# LABORATORY DATA CONSULTANTS, INC.



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

June 26, 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 June 24, 2014. Attachment 1 is a summary of the samples that were reviewed for each analysis.

### LDC Project #32028:

# SDG Fraction

4061913/4062007 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
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Collection Date: June 17 through June 18, 2014

Air

LDC Report Date: June 25, 2014

Matrix:

Parameters: Hexavalent Chromium

Validation Level: EPA Level IV

Laboratory: Eastern Research Group

Sample Delivery Group (SDG): 4061913/4062007

### Sample Identification

OAM 1 (06/17/14)	PAM-1 (06/18/14)DUP
OAM 2 (06/17/14)	PAM-1D (06/18/14)DUP
PAM-1 (06/17/14)	
PAM-1D (06/17/14)	
PAM-2 (06/17/14)	
PAM-3 (06/17/14)	
PAM-4 (06/17/14)	
PAM-21 (06/17/14)	
PAM-31 (06/17/14)	
OAM 1 (06/18/14)	
OAM 2 (06/18/14)	
PAM-1 (06/18/14)	
PAM-1D (06/18/14)	
PAM-2 (06/18/14)	
PAM-3 (06/18/14)	
PAM-4 (06/18/14)	
PAM-21 (06/18/14)	
PAM-31 (06/18/14)	
PAM-1 (06/17/14)DUP	
PAM-1D (06/17/14)DUP	

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

### Introduction

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

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

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

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- 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 (06/17/14) and PAM-31 (06/18/14) were identified as trip blanks. No hexavalent chromium was found.

Samples PAM-21 (06/17/14) and PAM-21 (06/18/14) were identified as field blanks. No hexavalent chromium was found.

### V. Matrix Spike/Matrix Spike Duplicates

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

### VI. Duplicates

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

DUP ID (Associated Samples)	Analyte	RPD (Limits)	Difference (Limits)	Flag	A or P
PAM-1D (06/17/14)DUP (PAM-1D (06/17/14))	Hexavalent chromium	25.2 (≤20)	-	J (all detects) UJ (all non-detects)	A

### 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 (06/17/14) and PAM-1D (06/17/14) and samples PAM-1 (06/18/14) and PAM-1D (06/18/14) 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 (06/17/14)	PAM-1D (06/17/14)	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.0226	0.0147	42 (≤20)	NQ	-

	Concentrati	ion (ng/m³)				
Analyte	PAM-1 (06/18/14)	PAM-1D (06/18/14)	RPD (Limits)	Flags	A or P	
Hexavalent chromium	0.0205	0.0149	32 (≤20)	NQ	-	

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

### Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Data Qualification Summary - SDG 4061913/4062007

SDG	Sample	Analyte	Flag	A or P	Reason	
4061913/ 4062007	PAM-1D (06/17/14)	Hexavalent chromium	J (all detects) UJ (all non-detects)	A	Duplicate sample analysis (RPD)	

### Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG 4061913/4062007

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 4061913/4062007

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

SDG #:	Level IV	
Laboratory: Eastern Research Group		F

Date: 06/25/14
Page: <u>\</u> of <u>\</u>
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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 COMPLETENESS WORKSHEET

	Validation Area		Comments
1.	Technical holding times	A	Sampling dates: 06/17 - 18/14
11	Initial calibration	A	
111.	Calibration verification	A	
IV	Blanks	A	
v	Matrix Spike/Matrix Spike Duplicates	N	Not Required
VI.	Duplicates	SW	Dup
VII.	Laboratory control samples	A	usio
VIII.	Sample result verification	A	
IX.	Overall assessment of data	A	
Х.	Field duplicates	SW	(3,4)(17,13)
	Field blanks	APM	(8, 17 = FB) (9, 18 = TB)

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

FB = Field blank

R = Rinsate

ND = No compounds detected

D = Duplicate TB = Trip blank EB = Equipment blank

Validated Samples:

LDC #:

32028A6

Airs

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

Dates approved to differentiate between FDS Notes:

Method: Inorganics (EPA Method Gee (000))				
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 <a> 0.995?</a>	/			
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.	$\checkmark$		pou	Deponly
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.			/	
Were the MS/MSD or duplicate relative percent differences (RPD) $\leq$ 20% for waters and $\leq$ 35% for soil samples? A control limit of $\leq$ CRDL( $\leq$ 2X CRDL for soil) was used for samples that were $\leq$ 5X the CRDL, including when only one of the duplicate sample values were $\leq$ 5X the CRDL.		/		
V. Laboratory control samples				
Was an LCS anayized for this SDG?	/			
Was an LCS analyzed per extraction batch?	<			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% (85-115% for Method 300.0) QC limits?	<			
VI. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		_	/	
Were the performance evaluation (PE) samples within the acceptance limits?				

### VALIDATION FINDINGS CHECKLIST

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

### VALIDATION FINDINGS WORKSHEET Duplicate Analysis

Page:_	$\int of $
Reviewer:	30
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	J

#### METHOD: Hexavalent Chromium (ASTM D7614)

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

(Y) N N/A Was a duplicate sample analyzed for each matrix in this SDG? Y(N)N/A Were all duplicate sample relative percent differences (RPD) < 2

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

#### LEVEL IV ONLY:

(Y)N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	Date	Duplicate ID	Matrix	Analyte	RPD ( <u>&lt;</u> 20%)	Difference (Limits)	Associated Samples	Qualifications
		20	Air	Cr+6	25.2		Att or 4*	J/UJ/A
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Comments:\_

\* other client Dp in beach within limits

### LDC# 32028A6 VALIDATION FINDINGS WORKSHEET Field Duplicates

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Reviewer:	30
2nd Reviewer:	a

Inorganics: Method\_\_See Cover\_\_

	Concentrat	tion (ng/m3)		
Analyte	3	4	RPD (≤20)	Qual. Parent Only
Hexavalent Chromium	0.0226	0.0147	42	NQ

	Concentra	tion (ng/m3)			
Analyte	12	13	RPD (≤20)	Qual. Parent Only	
Hexavalent Chromium	0.0205	0.0149	32	<del>-no qual</del> ≁- N Q	

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NQ= Not Qualified because one or both results are < 5x reporting limit

### LDC #: 32028410

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

Page:  $\lambda$  of  $\lambda$ Reviewer: 39 2nd Reviewer:

Method: Inorganics, Method See Cover

The correlation coefficient (r) for the calibration of  $\underline{Cr}^{\mu}$  was recalculated. Calibration date: <u>06/23/14</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

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/L)	Area	r or r <sup>2</sup>	r or r <sup>2</sup>	(Y/N)
Initial calibration		s1	0.05	0.0000199			
		s2	0.10	0.0000372	0.99996	0.99936	8 1
	( the	s3	0.20	0.0000811			3
		s4	0.50	0.0002069			
		s5	1.00	0.0004186			
		s6	2.00	0.0008533			
ICU (11:16)	1 +10		Found	True	-	_	<u> </u>
Calibration verification	Crie		8.4898 ng/m1	0.5000ngjul	98°6R	97.9%R	
CCN (14:51)	1 - 40		Fand	True			5 k
Calibration verification	C.V		0.4877ng/ml	O. Soconghi	27.5%r	97.5%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



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

 True
 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 (11:46)	Laboratory control sample	Cr+6	0.9870ng/m)	Inglal	18.7%E	98.7%F	S
ρ	Matrix spike sample		(SSR-SR)				
Dop (13:21)	Duplicate sample	Crtb	0.0222¢ ng/m3	U.OZZbng/m <sup>3</sup>	1.79%RPD	1.87%2RRD	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.

