

# LABORATORY DATA CONSULTANTS, INC.

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

ERM July 14, 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 July 11, 2014. Attachment 1 is a summary of the samples that were reviewed for each analysis.

#### LDC Project #32145:

**SDG** Fraction

4070836/7070922 Hexavalent Chromium

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

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

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

Christina Rink

Sincerely,

Project Manager/Chemist

100 17	198 pages-SF	3 DAY		.12112_			<u>.</u> . (200					T 1.5	1123			chm			<u> </u>	Tyring 42.			-1128						· · · · · · · · · · · · · · · · · · ·	11.12		rayar :						1 134	**********
	Level IV		DC #32	145	5 (E	RN	1 -	Mo	rris	svil	le,	NC		Ha	rbo	r P	oir	ıt, P	ИD	, He	exa	ıva	len	t C ∣	hro	mi	um	M.	oni	tor	ing	J) _				_	$\overline{}$	1.393	
LDC	SDG#	DATE REC'D	(3) DATE DUE	Cr( (D76	VI) 614)																										_							<u></u>	
	c: Air/Water/Soil		<b>,</b>	A	S	w	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s	W	s	w	s	w	s
A	4070836/7070922	07/11/14	07/16/14	35	#0₩						_				_	<del> </del>		-		-	-	-		-	├	-						-			$\square$	$\square$	-		<u> </u>
$\dashv$				$\vdash$					$\vdash$	├	-	-	<u> </u>	$\vdash$	┢					$\vdash$	$\vdash$	┼	ļ. —			$\vdash$	ļ					<del>                                     </del>			$\vdash$	H	$\dashv$		-
				<b>-</b>													<del> </del>				<del> </del>				H		<u> </u>								Н	H	$\dashv$		H
	<del></del> -			<b>†</b>					<del></del>								1								<b> </b>										П	П	$\neg \dagger$		Γ
					<u> </u>					L																										Ш	$\Box$		Ĺ
			<u> </u>	<u> </u>		_				<u> </u>		_		_		_							<u> </u>	<u> </u>	_	_			<u> </u>		_	<u> </u>			Ш	Ш	_		-
			ļ	-		<u> </u>			<b> </b>	<u> </u>	<u> </u>		-	-	$\vdash$	-	<del> </del>	-	_	-	<del> </del>	├	<del> </del>	-	<u> </u>	├	<del> </del>			_	┡				$\vdash\vdash$	$\vdash\vdash$		<b>  </b>	
			<del>                                     </del>						<u> </u>				-	1	<b>-</b>		┢	├	<del> </del> -	<u> </u>	┢	$\vdash$	$\vdash$		<u> </u>	-						-	-		$\vdash$		$\dashv$	$\vdash\vdash$	$\vdash$
$\dashv$			<del>                                     </del>			<del>                                     </del>				$\vdash$		$\vdash$			<del> </del> -			$\vdash$		$\vdash$			$\vdash$			$\vdash$						ļ			$\square$	-	_		-
				1											t —			İ		<u> </u>		†													П		$\exists$	$\Box$	Γ
			<u> </u>					$oxed{oxed}$		<u> </u>	L	<u> </u>	<u> </u>	<u> </u>	<u> </u>			<u> </u>		<u> </u>	_			_	<u> </u>	_						<u> </u>			Ш	Ш		$oxedsymbol{\sqcup}$	L
							_			ļ	ļ	ļ	<b> </b>		<u> </u>	<u> </u>	<u> </u>	ļ	ļ	<b> </b>	-	<u> </u>	-		<u> </u>	_	<u> </u>					<u> </u>				Ш	_		$\vdash$
$\dashv$			<u> </u>	-			_			$\vdash$			$\vdash$	-	├—		-	-	<u> </u>		-	├-	-	-	-	┢	_		_			$\vdash$			$\vdash\vdash$	$\vdash$			_
-			<del> </del>	-			$\vdash$			<u> </u>			<del> </del>	-	├	┢	┢	-	┝	-		$\vdash$	├	┼	-	╁			_	$\vdash$		╁	_		$\vdash \vdash$	$\vdash \vdash$	$\dashv$	$\dashv$	H
_			<del> </del>							$\vdash$				$\vdash$		H		$\vdash$						+	-						-				Н	$  \cdot  $	$\dashv$	$\Box$	Γ
			<u> </u>												<del> </del>	<u> </u>		T						<b> </b>	<b> </b>							T					$\exists$		Γ
															<u> </u>	<u> </u>				<u> </u>	_		<u> </u>		<u> </u>		<u> </u>					<u> </u>					_		L
				<u> </u>	<u> </u>	<u> </u>	<u> </u>					<u> </u>	<u> </u>		<u> </u>	ļ	_	_	ļ		<b> </b>		ļ	ļ	ļ	_					ļ	<u> </u>			$\square$	Ш	$\dashv$		L
			ļ			_	_		_	$\vdash$				ļ	<del> </del>			<u> </u>	_	_	_	-	_	1	├-	-				_	<u> </u>	<u> </u>	_				$\dashv$		-
	<del></del>			-			<u> </u>			<u> </u>	<u> </u>	-	-	$\vdash$	_	$\vdash$		-	_	<del> </del>	-	<del> </del>		<b> </b>		$\vdash$				-		├	-		$\vdash \vdash$	$\vdash \vdash \vdash$	$\dashv$	$\dashv$	
				+-		<del> </del>		-			-		<del> </del>	$\vdash$	-		$\vdash$	$\vdash$	$\vdash$	╁	-	1-	<del> </del>	<del> </del>	<del> </del>	<del> </del>				_		$\vdash$	<del> </del>			$\vdash$	$\dashv$	-	_
														$\vdash$	<del> </del>	$\vdash$		$\vdash$								$\vdash$			<del>                                     </del>						Н	-	$\dashv$	$\Box$	Γ
															$\vdash$																	Ĺ							
														<u></u>																							$\Box$		
Total	A/CR			35	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	35

# Laboratory Data Consultants, Inc. Data Validation Report

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

Collection Date: July 2 through July 8, 2014

LDC Report Date: July 14, 2014

Matrix: Air

Parameters: Hexavalent Chromium

Validation Level: EPA Level IV

**Laboratory:** Eastern Research Group

Sample Delivery Group (SDG): 4070836/4070922

# Sample Identification

OAM 1 (07/02/14)	PAM-3 (07/07/14)
OAM 2 (07/02/14)	PAM-4 (07/07/14)
PAM-1 (07/02/14)	PAM-21 (07/07/14)
PAM-1D (07/02/14)	PAM-31 (07/07/14)
PAM-2 (07/02/14)	OAM 1 (07/08/14)
PAM-3 (07/02/14)	OAM 2 (07/08/14)
PAM-4 (07/02/14)	PAM-1 (07/08/14)
PAM-21 (07/02/14)	PAM-1D (07/08/14)
PAM-31 (07/02/14)	PAM-2 (07/08/14)
OAM 1 (07/03/14)	PAM-3 (07/08/14)
OAM 2 (07/03/14)	PAM-4 (07/08/14)
PAM-1 (07/03/14)	PAM-21 (07/08/14)
PAM-1D (07/03/14)	PAM-31 (07/08/14)
PAM-3 (07/03/14)	PAM-1 (07/02/14)DUP
PAM-4 (07/03/14)	PAM-1D (07/02/14)DUP
PAM-21 (07/03/14)	PAM-1 (07/03/14)DUP
PAM-31 (07/03/14)	PAM-1D (07/03/14)DUP
OAM 1 (07/07/14)	PAM-1 (07/07/14)DUP
OAM2 (07/07/14)	PAM-1D (07/07/14)DUP
PAM-1 (07/07/14)	PAM-1 (07/08/14)DUP
PAM-1D (07/07/14)	PAM-1D (07/08/14)DUP
PAM-2 (07/07/14)	

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 (07/02/14), PAM-31 (07/03/14), PAM-31 (07/07/14), and PAM-31 (07/08/14) were identified as trip blanks. No hexavalent chromium was found.

Samples PAM-21 (07/02/14), PAM-21 (07/03/14), PAM-21 (07/07/14), and PAM-21 (07/08/14) 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 (07/02/14) and PAM-1D (07/02/14), samples PAM-1 (07/03/14) and PAM-1D (07/03/14), samples PAM-1 (07/07/14) and PAM-1D (07/07/14), and samples PAM-1 (07/08/14) and PAM-1D (07/08/14) were identified as field duplicates. No hexavalent chromium was detected in any of the samples with the following exceptions:

	Concentrat	tion (ng/m³)	DDD.		
Analyte	PAM-1 (07/02/14)	PAM-1D (07/02/14)	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.0626	0.0679	8 (≤20)	-	-

	Concentra	tion (ng/m³)			
Analyte	PAM-1 (07/03/14)	PAM-1D (07/03/14)	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.108	0.0948	13 (≤20)	-	-

	Concentrat	tion (ng/m³)	-		
Analyte	PAM-1 (07/07/14)	PAM-1D (07/07/14)	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.0648	0.0741	13 (≤20)	-	-

	Concentrat	ion (ng/m³)			
Analyte	PAM-1 (07/08/14)	PAM-1D (07/08/14)	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.0402	0.0541	29 (≤20)	J (all detects)	А

# Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Data Qualification Summary - SDG 4070836/4070922

SDG	Sample	Analyte	Flag	A or P	Reason
4070836/ 4070922	PAM-1 (07/08/14) PAM-1D (07/08/14)	Hexavalent chromium	J (all detects)	A	Field duplicates (RPD)

Harbor Point, MD, Hexavalent Chromium Monitoring
Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG
4070836/4070922

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
4070836/4070922

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

# LDC #: 32145A6 VALIDATION COMPLETENESS WORKSHEET

SDG #: 4070836/4070922

Level IV

Page: \\_of\_\\_ 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
l.	Technical holding times	A	Sampling dates: 07  02-03 14 7/07-08 14
11	Initial calibration	A	
III.	Calibration verification	A	
IV	Blanks	A	
V	Matrix Spike/Matrix Spike Duplicates	N	
VI.	Duplicates	A	Dup
VII.	Laboratory control samples	A	usio
VIII.	Sample result verification	A	
IX.	Overall assessment of data	A	
X.	Field duplicates	SW	FD= 13,4) (12,13) (20,21) (29,36)
L <sub>XI</sub>	Field blanks	ND	EB= FB=8, 16, 25, 34 TB=9,17,20,38

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 (07/02/14)	12	PAM-1 (07/03/14)	23	PAM-3 (07/07/14)	34	PAM-21 (07/08/14)
2	OAM 2 (07/02/14)	13	PAM-1D (07/03/14)	24	PAM-4 (07/07/14)	35	PAM-31 (07/08/14)
3	PAM-1 (07/02/14)	14	PAM-3 (07/03/14)	25	PAM-21 (07/07/14)	36	PAM-1 (07/02/14)DUP
4	PAM-1D (07/02/14)	15	PAM-4 (07/03/14)	26	PAM-31 (07/07/14)	37	PAM-1D (07/02/14)DUP
5	PAM-2 (07/02/14)	16	PAM-21 (07/03/14)	27	OAM 1 (07/08/14)	38	PAM-1 (07/03/14)DUP
6	PAM-3 (07/02/14)	17	PAM-31 (07/03/14)	28	OAM 2 (07/08/14)	39	PAM-1D (07/03/14)DUP
7	PAM-4 (07/02/14)	18	OAM 1 (07/07/14)	29	PAM-1 (07/08/14)	40	PAM-1 (07/07/14)DUP
8	PAM-21 (07/02/14)	19	OAM2 (07/07/14)	30	PAM-1D (07/08/14)	41	PAM-1D (07/07/14)DUP
9	PAM-31 (07/02/14)	20	PAM-1 (07/07/14)	31	PAM-2 (07/08/14)	42	PAM-1 (07/08/14)DUP
10	OAM 1 (07/03/14)	21	PAM-1D (07/07/14)	32	PAM-3 (07/08/14)	43	PAM-1D (07/08/14)DUP
11	OAM 2 (07/03/14)	22	PAM-2 (07/07/14)	33	PAM-4 (07/08/14)	44	

Notes:	745	appended	Todifferentian	between	samples
		4.0	•		o, 4

Page: \\_of \\_
Reviewer: \SO
2nd Reviewer: \\_\oldsymbol{

Method: Inorganics (EPA Method Sector)

wiethod.inorganics (EPA Method Delac)	<del>,</del>			
Validation Area .	Yes	No	NA	Findings/Comments
I. Technical holding times	·			
All technical holding times were met.	/			
Cooler temperature criteria was met.			L	
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 <del>90-110%</del> 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	<del></del>	<del></del>		
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.	/			Dup
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 anayized for this SDG?				
Was an LCS analyzed per extraction batch?				
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% (85-115% for Method 300.0) QC limits?	/			·
VI. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?			/	
Were the performance evaluation (PE) samples within the acceptance limits?			/	

Air!

Page: Zof Reviewer: SC 2nd Reviewer: OL

	<del>,</del>		,	
Validation Area	Yes	No	NA	Findings/Comments
VII. Sample Result Verification		<del>,</del> .		
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#	32145A6
	UZ 170/10

# **VALIDATION FINDINGS WORKSHEET**

Field Duplicates

Page:_	<u></u>
Reviewer:	30
2nd Reviewer:	on

Inorganics: Method See Cover

	Concentrat	tion (ng/m3)		
Analyte	3	4	RPD (≤20)	
Hexavalent Chromium	0.0626	0.0679	8	

	Concentrati	on (ng/m3)		
Analyte	12	13	RPD (≤20)	
Hexavalent Chromium	0.108	0.0948	13	

	Concentr	ation (ng/m3)		
Analyte	20	21	RPD (≤20)	.,,.
Hexavalent Chromium	0.0648	0.0741	13	

	Concentra	ation (ng/m3)		
Analyte	29	30	RPD (≤20)	
Hexavalent Chromium	0.0402	0.0541	29	Jack

\LDCFILESERVER\Validation\FIELD DUPLICATES\FD\_inorganic\32145A6.wpd

LDC #: \_ 3214544

# Validation Findings Worksheet Initial and Continuing Calibration Calculation Verification

Page:\_ of	
Reviewer:	$\mathcal{Q}$
nd Reviewer:_	<u>Q</u>

Metitod. Morganics, Method See Cover	Method:	Inorganics,	Method	See Cover	
--------------------------------------	---------	-------------	--------	-----------	--

The correlation coefficient (r) for the calibration of Cut was recalculated. Calibration date: 7/9/14

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>

True

Where,

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

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

					Recalculated	Reported	Acceptable
Type of analysis	Analyte	Standard	Conc. (ng/ml)	Area	r or r <sup>2</sup>	r or r²	(Y/N)
Initial calibration		s1_	0.05	0.0000106			
		s2	0.10	0.0000306	0.99980	0.99936	·
	Crab	s3	0.20	0.0000683			
	CV	s4	0.50	0.0001791			4
		s5	1.00	0.0003623			<b>)</b>
		s6	2.00	0.0007623			
719/14	Cx26	Found	True				· ·
Calibration verification	Crio	0.5198ng/ml	0.5000mg/m1		104.0%R	104.0%	
ICU 10111		.,		<u> </u>			
て \ lo \ \ \ Calibration verification	Cv+6	O SIUZMAN	0.5000mg/ml		102.9%R	107.9%R	<u> </u>
CCO <del>たらい</del> いい ついいし Calibration verification	Cv 26	0.2281	0.5000 ng/m/		111.662	111.7%R	9

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 #: 32145AW

# VALIDATION FINDINGS WORKSHEET Level IV Recalculation Worksheet

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

METHOD: Inorganics, Method Sel Cour
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 10:450 7/9/14	Laboratory control sample	Crab	1.109 ng/m	1.00mg/m1	111%P	1118R	7
N	Matrix spike sample		(SSR-SR)				
Dup 127914	Duplicate sample	Crabo	0.0710 ng/m3	ooben nglm3	<i>ધ.૫७%</i> ₹૧)	4,59% RPD	5

Comments: Re	efer to appropriate worksheet for	list of qualifications and associa	ted samples when reported re	sults do not agree within 10.	0% of the recalculated results.

LDC #: 32145A6

# VALIDATION FINDINGS WORKSHEET

Sample Calculation Verification

Page: of Page: So Pag

N	N/A Have results N/A Are results v	s been repo vithin the ca ction limits t	uestions answered "N". No rted and calculated correct alibrated range of the instruction the CRQL?	ly?	re identified as "N/	Α".
	ound (analyte) results		33) Cr+6		orted with a positiv	
oncer	rulated and verified using tration = \( \langle \langle \cdot \)		ving equation:    Vk=10m     Recalculation: [[	0.0002235mAU*m	W - (- P.ME	-06)]
			m= 20871	C 0.00	(0.0003993)	
Co= -6.64E-06 Co= 0.0003993			[hashir)lut] = ng/m3	(0.576m)	(0.576m/ml) (10mi)	
<b>7</b> ×	en- 0.0002235v	NAUXNIN	\v\\	20	91 m3	= 0.2
#	Sample ID		Analyte	Reported Concentration (Mg\w <sup>2</sup> )	Calculated Concentration ( ~ 4 ) m <sup>3</sup>	Acceptable (Y/N)
	1		Cx+6	0.0365	0.0364	7
	2			0.0319	0.318	1
	<u>2</u> 3			0.0626	0.0626	
	Ч			0.0679	0.0679	
	2			0.0795	0.0194	
	Ь			0.0846	0.0846	
	7			0.293	0.293	
	8			No	NO	
	9			<b>PD</b>	ND	
	lo			0.03&2	0.038	
				2820.0	0.0585	
	12	!		801.0	0-108	
	\3			0.0948	0.0948	
	14			0.0662	0.0662	
	12			0.0786	0 0786	
	16	•		hD	DU	
	17			P0	ND	
	18			0.0224	0.0225	
	19			0.0367	0.0367	
	w		7	0.0648	0.0648	J

LDC #: 32145A6

# **VALIDATION FINDINGS WORKSHEET**

Sample Calculation Verification

Page: 2 of _	2
Reviewer:	フ
2nd reviewer: 0	

METHOD: Inorg	ganics, Method <u>fee</u>	Lover	·
Please see qua Y N N/A Y N N/A Y N N/A	lifications below for all que Have results been reporte Are results within the cali Are all detection limits be	estions answered "N". Not appet and calculated correctly? brated range of the instrumer low the CRQL?	olicable questions are identified as "N/A".
Compound (and recalculated and	alyte) results for d verified using the following	ng equation:	reported with a positive detect were
Concentration =		Recalculation;	

#	Sample ID	Analyte	Reported Concentration (ng/m³)	Calculated Concentration ( \( \( \sigma_q \) ( \( \sigma_q \)	Acceptable (Y/N)
	21	Cx+6	0.0741	8.0741	4
	22		0.0602	0.0601	
	23		0.313	0.313	
	24		0.0505	0.0505	
	25		ND	20	
	26		ND	ND	
	27		0-0263	0.0264	
	78		0.0248	0.0248	
	75		0.0402	0.0403	
	30		0.0541	0.0541	
	31		0.0335	0.0336	
	32		0.0271	0.0272	
	33		0.216	0.276	
	34		NO	NO	
	35	4	ND	NO	7
		, .			
			<u> </u>		

Note:	 



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

**REPORTED:** 07/11/14 12:48

SUBMITTED:

m³

07/08/14 to 07/09/14

Malvern, PA 19355

AQS SITE

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

FAX: (410) 266-8912

SITE CODE:

Honeywell Hex Chrome Study

Description:

Comments:

OAM 1

Lab ID:

4070836-01

Sampled: 07/02/14 15:54

Matrix:

Air

Sample Volume:

21.39

Received: 07/08/14 11:06

Start Time 7/1/14 16:08

Analysis Date: 07/09/14 12:58

**Hexavalent Chromium** 

**Results** 

MDL

<u>Analyte</u>

**CAS Number** 

<u>ng/m³ Air</u>

<u>Flaq</u>

ng/m³ Air

**Hexavalent Chromium** 

1854-02-99

0.0365

0.0036

Or Mulia



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

**REPORTED:** 07/11/14 12:48

Malvern, PA 19355

SUBMITTED:

07/08/14 to 07/09/14

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:

Sample Volume:

4070836-02

Sampled: 07/02/14 16:18 Received: 07/08/14 11:06

Matrix: **Comments:**  Air Start Time 7/1/14 16:30 21.41

m³

Analysis Date: 07/09/14 13:08

**Hexavalent Chromium** 

**Results** 

MDL

**Analyte** 

**CAS Number** 

ng/m³ Air

<u>Flag</u>

ng/m³ Air

**Hexavalent Chromium** 

1854-02-99

0.0319

0.0036

Mula



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED:

07/11/14 12:48

Malvern, PA 19355

SUBMITTED:

07/08/14 to 07/09/14

ATTN: Mr. Jeff Boggs

FAX: (410) 266-8912

AQS SITE SITE CODE:

Honeywell Hex Chrome Study

Description:

PAM-1

Lab ID:

4070836-03

Sampled: 07/02/14 17:24

Matrix:

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

Air

Sample Volume:

21.35

m³

Received: 07/08/14 11:06

Comments: Col 1 Start Time 7/1/14 17:41 Analysis Date: 07/09/14 11:37

**Hexavalent Chromium** 

<u>Results</u>

<u>MDL</u>

**Analyte** 

**CAS Number** 

ng/m³ Air

Flag

<u>ng/m³ Air</u>

Hexavalent Chromium

1854-02-99

0.0626

0.0036

O Mula



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

**REPORTED:** 07/11/14 12:48

SUBMITTED:

07/08/14 to 07/09/14

Malvern, PA 19355

**AQS SITE** 

PHONE: (443) 803-8495

ATTN: Mr. Jeff Boggs

CODE:

Honeywell Hex Chrome Study

**Description:** 

PAM-1D

Lab ID:

4070836-04

Sampled: 07/02/14 17:27

Matrix:

Air

**Sample Volume:** 

21.31

m³

Received: 07/08/14 11:06 Analysis Date: 07/09/14 11:57

Comments:

Col 2 Start Time 7/1/14 17:46

FAX: (410) 266-8912

**Hexavalent Chromium** 

**Results** ng/m³ Air

<u>Flaq</u>

MDL ng/m³ Air

Hexavalent Chromium

**Analyte** 

**CAS Number** 1854-02-99

0.0679



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

**REPORTED:** 07/11/14 12:48

Malvern, PA 19355

SUBMITTED:

07/08/14 to 07/09/14

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

FAX: (410) 266-8912

**AQS SITE** SITE CODE:

Honeywell Hex Chrome Study

**Description:** 

PAM-2

4070836-05

Sampled: 07/02/14 17:09

Matrix: **Comments:**  Air

Start Time 7/1/14 17:21

Sample Volume:

Lab ID:

21.42

m³

Received: 07/08/14 11:06

Analysis Date: 07/09/14 13:38

**Hexavalent Chromium** 

**Results** 

<u>MDL</u>

**Analyte** 

**CAS Number** 

ng/m³ Air

<u>Flaq</u>

ng/m³ Air

**Hexavalent Chromium** 

1854-02-99

0.0795



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

07/11/14 12:48 REPORTED:

