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

ERM

December 11, 2014

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 December 9, 2014. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #33248:

SDG

Fraction

4120243/4120332

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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	Level IV	L	DC #33	248	8 (E	RN	1 -	Мо	rris	vil	le,	NC	;]	Ha	rbo	r P	oir	it, I	ИD	, Н	exa	iva	len	t C	hro	mi	um	M	oni	tor	ing	j) <u> </u>						12 12 12 12 12 12 12 12 12 12 12 12 12 1	
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Total	A/CR			16	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	16

Laboratory Data Consultants, Inc. Data Validation Report

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

Collection Date: December 1 through December 2, 2014

LDC Report Date: December 10, 2014

Matrix: Air

Parameters: Hexavalent Chromium

Validation Level: EPA Level IV

Laboratory: Eastern Research Group

Sample Delivery Group (SDG): 4120243/4120332

Sample Identification

OAM 1(12/01/14)

PAM-1(12/01/14)

PAM-2(12/01/14)

PAM-3(12/01/14)

PAM-4(12/01/14)

PAM-21(12/01/14)

PAM-31(12/01/14)

OAM 1(12/02/14)

OAM 2(12/02/14)

PAM-1(12/02/14)

PAM-1D(12/02/14)

PAM-2(12/02/14)

PAM-3(12/02/14)

PAM-4(12/02/14)

PAM-21(12/02/14)

PAM-31(12/02/14)

PAM-1(12/01/14)DUP

PAM-1(12/02/14)DUP

PAM-1D(12/02/14)DUP

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

Introduction

This data review covers 19 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(12/01/14) and PAM-31(12/02/14) were identified as trip blanks. No hexavalent chromium was found.

Samples PAM-21(12/01/14) and PAM-21(12/02/14) were identified as field blanks. No hexavalent chromium was found.

V. Matrix Spike/Matrix Spike Duplicates

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

VI. Duplicates

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

VII. Laboratory Control Samples

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

VIII. Sample Result Verification

All sample result verifications were acceptable.

IX. Overall Assessment of Data

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

X. Field Duplicates

Samples PAM-1(12/02/14) and PAM-1D(12/02/14) 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(12/02/14)	PAM-1D(12/02/14)	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.0279	0.0261	7 (≤20)	-	-

Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Data Qualification Summary - SDG 4120243/4120332

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
4120243/4120332

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 4120243/4120332

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

SDG#	33248A6 : 4120243/4120332 ttory: Eastern Research		ALIDATIOI		LETE Level l		SS WO	RKS	HEET		Date: \2\lo\li Page: \of \ Reviewer:
	OD: Hexavalent Chromi			4)							2nd Reviewer: 01
	mples listed below were on findings worksheets.		iewed for ead	ch of the fo	ollowing	y valid	dation ar	eas. \	/alidatio	n fin	dings are noted in attached
	Validation	Are	a.						Comm	ents	
I.	Technical holding times			A	Samplir	ng date	es: \2\	D) -	021	41	
ll	Initial calibration			A							
III.	Calibration verification			A							
IV	Blanks			\triangle							
V	Matrix Spike/Matrix Spike Du	uplica	ites	4	No	1 P	عورازه	eS			
VI.	Duplicates			A	DI	$\overline{\mathcal{X}}$					
VII.	Laboratory control samples			A	الاه	OF					
VIII.	Sample result verification			A							
IX.	Overall assessment of data		÷	_ A							
X.	Field duplicates			SW	50	<u>) = (</u> \	10,11	1			
L _{XI}	Field blanks			DO	FB	<u>-(k</u>	<u>(21) (c</u>	<u> </u>	B	<u>-(7</u>)(10)
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet		ND = No R = Rins FB = Fie		s detecte	:d	TB =	Ouplica Trip bl Equipi		k	-
validate	d Samples:										
1 O	AM 1(12/01/14)	11	PAM-1D(12/02	/14)	2	1				31	
2 P/	AM-1(12/01/14)	12	PAM-2(12/02/1	4)	2	2				32	
3 P/	AM-2(12/01/14)	13	PAM-3(12/02/1	4)	2	3				33	
4 P/	AM-3(12/01/14)	14	PAM-4(12/02/1	4)	2.	4				34	
5 P/	AM-4(12/01/14)	15	PAM-21(12/02/	(14)	2	5				35	
6 P/	AM-21(12/01/14)	16	PAM-31(12/02/	14)	2	6				36	
7 P/	AM-31(12/01/14)	17	PAM-1(12/01/1	4)DUP	2	7				37	
8 0.	AM 1(12/02/14)	18	PAM-1(12/02/1	4)DUP	2	8				38	

29

30

39

40

Notes:		

20

19 PAM-1D(12/02/14)DUP

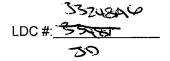
OAM 2(12/02/14)

10 PAM-1(12/02/14)

Method:Inorganics (EPA Method &

Method:Inorganics (EPA Method ⊱ (సులా)				
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 9 0-11 0% 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?				

Airs



VALIDATION FINDINGS CHECKLIST

Page: 2 of 2 Reviewer: 2nd Rev

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>33248A6</u>

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Page:	of
Reviewer:	30
2nd Reviewer:	α /

Inorganics: Method See Cover

	Concentrat	tion (ng/m3)		
Analyte	10	11	RPD (≤20)	Qual.
Hexavalent Chromium	0.0279	0.0261	7	

\LDCFILESERVER\Validation\FIELD DUPLICATES\FD_inorganic\33248A6.wpd

LDC #: 33248A6

Validation Findings Worksheet Initial and Continuing Calibration Calculation Verification

Page:\	_ of
Reviewer:	5 9
2nd Review	ver: <u> </u>

Method:	Inorganics,	Method	See Cover	

The correlation coefficient (r) for the calibration of was recalculated.Calibration date: 12 155 14

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	0.1	0.0000183			
		s2	0.1	0.00004	0.99995	0.99995	,
	ر عال ما	s3	0.2	0.0000847			S
		s4	0.5	0.0002128			
		s5	11	0.0004217			
		s6	2	0.0008329			
Ja 11:33	Cx+10	Found	True				
Calibration verification		10.510gna/m	0.5mjml		102.288	102.2908	
(L) 12:33		_			1-1-5-1		
Calibration verification	C	O 2346 Mgm	0.5 mg/m)		106992	1069928	
Calibration verification							

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

LDC #: 332484

VALIDATION FINDINGS WORKSHEET Level IV Recalculation Worksheet

Page: _of_	_
Reviewer:	2_
2nd Reviewer:	

		~	\sim	
METHOD: Inc	organics, Me	thod 🞾	2 (2)	مراج ا

Percent recoveries (%R) for a laboratory control sample 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 spike calculation,

True 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	Reported	Acceptable (Y/N)
LUS	Laboratory control sample	Lienett	(units)	(units)	%R / RPD	%R / RPD	(1714)
という	Eastratory control sample	Cxxx	1.09 ng/ml	1.00 majur	10996	109%R	7
)	Matrix spike sample		(SSR-SR)				
DR	Duplicate sample	صد					
13:03			0,0363 2/23	0.0334 neglon3	8.322EPD	8.53%,	

Comments: _			<u> </u>	
	 	 -		
				 -

LDC#: 33248A6

VALIDATION FINDINGS WORKSHEET

Sample Calculation Verification

Page: ___of__ Reviewer: ______ 2nd reviewer: _____

METHOD: Inorganics, Method	See Cover	
Y N N/A Have results by N N/A Are results with	v for all questions answered "Neen reported and calculated chin the calibrated range of the on limits below the CRQL?	
Compound (analyte) results for recalculated and verified using	the following equation:	حير؛ reported with a positive detect were
Concentration = (A-Co) (C,	VF= 10ml Recalculation:	(0.000014-5.12E-07) = 0.04045mg/ml
A = 0.0000174 Co = +5.12E-07 C1 = 0.0004175	(ng/ml)(us) = ng/m3	(D.04045mjm1) (10mi) 21.72m3 = 0-0186

#	Sample ID	Analyte	Reported Concentration (<u>nq</u> w ²)	Calculated Concentration (अशोज्डे)	Acceptable (Y/N)
	\	Crip	0.0%	0.0186	7
	2	1	0.0353	D.0334	774
	3		0.0256	D.0334 0.03356 0.03356	D. C. Oc.
	٩		0.0231	0.02352	47
	S		0.0476	0.0476	7
	6		NO	N3	
	7		NO	<i>PD</i>	
	8		0.01352	0032	4
	9		0.0234	0.0733	4*
	10		0.0279	0.0279	4
	11		0.0261	0.0261	
	\2		0.0676	0.0676	
	13		0.0137	0.037	4
	14		0.025	0.0214	474
ļ	15		ND	00	9
	16	4	00	70	Ţ

Note:	



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 Air

Start Time 11/30/14 15:02

Sample Volume:

Lab ID:

21.72

m³

FILE #: 3926.00 REPORTED:

SUBMITTED:

AQS SITE SITE CODE:

Sampled: 12/01/14 15:11

Received: 12/02/14 11:39

Analysis Date: 12/08/14 13:53

Honeywell Hex Chrome Study

Hexavalent Chromium by SOP ERG-MOR-063

4120243-01

Results

<u>MDL</u>

12/09/14 15:13

12/02/14 to 12/03/14

CAS Number

ng/m³ Air

<u>Flaq</u>

ng/m³ Air

Hexavalent Chromium

Analyte

1854-02-99

0.0186

0.0036

DEC 1 1 2014

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 3 of 20



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Col 1 Start Time 11/30/14 15:50

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: SUBMITTED: 12/09/14 15:13

12/02/14 to 12/03/14

AQS SITE

SITE CODE:

Flag

Honeywell Hex Chrome Study

Description: Matrix:

Comments:

PAM-1

Lab ID:

Sample Volume:

4120243-03

22.22

Sampled: 12/01/14 16:38 Received: 12/02/14 11:39

Analysis Date: 12/08/14 12:53

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

Analyte Hexavalent Chromium

CAS Number 1854-02-99

ng/m³ Air 0.0333

ng/m³ Air 0.0036

DEC 1 1 2014

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 20



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED:

12/09/14 15:13

SUBMITTED:

12/02/14 to 12/03/14

Malvern, PA 19355 ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

Air

FAX: (410) 266-8912

SITE CODE:

Honeywell Hex Chrome Study

Description:

PAM-2

Lab ID:

Sample Volume:

4120243-05

m³

Sampled: 12/01/14 16:28

Matrix: Comments:

Start Time 11/30/14 15:47

22.2

Received: 12/02/14 11:39

Analysis Date: 12/08/14 14:03

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

0.0256

0.0036

DEC 1 1 2014

Initials: CR



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED: 12/09/14 15:13

Malvern, PA 19355

SUBMITTED:

12/02/14 to 12/03/14

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

FAX: (410) 266-8912

SITE CODE:

Honeywell Hex Chrome Study

Description:

Comments:

PAM-3

Start Time 11/30/14 15:41

Lab ID:

4120243-06

Sampled: 12/01/14 16:16

Matrix:

Air

Sample Volume:

22.12 m³ Received: 12/02/14 11:39

Analysis Date: 12/08/14 14:12

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

Analyte

CAS Number

ng/m³ Air

Flag

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0231

0.0036

DEC 1 1 2014

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 20



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:

12/09/14 15:13

12/02/14 to 12/03/14

SUBMITTED: **AQS SITE**

SITE CODE:

Honeywell Hex Chrome Study

Description: Matrix:

PAM-4

Start Time 11/30/14 15:34

Lab ID:

Sample Volume:

4120243-07

m³

Sampled: 12/01/14 16:02 Received: 12/02/14 11:39

Analysis Date: 12/08/14 14:22

Hexavalent Chromium by SOP ERG-MOR-063

22.02

Results

<u>MDL</u>

Analyte

Comments:

CAS Number

ng/m³ Air

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0476

0.0036

DEC 1 1 2014

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 20



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

12/09/14 15:13 REPORTED:

SUBMITTED:

FILE #: 3926.00

12/02/14 to 12/03/14

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description: Matrix:

Comments:

PAM-21

Air

Lab ID:

Sample Volume:

4120243-08

 $\,m^3$

Sampled: 12/01/14 00:00 Received: 12/02/14 11:39

Analysis Date: 12/08/14 14:52

Hexavalent Chromium by SOP ERG-MOR-063

22.2

Results

MDL

Analyte

CAS Number

ng/m3 Air

<u>Flaq</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

ND

0.0036

DEC 1 1 2014

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 20



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED: 12/09/14 15:13

SUBMITTED:

12/02/14 to 12/03/14

Malvern, PA 19355 ATTN: Mr. Jeff Boggs

AQS SITE SITE CODE:

PHONE: (443) 803-8495

FAX: (410) 266-8912

Honeywell Hex Chrome Study

Description:

Comments:

PAM-31

Lab ID:

4120243-09

Sampled: 12/01/14 00:00

Matrix:

Air

Sample Volume:

22.12 m³ Received: 12/02/14 11:39

Analysis Date: 12/08/14 15:02

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

<u>Analyte</u>

CAS Number

ng/m³ Air

<u>Flaq</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

ND

0.0036

DEC 1 1 2014

Initials: CR

Eastern Research Group

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Page 9 of 20



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED:

12/09/14 15:13

Malvern, PA 19355

SUBMITTED:

12/02/14 to 12/03/14

ATTN: Mr. Jeff Boggs

AQS SITE SITE CODE:

PHONE: (443) 803-8495

FAX: (410) 266-8912

Honeywell Hex Chrome Study

Description:

OAM 1

Lab ID:

Sample Volume:

4120332-01

Sampled: 12/02/14 15:16

Received: 12/03/14 13:06

Matrix: Air

Start Time 12/1/14 15:20

21.54 m³

Analysis Date: 12/08/14 15:12

Comments:

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

0.0132

0.0036

DEC 1 1 2014

Initials: CR

Eastern Research Group

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Page 10 of 20



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED: 12/09/14 15:13

Malvern, PA 19355

SUBMITTED:

12/02/14 to 12/03/14

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

FAX: (410) 266-8912

SITE CODE:

Honeywell Hex Chrome Study

Description:

OAM 2

Lab ID: 4120332-02

Sampled: 12/02/14 15:34

Matrix: Air

Sample Volume:

21.44 m³ Received: 12/03/14 13:06

Comments:

Start Time 12/1/14 15:45

Analysis Date: 12/08/14 15:22

Hexavalent Chromium by SOP ERG-MOR-063

<u>Results</u>

<u>MDL</u>

<u>Analyte</u>

CAS Number

ng/m³ Air

<u>Flaq</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0234

0.0036

DEC 1 1 2014

Initials: CR

Eastern Research Group

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Page 11 of 20



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED:

12/09/14 15:13

Malvern, PA 19355

SUBMITTED:

12/02/14 to 12/03/14

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

Air

FAX: (410) 266-8912

SHE CODE:

Honeywell Hex Chrome Study Sampled: 12/02/14 16:34

Description: Matrix:

PAM-1

Lab ID:

4120332-03

m³

Received: 12/03/14 13:06

Comments:

Col 1 Start Time 12/1/14 16:50

Sample Volume:

21.36

Analysis Date: 12/08/14 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

0.0279

0.0036

DEC 1 1 2014

Initials: CR



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED:

12/09/14 15:13

Malvern, PA 19355

SUBMITTED:

12/02/14 to 12/03/14

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

FAX: (410) 266-8912

SITE CODE:

Honeywell Hex Chrome Study

Description: Matrix:

PAM-1D

Lab ID:

4120332-04

m³

Sampled: 12/02/14 16:38 Received: 12/03/14 13:06

Comments:

Air

Sample Volume:

21.37

Analysis Date: 12/08/14 13:32

Col 2 Start Time 12/1/14 16:53

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

0.0261

0.0036

DEC 1 1 2014

Initials: CR

Eastern Research Group

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Page 13 of 20



Environmental Resources Management, Inc

PAM-2

Air

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

Description:

Comments:

Analyte

ATTN: Mr. Jeff Boggs

Matrix:

PHONE: (443) 803-8495

Start Time 12/1/14 16:30

FAX: (410) 266-8912

Lab ID:

4120332-05

Sample Volume:

21.47

m³

FILE #: 3926.00

REPORTED:

SUBMITTED:

AQS SITE SITE CODE:

Honeywell Hex Chrome Study Sampled: 12/02/14 16:30

Received: 12/03/14 13:06 Analysis Date: 12/08/14 15:32

Hexavalent Chromium by SOP ERG-MOR-063

<u>Results</u>

<u>MDL</u>

12/09/14 15:13

12/02/14 to 12/03/14

Hexavalent Chromium

CAS Number 1854-02-99

ng/m³ Air 0.0676

<u>Flag</u>

ng/m3 Air

0.0036

DEC 1 1 2014

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 14 of 20



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:

12/09/14 15:13

12/02/14 to 12/03/14

SUBMITTED:

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description: Matrix:

PAM-3

Lab ID:

Sample Volume:

4120332-06

m³

Sampled: 12/02/14 16:09 Received: 12/03/14 13:06

Analysis Date: 12/08/14 15:42

Comments: Start Time 12/1/14 16:20

Hexavalent Chromium by SOP ERG-MOR-063

21.44

Results

<u>MDL</u>

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

<u>ng/m³ Air</u>

<u>Flag</u>

ng/m³ Air

1854-02-99

0.0137

0.0036

DEC 1 1 2014

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 20



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED:

12/09/14 15:13

Malvern, PA 19355

SUBMITTED:

12/02/14 to 12/03/14

ATTN: Mr. Jeff Boggs

AQS SITE SITE CODE:

PHONE: (443) 803-8495

FAX: (410) 266-8912

Honeywell Hex Chrome Study

Description:

Comments:

PAM-4

Lab ID:

4120332-07

Sampled: 12/02/14 15:57

Matrix:

Air

Sample Volume:

m³

Received: 12/03/14 13:06

Start Time 12/1/14 16:08

Analysis Date: 12/08/14 15:51

Hexavalent Chromium by SOP ERG-MOR-063

21.43

<u>Results</u>

<u>MDL</u>

Analyte

CAS Number

ng/m³ Air

<u>Flag</u>

ng/m3 Air

Hexavalent Chromium

1854-02-99

0.0215

0.0036

DEC 1 1 2014

Initials: CR

Eastern Research Group

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Page 16 of 20



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

12/09/14 15:13 REPORTED:

Malvern, PA 19355

SUBMITTED:

ATTN: Mr. Jeff Boggs

AQS SITE SITE CODE:

PHONE: (443) 803-8495

FAX: (410) 266-8912

Honeywell Hex Chrome Study

Description:

Comments:

PAM-21

Lab ID:

4120332-08

Sampled: 12/02/14 00:00

Matrix:

Air

Sample Volume:

21.47 m³ Received: 12/03/14 13:06

Analysis Date: 12/08/14 16:01

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

12/02/14 to 12/03/14

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

ng/m³ Air ND

<u>Flaq</u>

ng/m³ Air 0.0036

DEC 1 1 2014

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 20



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

Comments:

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

12/09/14 15:13

SUBMITTED:

12/02/14 to 12/03/14

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description: Matrix:

PAM-31

Air

Lab ID:

Sample Volume:

4120332-09

m³

Sampled: 12/02/14 00:00

Received: 12/03/14 13:06 **Analysis Date:** 12/08/14 16:12

Hexavalent Chromium by SOP ERG-MOR-063

21.44

Results

<u>MDL</u>

CAS Number

ng/m³ Air

<u>Flaq</u>

ng/m³ Air

Analyte Hexavalent Chromium

1854-02-99

ND

0.0036

DEC 1 1 2014

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 20



LABORATORY DATA CONSULTANTS, INC.

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

ERM

December 19, 2014

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

LDC Project #33307:

SDG

Fraction

4121113/4121205

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: December 10 through December 11, 2014

LDC Report Date: December 19, 2014

Matrix: Air

Parameters: Hexavalent Chromium

Validation Level: EPA Level IV

Laboratory: Eastern Research Group

Sample Delivery Group (SDG): 4121113/4121205

Sample Identification

OAM 1 (12/10/14) PAM-1 (12/11/14)DUP OAM 2 (12/10/14) PAM-1D (12/11/14)DUP

PAM-1 (12/10/14) PAM-1D (12/10/14)

PAM-1D (12/10/14) PAM-2 (12/10/14)

PAM-2 (12/10/14) PAM-3 (12/10/14)

PAM-4 (12/10/14)

PAM-21 (12/10/14)

PAM-31 (12/10/14)

OAM 1 (12/11/14)

OAM 2 (12/11/14)

PAM-1 (12/11/14)

PAM-1D (12/11/14)

PAM-2 (12/11/14) PAM-3 (12/11/14)

PAM-4 (12/11/14)

PAM-4 (12/11/14)

PAM-31 (12/11/14)

PAM-1 (12/10/14)DUP

PAM-1D (12/10/14)DUP

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

Introduction

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

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

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

The following are definitions of the data qualifiers:

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

I. Technical Holding Times

All technical holding time requirements were met.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met.

IV. Blanks

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

Samples PAM-31 (12/10/14) and PAM-31 (12/11/14) were identified as trip blanks. No hexavalent chromium was found.

Samples PAM-21 (12/10/14) and PAM-21 (12/11/14) were identified as field blanks. No hexavalent chromium was found.