<i>. o</i> .	.0004280	vf=10m:1 m3= 21.52	21.52m <sup>3</sup>	= 0.0	)226ng m
	Sample ID	Analyte	Reported Concentration (₩2,₩3)	Calculated Concentration ( ng/m <sup>2</sup> )	Acceptable (Y/N)
	١	Cvtb	0.0160	0.0161	3
	2	<u> </u>	0.032	0.0131	. 5
	3		0.0226	0.0226	Ч
	ч		0.0147	0.0147	3
	5		0.017	0.007	<u> </u>
	6		0.0185	0.0185	y
	<u> </u>		0.0134	0.0134	3
	8		NO	NO	3
	9		04	DU	y
	10		0.029	0.0129	У
	11		0.0134	0.0134	3
	12		0.0205	0.0205	J
	13		0.0149	0.0150	Y
	14		0.0145	0.0146	J
	15		0.0174	0.0174	У
	10		0.0183	0.083	y y
	17		ND	ND	ع ک
	18	<u> </u>	QU	A CI	S

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## VALIDATION FINDINGS WORKSHEET

Sample Calculation Verification

Recalculation:

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Reviewer:	30
2nd reviewer:	07

= 0.0487mg

\_\_\_\_\_reported with a positive detect were

[[0.0000157mAUXmin]-(-5.11E.06)]

METHOD: Inorganics, Method See Cover

Concentration = [(area - (co)] / C, / (ng/m)

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

<u>X N N/A</u> Have results been reported and calculated correctly? YN N/A

Are results within the calibrated range of the instruments?

Are all detection limits below the CRQL?

YN NA

1 DO # 37- 70 N

Environmental Re	Environmental Resources Management, Inc				FILE #: 3926.00			
75 Valley Stream I	Parkway, Suite 400			REPORTED: 06/24/14 13:49				
Malvern, PA 19355				SUBMITTED:	IITTED: 06/19/14 to 06/20/14			
ATTN: Mr. Jeff B PHONE: (443) 8	oggs 103-8495 <b>FAX:</b> (410	) 266-8912		AQS SITE CODE: SITE CODE:	ł	Honeywell Hex Chrome Study		
Description:	OAM 1	Lab	<b>ID:</b> 4061913-01			Sampled: 06/17/14 16:08		
Matrix:	Air	Sam	ple Volume: 21.5	56 m³		Received: 06/19/14 11:12		
Comments:	Start Time 6/16/14 16:16					Analysis Date: 06/23/14 14:31		
			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	0.0160		0.0036			

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Environmental Resources Management, Inc					FILE #: 3926.00			
75 Valley Stream I	<sup>D</sup> arkway, Suite 400			REPO	REPORTED: 06/24/14 13:49			
Malvern, PA 19355					SUBMITTED: 06/19/14 to 06/20/14			
ATTN: Mr. Jeff B PHONE: (443) 8	oggs 03-8495 <b>FAX:</b> (410	) 266-8912		AQS CODI SITE	SITE CODE:		Honeywell Hex Chrome Study	
Description:	OAM 2	La	a <b>b ID:</b> 4061913-0	)2			Sampled: 06/17/14 16:37	
Matrix:	Air	Sa	ample Volume:	21.59	m³		Received: 06/19/14 11:12	
Comments:	Start Time 6/16/14 16:42						Analysis Date: 06/23/14 14:41	
			Hexavalent	Chromiun	n			
			<u>Results</u>			MDL		
<u>Anaiyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Fl</u>	ag	<u>ng/m³ Air</u>		
Hexavalent Chromium		1854-02-99	0.0132			0.0036		

016/25/14

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Environmental Res	с	FILE #: 392	FILE #: 3926.00					
75 Valley Stream F	Parkway, Suite 400			REPORTED:	REPORTED: 06/24/14 13:49			
Malvern, PA 1935		SUBMITTED:	SUBMITTED: 06/19/14 to 06/20/14					
ATTN: Mr. Jeff B		AQS SITE	AQS SITE					
PHONE: (443) 8	03-8495 <b>FAX:</b> (410	) 266-8912		SITE CODE:	н	oneywell Hex Chrome Study		
Description:	PAM-1	Lab ID:	4061913-03			Sampled: 06/17/14 18:19		
Matrix:	Air	Sample	Volume: 21.	52 m³		Received: 06/19/14 11:12		
Comments:	Col 1 Start Time 6/16/14	18:25				Analysis Date: 06/23/14 13:11		
			Hexavalent Ch	romium				
			<u>Results</u>		MDL			
Analyte		CAS Number	<u>nq/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>			
Hexavalent Chromium		1854-02-99	0.0226		0.0036			

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Environmental Res	Environmental Resources Management, Inc					FILE #: 3926.00			
75 Valley Stream F	Parkway, Suite 400			REPORTED	REPORTED: 06/24/14 13:49				
Malvern, PA 19355					SUBMITTED: 06/19/14 to 06/20/14				
ATTN: Mr. Jeff Boggs				AQS SITE	AQS SITE				
PHONE: (443) 8	03-8495 FAX: (410	) 266-8912		SITE CODE:	: ł	loneywell Hex Chrome Study			
Description:	PAM-1D	Lab ID:	4061913-04			Sampled: 06/17/14 18:30			
Matrix:	Air	Sample	Volume: 22.5	58 m³		Received: 06/19/14 11:12			
Comments:	Col 2 Start Time 6/16/14	18:36				Analysis Date: 06/23/14 13:31			
			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	0.0147 5		0.0036				

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Environmental Resou	Environmental Resources Management, Inc					FILE #: 3926.00			
75 Valley Stream Par	rkway, Suite 400					REPORTED: 06/24/14 13:49			
Malvern, PA 19355				SUBMITTED: 06/19/14 to 06/20/14			to 06/20/14		
ATTN: Mr. Jeff Boggs						AQS SITE			
PHONE: (443) 803	-8495 <b>FAX:</b> (410)	266-8912				SITECOL	DE:		Honeywell Hex Chrome Study
Description: P/	AM-2		Lab ID:	4061913	-05				Sampled: 06/17/14 17:52
Matrix: Ai	ir		Sample Vo	olume:	21.27	7 m³			Received: 06/19/14 11:12
Comments: St	tart Time 6/16/14 18:05								Analysis Date: 06/23/14 15:11
			Н	lexavalen	t Chro	mium			
				<u>Results</u>				MDL	
<u>Analyte</u>		CAS Number	<u>r</u>	<u>ng/m³ Air</u>		<u>Flag</u>		<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99		0.0177				0.0036	

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Page 7 of 22

Environmental Res	Environmental Resources Management, Inc					FILE #: 3926.00			
75 Valley Stream I	<sup>p</sup> arkway, Suite 400			REPO	REPORTED: 06/24/14 13:49				
Malvern, PA 19355				SUBM	SUBMITTED: 06/19/14 to 06/20/14				
ATTN: Mr. Jeff Be PHONE: (443) 8	oggs 03-8495 <b>FAX:</b> (410	) 266-8912		AQS S	DITE	ŀ	Honeywell Hex Chrome Study		
Description:	PAM-3	La	<b>b ID:</b> 4061913-0	06			Sampled: 06/17/14 17:36		
Matrix:	Air	Sa	mple Volume:	20.52	m³		Received: 06/19/14 11:12		
Comments:	Start Time 6/16/14 17:50						Analysis Date: 06/23/14 15:21		
Hexavalent Chromium <u>Results</u> <u>MDL</u>									
Analyte		CAS Number	<u>ng/m³ Air</u>	<u>Fla</u>	a	<u>ng/m³ Air</u>			
Hexavalent Chromium		1854-02-99	0.0185			0.0038			

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Page 8 of 22

NERC		CERTIFIC	CATE OF	ANALYSIS	6			
Environmental Re	sources Management, Ind	c		FILE #: 392	FILE #: 3926.00			
75 Valley Stream		REPORTED:	REPORTED: 06/24/14 13:49					
Malvern, PA 1935	5			SUBMITTED:	06/19/14 to	06/20/14		
ATTN: Mr. Jeff B PHONE: (443) 8	oggs 303-8495 <b>FAX:</b> (410	) 266-8912		AQS SITE CODE: SITE CODE:	Н	oneywell Hex Chrome Study		
Description:	PAM-4	Lab ID:	4061913-07	,		Sampled: 06/17/14 17:11		
Matrix:	Air	Sample \	/olume: 2	1.3 m³		Received: 06/19/14 11:12		
Comments:	Start Time 6/16/14 17:20				/	Analysis Date: 06/23/14 15:31		
		I	Hexavalent C	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	0.0134		0.0036			

