

October 13, 2014

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

LDC Project #32828:

<u>SDG</u>

Fraction

4100211/4100310

Hexavalent Chromium

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

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

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

Sincerely,

Christina Rink Project Manager/Chemist

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Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:	Harbor Point, MD, Hexavalent Chromium Monitoring
Collection Date:	October 1 through October 2, 2014
LDC Report Date:	October 10, 2014
Matrix:	Air
Parameters:	Hexavalent Chromium
Validation Level:	EPA Level IV
Laboratory:	Eastern Research Group

Sample Delivery Group (SDG): 4100211/4100310

Sample Identification

OAM 1(10/01/14) OAM 2(10/01/14) PAM-1(10/01/14) PAM-1D(10/01/14) PAM-2(10/01/14) PAM-2(10/01/14) PAM-3(10/01/14) PAM-4(10/01/14) PAM-21(10/01/14) OAM 1(10/02/14) OAM 2(10/02/14) PAM-1(10/02/14) PAM-2(10/02/14) PAM-3(10/02/14) PAM-3(10/02/14) PAM-21(10/02/14) PAM-31(10/02/14) PAM-31(10/02/14)	PAM-1(10/02/14)DUP PAM-1D(10/02/14)DUP
PAM-1(10/01/14)DUP PAM-1D(10/01/14)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(10/01/14) and PAM-31(10/02/14) were identified as trip blanks. No hexavalent chromium was found.

Samples PAM-21(10/01/14) and PAM-21(10/02/14) were identified as field blanks. No hexavalent chromium was found.

V. Matrix Spike/Matrix Spike Duplicates

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

VI. Duplicates

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

VII. Laboratory Control Samples

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

VIII. Sample Result Verification

All sample result verifications were acceptable.

IX. Overall Assessment of Data

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

X. Field Duplicates

Samples PAM-1(10/01/14) and PAM-1D(10/01/14) and samples PAM-1(10/02/14) and PAM-1D(10/02/14) were identified as field duplicates. No hexavalent chromium was detected in any of the samples with the following exceptions:

	Concentrat	ion (ng/m³)	555			
Analyte	PAM-1(10/01/14)	PAM-1D(10/01/14)	RPD (Limits)	Flags	A or P	
Hexavalent chromium	0.0096	0.0096	0 (≤20)	-	-	

	Concentrat	ion (ng/m³)	555		A or P	
Analyte	PAM-1(10/02/14)	PAM-1D(10/02/14)	RPD (Limits)	Flags		
Hexavalent chromium	0.0146	0.0128	13 (≤20)	-	-	

Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Data Qualification Summary - SDG 4100211/4100310

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

Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG 4100211/4100310

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 4100211/4100310

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

LDC #:	<u>32828A6</u>	VALIDATION COMPLETENESS WORKSHEET
SDG #:	4100211/4100310	Level IV
Laborato	ry: Eastern Research	<u>Group</u>



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
Ι.	Technical holding times	A	Sampling dates: 10/01-02/14
11	Initial calibration	A	
III.	Calibration verification	A	
IV	Blanks	A	
V	Matrix Spike/Matrix Spike Duplicates	2	Not Required
VI.	Duplicates	A	Dup
VII.	Laboratory control samples	A	LUSID
VIII.	Sample result verification	A	
IX.	Overall assessment of data	A	
Х.	Field duplicates	SW	FD = (3,4) (12,13)
xı	Field blanks	ND	FB=(8), (n), TB=(9)(i8)

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(10/01/14)	11	OAM 2(10/02/14)	21	PAM-1(10/02/14)DUP	31	
2	OAM 2(10/01/14)	12	PAM-1(10/02/14)	22	PAM-1D(10/02/14)DUP	32	
3	PAM-1(10/01/14)	13	PAM-1D(10/02/14)	23		33	
4	PAM-1D(10/01/14)	14	PAM-2(10/02/14)	24		34	
5	PAM-2(10/01/14)	15	PAM-3(10/02/14)	25		35	
6	PAM-3(10/01/14)	16	PAM-4(10/02/14)	26		36	
7	PAM-4(10/01/14)	17	PAM-21(10/02/14)	27		37	
8	PAM-21(10/01/14)	18	PAM-31(10/02/14)	28		38	
9	PAM-31(10/01/14)	19	PAM-1(10/01/14)DUP	29		39	
10	OAM 1(10/02/14)	20	PAM-1D(10/01/14)DUP	30		40	
		1		ha			

Notes: Date of parded to differenniate between samples

LDC #:_3282846

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?	1			
Were all initial calibration correlation coefficients \geq 0.995?				
Were all initial and continuing calibration verification %Rs within the $90 + 10\%$ QC limits?	1			
Were titrant checks performed as required? (Level IV only)				
Were balance checks performed as required? (Level IV only)				
III. Blanks	···		····	
Was a method blank associated with every sample in this SDG?				
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		/		
IV. Matrix spike/Matrix spike duplicates and Duplicates				
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	/			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.			/	
Were the MS/MSD or duplicate relative percent differences (RPD) \leq 20% for waters and \leq 35% for soil samples? A control limit of \leq CRDL(\leq 2X CRDL for soil) was used for samples that were \leq 5X the CRDL, including when only one of the duplicate sample values were \leq 5X the CRDL.	/			
V. Laboratory control samples				
Was an LCS 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?	1			
VI. Regional Quality Assurance and Quality Control				
Nere performance evaluation (PE) samples performed?			/	
Were the performance evaluation (PE) samples within the acceptance limits?	I			

VALIDATION FINDINGS CHECKLIST

Page: Zof Z Reviewer: 50 2nd Reviewer: 02

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

LDC#<u>32828A6</u>

VALIDATION FINDINGS WORKSHEET Field Duplicates

Page: <u>i</u> of <u>i</u> Reviewer: <u>JO</u> 2nd Reviewer: <u>M</u>

Inorganics: Method See Cover

	Concentra			
Analyte	3	4	RPD (≤20)	Qual.
Hexavalent Chromium	0.0096	0.0096	0	

	Concentra	tion (ng/m3)		
Analyte	12	13	RPD (≤20)	Qual.
Hexavalent Chromium	0.0146	0.0128	13	

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LDC #: 32828AL

Validation Findings Worksheet Initial and Continuing Calibration Calculation Verification

Page: of
Reviewer: <u>50</u>
2nd Reviewer:

Method: Inorganics, Method See Cover

The correlation coefficient (r) for the calibration of \underline{C}^{4b} was recalculated.Calibration date: 10/06/14

Where,

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

%R = Found X 100

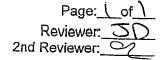
True

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

				0 	Recalculated	Reported	Acceptable
Type of analysis	Analyte	Standard	Conc. (ng/ml)	Area	r or r ²	r or r ²	(Y/N)
Initial calibration		s1	0.1	0.0000244			
		s2	0.1	0.0000406	0.99998	0.99998	
	Cr+6	s3	0.2	0.0000771			
		s4	0.5	0.0001922			3
		s5	1	0.0003872)
		s6	2	0.0007671			
ICU 11:08	1 26	Found	True				
Calibration verification	Cr+16	0.SIZnejiml	0.5 ng/ml		102.4%E	102.4 %R	
CW 12:07	Crto	Found	True		_	•	
Calibration verification	Cr	0.5185ng/ml	0.5 ng/ml		103.7%R	103.7%R	4/
)				
Calibration verification							

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

VALIDATION FINDINGS WORKSHEET Level IV Recalculation Worksheet



METHOD: Inorganics, Method See Cover

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

 $R = Found \times 100$ Where, Found = True

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 = concentration of each analyte in the source.

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

RPD = <u> S-D </u> 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	Reported	Acceptable (Y/N)
LCS 11:37	Laboratory control sample	Crac	2.10 ng/m)	1.00 mg/m)	110%P	110%P	Y
N	Matrix spike sample 🦻		(SSR-SR)				
Dup. 12:37	Duplicate sample	Gr46	0.0101	0.00915	6.12%PPD	6.24%297	Y*

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.

.

YN NA

Y N N/A

VALIDATION FINDINGS WORKSHEET Sample Calculation Verification

Page: <u>\</u> of_\	
Reviewer: 5D	
2nd reviewer:	

METHOD: Inorganics, Method See Cover

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

Have results been reported and calculated correctly?

Are results within the calibrated range of the instruments?

Are all detection limits below the CRQL?

Compound (analyte) results for ± 1 recalculated and verified using the following equation:

 $\frac{\text{Recalculation: } (0.0000147 - (2.7E-06))}{0.0003824} = 0.0313 \text{ Ng/ml}}$ $\frac{1}{(0.0313 \text{ Ng/ml})(10 \text{ ml})}{(0.0313 \text{ Ng/ml})(20 \text{ ml})} = 0.0143 \text{ Ng/m}^3$ Concentration = $(A - L_{0}) | L_{1}$ Rec Vf=10m1 $\frac{(n_{g}|m1)(ut)}{m^{3}}$ A= 0.0000147 CD= 2,72E-06 (1 = 0.0003824)Reported Calculated Concentration Concentration Acceptable (ng/m3) (na/m3) Sample ID Analyte # (Y/N)46 0.0105 Ч ſ 0.0105 2 0.0359 0.0360 YX 3 Y4 0.0096 2,00.0 4 0.0096 J 0.0096 5 0.0130 0.0130 J 6 0.0089 0.0089 <u>بر</u>* 0.0123 0.0124 8 ND J OU 9 NO \overline{J} ND 0.0091 0.009() 44 lO 0.0143 11 0.043 U 12 0.0146 0.0146 12 0.0128 0.0128 14 0.0123 0.0122 Y* 71 0.0140 J 0.0140 ١V 0.0131 0.0132 44 09 NO 10 18 ND NO Note: * Pounding

Environmental Resources Management, Inc					FILE #: 3926.00				
75 Valley Stream	Parkway, Suite 400			REPORTED:	10/09/14 15:37				
Malvern, PA 1935	5			SUBMITTED:	10/02/14 to 10/03/14				
ATTN: Mr. Jeff B	oggs			AQS SITE					
PHONE: (443) 8	03-8495 FAX: (410) 266-8912		SITE CODE:	Honeywell He	ex Chrome Study			
Description:	OAM 1	Lab ID	4100211-01		Sample	d: 10/01/14 16:22			
Matrix:	Air	Sample	e Volume: 21.	52 m³	Receive	ed: 10/02/14 10:30			
Comments:	Start Time 9/30/14 16:27				Analysis Da	te: 10/06/14 13:48			
Hexavalent Chromium									
			<u>Results</u>		MDL				
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>				
Hexavalent Chromium		1854-02-99	0.0105		0.0036				

OCT 1 0 2014

Initials: CR

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Environmental Resources Management, Inc					FILE #:	3926.0	0	
75 Valley Stream F	Parkway, Suite 400				REPORT	ED: 10	0/09/14 15:37	
Malvern, PA 19355	5				SUBMIT	TED:	10/02/14 to 10/03	3/14
ATTN: Mr. Jeff Bo PHONE: (443) 8) 266-8912			AQS SIT		Honey	vell Hex Chrome Study
Description:	OAM 2		Lab ID:	4100211-02			S	ampled: 10/01/14 16:41
Matrix:	Air	5	Sample Volu	ume: 21	.48 m³	3	R	eceived: 10/02/14 10:30
Comments:	Start Time 9/30/14 16:49						Analy	sis Date: 10/06/14 13:58
			He	xavalent Ch	romium			
			E	<u>Results</u>			<u>MDL</u>	
<u>Analyte</u>		CAS Number	<u>n</u>	g/m³ Air	<u>Flaq</u>	1	ng/m³ Air	
Hexavalent Chromium		1854-02-99		0.0359			0.0036	

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Malvern, PA 19355	5			SUB	MITTED:	10/02/14 to	o 10/03/14
ATTN: Mr. Jeff Bo		000 0040			SITE E: CODE:		la anna 11 Llan Charana Chudu
PHONE: (443) 8	03-8495 FAX: (410) 266-8912		SITE	CODE:	H	oneywell Hex Chrome Study
Description:	PAM-1	Lab	ID: 4100211	-03			Sampled: 10/01/14 17:47
Matrix:	Air	Sam	ple Volume:	21.09	m³		Received: 10/02/14 10:30
Comments:	Col 1 Start Time 9/30/14 1	8:21					Analysis Date: 10/06/14 12:27
			Hexavalent	: Chromiur	n		
			<u>Results</u>			<u>MDL</u>	
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>F</u> I	ag	<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99	0.0096			0.0036	

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Environmental Resources Management, Inc							FILE #: 392	6.00			
75 Valley Stream Parkway, Suite 400							REPORTED:	10/09/14 15:37			
Malvern, PA 1935					SUBMITTED:	10/02/14 to 10/03/14					
ATTN: Mr. Jeff B PHONE: (443) 8	3oggs 803-8495	FAX:	(410) 266-8912				AQS SITE CODE: SITE CODE:	ŀ	loneywell Hex Chrome Study		
Description:	PAM-1D			Lab ID:	410021	1-04	· · · · · · · · · · · · · · · · · · ·		Sampled: 10/01/14 17:49		
Matrix:	Air			Sample V	olume:	21.14	m³		Received: 10/02/14 10:30		
Comments:	Col 2 Start	Fime 9/30	0/14 18:20						Analysis Date: 10/06/14 12:47		
Hexavalent Chromium											
					<u>Results</u>			MDL			
<u>Analyte</u>			CAS Numb	<u>er</u>	<u>ng/m³ Ai</u>	ir	Flag	<u>ng/m³ Air</u>			
Hexavalent Chromiun	n		1854-02-99		0.0096			0.0036			

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Initials: CR

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

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Environmental Resources Management, Inc					FILE #:	3926.	00		
75 Valley Stream F	Parkway, Suite 400					REPORT	ED:	10/09/14 15:	37
Malvern, PA 19355	5					SUBMITT	ED:	10/02/14	o 10/03/14
ATTN: Mr. Jeff Bo PHONE: (443) 8	oggs 03-8495 FAX: (410) 266-8912				AQS SITE	_	I	Honeywell Hex Chrome Study
Description:	PAM-2	La	ab ID:	4100211-	-05				Sampled: 10/01/14 17:31
Matrix:	Air	Sa	ample Vo	olume:	21.27	7 m³			Received: 10/02/14 10:30
Comments:	Start Time 9/30/14 17:53								Analysis Date: 10/06/14 14:27
			н	exavalent	: Chro	mium			
				<u>Results</u>				MDL	
Analyte		CAS Number		<u>ng/m³ Air</u>		<u>Flag</u>		<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99		0.0130				0.0036	

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Initials: CR

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Environmental Re	sources Management,	Inc		FILE #:	3926.00					
75 Valley Stream I	Parkway, Suite 400		REPORT	ED: 10/09/14 15:	10/09/14 15:37					
Malvern, PA 1935	5		SUBMITT	ED: 10/02/14 t	10/02/14 to 10/03/14					
ATTN: Mr. Jeff B		140) 266 8012		AQS SITE		Inneural Line Chrome Study				
PHONE: (443) 8	803-8495 FAX: (4	110) 266-8912		SITE COL		Ioneywell Hex Chrome Study				
Description:	PAM-3	La	ab ID: 4100211-	06		Sampled: 10/01/14 17:20				
Matrix:	Air	Sa	ample Volume:	21.32 m ³		Received: 10/02/14 10:30				
Comments:	Start Time 9/30/14 17:	39				Analysis Date: 10/06/14 14:37				
Hexavalent Chromium										
			<u>Results</u>		<u>MDL</u>					
Analyte		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>					
Hexavalent Chromium	I	1854-02-99	0.0089		0.0036					

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Initials: CR

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Environmental Resources Management, Inc						FILE #: 3926.00			
75 Valley Stream F	Parkway, Suite 400				REPORTE	ED: 10/09/14 15	:37		
Malvern, PA 19355	5				SUBMITT	ED: 10/02/14	to 10/03/14		
ATTN: Mr. Jeff Bo PHONE: (443) 8) 266-8912			AQS SITE	-	Honeywell Hex Chrome Study		
Description:	PAM-4	La	ab ID: 410021	.1-07			Sampled: 10/01/14 17:08		
Matrix:	Air	Sa	ample Volume:	21.3	5 m³		Received: 10/02/14 10:30		
Comments:	Start Time 9/30/14 17:24						Analysis Date: 10/06/14 14:47		
			Hexavale	nt Chro	mium				
			<u>Results</u>			MDL			
<u>Analyte</u>		<u>CAS Number</u>	<u>ng/m³ A</u>	ir	<u>Flag</u>	<u>ng/m³ Air</u>			
Hexavalent Chromium		1854-02-99	0.0124			0.0036			

OCT 1 0 2014

Initials: CR

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Environmental Re	esources Manage	ement, Inc		FILE #:	3926.00	
75 Valley Stream	Parkway, Suite 4	100		REPOR	TED: 10/09/14	15:37
Malvern, PA 1935	5			SUBMIT	TED: 10/02	/14 to 10/03/14
ATTN: Mr. Jeff E	Boggs			AQS SI		
PHONE: (443)	803-8495 F A	X: (410) 266-8912		SITE	DDE:	Honeywell Hex Chrome Study
Description:	PAM-21		Lab ID: 410021	1-08		Sampled: 10/01/14 00:00
Matrix:	Air		Sample Volume:	21.27 m	13	Received: 10/02/14 10:30
Comments:						Analysis Date: 10/06/14 14:57
			Hexavaler	nt Chromium		
			<u>Results</u>		MD	L
Analyte		CAS Numb	<u>er ng/m³ Ai</u>	<u>r Flaq</u>	<u>ng/m³</u>	Air
Hexavalent Chromium		1854-02-99	ND	U	0.003	6

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Environmental Re	sources Manager	ment, Inc				FILE #:	3926.00	
75 Valley Stream	Parkway, Suite 40	00				REPORTE	D: 10/09/14 1	5:37
Malvern, PA 1935	5					SUBMITT	ED: 10/02/14	to 10/03/14
ATTN: Mr. Jeff E PHONE: (443) 8	3oggs 803-8495 FA)	(: (410) 266-8912				AQS SITE	-	Honeywell Hex Chrome Study
Description:	PAM-31		Lab ID:	410021	1-09			Sampled: 10/01/14 00:00
Matrix:	Air		Sample Vo	olume:	21.32	2 m³		Received: 10/02/14 10:30
Comments:								Analysis Date: 10/06/14 15:07
			н	exavaler	nt Chro	mium		
				<u>Results</u>			MDL	
<u>Analyte</u>		CAS Numb	er	ng/m³ Ai	Ľ	<u>Flag</u>	<u>ng/m³ Ai</u>	<u>r</u>
Hexavalent Chromium		1854-02-99		ND		υ	0.0036	

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Environmental Re	sources Management, In	c		FILE #: 3926	6.00	
75 Valley Stream	Parkway, Suite 400			REPORTED:	10/09/14 15:37	
Malvern, PA 1935	5			SUBMITTED:	10/02/14 to 10/0	3/14
ATTN: Mr. Jeff B PHONE: (443) 8	oggs 103-8495 FAX: (410) 266-8912		AQS SITE CODE: SITE CODE:	Honey	well Hex Chrome Study
Description:	OAM 1	Lab ID:	4100310-01		5	Sampled: 10/02/14 16:49
Matrix:	Air	Sample	Volume: 21.9	93 m³	F	Received: 10/03/14 11:01
Comments:	Start Time 10/1/14 16:27				Analy	sis Date: 10/06/14 15:17
			Hexavalent Chr	omium		
			<u>Results</u>		<u>MDL</u>	
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99	0.0091		0.0036	

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Environmental Res	sources Management, Inc	2			FILE #:	3926.00	
75 Valley Stream F	^p arkway, Suite 400				REPORT	ED: 10/09/14 1	5:37
Malvern, PA 1935	5				SUBMITT	ED: 10/02/14	to 10/03/14
ATTN: Mr. Jeff Be PHONE: (443) 8	oggs 03-8495 FAX: (410) 266-8912			AQS SITE		Honeywell Hex Chrome Study
Description:	OAM 2		Lab ID: 4	100310-02			Sampled: 10/02/14 17:05
Matrix:	Air		Sample Volun	ne: 21.8	39 m³		Received: 10/03/14 11:01
Comments:	Start Time 10/1/14 16:45						Analysis Date: 10/06/14 15:27
				avalent Chr	omium		
			<u>Re</u>	<u>esults</u>		<u>MDL</u>	
<u>Analyte</u>		CAS Number	r <u>ng/</u>	m³ Air	<u>Flag</u>	<u>ng/m³ Ai</u>	<u>r</u>
Hexavalent Chromium		1854-02-99	0.	.0143		0.0036	

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Environmental Res	ources Management, In	C			FILE #:	3926.00	
75 Valley Stream P	arkway, Suite 400				REPORTE	D: 10/09/14 15	37
Malvern, PA 19355					SUBMITTE	ED: 10/02/14	to 10/03/14
ATTN: Mr. Jeff Bo PHONE: (443) 80) 266-8912			AQS SITE		Honeywell Hex Chrome Study
Description:	PAM-1	Lat	b ID: 4100310-	-03			Sampled: 10/02/14 18:21
Matrix:	Air	Sar	mple Volume:	22.04	m³		Received: 10/03/14 11:01
Comments:	Col 1 Start Time 10/1/14	17:51					Analysis Date: 10/06/14 13:07
			Hexavalent	: Chro	mium		
			<u>Results</u>			MDL	
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>		Flag	<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99	0.0146			0.0036	

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Environmental Res	sources Management, In	c		FILE #	: 392	6.00	
75 Valley Stream F	^o arkway, Suite 400			REPO	RTED:	10/09/14 15:37	
Malvern, PA 1935	5			SUBM	TTED:	10/02/14 to 1	0/03/14
ATTN: Mr. Jeff Bo PHONE: (443) 8)) 266-8912		AQS S CODE SITE		Hon	eywell Hex Chrome Study
Description:	PAM-1D	Ĺab	b ID: 4100310-	04			Sampled: 10/02/14 18:21
Matrix:	Air	Sar	mple Volume:	22.03	m³		Received: 10/03/14 11:01
Comments:	Col 2 Start Time 10/1/14	17:53				An	alysis Date: 10/06/14 13:27
			Hexavalent <u>Results</u>	Chromium		MDL	
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Fla</u>	a a	<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99	0.0128			0.0036	

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Environmental Re	sources Management, Inc	:		FILE #:	3926.00	
75 Valley Stream	Parkway, Suite 400			REPORT	TED: 10/09/14	15:37
Malvern, PA 1935	5			SUBMIT	TED: 10/02/1	4 to 10/03/14
ATTN: Mr. Jeff B PHONE: (443) 8) 266-8912		AQS SITE		Honeywell Hex Chrome Study
Description:	PAM-2		Lab ID: 4100310-0)5	······································	Sampled: 10/02/14 17:54
Matrix:	Air	:	Sample Volume:	21.88 m	3	Received: 10/03/14 11:01
Comments:	Start Time 10/1/14 17:35					Analysis Date: 10/06/14 15:37
			Hexavalent	Chromium		
			<u>Results</u>		<u>MDL</u>	
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ /</u>	lir
Hexavalent Chromium		1854-02-99	0.0122		0.0036	i de la construcción de la constru

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Environmental Re	sources Management, Ind	c				FILE #:	3926.0	00	
75 Valley Stream I	Parkway, Suite 400					REPORTE	ED: 1	0/09/14 15:3	7
Malvern, PA 1935	5					SUBMITT	ED:	10/02/14 to	10/03/14
ATTN: Mr. Jeff Br PHONE: (443) 8) 266-8912				AQS SITE	-	н	oneywell Hex Chrome Study
Description:	PAM-3	La	ab ID:	4100310-0	06				Sampled: 10/02/14 17:44
Matrix:	Air	Sa	ample Vo	olume:	21.9	m³			Received: 10/03/14 11:01
Comments:	Start Time 10/1/14 17:24							1	Analysis Date: 10/06/14 15:47
			H	exavalent	Chro	mium			
				<u>Results</u>				<u>MDL</u>	
Analyte		CAS Number		<u>ng/m³ Air</u>		Flag	!	ng/m³ Air	
Hexavalent Chromium		1854-02-99		0.0140				0.0036	

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Environmental Res	sources Management, Ind	2				FILE #:	3926.0	00	
75 Valley Stream F	^p arkway, Suite 400					REPORT	ED: 1	0/09/14 15:3	37
Malvern, PA 19355	5					SUBMITT	ED:	10/02/14 t	o 10/03/14
ATTN: Mr. Jeff Bo PHONE: (443) 8) 266-8912				AQS SITE	-	ŀ	Ioneywell Hex Chrome Study
Description:	PAM-4		Lab ID:	4100310-	07				Sampled: 10/02/14 17:31
Matrix:	Air		Sample Vo	olume:	21.89	9 m³			Received: 10/03/14 11:01
Comments:	Start Time 10/1/14 17:12								Analysis Date: 10/06/14 15:57
			H	exavalent	Chro	mium			
				<u>Results</u>				<u>MDL</u>	
<u>Analyte</u>		CAS Numbe	<u>ir</u>	<u>ng/m³ Air</u>		<u>Flag</u>		<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99		0.0132				0.0036	

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Environmental Re	esources Mana	gement, Inc				FILE #:	3926.00		
75 Valley Stream	Parkway, Suite	e 400				REPORT	ED: 10/	09/14 15:37	
Malvern, PA 1935	5					SUBMITT	TED: 1	0/02/14 to	10/03/14
ATTN: Mr. Jeff E	Boggs					AQS SITE			
PHONE: (443)	803-8495	FAX: (410) 266-8912				SITECOL	DE:	Ho	neywell Hex Chrome Study
Description:	PAM-21		Lab ID:	4100310	0-08				Sampled: 10/02/14 00:00
Matrix:	Air		Sample Vol	ume:	21.88	m³			Received: 10/03/14 11:01
Comments:								A	nalysis Date: 10/06/14 16:26
			He	xavalen	t Chro	mium			
				<u>Results</u>				<u>MDL</u>	
<u>Analyte</u>		CAS Numbe	er n	g/m³ Aiı	<u> </u>	<u>Flaq</u>	nc	<u>/m³ Air</u>	
Hexavalent Chromium		1854-02-99		ND		υ		0.0036	

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Environmental Re	esources Mana	igeme	ent, Inc				FILE #: 392	26.00	
75 Valley Stream	Parkway, Suite	e 400					REPORTED:	10/09/14 15	37
Malvern, PA 1935	55						SUBMITTED:	10/02/14	to 10/03/14
ATTN: Mr. Jeff E	Boggs						AQS SITE		
PHONE: (443)	803-8495	FAX:	(410) 266-8912				SITE CODE:		Honeywell Hex Chrome Study
Description:	PAM-31			Lab ID:	4100310	0-09			Sampled: 10/02/14 00:00
Matrix:	Air			Sample V	/olume:	21.9	m³		Received: 10/03/14 11:01
Comments:									Analysis Date: 10/06/14 16:36
				F	lexavalen	t Chro	omium		
					<u>Results</u>			<u>MDL</u>	
<u>Analyte</u>			CAS Numbe	<u>er</u>	<u>ng/m³ Air</u>	<u>r</u>	<u>Flag</u>	<u>ng/m³ Air</u>	
Hexavalent Chromium			1854-02-99		ND		υ	0.0036	

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October 15, 2014

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

LDC Project #32848:

<u>SDG</u>

<u>Fraction</u>

4100734

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

100 pages-SF 5 DAY TAT Attachment 1 Level IV LDC #32848 (ERM - Morrisville, NC / Harbor Point, MD, Hexavalent Chromiu																										1													
Level IV LDC #32848 (ERM - Morrisville, NC / Harbor Point, MD, Hexavalent Chromium Monitoring) LDC SDG# DATE REC'D Cr(VI) DUE																																							
LDC	SDG#	DATE REC'D	(3) DATE DUE	Cr((D7	614)																																		
	Air/Water/Soil	l	1	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
	4100734	10/14/14	10/21/14	17	20								-	-	\vdash	\vdash		-														-		-		$\left - \right $		┢──┦	$\mid \mid \mid$
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Total	T/CR	 		17	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	17
	Shaded cell	s indicate Le	vel IV validat	ion (a	ll oth																													3284					

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:	Harbor Point, MD, Hexavalent Chromium Monitoring
Collection Date:	October 3 through October 6, 2014
LDC Report Date:	October 15, 2014
Matrix:	Air
Parameters:	Hexavalent Chromium
Validation Level:	EPA Level IV
Laboratory:	Eastern Research Group
Sample Delivery Group (SDG):	4100734

Sample Identification

OAM 1(10/03/14) OAM 2(10/03/14) PAM-1(10/03/14) PAM-1D(10/03/14) PAM-2(10/03/14) PAM-2(10/03/14) PAM-3(10/03/14) PAM-4(10/03/14) PAM-21(10/03/14) OAM 1(10/06/14) PAM-1D(10/06/14) PAM-2(10/06/14) PAM-21(10/06/14) PAM-21(10/06/14) PAM-31(10/06/14) PAM-31(10/06/14) PAM-31(10/03/14)DUP PAM-1D(10/03/14)DUP	PAM-1D(10/06/14)DUP
PAM-1D(10/03/14)DUP PAM-1(10/06/14)DUP	

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

1

Introduction

This data review covers 21 air samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per ASTM D7614 for Hexavalent Chromium.

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

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

The following are definitions of the data qualifiers:

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

I. Technical Holding Times

All technical holding time requirements were met.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met.

IV. Blanks

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

Samples PAM-31(10/03/14) and PAM-31(10/06/14) were identified as trip blanks. No hexavalent chromium was found.

Samples PAM-21(10/03/14) and PAM-21(10/06/14) were identified as field blanks. No hexavalent chromium was found.

V. Matrix Spike/Matrix Spike Duplicates

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

VI. Duplicates

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

VII. Laboratory Control Samples

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

VIII. Sample Result Verification

All sample result verifications were acceptable.

IX. Overall Assessment of Data

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

X. Field Duplicates

Samples PAM-1(10/03/14) and PAM-1D(10/03/14) and samples PAM-1(10/06/14) and PAM-1D(10/06/14) were identified as field duplicates. No hexavalent chromium was detected in any of the samples with the following exceptions:

Concentration (ng/m³)					
Analyte	PAM-1(10/03/14) PAM-1D(10/03/14)		RPD (Limits)	Flags	A or P
Hexavalent chromium	0.0313	0.0266	16 (≤20)	-	-

	Concentrati	ion (ng/m³)			
Analyte	PAM-1(10/06/14)	PAM-1D(10/06/14)	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.0548	0.0508	8 (≤20)	-	-

Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Data Qualification Summary - SDG 4100734

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

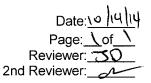
Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG 4100734

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 4100734

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

LDC #:	32848A6	_ VALIDATION COMPLETENESS WORKSHEET
SDG # <u>:</u>	4100734	Level IV
Laborato	ry: 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
Ι.	Technical holding times	A	Sampling dates: 10/03/14, 10/06/14
н	Initial calibration	A	
111.	Calibration verification	A	
١V	Blanks	A	
V	Matrix Spike/Matrix Spike Duplicates	N	Not Required
VI.	Duplicates	A	Dup
VII.	Laboratory control samples	A	Lesid
VIII.	Sample result verification	A	
IX.	Overall assessment of data	A	
X .	Field duplicates	SW	FD = (3, 4) (11, 12)
	Field blanks	30	ET JD FB=(8)(16) TB-(9)(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:

1	OAM 1(10/03/14)	11	PAM-1(10/06/14)	21	PAM-1D(10/06/14)DUP	31			
2	OAM 2(10/03/14)	12	PAM-1D(10/06/14)	22		32			
3	PAM-1(10/03/14)	13	PAM-2(10/06/14)	23		33			
4	PAM-1D(10/03/14)	14	PAM-3(10/06/14)	24		34			
5	PAM-2(10/03/14)	15	PAM-4(10/06/14)	25		35			
6	PAM-3(10/03/14)	16	PAM-21(10/06/14)	26		36			
7	PAM-4(10/03/14)	17	PAM-31(10/06/14)	27		37			
8	PAM-21(10/03/14)	18	PAM-1(10/03/14)DUP	28		38			
9	PAM-31(10/03/14)	19	PAM-1D(10/03/14)DUP	29		39			
10	OAM 1(10/06/14)	20	PAM-1(10/06/14)DUP	30		40			
Notes	otes: Dere appended to differentice between samples,								

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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?	\square			
Were all initial calibration correlation coefficients $\geq 0.995?$				······································
Were all initial and continuing calibration verification %Rs within the 90.110% QC limits?	X			50
Were titrant checks performed as required? (Level IV only)			$ \langle \rangle$	······
Were balance checks performed as required? (Level IV only)				
III. Blanks	,			~
Was a method blank associated with every sample in this SDG?	/			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		/		
IV. Matrix spike/Matrix spike duplicates and Duplicates			······	
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	/			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.			/	
Were the MS/MSD or duplicate relative percent differences (RPD) \leq 20% for waters and \leq 35% for soil samples? A control limit of \leq CRDL(\leq 2X CRDL for soil) was used for samples that were \leq 5X the CRDL, including when only one of the duplicate sample values were \leq 5X the CRDL.	/			
V. Laboratory control samples		<u> </u>	·	
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?	/	<u> </u>		
VI. Regional Quality Assurance and Quality Control	r		T	
Were performance evaluation (PE) samples performed?				
Were the performance evaluation (PE) samples within the acceptance limits?				

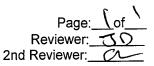
VALIDATION FINDINGS CHECKLIST

Page: 2 of 2 Reviewer: 30 2nd Reviewer: _____

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

LDC#<u>32848A6</u>

VALIDATION FINDINGS WORKSHEET Field Duplicates



Inorganics: Method See Cover

	Concentra			
Analyte	3	4	RPD (≤20)	Qual.
Hexavalent Chromium	0.0313	0.0266	16	

	Concentra			
Analyte	11	12	RPD (≤20)	Qual.
Hexavalent Chromium	0.0548	0.0508	8	

\LDCFILESERVER\Validation\FIELD DUPLICATES\FD_inorganic\32848A6.wpd

LDC #: 32848A6

Validation Findings Worksheet Initial and Continuing Calibration Calculation Verification

Page: \ of Reviewer: 2nd Reviewer

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

The correlation coefficient (r) for the calibration of $\frac{Cr^{2}}{2}$ was recalculated. Calibration date: 10/08/14

Where.

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

%R = Found X 100

True

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

					Recalculated	Reported	Acceptable
Type of analysis	Analyte	Standard	Conc. (ng/ml)	Area	r or r ²	r or r ²	(Y/N)
Initial calibration		s1	0.1	0.0000161			
		s2	0.1	0.0000354	0.99993	0.99993	
	Cr+6	s3	0.2	0.0000728			
		s4	0.5	0.0002037			Ч
		s5	1	0.000398			-
		s6	2	0.0007962			
ICU 9:39	Crab	Found	True				ч
Calibration verification	<u>Cr</u>	0.5117na/ml	O. Snalml		102.3%.R	102.3%R	
CW 10:38		0.5117 mg/ml	O. Snglml		1 - 2 9/ 2	102.3%F	Ч
Calibration verification	<u>۲</u>	USICINGIM	- 3		102.5/0K	102-5/04	
Calibration verification							

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

VALIDATION FINDINGS WORKSHEET Level IV Recalculation Worksheet

Page: __of__ Reviewer: _____ 2nd Reviewer: _____

METHOD: Inorganics, Method See Cover

.