V. Matrix Spike/Matrix Spike Duplicates

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

VI. Duplicates

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

VII. Laboratory Control Samples

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

VIII. Sample Result Verification

All sample result verifications were acceptable.

IX. Overall Assessment of Data

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

X. Field Duplicates

Samples PAM-1 (12/10/14) and PAM-1D (12/10/14) and samples PAM-1 (12/11/14) and PAM-1D (12/11/14) 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 (12/10/14)	PAM-1D (12/10/14)	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.0148	0.0160	8 (≤20)	-	-

	Concentrat	ion (ng/m³)			
Analyte	PAM-1 (12/11/14)	PAM-1D (12/11/14)	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.0235	0.0193	20 (≤20)	-	-

Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Data Qualification Summary - SDG 4121113/4121205

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 4121113/4121205

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 4121113/4121205

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



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

Description:

Comments:

Analyte

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Matrix:

Air

OAM 1

FAX: (410) 266-8912

Sample Volume:

Lab ID:

21.42

 $\,m^3$

SUBMITTED:

AQS SITE SITE CODE:

FILE #: 3926.00

REPORTED: 12/18/14 12:08

Honeywell Hex Chrome Study

Sampled: 12/10/14 15:06

Received: 12/11/14 10:33

Analysis Date: 12/15/14 14:32

Hexavalent Chromium by SOP ERG-MOR-063

4121113-01

Results

<u>MDL</u>

12/11/14 to 12/12/14

Hexavalent Chromium

Start Time 12/9/14 15:18

CAS Number 1854-02-99

ng/m³ Air 0.0127

<u>Flag</u>

ng/m³ Air

0.0036

DEC 19 2014

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 3 of 22



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

Description:

Comments:

Matrix:

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495 OAM 2

Air

Start Time 12/9/14 15:32

FAX: (410) 266-8912

Lab ID:

4121113-02

Sample Volume:

21.69

m³

FILE #: 3926.00

REPORTED:

SUBMITTED:

AQS SITE

SITE CODE:

Sampled: 12/10/14 15:38

Received: 12/11/14 10:33

Analysis Date: 12/15/14 14:42

Honeywell Hex Chrome Study

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

12/18/14 12:08

12/11/14 to 12/12/14

<u>Analyte</u>

CAS Number

ng/m³ Air

Flag

ng/m³ Air

Hexavalent Chromium

1854-02-99

ND

0.0036

DEC 19 2014

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: 12/18/14 12:08

Malvern, PA 19355

SUBMITTED:

12/11/14 to 12/12/14

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:

4121113-03

Sampled: 12/10/14 17:02

Matrix:

Sample Volume:

22.05 m³

Received: 12/11/14 10:33 Analysis Date: 12/15/14 13:52

Comments: Col 1 Start Time 12/9/14 16:32

Hexavalent Chromium by SOP ERG-MOR-063

<u>Results</u>

<u>MDL</u>

Analyte

CAS Number

ng/m³ Air

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0148

0.0036

DEC 1 9 2014

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.



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:

12/18/14 12:08

SUBMITTED:

12/11/14 to 12/12/14

AQS SITE CODE:

Honeywell Hex Chrome Study

Description:

PAM-1D

Lab ID:

Sample Volume:

4121113-04

22.11 m³ Sampled: 12/10/14 17:08

Received: 12/11/14 10:33 Analysis Date: 12/15/14 12:53

Comments:

Col 2 Start Time 12/9/14 16:34

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

0.0160

0.0036

DEC 1 9 2014

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 22



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

Description:

Comments:

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

FAX: (410) 266-8912

Start Time 12/9/14 16:15

FILE #: 3926.00

REPORTED: 12/18/14 12:08

SUBMITTED:

12/11/14 to 12/12/14

AQS SITE SITE CODE:

Sample Volume:

4121113-05

Honeywell Hex Chrome Study Sampled: 12/10/14 16:47

Matrix: Air

PAM-2

Lab ID:

 m^3

Received: 12/11/14 10:33

Analysis Date: 12/15/14 14:52

Hexavalent Chromium by SOP ERG-MOR-063

22.09

Results

MDL

Analyte

CAS Number

ng/m³ Air

Flag

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0124

0.0036

DEC 19 2014

Initials: CR

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Page 7 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:

12/18/14 12:08

SUBMITTED:

12/11/14 to 12/12/14

AQS SITE

CODE:

Honeywell Hex Chrome Study

Description: Matrix:

Comments:

PAM-3

Start Time 12/9/14 16:07

Lab ID:

Sample Volume:

4121113-06

 $\,m^3$

Sampled: 12/10/14 16:22 Received: 12/11/14 10:33

Analysis Date: 12/15/14 15:02

Hexavalent Chromium by SOP ERG-MOR-063

21.83

Results

MDL

Analyte

CAS Number

ng/m³ Air

ng/m³ Air

Hexavalent Chromium

1854-02-99

ND

<u>Flaq</u>

0.0036

DEC 1 9 2014

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Initials: CR

Eastern Research Group

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Page 8 of 22



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

(440) 000 040

PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

12/18/14 12:08

SUBMITTED:

12/11/14 to 12/12/14

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description: F

Comments:

PAM-4

Start Time 12/9/14 15:55

Air

Lab ID:

4121113-07

m³

<u>Flag</u>

Sampled: 12/10/14 16:08 **Received:** 12/11/14 10:33

Sample Volume:

21.79

Analysis Date: 12/15/14 15:12

Hexavalent Chromium by SOP ERG-MOR-063

<u>Results</u>

MDL

Analyte
Hexavalent Chromium

CAS Number 1854-02-99 ng/m³ Air 0,0168

<u>ng/m³ Air</u>

0.0036

DEC 1 9 2014

The state of the s

Initials: CR

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Page 9 of 22



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED:

12/18/14 12:08

Malvern, PA 19355

SUBMITTED:

12/11/14 to 12/12/14

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:

4121113-08

Sampled: 12/10/14 00:00

Matrix: Air Sample Volume:

22.09 m^3 Received: 12/11/14 10:33

Comments:

Analysis Date: 12/15/14 15:21

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

DEC 19 2014

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.



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

Air

FAX: (410) 266-8912

Lab ID:

4121113-09

Sample Volume:

21.83 m³

Sampled: 12/10/14 00:00 Received: 12/11/14 10:33

Honeywell Hex Chrome Study

Analysis Date: 12/15/14 15:31

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

12/11/14 to 12/12/14

<u>Analyte</u>

CAS Number

ng/m³ Air

<u>Flaq</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

ND

FILE #: 3926.00

SUBMITTED:

AQS SITE SITE CODE:

REPORTED: 12/18/14 12:08

0.0036

DEC 1 9 2014

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.



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:

12/18/14 12:08

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

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description: Matrix:

Comments:

OAM 1

Lab ID:

Sample Volume:

4121205-01

m³

Sampled: 12/11/14 14:55 Received: 12/12/14 11:18

Analysis Date: 12/15/14 15:41

Start Time 12/10/14 15:17

Hexavalent Chromium by SOP ERG-MOR-063

21.27

Results

<u>MDL</u>

<u>Analyte</u>

CAS Number

ng/m³ Air

<u>Flaq</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

ND

0.0036

DEC 1 9 2014

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 12 of 22



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

Description:

Comments:

Matrix:

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

OAM 2

Air

Start Time 12/10/14 15:43

FAX: (410) 266-8912

Lab ID:

4121205-02

Sample Volume:

21.15 m³

FILE #: 3926.00

SUBMITTED:

AQS SITE SITE CODE:

REPORTED: 12/18/14 12:08

Honeywell Hex Chrome Study

Sampled: 12/11/14 15:13 Received: 12/12/14 11:18

Analysis Date: 12/15/14 15:51

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

12/11/14 to 12/12/14

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

ng/m³ Air 0.0182

<u>Flag</u>

ng/m³ Air

0.0036

DEC 1 9 2014

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 13 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

PAM-1

Air

FAX: (410) 266-8912

Col 1 Start Time 12/10/14 17:05

Lab ID:

Sample Volume:

4121205-03

20.88

 ${\sf m}^{\sf 3}$

SUBMITTED:

AQS SITE SHE CODE:

FILE #: 3926.00

REPORTED: 12/18/14 12:08

Honeywell Hex Chrome Study

Sampled: 12/11/14 16:18

Received: 12/12/14 11:18 Analysis Date: 12/15/14 13:12

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

12/11/14 to 12/12/14

CAS Number

ng/m³ Air

<u>Flag</u>

ng/m3 Air

Hexavalent Chromium

Analyte

1854-02-99

0.0235

0.0036

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Initials: CR

Eastern Research Group

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Page 14 of 22



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED: 12/18/14 12:08

Malvern, PA 19355

SUBMITTED:

12/11/14 to 12/12/14

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: 4121205-04

Sampled: 12/11/14 16:20

Matrix:

Air

Sample Volume:

20.82 m³

Received: 12/12/14 11:18 Analysis Date: 12/15/14 13:32

Col 2 Start Time 12/10/14 17:11 Comments:

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

0.0193

0.0036

DEC 19 2014

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

12/18/14 12:08

REPORTED:

12/11/14 to 12/12/14

Malvern, PA 19355 ATTN: Mr. Jeff Boggs SUBMITTED: **AQS SITE**

PHONE: (443) 803-8495

FAX: (410) 266-8912

Start Time 12/10/14 16:52

SITE CODE:

Honeywell Hex Chrome Study

Description:

Comments:

Matrix:

PAM-2

Air

Lab ID:

Sample Volume:

4121205-05

m³

Sampled: 12/11/14 16:04 Received: 12/12/14 11:18

Analysis Date: 12/15/14 16:01

Hexavalent Chromium by SOP ERG-MOR-063

20.87

Results

MDL

Analyte

CAS Number

ng/m³ Air

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

ND

0.0036

DEC 1 9 2014

Initials: CR

Eastern Research Group

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Page 16 of 22



Environmental Resources Management, Inc.

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

Description:

Comments:

Matrix:

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

FAX: (410) 266-8912

Air

Start Time 12/10/14 16:26

PAM-3

Sample Volume:

Lab ID:

21.14

 m^3

<u>Flaq</u>

SUBMITTED:

AQS SITE SITE CODE:

FILE #: 3926.00

REPORTED: 12/18/14 12:08

Honeywell Hex Chrome Study

Sampled: 12/11/14 15:55 Received: 12/12/14 11:18

Analysis Date: 12/15/14 16:31

Hexavalent Chromium by SOP ERG-MOR-063

4121205-06

Results

MDL

12/11/14 to 12/12/14

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

ng/m³ Air ND

ng/m³ Air 0.0036

Initials: CR

DEC 19 2014

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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

Start Time 12/10/14 16:13

FAX: (410) 266-8912

SUBMITTED:

FILE #: 3926.00

REPORTED: 12/18/14 12:08

12/11/14 to 12/12/14

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-4

Air

Lab ID:

Sample Volume:

4121205-07

21.15 m³ Sampled: 12/11/14 15:43

Received: 12/12/14 11:18 Analysis Date: 12/15/14 16:41

Hexavalent Chromium by SOP ERG-MOR-063

<u>Results</u>

MDL

Analyte

CAS Number

ng/m³ Air

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0376

0.0036

DEC 1 9 2014

The state of

Initials: CR

Eastern Research Group

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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

PHONE: (443) 803-8495

Air

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

12/18/14 12:08

12/11/14 to 12/12/14

SUBMITTED:

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description: Matrix:

Comments:

PAM-21

Lab ID:

4121205-08

20.87

Sampled: 12/11/14 00:00 Received: 12/12/14 11:18

Sample Volume:

m³

Analysis Date: 12/15/14 16:51

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

Analyte

CAS Number

ng/m³ Air

ng/m³ Air

Hexavalent Chromium

1854-02-99

ND

<u>Flaq</u>

0.0036

DEC 1 9 2014

Charles of the sales of the sales of the

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 22



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

Description:

Comments:

Matrix:

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Air

PAM-31

_____F

FAX: (410) 266-8912

Lab ID:

4121205-09

Sample Volume:

21.14

m³

FILE #: 3926.00

REPORTED:

SUBMITTED: AQS SITE

CODE:

Honeywell Hex Chrome Study

Sampled: 12/11/14 00:00

Received: 12/12/14 11:18 **Analysis Date:** 12/15/14 17:01

Hexavalent Chromium by SOP ERG-MOR-063

<u>Results</u> ng/m³ Air

<u>Flag</u>

MDL ng/m³ Air

Hexavalent Chromium

Analyte

CAS Number 1854-02-99

ND

U

0.0036

12/18/14 12:08

12/11/14 to 12/12/14

.

DEC 1 9 2014

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.

SDG #: 4121113/4121205 Laboratory: <u>Eastern Research Group</u> Level IV

METHOD: Hexavalent Chromium (ASTM D7614)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: \2 \10 - \\ \1\
ll.	Initial calibration	A	•
111.	Calibration verification	A	
IV	Blanks	A	
V	Matrix Spike/Matrix Spike Duplicates	<i>N</i>	Not Required
VI.	Duplicates	A	DUP
VII.	Laboratory control samples	A	LCSID
VIII.	Sample result verification	A	
IX.	Overall assessment of data	A	
X.	Field duplicates	SW	FD=(3,4)(12,13)
xı	Field blanks	Da	FB=(8)(n) TB=(a)(18)

Note:

A = Acceptable

N = Not provided/applicable

SW = See worksheet

ND = No compounds detected

R = Rinsate

FB = Field blank

D = Duplicate

TB = Trip blank

EB = Equipment blank

Validated Samples: Air S

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

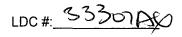
Notes:	 		

Page: _\of_Z Reviewer: _\of_\of_ 2nd Reviewer: __\of_

Method: Inorganics (EPA Method See Cover)

Method:Inorganics (EPA Method See (wer)	;			,
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 90-119% 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?			/	

Airs



VALIDATION FINDINGS CHECKLIST

Page: 2 of 2
Reviewer: 50
2nd Reviewer: 70

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>33307A6</u>

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Page:	of
Reviewer:	-30 ·
2nd Reviewer:	OV

Inorganics: Method See Cover

	Concentrat			
Analyte	3	4	RPD (≤20)	Qualifier
Hexavalent Chromium	0.0148	0.0160	8	

	Concentra	tion (ng/m3)		Qualifier
Analyte	12	13	RPD (≤20)	
Hexavalent Chromium	0.0235	0.0193	20	

\\LDCFILESERVER\Validation\FIELD DUPLICATES\FD_inorganic\33307A6.wpd

LDC #: 33307 Alo

Validation Findings Worksheet Initial and Continuing Calibration Calculation Verification

Page: 🔪	_ of	<u> </u>	
Reviewer:_	<u>り</u>	2	
2nd Review	er:_	a	

Method:	Inorganics,	Method	See Cover	

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,

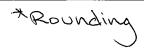
Found = concentration of each analyte <u>measured</u> in the analysis of the ICV or CCV solution

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	0.0000117			
		s2	0.10	0.0000283	0.99985	0.99982	
	طد م	s3	0.20	0.0000714			4*
		s4	0.50	0.0002096			
		s5	1.00	0.0004147			
		s6	2.00	0.0008252			
エン ハハス Calibration verification	Crip	500md 0.5195 mg/m	0.5 ng/ml		103.9%R	103,9%R	7
CCU \2\3 Calibration verification	Crab	0.5107mg/ml	O.Snglm)		102-1%R	102.2%2	Y*
Calibration verification							

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



LDC #: 33301AD

VALIDATION FINDINGS WORKSHEET Level IV Recalculation Worksheet

Page: <u></u> of	/
Reviewer: 3	$\overline{\mathcal{Q}}$
2nd Reviewer:	

	METHOD: Inorganics,	Method	<u>See</u>	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:

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

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 11:43	Laboratory control sample	Cx*	1.126 ng/na/	1.00 mg/ml	113%P	113%P	3)
N	Matrix spike sample		(SSR-SR)				
DUP	Duplicate sample	Cxxx	0.0165nglu3	0.0 147 rg/m²	11.5%RPD	10.7%.RPD	y *

Comments:	Pourding	
	J	

LDC #: 33307A40

VALIDATION FINDINGS WORKSHEET

Sample Calculation Verification

Page: of Reviewer: 50 2nd reviewer: 0

METHOD: Inorganics, Method See Cover	
Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A". Y N N/A	
Compound (analyte) results forreported with a positive determined using the following equation:	
Concentration = $(A-L)(C)$ $(A-L)(C)$ Recalculation: $(0.000025 - (-8.33E-06)) = 0.07$	795 mg/m
$C_0 = -8.33E-06$ (ng/ml)(4) = ng/m ³ (0.0795 ng/ml)(10ml) = 0.0376 ng/ml)(15 m ³ = 0.0376 ng/ml)(1	nglu ³

#	Sample ID	Analyte	Reported Concentration (സ്റ്റിസ്)	Calculated Concentration (〜ムルジ)	Acceptable (Y/N)
	1	Cr+6	0.0127	0.0127	2)
	2	\	100	20	7
	7))	8410.0	0.0147	9*
	4		0.0160	0.0160	5
	5		0.0124	0.003	y*
	6		ND	<i>h0</i>	3
<u> </u>	7		0.0168	0.0169	y*
	8		<i>NO</i>	100	4
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	10		<i>W</i>	NO	7
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Note:	



LABORATORY DATA CONSULTANTS, INC.

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

ERM

December 30, 2014

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

LDC Project #33322:

SDG

Fraction

4121626

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: December 12 through December 15, 2014

LDC Report Date: December 23, 2014

Matrix: Air

Parameters: Hexavalent Chromium

Validation Level: EPA Level IV

Laboratory: Eastern Research Group

Sample Delivery Group (SDG): 4121626

Sample Identification

PAM-4(12/13/14) PAM-21(12/13/14) PAM-31(12/13/14) OAM 1(12/15/14) OAM 2(12/15/14)

OAM 1(12/12/14) PAM-1(12/15/14) OAM 2(12/12/14) PAM-1D(12/15/14) PAM-1(12/12/14) PAM-2(12/15/14) PAM-1D(12/12/14) PAM-3(12/15/14) PAM-2(12/12/14) PAM-4(12/15/14) PAM-3(12/12/14) PAM-21(12/15/14) PAM-4(12/12/14) PAM-31(12/15/14) PAM-21(12/12/14) PAM-1(12/12/14)DUP PAM-31(12/12/14) PAM-1D(12/12/14)DUP OAM 1(12/13/14) PAM-1(12/13/14)DUP PAM-1D(12/13/14)DUP OAM 2(12/13/14) PAM-1(12/13/14) PAM-1(12/15/14)DUP PAM-1D(12/15/14)DUP PAM-1D(12/13/14) PAM-2(12/13/14) PAM-3(12/13/14)

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

Introduction

This data review covers 33 air samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per ASTM D7614 for Hexavalent Chromium.

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

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

The following are definitions of the data qualifiers:

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

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

I. Technical Holding Times

All technical holding time requirements were met.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met.

IV. Blanks

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

Samples PAM-31(12/12/14), PAM-31(12/13/14), and PAM-31(12/15/14) were identified as trip blanks. No hexavalent chromium was found.

Samples PAM-21(12/12/14), PAM-21(12/13/14), and PAM-21(12/15/14) were identified as field blanks. No hexavalent chromium was found.

V. Matrix Spike/Matrix Spike Duplicates

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

VI. Duplicates

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

VII. Laboratory Control Samples

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

VIII. Sample Result Verification

All sample result verifications were acceptable.