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Environmental Resources Manageme	ent, Inc	FILE #: 3	FILE #: 3926.00				
75 Valley Stream Parkway, Suite 400			REPORTED	REPORTED: 06/24/14 13:49			
Malvern, PA 19355				SUBMITTED: 06/19/14 to 06/20/14			
ATTN: Mr. Jeff Boggs				AQS SITE			
PHONE: (443) 803-8495 FAX:	(410) 266-8912		SITE CODE	i: ł	Ioneywell Hex Chrome Study		
Description: PAM-21	Lab ID:	4061913-08			Sampled: 06/17/14 00:00		
Matrix: Air	Sample	Volume: 21	l.27 m³		Received: 06/19/14 11:12		
Comments:					Analysis Date: 06/23/14 15:41		
		Hexavalent Ch	nromium				
		<u>Results</u>		MDL			
Analyte	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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Page 10 of 22

Environmental Resources Man	agement, Inc	FILE #: 3926.00				
75 Valley Stream Parkway, Suit	te 400	I	REPORTED: 06/24/14 13:49			
Malvern, PA 19355		SUBMITTED: 06/19/14 to 06/20/14				
ATTN: Mr. Jeff Boggs		AQS SITE				
PHONE: (443) 803-8495	FAX: (410) 266-8912		CODE: SITE CODE:	Honeywell Hex Chrome Study		
Description: PAM-31	Lab ID:	4061913-09		Sampled: 06/17/14 00:00		
Matrix: Air	Sample V	<b>/olume:</b> 20.52	m³	Received: 06/19/14 11:12		
Comments:	<u> </u>			Analysis Date: 06/23/14 15:51		
	ŀ	lexavalent Chror	nium			
		<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	ND	U	0.0038		

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Page 11 of 22

Environmental Resources Management, Inc					FILE #: 3926.00				
75 Valley Stream F	Parkway, Suite 400				REPORT	REPORTED: 06/24/14 13:49			
Malvern, PA 19355				SUBMITT	SUBMITTED: 0		o 06/20/14		
ATTN: Mr. Jeff Boggs				AQS SITE					
PHONE: (443) 8	03-8495 FAX: (410	) 266-8912			SITECO	DE:		Honeywell Hex Chrome Study	
Description:	OAM 1		Lab ID: 4	062007-01				Sampled: 06/18/14 16:32	
Matrix:	Air		Sample Volum	e: 21.9	94 m³			Received: 06/20/14 11:42	
Comments:	Start Time 6/17/14 16:14							Analysis Date: 06/23/14 16:01	
			Hexa	valent Chr	omium				
			<u>Re</u>	<u>sults</u>			MDL		
<u>Analyte</u>		CAS Number	<u>r ng/</u>	m³ Air	<u>Flag</u>		<u>ng/m³ Air</u>		
Hexavalent Chromium		1854-02-99	0.0	129			0.0036		

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Environmental Res	c	FILE #: 3926.00					
75 Valley Stream F	Parkway, Suite 400			REPORTED:	REPORTED: 06/24/14 13:49		
Malvern, PA 19355					SUBMITTED: 06/19/14 to 06/20/14		
ATTN: Mr. Jeff Bo PHONE: (443) 8	oggs 03-8495 <b>FAX:</b> (410	) 266-8912		AQS SITE CODE: SITE CODE:	Ho	neywell Hex Chrome Study	
Description:	OAM 2	Lab ID:	4062007-02			Sampled: 06/18/14 17:04	
Matrix:	Air	Sample	Volume: 22.0	)2 m³		Received: 06/20/14 11:42	
Comments:	Start Time 6/17/14 16:41				A	nalysis Date: 06/23/14 16:11	
			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	0.0134		0.0036		

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Page 13 of 22

Environmental Resources Management, Inc					FILE #: 3926.00			
75 Valley Stream I	Parkway, Suite 400			REPOR	REPORTED: 06/24/14 13:49			
Malvern, PA 19355					SUBMITTED: 06/19/14 to 06/20/14			
ATTN: Mr. Jeff Boggs PHONE: (443) 803-8495 FAX: (410) 266-8912				aqs site Site code:		Honeywell Hex Chrome Study		
Description:	PAM-1	Lab	ID: 4062007-0	03			Sampled: 06/18/14 18:28	
Matrix:	Air	Sam	ple Volume:	21.66 m	3		Received: 06/20/14 11:42	
Comments:	Col 1 Start Time 6/17/14	18:24					Analysis Date: 06/23/14 13:50	
			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	0.0205			0.0036		

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<b>NERC</b>	Ē		CEF	RTIFIC	ATE (	OF A	NALYSIS	6	49 :o 06/20/14 Honeywell Hex Chrome Study						
Environmental Re	esources Mar	nagemer	nt, Inc				FILE #: 3926	5.00							
75 Valley Stream	Parkway, Su	ite 400				REPORTED: 06/24/14 13:49									
Malvern, PA 1935	5						SUBMITTED:	06/19/14	o 06/20/14						
ATTN: Mr. Jeff E PHONE: (443) 8	3oggs 803-8495	FAX:	(410) 266-8912				AQS SITE CODE: SITE CODE:		Honeywell Hex Chrome Study						
Description:	PAM-1D			Lab ID:	406200	7-04	· · · · · · · · · · · · · · · · · · ·		Sampled: 06/18/14 18:35						
Matrix:	Air			Sample V	olume:	22.7	m³		Received: 06/20/14 11:42						
Comments:	Col 2 Start 7	Time 6/17	7/14 18:34						Analysis Date: 06/23/14 14:10						
				н	lexavaler	nt Chro	mium								
					<u>Results</u>			<u>MDL</u>							
<u>Analyte</u>			CAS Numb	<u>er</u>	<u>ng/m³ Ai</u>	ir	Flag	<u>ng/m³ Air</u>							
Hexavalent Chromium	n		1854-02-99		0.0149			0.0034							

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Environmental Re	sources Management, In	с		FILE #: 39	26.00	
75 Valley Stream	Parkway, Suite 400			REPORTED:	06/24/14 13:	49
Malvern, PA 1935	5			SUBMITTED:	06/19/14 1	to 06/20/14
ATTN: Mr. Jeff B	oggs			AQS SITE		
PHONE: (443) 8	803-8495 FAX: (410	) 266-8912		CODE: SITE CODE:	I	Honeywell Hex Chrome Study
Description:	PAM-2	Lab ID:	4062007-05			Sampled: 06/18/14 18:11
Matrix:	Air	Sample	Volume: 20	1.78 m³		Received: 06/20/14 11:42
Comments:	Start Time 6/17/14 18:08					Analysis Date: 06/23/14 16:20
			Hexavalent Ch	romium		
			<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	0.0145		0.0036	

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Page 16 of 22

Environmental Res	sources Management, Ind	c	FILE #:	3926.00		
75 Valley Stream F	Parkway, Suite 400			REPORTE	ED: 06/24/14 13:	49
Malvern, PA 19355	5			SUBMITT	ED: 06/19/14	to 06/20/14
ATTN: Mr. Jeff Bo	oggs			AQS SITE	E	
PHONE: (443) 8	03-8495 <b>FAX:</b> (410	) 266-8912		SITECOL	DE:	Honeywell Hex Chrome Study
Description:	PAM-3	Lab ID:	4062007-06			Sampled: 06/18/14 17:53
Matrix:	Air	Sample	Volume: 20.8	38 m³		Received: 06/20/14 11:42
Comments:	Start Time 6/17/14 17:42		• • • • • • • • • • • • • • • • • • •			Analysis Date: 06/23/14 16:30
			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	0.0174		0.0036	