Malvern, PA 19355

SUBMITTED:

m³

07/08/14 to 07/09/14

ATTN: Mr. Jeff Boggs

**AQS SITE** 

PHONE: (443) 803-8495

FAX: (410) 266-8912

SITE CODE:

Honeywell Hex Chrome Study

Description:

PAM-3

Start Time 7/1/14 17:11

Lab ID:

4070836-06

Sampled: 07/02/14 16:56

Matrix: Comments: Air

Sample Volume:

21.38

Received: 07/08/14 11:06

Analysis Date: 07/09/14 13:48

**Hexavalent Chromium** 

**Results** 

<u>MDL</u>

**Analyte** 

**CAS Number** 

ng/m³ Air

<u>Flaq</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0846

0.0036

Mula



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

**REPORTED:** 07/11/14 12:48

Malvern, PA 19355

SUBMITTED:

07/08/14 to 07/09/14

**AQS SITE** 

PHONE: (443) 803-8495

ATTN: Mr. Jeff Boggs

FAX: (410) 266-8912

SITE CODE:

Honeywell Hex Chrome Study

Description:

PAM-4

Start Time 7/1/14 16:52

Lab ID:

4070836-07

Sampled: 07/02/14 16:37

Matrix: Comments: Air

Sample Volume:

21.38

m³

Received: 07/08/14 11:06

Analysis Date: 07/09/14 13:58

**Hexavalent Chromium** 

**Results** 

<u>MDL</u>

**Analyte** 

**CAS Number** 

ng/m³ Air

Flag

ng/m³ Air

**Hexavalent Chromium** 

1854-02-99

0.293



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED:

07/11/14 12:48

Malvern, PA 19355

SUBMITTED:

07/08/14 to 07/09/14

PHONE: (443) 803-8495

ATTN: Mr. Jeff Boggs

FAX: (410) 266-8912

**AQS SITE** SITE CODE:

Honeywell Hex Chrome Study

**Description:** 

Sampled: 07/02/14 00:00

Matrix: Comments: PAM-21 Air

Sample Volume:

Lab ID:

21.42

m³

Received: 07/08/14 11:06

Analysis Date: 07/09/14 14:08

**Hexavalent Chromium** 

4070836-08

Results

<u>MDL</u>

**Analyte** Hexavalent Chromium CAS Number

ng/m³ Air ND

<u>Flaq</u>

ng/m³ Air

1854-02-99



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

**REPORTED:** 07/11/14 12:48

Malvern, PA 19355

07/08/14 to 07/09/14

ATTN: Mr. Jeff Boggs

SUBMITTED:

**AQS SITE** 

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

Sample Volume:

SITE CODE:

Honeywell Hex Chrome Study

Description:

PAM-31

Lab ID:

4070836-09

m³

Sampled: 07/02/14 00:00

Received: 07/08/14 11:06 Analysis Date: 07/09/14 14:18

Comments:

Matrix:

**Hexavalent Chromium** 

21.38

**MDL** 

<u>Analyte</u>

**CAS Number** 

FAX: (410) 266-8912

Results ng/m³ Air

<u>Flaq</u>

<u>ng/m³ Air</u>

Hexavalent Chromium

1854-02-99

ND



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

**REPORTED:** 07/11/14 12:48

07/08/14 to 07/09/14

Malvern, PA 19355

SUBMITTED:

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

**AQS SITE** SHE CODE:

Honeywell Hex Chrome Study

**Description:** 

OAM 1

Lab ID:

4070836-10

Sampled: 07/03/14 15:26

Matrix: Comments:

Start Time 7/2/14 15:59

Sample Volume:

21.11

m³

Received: 07/08/14 11:06

Analysis Date: 07/09/14 14:28

**Hexavalent Chromium** 

**Results** 

MDL

**Analyte** 

CAS Number

FAX: (410) 266-8912

ng/m³ Air

<u>Flaq</u>

<u>ng/m³ Air</u>

**Hexavalent Chromium** 

1854-02-99

0.0382



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED: 07/11/14 12:48

SUBMITTED:

07/08/14 to 07/09/14

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Matrix:

FAX: (410) 266-8912

**AQS SITE** 

SITE CODE:

Honeywell Hex Chrome Study

**Description:** 

Comments:

OAM 2

Air

Lab ID:

Sample Volume:

4070836-11

21.23

Sampled: 07/03/14 15:58 Received: 07/08/14 11:06

Start Time 7/2/14 16:23

m³

Analysis Date: 07/09/14 14:37

**Hexavalent Chromium** 

Results

MDL

<u>Analyte</u>

**CAS Number** 

<u>ng/m³ Air</u>

<u>Flag</u>

<u>ng/m³ Air</u>

**Hexavalent Chromium** 

1854-02-99

0.0586



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

**REPORTED:** 07/11/14 12:48

Malvern, PA 19355

SUBMITTED:

m³

07/08/14 to 07/09/14

**AQS SITE** 

PHONE: (443) 803-8495

ATTN: Mr. Jeff Boggs

FAX: (410) 266-8912

SITE CODE:

Honeywell Hex Chrome Study

**Description:** 

Comments:

PAM-1

Lab ID:

4070836-12

Sampled: 07/03/14 16:58

Matrix:

Air

Sample Volume:

21.15

Received: 07/08/14 11:06

Analysis Date: 07/09/14 12:17

Col 1 Start Time 7/2/14 17:28

**Hexavalent Chromium** Results

MDL

<u>Analyte</u>

**CAS Number** 

<u>nq/m³ Air</u>

<u>Flaq</u>

ng/m³ Air

**Hexavalent Chromium** 

1854-02-99

0.108



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED: 07/11/14 12:48

Malvern, PA 19355

SUBMITTED:

07/08/14 to 07/09/14

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:

4070836-13

m³

Sampled: 07/03/14 17:02

Matrix:

Sample Volume:

21.17

Received: 07/08/14 11:06

Analysis Date: 07/09/14 12:36

Comments:

Col 2 Start Time 7/2/14 17:31

**Hexavalent Chromium** 

**Results** 

MDL

**Analyte** 

**CAS Number** 

ng/m³ Air

<u>Flaq</u>

ng/m³ Air

**Hexavalent Chromium** 

1854-02-99

0.0948



Environmental Resources Management, Inc.

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

**REPORTED:** 07/11/14 12:48

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

SUBMITTED:

07/08/14 to 07/09/14

AQS SITE

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

FAX: (410) 266-8912

SITE CODE:

Honeywell Hex Chrome Study

Description:

Comments:

PAM-3

Start Time 7/2/14 17:01

Lab ID:

4070836-14

Sampled: 07/03/14 16:37

Matrix:

Sample Volume:

21.14

m³

Received: 07/08/14 11:06

Analysis Date: 07/09/14 14:47

**Hexavalent Chromium** 

**Results** 

<u>MDL</u>

**Analyte** 

CAS Number

ng/m³ Air

<u>Flag</u>

<u>ng/m³ Air</u>

**Hexavalent Chromium** 

1854-02-99

0.0662



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-4

Start Time 7/2/14 16:42

FAX: (410) 266-8912

Lab ID:

4070836-15

Sample Volume:

21.28

 $m^3$ 

SUBMITTED:

**AQS SITE** SITE CODE:

FILE #: 3926.00

**REPORTED:** 07/11/14 12:48

Sampled: 07/03/14 16:21 Received: 07/08/14 11:06

Analysis Date: 07/09/14 14:57

Honeywell Hex Chrome Study

**Hexavalent Chromium** 

Results

ng/m³ Air

<u>Flag</u>

**MDL** ng/m³ Air

**Hexavalent Chromium** 

**Analyte** 

**CAS Number** 1854-02-99

0.0786

0.0036

07/08/14 to 07/09/14

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

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

**REPORTED:** 07/11/14 12:48

Malvern, PA 19355

SUBMITTED:

07/08/14 to 07/09/14

AQS SITE

PHONE: (443) 803-8495

ATTN: Mr. Jeff Boggs

CODE:

Honeywell Hex Chrome Study

**Description:** 

PAM-21

Lab ID:

4070836-16

Sampled: 07/03/14 00:00 Received: 07/08/14 11:06

Matrix:

Sample Volume:

21.14

m³

Analysis Date: 07/09/14 15:07

**Comments:** 

**Hexavalent Chromium** 

**Results** 

MDL

**Analyte** 

**CAS Number** 

FAX: (410) 266-8912

ng/m³ Air

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

ND



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

**REPORTED:** 07/11/14 12:48

Malvern, PA 19355

SUBMITTED:

07/08/14 to 07/09/14

ATTN: Mr. Jeff Boggs

**AQS SITE** 

Honeywell Hex Chrome Study

Description:

PHONE: (443) 803-8495

FAX: (410) 266-8912

Lab ID:

SITE CODE:

Sampled: 07/03/14 00:00

PAM-31

4070836-17 Sample Volume:

Received: 07/08/14 11:06

Air Matrix:

21.14 m³

Analysis Date: 07/09/14 15:37

Comments:

**Hexavalent Chromium** 

**Results** 

<u>MDL</u> <u>ng/m³ Air</u>

<u>Flaq</u>

ng/m³ Air **Analyte CAS Number** Hexavalent Chromium 1854-02-99 ND



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

07/11/14 12:48 REPORTED:

Malvern, PA 19355

SUBMITTED:

07/08/14 to 07/09/14

ATTN: Mr. Jeff Boggs

**AQS SITE** 

PHONE: (443) 803-8495

SITE CODE:

Honeywell Hex Chrome Study

Description:

Comments:

OAM 1

Start Time 7/6/14 16:35

Lab ID:

4070836-18

Sampled: 07/07/14 15:55

Matrix:

Air

Sample Volume:

21.01

m³

Received: 07/08/14 11:06

Analysis Date: 07/10/14 12:52

**Hexavalent Chromium** 

**Results** 

<u>MDŁ</u>

**Analyte** 

**CAS Number** 

FAX: (410) 266-8912

ng/m³ Air

<u>Flaq</u>

ng/m³ Air

**Hexavalent Chromium** 

1854-02-99

0.0224



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

**REPORTED:** 07/11/14 12:48

Malvern, PA 19355

SUBMITTED:

07/08/14 to 07/09/14

IVIAIVEIII, FA 1935

SODIMITICE.

AQS SITE

ATTN: Mr. Jeff Boggs

FAX: (410) 266-8912

STECODE:

Honeywell Hex Chrome Study

Description:

Comments:

OAM 2

Start Time 7/6/14 16:57

Lab ID:

4070836-19

Sampled: 07/07/14 16:19

Matrix:

PHONE: (443) 803-8495

Air

Sample Volume:

m³

Received: 07/08/14 11:06

21.04

Analysis Date: 07/10/14 13:01

**Hexavalent Chromium** 

**Results** 

MDL

<u>Analyte</u>

**CAS Number** 

<u>ng/m³ Air</u>

Flag

<u>ng/m³ Air</u>

**Hexavalent Chromium** 

1854-02-99

0.0367

0.0036

Orling.



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

**REPORTED:** 07/11/14 12:48

Malvern, PA 19355

SUBMITTED:

07/08/14 to 07/09/14

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

AQS SITE SHE CODE:

Honeywell Hex Chrome Study

**Description:** 

PAM-1

Col 1 Start Time 7/6/14 17:21

FAX: (410) 266-8912

Lab ID:

4070836-20

Sampled: 07/07/14 17:35

Matrix: Comments: Air

**Sample Volume:** 

21.81

m³

Received: 07/08/14 11:06

Analysis Date: 07/10/14 11:31

**Hexavalent Chromium** 

Results

**MDL** 

<u>Analyte</u>

CAS Number

ng/m³ Air

<u>Flag</u>

ng/m³ Air

**Hexavalent Chromium** 

1854-02-99

0.0648



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

Col 2 Start Time 7/6/14 17:24

FILE #: 3926.00

**REPORTED:** 07/11/14 12:48

SUBMITTED:

07/08/14 to 07/09/14

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description:

Comments:

Matrix:

PAM-1D

Lab ID:

4070836-21 Sample Volume:

21.83

m³

Sampled: 07/07/14 17:39

Received: 07/08/14 11:06

Analysis Date: 07/10/14 11:51

**Hexavalent Chromium** 

**Results** 

ng/m³ Air

<u>Flaq</u>

<u>MDL</u> ng/m³ Air

**Hexavalent Chromium** 

**Analyte** 

**CAS Number** 1854-02-99

0.0741



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

**REPORTED:** 07/11/14 12:48

Malvern, PA 19355

SUBMITTED:

07/08/14 to 07/09/14

**AQS SITE** 

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

ATTN: Mr. Jeff Boggs

FAX: (410) 266-8912

CODE:

Honeywell Hex Chrome Study

Description:

PAM-2

Lab ID:

4070836-22

20.84

Sampled: 07/07/14 16:41

Matrix:

Air

Sample Volume:

m³

**Received:** 07/08/14 11:06

Comments:

Start Time 7/6/14 17:31

Analysis Date: 07/10/14 13:31

**Hexavalent Chromium** 

**Results** 

<u>MDL</u>

**Analyte** 

**CAS Number** 

ng/m³ Air

<u>Flaq</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0602



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

**REPORTED:** 07/11/14 12:48

SUBMITTED:

07/08/14 to 07/09/14

Malvern, PA 19355

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

ATTN: Mr. Jeff Boggs

FAX: (410) 266-8912

**AQS SITE** SITE CODE:

Honeywell Hex Chrome Study

Description:

Comments:

PAM-3

Start Time 7/6/14 18:03

Lab ID:

4070836-23

Sampled: 07/07/14 17:01

Matrix:

Air

Sample Volume:

20.9

m<sup>3</sup>

Received: 07/08/14 11:06

Analysis Date: 07/10/14 13:41

**Hexavalent Chromium** 

<u>Results</u>

**MDL** 

**Analyte** 

CAS Number

<u>ng/m³ Air</u>

Flag

ng/m³ Air

**Hexavalent Chromium** 

1854-02-99

0.313

0.0036

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

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

**REPORTED:** 07/11/14 12:48

Malvern, PA 19355

SUBMITTED:

07/08/14 to 07/09/14

**AQS SITE** 

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

FAX: (410) 266-8912

SITE CODE:

Honeywell Hex Chrome Study

**Description:** 

PAM-4

Air

Lab ID: Sample Volume:

4070836-24

m³

Sampled: 07/07/14 17:15

Matrix: Comments:

Start Time 7/6/14 17:48

20.88

Received: 07/08/14 11:06 Analysis Date: 07/10/14 13:51

**Hexavalent Chromium** 

**Results** 

<u>MDL</u>

**Analyte** 

CAS Number

ng/m³ Air

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0505



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

**REPORTED:** 07/11/14 12:48

Malvern, PA 19355

SUBMITTED:

07/08/14 to 07/09/14

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

FAX: (410) 266-8912

CODE:

Honeywell Hex Chrome Study

Description:

PAM-21

Lab ID:

4070836-25

Sampled: 07/07/14 00:00

Matrix:

Air

Sample Volume:

20.84

m³

**Received:** 07/08/14 11:06 **Analysis Date:** 07/10/14 14:01

Comments:

**Hexavalent Chromium** 

**Results** 

<u>ng/m³ Air</u>

Flag

MDL ng/m³ Air

Hexavalent Chromium

**Analyte** 

**CAS Number** 1854-02-99

ND

11

0.0036

Willer



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED: 07/11/14 12:48

Malvern, PA 19355

SUBMITTED:

07/08/14 to 07/09/14

**AQS SITE** 

m³

PHONE: (443) 803-8495

ATTN: Mr. Jeff Boggs

FAX: (410) 266-8912

SITE CODE:

Honeywell Hex Chrome Study

**Description:** 

Comments:

PAM-31

Lab ID:

4070836-26

Sampled: 07/07/14 00:00

Matrix:

Air

Sample Volume:

20.9

Received: 07/08/14 11:06

Analysis Date: 07/10/14 14:11

**Hexavalent Chromium** 

**Results** 

MDL

**Analyte** 

**CAS Number** 

ng/m³ Air

<u>Flaq</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

ND



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

**REPORTED:** 07/11/14 12:48

Malvern, PA 19355

SUBMITTED:

07/08/14 to 07/09/14

·

AQS SITE

PHONE: (443) 803-8495

ATTN: Mr. Jeff Boggs

FAX: (410) 266-8912

CODE: SITE CODE:

Honeywell Hex Chrome Study

Description:

Comments:

OAM 1

Start Time 7/7/14 16:01

Lab ID:

4070922-01

Sampled: 07/08/14 15:48

Matrix:

Air

Sample Volume:

21.41

m³

Received: 07/09/14 11:34

Analysis Date: 07/10/14 14:21

**Hexavalent Chromium** 

Results

MDL

<u>Analyte</u>

**CAS Number** 

ng/m³ Air

Flag

<u>ng/m³ Air</u>

**Hexavalent Chromium** 

1854-02-99

0.0263



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

**REPORTED:** 07/11/14 12:48

Malvern, PA 19355

SUBMITTED:

07/08/14 to 07/09/14

ATTN: Mr. Jeff Boggs

**AQS SITE** 

PHONE: (443) 803-8495

**Analyte** 

FAX: (410) 266-8912

SITE CODE:

Honeywell Hex Chrome Study

Analysis Date: 07/10/14 14:31

**Description:** 

OAM 2

Lab ID:

4070922-02

Sampled: 07/08/14 16:10

Matrix:

Air

Sample Volume:

21.39

m³

Received: 07/09/14 11:34

Comments:

Start Time 7/7/14 16:24

**Hexavalent Chromium** 

**Results** 

MDL ng/m³ Air

**Hexavalent Chromium** 

**CAS Number** 1854-02-99

ng/m³ Air 0.0248

<u>Flag</u>



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

**REPORTED:** 07/11/14 12:48

Malvern, PA 19355

SUBMITTED:

07/08/14 to 07/09/14

AQS SITE

ATTN: Mr. Jeff Boggs

CODE:

Honeywell Hex Chrome Study

**Description:** 

Comments:

PAM-1

Col 1 Start Time 7/7/14 17:40

Lab ID:

4070922-03

Sampled: 07/08/14 17:20

Matrix:

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

Air

Sample Volume:

21.3

m³

Received: 07/09/14 11:34

Analysis Date: 07/10/14 12:11

**Hexavalent Chromium** 

**Results** 

<u>MDL</u>

**Analyte** 

**CAS Number** 

FAX: (410) 266-8912

ng/m³ Air

<u>Flaq</u>

ng/m³ Air

**Hexavalent Chromium** 

1854-02-99

0.0402



Environmental Resources Management, Inc.

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

**REPORTED:** 07/11/14 12:48

Malvern, PA 19355

SUBMITTED:

07/08/14 to 07/09/14

ATTN: Mr. Jeff Boggs

**AQS SITE** 

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

FAX: (410) 266-8912

SITE CODE:

Honeywell Hex Chrome Study

Description:

PAM-1D

Air

Lab ID:

Sample Volume:

4070922-04

21.34

m³

Sampled: 07/08/14 17:26

Matrix: Comments:

Col 2 Start Time 7/7/14 17:43

Received: 07/09/14 11:34 Analysis Date: 07/10/14 12:30

**Hexavalent Chromium** 

**Results** 

**MDL** 

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

ng/m³ Air 0.0541

<u>Flag</u> D-F

ng/m³ Air 0.0036



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

**REPORTED:** 07/11/14 12:48

Malvern, PA 19355

SUBMITTED:

07/08/14 to 07/09/14

ATTN: Mr. Jeff Boggs

**AQS SITE** 

PHONE: (443) 803-8495

FAX: (410) 266-8912

SITE CODE:

21.79

Honeywell Hex Chrome Study

**Description:** 

PAM-2

Air

Lab ID:

Sample Volume:

4070922-05

Sampled: 07/08/14 16:59 Received: 07/09/14 11:34

Matrix: Comments:

Start Time 7/7/14 16:45

m³

Analysis Date: 07/10/14 14:41

**Hexavalent Chromium** 

**Results** 

MDL

**Analyte** 

**CAS Number** 

ng/m³ Air

<u>Flaq</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0335



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:** 07/11/14 12:48

SUBMITTED:

07/08/14 to 07/09/14

**AQS SITE** SITE CODE:

Honeywell Hex Chrome Study

Description: Matrix:

Comments:

PAM-3

Start Time 7/7/14 17:06

Air

Lab ID:

Sample Volume:

4070922-06

21.34

m³

Sampled: 07/08/14 16:49

Received: 07/09/14 11:34

Analysis Date: 07/10/14 14:50

**Hexavalent Chromium** 

**Results** 

ng/m³ Air

<u>Flaq</u>

MDL ng/m³ Air

**Hexavalent Chromium** 

**Analyte** 

**CAS Number** 1854-02-99

0.0271



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

**REPORTED:** 07/11/14 12:48

Malvern, PA 19355

SUBMITTED:

07/08/14 to 07/09/14

**AQS SITE** 

PHONE: (443) 803-8495

ATTN: Mr. Jeff Boggs

FAX: (410) 266-8912

SITE CODE:

Honeywell Hex Chrome Study

Description:

Comments:

PAM-4

Lab ID:

4070922-07

Sampled: 07/08/14 16:31

Matrix:

Air

Sample Volume:

20.91

m³

Received: 07/09/14 11:34

Start Time 7/7/14 17:17

Analysis Date: 07/10/14 15:00

**Hexavalent Chromium** 

**Results** 

ng/m³ Air

<u>Flaq</u>

<u>MDL</u> ng/m³ Air

**Hexavalent Chromium** 

**Analyte** 

**CAS Number** 1854-02-99

0.276



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

**REPORTED:** 07/11/14 12:48

Malvern, PA 19355

SUBMITTED:

07/08/14 to 07/09/14

**AQS SITE** 

PHONE: (443) 803-8495

ATTN: Mr. Jeff Boggs

FAX: (410) 266-8912

CODE:

Honeywell Hex Chrome Study

Description:

PAM-21

Lab ID:

4070922-08

Sampled: 07/08/14 00:00 Received: 07/09/14 11:34

Matrix:

Air

**Sample Volume:** 

21.79

Analysis Date: 07/10/14 15:30

Comments:

**Hexavalent Chromium** 

**Results** 

m³

<u>MDL</u>

**Analyte** 

**CAS Number** 

<u>ng/m³ Air</u>

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

ND



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

**REPORTED:** 07/11/14 12:48

Malvern, PA 19355

SUBMITTED:

07/08/14 to 07/09/14

ATTN: Mr. Jeff Boggs

**AQS SITE** 

m³

PHONE: (443) 803-8495

FAX: (410) 266-8912

SITE CODE:

Honeywell Hex Chrome Study

Analysis Date: 07/10/14 15:40

Description:

PAM-31

Lab ID:

4070922-09

Sampled: 07/08/14 00:00

Matrix:

Air

Sample Volume:

Received: 07/09/14 11:34

Comments:

**Results** 

ng/m³ Air

**Hexavalent Chromium** 

<u>Flag</u>

<u>MDL</u>

Hexavalent Chromium

**Analyte** 

CAS Number 1854-02-99

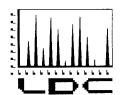
ND

ng/m³ Air 0.0036

Eastern Research Group

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

Page 38 of 40



# LABORATORY DATA CONSULTANTS, INC.

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

ERM July 28, 2014

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

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

Dear Mr. Boggs,

Enclosed is the revised validation report for the fraction listed below. Please replace the previously submitted report with the enclosed revised report.

