDG was received on March 10, 2015. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #33860:

SDG

Fraction

5030333

Hexavalent Chromium

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

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

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

Christina Rink

Sincerely,

Project Manager/Chemist

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Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: Harbor Point, MD, Hexavalent Chromium Monitoring

Collection Date: February 27 through February 28, 2015

LDC Report Date: March 11, 2015

Matrix: Air

Parameters: Hexavalent Chromium

Validation Level: EPA Level IV

Laboratory: Eastern Research Group

Sample Delivery Group (SDG): 5030333

Sample Identification

OAM 1(02/27/15) PAM-1(02/28/15)DUP OAM 2(02/27/15) PAM-1D (02/28/15)DUP

PAM-1(02/27/15)

PAM-1D (02/27/15)

PAM-2(02/27/15)

PAM-3(02/27/15)

PAM-4(02/27/15) PAM-21(02/27/15)

PAM-31(02/27/15)

OAM 1(02/28/15)

OAM 2(02/28/15)

PAM-1(02/28/15)

PAM-1D (02/28/15)

PAM-2(02/28/15)

PAM-3(02/28/15)

PAM-4(02/28/15)

PAM-21(02/28/15) PAM-31(02/28/15)

PAM-1(02/27/15)DUP

PAM-1D (02/27/15)DUP

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

Introduction

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

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

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

The following are definitions of the data qualifiers:

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

I. Technical Holding Times

All technical holding time requirements were met.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met.

IV. Blanks

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

Samples PAM-31(02/27/15) and PAM-31(02/28/15) were identified as trip blanks. No hexavalent chromium was found.

Samples PAM-21(02/27/15) and PAM-21(02/28/15) were identified as field blanks. No hexavalent chromium was found.

V. Matrix Spike/Matrix Spike Duplicates

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

VI. Duplicates

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

VII. Laboratory Control Samples

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

VIII. Sample Result Verification

All sample result verifications were acceptable.

IX. Overall Assessment of Data

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

X. Field Duplicates

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

	Concentrati	ion (ng/m³)			
Analyte	PAM-1(02/27/15)	PAM-1D (02/27/15)	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.0249	0.0237	5 (≤20)	-	-

	Concentrati	on (ng/m³)					
Analyte	PAM-1(02/28/15)	PAM-1D (02/28/15)	RPD (Limits)	Flags	A or P		
Hexavalent chromium	0.0182	0.0220	19 (≤20)	-	-		

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

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

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

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

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

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

LDC #: 33860A6

VALIDATION COMPLETENESS WORKSHEET

Level IV

SDG #: 5030333 Laboratory: Eastern Research Group 2nd Reviewer:

METHOD: (Analyte) Hexavalent Chromium (ASTM D7614)

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

	Validation Area		Comments
	VAIIGATION Area	 	
1.	Sample receipt/Technical holding times		2/21-28/15
П	Initial calibration	A	`
111.	Calibration verification	A	
IV	Laboratory Blanks	A	
V	Field blanks	<i>S</i> U	FB-(8)(17) TB-(9)(18)
VI.	Matrix Spike/Matrix Spike Duplicates	N	Not Regulard
VII.	Duplicate sample analysis	A	DUP
VIII.	Laboratory control samples	A	ics
IX.	Field duplicates	Sw	FD=(3.4)(12,13)
X.	Sample result verification	A	
ΧI	Overall assessment of data	A	

Note:

A = Acceptable

N = Not provided/applicable SW = See worksheet

ND = No compounds detected

R = Rinsate

FB = Field blank

D = Duplicate

TB = Trip blank EB = Equipment blank SB=Source blank

OTHER:

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

LDC #: 33860A6 SDG #: 5030333

VALIDATION COMPLETENESS WORKSHEET

Level IV

Reviewer: 3

Laboratory: Eastern Research Group

2nd Reviewer: Z

METHOD: (Analyte) Hexavalent Chromium (ASTM D7614)

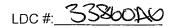
	Client ID	Lab ID	Matrix	Date
18	PAM-31 (02/28/15)	5030333-18	Air	02/28/15
19	PAM-1 (02/27/15)DUP	5030333-03DUP	Air	02/27/15
20	PAM-1D (02/27/15)DUP	5030333-04DUP	Air	02/27/15
21	PAM-1 (02/28/15)DUP	5030333-12DUP	Air	02/28/15
22	PAM-1D (02/28/15)DUP	5030333-13DUP	Air	02/28/15
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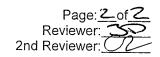
VALIDATION FINDINGS CHECKLIST