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<b>NERC</b>	Ì	CERTIFIC	CATE OF /	ANALYSIS	6	
Environmental Res	sources Management, In	C		FILE #: 3926	5.00	
75 Valley Stream	Parkway, Suite 400			REPORTED:	06/24/14 13:49	
Malvern, PA 1935	5			SUBMITTED:	06/19/14 to 06	6/20/14
ATTN: Mr. Jeff B PHONE: (443) 8	oggs 03-8495 <b>FAX:</b> (410	) 266-8912		AQS SITE CODE: SITE CODE:	Hone	eywell Hex Chrome Study
Description:	PAM-4	Lab ID:	4062007-07		· · · · · · · · · · · · · · · · · · ·	Sampled: 06/18/14 17:35
Matrix:	Air	Sample	Volume: 21	.67 m³		Received: 06/20/14 11:42
Comments:	Start Time 6/17/14 17:19				Ana	Ilysis Date: 06/23/14 16:40
			Hexavalent Ch	romium		
			<b>Results</b>		MDL	
<u>Analyte</u>		CAS_Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99	0.0183		0.0036	

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Page 18 of 22

Environmental Reso	ources Manageme	nt, Inc			FILE #: 392	6.00	
75 Valley Stream Pa	arkway, Suite 400				REPORTED:	06/24/14 13	:49
Malvern, PA 19355					SUBMITTED:	06/19/14	to 06/20/14
ATTN: Mr. Jeff Bog	ggs				AQS SITE		
PHONE: (443) 80	3-8495 FAX:	(410) 266-8912			CODE: SITE CODE:		Honeywell Hex Chrome Study
Description:	PAM-21		Lab ID: 406200	07-08			Sampled: 06/18/14 00:00
Matrix:	Air		Sample Volume:	20.78	m³		Received: 06/20/14 11:42
Comments:							Analysis Date: 06/23/14 17:10
			Hexavale	nt Chro	mium		
			<u>Results</u>			<u>MDL</u>	
Analyte		CAS Numbe	er <u>ng/m³ A</u>	<u>ir</u>	<u>Flag</u>	<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99	ND		U	0.0036	

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Page 19 of 22

Environmental Resources Management, I	nc		FILE #: 3926	3926.00								
75 Valley Stream Parkway, Suite 400		REPORTED:	06/24/14 13:49									
Malvern, PA 19355			SUBMITTED:	06/19/14 to 06/20/14								
ATTN: Mr. Jeff Boggs			AQS SITE									
PHONE: (443) 803-8495 FAX: (41	10) 266-8912		SITE CODE:	Honeywell Hex Chrome Study								
Description: PAM-31	Lab ID:	4062007-09		Sampled: 06/18/14 00:00								
Matrix: Air	Sample Ve	olume: 20.8	8 m³	<b>Received:</b> 06/20/14 11:42								
Comments:				Analysis Date: 06/23/14 17:20								
	н	lexavalent 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	ND	U	0.0036								

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

June 27, 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 June 26, 2014. Attachment 1 is a summary of the samples that were reviewed for each analysis.

### LDC Project #32044:

### <u>SDG</u>

<u>Fraction</u>

4062427 Hexavalent Chromium

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

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

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

Sincerely,

Christina Rink Project Manager/Chemist

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	Level IV	L	DC #32	044	EF	RM	- N	lorı	risv	/ille	e, N	IC	/ H	art	or	Po	int	, M	D,	He	xa	vale	ent	Cł	iro	miı	ım	Мс	oni	ori	ng	)						
DC	SDG#	DATE REC'D	(3) DATE DUE	Cr( (D7	(VI) 614)																																	
Matrix:	Air/Water/Soil		·	Α	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s	w
<u> </u>	4062427	06/26/14	07/01/14	17	0																												ļ					
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# Laboratory Data Consultants, Inc. Data Validation Report

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

Hexavalent Chromium

Collection Date: June 19 through June 20, 2014

Air

LDC Report Date: June 27, 2014

Matrix:

Parameters:

Validation Level: EPA Level IV

Laboratory: Eastern Research Group

Sample Delivery Group (SDG): 4062427

### Sample Identification

OAM 1 (06/19/14) OAM 2 (06/19/14) PAM-1 (06/19/14) PAM-1D (06/19/14) PAM-2 (06/19/14) PAM-3 (06/19/14) PAM-21 (06/19/14) PAM-31 (06/19/14) OAM 1 (06/20/14) OAM 2 (06/20/14) PAM-1 (06/20/14) PAM-1D (06/20/14) PAM-2 (06/20/14) PAM-3 (06/20/14) PAM-4 (06/20/14) PAM-21 (06/20/14) PAM-31 (06/20/14) PAM-1 (06/19/14)DUP PAM-1D (06/19/14)DUP PAM-1 (06/20/14)DUP PAM-1D (06/20/14)DUP

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

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

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

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

The following are definitions of the data qualifiers:

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

### I. Technical Holding Times

All technical holding time requirements were met.

### **II. Initial Calibration**

All criteria for the initial calibration were met.

### III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met.

### IV. Blanks

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

Samples PAM-31 (06/19/14) and PAM-31 (06/20/14) were identified as trip blanks. No hexavalent chromium was found.

Samples PAM-21 (06/19/14) and PAM-21 (06/20/14) were identified as field blanks. No hexavalent chromium was found.

### V. Matrix Spike/Matrix Spike Duplicates

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

### VI. Duplicates

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

### VII. Laboratory Control Samples

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

#### VIII. Sample Result Verification

All sample result verifications were acceptable.

#### IX. Overall Assessment of Data

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

### X. Field Duplicates

Samples PAM-1 (06/17/14) and PAM-1D (06/19/14) and samples PAM-1 (06/20/14) and PAM-1D (06/20/14) were identified as field duplicates. No hexavalent chromium was detected in any of the samples with the following exceptions:

Concentration (ng/m³)			222			
Analyte	PAM-1 (06/19/14)	PAM-1D (06/19/14)	(Limits)	Flags	A or P	
Hexavalent chromium	0.0244	0.0233	5 (≤20)	-	-	

	Concentrat	ion (ng/m³)	222		
Analyte	PAM-1 (06/20/14)	PAM-1D (06/20/14)	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.0140	0.0118	17 (≤20)	-	-

#### Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Data Qualification Summary - SDG 4062427

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

Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG 4062427

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 4062427

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

LDC #:_	32044A6	VALIDATION COMPLETENESS WORKSHEET	Date: 06/26/14
SDG #:_	4062427	Level IV	Page: Lof V
Laborato	ory: Eastern	Research Group	Reviewer: 30

	10000001.	
2nd	Reviewer:	9

#### METHOD: Hexavalent Chromium (ASTM D7614)

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

	Validation Area		<u>Comments</u>
١.	Technical holding times	A	Sampling dates: 06/19-20/14
11	Initial calibration	A	
.	Calibration verification	A	
IV	Blanks	A	
V	Matrix Spike/Matrix Spike Duplicates	N	Not Required
VI.	Duplicates	A	Duo
VII.	Laboratory control samples	A	Lesid
VIII.	Sample result verification	A	
IX.	Overall assessment of data	A	
<b>X</b> .	Field duplicates	SW	FD= (3.4) (11,12)
	Field blanks	A	(FB=7216) (TB=8217)

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

FB = Field blank

TB = Trip blank

EB = Equipment blank

Validated Samples: Airs

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

# Notes: Park appended to ID to differentiate between samples

### Method: Inorganics (EPA Method See cover)

Validation Area .	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	/			
Cooler temperature criteria was met.				
II. Calibration			<b>.</b>	
Were all instruments calibrated daily, each set-up time?	_			
Were the proper number of standards used?	/			
Were all initial calibration correlation coefficients > 0.995?				
Were all initial and continuing calibration verification %Rs within the 90-110% QC         limits?         \$5-115	/			
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.	/			Duponly
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.		/						

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LDC#<u>32044A6</u>

### VALIDATION FINDINGS WORKSHEET Field Duplicates

Page:_	<u>lof</u>
Reviewer:	<u> 50</u>
2nd Reviewer:	on

Inorganics: Method See Cover

	Concentrat		
Analyte	3	4	RPD (≤20)
Hexavalent Chromium	0.0244	0.0233	5

	Concentra		
Analyte	11	12	RPD (≤20)
Hexavalent Chromium	0.0140	0.0118	17

\\LDCFILESERVER\Validation\FIELD DUPLICATES\FD\_inorganic\32044A6.wpd

### LDC #: 32044A6

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

Page:\_∖\_of\_∖ Reviewer: 39 2nd Reviewer: C

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

The correlation coefficient (r) for the calibration of  $\frac{246}{25}$  was recalculated. Calibration date: <u> $\frac{66}{25}$  (14)</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