# LDC Project #32145:

<u>SDG</u>	<u>Fraction</u>
4070836/7070922	Hexavalent Chromium

 Per client request, the field duplicate qualifier association was changed to qualify all samples >5x the MDL on the date of the exceeded field duplicate set.

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

Sincerely,

Christina Rink

Project Manager/Chemist

# Laboratory Data Consultants, Inc. Data Validation Report

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

Collection Date: July 2 through July 8, 2014

LDC Report Date: July 25, 2014

Matrix: Air

Parameters: Hexavalent Chromium

Validation Level: EPA Level IV

**Laboratory:** Eastern Research Group

**Sample Delivery Group (SDG):** 4070836/4070922

# Sample Identification

OAM 1 (07/02/14)	PAM-3 (07/07/14)
OAM 2 (07/02/14)	PAM-4 (07/07/14)
PAM-1 (07/02/14)	PAM-21 (07/07/14)
PAM-1D (07/02/14)	PAM-31 (07/07/14)
PAM-2 (07/02/14)	OAM 1 (07/08/14)
PAM-3 (07/02/14)	OAM 2 (07/08/14)
PAM-4 (07/02/14)	PAM-1 (07/08/14)
PAM-21 (07/02/14)	PAM-1D (07/08/14)
PAM-31 (07/02/14)	PAM-2 (07/08/14)
OAM 1 (07/03/14)	PAM-3 (07/08/14)
OAM 2 (07/03/14)	PAM-4 (07/08/14)
PAM-1 (07/03/14)	PAM-21 (07/08/14)
PAM-1D (07/03/14)	PAM-31 (07/08/14)
PAM-3 (07/03/14)	PAM-1 (07/02/14)DUP
PAM-4 (07/03/14)	PAM-1D (07/02/14)DUP
PAM-21 (07/03/14)	PAM-1 (07/03/14)DUP
PAM-31 (07/03/14)	PAM-1D (07/03/14)DUP
OAM 1 (07/07/14)	PAM-1 (07/07/14)DUP
OAM2 (07/07/14)	PAM-1D (07/07/14)DUP
PAM-1 (07/07/14)	PAM-1 (07/08/14)DUP
PAM-1D (07/07/14)	PAM-1D (07/08/14)DUP
PAM-2 (07/07/14)	

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 (07/02/14), PAM-31 (07/03/14), PAM-31 (07/07/14), and PAM-31 (07/08/14) were identified as trip blanks. No hexavalent chromium was found.

Samples PAM-21 (07/02/14), PAM-21 (07/03/14), PAM-21 (07/07/14), and PAM-21 (07/08/14) 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 (07/02/14) and PAM-1D (07/02/14), samples PAM-1 (07/03/14) and PAM-1D (07/03/14), samples PAM-1 (07/07/14) and PAM-1D (07/07/14), and samples PAM-1 (07/08/14) and PAM-1D (07/08/14) were identified as field duplicates. No hexavalent chromium was detected in any of the samples with the following exceptions:

	Concentrati	on (ng/m³)			
Analyte	PAM-1 (07/02/14)	PAM-1D (07/02/14)	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.0626	0.0679	8 (≤20)	-	-

	Concentrati	ion (ng/m³)			
Analyte	PAM-1 (07/03/14)	PAM-1D (07/03/14)	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.108	0.0948	13 (≤20)	-	_

	Concentra	tion (ng/m³)	555		
Analyte	PAM-1 (07/07/14)	PAM-1D (07/07/14)	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.0648	0.0741	13 (≤20)	-	-

	Concentrat	ion (ng/m³)			
Analyte	PAM-1 (07/08/14)	PAM-1D (07/08/14)	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.0402	0.0541	29 (≤20)	J (all detects)	А

# Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Data Qualification Summary - SDG 4070836/4070922

SDG	Sample	Analyte	Flag	A or P	Reason
4070836/ 4070922	OAM 1 (07/08/14) OAM 2 (07/08/14) PAM-1 (07/08/14) PAM-1D (07/08/14) PAM-2 (07/08/14) PAM-3 (07/08/14) PAM-4 (07/08/14)	Hexavalent chromium	J (all detects)	А	Field duplicates (RPD)

Harbor Point, MD, Hexavalent Chromium Monitoring
Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG
4070836/4070922

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 4070836/4070922

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

#### VALIDATION COMPLETENESS WORKSHEET LDC #: 32145A6

SDG #: 4070836/4070922

Level IV

Date: <u>1/۱</u>	1
Page: <u>  \</u> of	1
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
<u>l.</u>	Technical holding times	A	Sampling dates:07  02-03 14 7/07-08 14
11	Initial calibration	LA	·
111.	Calibration verification	LA_	
IV	Blanks	LA	
V	Matrix Spike/Matrix Spike Duplicates	N	
VI.	Duplicates	A	Dup
VII.	Laboratory control samples	A	usiò
VIII.	Sample result verification	LA	
IX.	Overall assessment of data	A	
Χ.	Field duplicates	SW	FD= 13,4) (12,13) (20,21) (29,36)
ΧL	Field blanks	ND	EB= FB= 8, 16, 25, 34 TB=9, 17, 24,34

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:

	<u> </u>						
1	OAM 1 (07/02/14)	12	PAM-1 (07/03/14)	23	PAM-3 (07/07/14)	34	PAM-21 (07/08/14)
2	OAM 2 (07/02/14)	13	PAM-1D (07/03/14)	24	PAM-4 (07/07/14)	35	PAM-31 (07/08/14)
3	PAM-1 (07/02/14)	14	PAM-3 (07/03/14)	25	PAM-21 (07/07/14)	36	PAM-1 (07/02/14)DUP
4	PAM-1D (07/02/14)	15	PAM-4 (07/03/14)	26	PAM-31 (07/07/14)	37	PAM-1D (07/02/14)DUP
5	PAM-2 (07/02/14)	16	PAM-21 (07/03/14)	27	OAM 1 (07/08/14)	38	PAM-1 (07/03/14)DUP
6	PAM-3 (07/02/14)	17	PAM-31 (07/03/14)	28	OAM 2 (07/08/14)	39	PAM-1D (07/03/14)DUP
7	PAM-4 (07/02/14)	18	OAM 1 (07/07/14)	29	PAM-1 (07/08/14)	40	PAM-1 (07/07/14)DUP
8	PAM-21 (07/02/14)	19	OAM2 (07/07/14)	30	PAM-1D (07/08/14)	41	PAM-1D (07/07/14)DUP
9	PAM-31 (07/02/14)	20	PAM-1 (07/07/14)	31	PAM-2 (07/08/14)	42	PAM-1 (07/08/14)DUP
10	OAM 1 (07/03/14)	21	PAM-1D (07/07/14)	32	PAM-3 (07/08/14)	43	PAM-1D (07/08/14)DUP
11	OAM 2 (07/03/14)	22	PAM-2 (07/07/14)	33	PAM-4 (07/08/14)	44	

Notes:	145	annadad	todifferentier	between	randes	
					-0 4	

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

Method: Inorganics (EPA Method Seelaw)

Validation Area .				
Validation Alea .	Yes	No	NA	Findings/Comments
I. Technical holding times	<del></del>		,	
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 <del>00-110</del> % QC انتخابات المحافظة المحافظ	/			
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.	/			Dup
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.			/	
Were the MS/MSD or duplicate relative percent differences (RPD) ≤ 20% for waters and ≤ 35% for soil samples? A control limit of ≤ CRDL(≤ 2X CRDL for soil) was used for samples that were ≤ 5X the CRDL, including when only one of the duplicate sample values were < 5X the CRDL.				
V. Laboratory control samples				
Was an LCS 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?				

A

Page: Zof Reviewer: SC 2nd Reviewer: OL

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#	32145A6
	02 140/10

# **VALIDATION FINDINGS WORKSHEET**

# Field Duplicates

Inorganics: Method See Cover

	Concentra	tion (ng/m3)		
Analyte	3	4	RPD (≤20)	
Hexavalent Chromium	0.0626	0.0679	8	

	Concentrat	ion (ng/m3)		
Analyte	12	13	RPD (≤20)	
Hexavalent Chromium	0.108	0.0948	13	

	Concentra	ation (ng/m3)		
Analyte	20	21	RPD (≤20)	
Hexavalent Chromium	0.0648	0.0741	13	

	Concentra	tion (ng/m3)		
Analyte	29	30	RPD (≤20)	
Hexavalent Chromium	0.0402	0.0541	29	Jackin

\\LDCFILESERVER\\Validation\FIELD DUPLICATES\FD\_inorganic\32145A6.wpd

(quality 27-33)

LDC #: 3214544

# Validation Findings Worksheet Initial and Continuing Calibration Calculation Verification

Page:	<u></u> of	_'
Reviewer	: <	D.
2nd Revie	wer:_	9

Method:	Inorganics,	Method	See Cover	
miculou.	morganico,	INCUIVA		

The correlation coefficient (r) for the calibration of Cut was recalculated. Calibration date: 7/9/14

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 <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 <sup>2</sup>	r or r <sup>2</sup>	(Y/N)
Initial calibration		s1	0.05	0.0000106		<u>.</u>	
		s <u>2</u>	0.10	0.0000306	0.99980	0.99936	
	Crab	s3	0.20	0.0000683			
	CV	s4	0.50	0.0001791			4
		s5	1.00	0.0003623			•
		s6	2.00	0.0007623			
719/14	ملا ع	Found	True				u
Calibration verification	C420	0.5198ng/ml	0.5000ng/ml		104.0%	280.401	<u> </u>
ICU 10111	ما تم	11					<b>V</b>
ていいし Calibration verification	Cv+6	O.SIUZMAI	0.5000mg/ml		102.9°/02	107.9%	<u></u>
CW せいまいいし ついいしん Calibration verification	Cv 16	0281	0.5000 ng/m/		111.662	111.7%	7)

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 #: 32145A

# VALIDATION FINDINGS WORKSHEET Level IV Recalculation Worksheet

Page: <u></u>	_of\
Reviewer:	30
2nd Reviewer:_	ç

METHOD: Inorganics, I	Method <u>See</u>	Lover	<del></del>					
Percent recoveries (%R) for a laboratory control sample and a matrix spike sample were recalculated using the following formula:								
%R = <u>Found</u> x 100 True	Where,		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). tration of each analyte in the source.					
A sample and duplicate relative percent difference (RPD) was recalculated using the following formula:								
$RPD =  S-D  \times 100$ (S+D)/2	Where,	S = D =	Original sample concentration  Duplicate sample concentration					

Sample ID	Type of Analysis	Element	Found / S (units)	True / D (units)	Recalculated	Reported %R / RPD	Acceptable (Y/N)
LCS 10:450 719114	Laboratory control sample	Crab	1.209 ng/m	1.00mg/ml	111%P	111 %R	7
N	Matrix spike sample		(SSR-SR)				
Dup 1279714	Duplicate sample	مادي	0.0110 ng/m3	ODER mylm3	<i>વ.૫७%</i> (૪૧)	4,59% RPD	5

Comments: Refer to appropriate worksheet for list of o	qualifications and associated samples when repo	orted results do not agree within 10.0% of th	e recalculated results.

LDC #: 32145A6

# VALIDATION FINDINGS WORKSHEET Sample Calculation Verification

Page: \ of \frac{1}{2} \ Reviewer: \frac{50}{2} \]

2nd reviewer: \[ \frac{1}{2} \]

MET	HOD: Inorganics, Meth	od See Lover	3			
Pleas Y N Y N Y N	N/A Are results \	s been reported a	nd calculated correctly ed range of the instrum	?	re identified as "N/	A".
Comi	pound (analyte) results	for (33)	ما <sup>لم</sup> ی (	ren	orted with a positiv	ve detect war
racal	culated and varified ucit	an the following of				
Conce	ntration = ((aven) - ((	-0)]  VE=10	Recalculation: [(o	.0007235 mAU*mi	W - (- PME	-06)]
wa?	(C')	ſ.	V 0)	(0.00	(5025	= 0.57
٥٥.	= -6,64E-06 = 0.0003993 en= 0.00022350	[hg]w	ullut) - waling	(0.000) (0.5-10/10)	~1) ('O''')	V-3 1
Ç	= 0.0003993	1	2 5 19 W	(0.2-18-210		- D.27
~~	en- 0.0002235,	NINTOAN		20	91 m3	
#	Sample ID	•	Analyte	Reported Concentration (Mg]w <sup>Z</sup> )	Calculated Concentration ( ^A   w <sup>3</sup> )	Acceptable (Y/N)
	. (		Cx*6	0.0365	0.0364	7
	2			0.0319	0.318	1
	3			0.0626	0.0626	
	ų			0.0679	0.0679	
	2			0.0795	0.0194	
	b			0.0846	0.0846	
	7	·		0. 293	0.293	
~	8			_ NO	NO	
	9			ND	ND	
	lo			0.0382	0.038	
	11			2820.0	0.0585	
	12			801.0	0-108	
	\3			0.0948	00948	
	14			0.0662	0.0662	
<b>,</b>	12			0.0786	0 0786	
	16			hD	NO	
	17			_ NO	ND	
	18			0.0224	0.0225	
	. 19			0.0367	0.0367	
	72		4	8400.0	0.0648	

LDC #: 32145A6

# **VALIDATION FINDINGS WORKSHEET**

Sample Calculation Verification

Page: 2 of 7
Reviewer:
2nd reviewer:

METHOD: Inor	ganics, Method <u>{ee</u>	Lover	
Please see qua  Y N N/A Y N N/A Y N N/A	difications below for all que Have results been report Are results within the call Are all detection limits be	estions answered "N". Not applited and calculated correctly? ibrated range of the instrument alow the CRQL?	licable questions are identified as "N/A".
Compound (and recalculated and	alyte) results for d verified using the follow	ing equation:	reported with a positive detect were
Concentration =		Recalculation;	

#	Sample ID	Analyte		Reported Concentration (na) <sup>m3</sup> )	Calculated Concentration ( \( \( \sigma_1 \) \( \sigma_1 \)	Acceptable (Y/N)
	2\	Cr	<b>→</b> 6	1,600	8.0741	4
	22			0.0602	0.0601	
	23			0.313	0.313	
	24			0.0505	0.0505	
	25			ND	80	
	270		•	ND	NO	
	27			0-0263	0.0264	
	78			0.0248	0.0248	
	75			0.0402	0.0403	
	30			0.0541	0.0541	
	31			0.0335	0.0336	
	32			0.0271	0.0272	
	33	,		0.216	0.276	
	34			100	NO .	
	35		4	ND	NO	<u></u>
		·····				

Note:				
	 	~ <del>/~</del>	· · · · · · · · · · · · · · · · · · ·	



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

07/11/14 12:48 REPORTED: SUBMITTED:

07/08/14 to 07/09/14

AQS SITE

STE CODE:

Honeywell Hex Chrome Study

Description: OAM 1 Lab ID:

4070836-01

Sampled: 07/02/14 15:54

Matrix: Comments:

Start Time 7/1/14 16:08

Sample Volume:

21.39

m³

Received: 07/08/14 11:06

Analysis Date: 07/09/14 12:58

**Hexavalent Chromium** 

**Results** 

MDL

<u>Analyte</u>

**CAS Number** 

ng/m³ Air

<u>Flag</u>

ng/m³ Air

**Hexavalent Chromium** 

1854-02-99

0.0365

0.0036

Q Mulia



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Start Time 7/1/14 16:30

FAX: (410) 266-8912

FILE #: 3926.00

07/11/14 12:48

REPORTED:

SUBMITTED:

07/08/14 to 07/09/14

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description: OAM 2 Lab ID:

4070836-02

Sampled: 07/02/14 16:18

Matrix:

Sample Volume:

Received: 07/08/14 11:06

Analysis Date: 07/09/14 13:08

**Hexavalent Chromium** 

<u>Results</u>

MDL

**Analyte** 

Comments:

**CAS Number** 1854-02-99

<u>ng/m³ Air</u>

Flag

ng/m³ Air

**Hexavalent Chromium** 

0.0319

0.0036

Minha



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495 PAM-1

FAX: (410) 266-8912

Col 1 Start Time 7/1/14 17:41

FILE#: 3926.00

REPORTED: SUBMITTED:

m³

07/08/14 to 07/09/14

07/11/14 12:48

**AQS SITE** 

SHECODE: Lab ID: 4070836-03

Honeywell Hex Chrome Study Sampled: 07/02/14 17:24

Description: Matrix:

Sample Volume:

21.35

Received: 07/08/14 11:06

Analysis Date: 07/09/14 11:37

**Hexavalent Chromium** 

Results

MDL

**Analyte** 

**CAS Number** 

ng/m³ Air

Flag

<u>ng/m³ Air</u>

Hexavalent Chromium

Comments:

1854-02-99

0.0626

0.0036

Or Varla



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

07/11/14 12:48

REPORTED: SUBMITTED:

07/08/14 to 07/09/14

**AQS SITE** 

SITE CODE:

т³

Honeywell Hex Chrome Study

PAM-1D Description:

Lab ID: 4070836-04

Sample Volume: 21.31 Sampled: 07/02/14 17:27

Received: 07/08/14 11:06

Analysis Date: 07/09/14 11:57

Comments: Col 2 Start Time 7/1/14 17:46

**Hexavalent Chromium** 

<u>Results</u>

MDL

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

ng/m³ Air 0.0679

<u>Flaq</u>

ng/m³ Air 0.0036

1854-02-99



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

Start Time 7/1/14 17:21

FILE #: 3926.00

07/11/14 12:48 REPORTED:

SUBMITTED:

07/08/14 to 07/09/14

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

PAM-2 Description:

Lab ID: 4070836-05

Sample Volume: 21.42 m³

Sampled: 07/02/14 17:09

Received: 07/08/14 11:06 Analysis Date: 07/09/14 13:38

**Hexavalent Chromium** 

Results

MDL

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

ng/m³ Air 0.0795

<u>Flag</u>

ng/m³ Air 0.0036

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 40



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

FILE #: 3926.00

07/11/14 12:48 REPORTED:

SUBMITTED:

07/08/14 to 07/09/14

**AQS SITE** 

STE CODE:

Honeywell Hex Chrome Study

Sampled: 07/02/14 16:56

Description: PAM-3

Start Time 7/1/14 17:11

Lab ID: 4070836-06

Sample Volume: 21.38 m³

Received: 07/08/14 11:06

Analysis Date: 07/09/14 13:48

**Hexavalent Chromium** 

<u>Results</u>

MDL

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

1854-02-99

ng/m³ Air 0.0846

<u>Flaq</u>

ng/m³ Air 0.0036

Orthyla

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 40



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

495 FAX: (410) 266-8912

Start Time 7/1/14 16:52

e.

REPORTED: SUBMITTED:

FILE #: 3926.00

07/08/14 to 07/09/14

07/11/14 12:48

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

**Description:** PAM-4

(+10) 200-0012

4070836-07

Sampled: 07/02/14 16:37

Matrix:

Comments:

Air

Sample Volume:

Lab ID:

m³

Received: 07/08/14 11:06

Analysis Date: 07/09/14 13:58

**Hexavalent Chromium** 

21.38

Results

<u>MDL</u>

<u>Analyte</u>

CAS Number

ng/m³ Air

Flag

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.293

0.0036

O Muller



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

07/11/14 12:48 REPORTED:

SUBMITTED:

07/08/14 to 07/09/14

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-21

Lab ID: 4070836-08

Sample Volume:

21.42 mэ Sampled: 07/02/14 00:00

Received: 07/08/14 11:06

Analysis Date: 07/09/14 14:08

Matrix: Comments:

**Hexavalent Chromium** 

Results

MDL <u>ng/m³ Air</u>

Hexavalent Chromium

**Analyte** 

**CAS Number** 1854-02-99

ng/m³ Air ND

Flag U

0.0036

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 40



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

Matrix:

PHONE: (443) 803-8495 PAM-31

Air

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

07/11/14 12:48

07/08/14 to 07/09/14

SUBMITTED:

AQS SITE

STE CODE:

Honeywell Hex Chrome Study

Description:

Comments:

Lab ID:

4070836-09

Sample Volume:

21.38 m³ Sampled: 07/02/14 00:00

Received: 07/08/14 11:06

Analysis Date: 07/09/14 14:18

**Hexavalent Chromium** 

Results

MDL

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

ng/m³ Air ND

Flag

nq/m3 Air 0.0036



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

OAM 1

FAX: (410) 266-8912

FILE #: 3926.00

07/11/14 12:48 REPORTED:

SUBMITTED:

07/08/14 to 07/09/14

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description:

Lab ID: 4070836-10

Sample Volume: 21.11

m³

Flag

Sampled: 07/03/14 15:26

Received: 07/08/14 11:06 Analysis Date: 07/09/14 14:28

Comments:

Matrix:

Start Time 7/2/14 15:59

**Hexavalent Chromium** 

Results ng/m³ Air

MDL ng/m³ Air

**Hexavalent Chromium** 

**Analyte** 

**CAS Number** 1854-02-99

0.0382



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED: 07/11/14 12:48

Malvern, PA 19355

SUBMITTED:

07/08/14 to 07/09/14

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

FAX: (410) 266-8912

SITE CODE:

Honeywell Hex Chrome Study

Description:

4070836-11

Sampled: 07/03/14 15:58

Matrix: Comments:

Air

OAM 2

Start Time 7/2/14 16:23

Sample Volume:

Lab ID:

m³

Received: 07/08/14 11:06

Analysis Date: 07/09/14 14:37

**Hexavalent Chromium** 

**Results** 

<u>MDL</u>

**Analyte** 

**CAS Number** 

ng/m³ Air

Flag

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0586



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

07/11/14 12:48 REPORTED:

SUBMITTED:

07/08/14 to 07/09/14

**AQS SITE** 

SHE CODE:

Honeywell Hex Chrome Study

Description:

Matrix:

PAM-1

Lab ID:

4070836-12

21.15

m³

Flag

Sampled: 07/03/14 16:58

Received: 07/08/14 11:06 Analysis Date: 07/09/14 12:17

Air Comments: Col 1 Start Time 7/2/14 17:28

**Hexavalent Chromium** 

Results

ng/m³ Air

MDL

ng/m3 Air

Hexavalent Chromium

**Analyte** 

**CAS Number** 1854-02-99

Sample Volume:

0.108



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495 PAM-1D

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: SUBMITTED:

07/08/14 to 07/09/14

07/11/14 12:48

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Sampled: 07/03/14 17:02

Description: Matrix:

Lab ID: 4070836-13 Sample Volume:

m³

Received: 07/08/14 11:06

Analysis Date: 07/09/14 12:36

Comments:

Col 2 Start Time 7/2/14 17:31

**Hexavalent Chromium** 

**Results** 

ng/m³ Air

Flag

MDL ng/m³ Air

**Hexavalent Chromium** 

**Analyte** 

**CAS Number** 1854-02-99

0.0948



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

Description:

Comments:

**Hexavalent Chromium** 

<u>Analyte</u>

ATTN: Mr. Jeff Boggs

Matrix:

PHONE: (443) 803-8495

PAM-3

Start Time 7/2/14 17:01

FAX: (410) 266-8912

Lab ID:

**CAS Number** 

1854-02-99

4070836-14

Sample Volume:

**Hexavalent Chromium** 

ng/m³ Air

Results

0.0662

<u>Flag</u>

FILE #: 3926.00

REPORTED:

SUBMITTED:

m³

**AQS SITE** SITE CODE:

> ng/m³ Air 0.0036

<u>MDL</u>

07/11/14 12:48

07/08/14 to 07/09/14

Honeywell Hex Chrome Study

Sampled: 07/03/14 16:37

Received: 07/08/14 11:06

Analysis Date: 07/09/14 14:47

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 40



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Start Time 7/2/14 16:42

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: SUBMITTED:

07/08/14 to 07/09/14

07/11/14 12:48

**AQS SITE** 

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-4 Lab ID:

Sampled: 07/03/14 16:21

Matrix:

Comments:

Sample Volume:

21.28

m³

Received: 07/08/14 11:06

Analysis Date: 07/09/14 14:57

**Hexavalent Chromium** 

4070836-15

**Results** 

MDL

<u>Analyte</u>

**CAS Number** 

ng/m³ Air

<u>Flag</u>

ng/m³ Air

**Hexavalent Chromium** 

1854-02-99

0.0786



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

Description:

ATTN: Mr. Jeff Boggs

Matrix: Comments:

PHONE: (443) 803-8495 PAM-21

Air

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

07/11/14 12:48

SUBMITTED:

07/08/14 to 07/09/14

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Lab ID: 4070836-16

Sample Volume:

m³

Sampled: 07/03/14 00:00

Received: 07/08/14 11:06

Analysis Date: 07/09/14 15:07

**Hexavalent Chromium** 

21.14

Results

MDL

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

ng/m³ Air ND

Flag

ng/m3 Air 0.0036

Eastern Research Group

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

Page 19 of 40



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

Comments:

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Air

FAX: (410) 266-8912

FILE#: 3926.00

REPORTED:

07/11/14 12:48

SUBMITTED:

07/08/14 to 07/09/14

AQS SITE

SITE CODE:

m³

Honeywell Hex Chrome Study

Description: PAM-31 Matrix:

Lab ID: 4070836-17

Sampled: 07/03/14 00:00

Sample Volume:

21.14

Received: 07/08/14 11:06

Analysis Date: 07/09/14 15:37

**Hexavalent Chromium** 

**Results** 

MDL

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

ng/m³ Air ND

<u>Flaq</u>

ng/m<sup>3</sup> Air 0.0036

Eastern Research Group

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

Page 20 of 40



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: 07/11/14 12:48

SUBMITTED:

07/08/14 to 07/09/14

**AQS SITE** 

SHE CODE:

Honeywell Hex Chrome Study

Description: OAM 1

Sample Volume:

Lab ID:

21.01

m³

Sampled: 07/07/14 15:55

Received: 07/08/14 11:06 Analysis Date: 07/10/14 12:52

Comments:

Matrix:

Start Time 7/6/14 16:35

**Hexavalent Chromium** 

4070836-18

Results ng/m³ Air

MDL ng/m³ Air

**Hexavalent Chromium** 

**Analyte** 

**CAS Number** 1854-02-99

0.0224

Flag



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Start Time 7/6/14 16:57

Air

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

07/11/14 12:48

SUBMITTED:

07/08/14 to 07/09/14

**AQS SITE** 

Lab ID: 4070836-19 STECODE:

Honeywell Hex Chrome Study

Description: OAM 2 Matrix:

Comments:

Sample Volume:

21.04

m³

Sampled: 07/07/14 16:19 Received: 07/08/14 11:06

Analysis Date: 07/10/14 13:01

**Hexavalent Chromium** 

Results

MDL

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

ng/m³ Air 0.0367

Flag

ng/m<sup>3</sup> Air 0.0036



Environmental Resources Management, Inc.

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

803-8495 FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

07/11/14 12:48

SUBMITTED:

07/08/14 to 07/09/14

**AQS SITE** 

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-1

Matrix: Air

Col 1 Start Time 7/6/14 17:21

**Lab ID:** 4070836-20

Sample Volume: 21,81

m³

Sampled: 07/07/14 17:35 Received: 07/08/14 11:06

Janapio 10.a

L n

Analysis Date: 07/10/14 11:31

Hexavalent Chromium

Results

MDL.

<u>Analyte</u>

**CAS Number** 

<u>ng/m³ Air</u>

Flag

ng/m³ Air

Hexavalent Chromium

Comments:

1854-02-99

0.0648

0.0036

V/m/m



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: 07/11/14 12:48

07/08/14 to 07/09/14

SUBMITTED:

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description: Matrix: PAM-1D

Lab ID:

4070836-21

Sample Volume: 21.83 m³

Sampled: 07/07/14 17:39 Received: 07/08/14 11:06

Analysis Date: 07/10/14 11:51

Comments: Col 2 Start Time 7/6/14 17:24

**Hexavalent Chromium** 

**Results** 

ng/m³ Air

Flag

MDL ng/m³ Air

Hexavalent Chromium

**Analyte** 

**CAS Number** 1854-02-99

0.0741



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Air

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE#: 3926.00

REPORTED: 07/11/14 12:48

SUBMITTED:

07/08/14 to 07/09/14

**AQS SITE** 

CODE:

Honeywell Hex Chrome Study

Description: Matrix:

Comments:

PAM-2

Start Time 7/6/14 17:31

Lab ID:

Sample Volume:

4070836-22

m³

Sampled: 07/07/14 16:41 Received: 07/08/14 11:06

Analysis Date: 07/10/14 13:31

**Hexavalent Chromium** 

20.84

Results ng/m³ Air

<u>Flaq</u>

MDL ng/m³ Air

**Hexavalent Chromium** 

**Analyte** 

**CAS Number** 1854-02-99

0.0602



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Start Time 7/6/14 18:03

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

SUBMITTED:

07/08/14 to 07/09/14

07/11/14 12:48

**AQS SITE** 

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-3

Comments:

Lab ID:

4070836-23 20.9

m³

<u>Flag</u>

Sampled: 07/07/14 17:01

Sample Volume: Matrix:

Received: 07/08/14 11:06

Analysis Date: 07/10/14 13:41

**Hexavalent Chromium** 

Resuits <u>nq/m³ Air</u> <u>MDL</u>

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

0.313

<u>ng/m³ Air</u> 0.0036



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

PAM-4

Start Time 7/6/14 17:48

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

07/11/14 12:48

SUBMITTED:

07/08/14 to 07/09/14

**AQS SITE** SHECODE:

4070836-24

Honeywell Hex Chrome Study Sampled: 07/07/14 17:15

**Description:** Matrix:

Comments:

Lab ID:

Sample Volume:

20.88

m³

Received: 07/08/14 11:06

Analysis Date: 07/10/14 13:51

**Hexavalent Chromium** 

Results

MDL

<u>Analyte</u>

**CAS Number** 

ng/m³ Air

Flag

ng/m³ Air

**Hexavalent Chromium** 

1854-02-99

0.0505



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

Description:

Comments:

ATTN: Mr. Jeff Boggs

Matrix:

PHONE: (443) 803-8495

Air

PAM-21

FAX: (410) 266-8912

Lab ID:

4070836-25

Sample Volume:

20.84

m³

FILE #: 3926.00

REPORTED:

SUBMITTED:

AQS SITE STECODE:

Received: 07/08/14 11:06

Sampled: 07/07/14 00:00

Honeywell Hex Chrome Study

Analysis Date: 07/10/14 14:01

**Hexavalent Chromium** 

**Results** 

<u>ng/m³ Air</u>

<u>Flag</u>

MDL ng/m<sup>3</sup> Air

07/11/14 12:48

07/08/14 to 07/09/14

Hexavalent Chromium

**Analyte** 

**CAS Number** 1854-02-99

ND

0.0036

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 28 of 40



Environmental Resources Management, Inc.

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED: 07/11/14 12:48

Malvern, PA 19355

SUBMITTED:

07/08/14 to 07/09/14

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

FAX: (410) 266-8912

SITE CODE:

Honeywell Hex Chrome Study

Description:

PAM-31

Lab ID:

4070836-26

Sampled: 07/07/14 00:00

Matrix:

Air

Sample Volume: 20.9

m³

Received: 07/08/14 11:06

Comments:

Analysis Date: 07/10/14 14:11

**Hexavalent Chromium** 

Results

MDL

Analyte
Hexavalent Chromium

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

<u>Flaq</u>

ng/m³ Air 0.0036

Willy



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: 07/11/14 12:48

SUBMITTED:

07/08/14 to 07/09/14

**AQS SITE** 

SITE CODE:

Honeywell Hex Chrome Study

Description:

OAM 1

Start Time 7/7/14 16:01

Lab ID:

4070922-01

Sampled: 07/08/14 15:48

Matrix: Comments: Air

Sample Volume:

21.41 m³

Received: 07/09/14 11:34

Analysis Date: 07/10/14 14:21

**Hexavalent Chromium** 

**Results** 

MDL

**Analyte** 

**CAS Number** 

ng/m³ Air

Flag

ng/m³ Air

**Hexavalent Chromium** 

1854-02-99

0.0263



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

Description:

Comments:

ATTN: Mr. Jeff Boggs

Matrix:

PHONE: (443) 803-8495

Air

OAM 2

Start Time 7/7/14 16:24

FAX: (410) 266-8912

Lab ID:

4070922-02

Sample Volume:

21.39

m³

FILE #: 3926.00

REPORTED:

SUBMITTED:

AQS SITE

SITE CODE:

07/11/14 12:48

07/08/14 to 07/09/14

Received: 07/09/14 11:34 Analysis Date: 07/10/14 14:31

Sampled: 07/08/14 16:10

Honeywell Hex Chrome Study

**Hexavalent Chromium** 

**Results** 

ng/m³ Air

Flag

MDL ng/m³ Air

**Hexavalent Chromium** 

**Analyte** 

**CAS Number** 1854-02-99

0.0248



Environmental Resources Management, Inc

PAM-1

Air

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

Description:

Comments:

**Hexavalent Chromium** 

**Analyte** 

ATTN: Mr. Jeff Boggs

Matrix:

PHONE: (443) 803-8495

Col 1 Start Time 7/7/14 17:40

FAX: (410) 266-8912

1854-02-99

Lab ID:

Sample Volume:

Results

**CAS Number** 

0.0402 5

ng/m³ Air

4070922-03

07/08/14 to 07/09/14

07/11/14 12:48

Honeywell Hex Chrome Study

Sampled: 07/08/14 17:20

Received: 07/09/14 11:34

Analysis Date: 07/10/14 12:11

**Hexavalent Chromium** 

21.3

FILE #: 3926.00

REPORTED:

SUBMITTED:

m³

<u>Flaq</u>

**AQS SITE** SITE CODE:

> MDL ng/m³ Air



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

Matrix:

Comments:

PHONE: (443) 803-8495

Col 2 Start Time 7/7/14 17:43

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 07/11/14 12:48

SUBMITTED:

07/08/14 to 07/09/14

**AQS SITE** 

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-1D Lab ID:

Sample Volume:

4070922-04

m³

Sampled: 07/08/14 17:26 Received: 07/09/14 11:34

Analysis Date: 07/10/14 12:30

**Hexavalent Chromium** 

Results

MDL

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

<u>ng/m³ Air</u> 0.0541 5

Flag D-F

<u>ng/m³ Air</u> 0.0036



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

Description:

Comments:

ATTN: Mr. Jeff Boggs

Matrix:

PHONE: (443) 803-8495

PAM-2

Start Time 7/7/14 16:45

FAX: (410) 266-8912

Lab ID: 4070922-05

Sample Volume:

21.79

m³

Flag

FILE #: 3926.00

REPORTED:

SUBMITTED: AQS SITE

SITE CODE:

Analysis Date: 07/10/14 14:41

Honeywell Hex Chrome Study

Sampled: 07/08/14 16:59

Received: 07/09/14 11:34

07/08/14 to 07/09/14

**Hexavalent Chromium** 

Results

ng/m³ Air

MDL ng/m³ Air

07/11/14 12:48

Hexavalent Chromium

<u>Analyte</u>

**CAS Number** 1854-02-99

0.0335



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

03-8495 **FAX:** (410) 266-8912

Start Time 7/7/14 17:06

FILE #: 3926.00

REPORTED:

07/11/14 12:48

SUBMITTED:

07/08/14 to 07/09/14

AQS SITE

SODE:

Honeywell Hex Chrome Study

Description: Matrix:

Comments:

PAM-3

\_\_\_\_

**Lab ID:** 4070922-06

Sample Volume:

i n

m³

Sampled: 07/08/14 16:49 Received: 07/09/14 11:34

Analysis Date: 07/10/14 14:50

**Hexavalent Chromium** 

Results

MDL ng/m³ Air

Analyte
Hexavalent Chromlum

**CAS Number** 

1854-02-99

ng/m³ Air 0.0271 5

Flag

0.0036

Why



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

Matrix:

PHONE: (443) 803-8495

Start Time 7/7/14 17:17

FAX: (410) 266-8912

FILE #: 3926.00

07/11/14 12:48 REPORTED:

SUBMITTED:

07/08/14 to 07/09/14

**AQS SITE** 

STECODE:

Honeywell Hex Chrome Study

Description:

Comments:

PAM-4 Air

Lab ID:

4070922-07

m³

Sampled: 07/08/14 16:31 Received: 07/09/14 11:34

Analysis Date: 07/10/14 15:00

**Hexavalent Chromium** 

20.91

Results

Sample Volume:

ng/m³ Air

Flag

MDL ng/m³ Air

Hexavalent Chromium

<u>Analyte</u>

**CAS Number** 1854-02-99

0.276



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

Air

PAM-21

FAX: (410) 266-8912

**CAS Number** 

1854-02-99

Lab ID: Sample Volume:

4070922-08

21.79

m³

<u>Flag</u>

SUBMITTED:

**AQS SITE** 

SHE CODE:

FILE #: 3926.00

**REPORTED:** 07/11/14 12:48

Received: 07/09/14 11:34

07/08/14 to 07/09/14

Analysis Date: 07/10/14 15:30

Sampled: 07/08/14 00:00

Honeywell Hex Chrome Study

**Hexavalent Chromium** 

Results

ng/m³ Air

ND

ng/m³ Air 0.0036

MDL



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED: 07/11/14 12:48

Malvern, PA 19355

SUBMITTED:

07/08/14 to 07/09/14

ATTN: Mr. Jeff Boggs

**AQS SITE** 

PHONE: (443) 803-8495

FAX: (410) 266-8912

SITE CODE:

Honeywell Hex Chrome Study

Description:

PAM-31

Air

Lab ID:

4070922-09

m³

Sampled: 07/08/14 00:00

Matrix:

Sample Volume:

21.34

Received: 07/09/14 11:34

Comments:

Analysis Date: 07/10/14 15:40

**Hexavalent Chromium** 

Results

MDL

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

ng/m³ Air ND

<u>Flag</u>

ng/m³ Aìr 0.0036



# LABORATORY DATA CONSULTANTS, INC.

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

ERM July 16, 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 July 15, 2014. Attachment 1 is a summary of the samples that were reviewed for each analysis.

# **LDC Project #32172:**

**SDG** Fraction

4071006 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

64 pages-SF 3 DAY TAT Attachment 1 LDC #32172 (ERM - Morrisville, NC / Harbor Point, MD, Hexavalent Chromium Monitoring) Level IV DATE Cr(VI) DATE LDC SDG# REC'D DUE (D7614) Matrix: Air/Water/Soil 07/15/14 07/18/14 8 4071006 A/CR Total

# Laboratory Data Consultants, Inc. Data Validation Report

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

Collection Date: July 9, 2014

LDC Report Date: July 16, 2014

Matrix: Air

Parameters: Hexavalent Chromium

Validation Level: EPA Level IV

**Laboratory:** Eastern Research Group

Sample Delivery Group (SDG): 4071006

# Sample Identification

OAM 1

OAM 2

PAM-1

PAM-1D

PAM-3

PAM-4

PAM-21

PAM-31

PAM-1DUP

PAM-1DDUP

#### Introduction

This data review covers 10 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 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:

	Concentrati	on (ng/m³)			
Analyte	PAM-1	PAM-1D	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.0676	0.0682	1 (≤20)	-	-

# Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Data Qualification Summary - SDG 4071006

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

Harbor Point, MD, Hexavalent Chromium Monitoring
Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG
4071006

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 4071006

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

LDC #: 32172A6

# **VALIDATION COMPLETENESS WORKSHEET**

Level IV

SDG #:\_\_4071006 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: 7/9/14
11	Initial calibration	A	
111.	Calibration verification	A	
IV	Blanks	A	
V	Matrix Spike/Matrix Spike Duplicates	N	Norrequireb
VI.	Duplicates	A	OP
VII.	Laboratory control samples	Α	LG/0
VIII.	Sample result verification	A	
IX.	Overall assessment of data	A	
X.	Field duplicates	SW	(3,4)
ΧI	Field blanks	NO	FB=8 TB=9

Note:

A = Acceptable

N = Not provided/applicable

SW = See worksheet

ND = No compounds detected

R = Rinsate

FB = Field blank

D = Duplicate

TB = Trip blank
EB = Equipment blank

Validated Samples:

	ail					
1 2 3 4 5	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 7 8 9	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	·

lotes:_	

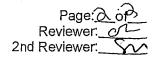
# **VALIDATION FINDINGS CHECKLIST**

Page: \of \of \one \text{Page:} \of \one \text{Page:} \one \text{P

Method:Inorganics (EPA Method Secorer)

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 9മി 10% QC limits?							
Were titrant checks performed as required? (Level IV only)	i						
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	,		, <del></del>				
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.	_			Op only			
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?			8				

# VALIDATION FINDINGS CHECKLIST



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

LDC#	32172A6
LDO#	3217270

# VALIDATION FINDINGS WORKSHEET Field Duplicates

Page: of Reviewer: 2nd Reviewer:

Inorganics: Method See Cover

	Concentra			
Analyte	3	4	RPD (≤20)	
Hexavalent Chromium	0.0676	0.0682	1	

 $\verb|\LDCFILESERVER|\Validation|\FIELD DUPLICATES|\FD_inorganic|\32172A6.wpd|$ 

LDC #: 3217246

# Validation Findings Worksheet Initial and Continuing Calibration Calculation Verification

Page: of	
Reviewer:	
2nd Reviewer:	

Method: Inorganics, Method	***	
The correlation coefficient (r) for the	calibration of <u>C</u>	was recalculated.Calibration date: 7/14/14
An initial or continuing calibration ve	erification 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 <sup>2</sup>	r or r <sup>2</sup>	(Y/N)
Initial calibration		s1	0.1	0.0000194			
		s2	0.1	0.0000413	0.99993	0.99993	
	4.5.	s3	0.2	0.0000829			Y
	C6+	s4	0.5	0.0002111			,
		s5	1	0.0004206			
		s6	2	0.0008628			
Calibration verification	a <sup>64</sup>	ICV (12744)	True O, Siglar	FOURD 0,5087ngm	102%	_	
Calibration verification	1	(15:48)	1	0,5290rdn	n 106°16	∑ between	1
Calibration verification							

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

LDC#: 32172.46

METHOD: Ingranics Method

SPECONER

# VALIDATION FINDINGS WORKSHEET Level IV Recalculation Worksheet

1 ]
Page: of
Reviewer: 92
2nd Reviewer: Su

	METTOD: morganios, wellou										
Percent recoveries (%R) for a laboratory control sample and a matrix spike sample were recalculated using the following formula:											
9	%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.										
F	A sample and duplicate relative percent difference (RPD) was recalculated using the following formula:										
F	RPD = <u>[S-D]</u> x 10		•	inal sample concentr							
	(S+D)/2	υ <del>-</del>	(S+D)/2 D = Duplicate sample concentration								
Recalculated Reported Reported											
						Recalculated	Reported-				
	Sample ID	Type of Analysis	Element	Found / S (units)	True / D (units)	Recalculated %R / RPD	Reported %R / RPD	Acceptable (Y/N)			
	Sample ID	Type of Analysis Laboratory control sample		1							
	Sample ID		Element 64	1	(units)	%R / RPD					
	Sample ID			(units)	(units)	%R / RPD	%R / RPD				
	Sample ID	Laboratory control sample		(units)	(units)	%R / RPD	%R / RPD				

00707 ng/m3 00676 ng/m3 448

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

Duplicate sample

LDC#: SUILATO

# VALIDATION FINDINGS WORKSHEET Sample Calculation Verification

Page:_	of_
Reviewer:	02
2nd reviewer:	Sm

						2nd reviev	wer:
METH	OD: Inorganics, Metho	d_Selover					
Rlease Y N Y N Y N	N/A Are results w	w for all questions and been reported and ca ithin the calibrated rar ion limits below the C	iculated corre	ectly?	·	e identified as "N/	A".
	ound (analyte) results f ulated and verified using	·	on.	·	repo	orted with a positiv	ve detect were
Concen	tration =	Re	calculation:	~ C	~~~(~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	xxxxx393 10	mL -
co-	0,000-1316-0,1	0000 34 3	<b>W</b> 3.	<u>O,C</u>	5,0004316	x — Z	2.13m3
					0.0	06756ng/	n <sup>3</sup>
#	Sample ID	Anal	yte .		Reported Concentration ((\sqrt{\sq}}}}}}}}}}}}}}}}}}}}}}}}}}}}}}}}}}}}	Calculated Concentration	Acceptable (Y/N)
	}	Ç	_6+		0.0413	0.8414	5
	7_		<b>\</b>		00543	0,0543	
	3				0.0676	0.0676	
	4 yasa				0.0682	00689	
	5.5°			·	0.0585	00585	
	78657				0.346	0.346	<del>\</del>
			<u></u>				
			<del></del>	<del></del>			
			<del></del>	·····			
				<del> </del>			
					······································		
lot-							
Vote:_			- <del></del>				



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

**REPORTED:** 07/15/14 15:23

Malvern, PA 19355

SUBMITTED:

07/10/14

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:

4071006-01

Sampled: 07/09/14 16:01

Matrix:

Air

Sample Volume:

21.7 m³

Received: 07/10/14 11:29 Analysis Date: 07/14/14 14:49

Comments:

Start Time 7/8/14 15:54

**Hexavalent Chromium** 

**Results** 

MDL

**Hexavalent Chromium** 

**CAS Number** 

ng/m³ Air

<u>Flag</u>

ng/m³ Air

**Analyte** 

1854-02-99

0.0413



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:** 07/15/14 15:23

07/10/14 SUBMITTED:

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

**Description:** 

OAM 2

Lab ID:

Sample Volume:

4071006-02

21.86 m³ Sampled: 07/09/14 16:32

Received: 07/10/14 11:29 Analysis Date: 07/14/14 14:59

Matrix: Comments:

Start Time 7/8/14 16:15

**Hexavalent Chromium** 

**Results** 

<u>MDL</u>

**Analyte** 

**CAS Number** 

ng/m³ Air

Flag

ng/m³ Air

**Hexavalent Chromium** 

1854-02-99

0.0543



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:** 07/15/14 15:23

07/10/14 SUBMITTED:

AQS SITE

CODE:

Honeywell Hex Chrome Study

**Description:** Matrix:

Comments:

PAM-1

Col 1 Start Time 7/8/14 17:25

Lab ID:

Sample Volume:

4071006-03

m³

Sampled: 07/09/14 18:00

Received: 07/10/14 11:29

22.13

Analysis Date: 07/14/14 14:07

**Hexavalent Chromium** 

**Results** 

<u>MDL</u>

**Analyte** 

**CAS Number** 

ng/m<sup>3</sup> Air

Flag

ng/m<sup>3</sup> Air

0.0036

**Hexavalent Chromium** 

1854-02-99



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:** 07/15/14 15:23 SUBMITTED:

07/10/14

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

**Description:** 

PAM-1D

Lab ID:

4071006-04

m³

Sampled: 07/09/14 18:03

Received: 07/10/14 11:29 Analysis Date: 07/14/14 14:27

Matrix: Comments:

Col 2 Start Time 7/8/14 17:31

**Hexavalent Chromium** 

22.08

**Results** ng/m³ Air <u>MDL</u>

**Analyte** 

**CAS Number** 

Sample Volume:

<u>Flag</u>

ng/m³ Air

**Hexavalent Chromium** 

1854-02-99

0.0682

0.0036

02/16/14



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:** 07/15/14 15:23

07/10/14 SUBMITTED:

**AQS SITE** 

SITE CODE:

Honeywell Hex Chrome Study

**Description:** 

PAM-3

Lab ID:

Sample Volume:

4071006-06

m<sup>3</sup>

Sampled: 07/09/14 17:23

Received: 07/10/14 11:29 Analysis Date: 07/14/14 15:09

Matrix: Comments:

Start Time 7/8/14 16:54

**Hexavalent Chromium** 

22.03

**Results** 

MDL

**Analyte** 

**CAS Number** 

ng/m³ Air

<u>Flaq</u>

ng/m³ Air

**Hexavalent Chromium** 

1854-02-99

0.0585

0.0036

outible



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:** 07/15/14 15:23

SUBMITTED:

07/10/14

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

**Description:** 

Comments:

Hexavalent Chromium

PAM-4

Start Time 7/8/14 16:36

Lab ID:

Sample Volume:

4071006-07

m<sup>3</sup>

Sampled: 07/09/14 16:52 Received: 07/10/14 11:29

Analysis Date: 07/14/14 15:19

**Hexavalent Chromium** 

21.85

**Results** 

<u>MDL</u>

**Analyte** 

**CAS Number** 

ng/m³ Air

<u>Flaq</u>

ng/m<sup>3</sup> Air

1854-02-99

0.346

0.0036

ortholia



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:

07/15/14 15:23

SUBMITTED: 07/10/14

**AQS SITE** 

SITE CODE:

Honeywell Hex Chrome Study

**Description:** 

Matrix:

PAM-21

Lab ID:

Sample Volume:

4071006-08

22.03

m³

Sampled: 07/09/14 00:00

Received: 07/10/14 11:29 **Analysis Date:** 07/14/14 15:28

Comments:

**Hexavalent Chromium** 

**Results** 

MDL

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

<u>nq/m³ Air</u>

<u>Flaq</u>

<u>ng/m³ Air</u> 0.0036



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

Matrix:

PHONE: (443) 803-8495

Air

FAX: (410) 266-8912

FILE #: 3926.00

**REPORTED:** 07/15/14 15:23 SUBMITTED:

07/10/14

**AQS SITE** 

SITE CODE:

Honeywell Hex Chrome Study

Description:

Comments:

PAM-31

Lab ID:

Sample Volume:

4071006-09

22.03

m³

Sampled: 07/09/14 00:00

Received: 07/10/14 11:29 Analysis Date: 07/14/14 15:38

**Hexavalent Chromium** 

**Results** 

<u>MDL</u>

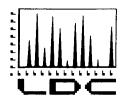
**Analyte** Hexavalent Chromium **CAS Number** 

<u>ng/m³ Air</u>

<u>ng/m³ Air</u>

1854-02-99

<u>Flag</u>



# LABORATORY DATA CONSULTANTS, INC.

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

ERM July 17, 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 July 16, 2014. Attachment 1 is a summary of the samples that were reviewed for each analysis.

### **LDC Project #32176:**

SDG Fraction

4071105

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 79 pages-SF 3 DAY TAT LDC #32176 (ERM - Morrisville, NC / Harbor Point, MD, Hexavalent Chromium Monitoring) Level IV DATE DATE Cr(VI) LDC REC'D DUE (D7614) SDG# Matrix: Air/Water/Soil 4071105 07/16/14 07/21/14 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 Total A/CR

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

Harbor Point, MD, Hexavalent Chromium Monitoring

**Collection Date:** 

July 10, 2014

**LDC Report Date:** 

July 17, 2014

Matrix:

Air

Parameters:

Hexavalent Chromium

Validation Level:

**EPA Level IV** 

Laboratory:

Eastern Research Group

Sample Delivery Group (SDG): 4071105

# Sample Identification

OAM 1

PAM-1

PAM-1D

PAM-2

PAM-3

PAM-4

PAM-21

PAM-31

PAM-1DUP

PAM-1DDUP

#### Introduction

This data review covers 10 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 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:

	Concentrati	on (ng/m³)	BDD		
Analyte	PAM-1	PAM-1D	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.0558	0.0516	8 (≤20)	-	-

# Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Data Qualification Summary - SDG 4071105

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

Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG 4071105

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 4071105

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

# LDC #: 32176A6

## **VALIDATION COMPLETENESS WORKSHEET**

Level IV

SDG #: 4071105 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.

<u> </u>	Validation Area		Comments
<u> </u>	Technical holding times	A	Sampling dates: 7110114
11	Initial calibration	A	
111.	Calibration verification	A	
IV	Blanks	A	
V	Matrix Spike/Matrix Spike Duplicates	N	Notregued
VI.	Duplicates	A	
VII.	Laboratory control samples	A	LCSID
VIII.	Sample result verification	A	
IX.	Overall assessment of data	A	
X.	Field duplicates	5W	(2.3)
_xı_	Field blanks	<i>N()</i>	TB-8 FB=7

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:

asc

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

Notes:			

# VALIDATION FINDINGS CHECKLIST

Page: \\_ of \\_
Reviewer: \_ \( \frac{1}{2} \)
2nd Reviewer: \_ \( \frac{1}{2} \)

Method: Inorganics (EPA Method Secorer )

metrod: morganics (E177 metrod 32200 - )				
Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	1			
Cooler temperature criteria was met.				
II. Calibration				
Were all instruments calibrated daily, each set-up time?				
Were the proper number of standards used?				
Were all initial calibration correlation coefficients ≥ 0.995?				
Were all initial and continuing calibration verification %Rs within the 90-110% QC limits?				
Were titrant checks performed as required? (Level IV only)				
Were balance checks performed as required? (Level IV only)				
III. Blanks			,	
Was a method blank associated with every sample in this SDG?				
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		_		
IV. Matrix spike/Matrix spike duplicates and Duplicates	·			
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.		- :		Oponly
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.	/	<i>'</i>		
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?	1			
VI. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?				
Were the performance evaluation (PE) samples within the acceptance limits?				

LDC#: 3776A6

## **VALIDATION FINDINGS CHECKLIST**

Page: 2 of Reviewer: 2nd Reviewer: 5

			<del></del>	
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#	32176A6

# VALIDATION FINDINGS WORKSHEET

# Field Duplicates

Page:	( of
Reviewer:	$\alpha$
2nd Reviewer:	\$\scale=

Inorganics: Method See Cover

	Concentra	tion (ng/m3)		
Analyte	2	3	RPD (≤20)	
Hexavalent Chromium	0.0558	0.0516	8	

\\LDCFILESERVER\\Validation\FIELD DUPLICATES\FD\_inorganic\32176A6.wpd

I DC #•	32176A6
LDC #:	

True

# Validation Findings Worksheet Initial and Continuing Calibration Calculation Verification

Page:(	_ of
Reviewer:	01
2nd Review	ver: 🗫

wethou: morganics, wethou <u>5e</u>		<del></del>	( )
The correlation coefficient (r) for the calibr	ration of	was recalculated.Calibration date:	115/14
		covery (%R) was recalculated for each type	
%R = <u>Found X 100</u>	Where,	Found = concentration of each analyte me	easured in the analysis of the ICV or CCV solution

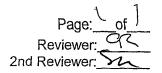
True = concentration of each analyte in the ICV or CCV source

					Recalculated	Reported	Acceptable
Type of analysis	Analyte	Standard	Conc. (ng/mL)	Area	r or r <sup>2</sup>	r orr <sup>2</sup>	(Y/N)
Initial calibration		s1	0.1	0.000018			
		s2	0.1	0.0000394	0.99998	0.99998	
	$\sim$ $\delta^{\tau}$	s3	0.2	0.0000795			$\mathcal{C}$
	<u> </u>	s4	0.5	0.0002084			(
		s5	1	0.0004124			
		s6	2	0.0008368			
Calibration verification		TCV (09:58)	O, Siglar	0.508 Zng/m	102	ĺ	
Calibration verification	1	CCV (13:09)	1	0,523218/m			+
Calibration verification							

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

LDC#: 32176A6

# VALIDATION FINDINGS WORKSHEET <u>Level IV Recalculation Worksheet</u>



METHOD: Inorganics, Method Secover							
Percent recoveries (%R) for a laboratory control sample and a matrix spike sample were recalculated using the following formula:							
%R = <u>Found</u> x 100 True	·	Four	entration of each ar nd = SSR (spiked sar n of each analyte in th	nple result) - SR (sa	the analysis of the s mple result).	ample. For the mat	rix spike calculation,
A sample and dupli	cate relative percent diffe	erence (RPD) was	recalculated using th	ne following formula:			
RPD = [S-D] x 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)
LES	Laboratory control sample	C667	1.06 g/mL	100 ng/mL	106	166	9
$\sim$	Matrix spike sample		(SSR-SR)				
9	Duplicate sample	C4 <sup>6+</sup>	0.0578ng/m3	0.0558ng/m	3,52	3,45	4
Comments: Refer to appropriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.							

LDC#: 252176A6

# VALIDATION FINDINGS WORKSHEET

Sample Calculation Verification

Page: of Reviewer: 22

METHOD: Inorganics, Method Second No. Not applicable questions are identified as "N/A".    N N/A							
Compound (analyte) results for							
Concentration = Recalculation:							
eg-0.0004194x-0.0000337 x 10ml =004987							
U			0.0004194	21.09	161 Em		
I				· · · · · · · · · · · · · · · · · · ·			
#	Sample ID	Analyte	Reported Concentration (M9/m)>	Calculated Concentration (((Q/m3)	Acceptable (Y/N)		
	1	Cot	0.0499	0.0998	Ų		
	<del> </del>						
11	7.	1	10.0558	0.0558			
	3		0.0558	0.0558			
	3		0.0558	0.0558			
	3 9 5		0.0558				
	3 9 5		0.0558 0.0516 0.0695 0.0453 0.0565	0.0695			
	39 5		0.0558 0.0516 0.0695 0.0453 0.0565	0.0695			
	39 9 5		0.0558 0.0516 0.0695 0.0453 0.0565	0.0695			

	Note:_			
•			 	 



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

**REPORTED:** 07/16/14 14:38

SUBMITTED:

Malvern, PA 19355

07/11/14

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

Matrix:

SITE CODE:

Honeywell Hex Chrome Study

**Description:** 

Comments:

OAM 1

Lab ID:

Sample Volume:

4071105-01

21.09

m³

Sampled: 07/10/14 15:38 Received: 07/11/14 10:46

Analysis Date: 07/15/14 12:09

Start Time 7/9/14 16:12

**Hexavalent Chromium** 

**Results** 

MDL.

**Analyte** 

**CAS Number** 

FAX: (410) 266-8912

ng/m3 Air

<u>Flag</u>

ng/m3 Air

**Hexavalent Chromium** 

1854-02-99

0.0499

0.0036

02/1/2/1/10



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED: 07/16/14 14:38

SUBMITTED:

Malvern, PA 19355

07/11/14

ATTN: Mr. Jeff Boggs

**AQS SITE** 

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

SITE CODE:

Honeywell Hex Chrome Study

Description:

PAM-1

Lab ID:

4071105-02

Sampled: 07/10/14 17:56

Matrix: Comments: Air

Sample Volume:

21.47

 $\,m^3$ 

Received: 07/11/14 10:46

Analysis Date: 07/15/14 11:23

Col 1 Start Time 7/9/14 18:04

FAX: (410) 266-8912

**Results** 

**Hexavalent Chromium** 

MDL

**Analyte** 

**CAS Number** 

ng/m³ Air

Flag

ng/m³ Air

**Hexavalent Chromium** 

1854-02-99

0.0558

0.0036

orthin



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

**REPORTED:** 07/16/14 14:38

Malvern, PA 19355

SUBMITTED:

ATTN: Mr. Jeff Boggs

**AQS SITE** 

PHONE: (443) 803-8495

21.58

Honeywell Hex Chrome Study

Description:

FAX: (410) 266-8912

SITE CODE:

PAM-1D

4071105-03

Sampled: 07/10/14 18:06

Matrix: Air Sample Volume:

Lab ID:

 $m^3$ 

Received: 07/11/14 10:46 Analysis Date: 07/15/14 11:42

Comments:

Col 2 Start Time 7/9/14 18:07

**Hexavalent Chromium** 

Results

<u>MDL</u>

07/11/14

**Analyte** 

**CAS Number** 

ng/m³ Air

<u>Flaq</u>

ng/m<sup>3</sup> Air

Hexavalent Chromium

1854-02-99

0.0516

0.0036

ornalin



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED: 07/16/14 14:38

Malvern, PA 19355

SUBMITTED:

ATTN: Mr. Jeff Boggs

07/11/14

**AQS SITE** 

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

FAX: (410) 266-8912

SITE CODE:

Honeywell Hex Chrome Study

**Description:** 

PAM-2

Lab ID:

4071105-04

Sampled: 07/10/14 17:29 Received: 07/11/14 10:46

Matrix: Comments: Air

Start Time 7/9/14 17:39

Sample Volume:

21.85

m³

Analysis Date: 07/15/14 12:19

**Hexavalent Chromium** 

Results

<u>MDL</u>

**Analyte** 

**CAS Number** 

ng/m³ Air

<u>Flaq</u>

ng/m<sup>3</sup> Air

**Hexavalent Chromium** 

1854-02-99

0.0695

0.0036

Miller



Environmental Resources Management, Inc

FILE #: 3926.00

**REPORTED:** 07/16/14 14:38

SUBMITTED:

07/11/14

Malvern, PA 19355

PHONE: (443) 803-8495

ATTN: Mr. Jeff Boggs

75 Valley Stream Parkway, Suite 400

FAX: (410) 266-8912

**AQS SITE** SITE CODE:

Honeywell Hex Chrome Study

Description:

PAM-3

Start Time 7/9/14 17:26

Lab ID:

4071105-05

Sampled: 07/10/14 17:19

Matrix: Comments: Air

Sample Volume:

21.5

m³

Received: 07/11/14 10:46

Analysis Date: 07/15/14 12:29

**Hexavalent Chromium** 

**Results** 

<u>MDL</u>

**Analyte** 

**CAS Number** 

ng/m³ Air

<u>Flag</u>

ng/m³ Air

**Hexavalent Chromium** 

1854-02-99

0.0453

0.0036

02/12/12



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

**REPORTED:** 07/16/14 14:38

Malvern, PA 19355

SUBMITTED:

m³

07/11/14

**AQS SITE** 

ATTN: Mr. Jeff Boggs

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

SITE CODE:

Honeywell Hex Chrome Study

Description:

PAM-4

Lab ID:

4071105-06

Sampled: 07/10/14 16:53

Matrix:

Air

Sample Volume:

21.37

Received: 07/11/14 10:46

Analysis Date: 07/15/14 12:39

Comments:

Start Time 7/9/14 17:09

**Hexavalent Chromium** 

**Results** 

<u>MDL</u>

**Analyte** 

**CAS Number** 

ng/m³ Air

Flag

ng/m³ Air

**Hexavalent Chromium** 

1854-02-99

0.0565

0.0036

02/1/1/1/1/



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

07/16/14 14:38 REPORTED:

Malvern, PA 19355

SUBMITTED:

07/11/14

ATTN: Mr. Jeff Boggs

**AQS SITE** 

PHONE: (443) 803-8495

SITE CODE:

Honeywell Hex Chrome Study

Description:

Comments:

PAM-21

Lab ID:

4071105-07

Sampled: 07/10/14 00:00

Matrix:

Air

Sample Volume:

21.85

Received: 07/11/14 10:46

Analysis Date: 07/15/14 12:49

**Hexavalent Chromium** 

**Results** 

<u>MDL</u>

**Analyte** 

**CAS Number** 

FAX: (410) 266-8912

ng/m³ Air

<u>Flag</u>

m³

ng/m<sup>3</sup> Air

Hexavalent Chromium

1854-02-99

ND



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

**REPORTED:** 07/16/14 14:38

Malvern, PA 19355

SUBMITTED:

07/11/14

ATTN: Mr. Jeff Boggs

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

FAX: (410) 266-8912

AQS SITE SITE CODE:

Honeywell Hex Chrome Study

**Description:** 

PAM-31

Lab ID:

4071105-08

Sampled: 07/10/14 00:00

Matrix: Comments:

Air

Sample Volume:

21.5

m³

Received: 07/11/14 10:46

Analysis Date: 07/15/14 12:59

**Hexavalent Chromium** 

**Results** 

MDL

Hexavalent Chromium

**CAS Number** 

ng/m³ Air

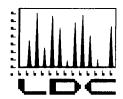
<u>Flaq</u>

ng/m³ Air

**Analyte** 

1854-02-99

ND



# LABORATORY DATA CONSULTANTS, INC.

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

ERM July 22, 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 July 18, 2014. Attachment 1 is a summary of the samples that were reviewed for each analysis.

### LDC Project #32201:

SDG

**Fraction** 

4071506/4071617

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	3 DAY		88 18 BB		*****				1	Types 11.	p de l'a				chm		- 12	onghe,"		1.25		3. F. S.	7 4 14	25.5%	270400740	7.7.2		11211		· ·			<u>इंद्रालय ,                                   </u>	-		_		
	Level IV		DC #32	201	1 (E	:RN	1 - 1	Мо	rris	svil	le,	NC	: /	Hai	rbo	rP	oin	ıt, I	ИD	, Ho	exa	ıva	len	t C	hrc	mi	um	M	oni	tor	ing	<u>)</u>							
LDC	SDG#	DATE REC'D	(3) DATE DUE	Cr (D7	(VI) 614)																																		
Matr	ix: Air/Water/Soil			Α	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s
Α	4071506/4071617	07/18/14	07/23/14	18	*0*																ļ																$\exists$		
																																<u> </u>					_	_	
																																					$\dashv$	$\exists$	
																																					コ		_
																																					$\exists$		
																																					$\dashv$	$\dashv$	_
																																					4	$\exists$	_
																																							_
																						ļ															$\dashv$		_
				ļ																																		$\exists$	_
																																					$\exists$		_
														<u> </u>													<u></u>						_			H	$\dashv$	$\dashv$	_
																																					$\dashv$	$\exists$	_
	-1-1-																																				$\exists$		
																																<u> </u>				$\square$	$\dashv$		_
																																					$\exists$	$\dashv$	_
																													_										_
otal	A/CR			18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	<u> </u>	<u>1</u> 2

# Laboratory Data Consultants, Inc. Data Validation Report

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

Collection Date: July 11 through July 15, 2014

LDC Report Date: July 22, 2014

Matrix: Air

Parameters: Hexavalent Chromium

Validation Level: EPA Level IV

Laboratory: Eastern Research Group

Sample Delivery Group (SDG): 4071506/4071617

#### Sample Identification

OAM 1 (071414) PAM-1 (071114)DUP OAM 2 (071414) PAM-1D (071114)DUP

PAM-1 (071414)

PAM-1D (071414)

PAM-2 (071414)

PAM-3 (071414)

PAM-4 (071414)

PAM-21 (071414)

PAM-31 (071414)

OAM 1 (071114)

OAM 2 (071114) PAM-1 (071114)

PAM-1D (071114)

PAM-2 (071114)

PAM-3 (071114)

PAM-4 (071114)

PAM-21 (071114)

PAM-31 (071114)

PAM-1 (071414)DUP

PAM-1D (071414)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 (071414) and PAM-31 (071114) were identified as trip blanks. No hexavalent chromium was found.