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

%R = <u>Found</u> x 100 Where, Found = True

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 = concentration of each analyte in the source.

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

RPD = <u> S-D </u> x 100	Where,	S =	Original sample concentration
(S+D)/2		D = .	Duplicate sample concentration

			Found / S	True / D	Recalculated	Reported	
Sample ID	Type of Analysis	Element	(units)	(units)	%R / RPD	%R / RPD	Acceptable (Y/N)
Les 10:09	Laboratory control sample	Crity	1.077 ng/ml	1.00 ng/L	108%P	108%R	S
	Matrix spike sample		(SSR-SR)				
Drb	Duplicate sample	Cr+6	0.0309 ng/m3	0.0313 ing/m3	1.29 % RED	1.24%RRD	J*

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.

LDÇ i	LDC # 3 Z 848A10 VALIDATION FINDINGS WORKSHEET Page:of Sample Calculation Verification Reviewer:O 2nd reviewer:O										
		<i>.</i> .		2nd review	wer:						
METH	IOD: Inorganics, Metho	d See Cover									
YN YN YN Comp recalc	N/A Have results N/A Are results w N/A Are all detect N/A Are all detect	g the following equation:	its?repo	e^{-06}	ve detect were						
)	10200000 0 = 1	(nature) (uf)	0.0004005		0.13338 ng/ml						
Ĺ	0=	-06 (mg/1)(M) (0). 13338 ngln1)(10m1)							
2	1 = 0.0004005	-06 (ngh1)(vf) (0 m ³	M3	- 0	.0607 ng/m3						
#	Sample ID	Analyte	Reported Concentration (٧٩,٣٣)	Calculated Concentration (12/11/3)	Acceptable (Y/N)						
	1	Crab	0.0296	0.0296	4						
	2		0.0197	0.0197							
	3		0.0313	0.0313	T						
	Ч		0.0260	0.0267	y*						
	5		0.0303	0.0303	3						
	6		0.0883	0.0884	Y*						
	7		0.0266	0.0265	YX						
	8		ND	D D	3						
	٩		DA D	ND							
	10		0.0289	0.0289							
	()		0.0548	0.0548	V						
	12		0.0508	0.0509	y*						
	13		0.0664	0.0663	y*						
	14		0.0660	0.0660	4						
	15		0.0607	0.0607	1						
	16		ND	ND							
	17	L DU DU									
Note:	* founding										

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Environmental Res	sources Management, In	5		FILE #:	3926.00		
75 Valley Stream F	^D arkway, Suite 400			REPORTED: 10/14/14 13:21			
Malvern, PA 1935	5		SUBMITTED: 10/07/14				
ATTN: Mr. Jeff B	oggs			AQS SITE	CODE:		
PHONE: (443) 8	03-8495 FAX: (410) 266-8912		SITE CODE	E: ł	Ioneywell Hex Chrome Study	
Description:	OAM 1	Lab ID:	4100734-01			Sampled: 10/03/14 16:20	
Matrix:	Air	Sample V	/olume: 21.1	.1 m³		Received: 10/07/14 12:40	
Comments:	Start Time 10/2/14 16:53					Analysis Date: 10/08/14 12:20	
		I	Hexavalent Chr	omium			
			<u>Results</u>		MDL		
<u>Analyte</u>		CAS Number	<u>nq/m³ Air</u>	Flag	<u>ng/m³ Air</u>		
Hexavalent Chromium 1854-02-99 0.0296					0.0036		

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Environmental Re	sources Management, In	с		FILE #: 3926.00			
75 Valley Stream	Parkway, Suite 400		REPORTED: 10/14/14 13:21				
Malvern, PA 1935	5			SUBMITTED: 10/07/14			
ATTN: Mr. Jeff B	oggs		AQS SITE CODE:				
PHONE: (443) 8	03-8495 FAX: (410)) 266-8912		SITE CODE:	He	oneywell Hex Chrome Study	
Description:	OAM 2	Lab ID:	4100734-02			Sampled: 10/03/14 16:34	
Matrix:	Air	Sample	Volume: 21.0	19 m³		Received: 10/07/14 12:40	
Comments:	Start Time 10/2/14 17:09				A	nalysis Date: 10/08/14 12:29	
			Hexavalent Chr	omium			
			<u>Results</u>		MDL		
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>		
Hexavalent Chromium	I Contraction of the second	1854-02-99	0.0197	0.0036			

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75 Valley Stream F	^D arkway, Suite 400			REPORT	REPORTED: 10/14/14 13:21			
Malvern, PA 1935	5		SUBMITT	SUBMITTED: 10/07/14				
ATTN: Mr. Jeff B	oggs		AQS SIT	AQS SITE CODE:				
PHONE: (443) 8	03-8495 FAX: (410) 266-8912		SITE COI	DE:	Honeywell Hex Chrome Study		
Description:	PAM-1	Lab ID:	4100734-03			Sampled: 10/03/14 17:29		
Matrix:	Air	Sample \	/olume: 20).76 m³		Received: 10/07/14 12:40		
Comments:	Col 1 Start Time 10/2/14	18:25			<u></u>	Analysis Date: 10/08/14 10:59		
		1	Hexavalent Ch	nromium				
			<u>Results</u>		MDL			
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>			
Hexavalent Chromium 1854-02-99 0.0313					0.0036			

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Malvern, PA 1935	5		SUBMITTED: 10/07/14				
ATTN: Mr. Jeff B	oggs		AQS SITE CODE:				
PHONE: (443) 8	03-8495 FAX: (410) 266-8912		SITE CODE	E: I	Honeywell Hex Chrome Study	
Description:	PAM-1D	Lab ID:	4100734-04			Sampled: 10/03/14 17:27	
Matrix:	Air	Sample	Volume: 20.	72 m³		Received: 10/07/14 12:40	
Comments:	Col 2 Start Time 10/2/14	18:26				Analysis Date: 10/08/14 11:18	
			Hexavalent Chr	omium			
			<u>Results</u>		MDL		
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>		
Hexavalent Chromium 1854-02-99 0.0266					0.0036		

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75 Valley Stream F	Parkway, Suite 400					REPORTED: 10/14/14 13:21					
Malvern, PA 19355	Valvern, PA 19355							SUBMITTED: 10/07/14			
ATTN: Mr. Jeff B		AQS SITE CODE:									
PHONE: (443) 8	03-8495 FAX: (410) 266-8912				SITE COL	DE:	F	Ioneywell Hex Chrome Study		
Description:	PAM-2	La	ab ID:	4100734-0)5				Sampled: 10/03/14 17:16		
Matrix:	Air	Sa	ample Vo	olume:	20.94	m³			Received: 10/07/14 12:40		
Comments:	Start Time 10/2/14 17:59								Analysis Date: 10/08/14 12:59		
			н	lexavalent (Chroi	mium					
				<u>Results</u>				<u>MDL</u>			
<u>Analyte</u>		CAS Number		<u>ng/m³ Air</u>		<u>Flaq</u>		<u>ng/m³ Air</u>			
Hexavalent Chromium 1854-02-99 0.0303								0.0036			

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Malvern, PA 19355	5		SUBMITTED: 10/07/14				
ATTN: Mr. Jeff Bo	oggs			AQS SITE CODE:			
PHONE: (443) 8	03-8495 FAX: (410) 266-8912		SITE CODE:	F	Ioneywell Hex Chrome Study	
Description:	PAM-3	Lab ID:	4100734-06			Sampled: 10/03/14 17:10	
Matrix:	Air	Sample V	/olume: 21.0	13 m³		Received: 10/07/14 12:40	
Comments:	Start Time 10/2/14 17:48					Analysis Date: 10/08/14 13:09	
		I	Hexavalent Chro	omium			
			<u>Results</u>		MDL		
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>		
Hexavalent Chromium		1854-02-99	0.0883		0.0036		

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ATTN: Mr. Jeff B	oggs		AQS SITE CODE:				
PHONE: (443) 8	03-8495 FAX: (410) 266-8912		SITE COD	DE:	Honeywell Hex Chrome Study	
Description:	PAM-4	Lab ID	4100734-07			Sampled: 10/03/14 17:03	
Matrix:	Air	Sample	e Volume: 21.1	2 m³		Received: 10/07/14 12:40	
Comments:	Start Time 10/2/14 17:35					Analysis Date: 10/08/14 13:19	
			Hexavalent Chr	omium			
			<u>Results</u>		MDL		
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>		
Hexavalent Chromium 1854-02-99 0.0266					0.0036		

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Malvern, PA 1935	55			SUBMI	SUBMITTED: 10/07/14				
ATTN: Mr. Jeff E	Boggs			AQS SI	AQS SITE CODE:				
PHONE: (443)	803-8495 FAX:	(410) 266-8912		SITE C	ODE:	Honeywell Hex Chrome Study			
Description:	PAM-21		Lab ID: 4100734	4-08		Sampled: 10/03/14 00:00			
Matrix:	Air		Sample Volume:	20.94 n	1 ³	Received: 10/07/14 12:40			
Comments:						Analysis Date: 10/08/14 13:29			
			Hexavalen	t Chromium					
			<u>Results</u>			MDL			
<u>Analyte</u>		CAS Numbe	<u>er ng/m³ Aiı</u>	<u>r Flag</u>	ng	<u>/m³ Air</u>			
Hexavalent Chromium		1854-02-99	ND	U		0.0036			

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75 Valley Stream	Parkway, Suite 400)		REPORTI	REPORTED: 10/14/14 13:21			
Malvern, PA 1935	5			SUBMITT	SUBMITTED: 10/07/14			
ATTN: Mr. Jeff E	Boggs			AQS SITE	AQS SITE CODE:			
PHONE: (443)	803-8495 FAX:	(410) 266-8912		SITE COL	DE:	Honeywell Hex Chrome Study		
Description:	PAM-31		Lab ID: 4100734-0)9		Sampled: 10/03/14 00:00		
Matrix:	Air	:	Sample Volume:	21.03 m ³		Received: 10/07/14 12:40		
Comments:						Analysis Date: 10/08/14 13:39		
			Hexavalent	Chromium				
			<u>Results</u>		<u>MDL</u>			
<u>Analyte</u>		CAS Number	r <u>ng/m³ Air</u>	Flag	<u>ng/m³ Air</u>			
Hexavalent Chromium		1854-02-99	ND	U	0.0036			

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Environmental Re	sources Mana	gement, Inc		FILE #	FILE #: 3926.00				
75 Valley Stream	Parkway, Suite	e 400		REPOR	REPORTED: 10/14/14 13:21				
Malvern, PA 1935	5			SUBM	SUBMITTED: 10/07/14				
ATTN: Mr. Jeff B	loggs			AQS S	AQS SITE CODE:				
PHONE: (443) 8	303-8495 I	FAX: (410) 266-8912		SITE C	ODE:	F	Ioneywell Hex Chrome Study		
Description:	OAM 1		Lab ID: 4100	734-10			Sampled: 10/06/14 16:11		
Matrix:	Air		Sample Volume:	21.63 ו	n³		Received: 10/07/14 12:40		
Comments:	Start Time 10,	/5/14 16:09					Analysis Date: 10/08/14 13:49		
			Hexaval	ent Chromium					
			Result	<u>'S</u>		MDL			
<u>Analyte</u>		CAS Numb	<u>er ng/m³</u>	<u>Air Fla</u>	1	<u>ng/m³ Air</u>			
Hexavalent Chromiun	n	1854-02-99	0.0289	i		0.0036			

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Environmental Res	sources Management, In	C	FILE #: 3926.00				
75 Valley Stream I	^D arkway, Suite 400			REPORTED: 10/14/14 13:21			
Malvern, PA 1935	5		SUBMITTED: 10/07/14				
ATTN: Mr. Jeff B	oggs		AQS SITE CODE:				
PHONE: (443) 8	03-8495 FAX: (410) 266-8912		SITE CODE	:: H	Honeywell Hex Chrome Study	
Description:	PAM-1	Lab ID:	4100734-12		_	Sampled: 10/06/14 18:11	
Matrix:	Air	Sample	Volume: 22.	27 m³		Received: 10/07/14 12:40	
Comments:	Col 1 Start Time 10/5/14	17:26				Analysis Date: 10/08/14 11:38	
			Hexavalent Chr	omium			
			<u>Results</u>		MDL		
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flaq</u>	<u>ng/m³ Air</u>		
Hexavalent Chromium 1854-02-99 0.0548					0.0036		

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Environmental Res	ources Management, Ind	C		FILE #:	3926.00	
75 Valley Stream F	Parkway, Suite 400			REPORTE	D: 10/14/14 13:	21
Malvern, PA 19355	5			SUBMITTE	ED: 10/07/14	
ATTN: Mr. Jeff Bo	oggs			AQS SITE	CODE:	
PHONE: (443) 80	03-8495 FAX: (410) 266-8912		SITE COD	E:	Honeywell Hex Chrome Study
Description:	PAM-1D	Lab ID:	4100734-13			Sampled: 10/06/14 18:11
Matrix:	Air	Sample	Volume: 22.2	29 m³		Received: 10/07/14 12:40
Comments:	Col 2 Start Time 10/5/14	17:25				Analysis Date: 10/08/14 11:58
			Hexavalent Chr	omium		
			<u>Results</u>		<u>MDL</u>	
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99	0.0508		0.0036	

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Environmental Res	sources Management, Ind	2		FILE #: 39	26.00	
75 Valley Stream F	^o arkway, Suite 400			REPORTED:	10/14/14 13:2	21
Malvern, PA 1935	5			SUBMITTED:	: 10/07/14	
ATTN: Mr. Jeff B	oggs			AQS SITE CO	DDE:	
PHONE: (443) 8	03-8495 FAX: (410) 266-8912		SITE CODE:	H	loneywell Hex Chrome Study
Description:	PAM-2	Lab ID:	4100734-14			Sampled: 10/06/14 17:49
Matrix:	Air	Sample	Volume: 22.1	l4 m³		Received: 10/07/14 12:40
Comments:	Start Time 10/5/14 17:13					Analysis Date: 10/08/14 13:59
		· ·	Hexavalent Chr	omium		
			<u>Results</u>		MDL	
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99	0.0664		0.0036	

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Environmental Res	sources Management, Inc	:		FILE #:	3926.00	
75 Valley Stream F	^D arkway, Suite 400			REPORTE	ED: 10/14/14 13	:21
Malvern, PA 19355	5			SUBMITT	ED: 10/07/14	
ATTN: Mr. Jeff B	oggs			AQS SITE	CODE:	
PHONE: (443) 8	03-8495 FAX: (410) 266-8912		SITE COD)E:	Honeywell Hex Chrome Study
Description:	PAM-3	Lab II	D: 4100734-15			Sampled: 10/06/14 17:30
Matrix:	Air	Sampl	le Volume: 21	.96 m³		Received: 10/07/14 12:40
Comments:	Start Time 10/5/14 17:06					Analysis Date: 10/08/14 14:08
			Hexavalent Ch	romium		
			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	0.0660		0.0036	

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Environmental Re	sources Management, In	с		FILE #: 392	6.00	
75 Valley Stream	Parkway, Suite 400			REPORTED:	10/14/14 13:2	21
Malvern, PA 1935	5			SUBMITTED:	10/07/14	
ATTN: Mr. Jeff B	loggs			AQS SITE CO	DE:	
PHONE: (443) 8	303-8495 FAX: (410	0) 266-8912		SITE CODE:	F	Ioneywell Hex Chrome Study
Description:	PAM-4	Lab ID:	4100734-1	6		Sampled: 10/06/14 17:15
Matrix:	Air	Sample	Volume:	21.96 m³		Received: 10/07/14 12:40
Comments:	Start Time 10/5/14 16:51					Analysis Date: 10/08/14 14:18
			Hexavalent	Chromium		
			<u>Results</u>		MDL	
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	Flag	<u>ng/m³ Air</u>	
Hexavalent Chromiun	1	1854-02-99	0.0607		0.0036	

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Environmental Reso	ources Managemei	nt, Inc		I	FILE #:	3926.00	
75 Valley Stream Pa	arkway, Suite 400			I	REPORT	ED: 10/14/14 1	3:21
Malvern, PA 19355				:	SUBMITT	FED: 10/07/14	L .
ATTN: Mr. Jeff Bog	ggs			1	AQS SITE	E CODE:	
PHONE: (443) 80	3-8495 FAX:	(410) 266-8912		:	SITE COI	DE:	Honeywell Hex Chrome Study
Description:	PAM-21		Lab ID: 4100734	-17			Sampled: 10/06/14 00:00
Matrix:	Air		Sample Volume:	22.14	m³		Received: 10/07/14 12:40
Comments:							Analysis Date: 10/08/14 14:28
			Hexavalent	t Chron	nium		
			<u>Results</u>			<u>MDL</u>	
<u>Analyte</u>		CAS Numbe	<u>r ng/m³ Air</u>		Flag	<u>ng/m³ Ai</u>	r
Hexavalent Chromium		1854-02-99	ND		U	0.0036	

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75 Valley Stream	Parkway, Suite 400			REPORTE	D: 10/14/14 13:	21
Malvern, PA 1935	5			SUBMITTE	ED: 10/07/14	
ATTN: Mr. Jeff E	Boggs			AQS SITE	CODE:	
PHONE: (443)	803-8495 FAX:	(410) 266-8912		SITE COD	E:	Honeywell Hex Chrome Study
Description:	PAM-31	Lab ID:	4100734-18			Sampled: 10/06/14 00:00
Matrix:	Air	Sample	Volume: 2	1.96 m ³		Received: 10/07/14 12:40
Comments:						Analysis Date: 10/08/14 14:58
			Hexavalent C	hromium		
			<u>Results</u>		<u>MDL</u>	
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99	ND	U	0.0036	

OCT 1 5 2014

Initials: CR

Eastern Research Group

NERG



October 16, 2014

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

LDC Project #32861:

SDG Fraction

4100826/4100914

Taction

Hexavalent Chromium

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

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

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

Sincerely.

Christina Rink Project Manager/Chemist

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LDC	SDG#	DATE REC'D	(3) DATE DUE	Cr	(VI) 614)		<u> </u>					9.547.										kade er e																	
Matri	x: Air/Water/Soil			Α	s	w	s	w	s	w	s	w	s	w	S	w	s	×	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s
А	4100826/4100914	10/15/14	10/22/14	17	0*		ļ														<u> </u>																		
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Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:	Harbor Point, MD, Hexavalent Chromium Monitoring
Collection Date:	October 7 through October 8, 2014
LDC Report Date:	October 16, 2014
Matrix:	Air
Parameters:	Hexavalent Chromium
Validation Level:	EPA Level IV
Laboratory:	Eastern Research Group

Sample Delivery Group (SDG): 4100826/4100914

Sample Identification

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

Introduction

This data review covers 21 air samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per ASTM D7614 for Hexavalent Chromium.

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

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

The following are definitions of the data qualifiers:

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

I. Technical Holding Times

All technical holding time requirements were met.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met.

IV. Blanks

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

Samples PAM-31(10/07/14) and PAM-31(10/08/14) were identified as trip blanks. No hexavalent chromium was found.

Samples PAM-21(10/07/14) and PAM-21(10/08/14) 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(10/07/14) and PAM-1D(10/07/14) and samples PAM-1(10/08/14) and PAM-1D(10/08/14) 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(10/07/14)	PAM-1D(10/07/14)	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.0319	0.0340	6 (≤20)	-	-

	Concentrati	on (ng/m³)			
Analyte	PAM-1(10/08/14)	PAM-1D(10/08/14)	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.0588	0.606	3 (≤20)	-	-

Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Data Qualification Summary - SDG 4100826/4100914

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

Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG 4100826/4100914

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 4100826/4100914

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

LDC #:	32861A6	VALIDATION COMPLETENESS WORKSHEET
SDG #:	4100826/4100914	Level IV
Laborato	ry: Eastern Research	<u>Group</u>

Date:	10/10/14
Page:_	<u>l</u> of <u>\</u> `
Reviewer:	<u>OC</u>
2nd Reviewer:	a

METHOD: Hexavalent Chromium (ASTM D7614)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 10/07/14- 10/08/14
	Initial calibration	A	
- 111.	Calibration verification	Ϋ́Α΄	
IV	Blanks	A	
v	Matrix Spike/Matrix Spike Duplicates	N	Not Required
VI.	Duplicates	A	Dup '
VII.	Laboratory control samples	A	Les D
VIII.	Sample result verification	A	
IX.	Overall assessment of data	A	
Х.	Field duplicates	SW	FO = (3, 4) (11, 12)
	Field blanks	<u>N</u> 2	FB=(8)(16) TB=(9)(7)

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

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

D = Duplicate TB = Trip blank EB = Equipment blank

Validated Samples:

Valid	lated Samples: AUS						
1	OAM 1(10/07/14)	11	PAM-1(10/08/14)	21	PAM-1D(10/08/14)DUP	31	
2	OAM 2(10/07/14)	12	PAM-1D(10/08/14)	22		32	
3	PAM-1(10/07/14)	13	PAM-2(10/08/14)	23		33	
4	PAM-1D(10/07/14)	14	PAM-3(10/08/14)	24		34	
5	PAM-2(10/07/14)	15	PAM-4(10/08/14)	25		35	
6	PAM-3(10/07/14)	16	PAM-21(10/08/14)	26		36	
7	PAM-4(10/07/14)	17	PAM-31(10/08/14)	27	10 10 100 mm	37	
8	PAM-21(10/07/14)	18	PAM-1(10/07/14)DUP	28		38	
9	PAM-31(10/07/14)	19	PAM-1D(10/07/14)DUP	29		39	
10	OAM 1(10/08/14)	20	PAM-1(10/08/14)DUP	30		40	

Notes:

VALIDATION FINDINGS CHECKLIST

Validation Area	Yes	No	NA	Findings/Comments			
I. Technical holding times	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?	\leq						
Were the proper number of standards used?	\leq						
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)			1				
Were balance checks performed as required? (Level IV only)			\leq				
III. Blanks	·						
Was a method blank associated with every sample in this SDG?	<						
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		/					
IV. Matrix spike/Matrix spike duplicates and Duplicates							
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	/						
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.			1				
Were the MS/MSD or duplicate relative percent differences (RPD) \leq 20% for waters and \leq 35% for soil samples? A control limit of \leq CRDL(\leq 2X CRDL for soil) was used for samples that were \leq 5X the CRDL, including when only one of the duplicate sample values were \leq 5X the CRDL.	/						
V. Laboratory control samples							
Was an LCS anaylzed for this SDG?	(
Was an LCS analyzed per extraction batch?	_						
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% (85-115% for Method 300.0) QC limits?	/						
VI. Regional Quality Assurance and Quality Control							
Were performance evaluation (PE) samples performed?							
Were the performance evaluation (PE) samples within the acceptance limits?							

VALIDATION FINDINGS CHECKLIST

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

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

LDC#<u>32861A6</u>

VALIDATION FINDINGS WORKSHEET Field Duplicates

Page: (of
Reviewer: <u>50</u>
2nd Reviewer:

Inorganics: Method See Cover

	Concentra	tion (ng/m3)		
Analyte	3	4	RPD (≤20)	Qual.
Hexavalent Chromium	0.0319	0.0340	6	

	Concentra			
Analyte	11	12	RPD (≤20)	Qual.
Hexavalent Chromium	0.0588	0.0606	3	

\LDCFILESERVER\Validation\FIELD DUPLICATES\FD_inorganic\32861A6.wpd

LDC #: 3280100

Validation Findings Worksheet Initial and Continuing Calibration Calculation Verification

Page: \setminus of _ Reviewer: 5 2nd Reviewer:

Method: Inorganics, Method See Cover

The correlation coefficient (r) for the calibration of $\frac{Cr^{4}}{r}$ was recalculated. Calibration date: $\frac{10}{13}$

Where,

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

%R = Found X 100

True

.

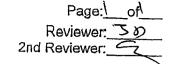
Found = concentration of each analyte <u>measured</u> in the analysis of the ICV or CCV solution True = concentration of each analyte in the ICV or CCV source

					Recalculated	Reported	Acceptable
Type of analysis	Analyte	Standard	Conc. (ng/mL)	Area	r or r ²	r or r ²	(Y/N)
Initial calibration		s1	0.1	0.0000143			
		s2	0.1	0.0000379	0.99974	0.99974	
		s3	0.2	0.000077			
		s4	0.5	0.0002049	_		Ч
		s5	1	0.0003905			
		s6	2	0.0008187			
エン 10:49 Calibration verification		Found 0.4917 hold	The O. Snalmi		98.3%F	98.3%E	Y
CCU 11249 Calibration verification			0.Snglml			102.6%2	Y*
Calibration verification							

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

LDC#: 3286196

VALIDATION FINDINGS WORKSHEET Level IV Recalculation Worksheet



METHOD: Inorganics, Method See Lover

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

 $%R = Found \times 100$ Where, Found = True

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 = concentration of each analyte in the source.

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

RPD = <u> S-D </u> x 100	Where,	S =	C	Driginal sample concentration
(S+D)/2		D =	. [Duplicate sample concentration

Sample ID	Type of Analysis	Element	Found / S (units)	True / D (units)	Recalculated ·	Reported	Acceptable (Y/N)
Les	Laboratory control sample	Cx+6	1.015 vg/ml	I ngln	102°/.2	102%,2	3
N	Matrix spike sample		(SSR-SR)				
ঀ৾৾৾৽ঀ	Duplicate sample	C++6	0.030 majm3	0.0318 mg/m3	5.49 %, ROD	5.92%PRD	Y*

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 #: 3286/A6

VALIDATION FINDINGS WORKSHEET Sample Calculation Verification

Page: Reviewer 2nd reviewer:

reported with a positive detect were

METHOD: Inorganics, Method

See Lover

+6

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

Have results been reported and calculated correctly? Are results within the calibrated range of the instruments?

N N/A N N/A

Are all detection limits below the CRQL?

Concer	$tration = (A - C_{c})/C_{c}$	$W_{\pm} 10 \text{ ml}$ Recalculation: (0.00 $\text{m}^3 = 21.74$	01372 - (-5.61	(=06) = 0.3	5487ng/m)
	$A = 0.0001372$ $C_0 = -5.61 = -06$ $C_1 = 0.0004096$	(ng/mi)(sf) m ³ = ng/m ³	0.0004096 (0.3487mg/ml		= 0.160mg
#	Sample ID	Analyte	Reported Concentration (\vyv ²)	Calculated Concentration (Nature)	Acceptable (Y/N)
		C5tb	0.0242	0.0241	Y*
	2	1	0.0279	0.0279	· J
	23		0.0319	0.0318	yx.
	4		0.0340	0.0341	4
	5		0.0305	0.0305	ソック
	6		0.0365	0.0365	2
	1		0.105	0.105	
	8		NO	00	
	9		ND	ND	Ý
	10		0.0256	0.0257	Y*
	11		0.0588	0.0588	Ч
	12		0.0606	0.0606	
	B		0.0300	0.0300	
	14		0.0187	0.0187	
	15		0.160	0.160	
	10		ND	0.160 NJ	
	17	4	ND	NO	
				1	<u> </u>

Note:_

Environmental Resources Management, Inc				FILE #:	3926.00		
75 Valley Stream F	^p arkway, Suite 400				REPORTE	D: 10/15/14 15	42
Malvern, PA 1935	5				SUBMITTE	ED: 10/08/14	to 10/09/14
ATTN: Mr. Jeff Br PHONE: (443) 8) 266-8912			AQS SITE		Honeywell Hex Chrome Study
Description:	OAM 1	Lab	ID: 4100826	-01			Sampled: 10/07/14 16:28
Matrix:	Air	Sam	ple Volume:	21.75	5 m³		Received: 10/08/14 10:34
Comments:	Start Time 10/6/14 16:18						Analysis Date: 10/13/14 13:30
			Hexavalent	t Chro	mium		
			<u>Results</u>			MDL	
<u>Analyte</u>		CAS Number	ng/m³ Air		<u>Flag</u>	<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99	0.0242			0.0036	

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Page 3 of 21

Environmental Resources Management, Inc					FILE #: 3926.00				
75 Valley Stream F	Parkway, Suite 400					REPORT	ED:	10/15/14 15:	:42
Malvern, PA 19355	5					SUBMITT	ED:	10/08/14	to 10/09/14
ATTN: Mr. Jeff Bo PHONE: (443) 8) 266-8912				AQS SITE			Honeywell Hex Chrome Study
Description:	OAM 2	L	.ab ID:	4100826-0)2				Sampled: 10/07/14 16:46
Matrix:	Air	s	Sample Vo	olume:	21.62	m³			Received: 10/08/14 10:34
Comments:	Start Time 10/6/14 16:45								Analysis Date: 10/13/14 13:40
			H	exavalent	Chroi	nium			
				<u>Results</u>				<u>MDL</u>	
<u>Analyte</u>		CAS Number		<u>ng/m³ Air</u>		<u>Flag</u>		<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99		0.0279				0.0036	

OCT 1 6 2014

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Environmental Resources Management, Inc				FILE #:	FILE #: 3926.00			
75 Valley Stream Parkway, Suite 400				REPORT	REPORTED: 10/15/14 15:42			
Malvern, PA 19355	i			SUBMITT	TED: 10/08/14	to 10/09/14		
ATTN: Mr. Jeff Bo PHONE: (443) 86) 266-8912		AQS SITI CODE: SITE COI		Honeywell Hex Chrome Study		
Description:	PAM-1	Lab	ID: 4100826-0	3		Sampled: 10/07/14 18:01		
Matrix:	Air	Sam	ple Volume:	21.27 m ³		Received: 10/08/14 10:34		
Comments:	Col 1 Start Time 10/6/14	18:23				Analysis Date: 10/13/14 12:09		
			Hexavalent	Chromium				
			<u>Results</u>		MDL			
<u>Analyte</u>		CAS Number	<u>ng/m³_Air</u>	Flag	<u>ng/m³ Air</u>			
Hexavalent Chromium		1854-02-99	0.0319		0.0036			

OCT 1 6 2014

Initials: CR

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Page 5 of 21

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Environmental Re	sources Mai	nagement, Inc			FILE #: 392	6.00		
75 Valley Stream	Parkway, Su	iite 400			REPORTED:	10/15/14 15:42		
Malvern, PA 1935	5				SUBMITTED:	10/08/14 to	10/09/14	
ATTN: Mr. Jeff E	loggs				AQS SITE			
PHONE: (443) 8	303-8495	FAX: (410) 266-8912			SITE CODE:	Ho	neywell Hex Chrome Study	
Description:	PAM-1D		Lab ID: 4100	826-04			Sampled: 10/07/14 18:02	
Matrix:	Air		Sample Volume:	21.3	m³		Received: 10/08/14 10:34	
Comments:	Col 2 Start	Time 10/6/14 18:22				A	nalysis Date: 10/13/14 12:28	
			Hexava	lent Chro	omium			
			<u>Resul</u>	<u>ts</u>		MDL		
<u>Analyte</u>		CAS Numb	<u>er ng/m³</u>	Air	<u>Flag</u>	<u>ng/m³ Air</u>		
Hexavalent Chromiun	ı	1854-02-99	0.034	D		0.0036		

OCT 1 6 2014

Initials: CR

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N ERC		CERTIFIC	CATE OF	ANALYSIS	3	
Environmental Re	sources Management, Ind	c		FILE #: 3920	5.00	
75 Valley Stream I	Parkway, Suite 400			REPORTED:	10/15/14 15:42	
Malvern, PA 1935	5			SUBMITTED:	10/08/14 to 10/09/14	
ATTN: Mr. Jeff B PHONE: (443) 8) 266-8912		AQS SITE CODE: SITE CODE:	Honeywell Hex Chrome St	tudy
Description:	PAM-2	Lab ID:	4100826-0	5	Sampled: 10/07/14	17:44
Matrix:	Air	Sample \	/olume:	21.44 m³	Received: 10/08/14	10:34
Comments:	Start Time 10/6/14 17:55				Analysis Date: 10/13/14	14:10
		I	Hexavalent (Chromium		
			<u>Results</u>		MDL	
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99	0.0305		0.0036	

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Initials: CR

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Environmental Resources Management, Inc				F	FILE #: 3926.00			
75 Valley Stream Parkway, Suite 400				I	REPORTE	D: 10/15/14 15:	42	
Malvern, PA 19355				9	SUBMITTED: 10/08/14 to 10/09/14			
ATTN: Mr. Jeff Br PHONE: (443) 8	oggs 03-8495 FAX: (410) 266-8912			AQS SITE		Honeywell Hex Chrome Study	
Description:	PAM-3	Lab	b ID: 4100826-	06	1		Sampled: 10/07/14 17:35	
Matrix:	Air	San	mple Volume:	21.56	m³		Received: 10/08/14 10:34	
Comments:	Start Time 10/6/14 17:38						Analysis Date: 10/13/14 14:19	
			Hexavalent	Chron	nium			
			<u>Results</u>			MDL		
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>		<u>Flag</u>	<u>ng/m³ Air</u>		
Hexavalent Chromium		1854-02-99	0.0365			0.0036		

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Initials: CR

Eastern Research Group

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Environmental Resources Management, Inc				Fil	FILE #: 3926.00			
75 Valley Stream Parkway, Suite 400				RE	PORTED:	10/15/14 15:	42	
Malvern, PA 19355				SU	SUBMITTED: 10/08/14 to 10/09/14			
ATTN: Mr. Jeff Bo PHONE: (443) 8) 266-8912			AS SITE	I	Honeywell Hex Chrome Study	
Description:	PAM-4	Lab I	(D: 4100826-0)7			Sampled: 10/07/14 17:15	
Matrix:	Air	Samı	ple Volume:	21.47	m³		Received: 10/08/14 10:34	
Comments:	Start Time 10/6/14 17:24						Analysis Date: 10/13/14 14:29	
			Hexavalent	Chromi	um			
			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	0.105			0.0036		

OCT 1 6 2014

Initials: CR

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Environmental Resources Management, Inc				FIL	FILE #: 3926.00			
75 Valley Stream Parkway, Suite 400				REI	PORTED:	10/15/14 15:	42	
Malvern, PA 19355				SU	BMITTED:	10/08/14 t	o 10/09/14	
ATTN: Mr. Jeff Bo PHONE: (443) 8	oggs 03-8495 FAX:	(410) 266-8912		•	S SITE DE: DECODE:	ł	Honeywell Hex Chrome Study	
Description:	PAM-21		Lab ID: 410082	6-08			Sampled: 10/07/14 00:00	
Matrix:	Air		Sample Volume:	21.44	т³		Received: 10/08/14 10:34	
Comments:							Analysis Date: 10/13/14 14:39	
			Hexavaler	nt Chromiu	ım			
			<u>Results</u>			MDL		
<u>Analyte</u>		CAS Numbe	er <u>ng/m³ Ai</u>	Ľ j	Flag	<u>ng/m³ Air</u>		
Hexavalent Chromium		1854-02-99	ND		บ	0.0036		

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Environmental Resources Management, Inc				FILE #: 3926.00			
75 Valley Stream Parkway, Suite 400 F				10/15/14 15:42	2		
Malvern, PA 19355				: 10/08/14 to	10/09/14		
ATTN: Mr. Jeff Boggs PHONE: (443) 803-8495	FAX: (410) 266-8912		AQS SITE CODE: SITE CODE:	Но	oneywell Hex Chrome Study		
Description: PAM-31		Lab ID: 4100826-09			Sampled: 10/07/14 00:00		
Matrix: Air		Sample Volume: 2	1.56 m³		Received: 10/08/14 10:34		
Comments:				Α	nalysis Date: 10/13/14 14:49		
		Hexavalent Cl	hromium				
		Results		MDL			
<u>Analyte</u>	CAS Numbe	<u>er ng/m³ Air</u>	Flag	<u>ng/m³ Air</u>			
Hexavalent Chromium	1854-02-99	ND	U	0.0036			