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/L)	Area	r or r <sup>2</sup>	r or r <sup>2</sup>	(Y/N)
Initial calibration		s1	0.05	0.0000148			· · · ·
		s2	0.10	0.0000366	0.99989	0.99936	
	1+6	s3	0.20	0.0000832			$\sim$
		s4	0.50	0.0002028			<b>`</b>
		s5	1.00	0.000419			
		s6	2.00	0.0008205		-	
ICU (10:04)	10 110	Found	True				_
Calibration verification	Cr	0.478/ml	0.5000ng/ml		95.6%R	- 95.6%r	<u> </u>
CC (13:06)	A 115	Found	True				
Calibration verification	~~~~~	0.5025	0.5000 ng/ml		100.5%R	100.3%R	<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



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

 True
 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	Acceptable
Sample ID	Type of Analysis	Element	(units)	(units) (units)		%R / RPD	(Y/N)
Les (10:34)	Laboratory control sample	Cr*b	1.0130ng/n1	1.000 ng/m1	101%R	101%2	Z
N	Matrix spike sample		(SSR-SR)				
Dup (11:33)	Duplicate sample	Crab	0.0227 mg/m <sup>2</sup>	0.0244 ng/m <sup>3</sup>	7.22% 880	694%280	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 #: 32044A6

### VALIDATION FINDINGS WORKSHEET Sample Calculation Verification

Page:_	<u>1_of \</u>
Reviewer:	20
2nd reviewer:	<u></u>

METHOD: Inorganics, Method See Cover

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

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

Comp recalc	ound (analyte) results f ulated and verified usin	or $C_{r+6}$ (15) g the following equation:	)	repo	orted with a positiv	ve detect were
Concen (vejlve	tration = [ (area) (CO)]	1/C, Recalculation	[(0.0000	113mAu*min}(-2.u		0.0331ng/m
area Co= @ C.= @	= 0.0000113mAU*w -240E- <sup>06</sup> 7 2.0064133)	$\frac{(3)^{-1}}{m^{3}} = ng/m^{3}$ $\frac{(3)^{-1}}{m^{3}} = 21.93m^{3}$	(0.03	21.93~3 21.93~3	) = 0.01	51ng/m <sup>3</sup>
#	Sample ID	Analyte		Reported Concentration ( ~~~~ )	Calculated Concentration (ng/m <sup>3</sup> )	Acceptable (Y/N)
	1	64 rJ		ND	NO	y

١	Cr <sup>±10</sup>	ND	20	g
2		0.0150	0.0150	5
3		0.0244	0.0244	J
4		0.0233	0.0233	Ц
5		0.0139	0.0138	У У
 6		0.0151	0.0151	Ц
 1		ND	04	S
8		ND	20	Ś
9		D.0109	0.0108	y
lo lo		0.01200	0.0126	Ś
11		0.0140	0.0140	Ŋ
12		0.0118	0.0118	3
13		0.0353	0,0353	Ś
14		0.0116	0.0116	Ś
15		0.0151	0.0151	Ч
16		ND	NO	Z
17	4	NO	ND	y
		·		

Note:\_\_\_

Environmental Resources Management, Inc						FILE #: 3926.00			
75 Valley Stream	Parkway, Suite 400				REPORTED	<b>):</b> 06/26/14 15:	35		
Malvern, PA 1935	5				SUBMITTE	D: 06/24/14			
ATTN: Mr. Jeff B PHONE: (443) 8	oggs 303-8495 <b>FAX:</b> (410	) 266-8912			AQS SITE CODE: SITE CODE	:	Honeywell Hex Chrome Study		
Description:	OAM 1	Lab II	<b>):</b> 4062427	7-01			Sampled: 06/19/14 15:44		
Matrix:	Air	Samp	le Volume:	20.88	m³		Received: 06/24/14 11:02		
Comments:	Start Time 6/18/14 16:37						Analysis Date: 06/25/14 12:46		
	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	ND		U	0.0036			

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Environmental Resources Management, Inc					FILE #: 3926.00				
75 Valley Stream I	Parkway, Suite 400					REPORTI	ED: (	06/26/14 15:	35
Malvern, PA 1935	5					SUBMITT	ſED:	06/24/14	
ATTN: Mr. Jeff B PHONE: (443) 8	oggs 803-8495 <b>FAX:</b> (410	) 266-8912				AQS SITE	E DE:		Honeywell Hex Chrome Study
Description:	OAM 2		Lab ID:	4062427	-02				Sampled: 06/19/14 16:11
Matrix:	Air		Sample V	olume:	20.8	m³			Received: 06/24/14 11:02
Comments:	Start Time 6/18/14 17:09								Analysis Date: 06/25/14 12:56
			н	lexavalen	t Chro	mium			
				<u>Results</u>				<u>MDL</u>	
<u>Analyte</u>		CAS Numbe	<u>er</u>	<u>ng/m³ Air</u>		<u>Flaq</u>		<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99		0.0150				0.0036	

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Environmental Res	ources Management, Ind	c	FILE #:	FILE #: 3926.00			
75 Valley Stream F	Parkway, Suite 400		REPORT	REPORTED: 06/26/14 15:35			
Malvern, PA 19355					SUBMITTED: 06/24/14		
ATTN: Mr. Jeff Bo PHONE: (443) 8	oggs 03-8495 <b>FAX:</b> (410	) 266-8912		AQS SITI SITE COL	E DE:	Honeywell Hex Chrome Study	
Description:	PAM-1	Lab ID:	4062427-03	}		Sampled: 06/19/14 17:54	
Matrix:	Air	Sample	Volume: 2	.0.79 m³		<b>Received:</b> 06/24/14 11:02	
Comments:	Col 1 Start Time 6/18/14	18:47		·		Analysis Date: 06/25/14 11:23	
			Hexavalent C	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		1854-02-99	0.0244		0.0036		

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Environmental Resources Management, Inc					FILE #: 3926.00			
75 Valley Stream Parkway, Suite 400						REPORTED: 06/26/14 15:35		
Malvern, PA 1935	5				SUBMITT	FED:	06/24/14	
ATTN: Mr. Jeff B PHONE: (443) 8	oggs 303-8495 FAX: (410	)) 266-8912			AQS SITE	E DE:	Н	oneywell Hex Chrome Study
Description:	PAM-1D	L	Lab ID: 40	62427-04				Sampled: 06/19/14 17:45
Matrix:	Air	S	Sample Volumo	21.8	3 m³			Received: 06/24/14 11:02
Comments:	Col 2 Start Time 6/18/14	18:41					A	nalysis Date: 06/25/14 11:43
			Hexav	alent Chr	omium			
			<u>Res</u>	<u>ults</u>			<u>MDL</u>	
<u>Analyte</u>		CAS Number	<u>ng/n</u>	<u>13 Air</u>	<u>Flaq</u>	Ľ	ng/m³ Air	
Hexavalent Chromium		1854-02-99	0.0	233			0.0036	

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# CERTIFICATE OF ANALYSIS

Environmental Res	sources Management, Ind	>	FILE #: 3926.00				
75 Valley Stream F	Parkway, Suite 400		REPORTED: 06/26/14 15:35				
Malvern, PA 19355					SUBMITTED: 06/24/14		
ATTN: Mr. Jeff Br PHONE: (443) 8	oggs 03-8495 FAX: (410	) 266-8912		AQS SITE CODE: SITE CODE:	ł	Honeywell Hex Chrome Study	
Description:	PAM-2	Lab ID:	4062427-05			Sampled: 06/19/14 17:24	
Matrix:	Air	Sample V	/olume: 19.9	7 m³		Received: 06/24/14 11:02	
Comments:	Start Time 6/18/14 18:17					Analysis Date: 06/25/14 13:26	
		ŀ	Hexavalent Chro	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	0.0139		0.0039		