IX. Overall Assessment of Data

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

X. Field Duplicates

Samples PAM-1(12/12/14) and PAM-1D(12/12/14), samples PAM-1(12/13/14) and PAM-1D(12/13/14), and samples PAM-1(12/15/14) and PAM-1D(12/15/14) 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(12/12/14)	PAM-1D(12/12/14)	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.0245	0.0260	6 (≤20)	-	-

	Concentra	tion (ng/m³)			
Analyte	PAM-1(12/13/14)	PAM-1D(12/13/14)	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.0138	0.0125	10 (≤20)	-	-

	Concentrat	ion (ng/m³)			
Analyte	PAM-1(12/15/14)	PAM-1D(12/15/14)	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.0242	0.0261	8 (≤20)	-	-

Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Data Qualification Summary - SDG 4121626

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
4121626

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 4121626

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

LDC #: 33322A6 VALIDATION COMPLETENESS WORKSHEET SDG #: 4121626 Level IV

Laboratory: Eastern Research Group

METHOD: Hexavalent Chromium (ASTM D7614)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 12/12-15/14
Ш	Initial calibration	A	
111.	Calibration verification	<u> </u>	
IV	Blanks	A	
V	Matrix Spike/Matrix Spike Duplicates	N	Not Required
VI.	Duplicates	Α	Dnb
VII.	Laboratory control samples	A	LISTO
VIII.	Sample result verification	A	
IX.	Overall assessment of data	A	
X.	Field duplicates	SW	FD=(3.4) (0,13) (21, 22)
XI	Field blanks	Oa	FB=(8)(17)(26) TB=(9)(8)(27)

Note:

A = Acceptable

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

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

Validated Samples:

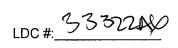
1	OAM 1 (12/12/14)	11	OAM 2 (12/13/14)	21	PAM-1 (12/15/14)	31	PAM-1D (12/13/14)DUP
2	OAM 2 (12/12/14)	12	PAM-1 (12/13/14)	22	PAM-1D (12/15/14)	32	PAM-1 (12/15/14)DUP
3	PAM-1 (12/12/14)	13	PAM-1D (12/13/14)	23	PAM-2 (12/15/14)	33	PAM-1D (12/15/14)DUP
4	PAM-1D (12/12/14)	14	PAM-2 (12/13/14)	24	PAM-3 (12/15/14)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

Notes	· ·		

Page: __of __ Reviewer: ____ 2nd Reviewer: ____

Method:Inorganics (EPA Method Scalare)							
Validation Area	Yes	No	NA	Findings/Comments			
I. Technical holding times							
All technical holding times were met.	/						
Cooler temperature criteria was met.							
II. Calibration							
Were all instruments calibrated daily, each set-up time?							
Were the proper number of standards used?							
Were all initial calibration correlation coefficients ≥ 0.995?	/						
Were all initial and continuing calibration verification %Rs within the 99-140% QC limits?	/						
Were titrant checks performed as required? (Level IV only)	ļ						
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 spik concentration by a factor of 4 or more, no action was taken.	9		/				
Were the MS/MSD or duplicate relative percent differences (RPD) \leq 20% for westers 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?							

xivy



VALIDATION FINDINGS CHECKLIST

Page: 2 of Z Reviewer: 3 7 2nd Reviewer: 07

							
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>33322A6</u>

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Page: _of_ Reviewer: _____ 2nd Reviewer: ______

Inorganics: Method See Cover

	Concentra			
Analyte	3	4	RPD (≤20)	Qualifier
Hexavalent Chromium	0.0245	0.0260	6	

	Concentra			
Analyte	12	13	RPD (≤20)	Qualifier
Hexavalent Chromium	0.0138	0.0125	10	

	Concentrat			
Analyte	21	22	RPD (≤20)	Qualifier
Hexavalent Chromium	0.0242	0.0261	8	

\\LDCFILESERVER\\Validation\FIELD DUPLICATES\FD_inorganic\33322A6.wpd

LDC #: 33322A10

Validation Findings Worksheet Initial and Continuing Calibration Calculation Verification

Page:_ of_	
Reviewer: 30	
2nd Reviewer: 7	

Method: Inorganics, Method	See Cover	
	7 70	A A. (
The correlation coefficient (r) for the	calibration of 🚅 was recalculated.Calibration date:	(2117/14

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 <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	0.0000203			
		s2	0.10	0.0000411	0.99982	0.99982	
	صد در	s3	0.20	0.0000887			
	Chi	s 4	0.50	0.0002325			4
		s5	1.00	0.0004588)
		s6	2.00	0.0008926			
Sw 11:33 Calibration verification	صبح	For-8 0.4988 ng/m	True 0. Svalul		99.8%	- २ ९ <i>०%</i>	7*
CCC V2\32 Calibration verification)			1035 95R	[03.58R	5)
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 #: 3337246

VALIDATION FINDINGS WORKSHEET Level IV Recalculation Worksheet

Page:_]	_of_\
Reviewer:_	<u>S0</u>
2nd Reviewer:_	Ź

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:

 $RPD = [S-D] \times 100$

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)
LUS	Laboratory control sample	طلح	1.02 ng/m/	1,00 mg/m	108%2	(08%R	C
2	Matrix spike sample		(SSR-SR)				
DUP	Duplicate sample	Chyp	0.02683-ng/m3	0.024u5nglm3	9.28%R	9.18%.80	7,3

Comments:		

& Roundary

LDC #: 323322AV

VALIDATION FINDINGS WORKSHEET

Sample Calculation Verification

METHOD: Inorganics, Method	se lover		
Y N N/A Have results I Y N N/A Are results wi	w for all questions answered "l been reported and calculated of ithin the calibrated range of the ion limits below the CRQL?		ed as "N/A".
Compound (analyte) results for recalculated and verified using	a the following equation:		a positive detect were
Concentration = A-Colc.		0.0000760 - (1.15 E-06)	= 0.05629 nglml
C1 = 1.15 = -06	(nglui)(L)	(0.0x29nghu) (com)	= 0.0260 ng lu3
A = 0-0000264	0.	21107 m3	

#	Sample ID	Analyte	Reported Concentration (Na)w^)	Calculated Concentration (Na)w ³)	Acceptable (Y/N)
	١	C5+10	०,०५	180000	3
	Z		0.0113	0.0112	×2×
	3		0-0245	0.0245	7 7
	4		0.0260	0.0200	
	2		0.0099	0.0100	46
	6		00	でゆ	7
	7		0.0355	0.0305	
	8		ND	トシ ハシ	
	9		04	PQ	
	OJ		0.0153	EDO.G	7
	()		Pria-0	0.0175	X Z
	12		0.0138	850.0	57
	13		0.0125	0.0(2)4	*
	14		0.0210	0.0215	不の
	15		8010.6	8010.0	3
	16		0.0122	0.0122	
	17		P D	60	
	81		NO	2 2	J
	۱۹		0.0199	8910.0	7×
	20	1	0-0180	0.080	4*

Note:	

LDC#: 33312AS

VALIDATION FINDINGS WORKSHEET

Sample Calculation Verification

Page: Zof Z
Reviewer: 50
2nd reviewer: _______

METHOD: Inorganics, Method See Core										
Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A". Y N N/A										
Concentration = $(A-L_0)/L_1$ U_1 U_2 U_3 U_4 U_5 U_6										
	Co=-1.4E-06	(walne)	(Je)	(0.0582val	(1,001) (1,001,000 C)					
	Co=-1.45-00 co=0.0004125 m2 = rajus				22.34 m ³ = 0.024m					
#	Sample ID		ılyte	Reported Concentration (ハヘー)	Calculated Concentration (\(\dag{\sqrt{3}} \)	Acceptable (Y/N)				
	21	حادي		0-0242	0.0243	KD.				
	22		1	0.0261	0-0261	9*				
	23			0.0401	00po, 0	3*				
	24			0.0232	0.0232	2				
	25			0.0389	0.0388	¥ Y				
1	26			ND	NO	4				
	21		<u>U</u>	ND	ND	Je				
										
										
 										
-										
-										
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Note:	* Downding			
	,			



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Air

Start Time 12/11/14 14:59

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: SUBMITTED: 12/22/14 11:14

12/16/14

AQS SITE

CODE:

m³

Honeywell Hex Chrome Study

Description: Matrix:

OAM 1

Lab ID:

4121626-01

21.48

Sampled: 12/12/14 14:51 Received: 12/16/14 11:49

Analysis Date: 12/17/14 14:34

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

Analyte

CAS Number

ng/m³ Air

Sample Volume:

Flag

ng/m³ Air

Hexavalent Chromium

Comments:

1854-02-99

0.0091

0.0036

DEC 2 3 2014

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 32



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: SUBMITTED: 12/22/14 11:14

12/16/14

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description: OAM 2

Lab ID:

Sample Volume:

4121626-02

m³

Sampled: 12/12/14 15:09

Received: 12/16/14 11:49 Analysis Date: 12/17/14 14:44

Comments: Start Time 12/11/14 15:16

Hexavalent Chromium by SOP ERG-MOR-063

21.5

Results

<u>MDL</u>

Analyte

CAS Number

ng/m³ Air 0.0113

Flag

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0036

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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:

12/22/14 11:14

SUBMITTED: 12/16/14

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description: Matrix:

PAM-1 Air

Lab ID:

Sample Volume:

4121626-03

m³

Sampled: 12/12/14 16:23 Received: 12/16/14 11:49

Analysis Date: 12/17/14 12:52

Comments: Col 1 Start Time 12/11/14 16:21

Hexavalent Chromium by SOP ERG-MOR-063

21.64

Results

<u>MDL</u>

Analyte **Hexavalent Chromium** **CAS Number**

ng/m³ Air

<u>Flag</u>

ng/m3 Air

1854-02-99

0.0245

0.0036

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REPORTED:

12/22/14 11:14

SUBMITTED: 12/16/14

AQS SITE

CODE:

Honeywell Hex Chrome Study

Description:

PAM-1D

Lab ID:

4121626-04

Sampled: 12/12/14 16:28

Matrix:

Col 2 Start Time 12/11/14 16:23

Sample Volume:

21.67 m³ Received: 12/16/14 11:49

Analysis Date: 12/17/14 13:12

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

Analyte

CAS Number

ng/m³ Air

<u>Flaq</u>

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Hexavalent Chromium

Comments:

1854-02-99

0.0260

0.0036

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FILE #: 3926.00

REPORTED: SUBMITTED: 12/22/14 11:14

12/16/14

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description:

PAM-2

Lab ID:

4121626-05

21.55

Sampled: 12/12/14 16:03

Sample Volume:

m³

Received: 12/16/14 11:49 Analysis Date: 12/17/14 17:33

Comments: Start Time 12/11/14 16:07

> **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

0.0099

0.0036

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REPORTED:

12/22/14 11:14

SUBMITTED: 12/16/14

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description:

PAM-3

Lab ID:

Sample Volume:

4121626-06

m³

Sampled: 12/12/14 15:53 Received: 12/16/14 11:49

Matrix: Air Comments:

Start Time 12/11/14 15:58

21.52

Analysis Date: 12/17/14 15:24

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL,

Analyte

CAS Number

ng/m³ Air

ng/m³ Air

Hexavalent Chromium

1854-02-99

ND

Flag

0.0036

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Description:

Comments:

Analyte

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Matrix:

Air

PAM-4

Start Time 12/11/14 15:46

FAX: (410) 266-8912

Lab ID:

4121626-07

Sample Volume:

21.41

m³

FILE #: 3926.00

REPORTED:

SUBMITTED:

AQS SITE

CODE:

Sampled: 12/12/14 15:33 Received: 12/16/14 11:49

Analysis Date: 12/17/14 15:34

Honeywell Hex Chrome Study

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

12/22/14 11:14

12/16/14

CAS Number Hexavalent Chromium

1854-02-99

ng/m³ Air 0.0305

<u>Flag</u>

ng/m³ Air

0.0036

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Page 10 of 32



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FILE #: 3926.00

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12/22/14 11:14 REPORTED:

Malvern, PA 19355

12/16/14

SUBMITTED:

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

Honeywell Hex Chrome Study

Description:

PAM-21

Lab ID: 4121626-08 SITE CODE:

m³

Sampled: 12/12/14 00:00

Matrix: Air

Sample Volume:

21.55

Received: 12/16/14 11:49

Comments:

Analysis Date: 12/17/14 15:44

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

FAX: (410) 266-8912

ND

0.0036

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Page 11 of 32



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Description:

Comments:

PHONE: (443) 803-8495

Air

PAM-31

FAX: (410) 266-8912

Lab ID:

4121626-09

Sample Volume:

21.52

m³

FILE #: 3926.00

REPORTED:

SUBMITTED:

AQS SITE SITE CODE:

> Sampled: 12/12/14 00:00 Received: 12/16/14 11:49

Honeywell Hex Chrome Study

Analysis Date: 12/17/14 15:53

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

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12/16/14

Hexavalent Chromium

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CAS Number 1854-02-99

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FILE #: 35

3926.00

REPORTED:

12/22/14 11:14

SUBMITTED: 12/16/14

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description: Matrix: OAM 1

Lab ID:

4121626-10

m³

Sampled: 12/13/14 14:38 **Received:** 12/16/14 11:49

Sample Volume:

Analysis Date: 12/17/14 16:03

Comments: Start Time 12/12/14 14:57

Hexavalent Chromium by SOP ERG-MOR-063

20.94

Results

MDL

<u>Analyte</u>

Hexavalent Chromium

CAS Number 1854-02-99

<u>ng/m³ Air</u>

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<u>Flag</u>

ng/m³ Air

0.0036

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12/22/14 11:14

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SUBMITTED:

12/16/14

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AQS SITE CODE:

Honeywell Hex Chrome Study

Description:

Comments:

OAM 2

Start Time 12/12/14 15:13

Lab ID:

4121626-11

Sampled: 12/13/14 14:50

Matrix:

PHONE: (443) 803-8495

Air

Sample Volume:

21.26

m³

Received: 12/16/14 11:49

Analysis Date: 12/17/14 16:13

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

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

ng/m³ Air 0.0174

<u>Flag</u>

ng/m³ Air

0.0036

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Col 1 Start Time 12/12/14 16:28

FILE #: 3926.00

REPORTED:

12/22/14 11:14

SUBMITTED:

12/16/14

AQS SITE

CODE:

Honeywell Hex Chrome Study

Description: Matrix:

PAM-1

Lab ID:

Sample Volume:

4121626-12

m³

Sampled: 12/13/14 15:54

Received: 12/16/14 11:49

Analysis Date: 12/17/14 13:32

Hexavalent Chromium by SOP ERG-MOR-063

21.08

Results

<u>MDL</u>

Analyte Hexavalent Chromium

Comments:

CAS Number

ng/m³ Air

<u>Flaq</u>

ng/m³ Air

1854-02-99

0.0138

0.0036

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Comments:

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Col 2 Start Time 12/12/14 16:32

FILE #: 3926.00

REPORTED:

12/22/14 11:14

SUBMITTED: 12/16/14

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description:

PAM-1D

Lab ID:

Sample Volume:

4121626-13

 m^3

Sampled: 12/13/14 15:56

Received: 12/16/14 11:49 Analysis Date: 12/17/14 14:14

Hexavalent Chromium by SOP ERG-MOR-063

21.05

Results

<u>MDL</u>

Analyte

CAS Number

ng/m³ Air

Flag

ng/m3 Air

Hexavalent Chromium

1854-02-99

0.0125

0.0036

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Matrix:

Description:

Comments:

Hexavalent Chromium

PAM-2

FAX: (410) 266-8912

FILE #: 3926.00

12/22/14 11:14 REPORTED:

SUBMITTED: 12/16/14

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

4121626-14

m³

Sampled: 12/13/14 14:50 Received: 12/16/14 11:49

Analysis Date: 12/17/14 16:23

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

Analyte CAS Number

Start Time 12/12/14 16:08

1854-02-99

Lab ID:

Sample Volume:

<u>Flag</u>

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21.26

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FILE #: 3926.00

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SUBMITTED: 12/16/14

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

SITE CODE:

Description:

Lab ID: 4121626-15

Sampled: 12/13/14 15:32

Matrix:

PAM-3

Sample Volume:

Received: 12/16/14 11:49

Comments:

Start Time 12/12/14 15:57

FAX: (410) 266-8912

21.23 m³

Analysis Date: 12/17/14 16:33

Honeywell Hex Chrome Study

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

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

ng/m³ Air 0.0108

Flag

ng/m³ Air

0.0036

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Page 18 of 32



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Start Time 12/12/14 15:37

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

12/22/14 11:14

SUBMITTED: 12/16/14

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description:

Matrix:

Comments:

PAM-4

Lab ID:

4121626-16

Hexavalent Chromium by SOP ERG-MOR-063

21.27

Sampled: 12/13/14 15:15

Sample Volume:

m³

Received: 12/16/14 11:49 Analysis Date: 12/17/14 17:43

<u>Results</u>

<u>MDL</u>

Hexavalent Chromium

Analyte

CAS Number 1854-02-99

ng/m³ Air

Flag

ng/m3 Air 0.0036

0.0122

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FILE #: 3926.00

12/22/14 11:14 REPORTED:

SUBMITTED: 12/16/14

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-21

Matrix:

Comments:

Air

Lab ID:

Sample Volume:

4121626-17

 m^3

Sampled: 12/13/14 00:00 Received: 12/16/14 11:49

Analysis Date: 12/17/14 17:13

Hexavalent Chromium by SOP ERG-MOR-063

21.26

<u>Results</u>

<u>MDL</u>

Analyte

CAS Number

ng/m³ Air

ng/m³ Air

Hexavalent Chromium

1854-02-99

ND

Flag

0.0036

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FILE #: 3926.00

REPORTED:

12/22/14 11:14

12/16/14 SUBMITTED:

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-31

Lab ID:

Sample Volume:

4121626-18

m³

Sampled: 12/13/14 00:00

Received: 12/16/14 11:49 Analysis Date: 12/17/14 17:23

Comments:

Hexavalent Chromium by SOP ERG-MOR-063 Results

<u>MDL</u>

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

ng/m³ Air ND

21.23

<u>Flag</u>

ng/m³ Air 0.0036

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FILE #: 3926.00

REPORTED:

12/22/14 11:14

SUBMITTED: 12/16/14

AQS SITE

CODE:

Honeywell Hex Chrome Study

Description: Matrix:

OAM 1

Lab ID:

Sample Volume:

4121626-19

Sampled: 12/15/14 15:03 Received: 12/16/14 11:49

Start Time 12/14/14 14:33

22.05 m^3

<u>Flag</u>

Analysis Date: 12/18/14 13:10

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

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

Comments:

CAS Number 1854-02-99

ng/m³ Air 0.0199

ng/m³ Air

0.0036

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FILE #: 3926.00

REPORTED:

12/22/14 11:14

SUBMITTED: 12/16/14

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study Sampled: 12/15/14 15:20

Description: Matrix:

OAM 2

Lab ID:

Sample Volume:

4121626-20

22.1 m³

Received: 12/16/14 11:49 Analysis Date: 12/18/14 13:20

Comments:

Start Time 12/14/14 14:47

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

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

ng/m³ Air 0.0180

<u>Flag</u>

<u>ng/m³ Air</u>

0.0036

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Comments:

FAX: (410) 266-8912

Col 1 Start Time 12/14/14 15:39

3926.00 FILE #:

REPORTED:

12/22/14 11:14

SUBMITTED: 12/16/14

AQS SITE

CODE:

Honeywell Hex Chrome Study

Description: PAM-1

Lab ID:

Sample Volume:

4121626-21

22.31 m³ Sampled: 12/15/14 16:26 Received: 12/16/14 11:49

Analysis Date: 12/18/14 12:50

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

0.0242

0.0036

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Col 2 Start Time 12/14/14 15:39

FAX: (410) 266-8912

3926.00 FILE #:

12/22/14 11:14 REPORTED:

12/16/14 SUBMITTED:

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description:

PAM-1D

Air

Lab ID:

Sample Volume:

4121626-22

22.34

m³

Sampled: 12/15/14 16:29 Received: 12/16/14 11:49

Analysis Date: 12/18/14 12:30

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

Hexavalent Chromium

Analyte

CAS Number 1854-02-99

ng/m³ Air 0.0261

Flag

ng/m³ Air 0.0036

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FILE #: 3926.00

REPORTED:

12/22/14 11:14

SUBMITTED: 12/16/14

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description: Matrix:

PAM-2

Start Time 12/14/14 15:27

Lab ID:

Sample Volume:

4121626-23

22.14 m³ Sampled: 12/15/14 16:03 Received: 12/16/14 11:49

Analysis Date: 12/18/14 13:30

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

Comments:

1854-02-99

0.0401

0.0036

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Analyte

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FAX: (410) 266-8912

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REPORTED:

12/22/14 11:14

12/16/14 SUBMITTED:

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description:

PAM-3

Lab ID:

Sample Volume:

4121626-24

m³

Sampled: 12/15/14 15:53

22.1

Received: 12/16/14 11:49 Analysis Date: 12/18/14 13:40

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

> **Hexavalent Chromium by SOP ERG-MOR-063 Results**

MDL

CAS Number

ng/m³ Air

ng/m³ Air

<u>Flag</u> 1854-02-99 0.0232

0.0036

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FILE #: 3926.00

REPORTED:

12/22/14 11:14

SUBMITTED: 12/16/14

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description: Matrix:

Comments:

PAM-4

Lab ID:

Sample Volume:

4121626-25

21.96 $\,m^3$

Sampled: 12/15/14 15:38 Received: 12/16/14 11:49

Analysis Date: 12/18/14 14:10

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

0.0389

0.0036

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FILE #: 3926.00

12/22/14 11:14

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SUBMITTED:

12/16/14

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AQS SITE

SHECODE:

PHONE: (443) 803-8495 Description:

Lab ID:

4121626-26

Honeywell Hex Chrome Study

Matrix:

PAM-21

22.14

Sampled: 12/15/14 00:00 Received: 12/16/14 11:49

Comments:

Sample Volume: m³ **Analysis Date:** 12/18/14 14:20

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

ND

0.0036

DEC 2 3 2014

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.



Environmental Resources Management, Inc.

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

Matrix:

Description:

Comments:

PHONE: (443) 803-8495

PAM-31

Air

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

12/22/14 11:14

12/16/14 SUBMITTED:

AQS SITE

CODE:

m³

Honeywell Hex Chrome Study

Sampled: 12/15/14 00:00 Received: 12/16/14 11:49

Analysis Date: 12/18/14 14:30

Hexavalent Chromium by SOP ERG-MOR-063

22.1

4121626-27

Results

<u>MDL</u>

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

Lab ID:

Sample Volume:

ng/m³ Air ND

Flag

ng/m³ Air

0.0036

DEC 2 3 2014

Initials: CR

Eastern Research Group

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Page 30 of 32



LABORATORY DATA CONSULTANTS, INC.