Samples PAM-21 (071414) and PAM-21 (071114) 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 (071414) and PAM-1D (071414) and samples PAM-1 (071114) and PAM-1D (071114) were identified as field duplicates. No hexavalent chromium was detected in any of the samples with the following exceptions:

	Concentrat	ion (ng/m³)	BDD		
Analyte	PAM-1 (071414)	PAM-1D (071414)	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.0873	0.0922	5 (≤20)	-	-

	Concentrat	ion (ng/m³)	BBB		
Analyte	PAM-1 (071114)	PAM-1D (071114)	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.0198	0.0144	32 (≤20)	NQ	-

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

# Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Data Qualification Summary - SDG 4071506/4071617

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

Harbor Point, MD, Hexavalent Chromium Monitoring
Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG
4071506/4071617

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 4071506/4071617

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

LDC #: 32201A6

#### **VALIDATION COMPLETENESS WORKSHEET**

SDG #: 4071506/4071617

Level IV

Laboratory: Eastern Research Group

Page: \\_\of\_ 

**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: 7/11-14/14
11	Initial calibration	9	
111.	Calibration verification	P	
IV	Blanks	H	
V	Matrix Spike/Matrix Spike Duplicates	$\mathcal{N}$	Not regired
VI.	Duplicates	A	$\alpha \rho$
VII.	Laboratory control samples	A	LCSIP
VIII.	Sample result verification	A	
IX.	Overall assessment of data	A	
X.	Field duplicates	Sin	(3,4) (12,13)
LXL	Field blanks	<u>  MO</u>	TB=9,18 FB=8,17

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:

ail

1	OAM 1 (071414)	11	OAM 2 (071114)	21	PAM-1 (071114)DUP	31	
2	OAM 2 (071414)	12	PAM-1 (071114)	22	PAM-1D (071114)DUP	32	
3	PAM-1 (071414)	13	PAM-1D (071114)	23		33	
4	PAM-1D (071414)	14	PAM-2 (071114)	24		34	
5	PAM-2 (071414)	15	PAM-3 (071114)	25		35	
6	PAM-3 (071414)	16	PAM-4 (071114)	26		36	
7	PAM-4 (071414)	17	PAM-21 (071114)	27		37	
8	PAM-21 (071414)	18	PAM-31 (071114)	28		38	
9	PAM-31 (071414)	19	PAM-1 (071414)DUP	29		39	
10	OAM 1 (071114)	20	PAM-1D (071414)DUP	30		40	

Notes: Dates appealed to differing beneer samples

#### **VALIDATION FINDINGS CHECKLIST**

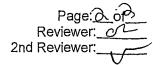
Page: of A Reviewer: 02 2nd Reviewer: 1

Method: Inorganics (EPA Method Secorer)

inotifed metgatines (21 / timetres 32 mos )				
Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.				
Cooler temperature criteria was met.				
II. Calibration				
Were all instruments calibrated daily, each set-up time?				
Were the proper number of standards used?				
Were all initial calibration correlation coefficients > 0.995?				
Were all initial and continuing calibration verification %Rs within the 90-110% QC limits?				
Were titrant checks performed as required? (Level IV only)			/	
Were balance checks performed as required? (Level IV only)			1	
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.				oponly
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 anayized for this SDG?				
Was an LCS analyzed per extraction batch?	أرأ			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% (85-115% for Method 300.0) QC limits?	V			
VI. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?				
Were the performance evaluation (PE) samples within the acceptance limits?			1	

DC#: 3000176

# VALIDATION FINDINGS CHECKLIST



Validation Area	Yes	No	NA	Findings/Comments
VII. Sample Result Verification				
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?				
Were detection limits < RL?	1			
VIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.				
IX. Field duplicates				
Field duplicate pairs were identified in this SDG.				
Target analytes were detected in the field duplicates.				
X. Field blanks				
Field blanks were identified in this SDG.	1			
Target analytes were detected in the field blanks.		7		

LDC#	32201A6

# VALIDATION FINDINGS WORKSHEET Field Duplicates

	1
Page:	of
Reviewer:	a,
nd Reviewer.	1/

Inorganics: Method\_See Cover\_

	Concentra			
Analyte	. 3	4	RPD (≤20)	
Hexavalent Chromium	0.0873	0.0922	5	

	Concent			
Analyte	12	13	RPD (≤20)	
Hexavalent Chromium	0.0198	0.0144	32	NQ

NQ = not qualified (one or both results are <5x the RL)

\\LDCFILESERVER\Validation\FIELD DUPLICATES\FD\_inorganic\32201A6.wpd

LDC #:	32201A6
--------	---------

# Validation Findings Worksheet Initial and Continuing Calibration Calculation Verification

( )
Page:of_
Reviewer:OL
nd Reviewer:

Method: Inorganics, Method	See Cover	<del></del>
The correlation coefficient (r) for the	calibration of	was recalculated.Calibration date: 7/16/14
An initial or continuing calibration ve	rification 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	An	alyte	Standard	Conc. (ng/mL)	Area	r or r <sup>2</sup>	r or r <sup>2</sup>	(Y/N)
Initial calibration			s1	0.1	0.0000183			
			s2	0.1	0.0000382	0.99983	0.99983	
		6 <sup>t</sup>	s3	0.2	0.0000794			
	C		s4	0.5	0.0002079			``
			s5	1	0.0003885			
			s6	2	0.0007871			
Calibration verification			ICV	Tive 0.5	<u>Fanol</u> (191mL) 0.5033	101	_	
Calibration verification	\		CCVC4-11)	L	0,5360	107		7
Calibration verification								

Comments: Refer to Calibration \	Verification findings worksheet fo	or list of qualifications and as	sociated samples when	reported results do not agre	e withir
10.0% of the recalculated results.	·				

LDC #: 37001AG

# VALIDATION FINDINGS WORKSHEET Level IV Recalculation Worksheet

Page: of	
Reviewer: 97	
2nd Reviewer:	_

METHOD: Inorganics,	Method 5	ecover_	<del></del>
Percent recoveries (%	R) for a labora	atory control samp	le 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 = conc	entration of each analyte in the source.
A sample and duplicat	e relative per	cent difference (Ri	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)
LCS	Laboratory control sample	C(6+	1,06 ng/mL	1.00 mg/mL	106	106	7
	Matrix spike sample		(SSR-SR)				
$\sim$							
19	Duplicate sample	C664	0.090219/2	0.0873 mg/m3	334	3,33	4

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

# VALIDATION FINDINGS WORKSHEET Sample Calculation Verification

Reviewer:\_\_ 2nd reviewer:\_

Y N N/A Have results W Are results W	bow for all questions answered "N". Not apple been reported and calculated correctly? Within the calibrated range of the instrument tion limits below the CRQL?  For	nts?	orted with a positive $\frac{10^{4}}{71.5}$	/e detect were
# Sample ID	Analyte .	Reported Concentration ()	Calculated Concentration	Acceptable (Y/N)
3 3 4 5 6 10 10 11 13 14 15	Qot Qot	00765 0.0278 0.0875 0.0977 0.0597 0.0567 0.0305 0.0166 0.0198 0.0198	0.0265 0.0228 0.0874 0.0874 0.0596 0.6688 0.0366 0.0166 0.0166 0.0350 0.0354 0.0403	



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

**REPORTED:** 07/18/14 16:32

Malvern, PA 19355

SUBMITTED:

07/15/14 to 07/16/14

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:

4071506-01

Sampled: 07/14/14 16:01

Matrix:

Air

Sample Volume:

21.22 m³ Received: 07/15/14 10:51

Comments: Start Time 7/13/14 16:26

Analysis Date: 07/16/14 13:51

**Hexavalent Chromium** 

**Results** 

<u>MDL</u>

<u>Analyte</u>

**CAS Number** 

ng/m³ Air

<u>Flag</u>

ng/m<sup>3</sup> Air

**Hexavalent Chromium** 

1854-02-99

0.0265

0.0036

calada



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED: 07/18/14 16:32

Malvern, PA 19355

SUBMITTED:

07/15/14 to 07/16/14

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:

Sample Volume:

4071506-02

m³

Sampled: 07/14/14 16:28 Received: 07/15/14 10:51

Matrix: Comments:

Start Time 7/13/14 16:52

**Analysis Date:** 07/16/14 14:01

**Hexavalent Chromium** 

21.24

**Results** 

**MDL** 

**Analyte** 

**CAS Number** 

ng/m<sup>3</sup> Air

Flag

ng/m³ Air

**Hexavalent Chromium** 

1854-02-99

0.0228

0.0036



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

**REPORTED:** 07/18/14 16:32

Malvern, PA 19355

SUBMITTED:

07/15/14 to 07/16/14

ATTN: Mr. Jeff Boggs

**AQS SITE** 

PHONE: (443) 803-8495

FAX: (410) 266-8912

CODE:

Honeywell Hex Chrome Study

Description:

PAM-1

Air

Lab ID:

Sample Volume:

4071506-03

Sampled: 07/14/14 18:37 Received: 07/15/14 10:51

Matrix: Comments:

Col 1 Start Time 7/13/14 18:15

Analysis Date: 07/16/14 12:30

**Hexavalent Chromium** 

21.94

<u>Results</u>

<u>MDL</u>

<u>Analyte</u>

**CAS Number** 

ng/m³ Air

<u>Flag</u>

ng/m³ Air

**Hexavalent Chromium** 

1854-02-99

0.0873

0.0036

Malin



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

**REPORTED:** 07/18/14 16:32

SUBMITTED:

07/15/14 to 07/16/14

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-1D

Lab ID:

4071506-04

Sampled: 07/14/14 18:44

Matrix:

Sample Volume:

21.97

Received: 07/15/14 10:51

Comments: Col 2 Start Time 7/13/14 18:19 Analysis Date: 07/16/14 12:50

**Hexavalent Chromium** 

**Results** 

MDL

<u>Analyte</u>

**CAS Number** 

ng/m³ Air

Flag

ng/m³ Air

**Hexavalent Chromium** 

1854-02-99

0.0922

0.0036

Cl Willer



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

**REPORTED:** 07/18/14 16:32

Malvern, PA 19355

SUBMITTED:

07/15/14 to 07/16/14

ATTN: Mr. Jeff Boggs

**AQS SITE** 

PHONE: (443) 803-8495

FAX: (410) 266-8912

SITE CODE:

Honeywell Hex Chrome Study

Description:

Comments:

PAM-2

Lab ID:

4071506-05

Sampled: 07/14/14 17:38

Matrix:

Sample Volume:

21.39 m³ Received: 07/15/14 10:51

Start Time 7/13/14 17:52

Analysis Date: 07/16/14 14:30

**Hexavalent Chromium** 

Results

<u>MDL</u>

**Analyte** 

**CAS Number** 

ng/m³ Air

Flag

ng/m³ Air

**Hexavalent Chromium** 

1854-02-99

0.0597

0.0036

Ortale



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

**REPORTED:** 07/18/14 16:32

Malvern, PA 19355

SUBMITTED:

07/15/14 to 07/16/14

ATTN: Mr. Jeff Boggs

**AQS SITE** 

PHONE: (443) 803-8495

FAX: (410) 266-8912 SITE CODE:

Honeywell Hex Chrome Study

Description:

PAM-3

Lab ID: 4071506-06

\_

Sampled: 07/14/14 17:25

Matrix:

Air

Sample Volume:

21.47 n

Received: 07/15/14 10:51

**Comments:** Start Time 7/13/14 17:38

**Analysis Date:** 07/16/14 14:40

**Hexavalent Chromium** 

**Results** 

MDL

<u>Analyte</u>

**CAS Number** 

ng/m³ Air

<u>Flag</u>

<u>ng/m³ Air</u>

**Hexavalent Chromium** 

1854-02-99

0.0667

0.0036

Mahr



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED:

07/18/14 16:32

Malvern, PA 19355

SUBMITTED:

07/15/14 to 07/16/14

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

FAX: (410) 266-8912

CODE:

Honeywell Hex Chrome Study

Description: Matrix:

PAM-4

Air

Lab ID:

Sample Volume:

4071506-07

Sampled: 07/14/14 17:06 Received: 07/15/14 10:51

Comments:

Start Time 7/13/14 17:21

m³

Analysis Date: 07/16/14 14:50

**Hexavalent Chromium** 

21.37

**Results** 

<u>MDL</u>

**Analyte** 

**CAS Number** 

ng/m<sup>3</sup> Air

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

ND

0.0036

Mahr



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

**REPORTED:** 07/18/14 16:32

Malvern, PA 19355

SUBMITTED:

07/15/14 to 07/16/14

**AQS SITE** 

ATTN: Mr. Jeff Boggs

SITE CODE:

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

Honeywell Hex Chrome Study

Description: Matrix:

PAM-21

Air

Lab ID:

Sample Volume:

4071506-08

m³

Sampled: 07/14/14 00:00 Received: 07/15/14 10:51

Comments:

21.39

Analysis Date: 07/16/14 15:00

**Hexavalent Chromium** 

**Results** 

<u>MDL</u>

**Analyte** 

**CAS Number** 

ng/m³ Air

<u>Flag</u>

ng/m<sup>3</sup> Air

Hexavalent Chromium

1854-02-99

ND

0.0036

01/12/10



Environmental Resources Management, Inc.

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

**REPORTED:** 07/18/14 16:32

Malvern, PA 19355

SUBMITTED:

07/15/14 to 07/16/14

**AQS SITE** 

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

FAX: (410) 266-8912

SITE CODE:

Honeywell Hex Chrome Study

Description:

Comments:

Matrix:

PAM-31

Air

Lab ID:

Sample Volume:

4071506-09

m³

Sampled: 07/14/14 00:00 Received: 07/15/14 10:51

**Analysis Date:** 07/16/14 15:10

**Hexavalent Chromium** 

21.47

**Results** 

<u>MDL</u>

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

ng/m<sup>3</sup> Air ND

<u>Flag</u>

ng/m³ Air 0.0036



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

**REPORTED:** 07/18/14 16:32

Malvern, PA 19355

SUBMITTED:

07/15/14 to 07/16/14

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

FAX: (410) 266-8912

SITE CODE:

21.75

Honeywell Hex Chrome Study

Description:

Comments:

OAM 1

Start Time 7/10/14 15:49

Lab ID: 4071617-01 Sampled: 07/11/14 15:59

Matrix:

Air

Sample Volume:

 ${\rm m}^{\rm 3}$ 

Flag

Received: 07/16/14 11:54

Analysis Date: 07/16/14 15:20

**Hexavalent Chromium** 

<u>Results</u>

MDL

**CAS Number** 

ng/m<sup>3</sup> Air

ng/m<sup>3</sup> Air

**Analyte Hexavalent Chromium** 

1854-02-99

0.0305

0.0036

de Waller



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

**REPORTED:** 07/18/14 16:32

Malvern, PA 19355

SUBMITTED:

07/15/14 to 07/16/14

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

FAX: (410) 266-8912

CODE:

Honeywell Hex Chrome Study

Description: 0

OAM 2

Lab ID:

4071617-02

Sampled: 07/11/14 16:29

Matrix:

Air

Sample Volume:

21.79 m<sup>3</sup>

Received: 07/16/14 11:54

Analysis Date: 07/16/14 15:30

Comments: Start Time 7/10/14 16:17

**Hexavalent Chromium** 

**Results** 

MDL

<u>Analyte</u>

**CAS Number** 

ng/m³ Air

<u>Flaq</u>

<u>ng/m³ Air</u>

Hexavalent Chromium

1854-02-99

0.0166

0.0036

ande



Environmental Resources Management, Inc

FILE#: 3926.00

75 Valley Stream Parkway, Suite 400

**REPORTED:** 07/18/14 16:32

Malvern, PA 19355

SUBMITTED:

07/15/14 to 07/16/14

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: 4071617-03

Sampled: 07/11/14 18:30

Matrix:

Sample Volume:

21.83 m³ Received: 07/16/14 11:54

Comments:

Col 1 Start Time 7/10/14 18:03

Analysis Date: 07/16/14 13:10

**Hexavalent Chromium** 

**Results** 

<u>MDL</u>

**Analyte** 

**CAS Number** 

ng/m³ Air

<u>Flaq</u>

ng/m<sup>3</sup> Air

**Hexavalent Chromium** 

1854-02-99

0.0198

0.0036

Willer



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

**REPORTED:** 07/18/14 16:32

Malvern, PA 19355

SUBMITTED:

07/15/14 to 07/16/14

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:

4071617-04

Sampled: 07/11/14 18:38

Matrix:

Sample Volume:

21.99  $m^3$  Received: 07/16/14 11:54

Analysis Date: 07/16/14 13:29

Col 2 Start Time 7/10/14 18:10

**Hexavalent Chromium** 

**Results** 

MDL

**Analyte** 

**CAS Number** 

ng/m³ Air

<u>Flag</u>

<u>ng/m³ Air</u>

**Hexavalent Chromium** 

1854-02-99

0.0144

0.0036

07/2/1/2



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

**REPORTED:** 07/18/14 16:32

Malvern, PA 19355

SUBMITTED:

07/15/14 to 07/16/14

ATTN: Mr. Jeff Boggs

AQS SITE

Start Time 7/10/14 17:35

FAX: (410) 266-8912

SITE CODE:

Honeywell Hex Chrome Study

Description:

Comments:

PAM-2

Lab ID:

4071617-05

Sampled: 07/11/14 18:01

Matrix:

PHONE: (443) 803-8495

Air

Sample Volume:

21.98 m³

Received: 07/16/14 11:54

Analysis Date: 07/16/14 15:40

**Hexavalent Chromium** 

**Results** 

MDL

**Analyte** 

**CAS Number** 

<u>nq/m³ Air</u>

<u>Flaq</u>

ng/m³ Air

**Hexavalent Chromium** 

1854-02-99

0.0349

0.0036



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED: 07/18/14 16:32

Malvern, PA 19355

SUBMITTED:

07/15/14 to 07/16/14

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

SITE CODE:

21.93

Honeywell Hex Chrome Study

Description:

Matrix:

PAM-3

Lab ID:

Sample Volume:

4071617-06

m³

Sampled: 07/11/14 17:45

Analysis Date: 07/16/14 15:50

Received: 07/16/14 11:54

Air Comments: Start Time 7/10/14 17:23

**Hexavalent Chromium** 

**Results** 

<u>Flaq</u>

**MDL** 

**Hexavalent Chromium** 

<u>Analyte</u>

**CAS Number** 1854-02-99

FAX: (410) 266-8912

ng/m³ Air 0.0354

ng/m<sup>3</sup> Air

0.0036

01/2///



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED:

07/18/14 16:32

Malvern, PA 19355

SUBMITTED:

07/15/14 to 07/16/14

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:

Sample Volume:

4071617-07

Sampled: 07/11/14 17:18 Received: 07/16/14 11:54

Matrix: Air Comments:

Start Time 7/10/14 17:06

21.85

m³

Analysis Date: 07/16/14 15:59

**Hexavalent Chromium** 

**Results** 

<u>MDL</u>

**Analyte** 

**CAS Number** 

ng/m<sup>3</sup> Air

Flag

ng/m³ Air

**Hexavalent Chromium** 

1854-02-99

0.0403

0.0036

ONWIN



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

**REPORTED:** 07/18/14 16:32

Malvern, PA 19355

SUBMITTED:

07/15/14 to 07/16/14

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: 4071617-08

Sampled: 07/11/14 00:00

Matrix: Air Sample Volume:

Received: 07/16/14 11:54

Comments:

21.98 m³

Analysis Date: 07/16/14 16:29

**Hexavalent Chromium** 

**Results** 

<u>MDL</u>

**Analyte** Hexavalent Chromium

**CAS Number** 1854-02-99

ng/m³ Air ND

<u>Flag</u>

ng/m³ Air 0.0036

C North



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

**REPORTED:** 07/18/14 16:32

Malvern, PA 19355

SUBMITTED:

 $\,m^3$ 

07/15/14 to 07/16/14

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:

4071617-09

Sampled: 07/11/14 00:00

Matrix:

Air

Sample Volume:

21.93

Received: 07/16/14 11:54

**Analysis Date:** 07/16/14 16:39

**Hexavalent Chromium** 

**Results** 

**MDL** 

Hexavalent Chromium

**CAS Number** 

ng/m<sup>3</sup> Air

<u>Flag</u>

ng/m³ Air

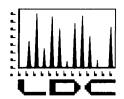
**Analyte** 

1854-02-99

ND

0.0036

Market



# LABORATORY DATA CONSULTANTS, INC.

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

ERM July 22, 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 July 21, 2014. Attachment 1 is a summary of the samples that were reviewed for each analysis.

#### LDC Project #32210:

**SDG** Fraction

4071617

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.

1/ >

Sincerely,

Christina Rink

Project Manager/Chemist

44 AUG	102 pages-SF	3 DAY	TAT DC #32	1,574		2025 .	<del></del>						14,000	3603 S VETS	Atta	chm	ent	1				-				. ••	-											
	Level IV	L	DC #32	210	) (E	RN	1 - 1	Мо	rris	svil	le,	NC		Hai	rbo	r P	oin	it, I	ИD	, H	exa	ıva	len	t C	hrc	mi	um	M	oni	tor	ing	J) .	<u> </u>					V 13 8-31
.DC	SDG#	DATE REC'D	(3) DATE DUE	Cr(	(VI) 614)																																	
Matrix:	Air/Water/Soil			A	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s	W	s	w	s	W
A	4071617	07/21/14	07/24/14	18	0.		-						<u> </u>	-								<u> </u>	-	_	ļ	-										_		
+				$\vdash$							<u> </u>		_															ļ		_							$\dashv$	
+		_		-					ļ	_		┢																		<u> </u>					$\rightarrow$		$\dashv$	-
- -																						_															$\dashv$	-
			İ																																		寸	
	1 7 11		:																					<u> </u>													_[	
				<u> </u>	_																	<u> </u>								<u> </u>						$\dashv$	_	
+		<u> </u>			-							_	_									<u> </u>	ļ													4	-+	4
+											_	-	<del> </del>									<u> </u>		<u> </u>	ļ											-	$\dashv$	$\dashv$
	-							$\vdash$														-														$\dashv$	$\dashv$	$\dashv$
								-														<u> </u>														_	$\dashv$	$\neg$
$\top$				ļ																																	$\neg \uparrow$	$\neg$
$\perp$				<u> </u>								<u> </u>	ļ									L															ightharpoonup	
_ _	<del>,</del>			<u> </u>																		<u> </u>														_	$\dashv$	
+				<del> </del>					 				_																			-		-		-		_
+																						<u> </u>			-											$\dashv$	$\dashv$	$\dashv$
+				<del>                                     </del>		$\vdash$				$\vdash$				H									<del>                                     </del>		$\vdash$					-						$\dashv$	$\dashv$	$\dashv$
$\top$																						_		$\vdash$	$\vdash$										$\dashv$	$\dashv$	+	$\dashv$
$\top$	.·																																		$\neg$	$\dashv$	十	$\neg$
																																					力	
																																					$\bot$	
$\perp$													L																							_	4	$\Box$
+								$\square$			_		<u> </u>		<u> </u>											$\sqcup$				-			$\sqcup$			$\dashv$		4
+								$\vdash \vdash$														_				$\left  - \right $										$\dashv$	$\dashv$	_
+					$\vdash$						_	<u> </u>	<u> </u>				$\dashv$			$\vdash$												$\vdash$		$\dashv$	$\dashv$	$\dashv$	$\dashv$	$\dashv$
otal	A/CR			18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

# Laboratory Data Consultants, Inc. Data Validation Report

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

Collection Date: July 12 through July 15, 2014

LDC Report Date: July 22, 2014

Matrix: Air

Parameters: Hexavalent Chromium

Validation Level: EPA Level IV

**Laboratory:** Eastern Research Group

Sample Delivery Group (SDG): 4071617

Sample Identification

OAM 1 (07/12/14) PAM-1 (07/15/14)DUP OAM 2 (07/12/14) PAM-1D (07/15/14)DUP

PAM-1 (07/12/14)

PAM-1D (07/12/14)

PAM-2 (07/12/14)

PAM-3 (07/12/14)

PAM-4 (07/12/14) PAM-21 (07/12/14)

PAM-31 (07/12/14)

OAM 1 (07/15/14)

OAM 2 (07/15/14)

PAM-1 (07/15/14)

PAM-1D (07/15/14)

PAM-2 (07/15/14) PAM-3 (07/15/14)

DAM A (07/15/14)

PAM-4 (07/15/14)

PAM-21 (07/15/14)

PAM-31 (07/15/14)

PAM-1 (07/12/14)DUP

PAM-1D (07/12/14)DUP

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

#### Introduction

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

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

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

The following are definitions of the data qualifiers:

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

#### I. Technical Holding Times

All technical holding time requirements were met.