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Environmental Resources Management, Inc				FILE #: 3	FILE #: 3926.00			
75 Valley Stream Parkway, Suite 400				REPORTED	D: 10/15/14 15:42			
Malvern, PA 19355				SUBMITTED	D: 10/08/14 to 10/09/14			
ATTN: Mr. Jeff Bo PHONE: (443) 8) 266-8912		AQS SITE CODE: SITE CODE:	E: Honeywell Hex Chrome Study			
Description:	OAM 1	Lab ID	4100914-01		Sampled: 10/08/14 16:33			
Matrix:	Air	Sampl	e Volume: 22	L.61 m³	Received: 10/09/14 10:47			
Comments:	Start Time 10/7/14 16:32				Analysis Date: 10/13/14 14:59			
			Hexavalent Ch	nromium				
			<u>Results</u>		MDL			
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>			
Hexavalent Chromium		1854-02-99	0.0256		0.0036			

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Initials: CR

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Environmental Resources Management, Inc				FILE #: 3926.00			
75 Valley Stream Parkway, Suite 400				REPORTED	REPORTED: 10/15/14 15:42		
Malvern, PA 19355				SUBMITTE	ED: 10/08/14 to 10/09/14		
ATTN: Mr. Jeff B PHONE: (443) 8	oggs 03-8495 FAX: (410) 266-8912		AQS SITE			
Description:	PAM-1	Lab ID:	4100914-03		Sampled: 10/08/14 18:15		
Matrix:	Air	Sample \	/olume: 21.3	75 m³	Received: 10/09/14 10:47		
Comments:	Col 1 Start Time 10/7/14	18:05			Analysis Date: 10/13/14 12:48		
		I	Hexavalent Chr	omium			
			<u>Results</u>		MDL		
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>		
Hexavalent Chromium		1854-02-99	0.0588		0.0036		

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Initials: CR

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Environmental Resources Management, Inc				FILE #: 3926.00		
75 Valley Stream Parkway, Suite 400				REPORTED:	10/15/14 15:42	
Malvern, PA 19355				SUBMITTED:	10/08/14 to 10/09/14	
ATTN: Mr. Jeff Boggs				AQS SITE		
PHONE: (443) 8	03-8495 FAX: (410) 266-8912		SITE CODE:	Honeywell Hex Chrome Study	
Description:	PAM-1D	Lab ID:	4100914-04		Sampled: 10/08/14 18:16	
Matrix:	Air	Sample \	/olume: 21.7	7 m³	Received: 10/09/14 10:47	
Comments:	Col 2 Start Time 10/7/14	18:05			Analysis Date: 10/13/14 13:08	
		I	Hexavalent Chro	omium		
			<u>Results</u>		MDL	
Analyte		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99	0.0606		0.0036	

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Environmental Resources Management, Ir	FILE #: 3926.00				
75 Valley Stream Parkway, Suite 400	REPORTED: 10/15/14 15:42				
Malvern, PA 19355	SUBMITTED: 10/08/14 to 10/09/14				
ATTN: Mr. Jeff Boggs PHONE: (443) 803-8495 FAX: (41	0) 266-8912		AQS SITE CODE: SITE CODE:	Honeywell Hex (Chrome Study
Description: PAM-2	Lab ID:	4100914-05		Sampled:	10/08/14 17:54
Matrix: Air	Sample Volu	ime: 21.68	m³	Received:	10/09/14 10:47
Comments: Start Time 10/7/14 17:48				Analysis Date:	10/13/14 15:19
		cavalent Chro	nium		
	<u>R</u>	<u>lesuits</u>		MDL	
Analyte	CAS Number ng	<u>a/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>	
Hexavalent Chromium	1854-02-99	0.0300		0.0036	

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Initials: CR

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Environmental Resources Management, Inc				FILE #:	FILE #: 3926.00			
75 Valley Stream I	Parkway, Suite 400			REPOR	TED: 10/15/14	15:42		
Malvern, PA 19355				SUBMIT	SUBMITTED: 10/08/14 to 10/09/14			
ATTN: Mr. Jeff B PHONE: (443) 8) 266-8912			-	Honeywell Hex Chrome Study		
Description:	PAM-3	Lab	ID: 4100914-0	6		Sampled: 10/08/14 17:43		
Matrix:	Air	Sam	ple Volume:	21.66 m	3	Received: 10/09/14 10:47		
Comments:	Start Time 10/7/14 17:39					Analysis Date: 10/13/14 15:29		
	Hexavalent Chromium Results MDL							
<u>Analyte</u>		CAS Number	ng/m³ Air	<u>Flaq</u>	<u>ng/m³</u>	-		
Hexavalent Chromium		1854-02-99	0.0187		0.003	6		

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Initials: CR

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Environmental Resource	s Management, Inc	FILE #: 3926.00						
75 Valley Stream Parkwa	ay, Suite 400		REPORTED:	10/15/14 15:42				
Malvern, PA 19355			SUBMITTED:	10/08/14 to 10/09/14				
ATTN: Mr. Jeff Boggs PHONE: (443) 803-849	95 FAX: (410) 266-8912		AQS SITE CODE: SITE CODE:	Honeywell Hex Chrome Study				
Description: PAM-4	ł	Lab ID: 4100914-07		Sampled: 10/08/14 17:28				
Matrix: Air		Sample Volume: 21.74	ł m³	Received: 10/09/14 10:47				
Comments: Start	Time 10/7/14 17:19			Analysis Date: 10/13/14 15:39				
	Hexavalent Chromium <u>Results</u> <u>MDL</u>							
<u>Analyte</u>	CAS Numbe	er <u>ng/m³ Air</u>	<u>Flaq</u>	<u>ng/m³ Air</u>				
Hexavalent Chromium	1854-02-99	0.160		0.0036				

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Initials: CR

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Environmental Resources Management, Inc				FILE #: 3926.00			
75 Valley Stream Parkway, Suite 400				REPORTED:	10/15/14 15:	42	
Malvern, PA 19355				SUBMITTED	: 10/08/14 t	o 10/09/14	
ATTN: Mr. Jeff Boggs PHONE: (443) 803-84		10) 266-8912		AQS SITE CODE: SITE CODE:	ł	Honeywell Hex Chrome Study	
Description: PAM	1-21	Lab ID:	4100914-08			Sampled: 10/08/14 00:00	
Matrix: Air		Sample	Volume: 21.	68 m³		Received: 10/09/14 10:47	
Comments:						Analysis Date: 10/13/14 16:42	
			Hexavalent Ch	romium			
			<u>Results</u>		<u>MDL</u>		
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>		
Hexavalent Chromium		1854-02-99	ND	U	0.0036		

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

Page 18 of 21

NER	Ē		CEF	RTIFIC	ATE C	DF A	NALYSIS	6		
Environmental Re	esources Ma	nageme	nt, Inc				FILE #: 392	6.00		
75 Valley Stream	Parkway, Su	ite 400					REPORTED:	10/15/14 15:	42	
Malvern, PA 1935	55						SUBMITTED:	10/08/14 t	o 10/09/14	
ATTN: Mr. Jeff E PHONE: (443)	3oggs 803-8495	FAX:	(410) 266-8912				AQS SITE CODE: SITE CODE:	ł	Ioneywell Hex Chrome Study	
Description:	PAM-31			Lab ID:	4100914	4-09			Sampled: 10/08/14 00:00	
Matrix:	Air			Sample Vo	olume:	21.66	5 m ³		Received: 10/09/14 10:47	
Comments:									Analysis Date: 10/13/14 16:52	
				Н	exavalen	nt Chro	mium			
					<u>Results</u>			<u>MDL</u>		
<u>Analyte</u>			CAS Numbe	er	ng/m³ Ai	r	<u>Flag</u>	<u>ng/m³ Air</u>		
Hexavalent Chromium			1854-02-99		ND		U	0.0036		

OCT 1 6 2014

Initials: CR

Eastern Research Group



October 21, 2014

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

LDC Project #32874:

<u>SDG</u>

Fraction

4101012

Hexavalent Chromium

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

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

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

Sincerely,

Christina Rink Project Manager/Chemist

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SDG#	DATE REC'D		Cr((D76	(VI) 614)																								_										
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T/CR			9	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	ò	0	0	0	0	5
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Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:	Harbor Point, MD, Hexavalent Chromium Monitoring
Collection Date:	October 9, 2014
LDC Report Date:	October 17, 2014
Matrix:	Air
Parameters:	Hexavalent Chromium
Validation Level:	EPA Level IV
Laboratory:	Eastern Research Group
Sample Delivery Group (SDG):	4101012

Sample Identification

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

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 were identified as trip blanks. No hexavalent chromium was found.

Samples PAM-21 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 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	0.08074	0.0642	31 (≤20)	J (all detects)	A

Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Data Qualification Summary - SDG 4101012

SDG	Sample	Analyte	Flag	A or P	Reason
4101012	OAM 1 OAM 2 PAM-1 PAM-1D PAM-2 PAM-3 PAM-4	Hexavalent chromium	J (all detects)	A	Field duplicates (RPD)

Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG 4101012

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 4101012

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

LDC #: <u>32874A6</u>	_ VALIDATION COMPLETENESS WORKSHEET	Date:
SDG # <u>: 4101012</u>	Level IV	Page:_
Laboratory: Eastern Researc	h Group	Reviewer:
-		

2nd Reviewe

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: 10/09/14
П	Initial calibration	A	
III.	Calibration verification	A	
١٧	Blanks	A	
V	Matrix Spike/Matrix Spike Duplicates	N	Not Required
VI.	Duplicates	A	No Ì
VII.	Laboratory control samples	A	LCSID
VIII.	Sample result verification	A	
IX.	Overall assessment of data	A'	
Х.	Field duplicates	SU	FD=(3,4)
	Field blanks	â	FB= 8 TB=9

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

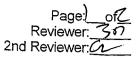
ND = No compounds detected R = Rinsate FB = Field blank

D = Duplicate TB = Trip blank EB = Equipment blank

Validated Samples:

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

Notes:



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?	1			
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 00,110% 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?	\leq			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		(
IV. Matrix spike/Matrix spike duplicates and Duplicates		······		
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	/			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.			/	
Were the MS/MSD or duplicate relative percent differences (RPD) \leq 20% for waters and \leq 35% for soil samples? A control limit of \leq CRDL(\leq 2X CRDL for soil) was used for samples that were \leq 5X the CRDL, including when only one of the duplicate sample values were \leq 5X the CRDL.	/			
V. Laboratory control samples				
Was an LCS anaylzed for this SDG?	\leq			
Was an LCS analyzed per extraction batch?		·		
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% (85-115% for Method 300.0) QC limits?	/			
VI. Regional Quality Assurance and Quality Control	·			
Were performance evaluation (PE) samples performed?			_	
Were the performance evaluation (PE) samples within the acceptance limits?				

LDC #: 32874AC

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?	1			
Were detection limits < RL?				
VIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	7			
IX. Field duplicates	_			
Field duplicate pairs were identified in this SDG.	/			
Target analytes were detected in the field duplicates.	1			
X. Field blanks				
Field blanks were identified in this SDG.	1			
Target analytes were detected in the field blanks.		1		

LDC#<u>32874A6</u>

VALIDATION FINDINGS WORKSHEET Field Duplicates

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

Inorganics: Method See Cover

	Concentra	tion (ng/m3)		
Analyte	3	4	RPD (≤20)	Qual. (1-7)(1-5)*
Hexavalent Chromium	0.0874	0.0642	31	Jdet/A

* Qual. all samples >5X LOG ~ ~ O L \\LDCFILESERVER\Validation\FIELD DUPLICATES\FD_inorganic\wettemp.WPD

LDC #: 32814 AU

Validation Findings Worksheet Initial and Continuing Calibration Calculation Verification

Page: \ of Reviewer: 2nd Reviewer:

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

The correlation coefficient (r) for the calibration of $\int \int u$ was recalculated. Calibration date: 10 |u| |u|

Where,

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

%R = Found X 100

True

<u>.</u>

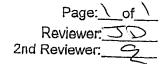
Found = concentration of each analyte <u>measured</u> in the analysis of the ICV or CCV solution True = concentration of each analyte in the ICV or CCV source

	······································				Recalculated	Reported	Acceptable
Type of analysis	Analyte	Standard	Conc. (ng/mL)	Area	r or r ²	r or r ²	(Y/N)
Initial calibration		s1	0.1	0.0000125			
		s2	0.1	0.0000302	0.99965	0.99965	
	1 +10	s3	0.2	0.0000724			
	Crto	s4	0.5	0.0001972			
		s5	1	0.000385	-		
		s6	2	0.0008213			
Ieu win	(_+b	Formed	True				1
Calibration verification		0.505nalmi	J. Suglan		101.0%E	101.0%2	
Cer 11:16	Crab				103 83/12	103,8%2	
Calibration verification		0.519 ng/ml	U. Shymi		103.01.0	103,87.4	Y
Calibration verification							

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

LDC #: 32874A /2

VALIDATION FINDINGS WORKSHEET Level IV Recalculation Worksheet



METHOD: Inorganics, Method See Cover

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

%R = <u>Found</u> x 100 Where, Found = True

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 = concentration of each analyte in the source.

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

RPD = <u> S-D </u> 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	Reported	Acceptable (Y/N)
LCS	Laboratory control sample	Cru	1.06 mg/m	1.00 mg/m]	106%E	106%R	
N	Matrix spike sample 🥆		(SSR-SR)				
Dup	Duplicate sample	Crab	0-0860mg/m3	0.0874 ng/m3	1.61% RR	1.59 % RPD	y*

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.

.

Page: (_of_____ Reviewer: ______ 2nd reviewer: ______ VALIDATION FINDINGS WORKSHEET LDC # 32874A4 Sample Calculation Verification METHOD: Inorganics, Method See Cover Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A". Have results been reported and calculated correctly? YN N/A Are results within the calibrated range of the instruments? Y N N/A Are all detection limits below the CRQL? Y/N N/A Compound (analyte) results for (2) Correct Correct with a positive detect were recalculated and verified using the following equation: recalculated and verified using the rollowing equation: Concentration = $(A-L_0)/L_1$ $w^3 = 21.29$ Recalculation: (0.0000104 - (-1.2E-05)) A = 0.0000104 $(ughul)(L_1)$ 0.0004131 = 0.0542 ughul) $C_0 = -1.2E-05$ $(ughul)(L_1)$ 0.0542 ughul)(1001) 30 $C_1 = 0.0004131$ $w^3 = ughul^3$ (0.0542 ughul)(1001) 30 $Z_{1.29}$ $w^3 = 0.0255$ $ughul^3$ Reported Calculated Concentration Concentration Acceptable (my/m3) Sample ID Analvte (ng/m3) # (Y/N) 0.0275 7 46 0.0276 Y* ١ Z 0.0255 0.0235 С 0.0874 0.0874 L 3 4× G 0.0643 0.0642 0.0411 0.0410 Y× 0.0278 С 6 0.0278 0.147 0.147 $\boldsymbol{\mathcal{A}}$ g NO ND 24 $\sigma \alpha$.

Environmental Res	sources Management, Ind	2	FILE #: 3920	5.00		
75 Valley Stream I	⊃arkway, Suite 400			REPORTED:	10/17/14 11:44	l.
Malvern, PA 1935	5			SUBMITTED:	10/10/14	
ATTN: Mr. Jeff B PHONE: (443) 8) 266-8912		AQS SITE CODE: SITE CODE:	Но	oneywell Hex Chrome Study
Description:	OAM 1	Lab IC): 4101012-01			Sampled: 10/09/14 16:23
Matrix:	Air	Sampl	le Volume: 21.	35 m³		Received: 10/10/14 10:26
Comments:	Start Time 10/8/14 16:40				A	nalysis Date: 10/14/14 12:17
			Hexavalent Chr <u>Results</u>	romium	<u>MDL</u>	
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	Flag	<u>ng/m³ Air</u>	
Hexavalent Chromium	I.	1854-02-99	0.0275		0.0036	

OCT 2 0 2014

Initials: CR

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NERG

Environmental Res	sources Management, Ind	c			FILE #:	3926.0	0		
75 Valley Stream F	Parkway, Suite 400					REPORT	ED: 10	0/17/14 11:4	4
Malvern, PA 19355	5					SUBMITT	ED:	10/10/14	
ATTN: Mr. Jeff Bo PHONE: (443) 8) 266-8912				AQS SITE		F	loneywell Hex Chrome Study
Description:	OAM 2		Lab ID:	4101012-	02				Sampled: 10/09/14 16:42
Matrix:	Air		Sample Vo	olume:	21.29	0 m³			Received: 10/10/14 10:26
Comments:	Start Time 10/8/14 17:03							- <u>-</u>	Analysis Date: 10/14/14 12:27
			н	exavalent	Chro	mium			
				<u>Results</u>				<u>MDL</u>	
<u>Analyte</u>		CAS Numbe	Ľ	<u>ng/m³ Air</u>		Flag	D	ng/m³ Air	
Hexavalent Chromium		1854-02-99		0.0255 5				0.0036	

OCT 2 0 2014

Initials: CR

Eastern Research Group

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NERC	Ē		CEF	RTIFIC	ATE C	DF A	NALYSIS	6	
Environmental Re	sources Mana	agement	, Inc				FILE #: 392	6.00	
75 Valley Stream	Parkway, Suit	e 400					REPORTED:	10/17/14 11	44
Malvern, PA 1935	5						SUBMITTED:	10/10/14	
ATTN: Mr. Jeff B PHONE: (443) 8		FAX: (410) 266-8912				AQS SITE CODE: SITE CODE:		Honeywell Hex Chrome Study
Description:	PAM-1			Lab ID:	410101	2-03			Sampled: 10/09/14 17:45
Matrix:	Air			Sample Vo	olume:	21.08	3 m ³		Received: 10/10/14 10:26
Comments:	Col 1 Start Ti	me 10/8/	14 18:20						Analysis Date: 10/14/14 11:36
				н	exavaler	nt Chro	mium		
					<u>Results</u>			<u>MDL</u>	
<u>Analyte</u>			CAS Numbe	er	<u>ng/m³ Ai</u>	r	<u>Flag</u>	<u>ng/m³ Air</u>	
Hexavalent Chromium	n		1854-02-99		0.0874	5		0.0036	

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Initials: CR

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Environmental Re	sources Management, In	с	FILE #:	3926.00		
75 Valley Stream I	Parkway, Suite 400			REPORT	ED: 10/17/14 11	44
Malvern, PA 1935	5			SUBMIT	TED: 10/10/14	
ATTN: Mr. Jeff B PHONE: (443) 8		0) 266-8912		AQS SIT	_	Honeywell Hex Chrome Study
Description:	PAM-1D	Lab I	D: 4101012-0)4		Sampled: 10/09/14 17:45
Matrix:	Air	Samp	le Volume:	21.06 m ³	:	Received: 10/10/14 10:26
Comments:	Col 2 Start Time 10/8/14	18:21				Analysis Date: 10/14/14 11:56
			Hexavalent	Chromium		
			<u>Results</u>		MDL	
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99	0.0642 5		0.0036	

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

Page 6 of 13

Environmental Res	sources Management, Inc	c			FILE #:	3926	5.00		
75 Valley Stream F	Parkway, Suite 400					REPORT	ED:	10/17/14 11:4	14
Malvern, PA 1935	5					SUBMITT	ED:	10/10/14	
ATTN: Mr. Jeff Bo PHONE: (443) 8) 266-8912				AQS SITI		ł	Honeywell Hex Chrome Study
Description:	PAM-2		Lab ID:	4101012·	-05		·		Sampled: 10/09/14 17:29
Matrix:	Air	:	Sample V	olume:	21.1	7 m³			Received: 10/10/14 10:26
Comments:	Start Time 10/8/14 17:58								Analysis Date: 10/14/14 12:37
			н	lexavalent	t Chro	mium			
				<u>Results</u>				MDL	
<u>Analyte</u>		CAS Number	<u>r</u>	<u>ng/m³ Air</u>		Flag		<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99		0.0410	5			0.0036	

OCT 2 0 2014

Initials: CR

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Environmental Res	sources Management, In	с		FILE #:	3926.00		
75 Valley Stream F	Parkway, Suite 400				REPORTE	D: 10/17/14 11:	44
Malvern, PA 1935	5				SUBMITTE	E D: 10/10/14	
ATTN: Mr. Jeff B	oggs				AQS SITE		
PHONE: (443) 8	03-8495 FAX: (410)) 266-8912			SITE COD	E:	Honeywell Hex Chrome Study
Description:	PAM-3	Lab	ID: 4101012	2-06			Sampled: 10/09/14 17:21
Matrix:	Air	Sam	nple Volume:	21.23	m³		Received: 10/10/14 10:26
Comments:	Start Time 10/8/14 17:46					78078	Analysis Date: 10/14/14 12:47
			Hexavalen	t Chro	mium		
			<u>Results</u>			MDL	
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>		<u>Flag</u>	<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99	0.0278	5		0.0036	

OCT 2 0 2014

Initials: CR

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Environmental Res	sources Management, Ind	2			FILE #:	3926.00	
75 Valley Stream	Parkway, Suite 400				REPORTE	D: 10/17/14 11	44
Malvern, PA 1935	5				SUBMITT	ED: 10/10/14	
ATTN: Mr. Jeff Be PHONE: (443) 8) 266-8912			AQS SITE CODE: SITE COD		Honeywell Hex Chrome Study
Description:	PAM-4	Li	ab ID: 4101012	-07			Sampled: 10/09/14 17:10
Matrix:	Air	S	ample Volume:	21.26	m³		Received: 10/10/14 10:26
Comments:	Start Time 10/8/14 17:33				_		Analysis Date: 10/14/14 12:57
			Hexavalent	t Chroi	mium		
			<u>Results</u>			MDL	
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>		<u>Flag</u>	<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99	0.147 J	-		0.0036	

OCT 2 0 2014

Initials: CR

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Environmental Resources Management, Ir	nc		FILE #: 3926	3.00	
75 Valley Stream Parkway, Suite 400			REPORTED:	10/17/14 11:44	
Malvern, PA 19355			SUBMITTED:	10/10/14	
ATTN: Mr. Jeff Boggs PHONE: (443) 803-8495 FAX: (41	0) 266-8912		AQS SITE CODE: SITE CODE:	Honey	well Hex Chrome Study
Description: PAM-21	Lab ID:	4101012-08		5	Sampled: 10/09/14 00:00
Matrix: Air	Sample Volu	ume: 21.17	1 m ³	F	Received: 10/10/14 10:26
Comments:				Analy	rsis Date: 10/14/14 13:06
	He	xavalent Chro	mium		
	Ē	<u>Results</u>		<u>MDL</u>	
Analyte	CAS Number ne	g/m³ Air	Flag	<u>ng/m³ Air</u>	
Hexavalent Chromium	1854-02-99	ND	U	0.0036	

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Initials: CR

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Environmental Re	esources Mana	igeme	nt, Inc			FILE #:	3926	5.00		
75 Valley Stream	Parkway, Suite	e 400					REPORT	ED:	10/17/14 11:	44
Malvern, PA 1935	55						SUBMITT	TED:	10/10/14	
ATTN: Mr. Jeff E	Boggs						AQS SITI	E		
PHONE: (443)	803-8495	FAX:	(410) 266-8912				SITECO	DE:		Honeywell Hex Chrome Study
Description:	PAM-31			Lab ID:	4101012	2-09				Sampled: 10/09/14 00:00
Matrix:	Air			Sample \	Volume:	21.23	3 m³			Received: 10/10/14 10:26
Comments:										Analysis Date: 10/14/14 13:36
				I	Hexavalen	it Chro	mium			
					<u>Results</u>				MDL	
<u>Analyte</u>			CAS Numbe	er	<u>ng/m³ Air</u>	<u>r</u>	Flag		<u>ng/m³ Air</u>	
Hexavalent Chromium			1854-02-99		ND		U		0.0036	

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Initials: CR

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October 24, 2014

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

LDC Project #32897:

<u>SDG</u>

Fraction

4101423

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

	101 pages-SF	5 DAY	TAT												Atta	achn	nent	: 1																					
	Level IV		DC #32	897	7 (E	R	1 = 1	Mo	rris	svil	le,	NC	; 1	Ha	rbo	r P	oin	nt, N	ND	, He	exa	val	len	t C	hrc	mi	um	M	oni	tor	ing	j)							
LDC	SDG#	DATE REC'D	(3) DATE DUE	Cr (D7	(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	s
	4101423	10/21/14	10/28/14	17.	0								-		<u> </u>										<u> </u>							-		-			-+	-	-
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Total	A/CR			17	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	17
	Shaded cells	s indicate Lev	vel IV validat	tion (a	all oth	er cel	lls are	e Leve	el II v	alidat	tion).	Thes	e sar	nple	count	s do r	not in	iclude	MS/	MSD,	and	DUP	s											3289	97ST.	wpd			

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:	Harbor Point, MD, Hexavalent Chromium Monitoring
Collection Date:	October 10 through October 13, 2014
LDC Report Date:	October 22, 2014
Matrix:	Air
Parameters:	Hexavalent Chromium
Validation Level:	EPA Level IV
Laboratory:	Eastern Research Group
Sample Delivery Group (SDG):	4101423

Sample Identification

OAM 1(10/10/14)	PAM-1D(10/13/14)DUP
OAM 2(10/10/14) PAM-1(10/10/14)	
PAM-1D(10/10/14)	
PAM-2(10/10/14)	
PAM-3(10/10/14)	
PAM-4(10/10/14)	
PAM-21(10/10/14)	
PAM-31(10/10/14)	
OAM 1(10/13/14)	
OAM 2(10/13/14)	
PAM-1(10/13/14)	
PAM-1D(10/13/14)	
PAM-3(10/13/14)	
PAM-4(10/13/14)	
PAM-21(10/13/14)	
PAM-31(10/13/14)	
PAM-1(10/10/14)DUP	
PAM-1D(10/10/14)DUP	
PAM-1(10/13/14)DUP	

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

1

Introduction

This data review covers 21 air samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per ASTM D7614 for Hexavalent Chromium.

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

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

The following are definitions of the data qualifiers:

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

I. Technical Holding Times

All technical holding time requirements were met.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met.

IV. Blanks

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

Samples PAM-31(10/10/14) and PAM-31(10/13/14) were identified as trip blanks. No hexavalent chromium was found.

Samples PAM-21(10/10/14) and PAM-21(10/13/14) were identified as field blanks. No hexavalent chromium was found.

V. Matrix Spike/Matrix Spike Duplicates

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

VI. Duplicates

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

VII. Laboratory Control Samples

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

VIII. Sample Result Verification

All sample result verifications were acceptable.

IX. Overall Assessment of Data

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

X. Field Duplicates

Samples PAM-1(10/10/14) and PAM-1D(10/10/14) and samples PAM-1(10/13/14) and PAM-1D(10/13/14) were identified as field duplicates. No hexavalent chromium was detected in any of the samples with the following exceptions:

Analyte	PAM-1(10/10/14)	PAM-1D(10/10/14)	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.0229	0.0223	3 (≤20)	-	-

	Concentrati				
Analyte	PAM-1(10/13/14)	PAM-1D(10/13/14)	RPD (Limits)	Flags	_A or P
Hexavalent chromium	0.0305	0.0311	2 (≤20)	-	-

Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Data Qualification Summary - SDG 4101423

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

Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG 4101423

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 4101423

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

LDC #:_	32897A6	VALIDATION COMPLETENESS WORKSHEET	Date: 10/22/14
SDG #:	4101423	_ Level IV	Page: 1_of
Laborato	ory: Eastern Resear	ch 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
1.	Technical holding times	A	Sampling dates: 10/10/14, 10/13/14
11	Initial calibration	A	
Ш.	Calibration verification	A	
١٧	Blanks	R	
v	Matrix Spike/Matrix Spike Duplicates	N	Not Registred
VI.	Duplicates	A	Dud
VII.	Laboratory control samples	A	Leslo
VIII.	Sample result verification	A	
IX.	Overall assessment of data	A	
Х.	Field duplicates	SW	FD=(3,4)(n,13)
xı	Field blanks	NO	FB=(8)(16) TB=(4)(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:

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

Notes: Bares oppended to IPS

LDC #: 32817 PU

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	/			
Cooler temperature criteria was met.	<u>/</u> .			
II. Calibration				
Were all instruments calibrated daily, each set-up time?	/			
Were the proper number of standards used?	1			
Were all initial calibration correlation coefficients > 0.995?	/			
Were all initial and continuing calibration verification %Rs within the 9 0-110% QC limits? ジーいく	/			
Were titrant checks performed as required? (Level IV only)			_	
Were balance checks performed as required? (Level IV only)			/	
III. Blanks			·	
Was a method blank associated with every sample in this SDG?	/			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		/		
IV. Matrix spike/Matrix spike duplicates and Duplicates				
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	/			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.			/	
Were the MS/MSD or duplicate relative percent differences (RPD) \leq 20% for waters and \leq 35% for soil samples? A control limit of \leq CRDL(\leq 2X CRDL for soil) was used for samples that were \leq 5X the CRDL, including when only one of the duplicate sample values were \leq 5X the CRDL.	/			
V. Laboratory control samples				
Was an LCS anaylzed for this SDG?	1			
Was an LCS analyzed per extraction batch?	/			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% (85-115% for Method 300.0) QC limits?				
VI, Regional Quality Assurance and Quality Control	·			
Were performance evaluation (PE) samples performed?			/	
Were the performance evaluation (PE) samples within the acceptance limits?			/	

VALIDATION FINDINGS CHECKLIST

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

LDC#<u>32897A6</u>

VALIDATION FINDINGS WORKSHEET Field Duplicates

Page: <u>1</u> of Reviewer: <u>5</u> 2nd Reviewer:

Inorganics: Method See Cover

	Concentra	tion (ng/m3)		
Analyte	3	4	RPD (≤20)	Qual.
Hexavalent Chromium	0.0229	0.0223	3	

	Concentra	tion (ng/m3)		
Analyte	12	13	RPD (≤20)	Qual.
Hexavalent Chromium	0.0305	0.0311	2	

\LDCFILESERVER\Validation\FIELD DUPLICATES\FD_inorganic\32897A6.wpd

LDC #: 32897P6

Validation Findings Worksheet Initial and Continuing Calibration Calculation Verification

Page: \ of Reviewer: 55 2nd Reviewer: C

Method: Inorganics, Method See Cover

The correlation coefficient (r) for the calibration of $\underline{\zeta r}^{\dagger b}$ was recalculated.Calibration date: 1511

Where,

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

%R = Found X 100

True

· · · · · · ·

<u>0</u>____

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

	and the second				Recalculated	Reported	Acceptable
Type of analysis	Analyte	Standard	Conc. (ng/mL)	Area	r or r ²	r or r ²	(Y/N)
Initial calibration		s1	0.1	0.0000137			
		s2	0.1	0.0000316	0.99994	0.99994	
	6+6	s3	0.2	0.0000753			
	Cr	s4	0.5	0.0001891			Ч
		s5	1	0.0003897)
		s6	2	0.000771			
ICU 10:47	Cx+6	Faind	True				1
Calibration verification		0.510/mg/m	0.5 malm		102-0%2	102.0%P	
Ccu 11:46	Crab	5					
Calibration verification		0.51398 ng/m	O. Sugiml		102.8%,2	107.8%p	<u> </u>
Calibration verification]

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

VALIDATION FINDINGS WORKSHEET Level IV Recalculation Worksheet

Page:	l_{of}
Reviewer:	30
2nd Reviewer:	Ĝ

METHOD: Inorganics, Method See Caver

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 Where, Fou True

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 = concentration of each analyte in the source.

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

RPD = <u> S-D </u> 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)	<u>Recalculated</u>	Reported	Acceptable (Y/N)
Les	Laboratory control sample						
11:16		Crtb	1.07 mg/m	Inglin	107%E	107%2	J
	Matrix spike sample		(SSR-SR)				
N							
Dup	Duplicate sample	1 +6					
		G+b	0.0237 ng/m3	0.0229. mg/m3	0.870%890	0.215,342,0	Y*

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.