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

ERM

December 30, 2014

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 December 23, 2014. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #33334:

SDG

Fraction

4121804/4121908

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

106 pages-SF 5 DAY TAT Attachment 1 LDC #33334 (ERM - Morrisville, NC / Harbor Point, MD, Hexavalent Chromium Monitoring) Level IV (3) DATE Cr(VI) DATE LDC SDG# REC'D DUE (D7614) Matrix: Air/Water/Soil -Als 4121804/4121908 12/23/14 12/31/14 18 0 A/CR Total

Laboratory Data Consultants, Inc. Data Validation Report

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

Collection Date: December 17 through December 18, 2014

LDC Report Date: December 24, 2014

Matrix: Air

Parameters: Hexavalent Chromium

Validation Level: EPA Level IV

Laboratory: Eastern Research Group

Sample Delivery Group (SDG): 4121804/4121908

Sample Identification

OAM 1 (12/17/14) PAM-1 (12/18/14)DUP OAM 2 (12/17/14) PAM-1D (12/18/14)DUP

PAM-1 (12/17/14) PAM-1D (12/17/14) PAM-2 (12/17/14) PAM-3 (12/17/14) PAM-4 (12/17/14) PAM-21 (12/17/14) PAM-31 (12/17/14) OAM 1 (12/18/14) OAM 2 (12/18/14) PAM-1 (12/18/14) PAM-1D (12/18/14) PAM-2 (12/18/14) PAM-3 (12/18/14) PAM-4 (12/18/14) PAM-21 (12/18/14) PAM-31 (12/18/14) PAM-1 (12/17/14)DUP

PAM-1D (12/17/14)DUP

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

Introduction

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

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

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

The following are definitions of the data qualifiers:

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

I. Technical Holding Times

All technical holding time requirements were met.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met.

IV. Blanks

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

Samples PAM-31 (12/17/14) and PAM-31 (12/18/14) were identified as trip blanks. No hexavalent chromium was found.

Samples PAM-21 (12/17/14) and PAM-21 (12/18/14) were identified as field blanks. No hexavalent chromium was found.

V. Matrix Spike/Matrix Spike Duplicates

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

VI. Duplicates

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

VII. Laboratory Control Samples

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

VIII. Sample Result Verification

All sample result verifications were acceptable.

IX. Overall Assessment of Data

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

X. Field Duplicates

Samples PAM-1 (12/17/14) and PAM-1D (12/17/14) and samples PAM-1 (12/18/14) and PAM-1D (12/18/14) 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 (12/17/14)	PAM-1D (12/17/14)	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.109	0.0788	32 (≤20)	J (detects)	Α

	Concentrat	tion (ng/m³)	DDD		
Analyte	PAM-1 (12/18/14)	PAM-1D (12/18/14)	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.0143	0.0109	27 (≤20)	NQ	-

NQ = No qualification is necessary because one or both of the results are less than 5x the MDL.

Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Data Qualification Summary - SDG 4121804/4121908

SDG	Sample	Analyte	Flag	A or P	Reason
4121804/ 4121908	PAM-1 (12/17/14) PAM-1D (12/17/14) PAM-4 (12/17/14)	Hexavalent chromium	J (all detects)	A	Field duplicates (RPD)

Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG 4121804/4121908

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 4121804/4121908

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

VALIDATION COMPLETENESS WORKSHEET LDC #: 33334A6

SDG #: 4121804/4121908

Level IV

Reviewer:_ 2nd Reviewer:

Laboratory: Eastern Research Group

METHOD: Hexavalent Chromium (ASTM D7614)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 12/13-18/14
11	Initial calibration	A	
III.	Calibration verification	A	
IV	Blanks	A	
V	Matrix Spike/Matrix Spike Duplicates	2	Not Required
VI.	Duplicates	A	DUP
VII.	Laboratory control samples	A	icsID
VIII.	Sample result verification	A	
IX.	Overall assessment of data	A	
X.	Field duplicates	SW	FD= (3,4) (12,13)
XI	Field blanks	<i>Qu</i>	FB=(8)(7) TB=(9)(8)

Note:

A = Acceptable

N = Not provided/applicable

SW = See worksheet

ND = No compounds detected

R = Rinsate

FB = Field blank

D = Duplicate

TB = Trip blank

EB = Equipment blank

Validated Samples:

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

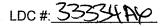
Notes:	 	

Page: 1 of 2
Reviewer: 50
2nd Reviewer: 6

Method: Inorganics (EPA Method Section)

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 90-416% 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?			/	

Airs



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.	1			
X. Field blanks				
Field blanks were identified in this SDG.	/			
Target analytes were detected in the field blanks.				

LDC#<u>33334A6</u>

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Page:	<u>_of_\</u>
Reviewer:	30
2nd Reviewer:	01

Inorganics: Method See Cover

	Concentra	tion (mg/L)		Qual. (3, 4, 7, 36)
Analyte	3	4	RPD (≤20)	(3, 4, 7, 76)
Hexavalent Chromium	0.109	0.0788	32	Jdet/A (A)

	Concentra	tion (mg/L)	222	Qual.
Analyte	12	13	RPD (≤20)	
Hexavalent Chromium	0.0143	0.0109	27	NQ

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

 $\verb|\LDCFILESERVER| Validation \verb|\FIELD DUPLICATES| FD_inorganic \verb|\wettemp.WPD| |$

LDC #: 33334AP

Validation Findings Worksheet Initial and Continuing Calibration Calculation Verification

Page: <u> </u> of <u> </u>
Reviewer: 30
2nd Reviewer:

Method: Ir	norganics,	Method	See Cover	

The correlation coefficient (r) for the calibration of 🚅 was recalculated.Calibration date: 12/22/14

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	0.0000263			-
		s2	0.10	0.0000448	0.99996	0.99996	
	CX	s3	0.20	0.0000836			. 0
	CY	s4	0.50	0.0002158			7
		s5	1.00	0.0004374			
		s6	2.00	0.0008675			<u> </u>
エン ハンリン Calibration verification	طدي	Found D.S.19 mg/m/	0.5 ng/ml		102.4%R	102.4%R	
CCU 12:40 Calibration verification	Ccto	0.5276ng/m	O.Snajul		105.5%R	105.5%R	\
Calibration verification						,	

Comments: Refer to Calibration V	erification findings worksheet fo	or list of qualifications ar	nd associated samples wi	hen reported results do i	not agree withii
10.0% of the recalculated results.					

LDC #: 33334AW

VALIDATION FINDINGS WORKSHEET Level IV Recalculation Worksheet

Page:	
Reviewer: SO	
2nd Reviewer:	

METHOD: Inorganics, Method			\sim	
	METHOD: Inorganics,	Method	<u></u>	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:

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

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)
LLS 12210	Laboratory control sample	طلم	1.088 ng/w/			1098/2	3)
N	Matrix spike sample		(SSR-SR)				
13.10 DOB	Duplicate sample	C 26	0.1074 ng/m³	0.1089.vg/m³	1.39% RPD	1.37% 890	<u></u>

Comments: _				 	
-					
	·			 	

LDC#: 33334AW

VALIDATION FINDINGS WORKSHEET

Sample Calculation Verification

2nd reviewer:

METHOD: Ino	organics, Method _	See (or	er_			
Please see qu Y N N/A Y N N/A Y/ N N/A	Have results bee Are results within	or all questions a en reported and o n the calibrated r limits below the	calculated cor ange of the ir	rrectly?	estions are identified as "N/A	۸".
Compound (ar	nalyte) results for nd verified using th	((b) ne following equa	ition:	<i>9</i>	reported with a positiv	e detect were
Concentration =	A-colc.	11/2=10001	Recalculation:	12000a O	3-(-1.08=-06)	21500

0.0004335 = 0.1528 mg/ml (0.1528 ng/m1) (10ml) = 0.0722 ng/m³ Co=1.08-E-06 m3=21.16 C1=0.0004335 (ng/m1)(u6) A=0.0000673 m3

	. 0340000 /	V ~ -	21.10 00		
#	Sample ID	Analyte	Reported Concentration (Ncy lw ³)	Calculated Concentration (Na M)	Acceptable (Y/N)
	١	Crth	ND	25	7
	2	1	ND	20	
	3		0.109	0.109	\$
	4		0.0788	0.0787*	Y*
	5		NO	ND	9
	6		ND	OU	
	7		0.146	0.146	
<u></u>	8		P0	<i>PD</i>	
	9		ND	ND	
	10		NO	とり	
	- 11		00	NS	4
	12		0.0143	0.0142	46
	13		0.0159	0.0109	<u> </u>
	14		0.0052	0.0052	
ļ	12		NO	00	
	160		0.072	0.0722	
	17		NO	NO	
	18	<u> </u>	NO	00	
<u> </u>					

Note:	* Pandina	 		
)			



Environmental Resources Management, Inc.

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

Description:

Comments:

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Start Time 12/16/14 15:09

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 12/23/14 11:27

SUBMITTED:

12/18/14 to 12/19/14

AQS SITE CODE:

SITE CODE:

OAM 1

Lab ID:

4121804-01

Sampled: 12/17/14 15:05

Honeywell Hex Chrome Study

Matrix:

Sample Volume:

21.55 m³

Received: 12/18/14 10:10

Analysis Date: 12/22/14 14:20

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

DEC 2 4 2014

Initials: CR

Eastern Research Group

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Page 3 of 22



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Matrix:

Comments:

Description:

OAM 2

Start Time 12/16/14 15:34

FAX: (410) 266-8912

Lab ID:

4121804-02

Sample Volume:

21.56

m³

SUBMITTED:

SITE CODE:

AQS SITE CODE:

FILE #: 3926.00

REPORTED: 12/23/14 11:27

12/18/14 to 12/19/14

Sampled: 12/17/14 15:31 Received: 12/18/14 10:10

Analysis Date: 12/22/14 14:30

Honeywell Hex Chrome Study

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

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

ng/m³ Air ND

<u>Flag</u>

ng/m³ Air 0.0036

DEC 2 4 2014

Initials: CR

Eastern Research Group

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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-1

Air

FAX: (410) 266-8912

Col 1 Start Time 12/16/14 16:53

Lab ID:

4121804-03

Sample Volume:

m³

FILE #: 3926.00

SUBMITTED:

SITE CODE:

AQS SITE CODE:

REPORTED: 12/23/14 11:27

Honeywell Hex Chrome Study

Sampled: 12/17/14 16:58

Received: 12/18/14 10:10 Analysis Date: 12/22/14 13:00

Hexavalent Chromium by SOP ERG-MOR-063

21.67

Results

MDL

12/18/14 to 12/19/14

Analyte Hexavalent Chromium

CAS Number 1854-02-99

ng/m³ Air 0.109 <u>Flag</u>

<u>ng/m³ Air</u>

0.0036

agrammer speakings

DEC 2 4 2014

Initials: CR

Eastern Research Group

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Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Matrix:

Col 2 Start Time 12/16/14 16:55

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 12/23/14 11:27

12/18/14 to 12/19/14

SUBMITTED:

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description:

Comments:

PAM-1D

Lab ID:

Sample Volume:

4121804-04

21.75

m³

<u>Flag</u>

Sampled: 12/17/14 17:05 Received: 12/18/14 10:10

Analysis Date: 12/22/14 13:20

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

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

ng/m³ Air

0.0788

ng/m³ Air

0.0036

DEC 2 4 2014

Initials: CR

Eastern Research Group

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Page 6 of 22



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: 12/23/14 11:27

SUBMITTED:

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description:

PAM-2

Lab ID:

Sample Volume:

4121804-05

m³

Sampled: 12/17/14 16:39 Received: 12/18/14 10:10

Analysis Date: 12/22/14 15:00

Comments:

Start Time 12/16/14 16:34

Hexavalent Chromium by SOP ERG-MOR-063

21.68

Results

MDL

12/18/14 to 12/19/14

Analyte Hexavalent Chromium CAS Number 1854-02-99

ng/m³ Air ND

<u>Flag</u>

ng/m³ Air 0.0036

DEC 2 4 2014

Initials: CR

Eastern Research Group

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Page 7 of 22



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

Start Time 12/16/14 16:21

FILE #: 3926.00

REPORTED:

12/23/14 11:27

12/18/14 to 12/19/14

SUBMITTED:

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: Matrix:

Comments:

PAM-3 Air

Lab ID:

Sample Volume:

4121804-06

m³

Sampled: 12/17/14 16:22 Received: 12/18/14 10:10

Analysis Date: 12/22/14 15:10

Hexavalent Chromium by SOP ERG-MOR-063

21.62

Results

<u>MDL</u>

<u>Analyte</u>

CAS Number

ng/m³ Air

ng/m³ Air

Hexavalent Chromium

1854-02-99

ND

<u>Flag</u>

0.0036

DEC 2 4 2014

gastination in

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

PAM-4

Air

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

Description:

Comments:

ATTN: Mr. Jeff Boggs

Matrix:

PHONE: (443) 803-8495

FAX: (410) 266-8912

Lab ID:

Sample Volume:

4121804-07

21.58

m³

<u>Flag</u>

SUBMITTED:

SITE CODE:

AQS SITE CODE:

FILE #: 3926.00

REPORTED: 12/23/14 11:27

Honeywell Hex Chrome Study Sampled: 12/17/14 16:03

Received: 12/18/14 10:10

Analysis Date: 12/22/14 15:20

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

12/18/14 to 12/19/14

Analyte CAS Number Hexavalent Chromium 1854-02-99

Start Time 12/16/14 16:05

<u>ng/m³ Air</u> 0.146

ng/m³ Air

0.0036

DEC 2 4 2014

Initials: CR



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

Description:

Comments:

Analyte

Hexavalent Chromium

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Matrix:

PAM-21

FAX: (410) 266-8912

Lab ID:

4121804-08

Sample Volume:

21.68

 $\,m^3$

SUBMITTED:

SITE CODE:

AQS SITE CODE:

FILE #: 3926.00

REPORTED: 12/23/14 11:27

Sampled: 12/17/14 00:00

Honeywell Hex Chrome Study

Received: 12/18/14 10:10 Analysis Date: 12/22/14 15:30

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

12/18/14 to 12/19/14

CAS Number 1854-02-99

<u>ng/m³ Air</u> ND

<u>Flag</u>

ng/m³ Air 0.0036

DEC 2 4 2014

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.



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-31

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 12/23/14 11:27

SUBMITTED:

12/18/14 to 12/19/14

AQS SITE CODE:

Lab ID: 4121804-09

Sample Volume:

Honeywell Hex Chrome Study

SITE CODE:

 $\,m^3$

Sampled: 12/17/14 00:00

Received: 12/18/14 10:10

Analysis Date: 12/22/14 15:40

Hexavalent Chromium by SOP ERG-MOR-063

21.62

Results

<u>MDL</u>

Analyte CAS Number Hexavalent Chromium

1854-02-99

ng/m³ Air ND

<u>Flag</u>

ng/m³ Air

0.0036

DEC 2 4 2014

Initials: CR

Eastern Research Group

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Page 11 of 22



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

Comments:

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

FAX: (410) 266-8912

Start Time 12/17/14 15:10

FILE #: 3926.00

REPORTED: 12/23/14 11:27

SUBMITTED:

12/18/14 to 12/19/14

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: Matrix:

OAM 1

Lab ID:

Sample Volume:

4121908-01

m³

Sampled: 12/18/14 14:55 Received: 12/19/14 11:32

Analysis Date: 12/22/14 15:49

Hexavalent Chromium by SOP ERG-MOR-063

21.38

Results

MDL

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

ng/m³ Air ND

<u>Flag</u>

ng/m³ Air 0.0036

DEC 2 4 2014

Initials: CR

Eastern Research Group

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Page 12 of 22



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Matrix:

Comments:

FAX: (410) 266-8912

Start Time 12/17/14 15:39

FILE #: 3926.00

REPORTED: 12/23/14 11:27

SUBMITTED:

12/18/14 to 12/19/14

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description:

OAM 2

Lab ID:

Sample Volume:

4121908-02

m³

Sampled: 12/18/14 15:16

Received: 12/19/14 11:32

Analysis Date: 12/22/14 15:59

Hexavalent Chromium by SOP ERG-MOR-063

21.26

Results

MDL

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

ng/m³ Air ND

Flag

ng/m³ Air 0.0036

DEC 2 4 2014

Initials: CR

Eastern Research Group

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Environmental Resources Management, Inc.

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

Matrix:

Comments:

PHONE: (443) 803-8495

FAX: (410) 266-8912

Col 1 Start Time 12/17/14 17:02

FILE #: 3926.00

REPORTED: 12/23/14 11:27

SUBMITTED: 12/18/14 to 12/19/14

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description:

PAM-1

Lab ID:

Sample Volume:

4121908-03

m³

Sampled: 12/18/14 16:30 Received: 12/19/14 11:32

Analysis Date: 12/22/14 13:40

Hexavalent Chromium by SOP ERG-MOR-063

21.12

Results

MDL

Analyte Hexavalent Chromium

CAS Number

ng/m³ Air

<u>Flag</u>

<u>ng/m³ Air</u>

1854-02-99

0.0143

0.0036

DEC 2 4 2014

Initials: CR

Eastern Research Group

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Page 14 of 22



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: 12/23/14 11:27

12/18/14 to 12/19/14

SUBMITTED:

AQS SITE CODE:

SITE CODE:

m³

Honeywell Hex Chrome Study

Description: PAM-1D

Lab ID:

Sample Volume:

4121908-04

21.05

Sampled: 12/18/14 16:32

Received: 12/19/14 11:32 Analysis Date: 12/22/14 14:00

Comments:

Col 2 Start Time 12/17/14 17:09

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

Analyte Hexavalent Chromium **CAS Number**

ng/m³ Air

<u>Flag</u>

ng/m³ Air 0.0036

1854-02-99 0.0109

DEC 2 4 2014

Initials: CR

Eastern Research Group

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Environmental Resources Management, Inc.

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Matrix:

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 12/23/14 11:27

12/18/14 to 12/19/14

SUBMITTED:

AQS SITE CODE: SITE CODE:

Honeywell Hex Chrome Study

Description:

Comments:

PAM-2

Start Time 12/17/14 16:43

Lab ID:

Sample Volume:

4121908-05

m³

Sampled: 12/18/14 16:10 Received: 12/19/14 11:32

Analysis Date: 12/22/14 16:09

Hexavalent Chromium by SOP ERG-MOR-063

21.11

Results

<u>MDL</u>

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

ng/m³ Air 0.0052

<u>Flag</u>

ng/m³ Air

0.0036

DEC 2 4 2014

Initials: CR



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

Description:

Comments:

Analyte

Hexavalent Chromium

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Matrix:

Air

PAM-3

Start Time 12/17/14 16:29

FAX: (410) 266-8912

Lab ID: 4121908-06

Sample Volume:

21.09

m³

FILE #: 3926.00

SUBMITTED:

SITE CODE:

AQS SITE CODE:

REPORTED: 12/23/14 11:27

12/18/14 to 12/19/14

Honeywell Hex Chrome Study Sampled: 12/18/14 15:55

Received: 12/19/14 11:32

Analysis Date: 12/22/14 16:19

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

CAS Number 1854-02-99

ng/m³ Air ND

<u>Flag</u>

ng/m³ Air 0.0036

DEC 2 4 2014

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.



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 12/23/14 11:27

12/18/14 to 12/19/14

SUBMITTED:

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: Matrix:

PAM-4

Lab ID:

Sample Volume:

4121908-07

21.16 m³ Sampled: 12/18/14 15:38 Received: 12/19/14 11:32

Analysis Date: 12/22/14 16:29

Comments: Start Time 12/17/14 16:08

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

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

ng/m³ Air 0.0722

<u>Flag</u>

ng/m³ Air

0.0036

DEC 2 4 2014

Initials: CZ

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 22



Environmental Resources Management, Inc.

PAM-21

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

Description:

Comments:

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Matrix:

FAX: (410) 266-8912

4121908-08

Sample Volume:

Lab ID:

21.11

m³

SUBMITTED:

SITE CODE:

AQS SITE CODE:

FILE #: 3926.00

REPORTED: 12/23/14 11:27

Honeywell Hex Chrome Study

Sampled: 12/18/14 00:00

Received: 12/19/14 11:32 Analysis Date: 12/22/14 16:59

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

CAS Number

ng/m³ Air

<u>Flag</u>

ng/m³ Air

12/18/14 to 12/19/14

Hexavalent Chromium

Analyte

1854-02-99

ND

0.0036

DEC 2 4 2014

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 22



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-31

FAX: (410) 266-8912

Lab ID:

4121908-09

Sample Volume:

21.09

m³

SUBMITTED:

SITE CODE:

AQS SITE CODE:

FILE #: 3926.00

REPORTED: 12/23/14 11:27

Sampled: 12/18/14 00:00

Honeywell Hex Chrome Study

Received: 12/19/14 11:32 Analysis Date: 12/22/14 17:09

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

12/18/14 to 12/19/14

CAS Number

ng/m³ Air

<u>ng/m³ Air</u>

Analyte Hexavalent Chromium

1854-02-99

ND

<u>Flag</u>

0.0036

DEC 2 4 2014

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

January 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 December 30, 2014. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #33369:

SDG

Fraction

4122325

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: December 19 through December 20, 2014

LDC Report Date: January 5, 2015

Matrix: Air

Parameters: Hexavalent Chromium

Validation Level: **EPA Level IV**

Laboratory: Eastern Research Group

Sample Delivery Group (SDG): 4122325

Sample Identification

OAM 1 (12/19/14) PAM-1 (12/20/14)DUP OAM 2 (12/19/14) PAM-1D (12/20/14)DUP

PAM-1 (12/19/14) PAM-1D (12/19/14)

PAM-2 (12/19/14)

PAM-3 (12/19/14)

PAM-4 (12/19/14)

PAM-21 (12/19/14)

PAM-31 (12/19/14)

OAM 1 (12/20/14)

OAM 2 (12/20/14)

PAM-1 (12/20/14)

PAM-1D (12/20/14)

PAM-2 (12/20/14) PAM-3 (12/20/14)

PAM-4 (12/20/14)

PAM-21 (12/20/14)

PAM-31 (12/20/14) PAM-1 (12/19/14)DUP

PAM-1D (12/19/14)DUP

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

Introduction

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

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

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

The following are definitions of the data qualifiers:

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

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

I. Technical Holding Times

All technical holding time requirements were met.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met.