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Environmental Resources Management, Inc					FILE #: 3926.00			
75 Valley Stream Pa	arkway, Suite 400				REPORTE	<b>D:</b> 06/26/14 1	5:35	
Malvern, PA 19355					SUBMITTE	ED: 06/24/14	4	
ATTN: Mr. Jeff Bo PHONE: (443) 80	ggs )3-8495 <b>FAX:</b> (410	266-8912			AQS SITE CODE: SITE COD	E:	Honeywell Hex Chrome Study	
Description:	PAM-3		Lab ID: 40	62427-06			Sampled: 06/19/14 17:00	
Matrix:	Air		Sample Volum	<b>e:</b> 19.6	57 m³		Received: 06/24/14 11:02	
Comments:	Start Time 6/18/14 18:00						Analysis Date: 06/25/14 13:35	
			Hexa	alent Chr	omium			
			Res	<u>uits</u>		MDL		
<u>Analyte</u>		CAS Number	<u>ng/n</u>	<u>n³ Air</u>	<u>Flag</u>	<u>ng/m³ A</u> i	Ľ	
Hexavalent Chromium		1854-02-99	0.0	151		0.0040		

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Environmental Resources Management, Inc					FILE #: 3926.00			
75 Valley Stream Parkway, Suite 400						REPORTED: 06/26/14 15:35		
Malvern, PA 19355				SUBMITTED: 06/24/14		4		
ATTN: Mr. Jeff E	Boggs					AQS SITE	:	
PHONE: (443)	803-8495 FA	<b>X:</b> (410) 266-8912				SITECOD	)E:	Honeywell Hex Chrome Study
Description:	PAM-21		Lab ID:	4062427	7-07			Sampled: 06/19/14 00:00
Matrix:	Air		Sample Vo	iume:	19.97	7 m³		Received: 06/24/14 11:02
Comments:								Analysis Date: 06/25/14 13:45
			He	exavalen	t Chro	mium		
				<u>Results</u>			MDL	
<u>Analyte</u>		CAS Number	er I	ng/m³ Air		<u>Flag</u>	<u>ng/m³ A</u>	<u>ir</u>
Hexavalent Chromium		1854-02-99		ND		U	0.0039	

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Environmental Re	sources Managen	ient, Inc			FILE #:	3926.00	
75 Valley Stream	Parkway, Suite 40	0			REPORTE	D: 06/26/14 15	35
Malvern, PA 1935	5				SUBMITTE	ED: 06/24/14	
ATTN: Mr. Jeff B	oggs				AQS SITE		
PHONE: (443) 8	803-8495 <b>FAX</b>	: (410) 266-8912			SITECODI	E:	Honeywell Hex Chrome Study
Description:	PAM-31		Lab ID: 40624	127-08			Sampled: 06/19/14 00:00
Matrix:	Air		Sample Volume:	19.67	m³		Received: 06/24/14 11:02
Comments:							Analysis Date: 06/25/14 13:55
			Hexaval	ent Chro	mium		
			Result	<u>s</u>		MDL	
<u>Analyte</u>		CAS Numbe	er <u>ng/m³</u>	<u>Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99	ND		U	0.0040	

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<b>NERC</b>		CERTIFIC	CATE OF	ANALYSIS	6	
Environmental Re	sources Management, In	с		FILE #: 3926	5.00	
75 Valley Stream I	Parkway, Suite 400			REPORTED:	06/26/14 15:3	5
Malvern, PA 1935	5			SUBMITTED:	06/24/14	
ATTN: Mr. Jeff B PHONE: (443) 8	oggs 603-8495 <b>FAX:</b> (410	)) 266-8912		AQS SITE CODE: SITE CODE:	н	oneywell Hex Chrome Study
Description:	OAM 1	Lab ID:	4062427-09			Sampled: 06/20/14 16:25
Matrix:	Air	Sample	Volume: 2	2.14 m³		Received: 06/24/14 11:02
Comments:	Start Time 6/19/14 15:49					Analysis Date: 06/25/14 14:05
			Hexavalent C	hromium		
			<b>Results</b>		<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	0.0109		0.0036	

026/27/14

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<b>N</b> ERC		CERTIFIC	CATE OF	ANALYSIS	5	
Environmental Re	sources Management, Ind	c		FILE #: 392	6.00	
75 Valley Stream I	Parkway, Suite 400			REPORTED:	06/26/14 15:3	35
Malvern, PA 1935	5			SUBMITTED:	06/24/14	
ATTN: Mr. Jeff B PHONE: (443) 8	oggs 03-8495 <b>FAX:</b> (410	) 266-8912		AQS SITE CODE: SITE CODE:	F	Ioneywell Hex Chrome Study
Description:	OAM 2	Lab ID:	4062427-1	0		Sampled: 06/20/14 16:49
Matrix:	Air	Sample	Volume:	22.08 m³		Received: 06/24/14 11:02
Comments:	Start Time 6/19/14 16:17					Analysis Date: 06/25/14 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	0.0126		0.0036	

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Environmental Re	sources Management, In	с		FILE #: 3	926.00	
75 Valley Stream I	⊃arkway, Suite 400			REPORTED	<b>06/26/14</b> 15:	35
Malvern, PA 1935	5			SUBMITTE	<b>D:</b> 06/24/14	
ATTN: Mr. Jeff B PHONE: (443) 8	oggs 03-8495 <b>FAX:</b> (410	)) 266-8912		AQS SITE CODE: SITE CODE	: H	Honeywell Hex Chrome Study
Description:	PAM-1	Lab ID:	4062427-11			Sampled: 06/20/14 17:42
Matrix:	Air	Sample	Volume: 21	1.36 m³		Received: 06/24/14 11:02
Comments:	Col 1 Start Time 6/19/14	17:58		- <u></u>		Analysis Date: 06/25/14 12:03
			Hexavalent Ch	nromium		
			<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	0.0140		0.0036	

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Environmental Re	sources Management, Ir	าด		FILE #:	3926.0	00	
75 Valley Stream	Parkway, Suite 400			REPORT	<b>TED:</b> 0	6/26/14 15:35	
Malvern, PA 1935	5			SUBMIT	TED:	06/24/14	
ATTN: Mr. Jeff B PHONE: (443) 8	oggs 303-8495 <b>FAX:</b> (41	0) 266-8912		AQS SIT	TE DDE:	Hon	eywell Hex Chrome Study
Description:	PAM-1D	Lab ID:	4062427-1	2			Sampled: 06/20/14 17:45
Matrix:	Air	Sample	Volume:	21.52 m	3		Received: 06/24/14 11:02
Comments:	Col 2 Start Time 6/19/14	17:50				Ana	alysis Date: 06/25/14 12:23
			Hexavalent	Chromium			
			<u>Results</u>			<u>MDL</u>	
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	l	ng/m³ Air	
Hexavalent Chromium	1	1854-02-99	0.0118			0.0036	

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Environmental Res	sources Management, Ind	;		FILE #: 39	926.00	
75 Valley Stream F	Parkway, Suite 400			REPORTED:	: 06/26/14 15:3	35
Malvern, PA 1935	5			SUBMITTED	: 06/24/14	
ATTN: Mr. Jeff Bo PHONE: (443) 8	oggs 03-8495 <b>FAX:</b> (410	) 266-8912		AQS SITE CODE: SITE CODE:	F	loneywell Hex Chrome Study
Description:	PAM-2	L	Lab ID: 4062427-13			Sampled: 06/20/14 17:56
Matrix:	Air	S	Sample Volume: 21.	98 m³		Received: 06/24/14 11:02
Comments:	Start Time 6/19/14 17:31	·				Analysis Date: 06/25/14 14:25
			Hexavalent 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	0.0353		0.0036	