* Rounding

LDC # 32857Ab VALIDATION FINDINGS WORKSHEET Page: lof l Sample Calculation Verification Reviewer: 50 2nd reviewer: 0											
METH	HOD: Inorganics, Metho	d See Cover									
	N/A Have results N/A Are results w N/A Are all detect	bw for all questions answered "N". Not been reported and calculated correctly within the calibrated range of the instru- tion limits below the CRQL? for $()$ () () () () () () () () () () () () ()	y? nents? repo	orted with a positi	ve detect we						
Concer A Cc	$\frac{1}{2} = -4.54 = -06$	g the following equation: $vf_{-1}v_{-1}$ $m^3 = z_{1} \cdot y_{-1}^{\text{Recalculation:}} (0 - 1)$ $(vg/m_1)(vf)$ $m^3 = rg/m^3$	0000210-(-4.50 0.000389 (0.67246/ml)	$\frac{1E-06}{(10m)} = 0$	672nglu						
C,	× 0.000389	M ² J	21.47	$m^3 = 0$	0313 ng						
#	Sample ID	Analyte	Reported Concentration (পণ্/ ^{M3})	Calculated Concentration (୮୦୯୦/୦୦ ³)	Acceptable (Y/N)						
		Cr+6	0.0224	0.0223	yx						
	2	1	0.0187	0.0186							
	3		0.0229	0.0229	4						
	4		0.0223	0.0223	7						
	2		0.0313	0.0312	4*						
	6		0.0213	0.0213	4						
	7		0.025	0.0225	1						
	8		04	NO							
	9		NO	ND							
	10		0.0540	10.0540							
	11		0.0570	0.0570	Ţ						
	12		2050.0	0.0306	9-*						
	13		0.0311	0.0311	4						
	14		0.0332	0.0332							
	12		0.0313	0.0313							
	16		20	NO	T						
	17	¥	001	24	4						
	· · · · · · · · · · · · · · · · · · ·			+	· · · · · · · · · · · · · · · · · · ·						
 											
					<u> </u>						

Note.___

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Environmental Resources Management, Inc						FILE #: 3926.00			
75 Valley Stream F		REPORT	REPORTED: 10/21/14 12:17						
Malvern, PA 19355		SUBMIT	SUBMITTED: 10/14/14						
ATTN: Mr. Jeff Bo				AQS SITE					
PHONE: (443) 8	03-8495 FAX: (410) 266-8912			SITECO	DE:	H	oneywell Hex Chrome Study	
Description:	OAM 1	La	ab ID:	4101423-01				Sampled: 10/10/14 16:33	
Matrix:	Air	Sa	ample Vo	plume: 21	.68 m³			Received: 10/14/14 10:49	
Comments:	Start Time 10/9/14 16:28							Analysis Date: 10/15/14 13:26	
			H	exavalent Ch	romium				
				<u>Results</u>			MDL		
Analyte		CAS Number		<u>ng/m³ Air</u>	<u>Flag</u>		<u>ng/m³ Air</u>		
Hexavalent Chromium		1854-02-99		0.0224			0.0036		

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Environmental Resources Management, Inc						FILE #: 3926.00			
75 Valley Stream Parkway, Suite 400						REPORTED: 10/21/14 12:17			
Malvern, PA 1935	5				SUBMITT	ED: 10/	14/14		
ATTN: Mr. Jeff Br PHONE: (443) 8) 266-8912			AQS SITE		Honeywell Hex Chrome Study		
			- L TD						
Description:	OAM 2	Lä	ab ID: 410142	23-02			Sampled: 10/10/14 16:45		
Matrix:	Air	Sa	ample Volume:	21.5	7 m³		Received: 10/14/14 10:49		
Comments:	Start Time 10/9/14 16:46						Analysis Date: 10/15/14 13:36		
			Hexavale	nt Chro	omium				
			<u>Results</u>			M	IDL		
<u>Analyte</u>		<u>CAS Number</u>	<u>ng/m³ A</u>	ir	<u>Flag</u>	<u>ng/r</u>	n ³ Air		
Hexavalent Chromium		1854-02-99	0.0187			0.	0036		

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Environmental Res	ources Management, In	c	FILE #:	FILE #: 3926.00				
75 Valley Stream F	arkway, Suite 400		REPORT	REPORTED: 10/21/14 12:17				
Malvern, PA 19355	;			SUBMITT	SUBMITTED: 10/14/14			
ATTN: Mr. Jeff Bo PHONE: (443) 86	oggs 03-8495 FAX: (410) 266-8912		AQS SITI	_	Honeywell Hex Chrome Study		
Description:	PAM-1	Lab II	4101423-03			Sampled: 10/10/14 17:35		
Matrix:	Air	Sampl	e Volume: 2	1.39 m³		Received: 10/14/14 10:49		
Comments:	Col 1 Start Time 10/9/14	17:49				Analysis Date: 10/15/14 12:06		
			Hexavalent C	hromium				
<u>Results</u> <u>MDL</u>								
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>			
Hexavalent Chromium		1854-02-99	0.0229		0.0036			

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Environmental Res	sources Management, In	с	FILE #: 392	FILE #: 3926.00			
75 Valley Stream F	⁵ arkway, Suite 400		REPORTED:	10/21/14 12:1	7		
Malvern, PA 19355	5			SUBMITTED:	10/14/14		
ATTN: Mr. Jeff Bo PHONE: (443) 8	00)) 266-8912		AQS SITE CODE: SITE CODE:	н	oneywell Hex Chrome Study	
Description:	PAM-1D	L	Lab ID: 4101423-04			Sampled: 10/10/14 17:32	
Matrix:	Air	S	Sample Volume: 21	.36 m³		Received: 10/14/14 10:49	
Comments:	Col 2 Start Time 10/9/14	17:48				Analysis Date: 10/15/14 12:26	
			Hexavalent Ch	romium			
			<u>Results</u>		MDL		
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	Flag	<u>ng/m³ Air</u>		
Hexavalent Chromium		1854-02-99	0.0223		0.0036		

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Environmental Resources Management, Inc						FILE #: 3926.00			
75 Valley Stream Parkway, Suite 400						REPORTI	REPORTED: 10/21/14 12:17		
Malvern, PA 19355						SUBMITTED: 10/14/14		10/14/14	
ATTN: Mr. Jeff Bo PHONE: (443) 8) 266-8912				AQS SITE	_	1	Honeywell Hex Chrome Study
Description:	PAM-2		Lab ID:	4101423	-05				Sampled: 10/10/14 17:24
Matrix:	Air		Sample Vo	olume:	21.43	3 m³			Received: 10/14/14 10:49
Comments:	Start Time 10/9/14 17:35								Analysis Date: 10/15/14 14:06
			H	exavalent	t Chro	mium			
				<u>Results</u>				<u>MDL</u>	
<u>Analyte</u>		CAS Number	r.	<u>nq/m³ Air</u>		<u>Flaq</u>		<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99		0.0313				0.0036	

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Environmental Res	sources Management, Inc	:	FILE #: 3	FILE #: 3926.00			
75 Valley Stream F	^p arkway, Suite 400		REPORTED	REPORTED: 10/21/14 12:17			
Malvern, PA 19355	5			SUBMITTE	D: 10/14/14		
ATTN: Mr. Jeff Bo PHONE: (443) 8	00	266-8912		AQS SITE CODE: SITE CODE	:: ł	Honeywell Hex Chrome Study	
Description:	PAM-3	Lab ID	: 4101423-06			Sampled: 10/10/14 17:18	
Matrix:	Air	Sample	Volume: 21.	.51 m³		Received: 10/14/14 10:49	
Comments:	Start Time 10/9/14 17:24					Analysis Date: 10/15/14 14:16	
			Hexavalent Chi <u>Results</u>	romium	MDL		
Analyte		CAS Number	ng/m ³ Air	Flag	ng/m³_Air		
Hexavalent Chromium		1854-02-99	0.0213	ridy	0.0036		

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Environmental Re	c		FILE #: 3926.00				
75 Valley Stream I				REPORTED:	10/21/14 12:	17	
Malvern, PA 1935	5				SUBMITTED:	10/14/14	
ATTN: Mr. Jeff B PHONE: (443) 8	55) 266-8912			AQS SITE CODE: SITE CODE:		Honeywell Hex Chrome Study
Description:	PAM-4		Lab ID: 41014	23-07			Sampled: 10/10/14 17:08
Matrix:	Air		Sample Volume:	21.51	L m ³		Received: 10/14/14 10:49
Comments:	Start Time 10/9/14 17:14						Analysis Date: 10/15/14 14:26
			Hexavale	ent Chro	mium		
			Results	<u>i</u>		MDL	
<u>Analyte</u>		CAS Numbe	er <u>ng/m³ A</u>	<u>Air</u>	<u>Flaq</u>	<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99	0.0225			0.0036	

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Environmental Resources Management, Inc F						FILE #:	3926.	00		
75 Valley Stream Parkway, Suite 400						REPORT	ED:	10/21/14 12:	17	
Malvern, PA 1935	55						SUBMITT	ED:	10/14/14	
ATTN: Mr. Jeff E PHONE: (443)	3oggs 803-8495	FAX:	(410) 266-8912				AQS SITE		ł	Honeywell Hex Chrome Study
Description:	PAM-21		()	Lab ID:	410142					Sampled: 10/10/14 00:00
Matrix:	Air			Sample Vo		21.43	5 m³			Received: 10/14/14 10:49
Comments:						_				Analysis Date: 10/15/14 14:36
				H	exavaler	nt Chro	mium			
					<u>Results</u>				<u>MDL</u>	
<u>Analyte</u>			CAS Numbe	er i	ng/m³ Ai	<u>r</u>	<u>Flaq</u>		<u>ng/m³ Air</u>	
Hexavalent Chromium			1854-02-99		ND		υ		0.0036	

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75 Valley Stream Park	kway, Suite 400		REPORTED:	10/21/14 12:17		
Malvern, PA 19355				SUBMITTED:	10/14/14	
ATTN: Mr. Jeff Bogg PHONE: (443) 803-		10) 266-8912		AQS SITE	Hon	eywell Hex Chrome Study
Description: PA	M-31	Lab ID:	4101423-09			Sampled: 10/10/14 00:00
Matrix: Air		Sample	Volume: 21.5	1 m³		Received: 10/14/14 10:49
Comments:					An	alysis Date: 10/15/14 14:45
			Hexavalent Chro	omium		
			<u>Results</u>		MDL	
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99	ND	U	0.0036	

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75 Valley Stream Parkway, Suite 400						REPORTED: 10/21/14 12:17		
Malvern, PA 1935	5				SUBMITTE	E D: 10/14/1	4	
ATTN: Mr. Jeff B PHONE: (443) 8) 266-8912			AQS SITE		Honeywell Hex Chrome Study	
Description:	OAM 1	L	Lab ID: 4	101423-10			Sampled: 10/13/14 16:13	
Matrix:	Air	S	Sample Volun	1e: 21.3	3 m³		Received: 10/14/14 10:49	
Comments:	Start Time 10/12/14 16:33	3					Analysis Date: 10/15/14 14:55	
			Hexa	valent Chr	omium			
			<u>Re</u>	<u>sults</u>		MDL		
<u>Analyte</u>		CAS Number	<u>ng/</u>	<u>m³ Air</u>	<u>Flag</u>	<u>ng/m³ A</u>	ir	
Hexavalent Chromium		1854-02-99	0.4	0540		0.0036		

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Environmental Resources Management, Inc				FILE #: 39	FILE #: 3926.00			
75 Valley Stream Parkway, Suite 400				REPORTED:	10/21/14 12:17			
Malvern, PA 19355				SUBMITTED:	: 10/14/14	10/14/14		
ATTN: Mr. Jeff Bo PHONE: (443) 8	66	0) 266-8912		AQS SITE CODE: SITE CODE:	ł	Honeywell Hex Chrome Study		
Description:	OAM 2	Lab ID:	4101423-11			Sampled: 10/13/14 16:40		
Matrix:	Air	Sample	Volume: 21	.42 m³		Received: 10/14/14 10:49		
Comments:	Start Time 10/12/14 16:5	2				Analysis Date: 10/15/14 15:05		
Hexavalent Chromium <u>Results</u> <u>MDL</u>								
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>			
Hexavalent Chromium		1854-02-99	0.0570		0.0036			

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Environmental Resources Management	FILE #: 3926.00							
75 Valley Stream Parkway, Suite 400	REPORTED:	REPORTED: 10/21/14 12:17						
Malvern, PA 19355			SUBMITTED:	10/14/14				
ATTN: Mr. Jeff Boggs PHONE: (443) 803-8495 FAX:	(410) 266-8912		AQS SITE CODE: SITE CODE:	Honeywell Hex	Chrome Study			
Description: PAM-1	Lab ID:	4101423-12		Sampled:	10/13/14 18:16			
Matrix: Air	Sample V	/olume: 21.8	32 [·] m³	Received	10/14/14 10:49			
Comments: Col 1 Start Time 10/2	12/14 18:01			Analysis Date:	10/15/14 12:46			
Hexavalent Chromium								
		<u>Results</u>		<u>MDL</u>				
Analyte	CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>				
Hexavalent Chromium	1854-02-99	0.0305		0.0036				

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

Page 14 of 21

Environmental Resources Management, Inc				FILE #: 3926.00				
75 Valley Stream Parkway, Suite 400				REPORTED: 10/21/14 12:17				
Malvern, PA 19355				SUBMITTED:	UBMITTED: 10/14/14			
ATTN: Mr. Jeff Bog PHONE: (443) 803		0) 266-8912		AQS SITE CODE: SITE CODE:	Ho	oneywell Hex Chrome Study		
Description: P	PAM-1D	Lab ID:	4101423-13			Sampled: 10/13/14 18:19		
Matrix: A	Air	Sample	Volume: 21.8	35 m³		Received: 10/14/14 10:49		
Comments: (Col 2 Start Time 10/12/14	18:02			A	nalysis Date: 10/15/14 13:06		
Hexavalent Chromium <u>Results</u> <u>MDL</u>								
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	Flag	<u>nq/m³ Air</u>			
Hexavalent Chromium		1854-02-99	0.0311		0.0036			

OCT 2 3 2014

Initials: CR

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Environmental Res	sources Management, Ind	C			FILE #:	3926.00		
75 Valley Stream	Parkway, Suite 400				REPORT	ED: 10/21/1	1 2:17	
Malvern, PA 1935	5				SUBMITT	ED: 10/14	/14	
ATTN: Mr. Jeff B PHONE: (443) 8) 266-8912			AQS SITE		Honeywell Hex Chrome Study	
Description:	PAM-3	L	ab ID: 410	1423-15			Sampled: 10/13/14 17:29	
Matrix:	Air	S	Sample Volume:	21.4	9 m³		Received: 10/14/14 10:49	
Comments:	Start Time 10/12/14 17:36	5					Analysis Date: 10/15/14 15:25	
			Hexava	lent Chro	omium			
			Resu	ts		<u>MD</u>	L	
<u>Analyte</u>		CAS Number	<u>ng/m³</u>	³ Air	<u>Flag</u>	<u>ng/m³</u>	Air	
Hexavalent Chromium		1854-02-99	0.033	2		0.00	36	

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Environmental Res	sources Management, In	c		F	ILE #:	3926.00	
75 Valley Stream F	Parkway, Suite 400			F	REPORTE	D: 10/21/14 12	17
Malvern, PA 1935	5			s	SUBMITTE	E D: 10/14/14	
ATTN: Mr. Jeff Bo PHONE: (443) 8) 266-8912		-	AQS SITE		Honeywell Hex Chrome Study
Description:	PAM-4	Lat	b ID: 4101423	-16		· • • •	Sampled: 10/13/14 17:10
Matrix:	Air	Sar	mple Volume:	21.47	m³		Received: 10/14/14 10:49
Comments:	Start Time 10/12/14 17:18	3					Analysis Date: 10/15/14 15:35
			Hexavalen <u>Results</u>	t Chron	nium	MDL	
Analyte		CAS Number	<u>ng/m³ Air</u>	:	<u>Flag</u>	<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99	0.0313			0.0036	

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Initials: CR

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Environmental Resource	ces Managemer	nt, Inc				FILE #:	3926.0	0	
75 Valley Stream Park	way, Suite 400					REPORTI	ED: 1	0/21/14 12:1	7
Malvern, PA 19355						SUBMITT	ED:	10/14/14	
ATTN: Mr. Jeff Boggs PHONE: (443) 803-8		(410) 266-8912				AQS SITE		F	ioneywell Hex Chrome Study
Description: PAN	M-21		Lab ID:	4101423	8-17				Sampled: 10/13/14 00:00
Matrix: Air			Sample Vo	olume:	21.67	′ m³			Received: 10/14/14 10:49
Comments:									Analysis Date: 10/15/14 16:05
			H	exavalen <u>Results</u>	t Chro	mium		MDL	
<u>Analyte</u>		CAS Numbe	<u>er</u>	ng/m³ Air	:	<u>Flaq</u>	Ī	<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99		ND		U		0.0036	

OCT 2 3 2014

Initials: CR

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Environmental Re	esources Manag	geme	ent, Inc				FILE #:	3926	.00	
75 Valley Stream	Parkway, Suite	400					REPORTI	ED:	10/21/14 12:	17
Malvern, PA 1935	55						SUBMITT	ED:	10/14/14	
ATTN: Mr. Jeff E PHONE: (443)		AX:	(410) 266-8912				AQS SITE			Honeywell Hex Chrome Study
Description:	PAM-31			Lab ID:	4101423	8-18				Sampled: 10/13/14 00:00
Matrix:	Air			Sample V	/olume:	21.4	9 m³			Received: 10/14/14 10:49
Comments:										Analysis Date: 10/15/14 16:15
				ŀ	lexavalen	t Chro	omium			
					<u>Results</u>				MDL	
<u>Analyte</u>			CAS Numbe	er	<u>ng/m³ Air</u>		Flag		<u>ng/m³ Air</u>	
Hexavalent Chromium			1854-02-99		ND		u		0.0036	

OCT 2 3 2014

Initials: CR

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October 24, 2014

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

LDC Project #32905:

<u>SDG</u>

Fraction

4101521

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

	70 pages-SF	5 DAY	TAT												Atta	achn	nent	<u>: 1</u>																					
	Level IV	L	DC #32	905	5 (E	RN	1 - 1	Мо	rris	svil	le,	NC	1	Ha	rbo	r P	oir	nt, I	MD	, Н	exa	iva	len	t C	hro	mi	um	M	oni	tor	ing	j)							
LDC	SDG#	DATE REC'D	(3) DATE DUE	Cr((D7)	(VI) 614)																																		
Matrix:				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	4101521	10/22/14	10/29/14	9	0							<u> </u>	<u> </u>	<u> </u>											<u> </u>							<u> </u>				\vdash	\dashv		\vdash
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LDC Report# 32905A6

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:	Harbor Point, MD, Hexavalent Chromium Monitoring
Collection Date:	October 14, 2014
LDC Report Date:	October 22, 2014
Matrix:	Air
Parameters:	Hexavalent Chromium
Validation Level:	EPA Level IV
Laboratory:	Eastern Research Group
Sample Delivery Group (SDG):	4101521
Sample Identification	

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

Introduction

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

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

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

The following are definitions of the data qualifiers:

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

I. Technical Holding Times

All technical holding time requirements were met.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met.

IV. Blanks

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

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

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

V. Matrix Spike/Matrix Spike Duplicates

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

VI. Duplicates

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

VII. Laboratory Control Samples

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

VIII. Sample Result Verification

All sample result verifications were acceptable.

IX. Overall Assessment of Data

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

X. Field Duplicates

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

	Concentrati	ion (ng/m³)		·····		
Analyte	Analyte PAM-1		RPD (Limits)	Flags	A or P	
Hexavalent chromium	0.0158	0.0158	0 (≤20)	_	-	

Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Data Qualification Summary - SDG 4101521

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

Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG 4101521

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 4101521

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

LDC #:	32905A6	VALIDATION COMPLETENESS WORKSHEET
SDG #:	4101521	Level IV
Laborato	ry: 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: 10 114114
11	Initial calibration	A	
Ш.	Calibration verification	A	
IV	Blanks	A	
V	Matrix Spike/Matrix Spike Duplicates	2	Not Required
VI.	Duplicates	A	Dup
VII.	Laboratory control samples	A	Lesid
VIII.	Sample result verification	A	
IX.	Overall assessment of data	A	
Х.	Field duplicates	SW	FD= (3,4)
XI	Field blanks	QU	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:

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

Notes:_

.

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 2.995?	/			
Were all initial and continuing calibration verification %Rs within the 98-110 % QC limits?	/			
Were titrant checks performed as required? (Level IV only)				
Were balance checks performed as required? (Level IV only)				
III. Blanks	······			
Was a method blank associated with every sample in this SDG?	/			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		/		
IV. Matrix spike/Matrix spike duplicates and Duplicates			·	······································
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	/			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.			/	
Were the MS/MSD or duplicate relative percent differences (RPD) \leq 20% for waters and \leq 35% for soil samples? A control limit of \leq CRDL(\leq 2X CRDL for soil) was used for samples that were \leq 5X the CRDL, including when only one of the duplicate sample values were \leq 5X the CRDL.	/			
V. Laboratory control samples				
Was an LCS anaylzed for this SDG?	-			
Was an LCS analyzed per extraction batch?	<			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% (85-115% for Method 300.0) QC limits?	1			
VI. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?			/	
Were the performance evaluation (PE) samples within the acceptance limits?				· · · · · · · · · · · · · · · · · · ·

Page: 2_of Reviewer: <u>____</u> 2nd Reviewer: ____

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

LDC#<u>32905A6</u>

VALIDATION FINDINGS WORKSHEET Field Duplicates

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

Inorganics: Method See Cover

	Concentrat	tion (ng/m3)				
Analyte	3	4	RPD (≤20)	Qual.		
Hexavalent Chromium	0.0158	0.0158	0			

\\LDCFILESERVER\Validation\FIELD DUPLICATES\FD_inorganic\32905A6.wpd

LDC #: 32905A6

Validation Findings Worksheet Initial and Continuing Calibration Calculation Verification

Page: _____ of ____ Reviewer: ______ 2nd Reviewer: CA

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

The correlation coefficient (r) for the calibration of $\underline{C_{\star}}^{\star}$ was recalculated.Calibration date: See Cover

Where,

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

%R = Found X 100

True

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

	· · · ·			- <u>Adda</u>	Recalculated	Reported	Acceptable
Type of analysis	Analyte	Standard	Conc. (ng/mL)	Area	r or r ²	r or r ²	(Y/N)
Initial calibration		s1	0.1	0.0000137			
		s2	0.1	0.0000346	0.99978	0.99978	
	C7-10	s3	0.2	0.0000754			
	Cr	s4	0.5	0.0002142			1.1
		s5	1	0.0004054			3
		s6	2	0.0008416			
JU 10:57	Crtb	Faired	True				
Calibration verification		0.5013 ng/m	Import.0		100.3%R	100.3%2	
cw 11:56							
Calibration verification	Cr46	D.S.IZZngh	0. Sng/ml		102.4 %e	102.5%E	y x
Calibration verification							

Comments: Refer to Calibration Verification findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results. $\frac{4700 \text{ N}}{100}$

LDC #: 3290546

VALIDATION FINDINGS WORKSHEET Level IV Recalculation Worksheet

Found = SSR (spiked sample result) - SR (sample result).

concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation,

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

METHOD: Inorganics, Method _____ Cover

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 Where, True

True = concentration of each analyte in the source.

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

RPD = <u> S-D </u> x 100	Where,	S =	Original sample concentration
(S+D)/2		D =	Duplicate sample concentration

Found =

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++10	1.0505 rg/ul	Ingla	105%E	105%R	Y
N	Matrix spike sample		(SSR-SR)				
Dug	Duplicate sample	Crtb	0.0132 ng/m ³	0.0158mg/m ³	17.9% pp	18.2%epd	Y*

Comments: XRounding

TOTCLC.6

LDÇ #	: <u>32905</u> 210	VALIDATION FINDINGS WORKSHEET Page: or Sample Calculation Verification Reviewer: 2nd reviewer: 2nd reviewer:						
METH	OD: Inorganics, Metho	d See Cover						
YN YN Compo recalcu Concent	N/A Have results N/A Are results w N/A Are all detect N/A Are all detect	g the following equation: $y = 1 \cdot 21 \cdot 21$ Recalculation: (C) $y = 21 \cdot 21 \cdot 21$	ctly? ruments? rep	ported with a positi $27E_{-0}$				
20-		(nglur)(ut) m3	(0.465mglul Xion ZI.27m	$\frac{1}{3} = 0.0$				
#	Sample ID	Analyte	Reported Concentration (Mg/M ³⁻)	Calculated Concentration (rgln ³)	Acceptable (Y/N)			
	\	Crab	0.0285	P.850.0	S			
	2)	0.0176	0.0176	1			
	3		0.0158	0.0158				
	4		0.0158	0.0157				
	5		0.0189	0.0189				
	6		0.0315	0.0315				
	7		O. UZIG	0.0219				
	8		NO	ND				
	9	¥	04	ND				
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75 Valley Stream Parkway, Suite 400					REPORTE	ED: 10/22/14 14	04	
Malvern, PA 1935	5				SUBMITT	ED: 10/15/14		
ATTN: Mr. Jeff Br PHONE: (443) 8	oggs 03-8495 FAX: (410) 266-8912			AQS SITE		Honeywell Hex Chrome Study	
Description:	OAM 1	Lai	b ID: 410152	1-01			Sampled: 10/14/14 16:10	
Matrix:	Air	Sa	mple Volume:	21.44	4 m³		Received: 10/15/14 10:47	
Comments:	Start Time 10/13/14 16:22	L					Analysis Date: 10/16/14 12:59	
			Hexavaler <u>Results</u>	nt Chro	mium	MDL		
<u>Analyte</u>		<u>CAS Number</u>	<u>ng/m³ Ai</u>	r	Flag	<u>ng/m³ Air</u>		
Hexavalent Chromium		1854-02-99	0.0285			0.0036		

OCT 2 3 2014

Initials: CR

Eastern Research Group

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Environmental Resources Management, Inc					I LE #: 3	3926.00	
75 Valley Stream F	^D arkway, Suite 400			R	EPORTED): 10/22/14 14:	04
Malvern, PA 1935	5			S	UBMITTED	D: 10/15/14	
ATTN: Mr. Jeff B PHONE: (443) 8		10) 266-8912			QS SITE ODE: ITE CODE	:: H	Ioneywell Hex Chrome Study
Description:	OAM 2	La	ab ID: 4101521	-02			Sampled: 10/14/14 16:27
Matrix:	Air	Sa	ample Volume:	21.35	m³		Received: 10/15/14 10:47
Comments:	Start Time 10/13/14 16:	:43					Analysis Date: 10/16/14 13:09
			Hexavalent	Chrom	ium		
			<u>Results</u>			MDL	
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>		<u>Flaq</u>	<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99	0.0176			0.0036	

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Environmental Resources Management, Inc					FILE #:	3926.00	
75 Valley Stream F	^D arkway, Suite 400			F	REPORTE	D: 10/22/14 14	04
Malvern, PA 1935	5			5	SUBMITTE	ED: 10/15/14	
ATTN: Mr. Jeff Ba PHONE: (443) 8	00)) 266-8912			AQS SITE		Honeywell Hex Chrome Study
Description:	PAM-1	Lat	b ID: 4101521-	·03			Sampled: 10/14/14 17:26
Matrix:	Air	Sar	mple Volume:	20.79	m³		Received: 10/15/14 10:47
Comments:	Col 1 Start Time 10/13/14	18:20					Analysis Date: 10/16/14 12:17
			Hexavalent <u>Results</u>	Chron	nium	MDL	
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>		<u>Flaq</u>	<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99	0.0158			0.0036	

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Environmental Resources Management, Inc					26.00	
75 Valley Stream Parkway, Suite 400					10/22/14 14:04	
Malvern, PA 1935	5			SUBMITTED:	10/15/14	
ATTN: Mr. Jeff B PHONE: (443) 8		0) 266-8912		AQS SITE CODE: SITE CODE:	Hor	eywell Hex Chrome Study
Description:	PAM-1D	Lab ID:	4101521-04			Sampled: 10/14/14 17:25
Matrix:	Air	Sample \	/olume: 20.7	74 m³		Received: 10/15/14 10:47
Comments:	Col 2 Start Time 10/13/14	18:23			An	alysis Date: 10/16/14 12:37
		I	Hexavalent Chr	omium		
			<u>Results</u>		MDL	
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flaq</u>	<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99	0.0158		0.0036	

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75 Valley Stream Parkway, Suite 400					REPORT	ED: 10/	/22/14 14:0	4	
Malvern, PA 19355	5					SUBMITT	ED: 1	10/15/14	
ATTN: Mr. Jeff Bo PHONE: (443) 8	66)) 266-8912				AQS SITE		н	oneywell Hex Chrome Study
Description:	PAM-2	Li	ab ID:	4101521-	-05				Sampled: 10/14/14 17:12
Matrix:	Air	Si	ample Vo	lume:	20.96	5 m³			Received: 10/15/14 10:47
Comments:	Start Time 10/13/14 17:5	5				<u>.</u> .			Analysis Date: 10/16/14 13:18
				exavalent Results	Chro	mium		MDL	
<u>Analyte</u>		CAS Number	r	<u>ng/m³ Air</u>		<u>Flag</u>	no	<u>a/m³ Air</u>	
Hexavalent Chromium		1854-02-99		0.0189				0.0036	

OCT 2 3 2014

Initials: CR

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Environmental Resources Management, Inc					3926.00	
75 Valley Stream Parkway, Suite 400					D: 10/22/14 14:	04
Malvern, PA 1935	5			SUBMITTE	E D: 10/15/14	
ATTN: Mr. Jeff Bo PHONE: (443) 8) 266-8912		AQS SITE		Honeywell Hex Chrome Study
Description:	PAM-3	Lab ID:	4101521-06			Sampled: 10/14/14 17:01
Matrix:	Air	Sample \	/olume: 2 :	1.12 m³		Received: 10/15/14 10:47
Comments:	Start Time 10/13/14 17:33	3				Analysis Date: 10/16/14 13:28
		I	Hexavalent Cl	nromium		
			<u>Results</u>		MDL	
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flaq</u>	<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99	0.0315		0.0036	

OCT 2 3 2014

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Environmental Re	sources Management, Ind	5		FILE #: 392	26.00	
75 Valley Stream F	^D arkway, Suite 400			REPORTED:	10/22/14 14:0)4
Malvern, PA 1935	5			SUBMITTED:	10/15/14	
ATTN: Mr. Jeff B PHONE: (443) 8) 266-8912		AQS SITE CODE: SITE CODE:	F	Ioneywell Hex Chrome Study
Description:	PAM-4	Lab ID:	4101521-07			Sampled: 10/14/14 16:52
Matrix:	Air	Sample	Volume: 21	27 m³		Received: 10/15/14 10:47
Comments:	Start Time 10/13/14 17:14	ł				Analysis Date: 10/16/14 13:38
			Hexavalent Ch <u>Results</u>	iromium	MDL	
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	ng/m³ Air	
Hexavalent Chromium		1854-02-99	0.0219		0.0036	

OCT 2 3 2014

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Environmental Resource	ces Manageme	nt, Inc			FILE #:	3926.00)	
75 Valley Stream Parky	way, Suite 400				REPORT	ED: 10)/22/14 14:04	
Malvern, PA 19355					SUBMITT	TED:	10/15/14	
ATTN: Mr. Jeff Boggs PHONE: (443) 803-8		(410) 266-8912			AQS SITI	_	Hone	ywell Hex Chrome Study
Description: PAM	4-21		Lab ID: 41	.01521-08				Sampled: 10/14/14 00:00
Matrix: Air			Sample Volum	e: 20.9	6 m³	1		Received: 10/15/14 10:47
Comments:							Anal	lysis Date: 10/16/14 13:48
				valent Chro	omium		MDI	
Analista		<u></u>				_		
						<u>D</u>		
Analyte Hexavalent Chromium		<u>CAS Numbe</u> 1854-02-99	<u>Res</u> r ng/n		omium <u>Flag</u> ט	<u>n</u>	<u>MDL</u> g/m ³ Air 0.0036	,

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Environmental Re	esources Mana	agemei	nt, Inc				FILE #:	3926	6.00	
75 Valley Stream	Parkway, Suit	e 400					REPORT	ED:	10/22/14 14	04
Malvern, PA 1935	55						SUBMIT	TED:	10/15/14	
ATTN: Mr. Jeff E PHONE: (443)		FAX:	(410) 266-8912				AQS SIT			Honeywell Hex Chrome Study
Description:	PAM-31			Lab ID:	410152	1-09			· · · · · · · · ·	Sampled: 10/14/14 00:00
Matrix:	Air			Sample V	/olume:	21.1	2 m ³	3		Received: 10/15/14 10:47
Comments:										Analysis Date: 10/16/14 14:18
				ł	lexavaler	nt Chro	mium			
					<u>Results</u>				MDL	
<u>Analyte</u>			CAS Numbe	<u>er</u>	<u>ng/m³ Ai</u>	<u>r</u>	<u>Flaq</u>		<u>ng/m³ Air</u>	
Hexavalent Chromium			1854-02-99		ND		υ		0.0036	

OCT 2 3 2014

Initials: \mathcal{CR}

Eastern Research Group

NERG



October 28, 2014

ERM 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 October 24, 2014. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #32924:

<u>SDG</u>

<u>Fraction</u>

4101712

Hexavalent Chromium

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

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

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

Sincerely,

Christina Rink Project Manager/Chemist

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	Level IV	Ľ	DC #32	924	4 (E	RN	1 -	Mo	rris	svil	le,	NC	: 1	Ha	rbo	or P	Poir	ıt, I	MD	, He	exa	iva	len	t C	hro	mi	um	M	oni	tor	ing	i)							
LDC	SDG#	DATE REC'D	(3) DATE DUE	Cr((D7)	(VI) 614)																																		
Matrix:	Air/Water/Soil		2000 - 1	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	4101712	10/24/14	10/31/14	9	30 ,2														<u> </u>		<u> </u>	-															-		<u> </u>
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Total	A/CR			9	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	9
Total		s indicate Le	vel IV validat	-						-		·												0	0	0	0	0	0	0	0	0		0	0.0.0.0		0	0	

LDC Report# 32924A6

Laboratory Data Consultants, Inc. Data Validation Report

Harbor Point, MD, Hexavalent Chromium Monitoring

•	•
Collection Date:	October 16, 2014
LDC Report Date:	October 28, 2014
Matrix:	Air
Parameters:	Hexavalent Chromium
Validation Level:	EPA Level IV
Laboratory:	Eastern Research Group

Sample Delivery Group (SDG): 4101712

Sample Identification

Project/Site Name:

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

1

Introduction

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

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

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

The following are definitions of the data qualifiers:

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

I. Technical Holding Times

All technical holding time requirements were met.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met.

IV. Blanks

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

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

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

V. Matrix Spike/Matrix Spike Duplicates

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

VI. Duplicates

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

VII. Laboratory Control Samples

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

VIII. Sample Result Verification

All sample result verifications were acceptable.

IX. Overall Assessment of Data

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

X. Field Duplicates

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

	Concentrati	on (ng/m³)			
Analyte	PAM-1	PAM-1D	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.0604	0.0619	2 (≤20)	-	-

Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Data Qualification Summary - SDG 4101712

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

Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG 4101712

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 4101712

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

LDC #: 32924A6	VALIDATION COMPLETENESS WORKSHEET	Dat
SDG #: 4101712	Level IV	Page
Laboratory: Eastern Research	Group	Reviewe

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: 10 10 14
11	Initial calibration	A	
111.	Calibration verification	A	
IV	Blanks		
v	Matrix Spike/Matrix Spike Duplicates	2	Not Required
VI.	Duplicates	A	Not Required DuD
VII.	Laboratory control samples	A	us
VIII.	Sample result verification	A	
IX.	Overall assessment of data	A	
Х.	Field duplicates	SW	FD=(3,4)
xı	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: Airs

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

Notes:

4

Method: Inorganics (EPA Method Sectorer)

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?	\leq			
Were all initial and continuing calibration verification %Rs within the 90-110% QC limits?	/			
Were titrant checks performed as required? (Level IV only)			_	
Were balance checks performed as required? (Level IV only)			/	
III. Blanks			,,	
Was a method blank associated with every sample in this SDG?				
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		/		
IV. Matrix spike/Matrix spike duplicates and Duplicates				
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	/			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.			/	
Were the MS/MSD or duplicate relative percent differences (RPD) \leq 20% for waters and \leq 35% for soil samples? A control limit of \leq CRDL(\leq 2X CRDL for soil) was used for samples that were \leq 5X the CRDL, including when only one of the duplicate sample values were \leq 5X the CRDL.	/			
V. Laboratory control samples		<u></u>		
Was an LCS anaylzed for this SDG?	\langle			
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?			1/	

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

LDC#<u>32924A6</u>

VALIDATION FINDINGS WORKSHEET Field Duplicates

Page: <u>∖_</u> of <u>∖</u>
Reviewer: <u>-> ೧</u>
2nd Reviewer:

Inorganics: Method See Cover

	Concentrat	ion (ng/m3)		Qual.	
Analyte	3	4	RPD (≤20)		
Hexavalent Chromium	0.0604	0.0619	2		

\LDCFILESERVER\Validation\FIELD DUPLICATES\FD_inorganic\32924A4.wpd

LDC #: 3292406

Validation Findings Worksheet Initial and Continuing Calibration Calculation Verification

Page: 1 of 1Reviewer: 2nd Reviewer:

Method: Inorganics, Method See Cover

The correlation coefficient (r) for the calibration of <u>معلق</u> was recalculated.Calibration date: المعادية الم

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

%R = Found X 100

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 ²	r or r ²	(Y/N)
Initial calibration		s1	0.1	0.0000146			
		s2	0.1	0.0000318	0.99965	0.99965	
		s3	0.2	0.00007			Ч
	مالع ف	s4	0.5	0.0001829	_		\mathcal{L}
	\smile	s5	1	0.0003589			
		s6	2	0.0007624			
エン ルンマ Calibration verification	Crau	Formal 0.515rylni	Ture D. Snalul		103.0%F	103.0%E	3
Ciu いという Calibration verification		0.5205mJm			104.1%E	104.1%E	Ţ
Calibration verification							

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

LDC #: 32924AU

VALIDATION FINDINGS WORKSHEET Level IV Recalculation Worksheet

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

METHOD: Inorganics, Method See Cover

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

%R = <u>Found</u> x 100 Where, Found True

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 = concentration of each analyte in the source.