IV. Blanks

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

Samples PAM-31 (12/19/14) and PAM-31 (12/20/14) were identified as trip blanks. No hexavalent chromium was found.

Samples PAM-21 (12/19/14) and PAM-21 (12/20/14) were identified as field blanks. No hexavalent chromium was found.

V. Matrix Spike/Matrix Spike Duplicates

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

VI. Duplicates

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

VII. Laboratory Control Samples

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

VIII. Sample Result Verification

All sample result verifications were acceptable.

IX. Overall Assessment of Data

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

X. Field Duplicates

Samples PAM-1 (12/19/14) and PAM-1D (12/19/14) and samples PAM-1 (12/20/14) and PAM-1D (12/20/14) 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 (12/19/14)	PAM-1D (12/19/14)	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.0612	0.0568	7 (≤20)	-	-

	Concentrat	ion (ng/m³)				
Analyte	PAM-1 (12/20/14)	PAM-1D (12/20/14)	RPD (Limits)	Flags	A or P	
Hexavalent chromium	0.0197	0.0190	4 (≤20)	-	-	

Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Data Qualification Summary - SDG 4122325

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
4122325

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 4122325

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

Validation Area	Co	mments					
The samples listed below were reviewed validation findings worksheets.	for each of the following validation areas. Valid	lation findings are noted in attached					
METHOD: Hexavalent Chromium (ASTM D7614)							
Laboratory: Eastern Research Group		Reviewer: 37 2nd Reviewer:					
SDG #: 4122325	Level IV	Page: 1 of 1					
LDC #: 33369A6 VALIDA	ATION COMPLETENESS WORKSHE	- 1 - 1 -					

	Validation Area		Comments
1.	Technical holding times	A	Sampling dates: \2\19\14 - \12\25\14
11	Initial calibration	A	
III.	Calibration verification	A	
IV	Blanks	A	
V	Matrix Spike/Matrix Spike Duplicates	N	Not Required
VI.	Duplicates	A	DUP
VII.	Laboratory control samples	A	LCSID
VIII.	Sample result verification	A	
IX.	Overall assessment of data	A	
X.	Field duplicates	SW	FD= (3,4) (12,113)
XI	Field blanks	QU	FB=(8)(n) TB=(9)(18)

Note:

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

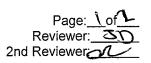
ND = No compounds detected R = Rinsate FB = Field blank

D = Duplicate TB = Trip blank EB = Equipment blank

Validated Samples: Aws

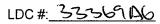
							·
1	OAM 1(12/19/14)	11	OAM 2(12/20/14)	21	PAM-1(12/20/14)DUP	31	
2	OAM 2(12/19/14)	12	PAM-1(12/20/14)	22	PAM-1D(12/20/14)DUP	32	
3_	PAM-1(12/19/14)	13	PAM-1D(12/20/14)	23		33	
4	PAM-1D(12/19/14)	14	PAM-2(12/20/14)	24		34	
5	PAM-2(12/19/14)	15	PAM-3(12/20/14)	25		35	
6	PAM-3(12/19/14)	16	PAM-4(12/20/14)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

Notes:		 	



Method:Inorganics (EPA Method See Cover)				
Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	/			
Cooler temperature criteria was met.				
II. Calibration	•			
Were all instruments calibrated daily, each set-up time?	/			
Were the proper number of standards used?				
Were all initial calibration correlation coefficients ≥ 0.995?	1			,
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?			/	

Ling



VALIDATION FINDINGS CHECKLIST

Page: 2_of_2 Reviewer: 30 2nd Reviewer: 4

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>33369A6</u>

VALIDATION FINDINGS WORKSHEET

Field Duplicates

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

Inorganics: Method See Cover

	Concentrati	on (ng/ml)		
Analyte	3	RPD (≤20)	Qual.	
Hexavalent Chromium	0.0612	0.0568	7	

	Concentrati	Concentration (ng/)				
Analyte	12	RPD (≤20)	Qual.			
Hexavalent Chromium	0.0197	0.0190	4			

 $\verb|\LDCFILESERVER|\Validation|\FIELD DUPLICATES|\FD_inorganic|\33369A6.wpd|$

LDC #: 33349A4

Validation Findings Worksheet Initial and Continuing Calibration Calculation Verification

Page: <u>\</u>	_ of <u>_\</u>
Reviewer:_	20
2nd Review	rer:_ <i>O</i> 2

Method: Inorganics, Method _	See Cover		
The correlation coefficient (r) for the	calibration of 🖒 wa	as recalculated.Calibration date	: 12/29/14

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 <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	0.0000182			
	!	s2	0.1	0.0000435	0.99979	0.99980	
	- \	s3	0.2	0.0000822			4*
	Coso	s4	0.5	0.0002154			
		s5	1	0.0004385			
		s6	2	0.0009141		-	
コムン いろう Calibration verification	Cray	5 and 0.4936mg/ml	True O.Snajul		98.7%R	98.7%R	3
Calibration verification	Cxx	O.4991 ndml			99.8%		7
Calibration verification							

Comments: Refer to Calibration	Verification findings \	worksheet for list of	qualifications and as	ssociated samples wh	en reported results	s do not agree withi
10.0% of the recalculated results	. * Rounding					

LDC #: 33369A6

VALIDATION FINDINGS WORKSHEET Level IV Recalculation Worksheet

Page:_	<u>\</u> of_\
Reviewer:	30
2nd Reviewer:	Q.

METHOD: Inorganics,	MethodS	ee Cover	
Percent recoveries (%	R) for a labora	atory control sam	ple and a matrix spike sample were recalculated using the following formula:
%R = <u>Found</u> x 100 True	Where,	Found =	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).
		True = cond	centration of each analyte in the source.
A sample and duplicate	e relative perc	ent difference (R	PD) was recalculated using the following formula:

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

Sample ID	Type of Analysis	Element	Found / S (units)	True / D (units)	Recalculated %R / RPD	Reported %R / RPD	Acceptable (Y/N)
12:03	Laboratory control sample	Cx	1.006 ng/ml	1-00 mg/ml	101%R	101%R	3)
N	Matrix spike sample		(SSR-SR)				
DUP 14:22	Duplicate sample	Cxxx	0.0619 ng/m³	0.0612 mg/m3	1.14%89	1.21% 220	7

Comments: _	 	 		
	·····		 	

LDC #: 33369A6

VALIDATION FINDINGS WORKSHEET

Sample Calculation Verification

Page:_	\	_of_	1
Reviewer:		3	D
nd reviewer.	•	0	

METHOD: Inorganics, Method _	See Cover	
Y N N/A Have results been Y N N/A Are results within	for all questions answered "N en reported and calculated co n the calibrated range of the i limits below the CRQL?	
Compound (analyte) results for _recalculated and verified using the		reported with a positive detect were
Concentration = (A-Co) / C, Co = -8166-000 Co = 0.0004582 A = 0.000084		$\frac{(0.000094 - (-8.69E-06))}{0.000458Z} = 0.03948mg/ml$ $\frac{(0.03948mg/ml)(10ml)}{21.33m^3} = 0.0185mg/m^3$

#	Sample ID	Analyte	Reported Concentration (Na(w ³)	Calculated Concentration (শুর্ খণ্য ³)	Acceptable (Y/N)
	\	C+10	0.0142	1410.0	KC
	2		0.0178	0.0177	44
	8)		0.0612	0.0617	<u>~</u>
	Ч		0.0568	0-0568	\
	S		0.0249	0-0249	
	6		0.0142	0.0142	
	7		0.0658	0.0658	
	8		00	ND	
	9		<i>PD</i>	ND	
	10		70	わら	
	()		ND	りる	
	12		0.0197	0.0197	4
	13		0.0190	0.0191	Y¥
	14		0.0289	0.0289	7
	12		0.0185	2810.0	
	طا		0.0250	0.0250	
	17		100	NO	
	18	4	ND	NO	_ 4

Note:	* Rounding				
)			



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

12/30/14 14:57 REPORTED:

Malvern, PA 19355

SUBMITTED:

12/23/14

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:

4122325-01

Sampled: 12/19/14 14:58

Matrix: Air

Sample Volume:

m³

Received: 12/23/14 12:26

Comments:

Start Time 12/18/14 14:59

21.58

Analysis Date: 12/29/14 18:57

Hexavalent Chromium by SOP ERG-MOR-063

Results ng/m³ Air

Flag

<u>MDL</u> ng/m³ Air

Analyte Hexavalent Chromium

CAS Number 1854-02-99

0.0142

0.0036

JAN 05 2015

Initials: CR



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

12/30/14 14:57 REPORTED:

Malvern, PA 19355

SUBMITTED:

12/23/14

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

FAX: (410) 266-8912

SHE CODE:

Honeywell Hex Chrome Study

Description:

OAM 2

Lab ID:

4122325-02

Sampled: 12/19/14 15:21

Matrix:

Air

Sample Volume:

21.63 m^3 Received: 12/23/14 12:26

Comments:

Start Time 12/18/14 15:19

Analysis Date: 12/29/14 15:02

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

CAS Number

<u>ng/m³ Air</u>

Flag

ng/m³ Air

Hexavalent Chromium

Analyte

1854-02-99

0.0178

0.0036

JAN 05 2015

Initials: CR

Eastern Research Group

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

Page 4 of 22



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

12/30/14 14:57 REPORTED:

Malvern, PA 19355

SUBMITTED:

12/23/14

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:

4122325-03

Sampled: 12/19/14 16:21

Matrix: Air

Sample Volume:

m³

Received: 12/23/14 12:26

Comments:

Col 1 Start Time 12/18/14 16:33

21.42

Analysis Date: 12/29/14 14:12

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

0.0612

0.0036

JAN 0 5 2015

Initials: CR



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

12/30/14 14:57 REPORTED:

Malvern, PA 19355

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12/23/14

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

FAX: (410) 266-8912

SITE CODE:

Honeywell Hex Chrome Study

Description:

Comments:

PAM-1D

Lab ID:

4122325-04

Sampled: 12/19/14 16:25

Matrix: Air

Col 2 Start Time 12/18/14 16:37

Sample Volume: 21.42 m³

Received: 12/23/14 12:26

Analysis Date: 12/29/14 13:13

Hexavalent Chromium by SOP ERG-MOR-063

Analyte

CAS Number

Results ng/m³ Air

<u>Flag</u>

MDL ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0568

0.0036

JAN 05 2015

Initials: CR

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Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

12/30/14 14:57 REPORTED:

Malvern, PA 19355

SUBMITTED:

12/23/14

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:

4122325-05

Sampled: 12/19/14 16:07

Matrix:

Sample Volume:

21.49

Received: 12/23/14 12:26

Comments:

Start Time 12/18/14 16:14

m³

Analysis Date: 12/29/14 19:07

Hexavalent Chromium by SOP ERG-MOR-063

<u>MDL</u>

Analyte

CAS Number

Results ng/m³ Air

Flag

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0249

0.0036

JAN 05 2015

Initials: CR



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED: 12/30/14 14:57

Malvern, PA 19355

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12/23/14

AQS SITE

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

SITE CODE:

Honeywell Hex Chrome Study

Description:

Lab ID:

4122325-06

Sampled: 12/19/14 15:57

Matrix:

PAM-3 Air

Sample Volume:

21.57 m³ Received: 12/23/14 12:26

Comments:

Start Time 12/18/14 15:58

Analysis Date: 12/29/14 15:22

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

Analyte

CAS Number

FAX: (410) 266-8912

ng/m³ Air

Flag

na/m³ Air

Hexavalent Chromium

1854-02-99

0.0142

0.0036

JAN 05 2015

Initials: CR

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Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

12/30/14 14:57 REPORTED:

Malvern, PA 19355

SUBMITTED:

12/23/14

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

FAX: (410) 266-8912

SITE CODE:

Honeywell Hex Chrome Study

Description:

PAM-4

Lab ID:

4122325-07

Sampled: 12/19/14 15:42

Matrix:

Air

Sample Volume:

m³

Received: 12/23/14 12:26

Comments:

Start Time 12/18/14 15:41

21.61

Analysis Date: 12/29/14 17:50

Hexavalent Chromium by SOP ERG-MOR-063

MDL

Analyte

CAS Number

Results ng/m³ Air

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0658

0.0036

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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 22



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

12/30/14 14:57 REPORTED:

Malvern, PA 19355

SUBMITTED:

12/23/14

AQS SITE

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

Honeywell Hex Chrome Study

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

SITE CODE:

Sampled: 12/19/14 00:00

Matrix: Air Sample Volume:

Lab ID:

m³

Received: 12/23/14 12:26

Comments:

21.49

Analysis Date: 12/29/14 15:41

Hexavalent Chromium by SOP ERG-MOR-063

4122325-08

Results

MDL

Analyte

CAS Number

ng/m³ Air

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

ND

0.0036

JAN 05 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED: 12/30/14 14:57

Malvern, PA 19355

SUBMITTED:

12/23/14

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

FAX: (410) 266-8912

SHECODE:

Honeywell Hex Chrome Study

Description:

PAM-31

Lab ID:

4122325-09

Sampled: 12/19/14 00:00

Matrix:

Sample Volume:

21.57 m³ Received: 12/23/14 12:26

Comments:

Analysis Date: 12/29/14 15:51

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

JAN 05 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

12/30/14 14:57 REPORTED:

Malvern, PA 19355

SUBMITTED:

12/23/14

AQS SITE

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

FAX: (410) 266-8912

SODE:

Honeywell Hex Chrome Study

Description:

OAM 1

Lab ID:

4122325-10

Sampled: 12/20/14 14:52

Matrix: Air

Sample Volume:

Received: 12/23/14 12:26

Comments: Start Time 12/19/14 15:01 21.46

m³

Analysis Date: 12/29/14 16:01

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

Analyte

CAS Number

<u>ng/m³ Air</u>

Flag

ng/m³ Air

Hexavalent Chromium

1854-02-99

ND

0.0036

JAN 05 2015

Initials: CR

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Page 12 of 22



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

12/30/14 14:57 REPORTED:

Malvern, PA 19355

SUBMITTED:

12/23/14

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

Honeywell Hex Chrome Study

Description: OAM 2 FAX: (410) 266-8912

4122325-11

SITE CODE:

Sampled: 12/20/14 15:09

Matrix:

Air

Sample Volume:

Lab ID:

21.38

Received: 12/23/14 12:26

Comments:

Start Time 12/19/14 15:24

m³

Analysis Date: 12/29/14 16:11

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

Analyte

CAS Number

ng/m³ Air

Flag

<u>ng/m³ Air</u>

Hexavalent Chromium

1854-02-99

ND

0.0036

JAN 05 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

12/30/14 14:57 REPORTED:

SUBMITTED:

12/23/14

Malvern, PA 19355

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:

4122325-12

Sampled: 12/20/14 16:11

Matrix:

Sample Volume:

m³

Received: 12/23/14 12:26

Comments:

Col 1 Start Time 12/19/14 16:25

21.38

Analysis Date: 12/29/14 13:32

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

0.0197

0.0036

JAN 05 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

12/30/14 14:57 REPORTED:

Malvern, PA 19355

SUBMITTED:

12/23/14

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

STECODE: FAX: (410) 266-8912

Honeywell Hex Chrome Study

Description:

PAM-1D

Lab ID:

4122325-13

Sampled: 12/20/14 16:14

Matrix: Air

Sample Volume:

21.39 m³ Received: 12/23/14 12:26

Comments: Col 2 Start Time 12/19/14 16:28

Analysis Date: 12/29/14 13:52

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

0.0190

0.0036

JAN 05 2015

Initials: CR

Eastern Research Group

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

Page 15 of 22



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

12/30/14 14:57 REPORTED:

Malvern, PA 19355

12/23/14

SUBMITTED:

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

FAX: (410) 266-8912

CODE:

Honeywell Hex Chrome Study

Description:

PAM-2

Lab ID:

4122325-14

Sampled: 12/20/14 15:50

Matrix:

Air

Sample Volume:

m³

Received: 12/23/14 12:26

Comments:

Start Time 12/19/14 16:09

21.31

Analysis Date: 12/29/14 18:17

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

0.0289

0.0036

JAN 05 2015

Initials: CR

Eastern Research Group

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

Page 16 of 22



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

12/30/14 14:57 REPORTED:

Malvern, PA 19355

SUBMITTED:

12/23/14

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:

4122325-15

Sampled: 12/20/14 15:41

Matrix:

Air

Sample Volume:

m³

Received: 12/23/14 12:26

Comments:

Start Time 12/19/14 15:59

21.33

Analysis Date: 12/29/14 19:17

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

0.0185

0.0036

JAN 05 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

12/30/14 14:57 REPORTED:

Malvern, PA 19355

SUBMITTED:

12/23/14

ATTN: Mr. Jeff Boggs

AQS SITE

<u>Flag</u>

PHONE: (443) 803-8495

FAX: (410) 266-8912

SHE CODE:

Honeywell Hex Chrome Study

Description:

PAM-4

Lab ID:

4122325-16

Sampled: 12/20/14 15:29

Matrix: Air

Sample Volume:

21.36

Received: 12/23/14 12:26

Comments:

Start Time 12/19/14 15:45

m³

Analysis Date: 12/29/14 17:01

Hexavalent Chromium by SOP ERG-MOR-063

Results ng/m³ Air

MDL ng/m³ Air

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

0.0250

0.0036

JAN 05 2015

Initials: CR

Eastern Research Group

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

Page 18 of 22



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

12/30/14 14:57 REPORTED:

SUBMITTED:

Malvern, PA 19355

12/23/14

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

SITE CODE: FAX: (410) 266-8912

Honeywell Hex Chrome Study

Description: PAM-21 Lab ID:

4122325-17

Sampled: 12/20/14 00:00

Matrix: Air Sample Volume:

m³

Received: 12/23/14 12:26

Comments:

21.31

Analysis Date: 12/29/14 17:11

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

ND

0.0036

JAN 05 2015

Initials: CR

Eastern Research Group

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

Page 19 of 22



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

12/30/14 14:57 REPORTED:

Malvern, PA 19355

SUBMITTED:

12/23/14

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

SITE CODE:

Honeywell Hex Chrome Study

Description:

PAM-31

Lab ID:

4122325-18

Sampled: 12/20/14 00:00

Matrix: Air Sample Volume:

m³

Received: 12/23/14 12:26

Comments:

21.33

Analysis Date: 12/29/14 17:21

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

Analyte

CAS Number

FAX: (410) 266-8912

na/m³ Air

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

ND

0.0036

JAN 05 2015

Initials: CR

Eastern Research Group

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

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

January 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 December 31, 2014. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #33377:

SDG

Fraction

4122325

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:

December 22, 2014

LDC Report Date:

January 5, 2015

Matrix:

Air

Parameters:

Hexavalent Chromium

Validation Level:

EPA Level IV

Laboratory:

Eastern Research Group

Sample Delivery Group (SDG): 4122325

Sample Identification

OAM 1

OAM 2

PAM-1

PAM-1D

PAM-2

PAM-3

PAM-4

PAM-21

PAM-31

PAM-1DUP

PAM-1DDUP

Introduction

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

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

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

The following are definitions of the data qualifiers:

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

I. Technical Holding Times

All technical holding time requirements were met.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met.

IV. Blanks

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

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

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

V. Matrix Spike/Matrix Spike Duplicates

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

VI. Duplicates

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

VII. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) 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	on (ng/m³)			
Analyte	PAM-1	PAM-1D	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.0310	0.0276	12 (≤20)	-	-

Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Data Qualification Summary - SDG 4122325

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 4122325

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 4122325

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

LDC #: 33377A6

VALIDATION COMPLETENESS WORKSHEET

SDG #: 4122325(19-27)-

Level IV Laboratory: Eastern Research Group

Reviewer: 2nd Reviewer:

METHOD: Hexavalent Chromium (ASTM D7614)

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

	Validation Area		Comments
l.	Technical holding times	A	Sampling dates: 121 2244
II	Initial calibration	A	
III.	Calibration verification	A	
ΙV	Blanks	A	
V	Matrix Spike/Matrix Spike Duplicates	2	Not Required
VI.	Duplicates	A	DUP
VII.	Laboratory control samples	A	LUSID
VIII.	Sample result verification	1	
IX.	Overall assessment of data	A	
X.	Field duplicates	SW	FD=(3,4)
ΧI	Field blanks	DU	FB=(8) TB=(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

Validated Samples: Aur S

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

Notes:_	Samples	(19-27)	

Method: Inorganics (EPA Method See Care)

Method:Inorganics (EPA Method 🗫 ക്രേപ്				
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 <u>90-11-0</u> % QC limits?				
Were titrant checks performed as required? (Level IV only)	<u> </u>		_	
Were balance checks performed as required? (Level IV only)	<u> </u>	ļ <u>.</u>		
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?				