#### II. Initial Calibration

All criteria for the initial calibration were met.

#### **III. Continuing Calibration**

Continuing calibration frequency and analysis criteria were met.

#### IV. Blanks

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

Samples PAM-31 (07/12/14) and PAM-31 (07/15/14) were identified as trip blanks. No hexavalent chromium was found.

Samples PAM-21 (07/12/14) and PAM-21 (07/15/14) 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 (07/12/14) and PAM-1D (07/12/14) and samples PAM-1 (07/15/14) and PAM-1D (07/15/14) 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 (07/12/14)	PAM-1D (07/12/14)	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.0848	0.0791	7 (≤20)	-	-

	Concentrat	ion (ng/m³)			
Analyte	PAM-1 (07/15/14)	PAM-1D (07/15/14)	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.111	0.0947	16 (≤20)	-	-

# Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Data Qualification Summary - SDG 4071617

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

Harbor Point, MD, Hexavalent Chromium Monitoring
Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG
4071617

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 4071617

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

# LDC #: 32210A6

# **VALIDATION COMPLETENESS WORKSHEET**

Level IV

SDG #: 4071617 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	<u> </u>	Comments
1.	Technical holding times	A	Sampling dates: 7/12-15/14
11	Initial calibration	10	
111.	Calibration verification	H	
IV	Blanks	H	
V	Matrix Spike/Matrix Spike Duplicates	N	Notregured
VI.	Duplicates	I A	QQ.
VII.	Laboratory control samples	A	LCSAP
VIII.	Sample result verification	A	
IX.	Overall assessment of data	A	
X.	Field duplicates	SW	(3,4) (12,13)
xı	Field blanks	( ) M	FB=8,17 TB=418

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:

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

Notes: Dates appended to differinize between semples

# VALIDATION FINDINGS CHECKLIST

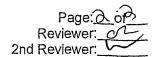
Page: of A Reviewer: 22 2nd Reviewer: 2

Method:Inorganics (EPA Method Secorer )

IVIETNOC:Inorganics (EPA Method Security )	<del></del>			<del> </del>
Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times	<del>,</del>	<sub>1</sub>	,	
All technical holding times were met.			<u> </u>	
Cooler temperature criteria was met.			<u> </u>	
II. Calibration				
Were all instruments calibrated daily, each set-up time?				
Were the proper number of standards used?				
Were all initial calibration correlation coefficients > 0.995?				
Were all initial and continuing calibration verification %Rs within the 90イ10% QC limits?				
Were titrant checks performed as required? (Level IV only)			-	
Were balance checks performed as required? (Level IV only)				
III. Blanks	· · · · · · · · · · · · · · · · · · ·	r		
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.				Rponly
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 anayized 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?				
vore pendificance evaluation (i L) samples pendifical	<del></del>			<del></del>

DC#: 32210A6

# **VALIDATION FINDINGS CHECKLIST**



Validation Area	Yes	No	NA	Findings/Comments		
VII. Sample Result Verification						
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	_					
Were detection limits < RL?						
VIII. Overall assessment of data	_					
Overall assessment of data was found to be acceptable.				·		
IX. Field duplicates	IX. Field duplicates					
Field duplicate pairs were identified in this SDG.	1					
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#	32210A6	

# VALIDATION FINDINGS WORKSHEET Field Duplicates

Page:	of
Reviewer:	W/
2nd Reviewer:	

Inorganics: Method See Cover

	Concentra	tion (ng/m3)		
Analyte	3	4	RPD (≤20)	
Hexavalent Chromium	0.0848	0.0791	7	

	Concentra	ition (ng/m3)		
Analyte	12	13	RPD (≤20)	
Hexavalent Chromium	0.111	0.0947	16	

\LDCFILESERVER\Validation\FIELD DUPLICATES\FD\_inorganic\32210A6.wpd

	3220A6
LDC #:	JUUGIN

# Validation Findings Worksheet Initial and Continuing Calibration Calculation Verification

Page: of
Reviewer: Other
nd Reviewer:

Method: Inorganics, MethodS	<u>ee Cover</u>	
The correlation coefficient (r) for the calil	oration of	was recalculated.Calibration date: 7/17/19
An initial or continuing calibration verific	ation percent rec	overy (%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	An	alyte	Standard	Conc. (ng/mL)	Area	r orr <sup>2</sup>	r or r <sup>2</sup>	(Y/N)
Initial calibration			s1	0.1	0.0000141			
			s2	0.1	0.0000351	0.99991	0.99990	$\Box$
	/ A	34	s3	0.2	0.0000743			(
	4		s4	0.5	0.000196			
			s5	1	0.0004122			1
		!	s6	2	0.0008108			
Calibration verification			TCV	Tire U.S	Found(nghnL) 0.50Z9	101		
Calibration verification	0	1	CCV(13:14)	7	0.5271	105		+
Calibration verification								

comments: Refer to Cambration verification findings worksneet for list of qualifications and associated samples when reported results do not agree wit
0.0% of the recalculated results.

LDC#: 52210AC

True

# VALIDATION FINDINGS WORKSHEET Level IV Recalculation Worksheet

1 1	
Page:of	
Reviewer: 97	
2nd Reviewer:	

METHOD: morganics,	Method	20000		
Percent recoveries (%I	R) for a labora	tory control sam	ple 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 calcu	ulation

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 D = Original sample concentration

580 ca 20

Sample ID	Type of Analysis	Element	Found / S (units)	True / D (units)	Recalculated %R / RPD	Reported %R / RPD	Acceptable (Y/N)
LCS	Laboratory control sample	C(6+	1,05mg/mL	1-00 rg/mL	105	105	7
N	Matrix spike sample		(SSR-SR)			·	
Id	Duplicate sample	C(61	0.083573/23	0,08483/23	1,54	1.55	9

Comments: Refer to appropriate worksheet for list of	of qualifications and associated samples when reported results d	o not agree within 10.0% of the recalculated results.
		· · · · · · · · · · · · · · · · · · ·

LDC#: 1220A6

# VALIDATION FINDINGS WORKSHEET Sample Calculation Verification

Page: of Page: Q2

Reviewer: Q2

2nd reviewer:

METHOD: Inorganics, MethodSe	<u>lover</u>	
/Y N N/A Have results been repo	orted and calculated correctly? alibrated range of the instrume	
Compound (analyte) results forrecalculated and verified using the follo	wing equation:	reported with a positive detect were
Concentration = $9-0.00006$	Recalculation:	5+0.00006 × 10mL 2008476/18/

#	Sample ID	Analyte .	Reported Concentration (% (m²)	Calculated Concentration	Acceptable (Y/N)
		Cot	0.0831	00831	7
	à		00231	00230	
	3		0.0848	0.0848	
	Ÿ		0.0191	00791	
	5		1 6 PO,0	6.0921	
	6		0.0993	0,0993	
	7		0.117	0119	
	16_		0.0655	0.0655	
			0.141	0.141	
	12		0.111	0.111	
	13		0.0947	0.0946	
	14		0,0880	0.0880	
	15		0.0911	0,041/	
	16	<u> </u>	0.122	0.122	
		·			

•	
Note:	



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

SUBMITTED:

**REPORTED:** 07/21/14 13:17

07/16/14

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: Matrix:

OAM 1

Air

Lab ID:

Sample Volume:

4071617-10

m³

Sampled: 07/12/14 15:42

Received: 07/16/14 11:54 Analysis Date: 07/17/14 12:55

Comments:

Start Time 7/11/14 16:07

**Hexavalent Chromium** 

21.22

**Results** 

<u>MDL</u>

**Analyte** 

**CAS Number** 

ng/m³ Air

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0831

0.0036

anapplu



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:** 07/21/14 13:17

SUBMITTED: AQS SITE CODE:

07/16/14

SITE CODE:

Honeywell Hex Chrome Study

Description: Matrix:

OAM 2

Lab ID:

Sample Volume:

4071617-11

20.87 m³

<u>Flag</u>

Sampled: 07/12/14 15:57 Received: 07/16/14 11:54

Analysis Date: 07/17/14 13:05

Comments:

Start Time 7/11/14 16:45

**Hexavalent Chromium** 

Results

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

ng/m³ Air 0.0231

ng/m³ Air 0.0036

<u>MDL</u>

andle



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 7/11/14 18:37

FILE #: 3926.00

**REPORTED:** 07/21/14 13:17

07/16/14 SUBMITTED:

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

PAM-1 **Description:** 

Matrix:

Comments:

Air

Lab ID:

4071617-12

m³

Sampled: 07/12/14 17:38 Received: 07/16/14 11:54

Analysis Date: 07/17/14 11:35

**Hexavalent Chromium** 

20.71

**Results** 

MDL

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

<u>Flaq</u>

ng/m³ Air

ng/m³ Air

Sample Volume:

1854-02-99

0.0848

0.0036

orthalin



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-1D

FAX: (410) 266-8912

Lab ID:

4071617-13 Sample Volume:

20.71

m³

SITE CODE:

SUBMITTED:

AQS SITE CODE:

FILE #: 3926.00

**REPORTED:** 07/21/14 13:17

07/16/14

Honeywell Hex Chrome Study

Sampled: 07/12/14 17:45

Received: 07/16/14 11:54 Analysis Date: 07/17/14 11:54

**Hexavalent Chromium** 

MDL

**Hexavalent Chromium** 

**CAS Number** 

ng/m<sup>3</sup> Air

Flag

ng/m<sup>3</sup> Air

Results

**Analyte** 

Col 2 Start Time 7/11/14 18:44

1854-02-99

0.0791

0.0036

<u>allale</u>



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:

07/21/14 13:17 07/16/14

SUBMITTED:

AQS SITE CODE:

Honeywell Hex Chrome Study

Description: Matrix:

PAM-2

Lab ID:

Sample Volume:

4071617-14

m³

SITE CODE:

Sampled: 07/12/14 17:08 Received: 07/16/14 11:54

Analysis Date: 07/17/14 13:34

Comments:

Start Time 7/11/14 18:07

**Hexavalent Chromium** 

20.71

Results

MDL.

**Analyte** 

**CAS Number** 

ng/m³ Air

<u>Flag</u>

ng/m3 Air

**Hexavalent Chromium** 

1854-02-99

0.0921

0.0036

<u>ornalu</u>



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:** 07/21/14 13:17

SUBMITTED:

07/16/14

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

**Description:** Matrix:

PAM-3

Air

Lab ID:

Sample Volume:

4071617-15

20.71 m³ Sampled: 07/12/14 16:54 Received: 07/16/14 11:54

Analysis Date: 07/17/14 13:44

Comments:

Start Time 7/11/14 17:53

**Hexavalent Chromium** 

**Results** 

<u>MDL</u>

**Analyte** 

**CAS Number** 

ng/m³ Air

Flag

ng/m³ Air

**Hexavalent Chromium** 

1854-02-99

0.0993

0.0036

ochadu



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:** 07/21/14 13:17

07/16/14

SUBMITTED:

**AQS SITE CODE:** 

m³

SITE CODE:

Honeywell Hex Chrome Study

Description:

Matrix:

PAM-4

Lab ID:

Sample Volume:

4071617-16

Sampled: 07/12/14 16:31

Analysis Date: 07/17/14 13:54

Received: 07/16/14 11:54

Comments:

Start Time 7/11/14 17:29

**Hexavalent Chromium** 

20.71

Results

<u>MDL</u>

**Analyte** 

**CAS Number** 

ng/m³ Air

<u>Flaq</u>

ng/m³ Air

**Hexavalent Chromium** 1854-02-99

0.112

0.0036

alleder



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:

07/21/14 13:17 07/16/14

SUBMITTED:

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Analysis Date: 07/17/14 14:04

Description: Matrix:

PAM-21

Air

Lab ID:

Sample Volume:

4071617-17

m³

Sampled: 07/12/14 00:00

Received: 07/16/14 11:54

Comments:

**Hexavalent Chromium** 

Results

20.71

<u>MDL</u>

**CAS Number** 

ng/m³ Air

Flag

ng/m³ Air

**Analyte** Hexavalent Chromium

1854-02-99

0.0036

Ollicher



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

FAX: (410) 266-8912

Lab ID:

4071617-18

Sample Volume:

20.71

m³

SITE CODE:

SUBMITTED:

AQS SITE CODE:

FILE #: 3926.00

**REPORTED:** 07/21/14 13:17

Sampled: 07/12/14 00:00

Honeywell Hex Chrome Study

Received: 07/16/14 11:54 Analysis Date: 07/17/14 14:14

**Hexavalent Chromium** 

Results ng/m<sup>3</sup> Air

ND

Flag

MDL ng/m³ Air

07/16/14

Hexavalent Chromium

**Analyte** 

**CAS Number** 1854-02-99

0.0036

Ormalia



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

OAM 1

FAX: (410) 266-8912

Lab ID: 4071617-19

Sample Volume:

m³

FILE #: 3926.00

REPORTED:

SUBMITTED:

SITE CODE:

**AQS SITE CODE:** 

Honeywell Hex Chrome Study

Sampled: 07/15/14 16:37 Received: 07/16/14 11:54

Analysis Date: 07/17/14 14:24

**Hexavalent Chromium** 

**Results** 

<u>MDL</u>

07/21/14 13:17

07/16/14

**Analyte** CAS Number

Start Time 7/14/14 16:11

1854-02-99

ng/m³ Air 0.0655

<u>Flag</u>

ng/m³ Air 0.0036

**Hexavalent Chromium** 

Olive



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Start Time 7/14/14 16:33

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

07/21/14 13:17

SUBMITTED:

07/16/14 AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description:

Comments:

**Hexavalent Chromium** 

OAM 2

Lab ID:

4071617-20

Sampled: 07/15/14 17:03

Matrix:

Air

Sample Volume:

22.05

m³

Received: 07/16/14 11:54

Analysis Date: 07/17/14 14:34

**Hexavalent Chromium** 

**Results** 

0.141

<u>MDL</u>

**Analyte** 

**CAS Number** 1854-02-99

ng/m³ Air

<u>Flag</u>

ng/m³ Air

0.0036

Malin



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 7/14/14 18:42

FILE #: 3926.00

REPORTED:

07/21/14 13:17 07/16/14

SUBMITTED:

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description:

Comments:

PAM-1

Lab ID:

4071617-21

Sampled: 07/15/14 18:43

Matrix:

Sample Volume:

21.26 m³ Received: 07/16/14 11:54

Analysis Date: 07/17/14 12:14

**Hexavalent Chromium** 

Results

<u>MDL</u>

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

ng/m³ Air 0.111

Flag

ng/m³ Air

0.0036

Male



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

Description:

**Comments:** 

ATTN: Mr. Jeff Boggs

Matrix:

PHONE: (443) 803-8495

Air

PAM-1D

FAX: (410) 266-8912

Lab ID:

4071617-22

Sample Volume: 21.58 m³

<u>Flaq</u>

FILE #: 3926.00

REPORTED:

SUBMITTED:

SITE CODE:

AQS SITE CODE:

Honeywell Hex Chrome Study

Sampled: 07/15/14 18:47 Received: 07/16/14 11:54

Analysis Date: 07/17/14 12:34

**Hexavalent Chromium** 

**Results** ng/m³ Air MDL

07/21/14 13:17

07/16/14

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

Col 2 Start Time 7/14/14 18:49

1854-02-99

0.0947

ng/m³ Air 0.0036

Male



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:

07/21/14 13:17 07/16/14

SUBMITTED:

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: Matrix:

PAM-2

Lab ID:

Sample Volume:

4071617-23

21.73 m³

Sampled: 07/15/14 18:09 Received: 07/16/14 11:54

Analysis Date: 07/17/14 14:44

Air Comments: Start Time 7/14/14 17:41

**Hexavalent Chromium** 

Results

MDL.

**Analyte** 

**CAS Number** 

ng/m³ Air

Flag

ng/m³ Air

**Hexavalent Chromium** 

1854-02-99

0.0880

0.0036



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:** 07/21/14 13:17

07/16/14 SUBMITTED:

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: Matrix:

PAM-3

Lab ID:

Sample Volume:

4071617-24

21.97  $m^3$ 

Sampled: 07/15/14 17:53 Received: 07/16/14 11:54

Analysis Date: 07/17/14 14:54

Comments:

Start Time 7/14/14 17:29

**Hexavalent Chromium** 

**Results** 

MDL

Hexavalent Chromium

**Analyte** 

**CAS Number** 1854-02-99

ng/m<sup>3</sup> Air 0.0911

Flag

ng/m<sup>3</sup> Air

0.0036

Mahr



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:** 07/21/14 13:17 07/16/14

SUBMITTED:

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

**Description:** 

PAM-4

Air

Lab ID:

Sample Volume:

4071617-25

m³

Sampled: 07/15/14 17:37

Received: 07/16/14 11:54 Analysis Date: 07/17/14 15:03

Comments:

Start Time 7/14/14 17:11

**Hexavalent Chromium** 

21.99

**Results** 

**Analyte** 

**CAS Number** 

ng/m³ Air

Flag

<u>MDL</u> ng/m³ Air

Hexavalent Chromium

1854-02-99

0.122

0.0036



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:

07/21/14 13:17 07/16/14

SUBMITTED:

**AQS SITE CODE:** 

SITE CODE:

Honeywell Hex Chrome Study

Description: Matrix:

Comments:

PAM-21

Air

Lab ID:

Sample Volume:

4071617-26

21.73 m³ Sampled: 07/15/14 00:00

Received: 07/16/14 11:54

Analysis Date: 07/17/14 15:33

**Hexavalent Chromium** 

Results

<u>MDL</u>

**Analyte** 

**CAS Number** 

<u>ng/m³ Air</u>

<u>Flag</u>

ng/m³ Air 0.0036

Hexavalent Chromium 1854-02-99



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: 07/21/14 13:17

07/16/14

SUBMITTED:

AQS SITE CODE:

SITE CODE:

m³

Honeywell Hex Chrome Study

Description:

PAM-31

Lab ID:

4071617-27

21.97

Sampled: 07/15/14 00:00 Received: 07/16/14 11:54

Analysis Date: 07/17/14 15:43

**Hexavalent Chromium** 

<u>Results</u>

<u>MDL</u>

**Analyte** 

**CAS Number** 

ng/m³ Air

Sample Volume:

ng/m³ Air

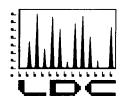
0.0036

Hexavalent Chromium

1854-02-99

ND

Flag



# LABORATORY DATA CONSULTANTS, INC.

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

ERM July 23, 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 July 22, 2014. Attachment 1 is a summary of the samples that were reviewed for each analysis.

# LDC Project #32225:

**SDG** Fraction

4071701/4071830

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	3 DAY				2.1.		5 (100) (30)	CARGO 12.1	586×1112000	WORLDS TO	740 6611				achn			at atau an "				5 (1.7	12.97	or here	6525	's a 1801					***			11.0 %	san a t	- Sec. 44		
	Level IV	L	DC #32	228	5 (E	RN	1 -	Мо	rris	svil	le,	NC	; /	Ha	rbc	r P	oir	ıt, I	ИD	, H	exa	ava	len	t C	hro	omi	um	M	oni	tor	inç	<u>))                                   </u>							
LDC	SDG#	DATE REC'D	(3) DATE DUE	Cr( (D7	(VI) 614)																																		
	c: Air/Water/Soil		<u> </u>	Α	S	w	s	w	s	w	s	w	s	<u>w</u>	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s	<u> w</u>	s	w	s	w	s	W	S
Α	4071701/4071830	07/22/14	07/25/14	18	0.		<u> </u>	ļ	_		<u> </u>	_	<u> </u>		_	ļ	<del> </del>	<del> </del>		<del> </del>	<u> </u>	-	<del> </del>	_	_	<u> </u>	_		_	-			<u> </u>	-	_	<u> </u>		-	╀
				$\vdash$	$\vdash$	_	<del>                                     </del>	ļ	_	<del> </del>		-	┢	┢		┢	┢	$\vdash$		-	<u> </u>	╁	+	$\vdash$		╁		_		<del> </del>				┢	-	H		$\vdash$	$\vdash$
				$\vdash$	$\vdash$		1					$\vdash$									┢	╁	╁─╴	$\vdash$		$\vdash$					<del> </del>	╁	-	<del> </del>		$\vdash$	$\vdash \vdash$	$\vdash$	H
								<del> </del>				╁┈	<del>                                     </del>	<del> </del>	<del>                                     </del>							<u> </u>				$\vdash$								H	-	H		$\vdash$	H
	:	·							<u> </u>	<b></b>					T		<b> </b>			<u> </u>			$\top$			<del>                                     </del>											М		H
																																							Γ
					<u> </u>	<u> </u>							<u> </u>	_																				_		$\bigsqcup$	Ш	_	Ĺ
				<u> </u>	<u> </u>									_	<u> </u>	<u> </u>	ļ	<u> </u>		<u> </u>	_		<u> </u>	ļ	ļ	<u> </u>			_	<u> </u>	<u> </u>	<u> </u>	<u> </u>		_		$\sqcup$	<u> </u>	Ļ
							ļ		<u> </u>				-	<u> </u>	<u> </u>	<u> </u>	_	ļ	_	-	<u> </u>	_	-	_							┞		<u> </u>	_	<u> </u>	<b> </b>			L
				<del> </del>	├		<del> </del>	-				├		┝	┢	-				┝		$\vdash$		-						_	$\vdash$	╀	⊢	├	_	⊬	$\square$	$\vdash$	Ł
			<u> </u>	-	-			_					┢			$\vdash$	┢	<del> </del>			$\vdash$	╁	╁	$\vdash$				-			<del> </del>	├	<del> </del>	╁		$\vdash$	$\vdash\vdash$	$\vdash$	⊦
					l											<del> </del>	<del> </del> -	<del> </del>		<del> </del>	╁─╴	<del> </del> -	<del> </del>	-	<del>                                     </del>	$\vdash$							<del>                                     </del>	$\vdash$		$\vdash$	$\vdash\vdash$	$\vdash$	H
					l								t		h	<b> </b>	<b>-</b>			┢	$\vdash$	<del> </del>	1	$\vdash$	-	ļ	-	<u> </u>					H			H	-		H
									<u> </u>		<del>                                     </del>		Ì																										r
														L	<b></b>	<u> </u>	<u>L</u> _		<u> </u>	<u> </u>	<u> </u>	<u> </u>			<u> </u>	<u> </u>													L
				<u> </u>				ļ		_		<u> </u>		<u> </u>		<u> </u>	<u> </u>			<u> </u>	<u> </u>	_	1							<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>					L
_														┡	ļ	ļ	<u> </u>	ļ		ļ	<b> </b>	ļ	-	<u> </u>	ļ			<u> </u>	_	_	<u> </u>	<u> </u>			<u> </u>	igspace		<u>—</u>	L
				ļ	-		<u> </u>				_	<u> </u>	-		1	-	<u> </u>		_		-	$\vdash$	-	-		<u> </u>	<u> </u>	_		<del> </del>	├	-	<del> </del>		_	igspace	$\square$	<u>—</u>	├
$\dashv$								_		<u> </u>			_	-	<del> </del>	$\vdash$	┢	├		├	┈	$\vdash$				├		_			┢							<del>                                     </del>	┝
			<del> </del>	┼─		$\vdash$			$\vdash$		$\vdash$					$\vdash$	$\vdash$		$\vdash$	<u> </u>	$\vdash$	$\vdash$	$\vdash$	$\vdash$		$\vdash$	$\vdash$	<del> </del>	-	-	$\vdash$	$\vdash$	_	$\vdash$		$\vdash$	$\vdash$		$\vdash$
										<b></b> -				<del>                                     </del>	-	$\vdash$	$\vdash$		-			$\vdash$		$\vdash$	$\vdash$	$\vdash$			$\vdash$					$\vdash$		$\vdash$		İ	H
										$\vdash$							Г												<del>                                     </del>				<u> </u>					<del></del>	T
				L																																			
				<u> </u>	<u> </u>				_	<u> </u>										<u> </u>								<u></u>		<u> </u>						igsqcup	Ш	<b></b>	
$\dashv$				<del> </del>			ļ	ļ		<u> </u>	_	<u> </u>			_	_	_	-		<u> </u>	_	1	_	_		<u> </u>			ļ	_		<u> </u>			<u> </u>		Ш		_
Fotal	T/CR		<u> </u>	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18

# Laboratory Data Consultants, Inc. Data Validation Report

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

Collection Date: July 16 through July 17, 2014

LDC Report Date: July 22, 2014

Matrix: Air

Parameters: Hexavalent Chromium

Validation Level: EPA Level IV

**Laboratory:** Eastern Research Group

**Sample Delivery Group (SDG):** 4071701/4071830

Sample Identification

OAM 1 (07/16/14) PAM-1 (07/17/14)DUP OAM 2 (07/16/14) PAM-1D (07/17/14)DUP

PAM-1 (07/16/14)

PAM-1D (07/16/14)

PAM-2 (07/16/14)

PAM-3 (07/16/14)

PAM-4 (07/16/14)

PAM-21 (07/16/14)

PAM-31 (07/16/14)

OAM 1 (07/17/14)

OAM 2 (07/17/14) PAM-1 (07/17/14)

PAM-1D (07/17/14)

PAM-2 (07/17/14)

PAM-3 (07/17/14)

PAM-4 (07/17/14)

PAM-21 (07/17/14)

PAM-31 (07/17/14)

PAM-1 (07/16/14)DUP

PAM-1 (07/16/14)DDUP

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 (07/16/14) and PAM-31 (07/17/14) were identified as trip blanks. No hexavalent chromium was found.