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

 $RPD = |S-D| \times 100$ Where,S =Original sample concentration(S+D)/2D =Duplicate sample concentration

Sample ID	Type of Analysis	Element	Found / S (units)	True / D (units)	Recalculated	Reported %R / RPD	Acceptable (Y/N)
LCS 11:47	Laboratory control sample	Crau	1.066 ng/ml	1-00-mg/ml	107%R	107%E	Z
	Matrix spike sample 🥆		(SSR-SR)				
D-8 12:47	Duplicate sample	Crto	0.0593 mg/uz	U. 0603:ng/m3	1.67% PR	1.71%280	J*

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.

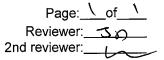
*Pounding

.

LDC #: 32424A6

VALIDATION FINDINGS WORKSHEET

Samp	le Cal	culation	Verific	ation



METHOD: Inorganics, Method See Cover

Please see gualifications below for all guestions answered "N". Not applicable guestions are identified as "N/A". <u>Ý N N/A</u>

Have results been reported and calculated correctly?

YIN N/A Are results within the calibrated range of the instruments? Y, <u>'N N/A</u>

Are all detection limits below the CRQL?

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

			2	1.79 ms	
#	Sample ID	Analyte	Reported Concentration (ମଧ୍ୟାୟ ⁵)	Calculated Concentration (VC(100 ⁵)	Acceptable (Y/N)
	١	Crab	0.0734	0.0733	4*
	2		0.0839	0.0839	3
	3		0.0604	0.0603	yx
	Ц		0.0619	0.0620	5*
	<u> </u>		0.0528	0.0529	44
	6		0.0633	0.0633	3
	<u>.</u>		0.0825	0.0825	4
	8		64	ND	15
	9	7	<u>CUI</u>	NT	J
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	<u></u>				
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	·····				

Kounding Note:

Environmental Res	inc	FILE #: 3920	FILE #: 3926.00			
75 Valley Stream F	^o arkway, Suite 400		REPORTED:	10/24/14 13:5	6	
Malvern, PA 1935	5		SUBMITTED:	10/17/14		
ATTN: Mr. Jeff B	oggs			AQS SITE COL	DE:	
PHONE: (443) 8	03-8495 FAX: (4	10) 266-8912		SITE CODE:	Н	oneywell Hex Chrome Study
Description:	OAM 1	Lab ID	4101712-01			Sampled: 10/16/14 16:17
Matrix:	Air	Sampi	e Volume: 21.	.74 m³		Received: 10/17/14 10:22
Comments:	Start Time 10/15/14 16	:08				Analysis Date: 10/20/14 15:20
			Hexavalent Ch	romium		
			Results		MDL	
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	Flag	<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99	0.0734		0.0036	

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Page 3 of 13

Environmental Res	sources Management, I	nc	FILE #: 392	FILE #: 3926.00				
75 Valley Stream F	^D arkway, Suite 400		REPORTED:	10/24/14 13:	56			
Malvern, PA 19355	5		SUBMITTED:	10/17/14				
ATTN: Mr. Jeff Bo	oggs			AQS SITE CO	DE:			
PHONE: (443) 8	03-8495 FAX: (41	10) 266-8912		SITE CODE:	ł	Ioneywell Hex Chrome Study		
Description:	OAM 2	Lab	ID: 4101712-02			Sampled: 10/16/14 16:36		
Matrix:	Air	San	nple Volume: 21	.78 m³		Received: 10/17/14 10:22		
Comments:	Start Time 10/15/14 16:	24				Analysis Date: 10/20/14 15:30		
			Hexavalent Ch	romium				
			Results		MDL			
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	Flag	<u>ng/m³ Air</u>			
Hexavalent Chromium		1854-02-99	0.0839		0.0036			

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Environmental Re	sources Management, Ir	nc	FILE #: 3920	FILE #: 3926.00				
75 Valley Stream I	Parkway, Suite 400			REPORTED:	10/24/14 13:	56		
Malvern, PA 1935	5			SUBMITTED:	10/17/14			
ATTN: Mr. Jeff B	oggs			AQS SITE COL	DE:			
PHONE: (443) 8	03-8495 FAX: (41	0) 266-8912		SITE CODE:	ł	Ioneywell Hex Chrome Study		
Description:	PAM-1	Lab ID:	4101712-03			Sampled: 10/16/14 17:35		
Matrix:	Air	Sample	Volume: 21.	68 m³		Received: 10/17/14 10:22		
Comments:	Col 1 Start Time 10/15/1	4 17:29				Analysis Date: 10/20/14 12:37		
			Hexavalent Ch	romium				
			<u>Results</u>		MDL			
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	Flag	<u>ng/m³ Air</u>			
Hexavalent Chromium	1	1854-02-99	0.0604		0.0036			

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Page 5 of 13

Environmental Resources Management, Inc						F	FILE #: 3926.00				
75 Valley Stream Parkway, Suite 400						F	REPORTED: 10/24/14 13:56				
Malvern, PA 19355					s	SUBMITTED: 10/17/14					
ATTN: Mr. Jeff E	Boggs					A	QS SIT	E COD	E:		
PHONE: (443)	803-8495 F	AX:	(410) 266-8912			s	ITE CO	DE:	ŀ	Honeywell Hex Chrome Study	
Description:	PAM-1D			Lab ID:	410171	2-04		~		Sampled: 10/16/14 17:36	
Matrix:	Air			Sample Vo	lume:	21.73	m³	ŧ.		Received: 10/17/14 10:22	
Comments:	Col 2 Start Tim	ne 10/1	5/14 17:27							Analysis Date: 10/20/14 12:57	
				He	exavaler	nt Chrom	ium				
					<u>Results</u>				MDL		
Analyte			CAS Numb	er I	<u>ng/m³ Ai</u>	Ľ	Flag		<u>ng/m³ Air</u>		

Hexavalent Chromium

NERG

1854-02-99

0.0619

0.0036

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Environmental Res	sources Management,	Inc		FILE #: 3926	5.00	
75 Valley Stream F	Parkway, Suite 400			REPORTED:	10/24/14 13:	56
Malvern, PA 19355	5			SUBMITTED:	10/17/14	
ATTN: Mr. Jeff B	oggs			AQS SITE COD	E:	
PHONE: (443) 8	03-8495 FAX: (4	10) 266-8912		SITE CODE:	I	Honeywell Hex Chrome Study
Description:	PAM-2	Lab ID:	4101712-05			Sampled: 10/16/14 17:17
Matrix:	Air	Sample \	/olume: 21.7	′8 m³		Received: 10/17/14 10:22
Comments:	Start Time 10/15/14 17:	05				Analysis Date: 10/20/14 15:40
		1	Hexavalent Chro	omium		
			<u>Results</u>		MDL	
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	Flag	<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99	0.0528		0.0036	

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Environmental Re	sources Management	, Inc		FILE #:	3926.0	00					
75 Valley Stream	Parkway, Suite 400			REPOR	TED: 7	10/24/14 13:56					
Malvern, PA 1935	5			SUBMIT	SUBMITTED: 10/17/14						
ATTN: Mr. Jeff B	loggs			AQS SI		:					
PHONE: (443) 8	303-8495 FAX: (4	410) 266-8912		SITE CO	DDE:	Ho	neywell Hex Chrome Study				
Description:	PAM-3		Lab ID: 4101712-	06			Sampled: 10/16/14 17:10				
Matrix:	Air	:	Sample Volume:	21.78 m	3		Received: 10/17/14 10:22				
Comments:	Start Time 10/15/14 10	5:58				A	nalysis Date: 10/20/14 15:50				
			Hexavalent	Chromium							
			Results			MDL					
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>		<u>ng/m³ Air</u>					
Hexavalent Chromium	ı	1854-02-99	0.0633			0.0036					

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Environmental Re	sources Management, Ind	c		FILE #:	3926	.00	
75 Valley Stream I	Parkway, Suite 400			REPOR	TED:	10/24/14 13:5	56
Malvern, PA 1935	5			SUBMIT	TED:	10/17/14	
ATTN: Mr. Jeff B	oggs			AQS SI	re cod	E:	
PHONE: (443) 8	303-8495 FAX: (410) 266-8912		SITE CO	DDE:	H	loneywell Hex Chrome Study
Description:	PAM-4	Lab	ID: 4101712	-07			Sampled: 10/16/14 17:03
Matrix:	Air	Sam	ple Volume:	21.79 m	3		Received: 10/17/14 10:22
Comments:	Start Time 10/15/14 16:50)					Analysis Date: 10/20/14 16:00
			Hexavaleni	t Chromium			
			<u>Results</u>			MDL	
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>		<u>ng/m³ Air</u>	
Hexavalent Chromium	1	1854-02-99	0.0825			0.0036	

1854-02-99

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Environmental Resources Manage	ement, Inc		FILE #: 3926	6.00	
75 Valley Stream Parkway, Suite 4	00		REPORTED:	10/24/14 13:5	6
Malvern, PA 19355			SUBMITTED:	10/17/14	
ATTN: Mr. Jeff Boggs			AQS SITE COD	E:	
PHONE: (443) 803-8495 FA	X: (410) 266-8912		SITE CODE:	Н	oneywell Hex Chrome Study
Description: PAM-21	Lab ID:	4101712-08			Sampled: 10/16/14 00:00
Matrix: Air	Sample V	'olume: 21.78	3 m³		Received: 10/17/14 10:22
Comments:					Analysis Date: 10/20/14 16:10
	ŀ	lexavalent Chro	mium		
		<u>Results</u>		MDL	
Analyte	CAS Number	<u>ng/m³ Air</u>	Flag	<u>ng/m³ Air</u>	
Hexavalent Chromium	1854-02-99	ND	υ	0.0036	

FF 10.28.14

Eastern Research Group

NERG

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Page 10 of 13

					valent suits	Chromi	um		MDL		
Comments:										Analysis Date	: 10/20/14 16:40
Matrix:	Air			Sample Volun	ne:	21.78	m³			Received	i: 10/17/14 10:22
Description:	PAM-31			Lab ID: 4	101712-0	09				Sampled	1: 10/16/14 00:00
PHONE: (443)	803-8495	FAX:	(410) 266-8912			SI	TE COD)E:		Honeywell Hex	Chrome Study
ATTN: Mr. Jeff E	Boggs					AC	as site	CODE	:		
Malvern, PA 1935	55					รเ	BMITTE	ED:	10/17/14		
75 Valley Stream	Parkway, Su	ite 400				RE	PORTE	ED: 1	0/24/14 13:	56	
Environmental Re	esources Mai	nageme	nt, Inc			FI	_E #:	3926.0	00		

ND

1854-02-99

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0.0036

Hexavalent Chromium

NERG

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Eastern Research Group

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October 30, 2014

ERM 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 October 28, 2014. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #32944:

SDG Fraction

4102118/4102232 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,

aller for

Christina Rink Project Manager/Chemist

LDC SE Matrix: Air/M	DG# F	DATE REC'D	(3) DATE DUE	944 Cr(10000	(20) (CLL-00) (D	1 - 1 	Moi	rris	svill	le,	NC	1	Har	bo	r Pi	oin	f N	AD	Н		val	An		hro	mi	um	Ma	oni	tor	ing	i)							
Matrix: Air/M	DG# F		DUE	Cr(VI)								and the second	200			90) - 3-2	eretati ja	12 ,		77a	vai	eII			19 (G.)	1200	all a set	3		8 J	N 1930-74		100 A. 10	i yazi gega	REPORT-STREE	2 632	He-	
Matrix: Air/M A 4102118	Vater/Soil 3/4102232 10	0/28/14																																					
A 4102118	3/4102232 10	0/28/14	的时代。他们	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
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Total T/	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

Shaded cells indicate Level IV validation (all other cells are Level II validation). These sample counts do not include MS/MSD, and DUPs

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:	Harbor Point, MD, Hexavalent Chromium Monitoring
Collection Date:	October 17 through October 21, 2014
LDC Report Date:	October 29, 2014
Matrix:	Air
Parameters:	Hexavalent Chromium
Validation Level:	EPA Level IV
Laboratory:	Eastern Research Group

Sample Delivery Group (SDG): 4102118/4102232

Sample Identification

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

Introduction

This data review covers 42 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(10/17/14), PAM-31(10/18/14), PAM-31(10/20/14), and PAM-31(10/21/14) were identified as trip blanks. No hexavalent chromium was found.

Samples PAM-21(10/17/14), PAM-21(10/18/14), PAM-21(10/20/14), and PAM-21(10/21/14) 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(10/17/14) and PAM-1D(10/17/14), samples PAM-1(10/18/14) and PAM-1D(10/18/14), and samples PAM-1(10/21/14) and PAM-1D(10/21/14) were identified as field duplicates. No hexavalent chromium was detected in any of the samples with the following exceptions:

	Concentrati	ion (ng/m³)			
Analyte	PAM-1(10/17/14)	PAM-1D(10/17/14)	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.0216	0.0194	11 (≤20)	-	-

	Concentrat	ion (ng/m³)			
Analyte	PAM-1(10/18/14)	PAM-1D(10/18/14)	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.0241	0.0243	1 (≤20)	-	-

	Concentrat	tion (ng/m ³)			
Analyte	PAM-1(10/21/14)	PAM-1D(10/21/14)	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.0718	0.0833	15 (≤20)	-	-

4

Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Data Qualification Summary - SDG 4102118/4102232

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

Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG 4102118/4102232

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 4102118/4102232

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

32944A6W.wpd	

LDC #: <u>32944A6</u>	ALIDATION COMPLETENESS WORKSHEET
SDG #: 4102118/4102232	_ Level IV
Laboratory: Eastern Research G	<u>roup</u>

Date: <u>lol25/14</u> Page: <u>lof l</u> Reviewer: <u>JO</u> 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
1.	Technical holding times	A	Sampling dates: 10/17-21/14
11	Initial calibration	A	
III.	Calibration verification	A	
IV	Blanks	A	
v	Matrix Spike/Matrix Spike Duplicates	N	Not Required
VI.	Duplicates	A	DUP
VII.	Laboratory control samples	A	Lasid
VIII.	Sample result verification	A	
IX.	Overall assessment of data	À	
Х.	Field duplicates	SN	FD=(3,4) (12,13) (29.30)
XL	Field blanks	ND	FB=[8X(1)[25)[34] TB=(9)(18)(20)(35)

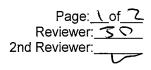
Note: A = Acceptable N = Not provided/applicable SW = See worksheet ND = No compounds detected R = Rinsate FB = Field blank D = Duplicate TB = Trip blank EB = Equipment blank

Validated Samples:

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

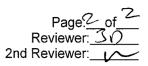
Notes:

VALIDATION FINDINGS CHECKLIST



Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	/			
Cooler temperature criteria was met.				
II. Calibration				
Were all instruments calibrated daily, each set-up time?		-		
Were the proper number of standards used?				
Were all initial calibration correlation coefficients <a> 0.995?	\leq			
Were all initial and continuing calibration verification %Rs within the 99110% QC limits?	/			
Were titrant checks performed as required? (Level IV only)			4	······
Were balance checks performed as required? (Level IV only)				
III. Blanks				
Was a method blank associated with every sample in this SDG?	/			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		/		
IV. Matrix spike/Matrix spike duplicates and Duplicates				
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	/			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.				
Were the MS/MSD or duplicate relative percent differences (RPD) \leq 20% for waters and \leq 35% for soil samples? A control limit of \leq CRDL(\leq 2X CRDL for soil) was used for samples that were \leq 5X the CRDL, including when only one of the duplicate sample values were \leq 5X the CRDL.	/			
V. Laboratory control samples				· · · · · · · · · · · · · · · · · · ·
Was an LCS anaylzed for this SDG?	/			
Was an LCS analyzed per extraction batch?	<			····
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% (85-115% for Method 300.0) QC limits?	/			
VI. Regional Quality Assurance and Quality Control	·			
Were performance evaluation (PE) samples performed?			/	
Were the performance evaluation (PE) samples within the acceptance limits?				

VALIDATION FINDINGS CHECKLIST



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

LDC#<u>32944A6</u>

VALIDATION FINDINGS WORKSHEET <u>Field Duplicates</u>

Page: _____of____ Reviewer: ______ 2nd Reviewer: ______

Inorganics: Method See Cover

	Concentra	tion (ng/m3)		Qual.
Analyte	3	4	RPD (≤20)	
Hexavalent Chromium	0.0216	0.0194	11	

	Concentra	tion (ng/m3)		Qual.
Analyte	12	13	RPD (≤20)	
Hexavalent Chromium	0.0241	0.0243	1	

	Concentra	tion (ng/m3)		Qual.
Analyte	29	30	RPD (≤20)	
Hexavalent Chromium	0.0718	0.0833	15	

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LDC #: 3294446

Validation Findings Worksheet Initial and Continuing Calibration Calculation Verification

Page: Reviewer: 2nd Reviewer:

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

The correlation coefficient (r) for the calibration of \underline{Cr}^{+} was recalculated. Calibration date: $\underline{io(22)(1+)}$

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

%R = Found X 100

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 ²	r or r ²	(Y/N)
Initial calibration		s1	0.05	0.0000124			
		s2	0.1	0.0000305	0.99973	0.99973	
	Crtb	s3	0.2	0.0000719			
	Cr	s4	0.5	0.0002025			
		s5	1	0.0003913			4
		s6	2	0.0008274			2
ICU 10:45	Crab	Found	Troe O.S. ngjml			24	
Calibration verification		0.497 na/m	0.5 national		99.4%E	49.4%E	
Cev +1:15 11:44	(500						
Calibration verification	<u>C</u>	D.SOIZnajml	0. Snglml		100.2%	100.2%	<u>Ч</u>
Calibration verification							

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

LDC #: 3294426

VALIDATION FINDINGS WORKSHEET Level IV Recalculation Worksheet

concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation,

Page: \ of Reviewer: 2nd Reviewer:

METHOD: Inorganics, Method See Cover

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

%R = <u>Found</u> x 100 Where, Found = True

Found = SSR (spiked sample result) - SR (sample result). True = concentration of each analyte in the source.

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

RPD = <u> S-D </u> 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)
LCS 11:15	Laboratory control sample	Cro	1.099mg/m	lnglml	110%P	110%p	J
	Matrix spike sample		(SSR-SR)				
12,16 D-P-	Duplicate sample	Crab	0.0221 ng/m3	0.0216rg/m ³	2.29 % RBD	2.41 % PR	·J*

Comments: * Rounding

LDC #: 32744A6

VALIDATION FINDINGS WORKSHEET

Sample Calculation Verification

Page:_	<u>∖_</u> of_′<
Reviewer:	50
2nd reviewer:	
	\sim

METH	IOD: Inorganics, Metho	d See Cover							
Please MNN MNN MNN	<u>N/A</u> Have results <u>N/A</u> Are results w	by for all questions answered "N". Not ap been reported and calculated correctly? ithin the calibrated range of the instrume tion limits below the CRQL?		re identified as "N/	Α".				
Comp	Compound (analyte) results for (23) (23) reported with a positive detect were								
	recalculated and verified using the following equation: $Concentration = (A - C_{0}) C, V = D_{N} Recalculation: (0.0000066 - (-7.40 = -36))$								
	.	m== 2180	0.0003168		0.0372 mg/m				
Cî C	7.40E-06	(ng/m/)(U4) (0. m ³	0372 najm1) 21.86	(10ml)).0172mg/m)				
Ĵ.	1= 0.0000066	m ^s .	21.86	m3 = 1	Derongian				
#	Sample ID	Analyte	Reported Concentration (ଏଦ୍ୟାମ୍ଦି)	Calculated Concentration (กรุโพ ³)	Acceptable (Y/N)				
	١	Crtu	0.0182	0.0182	9				
	2		QU	ND)				
	3		0.0216	0.0216	T				
	ц		0.0194	0.0193	Y7				
-	5		0.0189	0.0188	<u>1</u> 7*				
	6		0.0185	0.0185	4				
	-7		0.160	0.160					
	8		QU	ND					
	٩	L	64	64					
	10	L	0.DAS	0.0195					
	۱۱	L	0.0200	0.0206					
	12	L	0.0241	0.0241	↓				
	13		0.0243	0.0242	<u>44</u>				
	41		0.0222	0.0222	4				
	15		0,0167	0.0166	Y*				
	16		0.0349	0.0348	44				
i	17		D4	60	2				
	18		ND	ろう	<u> </u>				
	19		0.015	0.0174	Y*				
	20	J.	0.0170	0.0170	3				

Note: * Pounding

LDC #: 32944A6

VALIDATION FINDINGS WORKSHEET

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

Sample Calculation Verification

METHOD: Inorganics, Method See, Cover Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A". Y N <u>N/A</u> Have results been reported and calculated correctly? Y /N N/A Are results within the calibrated range of the instruments? Y/N N/AAre all detection limits below the CRQL? Compound (analyte) results for (2) reported with a positive detect were recalculated and verified using the following equation: $Concentration = (A - C_{6}) | C_{1} \quad (H = | U - u) \\ M^{3} = 2.192 \\ (U = -7.40 = -06 \\ (L_{3} + 0.0003768) \\ (L_{1} = 0.0003768 \\ A = 0.0000221 \\ M^{3} \quad 0.0783 mg/ml (10ml) = [0.0357 21.92 m3 = [0.0357] A= 0.0000221 nalm Reported Calculated Concentration Concentration Acceptable (nalm3) (nalm3) (Y/N) # Sample ID Analyte 4 0.0357 Crib 21 0.0357 0.0337 0.0337 22 0.0258 0.0258 73 24 0.057 0.0597 GG 20 25 ND 26 ろう 0.0238 27 0.0238 28 0.0330 0.0330 ZG 0.0118 0.0118 30 7 0.0832 0.0833 31 0.0291 0.0291 32 YY 0.0372 0-0371 33 DISI 0.151 NO 34 00 35 30 DU

Note: * Pounding

Environmental Re	c	FILE #: 3926.00							
75 Valley Stream F		REPORTED: 10/28/14 11:43							
Malvern, PA 1935	5		SUBMITTED:	MITTED: 10/21/14 to 10/22/14					
ATTN: Mr. Jeff B PHONE: (443) 8	oggs 03-8495 FAX: (410) 266-8912		AQS SITE STEECODE: Honeywell Hex Chrome Study					
Description:	OAM 1	Lab	ID: 4102118-01	· · · · · · · · · · · · · · · · · · ·		Sampled: 10/17/14 15:43			
Matrix:	Air	Sam	nple Volume: 21.0	2 m³		Received: 10/21/14 10:57			
Comments:	Start Time 10/16/14 16:2	1				Analysis Date: 10/22/14 13:27			
	Hexavalent Chromium								
			<u>Results</u>		<u>MDL</u>				
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>				
Hexavalent Chromium 1854-02-99 0.01					0.0036				

KK 10/29/14

Eastern Research Group

NERG

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

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NERG

CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc						FILE #: 3926.00		
75 Valley Stream Parkway, Suite 400						REPORTED: 10/28/14 11:43		
Malvern, PA 19355						SUBMITTED: 10/21/14 to 10/22/14		14 to 10/22/14
ATTN: Mr. Jeff Boggs PHONE: (443) 803-8495 FAX: (410) 266-8912						AQS SITE STECODE: Honeywell Hex Chrome Study		
Description:	OAM 2		Lab ID:	4102118-0)2			Sampled: 10/17/14 15:57
Matrix:	Air		Sample Vo	olume:	20.96	m³		Received: 10/21/14 10:57
Comments:	Start Time 10/16/14 16:40)						Analysis Date: 10/22/14 13:37
			Н	exavalent	Chro	mium		
				<u>Results</u>			MD	-
Analyte CAS Number				<u>ng/m³ Air</u>		Flag	<u>ng/m³</u>	Air
Hexavalent Chromium 1854-02-99				ND		U	0.003	6

KK 10/29/14

Eastern Research Group

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NERG

CERTIFICATE OF ANALYSIS

Environmental Resources Management, In	c	FILE #: 3926.00			
75 Valley Stream Parkway, Suite 400		REPORTED: 10/28/14 11:43			
Malvern, PA 19355		SUBMITTED:	TTED: 10/21/14 to 10/22/14		
ATTN: Mr. Jeff Boggs PHONE: (443) 803-8495 FAX: (410)) 266-8912		AQS SITE SITECODE: Honeywell Hex Chrome Study		
Description: PAM-1	Lab ID:	4102118-03		Sampled: 10/17/14 16	:51
Matrix: Air	Sample Vo	olume: 20.88	3 m³	Received: 10/21/14 10	:57
Comments: Col 1 Start Time 10/16/14	17:38			Analysis Date: 10/22/14 12	:06
	н	exavalent Chro	mium		
		<u>Results</u>		MDL	
Analyte	CAS Number	<u>ng/m³ Air</u>	Flag	<u>ng/m³ Air</u>	
Hexavalent Chromium	1854-02-99		0.0036		

|ck 10/29/14

Eastern Research Group

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NERC	ŝ	CERT	CERTIFICATE OF ANALYSIS					
Environmental Re	sources Managemei		FI	LE #: 392	3.00			
75 Valley Stream Parkway, Suite 400					REPORTED: 10/28/14 11:43			
Malvern, PA 1935	5			SUBMITTED: 10/21/14 to 10/22/14			o 10/22/14	
ATTN: Mr. Jeff B PHONE: (443) 8	oggs 803-8495 FAX:	(410) 266-8912			as site ODE: TE CODE:	F	Ioneywell Hex Chrome Study	
Description:	PAM-1D	La	b ID: 4102118	-04			Sampled: 10/17/14 16:51	
Matrix:	Air	Sa	mple Volume:	20.87	m³		Received: 10/21/14 10:57	
Comments:	Col 2 Start Time 10/	16/14 17:39					Analysis Date: 10/22/14 12:26	
			Hexavalent	t Chromi	ium			
			<u>Results</u>			MDL		
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>		<u>Flaq</u>	<u>ng/m³ Air</u>		
Hexavalent Chromium	1	1854-02-99	0.0194			0.0036		

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NERC	NERG CERTIFICATE OF ANALYSIS										
Environmental Re	sources Management, Ind	c	FILE #: 3926	FILE #: 3926.00							
75 Valley Stream I	Parkway, Suite 400		REPORTED: 10/28/14 11:43								
Malvern, PA 1935	5		SUBMITTED:	UBMITTED: 10/21/14 to 10/22/14							
ATTN: Mr. Jeff Boggs AQS SITE											
PHONE: (443) 8	03-8495 FAX: (410) 266-8912		SITE CODE:	Honeyw	ell Hex Chrome Study					
Description:	PAM-2	Lab ID:	4102118-05		Sa	mpled: 10/17/14 16:38					
Matrix:	Air	Sample	Volume: 20	.94 m³	Re	ceived: 10/21/14 10:57					
Comments:	Start Time 10/16/14 17:2:	1			Analysi	is Date: 10/22/14 14:07					
	Hexavalent Chromium										
			<u>Results</u>		<u>MDL</u>						
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	Flag	<u>ng/m³ Air</u>						
Hexavalent Chromium		1854-02-99	0.0189		0.0036						

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CERTIFICATE OF ANALYSIS										
Environmental Re	sources Management, Inc	c	FILE #: 3926.00							
75 Valley Stream I	Parkway, Suite 400		REPORTED: 10/28/14 11:43							
Malvern, PA 1935	5		SUBMITTED:	D: 10/21/14 to 10/22/14						
ATTN: Mr. Jeff B PHONE: (443) 8) 266-8912		AQS SITE CODE: SITE CODE:						
Description:	PAM-3	Lab ID:	4102118-06		5	Sampled: 10/17/14 16:30				
Matrix:	Air	Sample V	'olume: 20.'	94 m³	F	eceived: 10/21/14 10:57				
Comments:	Start Time 10/16/14 17:14	1			Analy	sis Date: 10/22/14 14:17				
		ł	lexavalent Chr	omium						
			<u>Results</u>		<u>MDL</u>					
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	Flag	<u>ng/m³ Air</u>					
Hexavalent Chromium		1854-02-99	02-99 0.0185		0.0036					

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CERTIFICATE OF ANALYSIS							
Environmental Res	sources Management, In	с	FILE #: 3926.00				
75 Valley Stream F	Parkway, Suite 400		REPORTED: 10/28/14 11:43				
Malvern, PA 1935	5		SUBMITTED:	SUBMITTED: 10/21/14 to 10/22/14			
ATTN: Mr. Jeff B							
PHONE: (443) 8	03-8495 FAX: (410)) 266-8912		SITE CODE:	Honeywell Hex C	hrome Study	
Description:	PAM-4	Lab ID:	4102118-07		Sampled: 1	10/17/14 16:22	
Matrix:	Air	Sample \	/olume: 20.9	93 m³	Received:	10/21/14 10:57	
Comments:	Start Time 10/16/14 17:0	6			Analysis Date:	10/22/14 14:27	
		I	Hexavalent Chr	omium			
			<u>Results</u>		<u>MDL</u>		
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	Flag	<u>ng/m³ Air</u>		
Hexavalent Chromium		1854-02-99	0.160		0.0036		

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NER (Ē	CEF	ERTIFICATE OF ANALYSIS							
Environmental R	esources Ma	nagement, Inc		FIL	E#: 392	6.00				
75 Valley Stream	Parkway, Su	uite 400		REI	REPORTED: 10/28/14 11:43					
Malvern, PA 1935	55			0/22/14						
ATTN: Mr. Jeff 1 PHONE: (443)	Boggs 803-8495	FAX: (410) 266-8912			S SITE DE: E CODE:	Hor	neywell Hex Chrome Study			
Description:	PAM-21		Lab ID: 4102	2118-08			Sampled: 10/17/14 00:00			
Matrix:	Air		Sample Volume:	20.94	m³		Received: 10/21/14 10:57			
Comments:						An	alysis Date: 10/22/14 14:37			
			Hexava	lent Chromiu	ım					
			Resul	<u>ts</u>		MDL				
<u>Analyte</u>		CAS Numbe	<u>er ng/m³</u>	Air	Flag	<u>ng/m³ Air</u>				
Hexavalent Chromium		1854-02-99	ND		U	0.0036				

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Environmental Resources Management, Inc						6.00	
75 Valley Stream Parkway, Suite 400						10/28/14 11:43	3
Malvern, PA 1935	55			SUBMI	TED:	10/21/14 to	10/22/14
ATTN: Mr. Jeff E PHONE: (443)		AX: (410) 266-8912				н	oneywell Hex Chrome Study
Description:	PAM-31		Lab ID: 4102118	-09			Sampled: 10/17/14 00:00
Matrix:	Air		Sample Volume:	20.94 п	1 ³		Received: 10/21/14 10:57
Comments:						/	Analysis Date: 10/22/14 14:46
			Hexavalen	t Chromium			
			<u>Results</u>			MDL	
Analyte		CAS Numbe	<u>er ng/m³ Air</u>	<u>Flag</u>		<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99	ND	U		0.0036	

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Environmental Re	sources Management, In	С	FILE #:	FILE #: 3926.00			
75 Valley Stream I	Parkway, Suite 400		REPOR	REPORTED: 10/28/14 11:43			
Malvern, PA 1935	5		SUBMIT	SUBMITTED: 10/21/14 to 10/22/14			
ATTN: Mr. Jeff B PHONE: (443) 8)) 266-8912		AQS SIT		Honeywell Hex Chi	rome Study
Description:	OAM 1	La	ab ID: 4102118-:	10		Sampled: 10	/18/14 15:43
Matrix:	Air	Sa	ample Volume:	21.56 m	3	Received: 10	/21/14 10:57
Comments:	Start Time 10/17/14 15:4	5				Analysis Date: 10	/22/14 14:56
			Hexavalent	Chromium			
			<u>Results</u>			<u>MDL</u>	
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	ם	<u>g/m³ Air</u>	
Hexavalent Chromium	I	1854-02-99	0.0195			0.0036	

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NERC		CERTIFIC	CATE C)F A	NALYSIS	\$	
Environmental Re	sources Management, In	c			FILE #: 3926	5.00	
75 Valley Stream I	Parkway, Suite 400			REPORTED: 10/28/14 11:43			
Malvern, PA 1935	5				SUBMITTED:	10/21/14 to	10/22/14
ATTN: Mr. Jeff B PHONE: (443) 8) 266-8912			AQS SITE CODE: SITE CODE:	н	oneywell Hex Chrome Study
Description:	OAM 2	Lab ID:	4102118	-11			Sampled: 10/18/14 16:15
Matrix:	Air	Sample	Volume:	21.81	m³		Received: 10/21/14 10:57
Comments:	Start Time 10/17/14 16:0	1					Analysis Date: 10/22/14 15:06
			Hexavalen	t Chro	mium		
			<u>Results</u>			<u>MDL</u>	
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>		<u>Flag</u>	<u>ng/m³ Air</u>	
Hexavalent Chromium	1	1854-02-99	0.0206			0.0036	

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Environmental Re	с	FIL	. E #: 392	6.00			
75 Valley Stream I	^D arkway, Suite 400		RE	PORTED:	10/28/14 11:4	3	
Malvern, PA 1935		SU	SUBMITTED: 10/21/14 to 10/22/14				
ATTN: Mr. Jeff B			AQS SITE				
PHONE: (443) 8	03-8495 FAX: (410)) 266-8912		ŝĥ	ECODE:	ł	Ioneywell Hex Chrome Study
Description:	PAM-1	Lal	b ID: 4102118-	12			Sampled: 10/18/14 17:33
Matrix:	Air	Sar	mple Volume:	22.18	m³		Received: 10/21/14 10:57
Comments:	Col 1 Start Time 10/17/14	16:54					Analysis Date: 10/22/14 12:46
			Hexavalent	Chromiu	um		
			<u>Results</u>			MDL	
<u>Analyte</u>		<u>CAS Number</u>	<u>ng/m³ Air</u>		Flag	<u>ng/m³ Air</u>	
Hexavalent Chromium	l i i i i i i i i i i i i i i i i i i i	1854-02-99	0.0241			0.0036	

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Environmental Re	sources Management, In	с	ILE #: 39	926.00				
75 Valley Stream I	Parkway, Suite 400		F	REPORTED:	: 10/28/14 11:	43		
Malvern, PA 19355						SUBMITTED: 10/21/14 to 10/22/14		
ATTN: Mr. Jeff Boggs						AQS SITE		
PHONE: (443) 8	03-8495 FAX: (410) 266-8912		{	TECODE:		Honeywell Hex Chrome Study	
Description:	PAM-1D	Lab	ID: 4102118	3-13			Sampled: 10/18/14 17:35	
Matrix:	Air	Sam	ple Volume:	22.21	m³		Received: 10/21/14 10:57	
Comments:	Col 2 Start Time 10/17/14	16:54					Analysis Date: 10/22/14 13:06	
			Hexavalen	t Chron	nium			
			<u>Results</u>			MDL		
<u>Analyte</u>		CAS Number	<u>ng/m³ Ai</u>	Ľ	<u>Flag</u>	<u>ng/m³ Air</u>		
Hexavalent Chromium		1854-02-99	0.0243			0.0036		

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Environmental Resources Management, Inc						3926.00		
75 Valley Stream Parkway, Suite 400						D: 10/28/14 11	43	
Malvern, PA 19355						SUBMITTED: 10/21/14 to 10/22/14		
ATTN: Mr. Jeff Bo PHONE: (443) 8	oggs 03-8495 FAX: (410) 266-8912			AQS SITE		Honeywell Hex Chrome Study	
Description:	PAM-2	La	b ID: 4102118-	-14			Sampled: 10/18/14 17:13	
Matrix:	Air	Sa	mple Volume:	22.07	′ m³		Received: 10/21/14 10:57	
Comments:	Start Time 10/17/14 16:41						Analysis Date: 10/22/14 15:16	
			Hexavalent	Chro	mium			
			<u>Results</u>			MDL		
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>		<u>Flag</u>	<u>ng/m³ Air</u>		
Hexavalent Chromium		1854-02-99	0.0222			0.0036		