Airs

LDC #: 33377Ab

VALIDATION FINDINGS CHECKLIST

Page: 2 of Z Reviewer: 50 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?	/			
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>33377A6</u>

VALIDATION FINDINGS WORKSHEET

Field Duplicates

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

Inorganics: Method See Cover

	Concentrati			
Analyte	3	4	RPD (≤20)	Qual.
Hexavalent Chromium	0.0310	0.0276	12	

\\LDCFILESERVER\Validation\FIELD DUPLICATES\FD_inorganic\33377A6.wpd

LDC #: 33377A6

Validation Findings Worksheet Initial and Continuing Calibration Calculation Verification

Page: \ of \	
Reviewer:_30_	
2nd Reviewer: C7	_

Method: Inorganics	, Method	See Cover	

The correlation coefficient (r) for the calibration of was recalculated. Calibration date: 12/3-01-4

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	0.0000134			
		s2	0.1	0.0000367	0.99964	0.99963	
		s3	0.2	0.0000754			
	Crabo	s4	0.5	0.0002066) •
		s5	1	0.0003982			\mathcal{L}
		s6	2	0.0008472			
ユω ハニハ Calibration verification	Crass	Found O. 5228 ng/ml	True O. Snajmi		104.68E	104.67.2	
Calibration verification	Cryo	0.5244 ng/m)			104.9%	104.9%2	4
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

LDC #: 33377A6

VALIDATION FINDINGS WORKSHEET Level IV Recalculation Worksheet

Page: <u>\</u> of_\	
Reviewer: 30	
2nd Reviewer:	

METHOD: Inorganics, Method _	Sear	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:

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

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)
11:47 LCS	Laboratory control sample	C+10	1.112ng/m	1_00mg/ml	111%2	111%R	7
2	Matrix spike sample		(SSR-SR)				
DUP 13:27	Duplicate sample	Crito	0.0307 ngjm3	0.0310 ng/m3	0.97% 490	1.20%	ソ

Comments:			 		
				_	

LDC#: 33377Ab

VALIDATION FINDINGS WORKSHEET

Sample Calculation Verification

Page:_	<u>\</u> of <u>\</u>
Reviewer:	30
nd reviewer:	a

METH	OD: Inorganics, Method	d See Core	×			
Please Y N Y N Y N	N/A Are results w	ow for all questions and been reported and cal ithin the calibrated rand ion limits below the Cl	lculated correctly? age of the instrument RQL?		e identified as "N/	A".
	ound (analyte) results f ulated and verified usin	g the following equation		······································	orted with a positiv	
Conceņ	tration = $(A - Co)$	Vf= 10m1 Re	ecalculation:	00678 - (-9.	67E-06))	N 1824~
A =	81800000	M3 = 21.6	0	.000 UZUS	3 -	
(1)	8724000.0 9.67E-04 - 0.0004248	Vf= 10m1 Re M3 = 21.6 (Ng/M) (VL) M3	·=valu3	D(0,1824)(10 21.6	$\frac{3m!}{m^3} = 0.08$	syl najviš
#	Sample ID	Anal		Reported Concentration (\www.^5)	Calculated Concentration (ハム(いろ)	Acceptable (Y/N)
	\		-	0.0221	0-0551	2
	2			NO	100	
	3			0.0310	0.0310	
	Ť			0.0276	0.0276	
	5			0.0844	0.0844	
	6			0.0291	0.0291	
	7			0.0270	0.0270	
	8			NO	DO	
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Note:_	400				•	



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

REPORTED:

12/31/14 10:56

SUBMITTED:

FILE #: 3926.00

12/23/14

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: Matrix:

OAM 1

Lab ID:

Sample Volume:

4122325-19

m³

Sampled: 12/22/14 14:52

Received: 12/23/14 12:26 Analysis Date: 12/30/14 13:58

Comments: Start Time 12/21/14 15:10

Hexavalent Chromium by SOP ERG-MOR-063

21.33

<u>Results</u>

MDL

Analyte

CAS Number

ng/m³ Air

<u>Flaq</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0221

0.0036

JAN 05 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:

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Air

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FILE #: 3926.00

REPORTED:

12/23/14

SUBMITTED:

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description:

OAM 2

Start Time 12/21/14 15:32

Lab ID:

Sample Volume:

4122325-20

Sampled: 12/22/14 15:18 Received: 12/23/14 12:26

Analysis Date: 12/30/14 15:28

Hexavalent Chromium by SOP ERG-MOR-063

21.39

Results

MDL

12/31/14 10:56

Analyte

CAS Number

ng/m³ Air

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

ND

0.0036

JAN 05 2015

Initials: CR

Eastern Research Group

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

Page 4 of 13



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Matrix:

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FAX: (410) 266-8912

Col 1 Start Time 12/21/14 16:30

FILE #: 3926.00

REPORTED:

12/31/14 10:56 12/23/14

SUBMITTED:

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description:

Comments:

PAM-1

Lab ID:

Sample Volume:

4122325-21

m³

Sampled: 12/22/14 16:25 Received: 12/23/14 12:26

Analysis Date: 12/30/14 13:18

Hexavalent Chromium by SOP ERG-MOR-063

21.52

Results

MDL

Analyte

CAS Number

ng/m³ Air

Flag

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0310

0.0036

JAN 05 2015

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Page 5 of 13



Environmental Resources Management, Inc

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Air

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 12/31/14 10:56 12/23/14

SUBMITTED:

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description:

Matrix:

PAM-1D

Lab ID:

Sample Volume:

4122325-22

m³

Sampled: 12/22/14 16:27

Analysis Date: 12/30/14 13:37

Received: 12/23/14 12:26

Comments:

Col 2 Start Time 12/21/14 16:32

Hexavalent Chromium by SOP ERG-MOR-063

21.53

Results

<u>MDL</u>

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

ng/m³ Air

Flag

ng/m³ Air

0.0276

0.0036

JAN 05 2015

Initials: CR

Eastern Research Group

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Page 6 of 13



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75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 12/31/14 10:56

SUBMITTED:

12/23/14

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: Matrix:

PAM-2 Air

Start Time 12/21/14 16:10

Lab ID:

Sample Volume:

4122325-23

m³

Sampled: 12/22/14 16:10 Received: 12/23/14 12:26

Analysis Date: 12/30/14 15:37

Hexavalent Chromium by SOP ERG-MOR-063

21.6

Results

<u>MDL</u>

Analyte

CAS Number

ng/m³ Air

<u>Flag</u>

ng/m3 Air

Hexavalent Chromium

Comments:

1854-02-99

0.0844

0.0036

JAN 05 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

PAM-3

Air

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

Description:

Comments:

ATTN: Mr. Jeff Boggs

Matrix:

PHONE: (443) 803-8495

Start Time 12/21/14 16:01

FAX: (410) 266-8912

Lab ID:

4122325-24

Sample Volume:

21.57

m³

Flag

SITE CODE:

SUBMITTED:

AQS SITE CODE:

FILE #: 3926.00

REPORTED: 12/31/14 10:56

Honeywell Hex Chrome Study

Sampled: 12/22/14 15:59 Received: 12/23/14 12:26

Analysis Date: 12/30/14 15:47

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

12/23/14

Hexavalent Chromium

Analyte

CAS Number 1854-02-99

ng/m³ Air 0.0291

<u>ng/m³ Air</u>

0.0036

JAN 05 2015

Initials: CR

Eastern Research Group

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Page 8 of 13



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

Matrix:

Comments:

PHONE: (443) 803-8495

Air

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 12/31/14 10:56

SUBMITTED: 12/23/14

AQS SITE CODE:

SITE CODE:

m³

Honeywell Hex Chrome Study

Description:

PAM-4

Lab ID:

4122325-25

21.39

Sampled: 12/22/14 15:37 Received: 12/23/14 12:26

Analysis Date: 12/30/14 14:58

Start Time 12/21/14 15:51

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

Analyte

CAS Number

ng/m³ Air 0.0270

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium 1854-02-99

Sample Volume:

0.0036

JAN 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 9 of 13



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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:

4122325-26

Sample Volume:

m³

SUBMITTED:

SITE CODE:

AQS SITE CODE:

FILE #: 3926.00

REPORTED: 12/31/14 10:56

Honeywell Hex Chrome Study Sampled: 12/22/14 00:00

Received: 12/23/14 12:26

Analysis Date: 12/30/14 15:08

Hexavalent Chromium by SOP ERG-MOR-063

21.6

Results

<u>MDL</u>

12/23/14

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

ng/m³ Air ND

Flag

<u>ng/m³ Air</u> 0.0036

JAN 05 2015

Initials: CR

Eastern Research Group

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

Page 10 of 13



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

Description:

Comments:

Matrix:

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

PAM-31

Air

FAX: (410) 266-8912

Lab ID:

4122325-27

Sample Volume:

21.57

m³

SITE CODE:

SUBMITTED:

AQS SITE CODE:

FILE #: 3926.00

REPORTED: 12/31/14 10:56

Honeywell Hex Chrome Study

Sampled: 12/22/14 00:00 Received: 12/23/14 12:26

Analysis Date: 12/30/14 15:18

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

12/23/14

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

<u>ng/m³ Air</u> ND

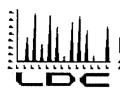
<u>Flag</u>

ng/m³ Air 0.0036

JAN 05 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

January 9, 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 January 6, 2015. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #33420:

SDG

Fraction

4123037/4123101

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

Attachment 1 113 pages-SF 1 WEEK TAT LDC #33420 (ERM - Morrisville, NC / Harbor Point, MD, Hexavalent Chromium Monitoring) Level IV (3) DATE DATE Cr(VI) (D7614) DUE SDG# REC'D LDC Matrix: Air/Water/Soil 01/06/15 01/13/15 18 10 4123037/4123101 0 0 0 0 0 0 0 0 0 0 0 0 A/CR lTotal

Laboratory Data Consultants, Inc. Data Validation Report

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

Collection Date: December 29 through December 30, 2014

LDC Report Date: January 9, 2015

Matrix: Air

Parameters: Hexavalent Chromium

Validation Level: EPA Level IV

Laboratory: Eastern Research Group

Sample Delivery Group (SDG): 4123037/4123101

Sample Identification

OAM 1 (12/29/14) PAM-1 (12/30/14)DUP OAM 2 (12/29/14) PAM-1D (12/30/14)DUP

PAM-1 (12/29/14)

PAM-1D (12/29/14)

PAM-2 (12/29/14)

PAM-3 (12/29/14)

PAM-4 (12/29/14)

PAM-21 (12/29/14)

PAM-31 (12/29/14)

OAM 1 (12/30/14)

OAM 2 (12/30/14) PAM-1 (12/30/14)

PAM-1D (12/30/14)

PAM-10 (12/30/14)

PAM-3 (12/30/14)

PAM-4 (12/30/14)

PAM-21 (12/30/14)

PAM-31 (12/30/14)

PAM-1 (12/29/14)DUP

PAM-1D (12/29/14)DUP

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

Introduction

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

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

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

The following are definitions of the data qualifiers:

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

I. Technical Holding Times

All technical holding time requirements were met.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met.

IV. Blanks

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

Samples PAM-31 (12/29/14) and PAM-31 (12/30/14) were identified as trip blanks. No hexavalent chromium was found.

Samples PAM-21 (12/29/14) and PAM-21 (12/30/14) were identified as field blanks. No hexavalent chromium was found.

V. Matrix Spike/Matrix Spike Duplicates

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

VI. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits with the following exceptions:

DUP ID (Associated Samples)	Analyte	Difference (Limits)	Flag	A or P
PAM-1D (12/30/14)DUP (PAM-1D (12/30/14))	Hexavalent chromium	0.0088 ng/m³ (≤0.0036)	J (all detects)	А

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 (12/29/14) and PAM-1D (12/29/14) and samples PAM-1 (12/30/14) and PAM-1D (12/30/14) were identified as field duplicates. No hexavalent chromium was detected in any of the samples with the following exceptions:

	Concentrati	ion (ng/m³)	555		
Analyte	PAM-1 (12/29/14)	PAM-1D (12/29/14)	RPD (Limits)	Flags	AorP
Hexavalent chromium	0.0207	0.0170	20 (≤20)	-	-

	Concentrat	ion (ng/m³)	555			
Analyte	PAM-1 (12/30/14)	PAM-1D (12/30/14)	RPD (Limits)	Flags	A or P	
Hexavalent chromium	0.0127	0.0157	21 (≤20)	NQ	-	

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

Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Data Qualification Summary - SDG 4123037/4123101

SDG	Sample	Analyte	Flag	A or P	Reason
4123037/ 4123101	PAM-1D (12/30/14)	Hexavalent chromium	J (all detects)	А	Duplicate sample analysis (difference)

Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG 4123037/4123101

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 4123037/4123101

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

LDC #: 33420A6 VALIDATION COMPLETENESS WORKSHEET

Level IV

SDG #: 412303/4123101 Laboratory: Eastern Research Group Page: \of \
Reviewer: \of \of \omega

2nd Reviewer: \of \omega

METHOD: Hexavalent Chromium (ASTM D7614)

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

	Validation Area		Comments
1.	Technical holding times	A	Sampling dates: \2\29 - 30 \14
- 11	Initial calibration	A	
III.	Calibration verification	A	
IV	Blanks	A	
V	Matrix Spike/Matrix Spike Duplicates	N	Not Required
VI.	Duplicates	SW	DUP
VII.	Laboratory control samples	A	LCSID
VIII.	Sample result verification	A	
IX.	Overall assessment of data	A	
Х.	Field duplicates	Su	FO=(3,4)(12,13)
XI	Field blanks	W	FB=(8)(17) TB=(9)(8)

Note: A = Acceptable

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

R = Rinsate

FB = Field blank

D = Duplicate

TB = Trip blank EB = Equipment blank

Validated Samples:

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

Notes:		

Method:Inorganics (EPA Method & Love)

Method:Inorganics (EPA Method 火 しいべ)	T			
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 9 0-410 % 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) \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	

Dis



VALIDATION FINDINGS CHECKLIST

Page: __of __ Reviewer: ____ 2nd Reviewer: ____

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 #: 33420A6

VALIDATION FINDINGS WORKSHEET <u>Duplicate Analysis</u>

	Page:_	l	_of_	1
	Reviewer:	-	30	2
2nd	Reviewer:		0	*
			۷.	

METHOD: Inorganics (See Cover)

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

Was a duplicate sample analyzed for each matrix in this SDG?

Were all duplicate sample relative percent differences (RPD) ≤ 20% for air samples and ≤ 35% for soil samples? If no, see qualifications below. A control limit of ±R.L. (±2X R.L. for soil) was used for sample values that were <5X the R.L., including the case when only one of the duplicate sample values was <5X R.L.. If field blanks were used for laboratory duplicates, note in the Overall Assessment.

LEVEL IV ONLY:

Y(N)N/A

,	1	
, 、,	N N/A	Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.
ĮΥ	/ NI NI/A	Where recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations
1 .	/ 134 134//3	TACIO ICCAICUIALEM ICSULIS ACCEDIADIC: OCC LEVEL IV INCCAICUIALION VOINSITEEL IOI IECAICUIALIONS.

₽	14//		l l		11111000100100100101111	T		
#	D-4-	Dentile of a ID		A I I	DDD (11. 16.)	(ng/m3) Difference (Limits)		
╟╇┪	<u>Date</u>	Duplicate ID	Matrix	Analyte	RPD (Limits)	Difference (Limits)	Associated Samples	Qualifications
Ш		22	Airs	Cr+6		0.0088 (0.0036)	13*	J/UJ/A (de l∕nd)
Ш								
Ш								
Ш								
Ш		****		-				
Щ								
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Comments:	*Parent only because other Dup in SDG ok		

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Page: _	1	_of_	7
Reviewer:_	7	<u> Sr</u>	2
2nd Reviewer:_		α	_

Inorganics: Method See Cover

	Concentra	tion (ng/m3)		
Analyte	3	4	RPD (≤20)	Qual.
Hexavalent Chromium	0.0207	0.0170	20	

	Concentra	tion (ng/m3)		
Analyte	12	13	RPD (≤20)	Qual.
Hexavalent Chromium	0.0127	0.0157	21	NQ

NQ = No Qual because one or both samples below 5X the MDL

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

LDC#: 33420A6

Validation Findings Worksheet <u>Initial and Continuing Calibration Calculation Verification</u>

Page:\	_ of	
Reviewer:_	<u> </u>	Ω
2nd Review	er:_	a

Method:	Inorganics,	Method	See Cover	

The correlation coefficient (r) for the calibration of was recalculated. Calibration date: 01/05/15

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	0.0000162			
		s2	0.1	0.0000395	0.99998	0.99998	
	Cxx	s3	0.2	0.0000852			4
	Cx.	s4	0.5	0.0002205			\cup
		s5	1	0.0004368			ĵ.
		s6	2	0.0008784			
ゴン ハンス& Calibration verification	Cxxx	5043 ralm	True 0.5 ng/ml		1007%E	100,9%	
Civ \2\28 Calibration verification	Cab	0.5109 mpla)			102.2%	10Z.Z%P	4
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 #: SSYNDAY

VALIDATION FINDINGS WORKSHEET Level IV Recalculation Worksheet

Page:\of\	
Reviewer: 30	
2nd Reviewer:	

WETHOD: Inorganics, I	Method	Sce	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:

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

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 N.58	Laboratory control sample	Carp	0.2100 rg/m	1.00 ng/m/	91.6%	91.6%	7
2	Matrix spike sample		(SSR-SR)				
PUP	Duplicate sample	Crip	0.0200mg/m ²	0.0228 rg/m³	3.92%.PM	3.38%,@0	94

Comments:	*Ros voling			•

LDC#: 33420146

VALIDATION FINDINGS WORKSHEET

Sample Calculation Verification

Page:_	<u></u> of `
Reviewer:	SD
2nd reviewer:	\bigcirc

				Zna reviev	wer:
METH	OD: Inorganics, Method	See Cover			
	N/A Have results l N/A Are results wi	w for all questions answered "N". Not appl been reported and calculated correctly? thin the calibrated range of the instrument ion limits below the CRQL?		e identified as "N/	A".
Compo recalci	ound (analyte) results fould along the contract of the contrac	or	repo	orted with a positiv	ve detect were
Concen	tration = $(A - C_0)$	Vf=10ml Recalculation: 0.000	20077 nghal	-(-3,47E-	هر))
Δ,		m= 21.41	0.0004	ار کے	= 0.0
Co	= -3.475-06 = 0.00000 = 0.0004413	(hgh)(ub) = ng/m3	(0.025mg)	m1)(10ml) =	0-0121 n
#	Sample ID	Analyte	Reported Concentration (W\\m^2)	Calculated Concentration (หลุโนรี)	Acceptable (Y/N)
	((x20	170	<i>PD</i>	3
	2		. NO	60	Sp
	3		0.0207	0.0208	7×
	4		0-0170	1710.0	7*
	5		0.0234	D.0234	3
	6		0.0118	0011	4*
			0.0730	0.0230	<u>y</u>
	8		NO	NO	4
	9		- NO	ND	
	lò		0.0121	0.0121	4
	11		0-0118	0.0117	72
	12		0.027	0.0127	7
	13		0.0159	0.0158	¥ W
	14		0.0708	0.0208	2
	72		721G.0	0.0157	
	lb		0.0232	0.0232	
	17		00	Da	
	18	<u> </u>	ND	CU	4
Note:					



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED:

01/06/15 15:14

Malvern, PA 19355

SUBMITTED:

12/30/14 to 12/31/14

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

Air

FAX: (410) 266-8912

SITE CODE:

m³

Honeywell Hex Chrome Study

Description:

Comments:

OAM 1

Lab ID:

Sample Volume:

4123037-01

Sampled: 12/29/14 14:52

Matrix:

Start Time 12/28/14 14:38

21.81

Received: 12/30/14 12:01 Analysis Date: 01/05/15 14:47

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

ND

0.0036

JAN 07 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED: 01/06/15 15:14

SUBMITTED:

12/30/14 to 12/31/14

Malvern, PA 19355 ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

FAX: (410) 266-8912

SITE CODE:

Honeywell Hex Chrome Study

Description:

OAM 2

Lab ID: 4123037-02

Sampled: 12/29/14 15:12

Matrix:

Air

Sample Volume:

21.81 m³

Received: 12/30/14 12:01 Analysis Date: 01/05/15 14:57

Comments:

Start Time 12/28/14 14:58

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

JAN 07 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

Col 1 Start Time 12/28/14 15:56

FILE #: 3926.00

REPORTED:

01/06/15 15:14

SUBMITTED:

12/30/14 to 12/31/14

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description: Matrix:

Comments:

PAM-1

Air

Lab ID:

Sample Volume:

4123037-03

21.77 m³ Sampled: 12/29/14 16:07

Received: 12/30/14 12:01 Analysis Date: 01/05/15 14:07

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

Analyte

CAS Number

<u>ng/m³ Air</u>

<u>Flaq</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0207

0.0036

JAN 07 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

PAM-1D

Air

Col 2 Start Time 12/28/14 15:56

Lab ID:

4123037-04

Sample Volume:

21.83

m³

FILE #: 3926.00

SUBMITTED:

AQS SITE SITE CODE:

REPORTED: 01/06/15 15:14

Sampled: 12/29/14 16:11 Received: 12/30/14 12:01

Honeywell Hex Chrome Study

Analysis Date: 01/05/15 17:46

Hexavalent Chromium by SOP ERG-MOR-063

<u>Results</u>

MDL

12/30/14 to 12/31/14

CAS Number

ng/m³ Air

Flag

ng/m³ Air

Hexavalent Chromium

Analyte

1854-02-99

0.0170

0.0036

JAN 07 2015

Initials: CR



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED: 01/06/15 15:14

Malvern, PA 19355

SUBMITTED:

12/30/14 to 12/31/14

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

SUECODE:

Honeywell Hex Chrome Study

Description:

Comments:

PAM-2

Lab ID: 4123037-05

Sampled: 12/29/14 15:55

Matrix: Air

.