Page: _of_ Reviewer: _SC 2nd Reviewer: __

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?	/			
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 anaylzed 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#<u>33860A6</u>

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Page: ____ of ___ Reviewer: _____ 2nd Reviewer: _____

Inorganics: Method See Cover

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

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

 $\verb|\LDCFILESERVER|\Validation\FIELD\ DUPLICATES\FD_inorganic\| 33860A6.wpd$

LDC #: 33860PM

Validation Findings Worksheet Initial and Continuing Calibration Calculation Verification

Page: __ of	F
Reviewer:	02
nd Reviewer:	Z

Method:	Inorganics,	Method	See Cover

The correlation coefficient (r) for the calibration of Cowas recalculated. Calibration date: 03/09/15

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

%R = Found X 100

Where,

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

True

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

					Recalculated	Reported	Acceptable
Type of analysis	Analyte	Standard	Conc. (ng/ml)	Area	r or r ²	r or r ²	(Y/N)
Initial calibration		s1	0.05	0.0000311			
		s2	0.1	0.0000712	0.99996	0.99996	
	صد م	s3	0.2	0.0001467			U
	CEN	s4	0.5	0.0003777	_		
		s5	1	0.0007449			
		s6	2	0.0015188			
Jew 11:28	Cx*	Family	True		0 6 7 7 9 7	100000	
Calibration verification		0.5233rg/ml	0.5 ng/~1		104.1304	1047%P	
CCU (2).27 Calibration verification	Cro	0.5118mg/m1	0.5mg/ml		102.4% R	102.3%P	
Calibration verification					<u> </u>	·	

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

LDC#: 33800 NO

VALIDATION FINDINGS WORKSHEET Level IV Recalculation Worksheet

Page: _of_\
Reviewer: S
2nd Reviewer:

METHOD: Inorganics,	Method	(oser			
Percent recoveries (%F	R) for a laborator	y control sample	e and a matrix spike sample were recalculated using the following formula:		
%R = Found x 100	Where	Found =	concentration of each analyte measured in the analysis of the sample. For the matrix	r snike calcul	ation

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:

 $RPD = \underline{[S-D]} \times 100$

True

Where,

S =

Original sample concentration

(S+D)/2

D =

Duplicate sample concentration

Sample ID	Type of Analysis	Element	Found / S (units)	True / D (units)	Recalculated %R / RPD	Reported %R / RPD	Acceptable (Y/N)
LCS	Laboratory control sample	C	1.08 mg/ml	1.00 ng/u/	108%	108%R	7
2	Matrix spike sample		(SSR-SR)				
DUR 12:57	Duplicate sample	حدث	0.0265ng/m³	0.0249rdju3	6.23%	6.3S.7.890	3

Comments: _	*Rounding					
)			 	
				_	 	

LDC #: 33860 PVC

VALIDATION FINDINGS WORKSHEET

Sample Calculation Verification

Page: 1 of 1

Reviewer: 20

2nd reviewer: 0

METH	OD: Inorganics, Metho	d Seo. Cave			Zilu Teviev	Wei
Please Y N	e see qualifications belo <u>N/A</u> Have results <u>N/A</u> Are results w		wered "N". Not apposed and apposed with the correctly? ge of the instrumer		e identified as "N/.	A".
Compo recalci	ound (analyte) results f ulated and verified usin	or <u>(</u> <u>(</u> <u>(</u> <u>(</u> <u>(</u> <u>(</u>) <u>(</u>) <u>(</u>) <u>(</u>) g the following equation	n:	repo	orted with a positiv	/e detect were
Concen	tration $= (A - CO) / C$	-, V=10m/Rec	calculation:	000331-(-6.4	SE-06)	
	4=0.000033	1.3-7192	_	0.00076	-	0.051987
C= -6.45 E-06 (ng/m1)(uf) = ng/m3 (0.05A)				0.05A8inglum ZI	1)(10~1)	D. 0737v
	- 0.00 ia		<u> </u>		192 m3 -	· · · · · · · · · · · · · · · · · · ·
#	Sample ID	Analy		Reported Concentration (૪૫ (ઑ)	Calculated Concentration (ハムル子)	Acceptable (Y/N)
		C	طبتع	0.083	0.083	7
	Z			0.017	0.017	
	3			0.0249	0.0249	
	4			0.023	0.0237	7
- - 1	~		l	10000		4×