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Environmental Re	sources Management, In	c		FILE #: 3926	5.00	
75 Valley Stream	Parkway, Suite 400			REPORTED:	10/28/14 11:43	
Malvern, PA 1935	5			SUBMITTED:	10/21/14 to 10/2	2/14
ATTN: Mr. Jeff B	oggs			AQS SITE		
PHONE: (443) 8	303-8495 FAX: (410) 266-8912		SITE CODE:	Honey	well Hex Chrome Study
Description:	PAM-3	Lab ID:	4102118-15		5	Sampled: 10/18/14 16:59
Matrix:	Air	Sample V	/olume: 21.9	97 m³	F	Received: 10/21/14 10:57
Comments:	Start Time 10/17/14 16:3	3			Analy	rsis Date: 10/22/14 15:26
		I	Hexavalent Chr	omium		
			<u>Results</u>		MDL	
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	Flag	<u>ng/m³ Air</u>	
Hexavalent Chromium	1	1854-02-99	0.0167		0.0036	

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Environmental Res	ources Management, Inc	:	FILE #:	3926.00				
75 Valley Stream F	Parkway, Suite 400		REPORT	E D: 10/28/1	4 11:43			
Malvern, PA 19355						SUBMITTED: 10/21/14 to 10/22/14		
ATTN: Mr. Jeff Boggs						AQS SITE		
PHONE: (443) 8	03-8495 FAX: (410	266-8912			SITECOL	DE:	Honeywell Hex Chrome Study	
Description:	PAM-4	Lab	ID: 4102118	8-16			Sampled: 10/18/14 16:42	
Matrix:	Air	Sam	nple Volume:	21.86	5 m³		Received: 10/21/14 10:57	
Comments:	Start Time 10/17/14 16:25	· · · · · · · · · · · · · · · · · · ·					Analysis Date: 10/22/14 15:36	
			Hexavalen	t Chro	mium			
			<u>Results</u>			<u>MC</u>	<u>L</u>	
<u>Analyte</u>		CAS Number	<u>ng/m³ Ai</u> r	[<u>Flag</u>	<u>ng/m³</u>	Air	
Hexavalent Chromium		1854-02-99	0.0349			0.00	36	

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Environmental Resources Management, Inc						FILE #:	3926.	00		
75 Valley Stream Parkway, Suite 400							REPORT	ED:	10/28/14 11	:43
Malvern, PA 1935	55						SUBMITT	TED:	10/21/14	to 10/22/14
ATTN: Mr. Jeff E	Boggs						AQS SITE	_		
PHONE: (443)	803-8495	FAX:	(410) 266-8912				SITECO	DE:		Honeywell Hex Chrome Study
Description:	PAM-21			Lab ID:	410211	8-17				Sampled: 10/18/14 00:00
Matrix:	Air			Sample V	olume:	22.0	7 m³	1		Received: 10/21/14 10:57
Comments:										Analysis Date: 10/22/14 16:06
				ł	łexavaler	nt Chro	omium		·	
					<u>Results</u>				<u>MDL</u>	
<u>Analyte</u>			CAS Numb	<u>er</u>	<u>ng/m³ Ai</u>	<u>r</u>	<u>Flag</u>		<u>ng/m³ Air</u>	
Hexavalent Chromium			1854-02-99		ND		υ		0.0036	

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NERG		CERTIFI	CATE OF	ANALYSIS	8	
Environmental Resour	rces Management	, Inc	FILE #: 392	6.00		
75 Valley Stream Park	way, Suite 400		REPORTED:	PORTED: 10/28/14 11:43		
Malvern, PA 19355				SUBMITTED:	10/21/14 to 10/2	2/14
ATTN: Mr. Jeff Bogg PHONE: (443) 803-4		410) 266-8912		AQS SITE	Honey	well Hex Chrome Study
Description: PA	M-31	Lab ID:	4102118-18	B	{	Sampled: 10/18/14 00:00
Matrix: Air		Sample	Volume:	21.97 m³	I	Received: 10/21/14 10:57
Comments:					Analy	/sis Date: 10/22/14 16:16
			Hexavalent C	Chromium		
			<u>Results</u>		MDL	
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99	ND	U	0.0036	

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Environmental Resources Management, Inc						FILE #: 3926.00			
75 Valley Stream Parkway, Suite 400						: 10/28/14 11:4	13		
Malvern, PA 1935	5				SUBMITTED	D: 10/21/14 t	o 10/22/14		
ATTN: Mr. Jeff B PHONE: (443) 8) 266-8912			AQS SITE CODE: SITE CODE:	: ł	Honeywell Hex Chrome Study		
Description:	OAM 1	L	Lab ID: 4102118	-19			Sampled: 10/20/14 16:11		
Matrix:	Air	S	Sample Volume:	21.65	i m³		Received: 10/21/14 10:57		
Comments:	Start Time 10/19/14 16:0	8				<u> </u>	Analysis Date: 10/23/14 13:15		
			Hexavalent	t Chro	mium				
			Results			MDL			
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>		<u>Flag</u>	<u>ng/m³ Air</u>			
Hexavalent Chromium	i	1854-02-99	0.0175			0.0036			

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NERC	Ē	CERTIFIC	CATE OF	ANALYSIS	5		
Environmental Re	sources Management, In	c		FILE #: 3926	5.00		
75 Valley Stream	Parkway, Suite 400		REPORTED:	REPORTED: 10/28/14 11:43			
Malvern, PA 1935	5		SUBMITTED:	SUBMITTED: 10/21/14 to 10/22/14			
ATTN: Mr. Jeff B PHONE: (443) 8) 266-8912		AQS SITE CODE: SITE CODE:	Hon	eywell Hex Chrome Study	
Description:	OAM 2	Lab ID:	4102118-20			Sampled: 10/20/14 16:39	
Matrix:	Air	Sample	Volume: 2	1.86 m³		Received: 10/21/14 10:57	
Comments:	Start Time 10/19/14 16:2	2			An	alysis Date: 10/23/14 13:25	
			Hexavalent C	hromium			
			<u>Results</u>		<u>MDL</u>		
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>		
Hexavalent Chromium	1	1854-02-99	0.0170		0.0036		

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NERC		CERTIFIC	CATE O	FANALYSIS	5			
Environmental Re	sources Management, In	c		FILE #: 392	6.00			
75 Valley Stream	Parkway, Suite 400		REPORTED:	REPORTED: 10/28/14 11:43				
Malvern, PA 1935	5		SUBMITTED:	SUBMITTED: 10/21/14 to 10/22/14				
ATTN: Mr. Jeff B	oggs			AQS SITE				
PHONE: (443) 8	03-8495 FAX: (410) 266-8912		SITE CODE:	Ho	neywell Hex Chrome Study		
Description:	PAM-1	Lab ID:	4102118-	21		Sampled: 10/20/14 17:47		
Matrix:	Air	Sample	/olume:	21.92 m³		Received: 10/21/14 10:57		
Comments:	Col 1 Start Time 10/19/14	17:26			A	nalysis Date: 10/23/14 12:13		
			Hexavalent	Chromium				
			<u>Results</u>		MDL			
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	Flag	<u>ng/m³ Air</u>			
Hexavalent Chromium	I	1854-02-99	0.0357		0.0036			

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NERC		CERTIFIC	CATE OF	ANALYSIS	;		
Environmental Re	sources Management, In-	с		FILE #: 3926	5.00		
75 Valley Stream F	Parkway, Suite 400		REPORTED:	REPORTED: 10/28/14 11:43			
Malvern, PA 1935	5		SUBMITTED:	SUBMITTED: 10/21/14 to 10/22/14			
ATTN: Mr. Jeff B PHONE: (443) 8)) 266-8912		AQS SITE CODE: SITE CODE:	На	oneywell Hex Chrome Study	
Description:	PAM-2	Lab ID:	4102118-23			Sampled: 10/20/14 17:29	
Matrix:	Air	Sample	Volume: 2	1.91 m³		Received: 10/21/14 10:57	
Comments:	Start Time 10/19/14 17:0	8			A	nalysis Date: 10/23/14 13:35	
			Hexavalent Ch	hromium			
			<u>Results</u>		MDL		
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>		
Hexavalent Chromium	I	1854-02-99	0.0337		0.0036		

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Environmental Resources Management, Ir	IC	FILE #: 3926.0	FILE #: 3926.00			
.75 Valley Stream Parkway, Suite 400		REPORTED: 1	0/28/14 11:43			
Malvern, PA 19355		SUBMITTED:	10/21/14 to 10/22/14			
ATTN: Mr. Jeff Boggs PHONE: (443) 803-8495 FAX: (41)	0) 266-8912	AQS SITE	Honeywell Hex Chrome Study			
Description: PAM-3	Lab ID: 4102118-24	1	Sampled: 10/20/14 17:14			
Matrix: Air	Sample Volume:	21.92 m³	Received: 10/21/14 10:57			
Comments: Start Time 10/19/14 16:5	52		Analysis Date: 10/23/14 13:45			
	Hexavalent (Chromium				
	<u>Results</u>		<u>MDL</u>			
Analyte	CAS Number ng/m³ Air	<u>Flag</u>	<u>ng/m³ Air</u>			
Hexavalent Chromium	1854-02-99 0.0258		0.0036			

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Environmental Res		F	FILE #: 3926.00						
75 Valley Stream F			F	REPORTED: 10/28/14 11:43			43		
Malvern, PA 19355							SUBMITTED: 10/21/14 to 10/22/14		
ATTN: Mr. Jeff Br PHONE: (443) 8) 266-8912	AQS SITE SITECODE:						
Description:	PAM-4		Lab ID:	4102118-2	5				Sampled: 10/20/14 16:57
Matrix:	Air	5	Sample Volu	ume:	21.82	m³			Received: 10/21/14 10:57
Comments:	Start Time 10/19/14 16:42	2							Analysis Date: 10/23/14 14:14
			He	xavalent C	Chron	nium			
			<u> </u>	<u>Results</u>				<u>MDL</u>	
<u>Analyte</u>		CAS Number	: ng	<u>a/m³ Air</u>		<u>Flag</u>	1	ng/m³ Air	
Hexavalent Chromium		1854-02-99		0.0597				0.0036	

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Environmental Resources Management, Inc								FILE #: 3926.00			
75 Valley Stream Parkway, Suite 400							REPORTED: 10/28/14 11:43				
Malvern, PA 1935	5						SUBMITT	ED:	10/21/14 to	0 10/22/14	
ATTN: Mr. Jeff E PHONE: (443) 8	55	=AX: ((410) 266-8912				AQS SITE	-	н	loneywell Hex Chrome Stud	ly
Description:	PAM-21			Lab ID:	4102118	8-26				Sampled: 10/20/14 00:	00
Matrix:	Air			Sample V	olume:	21.9	L m³			Received: 10/21/14 10:	57
Comments:										Analysis Date: 10/23/14 14:	24
				н	lexavalen	t Chro	mium				
					<u>Results</u>				MDL		
Analyte			CAS Numbe	er	<u>ng/m³ Air</u>		Flag	ļ	ng/m³ Air		
Hexavalent Chromium			1854-02-99		ND		U		0.0036		

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Environmental Resource	es Management, Inc	FILE #: 3926.00			
75 Valley Stream Parkw	ay, Suite 400	REPORTED:	10/28/14 11:43		
Malvern, PA 19355			SUBMITTED:	10/21/14 to 10/22/14	
ATTN: Mr. Jeff Boggs PHONE: (443) 803-84	95 FAX: (410) 266-8912		AQS SITE CODE: SITE CODE:	Honeywell Hex Chrome Study	
Description: PAM-	31	Lab ID: 4102118-27		Sampled: 10/20/14 00:00	
Matrix: Air		Sample Volume: 21.9	92 m³	Received: 10/21/14 10:57	
Comments:				Analysis Date: 10/23/14 14:34	
		Hexavalent Chr	omium		
		<u>Results</u>		MDL	
Analyte	CAS Numbe	<u>er ng/m³ Air</u>	Flag	<u>ng/m³ Air</u>	
Hexavalent Chromium	1854-02-99	ND	U	0.0036	

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CERTIFICATE OF ANALYSIS

Environmental Res	าต			FILE #: 3926.00					
75 Valley Stream F				REPORTED: 10/28/14 11:43			43		
Malvern, PA 19355							SUBMITTED: 10/21/14 to 10/22/14		
ATTN: Mr. Jeff Bo PHONE: (443) 8		0) 266-8912				AQS SITE			Honeywell Hex Chrome Study
Description:	OAM 1		Lab ID:	4102232	2-01				Sampled: 10/21/14 16:03
Matrix:	Air		Sample V	olume:	21.34	1 m³			Received: 10/22/14 10:58
Comments:	Start Time 10/20/14 16:2	20				<u></u>			Analysis Date: 10/23/14 14:44
			H	lexavalen	t Chro	mium			
				<u>Results</u>				MDL	
<u>Analyte</u>		CAS Numbe	<u>er</u>	<u>ng/m³ Air</u>	:	<u>Flag</u>		<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99		0.0238				0.0036	

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Environmental Re	sources Mar	agement	, inc				FILE #: 39	26.00		
75 Valley Stream Parkway, Suite 400							REPORTED: 10/28/14 11:43			
Malvern, PA 19355							SUBMITTED: 10/21/14 to 10/22/14			
ATTN: Mr. Jeff B					AQS SITE					
PHONE: (443) 8	303-8495	FAX:	410) 266-8912				SITE CODE:		Honeywell Hex Chrome Study	
Description:	OAM 2			Lab ID:	4102232	2-02			Sampled: 10/21/14 16:23	
Matrix:	Air			Sample V	olume:	21.28	m ³		Received: 10/22/14 10:58	
Comments:	Start Time 1	.0/20/14 1	.6:44						Analysis Date: 10/23/14 14:54	
				н	lexavaler	it Chro	mium			
					<u>Results</u>			<u>MDL</u>		
Analyte			CAS Numb	<u>er</u>	<u>ng/m³ Ai</u>	Ľ	Flag	<u>ng/m³ Air</u>		
Hexavalent Chromium	ı		1854-02-99		0.0330			0.0036		

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NERC	Ē	CER	TIFICATE	OF ANA	LYSI	5		
Environmental Re	sources Manag	ement, Inc		FILE	#: 392	6.00		
75 Valley Stream	Parkway, Suite	400		REP	REPORTED: 10/28/14 11:43			
Malvern, PA 1935	5			SUB	SUBMITTED: 10/21/14 to 10/22/14			
ATTN: Mr. Jeff B PHONE: (443) 8		AX: (410) 266-8912			SITE CODE:	н	oneywell Hex Chrome Study	
Description:	PAM-1		Lab ID: 410223	32-03			Sampled: 10/21/14 17:06	
Matrix:	Air		Sample Volume:	20.93	m³		Received: 10/22/14 10:58	
Comments:	Col 1 Start Tim	e 10/20/14 17:51					Analysis Date: 10/23/14 12:33	
			Hexavale	nt Chromiu	n			
			<u>Results</u>			MDL		
<u>Analyte</u>		CAS Number	<u>ng/m³ A</u>	ir F	laq	<u>ng/m³ Air</u>		
Hexavalent Chromiun	1	1854-02-99	0.0718			0.0036		

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NERC	Ē	CERTIFIC	ATE OF	F ANALYS	SIS		
Environmental Re	sources Management, In	с		FILE #:	3926.00		
75 Valley Stream I	Parkway, Suite 400		REPORTE	REPORTED: 10/28/14 11:43			
Malvern, PA 1935	5			SUBMITTE	D: 10/21/14 to	10/22/14	
ATTN: Mr. Jeff B PHONE: (443) 8)) 266-8912		AQS SITE CODE: SITE COD	E: Ho	neywell Hex Chrome Study	
Description:	PAM-1D	Lab ID:	4102232-0	4		Sampled: 10/21/14 17:11	
Matrix:	Air	Sample \	/olume:	20.85 m³		Received: 10/22/14 10:58	
Comments:	Col 2 Start Time 10/20/14	18:01			Α	nalysis Date: 10/23/14 12:53	
		I	Hexavalent (Chromium			
			<u>Results</u>		MDL		
Analyte		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>		
Hexavalent Chromium	1	1854-02-99	0.0833		0.0036		

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NERC	Ĵ	CERTIFIC	CATE OF	F ANALY	SIS			
Environmental Re	sources Management, In	c		FILE #:	3926.00			
75 Valley Stream I	Parkway, Suite 400		REPORTI	REPORTED: 10/28/14 11:43				
Malvern, PA 1935	5		SUBMITT	SUBMITTED: 10/21/14 to 10/22/14				
ATTN: Mr. Jeff B PHONE: (443) 8	00)) 266-8912		AQS SITE CODE: SITE COL	-	Honeywell Hex Chrome Study		
Description:	PAM-2	Lab ID:	4102232-0)5		Sampled: 10/21/14 16:56		
Matrix:	Air	Sample	Volume:	21.05 m ³		Received: 10/22/14 10:58		
Comments:	Start Time 10/20/14 17:3	3				Analysis Date: 10/23/14 15:04		
			Hexavalent	Chromium				
			<u>Results</u>		MDL			
Analyte		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>			
Hexavalent Chromium	I	1854-02-99	0.0291		0.0036			

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NERC	Ì	CERTIFIC	CATE OF /	ANALYSIS	6					
Environmental Re	sources Management, li	nc		FILE #: 3920	5.00					
75 Valley Stream	Parkway, Suite 400		REPORTED:	REPORTED: 10/28/14 11:43						
Malvern, PA 1935	5			SUBMITTED:	10/21/14 to '	10/22/14				
ATTN: Mr. Jeff B PHONE: (443) 8		0) 266-8912		AQS SITE CODE: SITE CODE:	Ho	neywell Hex Chrome Study				
Description:	PAM-3	Lab ID:	4102232-06			Sampled: 10/21/14 16:45				
Matrix:	Air	Sample	Volume: 21	.1 m³		Received: 10/22/14 10:58				
Comments:	Start Time 10/20/14 17:	18			Aı	nalysis Date: 10/23/14 15:14				
			Hexavalent Ch	romium						
			<u>Results</u>		<u>MDL</u>					
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	Flag	<u>ng/m³ Air</u>					
Hexavalent Chromium	I	1854-02-99	0.0372		0.0036					

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CERTIFICATE OF ANALYSIS

Environmental Res	sources Management, Ind	0			FILE #: 3926.00							
75 Valley Stream F				REPORTED: 10/28/14 11:43								
Malvern, PA 19355							SUBMITTED: 10/21/14 to 10/22/14					
ATTN: Mr. Jeff Bo PHONE: (443) 8	oggs 03-8495 FAX: (410) 266-8912				AQS SITE		ł	Honeywell Hex Chrome Study			
Description:	PAM-4		Lab ID:	4102232-	-07				Sampled: 10/21/14 16:36			
Matrix:	Air		Sample Vo	olume:	21.23	8 m³			Received: 10/22/14 10:58			
Comments:	Start Time 10/20/14 17:02	1							Analysis Date: 10/23/14 15:24			
	Hexavalent Chromium <u>Results</u> <u>MDL</u>											
Analyte		CAS Numbe	r	<u>ng/m³ Air</u>		<u>Flag</u>	i	<u>ng/m³ Air</u>				
Hexavalent Chromium		1854-02-99		0.151				0.0036				

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Environmental Resources Ma	nagement, Inc	FILE #:	FILE #: 3926.00							
75 Valley Stream Parkway, Su	iite 400	REPORT	REPORTED: 10/28/14 11:43							
Malvern, PA 19355		SUBMIT	SUBMITTED: 10/21/14 to 10/22/14							
ATTN: Mr. Jeff Boggs PHONE: (443) 803-8495	FAX: (410) 266-8912	AQS SIT								
Description: PAM-21	Lab ID:	4102232-08	Sampled: 10/21/14 00:00							
Matrix: Air	Sample Vo	olume: 21.05 m³	n ³ Received: 10/22/14 10:58							
Comments:			Analysis Date: 10/23/14 15:34							
	Hexavalent Chromium Results MDL									
Analyte	CAS Number	<u>ng/m³ Air</u> <u>Flag</u>	<u>ng/m³ Air</u>							
Hexavalent Chromium	1854-02-99	ND U	0.0036							

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CERTIFICATE OF ANALYSIS

Environmental Reso	urces Managemei	nt, Inc		FILE #: 3926.00							
75 Valley Stream Pa	rkway, Suite 400			REPORTED: 10/28/14 11:43							
Malvern, PA 19355					SUBMITTED	D: 10/21/14 1	o 10/22/14				
ATTN: Mr. Jeff Bog PHONE: (443) 803		(410) 266-8912			AQS SITE	: 1	Honeywell Hex Chrome Study				
Description: P	AM-31		Lab ID:	4102232-09			Sampled: 10/21/14 00:00				
Matrix: A	lir.		Sample Volu	ume: 21.1	m³		Received: 10/22/14 10:58				
Comments:							Analysis Date: 10/23/14 15:43				
				xavalent Chro	mium						
			E	<u>Results</u>		MDL					
<u>Analyte</u>		CAS Numbe	<u>er no</u>	<u>g/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>					
Hexavalent Chromium		1854-02-99		ND	U	0.0036					

KK 10/29/14

Eastern Research Group



October 31, 2014

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

LDC Project #32961:

<u>SDG</u>

Fraction

4102421

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,

till for

Christina Rink Project Manager/Chemist

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	Level IV	L	DC #32	96	1 (E	R	/ -	Mo	rris	svil	le,	NC	; 1	Ha	rbo	r P	oin	n t, f	MD	, He	exa	va	len	t C	hrc	mi	um	M	oni	tor	ing)		Vjetere					
LDC	SDG#	DATE REC'D	(3) DATE DUE	Cr (D7	(VI) (614)								-		_								-		_		-						-						
Matrix	: Air/Water/Soil	1		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
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Total	T/CR			9	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	9

LDC Report# 32961A6

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:	Harbor Point, MD, Hexavalent Chromium Monitoring
Collection Date:	October 23, 2014
LDC Report Date:	October 30, 2014
Matrix:	Air
Parameters:	Hexavalent Chromium
Validation Level:	EPA Level IV
Laboratory:	Eastern Research Group
Sample Delivery Group (SDG):	4102421

1

Sample Identification

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

Introduction

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

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

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

The following are definitions of the data qualifiers:

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

2

I. Technical Holding Times

All technical holding time requirements were met.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met.

IV. Blanks

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

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

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

V. Matrix Spike/Matrix Spike Duplicates

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

VI. Duplicates

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

VII. Laboratory Control Samples

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

VIII. Sample Result Verification

All sample result verifications were acceptable.

IX. Overall Assessment of Data

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

X. Field Duplicates

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

	Concentrati	ion (ng/m³)			
Analyte	PAM-1	PAM-1D	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.0507	0.0461	10 (≤20)	-	-

Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Data Qualification Summary - SDG 4102421

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

Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG 4102421

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 4102421

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

LDC #: <u>32961A6</u>	_ VALIDATION COMPLETENESS WORKSHEET	Date: [0]
SDG #: 4102421	Level IV	Page: <u>l</u> ot
Laboratory: Eastern Researc	h 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
1.	Technical holding times	A	Sampling dates: 10/23/14
11	Initial calibration	A	
111.	Calibration verification	A	
١٧	Blanks	A	
v	Matrix Spike/Matrix Spike Duplicates	N	Not Required
VI.	Duplicates	A	DUD
VII.	Laboratory control samples	A	Lesio
VIII.	Sample result verification	A	
IX.	Overall assessment of data	A	
Х.	Field duplicates	SW	FO=(3,4)
	Field blanks	20	FB=8 -1B=9

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

NS

ND = No compounds detected R = Rinsate FB = Field blank D = Duplicate TB = Trip blank EB = Equipment blank

Validated Samples:

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

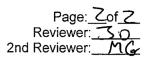
Notes:_

VALIDATION FINDINGS CHECKLIST

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?	1			,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
Were the proper number of standards used?	/			
Were all initial calibration correlation coefficients ≥ 0.995 ?	/			
Were all initial and continuing calibration verification %Rs within the 90-110% QC limits?	/			
Were titrant checks performed as required? (Level IV only)				
Were balance checks performed as required? (Level IV only)				
III. Blanks				
Was a method blank associated with every sample in this SDG?	/			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		/		
IV. Matrix spike/Matrix spike duplicates and Duplicates				
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	/			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.			/	
Were the MS/MSD or duplicate relative percent differences (RPD) \leq 20% for waters and \leq 35% for soil samples? A control limit of \leq CRDL(\leq 2X CRDL for soil) was used for samples that were \leq 5X the CRDL, including when only one of the duplicate sample values were \leq 5X the CRDL.	/			
V. Laboratory control samples				
Was an LCS anaylzed for this SDG?	/			
Was an LCS analyzed per extraction batch?	$\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{$			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% (85-115% for Method 300.0) QC limits?	/			
VI. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?			/	
Were the performance evaluation (PE) samples within the acceptance limits?			-	

LDC #: 32961AC

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?	1			
Were detection limits < RL?	/			
VIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	/			
IX. Field duplicates				
Field duplicate pairs were identified in this SDG.	/			
Target analytes were detected in the field duplicates.	/	:		
X. Field blanks		5	5	
Field blanks were identified in this SDG.		*		(yez)
Target analytes were detected in the field blanks.		/		

•

LDC# 32961A6

VALIDATION FINDINGS WORKSHEET Field Duplicates

Page: <u>l</u>of <u>l</u> Reviewer: <u>SD</u> 2nd Reviewer: <u>MG</u>

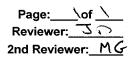
Inorganics: Method See Cover

	Concentra	tion (ng/m3)		Qual.
Analyte	3	4	RPD (≤20)	
Hexavalent Chromium	0.0507	0.0461	10	

\LDCFILESERVER\Validation\FIELD DUPLICATES\FD_inorganic\32961A6.wpd

LDC #: 3361A6

Validation Findings Worksheet Initial and Continuing Calibration Calculation Verification



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

The correlation coefficient (r) for the calibration of C

Where,

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

%R = Found X 100

True

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

					Recalculated	Reported	Acceptable
Type of analysis	Analyte	Standard	Conc. (ng/mL)	Area	r or r ²	r or r ²	(Y/N)
Initial calibration		s1	0.05	0.000017			
		s2	0.1	0.0000363	0.99994	0.99994	
		s3	0.2	0.000079			
	Crit	s4	0.5	0.0002057			Ч
		s5	1	0.0004097			\mathcal{I}
		s6	2	0.0008423			
Jev 11:25	Cito	Faind	Tre				
Calibration verification		0.5105mjm	O.Snafml		102.1%E	102.1%2	
CEU 12:27 Calibration verification	Craw	0.5091 ng/m	O. Snglul		101.8%p	101.8%R	Y
Calibration verification							

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

LDC #: 32961A6

VALIDATION FINDINGS WORKSHEET Level IV Recalculation Worksheet

METHOD: Inorganics, Method See Cover

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

%R = Found x 100 Found = concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation, Where. Found = SSR (spiked sample result) - SR (sample result). True

True = concentration of each analyte in the source.

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

RPD = <u> S-D </u> 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)
LCS 11:54	Laboratory control sample	Crth	1.07 mg/ml	Inglui	107%R	107%E	3
	Matrix spike sample		(SSR-SR)				
Dup 12:57	Duplicate sample	Crto	0.0546ng/m ³	0.0507 ng/2	7.41 /200	7.45 %RPD	3

Comments:

LDC #: 3296146

VALIDATION FINDINGS WORKSHEET

Samp	le Cal	culation	Verification

Page:_	of
Reviewer:	50
	MG

METHOD: Inorganics, Method See Cover

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

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

Comp	ound (analyte) results fo	r	(4)	repo	orted with a positiv	ve detect were	е
Concen	ulated and verified using $tration = (A - C_0) C_0$ $arrow - b - 2E - 0 - b_0$	Recalcul	r	000-427-7	-	0.1013	
	= 0.000477 = 0.0000366	m3 = 21.96 (ng/m1)(bf) m3	- (1	21.0 21.0	$\frac{(10-1)}{16m^3} = l$	0.0461	rg/m ³
#	Sample ID	Analyte		Reported Concentration (Vicy)m ³)	Calculated Concentration (nalun ³)	Acceptable (Y/N)	
	١ ١	Cxt	+10	0.043	0.0113	4	
	2)		QU	ND		
	3			0.0507	0.0507		
	4			0.0461	0.0461	4	
	4 5			0.0348	0.0347	4*	
	6			NO	NO	3	
	7			0.0367	0.0366	47	
	8			ND	NO	Y	
	9			94	ND	Υ.	
			°				
						·	* ~

Note:_

NERC		CERTIFIC	ATE OF A	ANALYSIS	5						
Environmental Re	sources Management, Inc	c	FILE #: 3926	6.00							
75 Valley Stream i	Parkway, Suite 400			REPORTED:	10/30/14 12:39						
Malvern, PA 1935	5			SUBMITTED:	10/24/14						
ATTN: Mr. Jeff B	oggs			AQS SITE COD)E:						
PHONE: (443) 8	03-8495 FAX: (410) 266-8912		SITE CODE:	Ho	neywell Hex Chrome Study					
Description:	OAM 1	Lab ID:	4102421-01			Sampled: 10/23/14 16:00					
Matrix:	Air	Sample V	/olume: 21.	72 m³		Received: 10/24/14 11:40					
Comments:	Start Time 10/22/14 15:52	2			A	nalysis Date: 10/27/14 13:29					
Hexavalent Chromium											
			<u>Results</u>		<u>MDL</u>						
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>						
Hexavalent Chromium	I	1854-02-99	0.0113		0.0036						

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CERTIFICATE OF ANALYSIS										
Environmental Resources Management, Inc							FILE #: 392	26.00		
75 Valley Stream Parkway, Suite 400						REPORTED:	10/30/14 12	:39		
Malvern, PA 1935	5						SUBMITTED:	10/24/14		
ATTN: Mr. Jeff E	Boggs						AQS SITE CO	DE:		
PHONE: (443)	803-8495	FAX: (41)	0) 266-8912				SITE CODE:		Honeywell Hex Chrome Study	
Description:	OAM 2			Lab ID:	410242	1-02			Sampled: 10/23/14 16:18	
Matrix:	Air			Sample V	olume:	21.7	m³		Received: 10/24/14 11:40	
Comments:	Start Time	10/22/14 16:1	.1						Analysis Date: 10/27/14 13:39	
				н	exavale	nt Chro	omium			
					<u>Results</u>			<u>MDL</u>		
<u>Analyte</u>			<u>CAS Numbe</u>	<u>er</u>	<u>ng/m³ Ai</u>	ir	Flag	<u>ng/m³ Air</u>		
Hexavalent Chromium			1854-02-99		ND		U	0.0036		

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Environmental Resources Management, Inc					FILE #: 3926.00			
75 Valley Stream F	^o arkway, Suite 400		REPORTED	REPORTED: 10/30/14 12:39				
Malvern, PA 19355	5		SUBMITTED: 10/24/14					
ATTN: Mr. Jeff B	oggs			AQS SITE CODE:				
PHONE: (443) 8	03-8495 FAX: (410	0) 266-8912		SITE CODE	:	Honeywell Hex Chrome Study		
Description:	PAM-1	Lab ID:	4102421-03			Sampled: 10/23/14 17:10		
Matrix:	Air	Sample	Volume: 21.9)3 m³		Received: 10/24/14 11:40		
Comments:	Col 1 Start Time 10/22/14	16:48				Analysis Date: 10/27/14 12:47		
			Hexavalent Chr	omium				
			<u>Results</u>		MDL			
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	Flag	<u>ng/m³ Air</u>			
Hexavalent Chromium		1854-02-99	0.0507		0.0036			

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Page 5 of 13

Environmental Re	sources Management, In	с		FILE #:	3926.00	
75 Valley Stream	Parkway, Suite 400			REPORT	TED: 10/30/14 1	2:39
Malvern, PA 1935	5			SUBMIT	TED: 10/24/14	
ATTN: Mr. Jeff B	oggs			AQS SIT	E CODE:	
PHONE: (443) 8	303-8495 FAX: (410)) 266-8912		SITE CO	DE:	Honeywell Hex Chrome Study
Description:	PAM-1D	Lab ID	4102421-	-04		Sampled: 10/23/14 17:15
Matrix:	Air	Sample	e Volume:	21.96 m ²	3	Received: 10/24/14 11:40
Comments:	Col 2 Start Time 10/22/14	16:51				Analysis Date: 10/27/14 13:07
			Hexavalent	Chromium		
			<u>Results</u>		MDL	
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Ai</u>	I Contraction of the second second second second second second second second second second second second second
Hexavalent Chromium	1	1854-02-99	0.0461		0.0036	

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Page 6 of 13

N ERC	Ē	CERTIFIC	ATE OF	ANALYSIS	5	
Environmental Re	sources Management, In	с		FILE #: 392	6.00	
75 Valley Stream	Parkway, Suite 400			REPORTED:	10/30/14 12:3	39
Malvern, PA 1935	5			SUBMITTED:	10/24/14	
ATTN: Mr. Jeff B	loggs			AQS SITE COI	DE:	
PHONE: (443) 8	303-8495 FAX: (410)) 266-8912		SITE CODE:	ŀ	Ioneywell Hex Chrome Study
Description:	PAM-2	Lab ID:	4102421-05			Sampled: 10/23/14 16:58
Matrix:	Air	Sample \	/olume: 21	.87 m³		Received: 10/24/14 11:40
Comments:	Start Time 10/22/14 16:4	0				Analysis Date: 10/27/14 13:49
		I	Hexavalent Ch	romium		
			<u>Results</u>		<u>MDL</u>	
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>	
Hexavalent Chromium	1	1854-02-99	0.0348		0.0036	

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Page 7 of 13

Environmental Resour	irces Management, Inc		FILE #: 3926.00							
75 Valley Stream Park	kway, Suite 400			REPORTED: 10/30/14 12:39						
Malvern, PA 19355				SUBMITTED	: 10/24/14					
ATTN: Mr. Jeff Bogg	IS			AQS SITE CO	ODE:					
PHONE: (443) 803-	8495 FAX: (410)	266-8912		SITE CODE:	H	ioneywell Hex Chrome Study				
Description: PA	M-3	Lab ID:	4102421-06			Sampled: 10/23/14 16:48				
Matrix: Air	r	Sample \	/olume: 21.8	4 m³		Received: 10/24/14 11:40				
Comments: Sta	art Time 10/22/14 16:32					Analysis Date: 10/27/14 13:59				
		I	Hexavalent Chro	omium						
			<u>Results</u>		MDL					
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	Flag	<u>ng/m³ Air</u>					
Hexavalent Chromium		1854-02-99	ND	U	0.0036					

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Environmental Res	sources Management, In	c		FILE #: 3926.00					
75 Valley Stream F	Parkway, Suite 400				REPORTE	E D: 10/30/14 12	2:39		
Malvern, PA 19355	5				SUBMITT	ED: 10/24/14			
ATTN: Mr. Jeff B	oggs				AQS SITE	CODE:			
PHONE: (443) 8	03-8495 FAX: (410) 266-8912			SITE COD	DE:	Honeywell Hex Chrome Study		
Description:	PAM-4	Lab	ID: 4102421-	07			Sampled: 10/23/14 16:28		
Matrix:	Air	Sam	nple Volume:	21.65	m³		Received: 10/24/14 11:40		
Comments:	Start Time 10/22/14 16:2	5	- <u>-</u>	_			Analysis Date: 10/27/14 14:09		
			Hexavalent	Chro	mium				
			<u>Results</u>			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			

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Environmental Resources M	ianagement, Inc	FILI	E#: 3926.00	
75 Valley Stream Parkway, S	Suite 400	REF	PORTED: 10/30	14 12:39
Malvern, PA 19355		SUE	SMITTED: 10/2	24/14
ATTN: Mr. Jeff Boggs		AQ	S SITE CODE:	
PHONE: (443) 803-8495	FAX: (410) 266-8912	SIT	E CODE:	Honeywell Hex Chrome Study
Description: PAM-21	Lab ID:	4102421-08		Sampled: 10/23/14 00:00
Matrix: Air	Sample V	/olume: 21.87	m³	Received: 10/24/14 11:40
Comments:				Analysis Date: 10/27/14 14:19
	I	Hexavalent Chromiu	m	
		<u>Results</u>	M	<u>DL</u>
<u>Analyte</u>	CAS Number	<u>ng/m³ Air</u>	<u>Flag ng/n</u>	<u>1³ Air</u>
Hexavalent Chromium	1854-02-99	ND	U 0.	0036

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Environmental R	esources Ma	nagemer	it, Inc			F	ILE #: 392	6.00	
75 Valley Stream	Parkway, S	uite 400				R	EPORTED:	10/30/14 12:	39
Malvern, PA 193	55					S	UBMITTED:	10/24/14	
ATTN: Mr. Jeff	Boggs					A	QS SITE CO	DE:	
PHONE: (443)	803-8495	FAX:	(410) 266-8912			s	ITE CODE:		Honeywell Hex Chrome Study
Description:	PAM-31			Lab ID:	410242	1-09			Sampled: 10/23/14 00:00
Matrix:	Air			Sample Vo	lume:	21.84	m³		Received: 10/24/14 11:40
Comments:									Analysis Date: 10/27/14 14:49
				He	exavaler	nt Chrom	ium		
					<u>Resuits</u>			<u>MDL</u>	
<u>Analyte</u>			CAS Numbe	er I	ng/m³ Ai	r	<u>Flag</u>	<u>ng/m³ Air</u>	
Hexavalent Chromium			1854-02-99		ND		U	0.0036	

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Page 11 of 13



November 11, 2014

ERM 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 November 10, 2014. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #33053:

<u>SDG</u>

Fraction

4102826

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

	102 pages-SF															achn																							
	Level IV	Ē	DC #33	053	3 (E	RN	1 = 1	Мо	rris	svil	le,	NC	; 1	Ha	rbc	r P	oir	nt, I	MD	, H	exa	iva	len	t C	hro	omi	um	M	oni	tor	ing	I)							
LDO	SDG#	DATE REC'D	(3) DATE DUE	Cr((D7	(VI) 614)		_																		_														
	trix: Air/Water/Soil	I	All states and states	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	4102826	11/10/14	11/17/14	18	0		<u> </u>				-			-		-	-			<u> </u>																	-	\vdash	
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Tota	I A/CR			18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18

Shaded cells indicate Level IV validation (all other cells are Level II validation). These sample counts do not include MS/MSD, and DUPs

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:	Harbor Point, MD, Hexavalent Chromium Monitoring
Collection Date:	October 24 through October 27, 2014
LDC Report Date:	November 10, 2014
Matrix:	Air
Parameters:	Hexavalent Chromium
Validation Level:	EPA Level IV
Laboratory:	Eastern Research Group
Sample Delivery Group (SDG):	4102826

Sample Identification

OAM 1(10/24/14) OAM 2(10/24/14) PAM-1(10/24/14) PAM-1D(10/24/14) PAM-2(10/24/14) PAM-3(10/24/14) PAM-3(10/24/14) PAM-4(10/24/14) PAM-21(10/24/14) OAM 1(10/27/14) OAM 2(10/27/14) PAM-1D(10/27/14) PAM-2(10/27/14) PAM-3(10/27/14) PAM-21(10/27/14) PAM-31(10/27/14)	PAM-1(10/27/14)DUP PAM-1D(10/27/14)DUP
PAM-31(10/27/14) PAM-1(10/24/14)DUP	
PAM-1D(10/24/14)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(10/24/14) and PAM-31(10/27/14) were identified as trip blanks. No hexavalent chromium was found.