Start Time 12/28/14 15:31

Sample Volume:

21.94 m³

Received: 12/30/14 12:01

Analysis Date: 01/05/15 15:07

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>Flaq</u>

<u>ng/m³ Air</u>

Hexavalent Chromium

1854-02-99

0.0234

0.0036

JAN 07 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED: 01/06/15 15:14

Malvern, PA 19355

SUBMITTED:

12/30/14 to 12/31/14

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

Air

FAX: (410) 266-8912

SITE CODE:

Honeywell Hex Chrome Study

Description: Matrix:

Comments:

PAM-3

Start Time 12/28/14 15:24

Lab ID:

Sample Volume:

4123037-06

 m^3

Sampled: 12/29/14 15:45 Received: 12/30/14 12:01

21.91

Analysis Date: 01/05/15 15:17

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

0.0118

0.0036

JAN 07 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED: 01/06/15 15:14

Malvern, PA 19355

SUBMITTED:

12/30/14 to 12/31/14

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

SITE CODE:

Honeywell Hex Chrome Study

Description:

PAM-4

Lab ID: 4123037-07

Sampled: 12/29/14 15:29

Matrix: Air

Sample Volume:

Received: 12/30/14 12:01

Comments:

Start Time 12/28/14 15:15

21.81 m³

Analysis Date: 01/05/15 15:27

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

0.0230

0.0036

JAN 07 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

FAX: (410) 266-8912

Air

PAM-21

Lab ID:

4123037-08

Sample Volume:

21.94

m³

SUBMITTED:

AQS SITE CODE:

FILE #: 3926.00

REPORTED: 01/06/15 15:14

Honeywell Hex Chrome Study Sampled: 12/29/14 00:00

Received: 12/30/14 12:01

Analysis Date: 01/05/15 15:37

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

12/30/14 to 12/31/14

CAS Number

ng/m³ Air

<u>Flaq</u>

ng/m³ Air

Hexavalent Chromium

Analyte

1854-02-99

ND

0.0036

JAN 07 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

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

Description:

Comments:

ATTN: Mr. Jeff Boggs

Matrix:

PHONE: (443) 803-8495

FAX: (410) 266-8912

Air

PAM-31

Lab ID:

Sample Volume:

4123037-09

21.91

m³

FILE #: 3926.00

SUBMITTED:

AQS SITE SITE CODE:

REPORTED: 01/06/15 15:14

12/30/14 to 12/31/14

Sampled: 12/29/14 00:00

Honeywell Hex Chrome Study

Received: 12/30/14 12:01 **Analysis Date:** 01/05/15 15:46

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

JAN 07 2015

See Age of the

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 22



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED: 01/06/15 15:14

Malvern, PA 19355

SUBMITTED:

12/30/14 to 12/31/14

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:

Sample Volume:

4123101-01

m³

Sampled: 12/30/14 14:46 Received: 12/31/14 10:38

Matrix: Comments:

Start Time 12/29/14 14:55

Analysis Date: 01/05/15 17:25

Hexavalent Chromium by SOP ERG-MOR-063

21.47

Results

<u>MDL</u>

Analyte

CAS Number

ng/m³ Air

<u>Flaq</u>

ng/m3 Air

Hexavalent Chromium

1854-02-99

0.0121

0.0036

JAN 07 2015

compagnition

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 12 of 22



Environmental Resources Management, Inc

FILE #: 3926.00 •

75 Valley Stream Parkway, Suite 400

REPORTED: 01/06/15 15:14

Malvern, PA 19355

SUBMITTED:

12/30/14 to 12/31/14

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

FAX: (410) 266-8912

SITE CODE:

Honeywell Hex Chrome Study

Description:

OAM 2

Lab ID:

4123101-02

Sampled: 12/30/14 15:09

Matrix:

Air

Sample Volume:

21.51 m³

Received: 12/31/14 10:38

Comments: Si

Start Time 12/29/14 15:15

.1.51

Analysis Date: 01/05/15 18:46

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

<u>Analyte</u>

CAS Number

<u>ng/m³ Air</u>

Flag

<u>ng/m³ Air</u>

Hexavalent Chromium

1854-02-99

0.0118

0.0036

JAN 07 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 13 of 22



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

Description:

Comments:

Analyte

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

FAX: (410) 266-8912

Matrix:

Air

PAM-1

Col 1 Start Time 12/29/14 16:11

Sample Volume:

Lab ID:

21.84

 m^3

FILE #: 3926.00

REPORTED:

SUBMITTED:

AQS SITE SITE CODE:

Honeywell Hex Chrome Study

Sampled: 12/30/14 16:27

Received: 12/31/14 10:38 Analysis Date: 01/05/15 13:27

Hexavalent Chromium by SOP ERG-MOR-063

Results

4123101-03

<u>MDL</u>

01/06/15 15:14

12/30/14 to 12/31/14

CAS Number Hexavalent Chromium

1854-02-99

ng/m³ Air 0.0127

Flag

ng/m³ Air

0.0036

JAN 07 2015



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED: 01/06/15 15:14

Malvern, PA 19355

12/30/14 to 12/31/14

ATTN: Mr. Jeff Boggs

SUBMITTED: **AQS SITE**

PHONE: (443) 803-8495

FAX: (410) 266-8912

SITE CODE:

Honeywell Hex Chrome Study

Description:

PAM-1D

Lab ID:

4123101-04

Sampled: 12/30/14 16:29

Matrix:

Air

Sample Volume:

21.82

Received: 12/31/14 10:38

Comments:

Col 2 Start Time 12/29/14 16:15

m³

Analysis Date: 01/05/15 18:06

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

0.0159 5

0.0036

JAN 07 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.



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:

01/06/15 15:14

12/30/14 to 12/31/14

SUBMITTED:

AQS SITE

SITE CODE:

m³

Honeywell Hex Chrome Study

Description: Matrix:

PAM-2

Lab ID:

Sample Volume:

4123101-05

21.74

Sampled: 12/30/14 16:07

Received: 12/31/14 10:38 Analysis Date: 01/05/15 16:16

Air Comments: Start Time 12/29/14 15:58

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

0.0208

0.0036

JAN 07 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

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: 01/06/15 15:14

SUBMITTED:

12/30/14 to 12/31/14

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description: Matrix:

Comments:

PAM-3

Start Time 12/29/14 15:48

Air

Lab ID:

Sample Volume:

4123101-06

m³

Sampled: 12/30/14 15:56 Received: 12/31/14 10:38

Analysis Date: 01/05/15 16:46

Hexavalent Chromium by SOP ERG-MOR-063

21.71

Results

<u>MDL</u>

<u>Analyte</u>

CAS Number

ng/m³ Air

<u>Flaq</u>

ng/m3 Air

Hexavalent Chromium

1854-02-99

0.0157

0.0036

JAN 07 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.



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:

01/06/15 15:14

SUBMITTED:

12/30/14 to 12/31/14

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description: Matrix:

PAM-4

Air

Lab ID:

Sample Volume:

4123101-07

m³

Sampled: 12/30/14 15:33 Received: 12/31/14 10:38

Start Time 12/29/14 15:32

21.61

Analysis Date: 01/05/15 16:56

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

Analyte

CAS Number

ng/m³ Air

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

Comments:

1854-02-99

0.0232

0.0036

JAN 07 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.



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

Description:

Comments:

Analyte

Hexavalent Chromium

Matrix:

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

FAX: (410) 266-8912

Air

PAM-21

Lab ID:

4123101-08

Sample Volume:

21.74

m³

SUBMITTED:

AQS SITE SITE CODE:

FILE #: 3926.00 REPORTED:

Honeywell Hex Chrome Study

Sampled: 12/30/14 00:00

Received: 12/31/14 10:38 Analysis Date: 01/05/15 17:06

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

01/06/15 15:14

12/30/14 to 12/31/14

CAS Number 1854-02-99

ng/m³ Air ND

Flag

ng/m³ Air 0.0036

JAN 07 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 22



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED: 01/06/15 15:14

Malvern, PA 19355

SUBMITTED:

12/30/14 to 12/31/14

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:

4123101-09

Sampled: 12/30/14 00:00

Matrix: Air

Sample Volume:

21.71 m³ Received: 12/31/14 10:38

Analysis Date: 01/05/15 17:16

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

ND

0.0036

JAN 07 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

January 15, 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 January 13, 2015. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #33488:

SDG

Fraction

5010643

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

214 pages-SF 1 WEEK TAT Attachment 1 LDC #33488 (ERM - Morrisville, NC / Harbor Point, MD, Hexavalent Chromium Monitoring) Level IV (3) DATE Cr(VI) DATE (D7614) LDC SDG# REC'D DUE Matrix: Air/Water/Soil 01/13/15 01/20/15 35 0 5010643 0 0 0 0 0 0 0 0 0 0 T/CR Total

Laboratory Data Consultants, Inc. Data Validation Report

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

Collection Date: December 31, 2014 through January 5, 2015

LDC Report Date: January 15, 2015

Matrix: Air

Parameters: Hexavalent Chromium

Validation Level: EPA Level IV

Laboratory: Eastern Research Group

Sample Delivery Group (SDG): 5010643

Sample Identification

OAM 1 (12/31/14)	PAM-3 (1/03/15)
OAM 2 (12/31/14)	PAM-4 (1/03/15)
PAM-1 (12/31/14)	PAM-21 (1/03/15)
PAM-1D (12/31/14)	PAM-31 (1/03/15)
PAM-2 (12/31/14)	OAM 1 (1/05/15)
PAM-3 (12/31/14)	OAM 2 (1/05/15)
PAM-4 (12/31/14)	PAM-1 (1/05/15)
PAM-21 (12/31/14)	PAM-1D (1/05/15)
PAM-31 (12/31/14)	PAM-2 (1/05/15)
OAM 1 (1/02/15)	PAM-3 (1/05/15)
OAM 2 (1/02/15)	PAM-4 (1/05/15)
PAM-1 (1/02/15)	PAM-21 (1/05/15)
PAM-1D (1/02/15)	PAM-31 (1/05/15)
PAM-3 (1/02/15)	PAM-1 (12/31/14)DUP
PAM-4 (1/02/15)	PAM-1D (12/31/14)DUP
PAM-21 (1/02/15)	PAM-1 (1/02/15)DUP
PAM-31 (1/02/15)	PAM-1D (1/02/15)DUP
OAM 1 (1/03/15)	PAM-1 (1/03/15)DUP
OAM2 (1/03/15)	PAM-1D (1/03/15)DUP
PAM-1 (1/03/15)	PAM-1 (1/05/15)DUP
PAM-1D (1/03/15)	PAM-1D (1/05/15)DUP
PAM-2 (1/03/15)	

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

Introduction

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

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

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

The following are definitions of the data qualifiers:

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

I. Technical Holding Times

All technical holding time requirements were met.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met.

IV. Blanks

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

Samples PAM-31 (12/31/14), PAM-31 (1/02/15), PAM-31 (1/03/15), and PAM-31 (1/05/15) were identified as trip blanks. No hexavalent chromium was found.

Samples PAM-21 (12/31/14), PAM-21 (1/02/15), PAM-21 (1/03/15), and PAM-21 (1/05/15) were identified as field blanks. No hexavalent chromium was found.

V. Matrix Spike/Matrix Spike Duplicates

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

VI. Duplicates

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

VII. Laboratory Control Samples

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

VIII. Sample Result Verification

All sample result verifications were acceptable.

IX. Overall Assessment of Data

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

X. Field Duplicates

Samples PAM-1 (12/31/14) and PAM-1D (12/31/14), samples PAM-1 (1/02/15) and PAM-1D (1/02/15), samples PAM-1 (1/03/15) and PAM-1D (1/03/15), and samples PAM-1 (1/05/15) and PAM-1D (1/05/15) were identified as field duplicates. No hexavalent chromium was detected in any of the samples with the following exceptions:

	Concentration (ng/m³) PAM-1 (12/31/14) PAM-1D (12/31/14)				
Analyte			RPD (Limits)	Flags	A or P
Hexavalent chromium	0.0261	0.0251	4 (≤20)	-	-

	Concentration (ng/m³)				
Analyte	PAM-1 (1/02/15)	PAM-1D (1/02/15)	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.0320	0.0329	3 (≤20)	-	-

	Concentrat	ion (ng/m³)	222			
Analyte	PAM-1 (1/03/15)	PAM-1D (1/03/15)	RPD (Limits)	Flags	A or P	
Hexavalent chromium	0.0571	0.0641	12 (≤20)	-	-	

Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Data Qualification Summary - SDG 5010643

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 5010643

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 5010643

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

LDC #: 33488A6 VALIDATION COMPLETENESS WORKSHEET SDG #: 5010643 Level IV Laboratory: Eastern Research Group

	Date:	<u>1/14/12</u>
	Page:_	_ \of_ _
	Reviewer:	<u> </u>
2nd	Reviewer:	a

METHOD: (Analyte) Hexavalent Chromium (ASTM D7614)

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

	Validation Area		Comments
1.	Sample receipt/Technical holding times	A	12/31/14-1/5/15
II	Initial calibration	A	
III.	Calibration verification	A	
ĮV	Laboratory Blanks	A	
V	Field blanks	N2	FB=(8)(m)(26)(34) TB=(9)(18)(21/35)
VI.	Matrix Spike/Matrix Spike Duplicates	<i>N</i>	Not Regulied
VII.	Duplicate sample analysis	A	DUP ,
VIII.	Laboratory control samples	A	LUSID
IX.	Field duplicates	SW	FD=(3,4) (12,13) (21,22) (30,31)
X	Sample result verification	A	- / / /
L _{xi} _	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	OAM 1(12/31/14)	5010643-01	air	12/31/14
2	OAM 2(12/31/14)	5010643-02	air	12/31/14
3	PAM-1(12/31/14)	5010643-03	air	12/31/14
4	PAM-1D(12/31/14)	5010643-04	air	12/31/14
5	PAM-2(12/31/14)	5010643-05	air	12/31/14
6	PAM-3(12/31/14)	5010643-06	air	12/31/14
7	PAM-4(12/31/14)	5010643-07	air	12/31/14
8	PAM-21(12/31/14)	5010643-08	air	12/31/14
9	PAM-31(12/31/14)	5010643-09	air	12/31/14
10	OAM 1(01/02/15)	5010643-10	air	01/02/15
11	OAM 2(01/02/15)	5010643-11	air	01/02/15
12	PAM-1(01/02/15)	5010643-12	air	01/02/15
13	PAM-1D(01/02/15)	5010643-13	air	01/02/15
14	PAM-2(01/02/15)	5010643-14	air	01/02/15
15	PAM-3(01/02/15)	5010643-15	air	01/02/15
16	PAM-4(01/02/15)	5010643-16	air	01/02/15
17	PAM-21(01/02/15)	5010643-17	air	01/02/15

VALIDATION COMPLETENESS WORKSHEET

Level IV

SDG #: 5010643
Laboratory: Eastern Research Group

LDC #: 33488A6

Page: 2 of 2 Reviewer: 50 2nd Reviewer: 61

METHOD: (Analyte) Hexavalent Chromium (ASTM D7614)

	Client ID	Lab ID	Matrix	Date
18	PAM-31(01/02/15)	5010643-18	air	01/02/15
	OAM 1(01/03/15)	5010643-19	air	01/03/15
	OAM 2(01/03/15)	5010643-20	air	01/03/15
21	PAM-1(01/03/15)	5010643-21	air	01/03/15
22	PAM-1D(01/03/15)	5010643-22	air	01/03/15
23	PAM-2(01/03/15)	5010643-23	air	01/03/15
24	PAM-3(01/03/15)	5010643-24	air	01/03/15
25	PAM-4(01/03/15)	5010643-25	air	01/03/15
26	PAM-21(01/03/15)	5010643-26	air	01/03/15
27	PAM-31(01/03/15)	5010643-27	air	01/03/15
28	OAM 1(01/05/15)	5010643-28	air	01/05/15
29	OAM 2(01/05/15)	5010643-29	air	01/05/15
30	PAM-1(01/05/15)	5010643-30	air	01/05/15
31	PAM-1D(01/05/15)	5010643-31	air	01/05/15
32	PAM-3(01/05/15)	5010643-33	air	01/05/15
33	PAM-4(01/05/15)	5010643-34	air	01/05/15
34	PAM-21(01/05/15)	5010643-35	air	01/05/15
35	PAM-31(01/05/15)	5010643-36	air	01/05/15
36	PAM-1(12/31/14)DUP	5010643-03DUP	air	12/31/14
37	PAM-1D(12/31/14)DUP	5010643-04DUP	air	12/31/14
38	PAM-1(01/02/15)DUP	5010643-12DUP	air	01/02/15
39	PAM-1D(01/02/15)DUP	5010643-13DUP	air	01/02/15
40	PAM-1(01/03/15)DUP	5010643-21DUP	air	01/03/15
41	PAM-1D(01/03/15)DUP	5010643-22DUP	air	01/03/15
42	PAM-1(01/05/15)DUP	5010643-30DUP	air	01/05/15
43	PAM-1D(01/05/15)DUP	5010643-31DUP	air	01/05/15

LDC#: 33488146

VALIDATION FINDINGS CHECKLIST

Page: _of _ Reviewer: _S_ 2nd Reviewer:

Method: Inorganics (FPA Method See Carre)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	/			
Cooler temperature criteria was met.	/			
II. Calibration				
Were all instruments calibrated daily, each set-up time?	/			
Were the proper number of standards used?				
Were all initial calibration correlation coefficients ≥ 0.995?				
Were all initial and continuing calibration verification %Rs within the 99-110% 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.	9		/	
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: 2 of 2 Reviewer: 50 2nd Reviewer:

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?	1			
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>33488A6</u>

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Inorganics: Method See Cover

	Concentrati	on (ng/m3)		
Analyte	3 4		RPD (≤20)	Qual.
Hexavalent Chromium	0.0261	0.0251	4	

	Concentrati	222	01	
Analyte	12	13	RPD (≤20)	Qual.
Hexavalent Chromium	0.0320	0.0329	3	

	Concentration (ng/m3)		,	_
Analyte	21	22	RPD (≤20)	Qual.
Hexavalent Chromium	0.0571	0.0641	12	

\LDCFILESERVER\Validation\FIELD DUPLICATES\FD_inorganic\33488A6.wpd

LDC #: 3348846

Validation Findings Worksheet Initial and Continuing Calibration Calculation Verification

Page:\	<u>_</u> of
Reviewer:	QZ
2nd Reviev	ver: 9

Method: Inorganics, Method <u>See Cover</u>	
The correlation coefficient (r) for the calibration of was recalculated. Calibration date: \(\sigma \)\(\sigma \)\(\sigma \)	

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 <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	0.0000123			
		s2	0.1	0.0000323	0.99920	0.99920	
	CXX	s3	0.2	0.0000784			
		s4	0.5	0.0002107]		4
		s5	1	0.0003887			\supset
		s6	2	0.0008471			
Teシー ハンコ Calibration verification	Cray	Ford O. Signalm	True 0. Snglml		102.8%R	102-89.R	
CC V2.26 Calibration verification	Crth	0.5165ng/ml	a. Single		1033%	-103.382	
Calibration verification							

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

LDC #: 33488AV

VALIDATION FINDINGS WORKSHEET Level IV Recalculation Worksheet

Page: 1 of 1
Reviewer: <u>るり</u>
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	Element	Found / S (units)	True / D (units)	Recalculated %R / RPD	Reported %R / RPD	Acceptable (Y/N)
11:57	Laboratory control sample	طيد	1.05 ng/m1	1-00ng/ml	105%R	1059.R	2
N	Matrix spike sample		(SSR-SR)				
15,2P DNS	Duplicate sample	Crass	0.0252mg/m3	0.0262 mg/m³	3.89%	3,53%.RPD	7)

Comments: _	 			
		•	_	

LDC#: 33488AV

VALIDATION FINDINGS WORKSHEET

Sample Calculation Verification

Page:_	(_of_	Z
Reviewer:	2	35	5
nd reviewer: -		<u></u>	

METHOD: Inorganics, Method	See Cover			
Y N N/A Are results within	or all questions answere on reported and calculat on the calibrated range of limits below the CRQL?	ted correctly? f the instrument	•	fied as "N/A".
Compound (analyte) results for _ recalculated and verified using th	,	2+6	reported w	ith a positive detect were
Concentration = $(A-C_0)C_1$	W=10m/ Recalculary 13 = 21.34	ation: (0.00	320.1-)-(8P00000 04SV000.0	-05) - 0.0479 ng/ml
C1=0.0004240	(nglm1)(cf)	(O.047A.	ng/m1) (10m1) = ():224 ng/m³