	<u> </u>	<u> </u>		
	Cino	0.083	0.053	7)
Z		0.017	0.017	
3		0.0249	0.0249	
4		0.023	0.0237	4
5		0.0390	0.0391	7*
6		0.0229	0.0229	3
7		0.0387	0.0387	Ì
8		177	NO.	
9		20	NO	
10		0.037	0.0137	
.//		0.0155	0.0155	
. 12		0.0182	B10-0	y*
13		0.0220	0.0220	4
14		0.0302	0.0302	
15		0.0.570	0.0200	
16		0.0249	0.0249	
17		no,	DD,	
18	4	N2	ND	4
			į.	

		1
Note:	* Rosmalina	
	T (1) (.	



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Matrix:

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 03/10/15 14:47

03/03/15 SUBMITTED:

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description:

OAM 1

Lab ID:

Sample Volume:

5030333-01

m³

Sampled: 02/27/15 15:35

Analysis Date: 03/09/15 14:08

Received: 03/03/15 10:58

Comments:

Start Time 2/26/15 15:04

Hexavalent Chromium by SOP ERG-MOR-063

22.07

Results

<u>MDL</u>

Analyte

CAS Number

ng/m³ Air

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0193

0.0038

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FILE #: 3926.00

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Malvern, PA 19355

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ATTN: Mr. Jeff Boggs

AQS SITE CODE:

PHONE: (443) 803-8495

95 **FAX:** (410) 266-8912

SITE CODE:

m³

Honeywell Hex Chrome Study

Description:

OAM 2

Lab ID:

5030333-02

Sampled: 02/27/15 15:56

Analysis Date: 03/09/15 14:18

Matrix:

...

Sample Volume:

22

Received: 03/03/15 10:58

Comments: Start Time 2/26/15 15:29

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

<u>Analyte</u>

CAS Number

<u>ng/m³ Air</u>

<u>Flag</u>

<u>ng/m³ Air</u>

Hexavalent Chromium

1854-02-99

0.0177

0.0038

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75 Valley Stream Parkway, Suite 400

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Description:

Comments:

ATTN: Mr. Jeff Boggs

Matrix:

PHONE: (443) 803-8495

PAM-1

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

FAX: (410) 266-8912

Lab ID:

Sample Volume:

21.91

5030333-03

m³

FILE #: 3926.00

SUBMITTED:

SITE CODE:

AQS SITE CODE:

REPORTED: 03/10/15 14:47

Honeywell Hex Chrome Study

Sampled: 02/27/15 16:36 Received: 03/03/15 10:58

Analysis Date: 03/09/15 12:48

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

03/03/15

<u>Analyte</u> **Hexavalent Chromium** **CAS Number**

ng/m³ Air

Flag

<u>ng/m³ Air</u>

1854-02-99

0.0249

0.0038

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Page 5 of 22



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ATTN: Mr. Jeff Boggs

AQS SITE CODE:

m³

PHONE: (443) 803-8495

FAX: (410) 266-8912

SITE CODE:

Honeywell Hex Chrome Study

Description:

PAM-1D

Lab ID:

5030333-04

Sampled: 02/27/15 16:38

Matrix:

Air

Sample Volume:

21.92

Received: 03/03/15 10:58

Comments: Col 2 Start Time 2/26/15 16:16 Analysis Date: 03/09/15 13:07

Hexavalent Chromium by SOP ERG-MOR-063

<u>Results</u>

<u>MDL</u>

<u>Analyte</u>

CAS Number

ng/m³ Air

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0237

0.0038

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e parteria person.