Samples PAM-21(10/24/14) and PAM-21(10/27/14) 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(10/24/14) and PAM-1D(10/24/14) and samples PAM-1(10/27/14) and PAM-1D(10/27/14) were identified as field duplicates. No hexavalent chromium was detected in any of the samples with the following exceptions:

	Concentrati	ion (ng/m³)			
Analyte	PAM-1(10/24/14)	PAM-1D(10/24/14)	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.0229	0.0190	19 (≤20)	-	-

	Concentrati	ion (ng/m³)			
Analyte	PAM-1(10/27/14)	PAM-1D(10/27/14)	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.0843	0.101	18 (≤20)	-	-

Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Data Qualification Summary - SDG 4102826

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

Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG 4102826

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 4102826

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

LDC #:	33053A6	VALIDATION COMPLETENESS WORKSHEET	Date: 11/10/14
SDG #:	4102826	Level IV	Page: 1_of_1_
Laborato	ory: Eastern Research	Group	Reviewer: 39
			2nd Reviewer: 0

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
١.	Technical holding times	A	Sampling dates: 10/24/14, [0/27/14
u	Initial calibration	A	
10.	Calibration verification	A	
IV	Blanks	A	
v	Matrix Spike/Matrix Spike Duplicates	N	Not Required
VI.	Duplicates	A	Dup '
VII.	Laboratory control samples	A	LCSD
VIII.	Sample result verification	A	
IX.	Overall assessment of data	A	
Х.	Field duplicates	SN	FD = (3.4) (12.13)
	Field blanks	<u>VV</u>	FB = (8), (17), TB = (9)(18)

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

ND = No compounds detected R = Rinsate FB = Field blank D = Duplicate TB = Trip blank EB = Equipment blank

Validated Samples:

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

Notes:_

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VALIDATION FINDINGS CHECKLIST

-

Method: Inorganics (EPA Method See Cover)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times	.			
All technical holding times were met.	/			
Cooler temperature criteria was met.	1			
II. Calibration		·····		······································
Were all instruments calibrated daily, each set-up time?	/			· · · · · · · · · · · · · · · · · · ·
Were the proper number of standards used?	\leq			
Were all initial calibration correlation coefficients > 0.995?	\square			
Were all initial and continuing calibration verification %Rs within the 20-110 % QC limits?	/			······
Were titrant checks performed as required? (Level IV only)	L		1	· · · · · · · · · · · · · · · · · · ·
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.	/			
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.	1			
V. Laboratory control samples				
Was an LCS anaylzed for this SDG?				
Was an LCS analyzed per extraction batch?	\langle			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% (85-115% for Method 300,0) QC limits?	/			
VI. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?			/	······································
Were the performance evaluation (PE) samples within the acceptance limits?				

VALIDATION FINDINGS CHECKLIST

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

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LDC#<u>33053A6</u>

VALIDATION FINDINGS WORKSHEET Field Duplicates

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

Inorganics: Method See Cover

	Concentra	tion (ng/m3)		Qual.
Analyte	3	4	RPD (≤20)	
Hexavalent Chromium	0.0229	0.0190	19	

	Concentra	tion (ng/m3)		Qual.
Analyte	12	13	RPD (≤20)	
Hexavalent Chromium	0.0843	0.101	18	

\LDCFILESERVER\Validation\FIELD DUPLICATES\FD_inorganic\33053A6.wpd

LDC #: 33053Ab

Validation Findings Worksheet Initial and Continuing Calibration Calculation Verification

Page: 1 of Reviewer: 7 2nd Reviewer:

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

The correlation coefficient (r) for the calibration of $\underline{C_{5}}^{4}$ was recalculated.Calibration date: 10/29/14

Where,

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

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

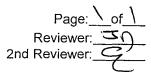
					Recalculated	Reported	Acceptable
Type of analysis	Analyte	Standard	Conc. (ng/ml)	Area	r or r ²	r or r ²	(Y/N)
Initial calibration		s1	0.50	0.0000157			
		s2	0.10	0.0000372	1.00000	1.00000	
		<u>s3</u>	0.20	0.0000787			
	Crtb	<u>s4</u>	0.50	0.0002074			* 1
		<u>s5</u>	1.00	0.0004191			Ň
		s6	2.00	0.0008443			
エム _{いい} のく Calibration verification	ماد ۲	Found D. Silionalmi	Three O. Snalml		102.3%P	102.3%2	
Cock 12:05 Calibration verification	Cx20	0.5116 majul	, ,		102.3%,F	-102.3%P	
Calibration verification							

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

LDC #: 33053A6

VALIDATION FINDINGS WORKSHEET Level IV Recalculation Worksheet

concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation,



METHOD: Inorganics, Method See Cover

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

%R = <u>Found</u> x 100 Where, Found = True

Found = SSR (spiked sample result) - SR (sample result). True = concentration of each analyte in the source.

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

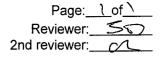
RPD = <u> S-D </u> x 100	Where,	S =	Original sample concentration
(S+D)/2		D =	Duplicate sample concentration

Sample ID	Type of Analysis	Element	Found / S (units)	True / D (units)	Recalculated	Reported %R / RPD	Acceptable (Y/N)
LCS 11:35	Laboratory control sample	Crity	1-11 ng/ml	Inglant	1110%.2	111% P	Z
	Matrix spike sample		(SSR-SR)				
DUR	Duplicate sample	Crab	0.0233mg/m ²	0.0229 ng/m3	1.73%RRD	2.05°/289	2)

Comments:

LDC #: 33053A1/

VALIDATION FINDINGS WORKSHEET Sample Calculation Verification



Odmple Odlediation Verno

METHOD: Inorganics, Method See Caser Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A". M N/A Have results been reported and calculated correctly? Y N N/A Are results within the calibrated range of the instruments? ¥ Are all detection limits below the CRQL? 'N N/A Compound (analyte) results for (16) (26) recalculated and verified using the following equation: reported with a positive detect were Calculated Reported Acceptable Concentration Concentration (nam3) (nojn3) (Y/N) # Sample ID Analyte (~*0 бu 1 $\mathcal{O}\mathcal{O}$ 2_ ND ND 3 0.0229 0.0229 5 0.0190 0.0190 5 V O. DIUN 0-0140 6 Ч 0.0107 C.0107 4* 0.0604 0.0605 9 29 CU 9 RV NO 0.0202 0.0202 10 44 Ì١ 0.0314 0.0315 2 0.0843 0.0843 ١ 13 0-101 0.101 14 0.0616 0.0616 ч× 15 0.0217 0-0278 U 16 0.145 0.145 ND 17 20 ١Å 69 23

CERTIFICATE OF ANALYSIS									
Environmental Re	sources Manager	nent, Inc		FILE #:	3926.00				
75 Valley Stream	Parkway, Suite 40	0		REPORTE	REPORTED: 11/04/14 10:07				
Malvern, PA 1935	5			SUBMITTI	ED: 10/28/14				
ATTN: Mr. Jeff E PHONE: (443) 8	80ggs 803-8495 FAX	: (410) 266-8912		AQS SITE CODE: SITE COD		Honeywell Hex Chrome Study			
Description:	OAM 1	Lab	ID: 4102826-	-01		Sampled: 10/24/14 15:45			
Matrix:	Air	San	nple Volume:	21.31 m³		Received: 10/28/14 10:51			
Comments:	Start Time 10/23/	14 16:05				Analysis Date: 10/29/14 13:45			
			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	ND	U	0.0036				

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Environmental Resources Management, Inc				FILE #:	3926	6.00		
75 Valley Stream	Parkway, Suite 400			REPOR	TED:	11/04/14 10:0	7	
Malvern, PA 1935	5			SUBMI	TTED:	10/28/14		
ATTN: Mr. Jeff B PHONE: (443) 8) 266-8912		AQS SI CODE: SITE C		F	loneywell Hex Chrome Study	
Description:	OAM 2	Lab	ID: 4102826-	02			Sampled: 10/24/14 15:59	
Matrix:	Air	Sam	nple Volume:	21.25 r	1 ³		Received: 10/28/14 10:51	
Comments:	Start Time 10/23/14 16:2	2					Analysis Date: 10/29/14 13:55	
			Hexavalent	Chromium				
			<u>Results</u>			MDL		
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	L	<u>ng/m³ Air</u>		
Hexavalent Chromium		1854-02-99	ND	U		0.0036		

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Environmental Re	sources Management,	nc	FILE #: 3926	6.00				
75 Valley Stream	Parkway, Suite 400			REPORTED: 11/04/14 10:07				
Malvern, PA 1935	5			SUBMITTED: 10/28/14				
ATTN: Mr. Jeff B PHONE: (443) 8		10) 266-8912		AQS SITE CODE: SITE CODE:	н	oneywell Hex Chrome Study		
Description:	PAM-1	Lab ID:	4102826-03			Sampled: 10/24/14 16:37		
Matrix:	Air	Sample \	/olume: 21.	06 m³		Received: 10/28/14 10:51		
Comments:	Col 1 Start Time 10/23/	14 17:13			1	Analysis Date: 10/29/14 12:25		
		!	Hexavalent Chi	omium				
			<u>Results</u>		<u>MDL</u>			
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flaq</u>	<u>ng/m³ Air</u>			
Hexavalent Chromium	I	1854-02-99	0.0229		0.0036			

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Environmental Res	sources Management, In	с	FILE #: 392	FILE #: 3926.00						
75 Valley Stream F	Parkway, Suite 400		REPORTED:	REPORTED: 11/04/14 10:07						
Malvern, PA 19355	5		SUBMITTED:	SUBMITTED: 10/28/14						
ATTN: Mr. Jeff Boggs PHONE: (443) 803-8495 FAX: (410) 266-8912			AQS SITE SITECODE:		н	oneywell Hex Chrome Study				
Description:	PAM-1D	Lab ID	4102826-04	* *		Sampled: 10/24/14 16:41				
Matrix:	Air	Sample	e Volume: 21.	04 m³		Received: 10/28/14 10:51				
Comments:	Col 2 Start Time 10/23/14	17:18				Analysis Date: 10/29/14 12:44				
Hexavalent Chromium										
			<u>Results</u>		MDL					
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>					
Hexavalent Chromium		1854-02-99	0.0190		0.0036					

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

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Environmental Re	с	FILE #: 3926.00							
75 Valley Stream Parkway, Suite 400						REPORTED: 11/04/14 10:07			
Malvern, PA 19355						UBMITTED: 10/28/14			
ATTN: Mr. Jeff B PHONE: (443) 8)) 266-8912			AQS SITE CODE: SITE CODE:		Ho	neywell Hex Chrome Study	
Description:	PAM-2	Lat	b ID: 410	2826-05				Sampled: 10/24/14 16:27	_
Matrix:	Air	Sar	mple Volume	21.0	7 m³	5		Received: 10/28/14 10:51	
Comments:	Start Time 10/23/14 17:0	2					A	nalysis Date: 10/29/14 14:24	
Hexavalent Chromium <u>Results</u> MDL									
<u>Analyte</u> Hexavalent Chromium		CAS Number	<u>ng/m</u>	³ Air	<u>Flag</u>	I	ng/m³ Air		
Matrix: Comments: <u>Analyte</u>	Air Start Time 10/23/14 17:0	Sar 2	mple Volume Hexava <u>Resu</u>	alent Chro Its Alin	omium		MDL	Received: 10/28/14 10:51	

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75 Valley Stream Parkway, Suite 400						REPORTED: 11/04/14 10:07			7
Malvern, PA 19355						SUBMITT	SUBMITTED: 10/28/14		
ATTN: Mr. Jeff Boggs PHONE: (443) 803-8495 FAX: (410) 266		0) 266-8912				AQS SITE			oneywell Hex Chrome Study
Description:	PAM-3	Li	ab ID:	4102826	-06				Sampled: 10/24/14 16:18
Matrix:	Air	Si	ample Vo	olume:	21.09) m³			Received: 10/28/14 10:51
Comments:	Start Time 10/23/14 16:	51							Analysis Date: 10/29/14 14:34
Hexavalent Chromium									
				<u>Results</u>				<u>MDL</u>	
<u>Analyte</u>		CAS Number		<u>nq/m³ Air</u>		<u>Flag</u>	ļ	<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99		0.0107				0.0036	

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75 Valley Stream Parkway, Suite 400						REPORT	REPORTED: 11/04/14 10:07			
Malvern, PA 19355						SUBMITT	UBMITTED: 10/28/14			
ATTN: Mr. Jeff Boggs PHONE: (443) 803-8495 FAX: (410) 266						AQS SITE CODE: SITE CODE:		ŀ	Honeywell Hex Chrome Study	
Description:	PAM-4		Lab ID:	4102826	-07				Sampled: 10/24/14 16:11	
Matrix:	Air		Sample Vo	olume:	21.29	m³			Received: 10/28/14 10:51	
Comments:	Start Time 10/23/14	16:32							Analysis Date: 10/29/14 14:44	
Hexavalent Chromium										
				<u>Results</u>				<u>MDL</u>		
<u>Analyte</u>		CAS Numbe	er	<u>ng/m³ Air</u>		<u>Flaq</u>		<u>ng/m³ Air</u>		
Hexavalent Chromium		1854-02-99		0.0605				0.0036		

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Environmental Re	esources Manage	ement, Inc		F	ILE #: 392	6.00	
75 Valley Stream	Parkway, Suite 4	00		F	EPORTED:	11/04/14 10:0	17
Malvern, PA 1935	55			s	UBMITTED:	10/28/14	
ATTN: Mr. Jeff E PHONE: (443)		X: (410) 266-8912			QS SITE	F	loneywell Hex Chrome Study
Description:	PAM-21		Lab ID: 41028	26-08			Sampled: 10/24/14 00:00
Matrix:	Air		Sample Volume:	21.07	m³		Received: 10/28/14 10:51
Comments:							Analysis Date: 10/29/14 14:54
			Hexavale	nt Chron	nium		
			<u>Results</u>			MDL	
<u>Analyte</u>		CAS Numbe	er <u>ng/m³ A</u>	<u>ir</u>	<u>Flag</u>	<u>nq/m³ Air</u>	
Hexavalent Chromium		1854-02-99	ND		U	0.0036	

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75 Valley Stream	Parkway, Suite	400					REPORT	ED:	11/04/14 10:0	07
Malvern, PA 1935	5						SUBMITT	ED:	10/28/14	
ATTN: Mr. Jeff E PHONE: (443)		AX: ((410) 266-8912				AQS SITE	_	I	Honeywell Hex Chrome Study
Description:	PAM-31		·	Lab ID:	4102826	5-09				Sampled: 10/24/14 00:00
Matrix:	Air			Sample V	olume:	21.0	9 m³			Received: 10/28/14 10:51
Comments:					_					Analysis Date: 10/29/14 15:04
				F	lexavalen	t Chro	mium			
					<u>Results</u>				MDL	
<u>Analyte</u>			CAS Numbe	er	<u>ng/m³ Air</u>	:	<u>Flag</u>		<u>ng/m³ Air</u>	
Hexavalent Chromium			1854-02-99		ND		U		0.0036	

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75 Valley Stream F	Parkway, Suite 400				REPORT	ED:	11/04/14 10:0	70
Malvern, PA 1935	5				SUBMITT	TED:	10/28/14	
ATTN: Mr. Jeff Bo PHONE: (443) 8	oggs 03-8495 FAX: (410) 266-8912			AQS SITE	-	ł	Honeywell Hex Chrome Study
Description:	OAM 1	L	ab ID: 410	2826-10				Sampled: 10/27/14 15:55
Matrix:	Air	s	Sample Volume	20.8	6 m³			Received: 10/28/14 10:51
Comments:	Start Time 10/26/14 16:4	1						Analysis Date: 10/29/14 15:14
			Hexav <u>Resu</u>	alent Chro I <u>lts</u>	omium		<u>MDL</u>	
Analyte		CAS Number	<u>ng/m</u>	³ Air	Flag		<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99	0.02	02			0.0036	

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75 Valley Stream F	Parkway, Suite 400					REPORTE	ED: 1 ⁻	1/04/14 10:0	17
Malvern, PA 1935	5					SUBMITT	ED:	10/28/14	
ATTN: Mr. Jeff B	oggs			• •		AQS SITE			
PHONE: (443) 8	03-8495 FAX:	(410) 266-8912				SITECOD	DE:	ŀ	Ioneywell Hex Chrome Study
Description:	OAM 2		Lab ID:	4102826-	·11				Sampled: 10/27/14 16:12
Matrix:	Air		Sample Vo	olume:	20.86	m³			Received: 10/28/14 10:51
Comments:	Start Time 10/26/14	17:02							Analysis Date: 10/29/14 15:24
			H	exavalent	Chro	mium			
				<u>Results</u>				<u>MDL</u>	
<u>Analyte</u>		CAS Numbe	er .	ng/m³ Air		<u>Flag</u>	ī	ng/m³ Air	
Hexavalent Chromium		1854-02-99		0.0314				0.0036	

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Environmental Re	sources Management,	Inc			FILE #:	392	6.00	
75 Valley Stream F	Parkway, Suite 400				REPOR	RTED:	11/04/14 10:0	7
Malvern, PA 1935	5				SUBMI	TTED:	10/28/14	
ATTN: Mr. Jeff Br PHONE: (443) 8		10) 266-8912			AQS S		ł	Ioneywell Hex Chrome Study
Description:	PAM-1	L	Lab ID:	4102826-12				Sampled: 10/27/14 17:22
Matrix:	Air	S	Sample Volu	i me: 2	1.04 r	n³		Received: 10/28/14 10:51
Comments:	Col 1 Start Time 10/26/	14 17:59						Analysis Date: 10/29/14 13:04
			Hex	cavalent C	hromium			
			<u>R</u>	<u>lesults</u>			<u>MDL</u>	
<u>Analyte</u>		CAS Number	<u>ng</u>	<u>ı/m³ Air</u>	Flag	l	<u>ng/m³_Air</u>	
Hexavalent Chromium		1854-02-99	(0.0843			0.0036	

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Environmental Res	sources Management, In	c		FILE #:	3926.00	
75 Valley Stream F	Parkway, Suite 400			REPORTE	D: 11/04/14 10:	07
Malvern, PA 19355	5			SUBMITTE	ED: 10/28/14	
ATTN: Mr. Jeff Bo PHONE: (443) 8		0) 266-8912		AQS SITE		Honeywell Hex Chrome Study
Description:	PAM-1D	Lab ID:	4102826-13	3		Sampled: 10/27/14 17:27
Matrix:	Air	Sample	Volume: 2	20.88 m³		Received: 10/28/14 10:51
Comments:	Col 2 Start Time 10/26/14	18:15				Analysis Date: 10/29/14 13:24
			Hexavalent C <u>Results</u>	hromium	MDL	
Analyte		CAS Number	ng/m³ Air	Flag	<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99	0.101	<u>1.104</u>	0.0036	

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Environmental Re	sources Management, In	c		FILE #:	3926.00	
75 Valley Stream F	Parkway, Suite 400			REPORTE	D: 11/04/14 10:	07
Malvern, PA 1935	5			SUBMITT	ED: 10/28/14	
ATTN: Mr. Jeff B PHONE: (443) 8)) 266-8912		AQS SITE		Honeywell Hex Chrome Study
Description:	PAM-2	Lab ID:	4102826-1	14		Sampled: 10/27/14 17:06
Matrix:	Air	Sample	Volume:	21.04 m ³		Received: 10/28/14 10:51
Comments:	Start Time 10/26/14 17:4	3				Analysis Date: 10/29/14 15:34
			Hexavalent	Chromium		
			<u>Results</u>		MDL	
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flaq</u>	<u>ng/m³ Air</u>	
Hexavalent Chromium	I	1854-02-99	0.0616		0.0036	

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Environmental Re	sources Management, Ir	าด		F	ILE #: 3	3926.00	
75 Valley Stream I	Parkway, Suite 400			F	EPORTED): 11/04/14 10:	07
Malvern, PA 1935	5			s	UBMITTER	D: 10/28/14	
ATTN: Mr. Jeff B	oggs				QS SITE		
PHONE: (443) 8	03-8495 FAX: (41	0) 266-8912		Ş	ITE CODE	:: I	Honeywell Hex Chrome Study
Description:	PAM-3	Lab	ID: 4102	826-15			Sampled: 10/27/14 16:54
Matrix:	Air	Sam	nple Volume:	21.01	m³		Received: 10/28/14 10:51
Comments:	Start Time 10/26/14 17:3	33					Analysis Date: 10/29/14 15:44
			Hexaval	ent Chrom	ium		
			<u>Result</u>	<u>s</u>		MDL	
<u>Analyte</u>		CAS Number	<u>ng/m³</u>	<u>Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>	
Hexavalent Chromium	I	1854-02-99	0.0277			0.0036	

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Environmental Res	sources Management, Ind	;			I	FILE #:	3926.00			
75 Valley Stream F	[⊃] arkway, Suite 400				I	REPORTE	D: 11/04	4/14 10:07		
Malvern, PA 1935	5				:	SUBMITTE	ED: 10	/28/14		
ATTN: Mr. Jeff Be PHONE: (443) 8) 266-8912				AQS SITE		Hor	neywell Hex Chrome Study	
Description:	PAM-4	La	ab ID:	4102826-1	6				Sampled: 10/27/14 16:32	
Matrix:	Air	Sa	ample Volu	ume:	20.93	m³			Received: 10/28/14 10:51	
Comments:	Start Time 10/26/14 17:17	7						Ar	alysis Date: 10/29/14 15:54	
				xavalent (<u>Results</u>	Chror	nium	l	MDL		
<u>Analyte</u>		<u>CAS Number</u>	ne	g/m³ Air		<u>Flaq</u>	<u>nq/</u>	<u>m³ Air</u>		
Hexavalent Chromium		1854-02-99		0.145			0	.0036		

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Environmental Re	esources Manage	ment, Inc				FILE #:	3926	5.00	
75 Valley Stream	Parkway, Suite 40	00				REPORT	ED:	11/04/14 10:	07
Malvern, PA 1935	55					SUBMIT	TED:	10/28/14	
ATTN: Mr. Jeff E PHONE: (443)	3oggs 803-8495 FA X	x: (410) 266-8912				AQS SIT			Honeywell Hex Chrome Study
Description:	PAM-21		Lab ID:	4102820	5-17				Sampled: 10/27/14 00:00
Matrix:	Air		Sample Vo	olume:	21.04	1 m³	;		Received: 10/28/14 10:51
Comments:									Analysis Date: 10/29/14 16:23
			Н	exavaler	nt Chro	mium			
				<u>Results</u>				<u>MDL</u>	
<u>Analyte</u>		CAS Numb	er .	ng/m³ Ai	Ľ	<u>Flag</u>		<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99		ND		U		0.0036	

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Environmental Resources Ma	anagement, Inc	· F	FILE #: 3926	5.00	
75 Valley Stream Parkway, S	uite 400	F	REPORTED:	11/04/14 10:07	
Malvern, PA 19355		S	SUBMITTED:	10/28/14	
ATTN: Mr. Jeff Boggs PHONE: (443) 803-8495	FAX: (410) 266-8912		AQS SITE CODE: SITE CODE:	Honeywell He	x Chrome Study
Description: PAM-31	Lab ID:	4102826-18		Sample	d: 10/27/14 00:00
Matrix: Air	Sample	Volume: 21.01	m³	Receive	d: 10/28/14 10:51
Comments:				Analysis Dat	e: 10/29/14 16:33
		Hexavalent Chron <u>Results</u>	nium	MDL	
<u>Analyte</u>	CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>	
Hexavalent Chromium	1854-02-99	ND	U	0.0036	

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November 7, 2014

ERM 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 November 6, 2014. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #33026:

<u>SDG</u>

<u>Fraction</u>

4103006

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 Rínk Project Manager/Chemist

	103 pages-SF	5 DAY	TAT												Atta	achr	nen	t 1																					
	Level IV	, × L	DC #33	026	6 (E	RN	n .=.	Mo	rris	svil	le,	NC	: /	Ha	rbc	or P	?oir	nt, I	٩D	, He	exa	iva	len	t C	hrc	omi	um	M	oni	tor	inc)							
LDC		DATE REC'D		Cr (D7																			-																
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	Shaded cells	indicate Lev	vel IV validati	ion (a	ll othe	er cel	ls are	Leve	el II v	alidat	ion).	Thes	e sar	nple	count	s do i	not in	clude	MS/I	MSD,	and	DUP												3302	26ST.	wpd			

Laboratory Data Consultants, Inc. Data Validation Report

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

Hexavalent Chromium

Eastern Research Group

Collection Date: October 28 through October 29, 2014

LDC Report Date: November 6, 2014

Matrix:

Air

Parameters:

Validation Level: EPA Level IV

Laboratory:

Sample Delivery Group (SDG): 4103006

Sample Identification

PAM-1(10/29/14)DUP OAM 1(10/28/14) OAM 2(10/28/14) PAM-1D(10/29/14)DUP PAM-1(10/28/14) PAM-1D(10/28/14) PAM-2(10/28/14) PAM-3(10/28/14) PAM-4(10/28/14) PAM-21(10/28/14) PAM-31(10/28/14) OAM 1(10/29/14) OAM 2(10/29/14) PAM-1(10/29/14) PAM-1D(10/29/14) PAM-2(10/29/14) PAM-3(10/29/14) PAM-4(10/29/14) PAM-21(10/29/14) PAM-31(10/29/14) PAM-1(10/28/14)DUP PAM-1D(10/28/14)DUP

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

1

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.

2

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(10/28/14) and PAM-31(10/29/14) were identified as trip blanks. No hexavalent chromium was found.

Samples PAM-21(10/28/14) and PAM-21(10/29/14) 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(10/28/14) and PAM-1D(10/28/14) and samples PAM-1(10/29/14) and PAM-1D(10/29/14) 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(10/28/14)	PAM-1D(10/28/14)	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.0623	0.0606	3 (≤20)	-	-

	Concentrati	on (ng/m³)				
Analyte	PAM-1(10/29/14) PAM-1D(10/29/		RPD (Limits)	Flags	A or P	
Hexavalent chromium	0.0506	0.0603	17 (≤20)	-	-	

Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Data Qualification Summary - SDG 4103006

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

Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG 4103006

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 4103006

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

LDC #: <u>33026A6</u>	VALIDATION COMPLETENESS WORKSHEET	Date: 11/6/14
SDG #:	Level IV	Page:of
Laboratory: Eastern Researc	h Group	Reviewer: <u>` < s</u>
		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
1.	Technical holding times	A	Sampling dates: 10/28-29/14
Ш	Initial calibration	A	
111.	Calibration verification	A	
١V	Blanks	A	
v	Matrix Spike/Matrix Spike Duplicates	Ň	Not Required
VI.	Duplicates	A	Dup
VII.	Laboratory control samples	A	LISID
VIII.	Sample result verification	A	
IX.	Overall assessment of data	Â	
Х.	Field duplicates	SW	FO = (3, 4) (12, 13)
xı	Field blanks	24	FB{8)(17) TB=(9)(B)

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: A

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

Notes:

LDC #: 33026R4

VALIDATION FINDINGS CHECKLIST

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times			··	
All technical holding times were met.				
Cooler temperature criteria was met.	/			
II. Calibration			<u>,</u>	
Were all instruments calibrated daily, each set-up time?	<u> </u>			
Were the proper number of standards used?	1			
Were all initial calibration correlation coefficients > 0.995?	/			
Were all initial and continuing calibration verification %Rs within the 90-11 0% QC limits?	/			
Were titrant checks performed as required? (Level IV only)				
Were balance checks performed as required? (Level IV only)				
III. Blanks				
Was a method blank associated with every sample in this SDG?				
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		1		
IV. Matrix spike/Matrix spike duplicates and Duplicates				
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.				
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.			/	
Were the MS/MSD or duplicate relative percent differences (RPD) \leq 20% for waters and \leq 35% for soil samples? A control limit of \leq CRDL(\leq 2X CRDL for soil) was used for samples that were \leq 5X the CRDL, including when only one of the duplicate sample values were \leq 5X the CRDL.	1			
V. Laboratory control samples				
Was an LCS anaylzed for this SDG?	$\left \right\rangle$			
Was an LCS analyzed per extraction batch?	(
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% (85-115% for Method 300.0) QC limits?	/			
VI. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?			_1	
Were the performance evaluation (PE) samples within the acceptance limits?			/	

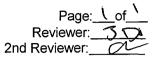
VALIDATION FINDINGS CHECKLIST

,

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?	1								
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.		/							

LDC#<u>33026A6</u>

VALIDATION FINDINGS WORKSHEET Field Duplicates



Inorganics: Method See Cover

	Concentra	tion (ng/m3)		Qual.
Analyte	3	4	RPD (≤20)	
Hexavalent Chromium	0.0623	0.0606	3	

	Concentra		Qual.	
Analyte	12	13	RPD (≤20)	
Hexavalent Chromium	0.0506	0.0603	17	

\LDCFILESERVER\Validation\FIELD DUPLICATES\FD_inorganic\33026A6.wpd

LDC #: 3302606

Validation Findings Worksheet Initial and Continuing Calibration Calculation Verification

Page: \land of \land Reviewer: 3 2nd Reviewer:

Method: Inorganics, Method See Cover

The correlation coefficient (r) for the calibration of $\frac{2}{3}$ was recalculated. Calibration date: $\frac{116314}{16314}$

Where,

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

%R = Found X 100

True

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

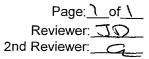
				·	Recalculated	Reported	Acceptable
Type of analysis	Analyte	Standard	Conc. (ng/ml)	Area	r or r ²	r or r ²	(Y/N)
Initial calibration		s1	0.05	0.0000158			
		s2	0.1	0.0000363	0.99968	0.99968	
		s3	0.2	0.0000733			\sim
	(- ile	s4	0.5	0.0001973			1
	(r)	s5	1	0.000388			
		s6	2	0.0008219			
ゴムー リンB Calibration verification	Crib	For 21 miles	Tre O. Sneful		94.5%P	94.5°62	
Calibration verification	Crto	5	O. Snglml		97.9%E	97,9%R	V
Calibration verification							

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

LDC #: 33026260

VALIDATION FINDINGS WORKSHEET Level IV Recalculation Worksheet

concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation,



METHOD: Inorganics, Method See Cover

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

%R = <u>Found</u> x 100 Where, Found = True True True = c

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 = <u> S-D </u> 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)
445	Laboratory control sample	Crtb	1.07 mylul	Inglul	107 %E	107 105%R	Y
11-48	Matrix spike sample		(SSR-SR)	(vig (m.)		30	
N							
No	Duplicate sample	Crite	NOLAL 13	apzzna).	10-8% Fro	10.8% RD	y
			U.UOI Ing/m				