#	Sample ID	Analyte	Reported Concentration (水小)	Calculated Concentration (va)m ²)	Acceptable (Y/N)
	l	C+10	au au	20	3
	2		0.0224	0-0224	7
	3		0.0261	0.0262	734
	ŭ		0.0251	0.0252	3x
			0.0312	0.313	3 *
	6		<i>ND</i>	とり	2
	7		0.0316	0.0316	1
	8		DQ	60	
	ς		00	OU	
	lò		100	<i>PO</i>	
	11		0.0238	0.0238	4
	12		0.0320	0.0321	97×
	13		0.0829	0.0329	<u>5</u>
	14		0.0220	0.0221	4*
	- 15		NO	NO	3)
	16		0-0401	0.0401	
			PD	20	
	18		Qu	20	1
	19	•	0.0403	0.0403	7)
	20	\	0.0536	0.0536	7

Note:_	*Rounding				
)			
				-	

LDC #: 33488AVO

VALIDATION FINDINGS WORKSHEET

Sample Calculation Verification

Page:	<u>Zof Z</u>
Reviewer:_	30
2nd reviewer:_	

MET	HOD: Ino	rganics, Metho	d <u>See</u>	Cover	<u> </u>			_	
Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A". Y N N/A									
	recalculated and verified using the following equation: Concentration = $(A co) / C$, WE so where $(C coss) - (-1.25E - 05)$ WE so where $(C coss) - (-1.25E - 05)$								
		Aco)/C,	Ufal	の叫 Recalc 2173	ulation: (0,000	0.000387 50000387	(C = 0Z)	0.1242~	ماسا
ı		5 E-05 .000382	(,,,),,	(20)(12	_	0.000			_
		250 000 . 250 000 .		m3		+2 ng/m/) (19 21:73 n	$\frac{7}{\sqrt{3}} = 0$	0571 ng/m	ح

#	Sample ID	Analyte	Reported Concentration (५०)५४)	Calculated Concentration (va) w ²)	Acceptable (Y/N)
	21	Cr+10	0.0571	0.0571	7
	22)	0.0641	0.064)	3
	23		0.0792	0.072	4
	24		4240.0	0.0453	4×
	25		0.0600	0.0599	9*
	26		00	ND	y
	27		ND	CU	
	78		8810.0	0.0188	
	29		64	<i>PD</i>	
	30		20	2	
	31		20	20	
	32		20	<i>QU</i>	
	33		0.0253	0.0253	
	34		69	60	
	34 35	4	20	G	7

Note:_	外节	200ns	7.				
_	*			 			
			_	 	 	 	



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:

01/13/15 13:17 01/06/15

SUBMITTED:

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Analysis Date: 01/07/15 14:47

Description: Matrix:

OAM 1

Lab ID:

Sample Volume:

5010643-01

21.24

m³

Sampled: 12/31/14 14:25 Received: 01/06/15 11:49

Comments: Start Time 12/30/14 14:49

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

ND

0.0036

JAN 1 5 2015



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Start Time 12/30/14 15:14

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

01/13/15 13:17 01/06/15

SUBMITTED:

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description:

Comments:

OAM 2

Lab ID:

Sample Volume:

5010643-02

m³

Sampled: 12/31/14 14:57 Received: 01/06/15 11:49

Analysis Date: 01/07/15 14:57

Hexavalent Chromium by SOP ERG-MOR-063

21.34

Results

<u>MDL</u>

Analyte

CAS Number

ng/m³ Air

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0224

0.0036

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01/13/15 13:17

SUBMITTED:

01/06/15

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description:

PAM-1

Lab ID:

Sample Volume:

5010643-03

20.97

Sampled: 12/31/14 15:37

Received: 01/06/15 11:49 Analysis Date: 01/07/15 14:06

Comments: Col 1 Start Time 12/30/14 16:31

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

Analyte Hexavalent Chromium **CAS Number**

ng/m³ Air

<u>Flag</u>

ng/m³ Air

1854-02-99

0.0261

0.0036

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01/13/15 13:17 01/06/15

SUBMITTED:

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Analysis Date: 01/07/15 13:06

Description:

PAM-1D

Lab ID:

Sample Volume:

5010643-04

Sampled: 12/31/14 15:38

Received: 01/06/15 11:49

Comments:

Col 2 Start Time 12/30/14 16:32

Hexavalent Chromium by SOP ERG-MOR-063

20.79

Results

MDL

Analyte

CAS Number

ng/m³ Air

<u>Flag</u>

m³

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0251

0.0036

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Comments:

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PAM-2

Start Time 12/30/14 16:10

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

01/13/15 13:17

SUBMITTED: 01/06/15

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Sampled: 12/31/14 15:28

Lab ID:

Sample Volume:

20.97

Received: 01/06/15 11:49

Analysis Date: 01/07/15 15:06

Hexavalent Chromium by SOP ERG-MOR-063

5010643-05

Results

MDL

Analyte Hexavalent Chromium

CAS Number 1854-02-99

ng/m³ Air 0.0312

Flag

ng/m³ Air 0.0036

Initials: CR

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Page 8 of 40



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01/13/15 13:17

SUBMITTED: 01/06/15

AQS SITE

SITE CODE:

Flag

Honeywell Hex Chrome Study

Description:

PAM-3

Lab ID:

Sample Volume:

5010643-06

21.04

Sampled: 12/31/14 15:21 Received: 01/06/15 11:49

Analysis Date: 01/07/15 15:16

Start Time 12/30/14 15:58

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

Analyte Hexavalent Chromium

CAS Number 1854-02-99

ng/m³ Air ND

ng/m³ Air

0.0036

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REPORTED:

01/13/15 13:17

SUBMITTED: 01/06/15

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description: Matrix:

PAM-4

Lab ID:

Sample Volume:

5010643-07

m³

Sampled: 12/31/14 15:13

Comments:

Start Time 12/30/14 15:36

21.25

Received: 01/06/15 11:49 Analysis Date: 01/07/15 17:25

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

Analyte Hexavalent Chromium **CAS Number**

ng/m³ Air

Flag

ng/m³ Air

1854-02-99

0.0316

0.0036

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REPORTED:

01/13/15 13:17

01/06/15 SUBMITTED:

AQS SITE

SUPECODE:

Honeywell Hex Chrome Study

Description: Matrix:

Comments:

PAM-21

Air

Lab ID:

Sample Volume:

5010643-08

m³

Sampled: 12/31/14 00:00 Received: 01/06/15 11:49

Analysis Date: 01/07/15 15:36

Hexavalent Chromium by SOP ERG-MOR-063

20.97

Results

<u>MDL</u>

Analyte

CAS Number

ng/m³ Air

Flag

ng/m³ Air

* Hexavalent Chromium

1854-02-99

0.0036

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Initials: CR

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Page 11 of 40



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Air

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 01/13/15 13:17

SUBMITTED: 01/06/15

AQS SITE

SODE:

Honeywell Hex Chrome Study

Description:

Comments:

Malvern, PA 19355

PAM-31

Lab ID:

Sample Volume:

5010643-09

21.04

m³

Sampled: 12/31/14 00:00 Received: 01/06/15 11:49

Analysis Date: 01/07/15 15:46

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

Analyte

CAS Number

ng/m³ Air

ng/m³ Air

Hexavalent Chromium

1854-02-99

ND

<u>Flag</u>

0.0036

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Start Time 1/1/15 14:46

FILE #: REPORTED:

01/13/15 13:17

3926.00

SUBMITTED:

01/06/15

AQS SITE

CODE:

Honeywell Hex Chrome Study

Description: Matrix:

Comments:

OAM 1

Lab ID:

Sample Volume:

5010643-10

Sampled: 01/02/15 14:30 Received: 01/06/15 11:49

Analysis Date: 01/07/15 15:56

Hexavalent Chromium by SOP ERG-MOR-063

21.36

Results

MDL

Analyte

CAS Number

ng/m³ Air

Flag

ng/m³ Air

Hexavalent Chromium

1854-02-99

ND

0.0036

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FILE #: 3926.00

REPORTED: SUBMITTED: 01/13/15 13:17 01/06/15

AQS SITE

SODE:

Honeywell Hex Chrome Study

Description:

OAM 2 Air

Lab ID:

Sample Volume:

5010643-11

21.46 m³ Sampled: 01/02/15 14:52

Received: 01/06/15 11:49 Analysis Date: 01/07/15 16:06

Comments:

Matrix:

Start Time 1/1/15 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

0.0238

0.0036

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FILE #: 3926.00

REPORTED:

01/13/15 13:17

01/06/15 SUBMITTED:

AQS SITE

SODE:

Honeywell Hex Chrome Study

Description: PAM-1

Lab ID:

5010643-12

Sampled: 01/02/15 15:52 Received: 01/06/15 11:49

Matrix: Comments:

Col 1 Start Time 1/1/15 15:57

Sample Volume:

21.52

m³

Analysis Date: 01/07/15 13:26

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

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

ng/m³ Air

<u>Flag</u>

ng/m³ Air

0.0320 0.0036

JAN 1 5 2015

Initials: CR

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Page 15 of 40



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

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

01/13/15 13:17

SUBMITTED:

01/06/15

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description: Matrix:

PAM-1D

Air

Lab ID:

Sample Volume:

5010643-13

21.58

m³

Sampled: 01/02/15 15:56 Received: 01/06/15 11:49

Analysis Date: 01/07/15 17:56

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

Analyte

Comments:

CAS Number

ng/m³ Air

Flag

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0329

0.0036

JAN 1 5 2015



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Malvern, PA 19355

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PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

01/13/15 13:17

01/06/15 SUBMITTED:

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description:

Comments:

PAM-2

Lab ID:

5010643-14

Sampled: 01/02/15 15:40

Matrix: Air

Start Time 1/1/15 15:48

Sample Volume: 21.48 m³

Received: 01/06/15 11:49

Analysis Date: 01/07/15 16:16

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

Analyte

CAS Number

ng/m³ Air

Flag

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0220

0.0036

JAN 1 5 2015

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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:

01/13/15 13:17

SUBMITTED:

01/06/15

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description: Matrix:

PAM-3

Lab ID:

Sample Volume:

5010643-15

21.65

Sampled: 01/02/15 15:30

Received: 01/06/15 11:49 Analysis Date: 01/07/15 16:46

Comments:

Start Time 1/1/15 15:27

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

Analyte Hexavalent Chromium

CAS Number

ng/m³ Air

<u>Flag</u>

<u>ng/m³ Air</u> 0.0036

1854-02-99 ND

JAN 1 5 2015



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75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 01/13/15 13:17

SUBMITTED: 01/06/15

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description:

PAM-4

Lab ID:

5010643-16

Sampled: 01/02/15 15:08

Matrix: Comments:

Start Time 1/1/15 15:18

Sample Volume: 21.45

Received: 01/06/15 11:49

Analysis Date: 01/07/15 16:55

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

Analyte Hexavalent Chromium

CAS Number 1854-02-99

ng/m³ Air 0.0401

<u>Flag</u>

ng/m³ Air

0.0036

JAN 1 5 2015



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

FILE #: 3926.00

REPORTED:

01/13/15 13:17

Malvern, PA 19355

SUBMITTED:

01/06/15

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:

5010643-17

Sampled: 01/02/15 00:00

Matrix:

Air

Sample Volume:

m³

Received: 01/06/15 11:49

Analysis Date: 01/07/15 17:05

Hexavalent Chromium by SOP ERG-MOR-063

21.48

Results

MDL

Analyte

CAS Number

ng/m³ Air

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0036

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Environmental Resources Management, Inc

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Malvern, PA 19355

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Air

FAX: (410) 266-8912

FILE #:

3926.00

REPORTED:

01/13/15 13:17 01/06/15

SUBMITTED:

AQS SITE

SITE CODE:

m³

Honeywell Hex Chrome Study

Description:

PAM-31

Lab ID:

Sample Volume:

5010643-18

21.65

Sampled: 01/02/15 00:00

Analysis Date: 01/07/15 17:15

Received: 01/06/15 11:49

Comments:

Matrix:

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

Analyte

CAS Number

ng/m³ Air

ng/m³ Air

Hexavalent Chromium

1854-02-99

ND

<u>Flag</u>

0.0036

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FILE #: 3926.00

REPORTED:

01/13/15 13:17 01/06/15

SUBMITTED:

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description:

OAM 1

Lab ID:

Sample Volume:

5010643-19

m³

Sampled: 01/03/15 14:11

Matrix: Air Comments:

Start Time 1/2/15 14:33

21.27

Received: 01/06/15 11:49 Analysis Date: 01/08/15 16:44

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

0.0403

0.0036

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Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Matrix:

Comments:

Analyte

Description: OAM 2

FAX: (410) 266-8912

Lab ID:

5010643-20

Sample Volume: 21.36

FILE #: 3926.00

REPORTED:

SUBMITTED:

AQS SITE SITE CODE:

Honeywell Hex Chrome Study Sampled: 01/03/15 14:56

Received: 01/06/15 11:49

Analysis Date: 01/08/15 14:25

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

01/13/15 13:17

01/06/15

Hexavalent Chromium

Start Time 1/2/15 14:55

<u>Flag</u>

<u>nq/m³ Air</u>

ng/m³ Air **CAS Number** 1854-02-99 0.0536 0.0036

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ATTN: Mr. Jeff Boggs

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Col 1 Start Time 1/2/15 15:56

FAX: (410) 266-8912

FILE #:

3926.00

REPORTED: SUBMITTED: 01/13/15 13:17

01/06/15

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description: Matrix:

Comments:

PAM-1

Lab ID:

Sample Volume:

5010643-21

<u>Flag</u>

Sampled: 01/03/15 16:04 Received: 01/06/15 11:49

Analysis Date: 01/08/15 12:16

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

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

ng/m³ Air 0.0571

21.73

<u>ng/m³ Air</u>

0.0036

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Col 2 Start Time 1/2/15 15:59

FILE #: 3926.00

REPORTED:

01/13/15 13:17

SUBMITTED: 01/06/15

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description: Matrix:

Comments:

PAM-1D

Lab ID:

Sample Volume:

5010643-22

m³

Sampled: 01/03/15 16:00 Received: 01/06/15 11:49

Analysis Date: 01/08/15 13:35

Hexavalent Chromium by SOP ERG-MOR-063

21.74

Results

MDL

Analyte

CAS Number

ng/m³ Air

<u>Flag</u>

<u>ng/m³ Air</u>

Hexavalent Chromium

1854-02-99

0.0641

0.0036

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FILE #: 3926.00

REPORTED:

01/13/15 13:17

SUBMITTED: 01/06/15

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description: Matrix:

PAM-2

Lab ID:

Sample Volume:

5010643-23

m³

Sampled: 01/03/15 15:44

Analysis Date: 01/08/15 16:54

Received: 01/06/15 11:49

Air Comments: Start Time 1/2/15 15:44

Hexavalent Chromium by SOP ERG-MOR-063

21.59

Results

<u>MDL</u>

Analyte

CAS Number

ng/m³ Air

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0792

0.0036

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Page 26 of 40



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Start Time 1/2/15 15:34

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: SUBMITTED: 01/13/15 13:17

01/06/15

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description: Matrix:

Comments:

PAM-3

Air

Lab ID:

Sample Volume:

5010643-24

21.51

Sampled: 01/03/15 15:34 Received: 01/06/15 11:49

Analysis Date: 01/08/15 14:45

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

0.0454

0.0036

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FILE #: 3926.00

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REPORTED: 01/13/15 13:17

SUBMITTED: 01/06/15

Malvern, PA 19355

AQS SITE

ATTN: Mr. Jeff Boggs

SITE CODE:

PHONE: (443) 803-8495

Comments:

FAX: (410) 266-8912

21.5

Honeywell Hex Chrome Study

Description:

PAM-4

Lab ID:

5010643-25

Sampled: 01/03/15 15:05

Matrix:

Air

Start Time 1/2/15 15:11

Sample Volume:

m³

Received: 01/06/15 11:49

Analysis Date: 01/08/15 14:55

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

Analyte

CAS Number

ng/m³ Air

Flag

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0600

0.0036

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FILE #: 3926.00

REPORTED:

01/13/15 13:17 01/06/15

SUBMITTED:

AQS SITE

SODE:

Honeywell Hex Chrome Study

Description: Matrix:

PAM-21

Air

Lab ID:

Sample Volume:

5010643-26

21.59

Sampled: 01/03/15 00:00 Received: 01/06/15 11:49

Comments:

m³

Analysis Date: 01/08/15 15:05

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

Analyte

CAS Number

ng/m³ Air

ng/m³ Air

Hexavalent Chromium

1854-02-99

ND

<u>Flag</u>

0.0036

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FILE #: 3926.00

REPORTED: SUBMITTED: 01/13/15 13:17

01/06/15

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description: Matrix:

PAM-31

Lab ID:

5010643-27

21.51

Sampled: 01/03/15 00:00

Sample Volume:

Received: 01/06/15 11:49 Analysis Date: 01/08/15 15:15

Comments:

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

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

ng/m³ Air ND

<u>Flag</u>

ng/m³ Air 0.0036

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FILE #: 3926.00

REPORTED:

01/13/15 13:17

SUBMITTED: 01/06/15

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description: Matrix:

OAM 1

Air

Lab ID:

Sample Volume:

5010643-28

m³

Sampled: 01/05/15 15:13

Received: 01/06/15 11:49 Analysis Date: 01/08/15 17:04

Comments:

Start Time 1/4/15 15:10

Hexavalent Chromium by SOP ERG-MOR-063

21.64

Results

MDL

Analyte

CAS Number

ng/m³ Air

<u>Flaq</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0188

0.0036

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FILE #: 3926.00

REPORTED: SUBMITTED: 01/13/15 13:17

01/06/15

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description: Matrix:

OAM 2

Air

Lab ID:

Sample Volume:

5010643-29

m³

Sampled: 01/05/15 15:35

Received: 01/06/15 11:49 Analysis Date: 01/08/15 15:35

Comments:

Start Time 1/4/15 15:21

Hexavalent Chromium by SOP ERG-MOR-063

Results

<u>MDL</u>

Analyte

CAS Number

ng/m³ Air

21.81

ng/m³ Air

Hexavalent Chromium

1854-02-99

ND

<u>Flag</u>

0.0036

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Page 32 of 40



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Air

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

01/13/15 13:17

SUBMITTED: 01/06/15

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

PAM-1 Description: Matrix:

Col 1 Start Time 1/4/15 15:52

Lab ID: Sample Volume:

5010643-30

m³

Sampled: 01/05/15 16:34 Received: 01/06/15 11:49

Analysis Date: 01/08/15 12:55

Hexavalent Chromium by SOP ERG-MOR-063

22.23

Results

<u>MDL</u>

Analyte

CAS Number

ng/m³ Air

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

ND

0.0036

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Page 33 of 40



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Air

Col 2 Start Time 1/4/15 15:52

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

01/13/15 13:17

SUBMITTED: 01/06/15

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description:

Matrix:

Comments:

PAM-1D

Lab ID:

Sample Volume:

5010643-31

22.27 m³ Sampled: 01/05/15 16:37 Received: 01/06/15 11:49

Analysis Date: 01/08/15 13:15

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL

Analyte

CAS Number

ng/m³ Air

Flag

ng/m³ Air 0.0036

Hexavalent Chromium 1854-02-99 ND

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Comments:

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Start Time 1/4/15 15:40

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

01/13/15 13:17

SUBMITTED: 01/06/15

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description: Matrix:

PAM-3

Lab ID:

Sample Volume:

5010643-33

22.15 m³ Sampled: 01/05/15 16:17 Received: 01/06/15 11:49

Analysis Date: 01/08/15 15:45

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

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FILE #: 3926.00

REPORTED:

01/13/15 13:17

SUBMITTED: 01/06/15

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description:

Comments:

PAM-4

Start Time 1/4/15 15:34

Lab ID:

5010643-34

Sampled: 01/05/15 15:52

Matrix:

Air

Sample Volume:

21.87 m³ Received: 01/06/15 11:49

Analysis Date: 01/08/15 17:37

Hexavalent Chromium by SOP ERG-MOR-063

Results

MDL.

Analyte

CAS Number

ng/m³ Air

Flag

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0253

0.0036

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Page 36 of 40



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FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

01/13/15 13:17

01/06/15 SUBMITTED:

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description: Matrix:

PAM-21

Lab ID:

Sample Volume:

5010643-35

Sampled: 01/05/15 00:00

Received: 01/06/15 11:49 Analysis Date: 01/08/15 16:24

Comments:

Hexavalent Chromium by SOP ERG-MOR-063

22.15

Results

MDL

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

ng/m³ Air ND

<u>Flag</u>

ng/m³ Air 0.0036

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Page 37 of 40



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ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Air

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

01/13/15 13:17

SUBMITTED: 01/06/15

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description: Matrix:

PAM-31

Lab ID:

Sample Volume:

5010643-36

m³

Sampled: 01/05/15 00:00

Analysis Date: 01/08/15 16:34

Received: 01/06/15 11:49

Comments:

Hexavalent Chromium by SOP ERG-MOR-063

22.15

Results

<u>MDL</u>

Analyte

CAS Number

ng/m³ Air

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium 1854-02-99 ND 0.0036

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