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Environmental Res	sources Management, In	c			FILE #:	3926.00	
75 Valley Stream F	Parkway, Suite 400				REPORT	ED: 06/26/14 1	5:35
Malvern, PA 19355	5				SUBMITT	ED: 06/24/14	
ATTN: Mr. Jeff Bo PHONE: (443) 8	oggs 03-8495 <b>FAX:</b> (410	) 266-8912			AQS SITE CODE: SITE COD	E DE:	Honeywell Hex Chrome Study
Description:	PAM-3		Lab ID: 406	2427-14		· · · · · · · · · · · · · · · · · · ·	Sampled: 06/20/14 17:24
Matrix:	Air		Sample Volume:	21.7	78 m³		Received: 06/24/14 11:02
Comments:	Start Time 6/19/14 17:12						Analysis Date: 06/25/14 14:35
			Hexava	lent Chro	omium		
			Resu	ts		<u>MDL</u>	
<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	0.011	.6		0.0036	

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Environmental Res	sources Management, In	с		FILE #: 3926	5.00	
75 Valley Stream F	Parkway, Suite 400			REPORTED:	06/26/14 15:3	5
Malvern, PA 1935	5			SUBMITTED:	06/24/14	
ATTN: Mr. Jeff B PHONE: (443) 8	oggs 03-8495 FAX: (410	0) 266-8912		AQS SITE CODE: SITE CODE:	н	oneywell Hex Chrome Study
Description:	PAM-4	Lab ID:	4062427-15			Sampled: 06/20/14 17:06
Matrix:	Air	Sample	Volume: 21.9	)3 m³		Received: 06/24/14 11:02
Comments:	Start Time 6/19/14 16:44					Analysis Date: 06/25/14 14:45
			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	0.0151		0.0036	

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Environmental Re	esources Ma	nageme	nt, Inc				FILE #:	3926.00		
75 Valley Stream	Parkway, Su	uite 400					REPORTE	D: 06/26/14 15	35	
Malvern, PA 1935	5						SUBMITTE	D: 06/24/14		
ATTN: Mr. Jeff E	Boggs						AQS SITE			
PHONE: (443)	803-8495	FAX:	(410) 266-8912				SITECODE	E:	Honeywell Hex Chrome Study	
Description:	PAM-21			Lab ID:	4062427	-16			Sampled: 06/20/14 00:00	
Matrix:	Air			Sample V	olume:	21.98	3 m³		Received: 06/24/14 11:02	
Comments:									Analysis Date: 06/25/14 14:55	
				Н	lexavalen	t Chro	mium			
					<u>Results</u>			MDL		
<u>Analyte</u>			CAS Numbe	er	<u>ng/m³ Air</u>		<u>Fiag</u>	<u>ng/m³ Air</u>		
Hexavalent Chromium			1854-02-99		ND		U	0.0036		

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Environmental Resc	ources Manageme	nt, <b>inc</b>				FILE #:	3926.00		
75 Valley Stream Pa	arkway, Suite 400					REPORT	ED: 06/26	6/14 15:35	
Malvern, PA 19355						SUBMITT	ED: 06/	24/14	
ATTN: Mr. Jeff Bog	ggs					AQS SITE	E		
PHONE: (443) 803	3-8495 FAX:	(410) 266-8912				SITECOL	DE:	Honeywell Hex Chrome Stud	у
Description:	PAM-31		Lab ID:	4062422	7-17			Sampled: 06/20/14 00:	00
Matrix: A	Air		Sample V	olume:	21.78	m³		Received: 06/24/14 11:	02
Comments:								Analysis Date: 06/25/14 15:	24
			н	lexavalen	t Chro	mium			
				<u>Results</u>			<u>N</u>	<u>1DL</u>	
<u>Analyte</u>		CAS Numbe	<u>er</u>	<u>ng/m³ Air</u>	<u> </u>	<u>Flag</u>	<u>ng/r</u>	<u>n³ Air</u>	
Hexavalent Chromium		1854-02-99		ND		υ	0	.0036	

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July 2, 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 June 30, 2014. Attachment 1 is a summary of the samples that were reviewed for each analysis.

## LDC Project #32053:

<u>SDG</u>

#### **Fraction**

4062511 Hexavalent Chromium

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

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

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

Sincerely,

Christina Rink Project Manager/Chemist

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	Level IV	L	DC #32	053	(El	RM	- M	lorı	risv	ville	e, N	IC	/ H	larl	oor	Po	oint	t, M	ID,	He	xa	val	ent	Cł	۱ro	miu	JM	Mo	oni	tori	ing	)							
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
<u> </u>	4062511	06/30/14	07/03/14	9	0																				<u> </u>				<u> </u>							$\left  - \right $		┢━━╋	
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Fotal	T/CR	l	<u> </u>	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# 32053A6

# Laboratory Data Consultants, Inc. Data Validation Report

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

Collection Date: June 23, 2014

LDC Report Date: July 1, 2014

Matrix: Air

Parameters: Hexavalent Chromium

Validation Level: EPA Level IV

Laboratory: Eastern Research Group

Sample Delivery Group (SDG): 4062511

### Sample Identification

OAM 1 OAM 2 PAM-1 PAM-1D 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) 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	0.0663	0.0701	6 (≤20)	-	-

#### Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Data Qualification Summary - SDG 4062511

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

Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG 4062511

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 4062511

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

LDC #: 32053A6	VALIDATION COMPLETENESS WORKSHEET
SDG #: 4062511	Level IV
Laboratory: Eastern Research	Group



#### METHOD: Hexavalent Chromium (ASTM D7614)

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

	Validation Area		Comments			
Ι.	Technical holding times	Å	Sampling dates: 06/23/14			
Ił	Initial calibration	A				
111.	Calibration verification	A				
IV	Blanks	Å				
v	Matrix Spike/Matrix Spike Duplicates	N	Not Required			
VI.	Duplicates	A	Dup			
VII.	Laboratory control samples	A	LCSID			
VIII.	Sample result verification	A				
IX.	Overall assessment of data	A	<u>_</u>			
<b>X</b> .	Field duplicates	Siv	(3,4)			
XI	Field blanks	ND	FB=(8), $TB=(9)$			

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

ND = No compounds detected R = Rinsate

D = Duplicate

FB = Field blank

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:\_\_
Method:Inorganics (EPA Method	<u></u>			
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?</a>	1			
Were all initial and continuing calibration verification %Rs within the 99-110% QC limits?	/			
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.		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.	/			Osponly
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.			/	
Were the MS/MSD or duplicate relative percent differences (RPD) $\leq 20\%$ for waters and $\leq 35\%$ for soil samples? A control limit of $\leq CRDL(\leq 2X CRDL$ for soil) was used for samples that were $\leq 5X$ the CRDL, including when only one of the duplicate sample values were $\leq 5X$ the CRDL.	/			
V. Laboratory control samples				
Was an LCS anayized for this SDG?	/			
Was an LCS analyzed per extraction batch?				
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% (85-115% for Method 300.0) QC limits?	/			
VI. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?			1	
Were the performance evaluation (PE) samples within the acceptance limits?				······································

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### VALIDATION FINDINGS CHECKLIST

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

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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>32053A6</u>

#### VALIDATION FINDINGS WORKSHEET Field Duplicates

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

Inorganics: Method See Cover

	Concentra		
Analyte	3	4	RPD (≤20)
Hexavalent Chromium	0.0663	0.0701	6

\\LDCFILESERVER\Validation\FIELD DUPLICATES\FD\_inorganic\32053A6.wpd

#### LDC #: 32053Ab

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

Page: 🖊	_ of <u>\</u>
Reviewer:	50
2nd Review	ver:

Method: Inorganics, Method See Cover

The correlation coefficient (r) for the calibration of <u>C</u> was recalculated. Calibration date: <u>Ob</u> 2014

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/L)	Area	r or r <sup>2</sup>	r or r <sup>2</sup>	(Y/N)
Initial calibration		s1	0.05	0.0000147			
		s2	0.10	0.0000369	0.99996	0.99936	
	d+	s3	0.20	0.0000805			$\mathcal{S}$
	Cv	s4	0.50	0.0002004			
		s5	1.00	0.0004191			
		s6	2.00	0.0008437			to a fe <sup>ra</sup> tur
JCU 10:02			Found	True		_	• -
Calibration verification	Crab		0.480groglan)	0.5000noy/ml	96-2º/0R	96-2% <del>x</del>	ک
La 11:01			Found	True			5
Calibration verification	Cr		0.4701ng/m	0.5000ng/ml	94%E	94%E	
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 # 32053AL

#### 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, 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

	<b>T</b>	<b>-</b>	Found / S	True / D	Recalculated	Reported	Acceptable
Sample ID	i ype of Analysis	Element	(units)	(units)	%R / RPD	%R / RPD	(Y/N)
LLS 10:32	Laboratory control sample	Crtb	0,9986 mg/m)	1.00 mg/ml	99.9%E	99.9%R	S
	Matrix spike sample		(SSR-SR)				
N							
Dup	Duplicate sample	Crab	0.0672	0.0663ng/m3	1.35%880	\.43%#PD	3)

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 #: 32053A6

#### VALIDATION FINDINGS WORKSHEET Sample Calculation Verification

Page:_	1	_of_	)	_
Reviewer:	-	35	2	
2nd reviewer:				_

METHOD: Inorganics, Method See Cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A". <u>Y N 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/A Are all detection limits below the CRQL?