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ATTN: Mr. Jeff Boggs

AQS SITE CODE:

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SITE CODE:

Honeywell Hex Chrome Study

Description:

PAM-2

Lab ID: 5030333-05

Sampled: 02/27/15 16:24

Matrix:

Air

Sample Volume:

21.89

m³

Received: 03/03/15 10:58

Comments: Start Time 2/26/15 16:08 Analysis Date: 03/09/15 14:48

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

Analyte

CAS Number

FAX: (410) 266-8912

ng/m³ Air

Flag

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0390

0.0038

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AQS SITE CODE:

PHONE: (443) 803-8495

ATTN: Mr. Jeff Boggs

SITE CODE:

m³

Honeywell Hex Chrome Study

Description:

Comments:

PAM-3

Lab ID:

5030333-06

Sampled: 02/27/15 16:19

Received: 03/03/15 10:58

Matrix:

Sample Volume:

21.91

Analysis Date: 03/09/15 14:58

Start Time 2/26/15 15:58

FAX: (410) 266-8912

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

Analyte

CAS Number

ng/m³ Air

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0229

0.0038

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Environmental Resources Management, Inc

PAM-4

Air

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

Description:

Comments:

ATTN: Mr. Jeff Boggs

Matrix:

PHONE: (443) 803-8495

Start Time 2/26/15 15:46

FAX: (410) 266-8912

Lab ID: 5030333-07

Sample Volume:

22.04

m³

SUBMITTED:

SITE CODE:

AQS SITE CODE:

FILE #: 3926.00

REPORTED: 03/10/15 14:47

Honeywell Hex Chrome Study

Sampled: 02/27/15 16:15 Received: 03/03/15 10:58

Analysis Date: 03/09/15 15:07

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

03/03/15

<u>Analyte</u>

CAS Number

ng/m³ Air

Flag

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0387

0.0038

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Description:

Comments:

ATTN: Mr. Jeff Boggs

Matrix:

PHONE: (443) 803-8495

Air

PAM-21

03-8495 **FAX:** (

FAX: (410) 266-8912

Lab ID:

5030333-08

Sample Volume:

21.89

m³

FILE #: 3926.00

SUBMITTED:

SITE CODE:

AQS SITE CODE:

REPORTED: 03/10/15 14:47

Honeywell Hex Chrome Study

Sampled: 02/27/15 00:00 **Received:** 03/03/15 10:58

Analysis Date: 03/09/15 15:17

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

03/03/15

Analyte
Hexavalent Chromium

CAS Number 1854-02-99

ng/m³ Air ND Flag

ng/m³ Air

0.0038

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75 Valley Stream Parkway, Suite 400

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Description:

Comments:

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Matrix:

Air

PAM-31

FAX: (410) 266-8912

Lab ID: Sample Volume:

5030333-09

21.91

 $\,m^3$

SITE CODE:

SUBMITTED:

AQS SITE CODE:

F!LE #: 3926.00

REPORTED: 03/10/15 14:47

Honeywell Hex Chrome Study

Sampled: 02/27/15 00:00

Received: 03/03/15 10:58 Analysis Date: 03/09/15 15:27

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

03/03/15

<u>Analyte</u>

CAS Number

ng/m³ Air

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

ND

0.0038

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SUBMITTED:

03/03/15

Malvern, PA 19355

AQS SITE CODE:

m³

PHONE: (443) 803-8495

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SITE CODE:

Honeywell Hex Chrome Study

Description:

OAM 1

Lab ID:

5030333-10

Sampled: 02/28/15 15:02

Matrix:

Air

Sample Volume:

21.04

Received: 03/03/15 10:58 **Analysis Date:** 03/09/15 15:37

Comments: Start Time 2/27/15 15:39

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

<u>Analyte</u>

CAS Number

ng/m³ Air

<u>Flag</u>

<u>ng/m³ Air</u>

Hexavalent Chromium

1854-02-99

0.0137

0.0038

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Page 12 of 22



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Description:

Comments:

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Matrix:

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OAM 2

FAX: (410) 266-8912

Air

Start Time 2/27/15 15:58

FILE #: 3926.00

REPORTED: 03/10/15 14:47

03/03/15

SUBMITTED:

AQS SITE CODE:

SITE CODE:

m³

Honeywell Hex Chrome Study

Sampled: 02/28/15 15:25 Received: 03/03/15 10:58

Analysis Date: 03/09/15 15:47

Hexavalent Chromium by SOP ERG-MOR-063

21.1

Results

<u>MDL</u>

<u>Analyte</u> **Hexavalent Chromium** **CAS Number** 1854-02-99

Lab ID:

Sample Volume:

ng/m³ Air 0.0155

5030333-11

Flag

ng/m³ Air

0.0038

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Page 13 of 22



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03/03/15

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- -

FAX: (410) 266-8912

SITE CODE:

Honeywell Hex Chrome Study

Description:

PAM-1

Lab ID:

5030333-12

Sampled: 02/28/15 16:12

Matrix:

Air

Sample Volume:

m³

Received: 03/03/15 10:58

Comments: Col 1 Start Time 2/27/15 16:39

Analysis Date: 03/09/15 13:27

Hexavalent Chromium by SOP ERG-MOR-063

21.19

Results

MDL

<u>Analyte</u>

CAS Number

ng/m³ Air

Flag

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0182

0.0038

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Malvern, PA 19355

SUBMITTED: 03/03/15

ATTN: Mr. Jeff Boggs

AQS SITE CODE:

PHONE: (443) 803-8495

FAX: (410) 266-8912

SITE CODE:

Honeywell Hex Chrome Study

Description:

Comments:

PAM-1D

Lab ID:

Sampled: 02/28/15 16:14

Matrix:

Air

Sample Volume:

21.18

Received: 03/03/15 10:58

Col 2 Start Time 2/27/15 16:42

m³

Analysis Date: 03/09/15 13:47

Hexavalent Chromium by SOP ERG-MOR-063

5030333-13

Results

<u>MDL</u>

Analyte

CAS Number

ng/m³ Air

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0220

0.0038

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Environmental Resources Management, Inc

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75 Valley Stream Parkway, Suite 400

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Malvern, PA 19355

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03/03/15

ATTN: Mr. Jeff Boggs

AQS SITE CODE:

PHONE: (443) 803-8495

FAX: (410) 266-8912

SITE CODE:

Honeywell Hex Chrome Study

Description:

Comments:

PAM-2

Start Time 2/27/15 16:27

Lab ID:

5030333-14

21.02

Sampled: 02/28/15 15:49

Matrix:

Air

Sample Volume:

m³

Received: 03/03/15 10:58

Analysis Date: 03/09/15 15:57

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

<u>Analyte</u>

CAS Number

ng/m³ Air

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0302

0.0038

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Page 16 of 22



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

Matrix:

Comments:

PHONE: (443) 803-8495

Description: PAM-3

Air

Start Time 2/27/15 16:21

FAX: (410) 266-8912

Lab ID:

5030333-15

Sample Volume:

21

 m^3

SUBMITTED:

SITE CODE:

AQS SITE CODE:

FILE #: 3926.00

REPORTED: 03/10/15 14:47

Honeywell Hex Chrome Study Sampled: 02/28/15 15:41

Received: 03/03/15 10:58

Analysis Date: 03/09/15 16:07

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

03/03/15

Analyte Hexavalent Chromium **CAS Number** 1854-02-99

ng/m³ Air

<u>Flag</u>

ng/m³ Air

0.0210

0.0038

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Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

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PHONE: (443) 803-8495

AQS SITE CODE: SITE CODE:

Honeywell Hex Chrome Study

Description:

Comments:

PAM-4

Lab ID:

5030333-16

Sampled: 02/28/15 15:39

Matrix:

Air

Sample Volume:

21.02

m³

Received: 03/03/15 10:58

Start Time 2/27/15 16:18

FAX: (410) 266-8912

Analysis Date: 03/09/15 16:17

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

<u>Analyte</u>

CAS Number

ng/m³ Air

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0249

0.0038

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Page 18 of 22



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

Matrix:

Comments:

PHONE: (443) 803-8495

Air

Description: PAM-21 FAX: (410) 266-8912

Lab ID: Sample Volume:

5030333-17

21.02

m³

FILE #: 3926.00

SUBMITTED: AQS SITE CODE:

SITE CODE:

REPORTED: 03/10/15 14:47

Honeywell Hex Chrome Study

Sampled: 02/28/15 00:00 Received: 03/03/15 10:58

Analysis Date: 03/09/15 16:47

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

03/03/15

Analyte Hexavalent Chromium **CAS Number** 1854-02-99

ng/m³ Air ND

Flag

ng/m³ Air

0.0038

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AQS SITE CODE:

PHONE: (443) 803-8495

ATTN: Mr. Jeff Boggs

FAX: (410) 266-8912

SITE CODE:

m³

Honeywell Hex Chrome Study

Description:

Comments:

PAM-31

Lab ID:

5030333-18

Sampled: 02/28/15 00:00

Matrix:

Air

Sample Volume:

Received: 03/03/15 10:58

Analysis Date: 03/09/15 16:56

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

Analyte

CAS Number

ng/m³ Air

<u>Flaq</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

ND

0.0038

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