Samples PAM-21 (07/16/14) and PAM-21 (07/17/14) 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 (07/16/14) and PAM-1D (07/16/14) and samples PAM-1 (07/17/14) and PAM-1D (07/17/14) 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 (07/16/14)	PAM-1D (07/16/14)	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.0228	0.0194	16 (≤20)	-	-

	Concentrat	ion (ng/m³)				
Analyte	PAM-1 (07/17/14)	PAM-1D (07/17/14)	RPD (Limits)	Flags	A or P	
Hexavalent chromium	0.0540	0.0444	20 (≤20)	-	-	

# Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Data Qualification Summary - SDG 4071701/4071830

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

Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG 4071701/4071830

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 4071701/4071830

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

#### LDC #: 32225A6

#### **VALIDATION COMPLETENESS WORKSHEET**

Level IV

SDG #: 4071701/4071830 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: 7/16-17/14
	Initial calibration	À	
111.	Calibration verification	4)	
IV	Blanks	A	
V	Matrix Spike/Matrix Spike Duplicates	N	Norrequied
VI.	Duplicates	A	O.R.
VII.	Laboratory control samples	A	LCS/D
VIII.	Sample result verification	A	, ,
IX.	Overall assessment of data	I A	
X.	Field duplicates	5W	(C3,4) (17,13)
_XI_	Field blanks	$\mathcal{M}$	F15=8,17 TB=9,18

Note:

A = Acceptable

N = Not provided/applicable

SW = See worksheet

ND = No compounds detected

R = Rinsate

FB = Field blank

D = Duplicate

TB = Trip blank
EB = Equipment blank

Validated Samples:

air

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

Notes:	Dates appended	to differmer	between samples

# **VALIDATION FINDINGS CHECKLIST**

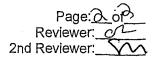
Page: \\_of \arrow
Reviewer: \_\chicklet
2nd Reviewer: \_\sqrt{\chicklet}

Method: Inorganics (EPA Method Secorer)

Metrod: morganics (EPA Metrod 30000)							
Validation Area	Yes	No	NA	Findings/Comments			
I. Technical holding times							
All technical holding times were met.							
Cooler temperature criteria was met.		<u> </u>	<u> </u>				
II. Calibration	-						
Were all instruments calibrated daily, each set-up time?							
Were the proper number of standards used?		<u></u>					
Were all initial calibration correlation coefficients > 0.995?							
Were all initial and continuing calibration verification %Rs within the 90-110% QC limits?							
Were titrant checks performed as required? (Level IV only)							
Were balance checks performed as required? (Level IV only)							
III. Blanks	······································						
Was a method blank associated with every sample in this SDG?	_						
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.							
IV. Matrix spike/Matrix spike duplicates and Duplicates	····	<del>/*********</del> *	· · · · · · · · · · · · · · · · · · ·				
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.	/			Donly			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.							
Were the MS/MSD or duplicate relative percent differences (RPD) ≤ 20% for waters and ≤ 35% for soil samples? A control limit of ≤ CRDL(≤ 2X CRDL for soil) was used for samples that were ≤ 5X the CRDL, including when only one of the duplicate sample values were ≤ 5X the CRDL.							
V. Laboratory control samples							
Was an LCS 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?				•			

DC#: 32225:A6

# VALIDATION FINDINGS CHECKLIST



Validation Area	Yes	No	NA	Findings/Comments
VII. Sample Result Verification				
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	\			
Were detection limits < RL?				
VIII. Overall assessment of data		_		
Overall assessment of data was found to be acceptable.				
IX. Field duplicates				
Field duplicate pairs were identified in this SDG.		r		
Target analytes were detected in the field duplicates.		_		
X. Field blanks				
Field blanks were identified in this SDG.				
Target analytes were detected in the field blanks.		1		

LDC#_	32225A6

#### VALIDATION FINDINGS WORKSHEET Field Duplicates

,	. 1
Page:_	of_'
Reviewer:_	CI
2nd Reviewer:	200

Inorganics: Method See Cover

	Concentrat			
Analyte	3	4	RPD (≤20)	
Hexavalent Chromium	0.0228	0.0194	16	

	Concentra			
Analyte	12	13	RPD (≤20)	
Hexavalent Chromium	0.0540	0.0444	20	

 $\verb|\LDCFILESERVER|\Validation|\FIELD DUPLICATES|\FD\_inorganic|\32225A6.wpd|$ 

LDC #: 3725/6

# Validation Findings Worksheet Initial and Continuing Calibration Calculation Verification

Page:\_\_\_of\_\_ Reviewer:\_\_\_

Method: Inorganics, Method See Cover							
The correlation coefficient (r) for the calib	oration of	was recalculated.Calibration date: 7/2/11/1					
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	An	alyte	Standard	Conc. (ng/mL)	Area	r or r <sup>2</sup>	r or r <sup>2</sup>	(Y/N)
Initial calibration			s1	0.1	0.0000183			
			s2	0.1	0.0000432	0.99990	0.99989	$\cup$
	-Œ	x+	s3	0.2	0.0000809			(
	4		s4	0.5	0.0002022			1
			<b>s</b> 5	1	0.0004093			
			s6	2	0.00084			
Calibration verification			tou	True 0.5	Ford (18/11)	101	•	
Calibration verification	•		CV (14,32)	1	05172	103	-	+
Calibration verification								

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

LDC#: 32725A

# VALIDATION FINDINGS WORKSHEET Level IV Recalculation Worksheet

1 1	
Page: of /	
Reviewer: 97	
2nd Reviewer: St	

METHOD: Inorgan	ics, Method <u>Sec</u>	cover					
Percent recoveries	(%R) for a laboratory	control sample a	ınd a matrix spike sample	were recalculated u	using the following fo	rmula:	•
%R = <u>Found</u> x 100 True	Where, .		concentration of each ar Found = SSR (spiked sar ration of each analyte in tl	nple result) - SR (sa		eample. For the mati	rix spike calculation,
A sample and dupli	icate relative percent	difference (RPD)	was recalculated using th	ne following formula:			
RPD = $ S-D  \times 10$ (S+D)/2	0 Where,		Original sample concentr Duplicate sample concen				
Sample ID	Type of Analysis	Element	Found / S (units)	True / D (units)	Recalculated %R / RPD	Reported %R / RPD	Acceptable (Y/N)
19 105a	Laboratory control sample Dylica te oz	Q6+	00195%	0.0228	\$ 15.6	15.8	+
~	Matrix spike sample		(SSR-SR)				
Les	Duplicate sample	C(ot	1.04mg/m	1.00mg/ml	10-1	104	4
Comments: Refer t	o appropriate worksh	eet for list of quali	fications and associated s	amples when report	ed results do not agre	ee within 10.0% of the	e recalculated results.

# VALIDATION FINDINGS WORKSHEET Sample Calculation Verification

Page:	of_	
Reviewer:	02	
2nd reviewer:	$\overline{s}$	$\overline{\sim}$

				ZIIG ICVIC	wei. 3VC
METH	OD: Inorganics, Metho	od <u>Sel cover</u>			
Please Y N I Y N I Y N I	<u>V/A</u> Have results V/A Are results v	ow for all questions answered " s been reported and calculated of within the calibrated range of the ction limits below the CRQL?	correctly? e instruments?	re identified as "N/	A".
Compo	ound (analyte) results ulated and verified usir	for $\frac{12}{12}$ C6 or $\frac{12}{12}$ c7 or $\frac{12}{$	rep	orted with a positiv	ve detect were
Concent		Recalculation	n:		. 1 -
Cy:	-0000410191-	0,0000373	0,0000456+0,000	20373 XZI	.74m3=
				0.05	40418/m
#	Sample ID	Analyte	Reported Concentration	Calculated Concentration (12/m3)	Acceptable (Y/N)
	(	Gor	0.0135	0.0134	Y
	9		0,037]	00071	
	3	<del> </del>	0,0228	0,0228	
	9		0,0144	0.0194	
	<del>`</del>	<del> </del>	0.0270	0.0270	
	9		0.0200	00008	
			0,0203	0000	
	-	<del> </del>	0.0154	00159	
	12		0.0540	0,0546	
	13		00444	00444	
	14		00369	0.0380°	0,0368
	15		0.0106	0.0106	
	16		0.0171	00171	
			,		
		<u> </u>			
Note:					



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:

07/22/14 13:48

SUBMITTED:

07/17/14 to 07/18/14

**AQS SITE** 

SITE CODE:

<u>Flaq</u>

m³

Honeywell Hex Chrome Study

Description: Matrix:

OAM 1

Lab ID:

Sample Volume:

4071701-01

Sampled: 07/16/14 16:10

Received: 07/17/14 10:17 Analysis Date: 07/21/14 14:12

Comments: Start Time 7/15/14 16:41

**Hexavalent Chromium** 

Results

MDL

**CAS Number** 

ng/m³ Air

ng/m³ Air

**Hexavalent Chromium** 

**Analyte** 

1854-02-99

0.0135



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:

07/22/14 13:48

SUBMITTED:

07/17/14 to 07/18/14

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description: Matrix:

OAM 2

Lab ID:

4071701-02

m³

<u>Flag</u>

Sampled: 07/16/14 16:35 Received: 07/17/14 10:17

Analysis Date: 07/21/14 14:22

Start Time 7/15/14 17:08

Results

Sample Volume:

ng/m³ Air

**Hexavalent Chromium** 

21.11

**MDL** 

ng/m³ Air

**Hexavalent Chromium** 

**Analyte** 

Comments:

**CAS Number** 1854-02-99

0.0271

0.0036

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

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:

07/22/14 13:48

SUBMITTED:

07/17/14 to 07/18/14

**AQS SITE** 

SITE CODE:

Honeywell Hex Chrome Study

Description:

Comments:

Matrix:

PAM-1

Lab ID:

Sample Volume:

4071701-03

m³

Sampled: 07/16/14 18:30 Received: 07/17/14 10:17

Analysis Date: 07/21/14 12:53

Col 1 Start Time 7/15/14 18:57

**Hexavalent Chromium** 

**Results** 

MDL

**Hexavalent Chromium** 

**Analyte** 

**CAS Number** 1854-02-99

ng/m³ Air 0.0228

<u>Flaq</u>

ng/m<sup>3</sup> Air

0.0036

Eastern Research Group



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

07/22/14 13:48

SUBMITTED:

07/17/14 to 07/18/14

**AQS SITE** 

SITE CODE:

Honeywell Hex Chrome Study

**Description:** Matrix:

PAM-1D

Lab ID:

Sample Volume:

4071701-04

m³

Sampled: 07/16/14 18:38

Received: 07/17/14 10:17 Analysis Date: 07/21/14 13:13

Air Comments: Col 2 Start Time 7/15/14 18:51

**Hexavalent Chromium** 

21.4

Results

<u>MDL</u>

**Analyte** 

**CAS Number** 

ng/m³ Air

<u>Flag</u>

<u>ng/m³ Air</u>

**Hexavalent Chromium** 

1854-02-99

0.0194

0.0036

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

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

07/22/14 13:48

SUBMITTED:

07/17/14 to 07/18/14

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description: Matrix:

PAM-2

Lab ID:

Sample Volume:

4071701-05

m³

Sampled: 07/16/14 18:02

Start Time 7/15/14 18:33

21.14

Received: 07/17/14 10:17

Analysis Date: 07/21/14 14:52

**Hexavalent Chromium** 

Results

ng/m³ Air

Flag

<u>MDL</u>

<u>Analyte</u>

**CAS Number** 

ng/m³ Air

**Hexavalent Chromium** 

Comments:

1854-02-99

0.0270



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:** 07/22/14 13:48

SUBMITTED:

07/17/14 to 07/18/14

AQS SITE

STE CODE:

Honeywell Hex Chrome Study

**Description:** Matrix:

PAM-3 Air

Lab ID:

Sample Volume:

4071701-06

21.36 m³ Sampled: 07/16/14 17:42 Received: 07/17/14 10:17

Analysis Date: 07/21/14 15:02

Start Time 7/15/14 17:58

**Hexavalent Chromium** 

Results

MDL

**Analyte Hexavalent Chromium** 

Comments:

**CAS Number** 1854-02-99

ng/m³ Air 0.0208

Flag

ng/m³ Air

0.0036

Eastern Research Group



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

REPORTED:

07/22/14 13:48

SUBMITTED:

FILE #: 3926.00

07/17/14 to 07/18/14

AQS SITE CODE: SITE CODE:

PHONE: (443) 803-8495

ATTN: Mr. Jeff Boggs

FAX: (410) 266-8912

Start Time 7/15/14 17:41

4071701-07

Honeywell Hex Chrome Study

**Description:** P

**Comments:** 

PAM-4

Air

Lab ID:

Sample Volume: 21.23

m³

**Sampled:** 07/16/14 17:16 **Received:** 07/17/14 10:17

**Analysis Date:** 07/21/14 15:12

Hexavalent Chromium

Results

MDL

**Analyte** 

CAS Number

ng/m³ Air

Flag

<u>ng/m³ Air</u>

**Hexavalent Chromium** 

1854-02-99

0.0283

0.0036

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

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

Comments:

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

No CoC sent with sample.

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: SUBMITTED:

07/17/14 to 07/18/14

07/22/14 13:48

**AQS SITE** 

SITE CODE:

Honeywell Hex Chrome Study

Description: Matrix:

PAM-21

Air

Lab ID:

Sample Volume:

4071701-08

m³

Sampled: 07/16/14 00:00 Received: 07/17/14 10:17

Analysis Date: 07/21/14 15:22

**Hexavalent Chromium** 

21.14

**Results** 

MDL

**Analyte** 

**CAS Number** 

ng/m³ Air

Flag

ng/m³ Air

Hexavalent Chromium

1854-02-99



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:

07/22/14 13:48

SUBMITTED:

07/17/14 to 07/18/14

**AQS SITE** 

SITE CODE:

Honeywell Hex Chrome Study

**Description:** PAM-31

Matrix:

Comments:

Lab ID:

Sample Volume:

4071701-09

21.36 m³ Sampled: 07/16/14 00:00 Received: 07/17/14 10:17

Analysis Date: 07/21/14 15:32

**Hexavalent Chromium** 

**Results** 

MDL

**Analyte** 

**CAS Number** 

ng/m³ Air ND

<u>Flaq</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99



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

REPORTED:

07/22/14 13:48

FILE #: 3926.00

SUBMITTED:

07/17/14 to 07/18/14

**AQS SITE** 

SITE CODE:

Honeywell Hex Chrome Study

Description: Matrix:

OAM 1

Lab ID:

Sample Volume:

4071830-01

Sampled: 07/17/14 16:39 Received: 07/18/14 11:05

Analysis Date: 07/21/14 15:42

Start Time 7/16/14 16:16

**Hexavalent Chromium** 

21.95

Results

<u>MDL</u>

**Analyte Hexavalent Chromium** 

Comments:

**CAS Number** 1854-02-99

ng/m³ Air 0.0415

<u>Flaq</u>

ng/m³ Air

0.0036

Eastern Research Group



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

Description:

Comments:

**Hexavalent Chromium** 

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Start Time 7/16/14 16:40

FAX: (410) 266-8912

FILE #: 3926.00

**REPORTED:** 07/22/14 13:48

SUBMITTED:

07/17/14 to 07/18/14

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Matrix: Air

OAM 2

Lab ID:

Sample Volume:

4071830-02

22.01

 $m^3$ 

Sampled: 07/17/14 17:08 Received: 07/18/14 11:05

Analysis Date: 07/21/14 15:52

**Hexavalent Chromium** 

Results

<u>MDL</u>

**Analyte CAS Number** 

1854-02-99

ng/m³ Air 0.0154

<u>Flaq</u>

ng/m³ Air

0.0036

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

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

07/22/14 13:48

SUBMITTED:

07/17/14 to 07/18/14

**AQS SITE** 

SITE CODE:

Honeywell Hex Chrome Study

Description:

Matrix:

PAM-1 Air

Lab ID:

Sample Volume:

4071830-03

m³

Sampled: 07/17/14 18:46 Received: 07/18/14 11:05

Analysis Date: 07/21/14 13:32

Comments:

Col 1 Start Time 7/16/14 18:37

**Hexavalent Chromium** 

21.74

Results

<u>MDL</u>

**Hexavalent Chromium** 

**Analyte** 

**CAS Number** 

ng/m³ Air 0.0540

Flag

ng/m³ Air

1854-02-99

0.0036

Eastern Research Group



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

07/22/14 13:48

SUBMITTED:

07/17/14 to 07/18/14

**AQS SITE** 

SITE CODE:

Flag

Honeywell Hex Chrome Study

Description:

PAM-1D

Lab ID:

Sample Volume:

4071830-04

 $\,m^3$ 

Sampled: 07/17/14 18:53 Received: 07/18/14 11:05

Analysis Date: 07/21/14 13:52

Matrix: Comments:

Col 2 Start Time 7/16/14 18:43

**Hexavalent Chromium** 

21.74

Results

**Analyte Hexavalent Chromium** 

**CAS Number** 1854-02-99

ng/m³ Air 0.0444

ng/m³ Air

MDL

0.0036

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

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:

07/22/14 13:48

SUBMITTED:

07/17/14 to 07/18/14

**AQS SITE** 

SITE CODE:

Honeywell Hex Chrome Study

Analysis Date: 07/21/14 16:01

Description:

PAM-2

Air

Lab ID:

Sample Volume:

4071830-05

Sampled: 07/17/14 18:24

Received: 07/18/14 11:05

**Comments:** 

Start Time 7/16/14 18:10

**Hexavalent Chromium** 

21.81

Results

<u>Flaq</u>

MDL

**Analyte** 

**CAS Number** 

<u>ng/m³ Air</u>

**Hexavalent Chromium** 

1854-02-99

0.0369

ng/m³ Air 0.0036



Environmental Resources Management, Inc

PAM-3

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

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

SITE CODE:

Description: 4071830-06 Sampled: 07/17/14 18:06 Matrix: Sample Volume: 21.83 Received: 07/18/14 11:05 Air

Comments: Analysis Date: 07/21/14 16:11 Start Time 7/16/14 17:50

**Hexavalent Chromium** 

Results

Lab ID:

ng/m³ Air Flag

FILE #: 3926.00

07/22/14 13:48

MDL

07/17/14 to 07/18/14

Honeywell Hex Chrome Study

REPORTED:

SUBMITTED:

AQS SITE

**Analyte** ng/m³ Air **CAS Number Hexavalent Chromium** 0.0106 1854-02-99 0.0036

Eastern Research Group



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

07/22/14 13:48

SUBMITTED:

07/17/14 to 07/18/14

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Analysis Date: 07/21/14 16:21

Description: Matrix:

PAM-4 Air

Lab ID:

Sample Volume:

4071830-07

21.87

Sampled: 07/17/14 17:45

Received: 07/18/14 11:05

Comments: Start Time 7/16/14 17:27

**Hexavalent Chromium** 

**Results** 

MDL

**Analyte** 

**CAS Number** 

ng/m³ Air

Flag

ng/m³ Air

**Hexavalent Chromium** 

1854-02-99

0.0171



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

Description:

Comments:

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Matrix:

(443) 003-0495

PAM-21

Air

FAX: (410) 266-8912

PEDC

FILE #: 3926.00

REPORTED:

07/22/14 13:48

SUBMITTED:

07/17/14 to 07/18/14

AQS SITE CODE: SITE CODE:

Lab ID:

Sample Volume:

4071830-08

m³

Sampled: 07/17/14 00:00

Received: 07/18/14 11:05

Analysis Date: 07/21/14 16:51

Honeywell Hex Chrome Study

**Hexavalent Chromium** 

21.81

<u>Results</u>

<u>MDL</u>

Analyte
Hexavalent Chromium

1854-02-99

ng/m³ Air

<u>Air</u>

<u>Flag</u>

ng/m³ Air

0.0036

Eastern Research Group



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

Matrix:

Comments:

PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

07/22/14 13:48

SUBMITTED:

07/17/14 to 07/18/14

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-31

Air

Lab ID:

Sample Volume:

4071830-09

m³

Sampled: 07/17/14 00:00 Received: 07/18/14 11:05

Analysis Date: 07/21/14 17:01

**Hexavalent Chromium** 

21.83

Results

**MDL** 

**Analyte** 

**CAS Number** 

ng/m³ Air

<u>Flaq</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0036

Eastern Research Group