Comments: _____

LDC #: 33026Ap

VALIDATION FINDINGS WORKSHEET

Sample Calculation Verification

Page:		1
Reviewer:	30	2
2nd reviewer:	$-\alpha$	Ζ

					2nd review	ver
метн	IOD: Inorganics, Metho	d See Cover	<u></u>			
Please Y N Y N Y N	<u>N/A</u> Have results <u>N/A</u> Are results w	bw for all questions answ been reported and calcu vithin the calibrated range tion limits below the CRG	lated correctly? of the instrument		e identified as "N/.	Α".
recalci		g the following equation:	Cero	repc	orted with a positiv	/e (
	tration = $\left(A - C_0 \right) \left[C \right]$	Vf-10ml Recal m3=Z1.68	culation: $\left(\underbrace{\mathcal{O}, \infty \mathcal{O}}_{\mathcal{O}} \right)$	0516-(-8.76E	<u>-06)</u> = 0.14	6
C. C. A	p = -8.76 E-6 = 0.0004118 = 0.000516	(nglmi)(ik) (m ³ = hgl	1m3 (0.144	46 mg/ml) (10ml) Z1.68m ³		ve
#	Sample ID	Analyte	,	Reported Concentration (いいいろ)	Calculated Concentration (va) ^{w²})	
	1	<u>C</u> r	4.6	0.0676	0.0676	
	2			0.0436	0.0435	
	3			0.0623	0.0623	

<u>Y/ N</u>		tion limits below the CRQL?			
ecalc		g the following equation:	repc	orted with a positiv	/e detect were
oncen	tration = $\left(A - C_{o} \right) \left C_{o} \right $	Vf=10 m Recalculation: (0.0)	000516-(-8.76E	<u></u>	66 ng/m
C,)= -8.76E-6	(nglmi)(ut)	unterester 1) (12ml)		
, C 	= 0.0004/18 = 0.000516	(nglmi)(ch) m ³ = nglm ³ (0.	Z1.68m ³	= 0.0676	ng/m3
#	Sample ID	Analyte	Reported Concentration (પ્ર્યાખ ²)	Calculated Concentration (પ્રદ્વોખ ²)	Acceptable (Y/N)
	1	Crth	0.0676	0.0676	4
	2	<u> </u>	0.0436	0.0435	3× 3
	3		0.0623	0.0623	
	4		0.0606	0.0605	Y*
	2		0.0712	0.0712	4
	6		0.0668	0.0668	
	1		0.0795	0.0795	
	8		NO	24	
	9		ND	R ND	9
	10		0.0339	D.0338	J×
	11		0.0402	0.0402	3
	12		0.0506	0.0506	
	13		0.0603	0.0603	
	14		0.0412	0.0412	
	12		0.0342	0.0342	
			0.0910	0.0910	
	<u> </u>		NO	NO	
	18		NO	NO	1
		L			

*Parkin Note:

Environmental Res	sources Management, In	c	FILE #: 3926	FILE #: 3926.00						
75 Valley Stream F	^D arkway, Suite 400		REPORTED:	REPORTED: 11/06/14 07:11						
Malvern, PA 1935	5		SUBMITTED:	10/30/14						
ATTN: Mr. Jeff Br PHONE: (443) 8	oggs 03-8495 FAX: (410)) 266-8912		AQS SITE CODE: SITE CODE:	Н	oneywell Hex Chrome Study				
Description:	OAM 1	Lab ID:	4103006-01			Sampled: 10/28/14 16:04				
Matrix:	Air	Sample	Volume: 21	68 m³		Received: 10/30/14 10:21				
Comments:	Start Time 10/27/14 15:5	9			4	nalysis Date: 11/03/14 13:58				
Hexavalent Chromium Results MDL										
Analyte		CAS Number	<u>ng/m³ Air</u>	Flag	ng/m³ Air					
Hexavalent Chromium		1854-02-99	0.0676		0.0036					

NOV 0 6 2014

Initials: CR

Eastern Research Group

NERG

Environmental Res	sources Management, In	c	FILE #: 39	FILE #: 3926.00							
75 Valley Stream F	^o arkway, Suite 400		REPORTED:	REPORTED: 11/06/14 07:11							
Malvern, PA 1935	5			SUBMITTED:	10/30/14						
ATTN: Mr. Jeff Bo PHONE: (443) 8) 266-8912		AQS SITE CODE: SITE CODE:	ŀ	loneywell Hex Chrome Study					
Description:	OAM 2	Lab ID	4103006-02			Sampled: 10/28/14 16:22					
Matrix:	Air	Sample	e Volume: 21	.67 m³		Received: 10/30/14 10:21					
Comments:	Start Time 10/27/14 16:10	5				Analysis Date: 11/03/14 14:08					
	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	0.0436		0.0036						

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Initials: CR

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Environmental Res	5	I	FILE #: 3926.00							
75 Valley Stream Parkway, Suite 400							REPORTED: 11/06/14 07:11			
Malvern, PA 19355						SUBMITTED: 10/30/14				
ATTN: Mr. Jeff B PHONE: (443) 8	oggs :03-8495 FAX: (410) 266-8912				AQS SITE		ł	Ioneywell Hex Chrome Study	
Description:	PAM-1	_	Lab ID:	4103006-0)3				Sampled: 10/28/14 17:14	
Matrix:	Air		Sample Volu	ıme:	21.42	m³			Received: 10/30/14 10:21	
Comments:	Col 1 Start Time 10/27/14	17:26		-					Analysis Date: 11/03/14 12:38	
				(avalent	Chron	nium				
			<u>R</u>	<u>tesults</u>				<u>MDL</u>		
<u>Analyte</u>		CAS Number	<u>r na</u>	<u>1/m³ Air</u>		Flag		<u>ng/m³ Air</u>		
Hexavalent Chromium		1854-02-99		0.0623				0.0036		

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Initials: CR

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Environmental Re	sources Management, In	c	FILE #: 3926.00					
75 Valley Stream Parkway, Suite 400						REPORTED: 11/06/14 07:11		
Malvern, PA 19355					SUBMITTED: 10/30/14			
ATTN: Mr. Jeff B PHONE: (443) 8	00	0) 266-8912			AQS SITE		Honeywell Hex Chrome Study	
Description:	PAM-1D	Lab II): 4103006	5-04			Sampled: 10/28/14 17:19	
Matrix:	Air	Samp	le Volume:	21.42	2 m³		Received: 10/30/14 10:21	
Comments:	Col 2 Start Time 10/27/14	4 17:31					Analysis Date: 11/03/14 12:58	
			Hexavalen	t Chro	mium			
			<u>Results</u>			<u>MDL</u>		
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	Ľ	<u>Flaq</u>	<u>ng/m³ Air</u>		
Hexavalent Chromium		1854-02-99	0.0606			0.0036		

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Initials: CR

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Environmental Resources Management, Ir	IC	FILE #:	FILE #: 3926.00							
75 Valley Stream Parkway, Suite 400		REPORT	REPORTED: 11/06/14 07:11							
Malvern, PA 19355		SUBMIT	TED: 10/30/14							
ATTN: Mr. Jeff Boggs PHONE: (443) 803-8495 FAX: (41	0) 266-8912	AQS SIT CODE: SITE CO		Honeywell Hex Chrome Study						
Description: PAM-2	Lab ID: 4103	3006-05		Sampled: 10/28/14 16:58						
Matrix: Air	Sample Volume:	21.4 m ³	:	Received: 10/30/14 10:21						
Comments: Start Time 10/27/14 17:1	1			Analysis Date: 11/03/14 14:38						
Hexavalent Chromium Results MDL										
Analyte	<u>CAS Number ng/m³</u>	Air <u>Flag</u>	<u>ng/m³ Air</u>							
Hexavalent Chromium	1854-02-99 0.071	2	0.0036							

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Initials: CR

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Environmental Res	Environmental Resources Management, Inc							FILE #: 3926.00			
75 Valley Stream Parkway, Suite 400						REPORTED: 11/06/14 07:11					
Malvern, PA 1935	5				SUBMITT	TED:	10/30/14				
ATTN: Mr. Jeff Be PHONE: (443) 8	oggs 03-8495 FAX: (410) 266-8912			AQS SITI CODE: SITE COI		Но	oneywell Hex Chrome Study			
Description:	PAM-3	L	Lab ID: 41)3006-06				Sampled: 10/28/14 16:44			
Matrix:	Air	s	Sample Volume	: 21.3	9 m³	3		Received: 10/30/14 10:21			
Comments:	Start Time 10/27/14 16:5	7					A	nalysis Date: 11/03/14 16:57			
			Hexav	alent Chr	omium						
			Resi	<u>ilts</u>			<u>MDL</u>				
<u>Analyte</u>		CAS Number	<u>ng/m</u>	³ Air	<u>Flaq</u>		<u>nq/m³ Air</u>				
Hexavalent Chromium		1854-02-99	0.06	68			0.0036				

NOV 0 6 2014

Initials: CR

Eastern Research Group

NERG

Environmental Res	sources Management, Ind	C	FILE #: 3926.00					
75 Valley Stream Parkway, Suite 400						REPORTED: 11/06/14 07:11		
Malvern, PA 1935	5				SUBMITT	ED: 10	/30/14	
ATTN: Mr. Jeff Boggs PHONE: (443) 803-8495 FAX: (410)) 266-8912	AQS SITE SITECODE:		-	Honeywell Hex Chrome Study		
Description:	PAM-4	La	b ID: 41030	06-07			Sam	pled: 10/28/14 16:35
Matrix:	Air	Sa	mple Volume:	21.59	9 m³		Rece	ived: 10/30/14 10:21
Comments:	Start Time 10/27/14 16:36	5					Analysis I	Date: 11/03/14 14:58
			Hexavale	ent Chro	mium			
			<u>Results</u>	L		Ī	MDL	
<u>Analyte</u>		CAS Number	<u>ng/m³ /</u>	<u>\ir</u>	<u>Flag</u>	<u>nq/</u>	<u>m³ Air</u>	
Hexavalent Chromium		1854-02-99	0.0795			0	.0036	

NOV 0 6 2014

initials: CR

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Environmental Resources Management, Inc							FILE #: 3926.00			
75 Valley Stream Parkway, Suite 400						REPORTED: 11/06/14 07:11				
Malvern, PA 19355						SUBMITTE	ED: 10/	/30/14		
ATTN: Mr. Jeff Bog	ggs					AQS SITE				
PHONE: (443) 803	3-8495 FAX:	(410) 266-8912				SITECOD	E:	Honeywell Hex Chrome Study		
Description:	PAM-21		Lab ID:	4103006	-08			Sampled: 10/28/14 00:00		
Matrix:	Air		Sample Vo	olume:	21.4	m³		Received: 10/30/14 10:21		
Comments:								Analysis Date: 11/03/14 15:08		
			н	exavalen	t Chro	mium				
				<u>Results</u>			1	MDL		
Analyte		CAS Numbe	er .	<u>ng/m³ Air</u>		<u>Flag</u>	<u>ng/</u>	<u>m³ Air</u>		
Hexavalent Chromium		1854-02-99		ND		U	C	0.0036		

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Initials: CR

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Environmental Resources Management, Inc							FILE #: 3926.00			
75 Valley Stream Parkway, Suite 400						REPORT	REPORTED: 11/06/14 07:11			
Malvern, PA 1935	55						SUBMIT	TED:	10/30/14	
ATTN: Mr. Jeff E PHONE: (443)	••	FAX:	(410) 266-8912				AQS SIT			Honeywell Hex Chrome Study
Description:	PAM-31			Lab ID:	410300	6-09				Sampled: 10/28/14 00:00
Matrix:	Air			Sample V	olume:	21.3	9 m³	•		Received: 10/30/14 10:21
Comments:										Analysis Date: 11/03/14 15:18
				F	lexavaler	nt Chro	mium			
					<u>Results</u>				<u>MDL</u>	
<u>Analyte</u>			CAS Numb	er	<u>ng/m³ Ai</u>	<u>r</u>	Flag		<u>nq/m³ Air</u>	
Hexavalent Chromium			1854-02-99		ND		U		0.0036	

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Initials: CR

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NERC		CERTIFIC	ATE OF A	NALYSIS							
Environmental Re	sources Management, In	C	FILE #: 3926.00								
75 Valley Stream	Parkway, Suite 400		REPORTED:	EPORTED: 11/06/14 07:11							
Malvern, PA 1935	5		SUBMITTED:	10/30/14							
ATTN: Mr. Jeff B	oggs			AQS SITE							
PHONE: (443) 8	03-8495 FAX: (410) 266-8912		SITE CODE:	Honeywell Hex (Chrome Study					
Description:	OAM 1	Lab ID:	4103006-10		Sampled:	10/29/14 16:10					
Matrix:	Air	Sample V	/olume: 21.6	5 m³	Received:	10/30/14 10:21					
Comments:	Start Time 10/28/14 16:0	7			Analysis Date:	11/03/14 15:28					
Hexavalent Chromium											
			Results		MDL						
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>nq/m³ Air</u>						
Hexavalent Chromium	i i	1854-02-9 9	0.0339		0.0036						

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initials: CR

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

Environmental Re	sources Management, In	C	FILE #: 392	FILE #: 3926.00						
75 Valley Stream I		REPORTED:	REPORTED: 11/06/14 07:11							
Malvern, PA 1935		SUBMITTED:	SUBMITTED: 10/30/14							
ATTN: Mr. Jeff B PHONE: (443) 8) 266-8912		AQS SITE CODE: SITE CODE:	н	loneywell Hex Chrome Study				
Description:	OAM 2	Lab ID	: 4103006-11		-	Sampled: 10/29/14 16:25				
Matrix:	Air	Sample	Volume: 21	.6 m³		Received: 10/30/14 10:21				
Comments:	Start Time 10/28/14 16:2	5				Analysis Date: 11/03/14 15:37				
Hexavalent Chromium <u>Results</u> <u>MDL</u>										
Analyte		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>					
Hexavalent Chromium		1854-02-99	0.0402		0.0036					

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Environmental Res	Environmental Resources Management, Inc					
75 Valley Stream F	Parkway, Suite 400			REPORTED:	11/06/14 07:1	1
Malvern, PA 1935	5			SUBMITTED:	10/30/14	
ATTN: Mr. Jeff Bo PHONE: (443) 8		0) 266-8912		AQS SITE CODE: SITE CODE:	ŀ	Ioneywell Hex Chrome Study
Description:	PAM-1	Lab ID:	4103006-12			Sampled: 10/29/14 17:29
Matrix:	Air	Sample	Volume: 21	.77 m³		Received: 10/30/14 10:21
Comments:	Col 1 Start Time 10/28/14	4 17:18				Analysis Date: 11/03/14 13:18
			Hexavalent Ch	romium		
			<u>Results</u>		MDL	
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	Flag	<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99	0.0506		0.0036	

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Environmental Resources Management, Inc					3926.00			
75 Valley Stream F	^o arkway, Suite 400			REPORTED	D: 11/06/14 07:	11		
Malvern, PA 19355	5			SUBMITTE	D: 10/30/14			
ATTN: Mr. Jeff Bo PHONE: (443) 8		0) 266-8912		AQS SITE CODE: SITE CODE	E:	Honeywell Hex Chrome Study		
Description:	PAM-1D	Lab ID:	4103006-13			Sampled: 10/29/14 17:34		
Matrix:	Air	Sample	Volume: 21.	77 m³		Received: 10/30/14 10:21		
Comments:	Col 2 Start Time 10/28/14	4 17:22			_	Analysis Date: 11/03/14 13:37		
Hexavalent Chromium <u>Results</u> <u>MDL</u>								
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>			
Hexavalent Chromium		1854-02-99	0.0603		0.0036			

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Initials: CR

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Environmental Resources Management, Inc						FILE #:	3926.00	0	
75 Valley Stream F	^p arkway, Suite 400					REPORTE	ED: 11	/06/14 07:1	1
Malvern, PA 19355	5					SUBMITT	TED:	10/30/14	
ATTN: Mr. Jeff Bo PHONE: (443) 8	00) 266-8912				AQS SITE	_	F	Ioneywell Hex Chrome Study
Description:	PAM-2		Lab ID:	4103006	-14				Sampled: 10/29/14 17:14
Matrix:	Air		Sample Vo	olume:	21.78	m³			Received: 10/30/14 10:21
Comments:	Start Time 10/28/14 17:03	l							Analysis Date: 11/03/14 15:47
Hexavalent Chromium <u>Results</u> <u>MDL</u>									
<u>Analyte</u>		CAS Number	E !	ng/m³ Air	:	<u>Flaq</u>	n	<u>iq/m³ Air</u>	
Hexavalent Chromium		1854-02-99		0.0412				0.0036	

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initials: CR

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Environmental Res	Environmental Resources Management, Inc							
75 Valley Stream F	^o arkway, Suite 400			REPORTE	D: 11/06/14 07:	11		
Malvern, PA 19355	5			SUBMITT	ED: 10/30/14			
ATTN: Mr. Jeff Bo PHONE: (443) 8) 266-8912		AQS SITE		Honeywell Hex Chrome Study		
Description:	PAM-3	Lab ID	: 4103006-15			Sampled: 10/29/14 16:58		
Matrix:	Air	Sample	e Volume: 2	1.76 m ³		Received: 10/30/14 10:21		
Comments:	Start Time 10/28/14 16:47	7				Analysis Date: 11/03/14 15:57		
Hexavalent Chromium								
			<u>Results</u>		MDL			
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>			
Hexavalent Chromium		1854-02-99	0.0342		0.0036			

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Environmental Res	C	FILE #: 392	6.00					
75 Valley Stream F	Parkway, Suite 400			REPORTED:	11/06/14 07:1	1		
Malvern, PA 1935	5			SUBMITTED:	10/30/14			
ATTN: Mr. Jeff Be PHONE: (443) 8) 266-8912		AQS SITE CODE: SITE CODE:	н	oneywell Hex Chrome Study		
Description:	PAM-4	Lab ID:	4103006-16		· · · · · · · · · · · · · · · · · · ·	Sampled: 10/29/14 16:43		
Matrix:	Air	Sample \	/olume: 21	66 m³		Received: 10/30/14 10:21		
Comments:	Start Time 10/28/14 16:39)				Analysis Date: 11/03/14 16:07		
Hexavalent Chromium <u>Results</u> <u>MDL</u>								
Analyte		CAS Number	<u>ng/m³ Air</u>	<u>Flaq</u>	<u>ng/m³ Air</u>			
Hexavalent Chromium		1854-02-99	0.0910		0.0036			

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Initials: CR

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Environmental Resources Management, Inc					3926	5.00	
75 Valley Stream Pa	arkway, Suite 400			REPOR	TED:	11/06/14 07:11	
Malvern, PA 19355				SUBMIT	TED:	10/30/14	
ATTN: Mr. Jeff Bog PHONE: (443) 80	•••	(410) 266-8912		AQS SI CODE: SITE CO		Нс	neywell Hex Chrome Study
Description:	PAM-21	L	Lab ID: 4103006	5-17	<u> </u>		Sampled: 10/29/14 00:00
Matrix:	Air	S	Sample Volume:	21.78 m	3		Received: 10/30/14 10:21
Comments:						A	nalysis Date: 11/03/14 16:37
			Hexavalen	t Chromium			
			<u>Results</u>			MDL	
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	. <u>Flag</u>		<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99	ND	U		0.0036	

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Initials: \mathcal{CR}

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Environmental Re	esources Manag	ement, Inc		F	ILE #: 3	3926.00	
75 Valley Stream	Parkway, Suite	400		F	REPORTED	D: 11/06/14 07:	11
Malvern, PA 1935	55			s	UBMITTE	D: 10/30/14	
ATTN: Mr. Jeff E PHONE: (443)		AX: (410) 266-8912			AQS SITE	E:	Honeywell Hex Chrome Study
Description:	PAM-31	·	Lab ID: 410	3006-18			Sampled: 10/29/14 00:00
Matrix:	Air		Sample Volume	: 21.76	m³		Received: 10/30/14 10:21
Comments:							Analysis Date: 11/03/14 16:47
			Hexava	alent Chrom	nium		
			Resu	<u>ilts</u>		MDL	
<u>Analyte</u>		CAS Numbe	er <u>ng/m</u>	³ Air	<u>Flag</u>	<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99	ND	1	U	0.0036	

NOV 0 6 2014

Initials: CR

Eastern Research Group

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November 11, 2014

ERM 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 November 7, 2014. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #33039:

<u>SDG</u>

Fraction

4103112

Hexavalent Chromium

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

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

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

Sincerely,

Christina Rink Project Manager/Chemist

Level IV LDC #33039 (ERM - Morrisville, NC / Harbor Point, MD, Hexavalent Chromium Monitoring) DC SDG# DATE REC'D Cr(VI) DATE (0') V <th></th>	
LDC SDG# DATE REC'D Cr(VI) DUE DUE Cr(VI) (D7614) Image: Cr(VI) (D	
Matrix: A ir/Water/Soil A isolation S w isolation	
A 4103112 11/07/14 11/14/14 99 800 Image: Constraint of the constrai	swswsws
	╀╾╀╌┠╌┠╌┠╌┠
	┼┼┼┼┼┾┿┿
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Total A/CR 9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 9

LDC Report# 33039A6

Laboratory Data Consultants, Inc. Data Validation Report

Collection Date: October 30, 2014

LDC Report Date: November 10, 2014

Matrix:

Air

Parameters: Hexavalent Chromium

Validation Level: EPA Level IV

Laboratory: Eastern Research Group

Sample Delivery Group (SDG): 4103112

Sample Identification

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

Introduction

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

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

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

The following are definitions of the data qualifiers:

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

I. Technical Holding Times

All technical holding time requirements were met.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met.

IV. Blanks

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

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

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

V. Matrix Spike/Matrix Spike Duplicates

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

VI. Duplicates

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

VII. Laboratory Control Samples

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

VIII. Sample Result Verification

All sample result verifications were acceptable.

IX. Overall Assessment of Data

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

X. Field Duplicates

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

	Concentra	tion (ng/m³)			
Analyte	PAM-1	PAM-1D	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.0217	0.0218	0 (≤20)	-	-

Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Data Qualification Summary - SDG 4103112

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

Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG 4103112

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 4103112

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

LDC #: <u>33039A6</u>	VALIDATION COMPLETENESS WORKSHEET		Dat
SDG # <u>: 4103112</u>	Level IV		Page
Laboratory: Eastern Research G	<u>iroup</u>	-	Reviewe

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: 10/30/14
- 11	Initial calibration	A	
- 111.	Calibration verification	A	
١V	Blanks	A	
v	Matrix Spike/Matrix Spike Duplicates	2 V	Not Required
VI.	Duplicates	A	$\mathcal{P}_{\mathcal{P}\mathcal{P}}$
VII.	Laboratory control samples	Å	LCSO
VIII.	Sample result verification	À	
IX.	Overall assessment of data	A	
Х.	Field duplicates	SW	FD=(3,4)
XL	Field blanks	てて	FB= 8, TB=9

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

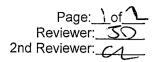
ND = No compounds detected R = Rinsate FB = Field blank

D = Duplicate TB = Trip blank EB = Equipment blank

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

Notes:

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Method: Inorganics (EPA Method See (over)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times	<u>د</u>	<u>.</u>	L	I
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?	1			
Were all initial calibration correlation coefficients <a> 0.995?	1			
Were all initial and continuing calibration verification %Rs within the 9 0-11 0% QC limits?	/			
Were titrant checks performed as required? (Level IV only)			/	
Were balance checks performed as required? (Level IV only)			/	
III. Blanks				
Was a method blank associated with every sample in this SDG?	/			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		/		
IV. Matrix spike/Matrix spike duplicates and Duplicates				
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	/			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.			/	
Were the MS/MSD or duplicate relative percent differences (RPD) \leq 20% for 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?			J	

VALIDATION FINDINGS CHECKLIST

Page: <u>2</u>of <u>2</u> Reviewer: <u>5</u> O 2nd Reviewer: <u>6</u>

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?	\angle			
VIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	/			
IX. Field duplicates				
Field duplicate pairs were identified in this SDG.	/			
Target analytes were detected in the field duplicates.	/			
X. Field blanks				
Field blanks were identified in this SDG.	/			
Target analytes were detected in the field blanks.		/		

.

LDC#<u>33039A6</u>

VALIDATION FINDINGS WORKSHEET Field Duplicates

Page: <u>i</u> of <u>i</u> Reviewer: <u>5</u> 2nd Reviewer: <u>6</u>

Inorganics: Method See Cover

	Concentra		Qual.	
Analyte	3	4	RPD (≤20)	
Hexavalent Chromium	0.0217	0.0218	0	

\LDCFILESERVER\Validation\FIELD DUPLICATES\FD_inorganic\33039A6.wpd

LDC #: 330597A

Validation Findings Worksheet Initial and Continuing Calibration Calculation Verification

Page: of	
Reviewer: 30	
2nd Reviewer:	

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

Where,

The correlation coefficient (r) for the calibration of \underline{C}^{+6} was recalculated. Calibration date: $\underline{11} \underline{14} \underline{14}$

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

%R = Found X 100

True

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

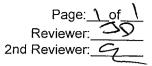
······					Recalculated	Reported	Acceptable
Type of analysis	Analyte	Standard	Conc. (ng/ml)	Area	r or r ²	r or r ²	(Y/N)
Initial calibration		s1	0.50	0.0000139			
		s2	0.10	0.0000321	0.99988	0.99989	
		s3	0.20	0.0000723			
	Crtb	<u>s4</u>	0.50	0.0001953			
		<u>s5</u>	1.00	0.0004103			4
		s6	2.00	0.0008056			\smile
エン いっつろ Calibration verification	C7+6	Found 0.5157 ng/m	True O.Snglml		103.1%P	103.1%2	
Calibration verification	Crtho	0.5287.mg/ml	0.Sng/ml		105.7%P	105.7%R	4
Calibration verification							

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

LDC #: 33039 A/0

VALIDATION FINDINGS WORKSHEET Level IV Recalculation Worksheet

concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation,



METHOD: Inorganics, Method See Cover

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

%R = <u>Found</u> x 100 Where, Found = True

Found = SSR (spiked sample result) - SR (sample result). True = concentration of each analyte in the source.

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

RPD = <u> S-D </u> 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	Acceptable (Y/N)
LCS 11:33	Laboratory control sample	C	1.087 ng/m/	1.00 ng/n/	109%p	109%p	3
Ν	Matrix spike sample		(SSR-SR)				
Dup 12-47	Duplicate sample	Crtho	0.0236ng/m ³	0.0218 ng/m ³	7.93%890	8.41% RD	J¥

Comments: <u>*</u> Counting

Ind reviewer:
$\begin{array}{c c c c c c c c c c c c c c c c c c c $
#Sample IDAnalyteReported Concentration ($red lm^3$)Calculated Concentration ($red lm^3$)Acceptable ($red lm^3$)1 Cr^{+y} 0.0166 $0.01b6$ Y 2 0.0204 0.0204 y 3 0.0217 0.0218 y 4 0.0218 0.0218 y 5 0.0324 0.0324 y 6 0.0156 0.056 0.056
#Sample IDAnalyteReported Concentration ($red lm^3$)Calculated Concentration ($red lm^3$)Acceptable ($red lm^3$)1 Cr^{14} 0.0166 $0.01b6$ Y 2 0.0204 0.0204 y 3 0.0217 0.0218 y 4 0.0218 0.0218 y 5 0.0324 0.0324 y 6 0.0156 0.056 0.056
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$\begin{array}{c ccccccccccccccccccccccccccccccccccc$
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$
6 0.0156 0.056 0.056 0.056 0.056 0.056 0.056
<u>7</u> <u>0.0732</u> <u>0.032</u>
8 DU DU ND
A V ND ND V

Note:_____

Environmental Res	sources Management, Ind	2		FILE #:	3926.00					
75 Valley Stream F	^o arkway, Suite 400			REPORTE	D: 11/07/14 09:	59				
Malvern, PA 19355					SUBMITTED: 10/31/14					
ATTN: Mr. Jeff Boggs					AQS SITE CODE:					
PHONE: (443) 8	03-8495 FAX: (410) 266-8912		SITE CODE	E: ł	Ioneywell Hex Chrome Study				
Description:	OAM 1	Lab II	D: 4103112-01			Sampled: 10/30/14 16:11				
Matrix:	Air	Samp	le Volume: 21.	56 m³		Received: 10/31/14 10:46				
Comments:	Start Time 10/29/14 16:14	ļ				Analysis Date: 11/04/14 14:05				
	Hexavalent Chromium									
			<u>Results</u>		<u>MDL</u>					
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>					
Hexavalent Chromium		1854-02-99	0.0166		0.0036					

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Environmental Resources Management, Inc					FILE #: 3926.00				
75 Valley Stream Parkway, Suite 400					REPORTED: 11/07/14 09:59				
Malvern, PA 19355					SUBMITTED: 10/31/14				
ATTN: Mr. Jeff Boggs					AQS SITE CODE:				
PHONE: (443) 8	03-8495 FAX: (410) 266-8912		SITE CODE	E: Honeywell Hex Chrome Study				
Description:	OAM 2	Lab ID:	4103112-02		Sampled: 10/30/14 16:31				
Matrix:	Air	Sample	Volume: 21.	63 m³	Received: 10/31/14 10:46				
Comments:	Start Time 10/29/14 16:29)			Analysis Date: 11/04/14 14:15				
	Hexavalent Chromium								
			<u>Results</u>		MDL				
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>				
Hexavalent Chromium		1854-02-99	0.0204		0.0036				

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75 Valley Stream F	Parkway, Suite 400			REPORTE	ED: 11/07/14 09:	59		
Malvern, PA 19355					SUBMITTED: 10/31/14			
ATTN: Mr. Jeff Bo	oggs		AQS SITE CODE:					
PHONE: (443) 8	03-8495 FAX: (410) 266-8912		SITE COD	E:	Honeywell Hex Chrome Study		
Description:	PAM-1	Lab ID:	4103112-03			Sampled: 10/30/14 17:27		
Matrix:	Air	Sample \	/olume: 21.5	51 m³		Received: 10/31/14 10:46		
Comments:	Col 1 Start Time 10/29/14	17:33		11 1		Analysis Date: 11/04/14 12:37		
Hexavalent Chromium								
			<u>Results</u>		MDL			
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>			
Hexavalent Chromium		1854-02-99	0.0217		0.0036			

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75 Valley Stream Parkway, Suite 400					REPORTED: 11/07/14 09:59		
Malvern, PA 19355					SUBMITTED: 10/31/14		
ATTN: Mr. Jeff B	oggs			AQS SITE CODE:			
PHONE: (443) 8	03-8495 FAX: (410) 266-8912		SITE COE	DE:	Honeywell Hex Chrome Study	
Description:	PAM-1D	Lab ID:	4103112-04			Sampled: 10/30/14 17:32	
Matrix:	Air	Sample \	/olume: 21.5	53 m³		Received: 10/31/14 10:46	
Comments:	Col 2 Start Time 10/29/14	17:37				Analysis Date: 11/04/14 13:21	
Hexavalent Chromium							
			<u>Results</u>		<u>MDL</u>		
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>		
Hexavalent Chromium		1854-02- 99	0.0218		0.0036		

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Environmental Res	sources Management, In	3		FILE #: 3	3926.00		
75 Valley Stream Parkway, Suite 400				REPORTED	REPORTED: 11/07/14 09:59		
Malvern, PA 19355				SUBMITTED: 10/31/14			
ATTN: Mr. Jeff B	oggs			AQS SITE CODE:			
PHONE: (443) 8	03-8495 FAX: (410) 266-8912		SITE CODE	E: H	oneywell Hex Chrome Study	
Description:	PAM-2	Lab ID): 4103112-05			Sampled: 10/30/14 17:14	
Matrix:	Air	Sampl	e Volume: 21.	55 m³		Received: 10/31/14 10:46	
Comments:	Start Time 10/29/14 17:18	3				Analysis Date: 11/04/14 14:25	
Hexavalent Chromium							
			<u>Results</u>		MDL		
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>		
Hexavalent Chromium		1854-02-99	0.0324		0.0036		

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Environmental Resources Management, Inc					FILE #: 3926.00			
75 Valley Stream Parkway, Suite 400					REPORTED: 11/07/14 09:59			
Malvern, PA 19355				SUBMITTED: 10/31/14				
ATTN: Mr. Jeff B	oggs			AQS SITE CODE:				
PHONE: (443) 8	03-8495 FAX: (410) 266-8912		SITE COD	E:	Honeywell Hex Chrome Study		
Description:	PAM-3	Lab ID:	4103112-06			Sampled: 10/30/14 17:04		
Matrix:	Air	Sample V	/olume: 21.6	54 m³		Received: 10/31/14 10:46		
Comments:	Start Time 10/29/14 17:01	L			. <u>.</u>	Analysis Date: 11/04/14 14:34		
Hexavalent Chromium								
			<u>Results</u>		MDL			
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>			
Hexavalent Chromium		1854-02-99	0.0156		0.0036			

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Environmental Resources Management, Inc				FILE #: 3926.00				
75 Valley Stream Parkway, Suite 400				REPORTE	REPORTED: 11/07/14 09:59			
Malvern, PA 19355				SUBMITTED: 10/31/14				
ATTN: Mr. Jeff B	oggs			AQS SITE CODE:				
PHONE: (443) 8	03-8495 FAX: (410) 266-8912		SITE COD)E:	Honeywell Hex Chrome Study		
Description:	PAM-4	Lab ID:	4103112-07			Sampled: 10/30/14 16:48		
Matrix:	Air	Sample	Volume: 21.6	52 m³		Received: 10/31/14 10:46		
Comments:	Start Time 10/29/14 16:47	7		·····	<u></u>	Analysis Date: 11/04/14 14:44		
Hexavalent Chromium								
			<u>Results</u>		<u>MDL</u>			
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>			
Hexavalent Chromium		1854-02-99	0.0232		0.0036			

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Environmental Re	sources Manageme	nt, Inc		FILE #:	3926.00			
75 Valley Stream Parkway, Suite 400				REPORT	REPORTED: 11/07/14 09:59			
Malvern, PA 19355					SUBMITTED: 10/31/14			
ATTN: Mr. Jeff B	oggs			AQS SITE	AQS SITE CODE:			
PHONE: (443) 8	03-8495 FAX:	(410) 266-8912		SITE COL	DE: I	Honeywell Hex Chrome Study		
Description:	PAM-21	I	Lab ID: 4103112-	08		Sampled: 10/30/14 00:00		
Matrix:	Air	:	Sample Volume:	21.55 m³		Received: 10/31/14 10:46		
Comments:						Analysis Date: 11/04/14 14:54		
Hexavalent Chromium								
			Results		<u>MDL</u>			
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>			
Hexavalent Chromium		1854-02-99	ND	U	0.0036			

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Environmental Resources Ma	nagement, Inc	I	FILE #: 3926	6.00				
75 Valley Stream Parkway, St	I	REPORTED: 11/07/14 09:59						
Malvern, PA 19355		:	SUBMITTED: 10/31/14					
ATTN: Mr. Jeff Boggs			AQS SITE CODE:					
PHONE: (443) 803-8495	FAX: (410) 266-8912	:	SITE CODE:	Hone	eywell Hex Chrome Study			
Description: PAM-31	Lab ID:	4103112-09			Sampled: 10/30/14 00:00			
Matrix: Air	Sample	Volume: 21.64	m³		Received: 10/31/14 10:46			
Comments:				Ana	lysis Date: 11/04/14 15:24			
Hexavalent Chromium								
		<u>Results</u>		<u>MDL</u>				
<u>Analyte</u>	CAS Number	<u>ng/m³ Air</u>	Flag	<u>ng/m³ Air</u>				
Hexavalent Chromium	1854-02-99	ND	υ	0.0036				

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