Compound (analyte) results for \_\_\_\_\_\_( recalculated and verified using the following equation: \_\_\_\_\_reported with a positive detect were [(0.0002064mA0+min)-(-6.74E-06)] 0.0004250 Concentration = [(area)-(Lo)] Recalculation:

(ng/m1) (vf) = ng/m3 (ng/ml) =0,501k aren = 0.0002004 mA0\* ng (0.5016 mg/m1)(10ml) CO = -6.79E-00 C= 0.0004250 14=10m1# = 0.233 ng/m3 21.57m3 W3= 21.57 Reported Calculated

#	Sample ID	Analyte	Concentration	Concentration	Acceptable (Y/N)
	1	Cr+b	0.0569	0.0569	$\sim$
	2	<u> </u>	6.0245	0.0246	
	3		0.0663	0.0663	
	Ч		1010,0	0.0700	
	5		0.0664	0.0664	
	6		0.115	0.115	
	7		0.223	0.233	
	8		00	24	
	9		24	ND	¥
	·				

Note:

# ERG

# CERTIFICATE OF ANALYSIS

Environmental Res	sources Management, Ind	c		FILE #: 39	26.00			
75 Valley Stream F	Parkway, Suite 400			REPORTED:	06/30/14 09:2 <sup>-</sup>	1		
Malvern, PA 19355	5			SUBMITTED: 06/25/14				
ATTN: Mr. Jeff Bo	oggs			AQS SITE CODE:				
PHONE: (443) 8	03-8495 <b>FAX:</b> (410	) 266-8912		SITE CODE:	Ho	oneywell Hex Chrome Study		
Description:	OAM 1	Lab II	<b>D:</b> 4062511-01			Sampled: 06/23/14 15:51		
Matrix:	Air	Samp	le Volume: 21.3	5 m³		Received: 06/25/14 10:56		
Comments:	Start Time 6/22/14 16:07				4	nalysis Date: 06/26/14 12:22		
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	0.0569		0.0036			

CR7/1/14

Eastern Research Group

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# CERTIFICATE OF ANALYSIS

Environmental Res	sources Management, Inc	:		FILE #:	3926.00			
75 Valley Stream F	Parkway, Suite 400			REPORTE	D: 06/30/14 09	:21		
Malvern, PA 19355	5			SUBMITTE	ED: 06/25/14			
ATTN: Mr. Jeff Bo	oggs			AQS SITE CODE:				
PHONE: (443) 8	03-8495 <b>FAX:</b> (410	) 266-8912		SITE CODI	E:	Honeywell Hex Chrome Study		
Description:	OAM 2	Lab ID:	4062511-02			Sampled: 06/23/14 16:11		
Matrix:	Air	Sample \	/olume: 21.4	5 m³		Received: 06/25/14 10:56		
Comments:	Start Time 6/22/14 16:21					Analysis Date: 06/26/14 12:31		
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	0.0245		0.0036			

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### CERTIFICATE OF ANALYSIS

Environmental Res	sources Management, Inc	0		FILE #: 39	926.00		
75 Valley Stream F	<sup>p</sup> arkway, Suite 400			REPORTED:	06/30/14 09:2	1	
Malvern, PA 19355	5			SUBMITTED	: 06/25/14		
ATTN: Mr. Jeff Bo	oggs			AQS SITE CODE:			
PHONE: (443) 8	03-8495 <b>FAX:</b> (410	) 266-8912		SITE CODE:	F	loneywell Hex Chrome Study	
Description:	PAM-1	Lab ID:	4062511-03			Sampled: 06/23/14 17:26	
Matrix:	Air	Sample V	/olume: 21.98	8 m³		Received: 06/25/14 10:56	
Comments:	Col 1 Start Time 6/22/14	17:00				Analysis Date: 06/26/14 11:37	
		ł	Hexavalent Chro	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	0.0663		0.0036		

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Environmental Res	sources Management, In	с			FILE #:	3926.	00	
75 Valley Stream I	<sup>o</sup> arkway, Suite 400				REPORT	ED:	06/30/14 09:	21
Malvern, PA 1935	5				SUBMITT	FED:	06/25/14	
ATTN: Mr. Jeff B	oggs				AQS SITE	E CODE	Ξ:	
PHONE: (443) 8	03-8495 <b>FAX:</b> (410	)) 266-8912			SITE CO	DE:	ł	Honeywell Hex Chrome Study
Description:	PAM-1D		Lab ID: 4	062511-04				Sampled: 06/23/14 17:32
Matrix:	Air		Sample Volum	ne: 22.0	)4 m³	I		Received: 06/25/14 10:56
Comments:	Col 2 Start Time 6/22/14	17:03	<u> </u>					Analysis Date: 06/26/14 11:57
			Hexa	valent Chr	omium			
			Res	<u>sults</u>			<u>MDL</u>	
<u>Analyte</u>		<u>CAS_Numbe</u>	r ng/i	<u>m³ Air</u>	<u>Flag</u>		<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99	0.0	0701			0.0036	

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Environmental Res	sources Management, li	าด			FILE #:	3926.00	
75 Valley Stream F	Parkway, Suite 400				REPORT	ED: 06/30/14 09	21
Malvern, PA 19355	5				SUBMITT	ED: 06/25/14	
ATTN: Mr. Jeff Be	oggs				AQS SITE	E CODE:	
PHONE: (443) 8	03-8495 <b>FAX:</b> (41	0) 266-8912			SITE COD	DE:	Honeywell Hex Chrome Study
Description:	PAM-2	L	Lab ID:	4062511-05			Sampled: 06/23/14 17:08
Matrix:	Air	S	Sample Volu	u <b>me:</b> 21.8	5 m³		Received: 06/25/14 10:56
Comments:	Start Time 6/22/14 16:5	1					Analysis Date: 06/26/14 12:41
			Hex	xavalent Chro	omium		
			<u>F</u>	<u>Results</u>		MDL	
<u>Analyte</u>		<u>CAS Number</u>	nc	g/m³ Air	Flag	<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99		0.0664		0.0036	

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# CERTIFICATE OF ANALYSIS

Environmental Res	sources Management, Ind	;			FILE #:	3926.00	
75 Valley Stream F	Parkway, Suite 400				REPORT	ED: 06/30/14 09	:21
Malvern, PA 19355	5				SUBMITT	ED: 06/25/14	
ATTN: Mr. Jeff Bo	oggs				AQS SITE	CODE:	
PHONE: (443) 8	03-8495 FAX: (410	) 266-8912			SITE COD	DE:	Honeywell Hex Chrome Study
Description:	PAM-3		Lab ID: 4062511	-06			Sampled: 06/23/14 16:58
Matrix:	Air		Sample Volume:	21.78	m³		Received: 06/25/14 10:56
Comments:	Start Time 6/22/14 16:46						Analysis Date: 06/26/14 12:51
			Hexavalen	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	0.115			0.0036	

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### CERTIFICATE OF ANALYSIS

Environmental Res	sources Management, Inc	;		FILE #: 392	26.00	
75 Valley Stream F	Parkway, Suite 400			REPORTED:	06/30/14 09:2	1
Malvern, PA 19355	5			SUBMITTED:	06/25/14	
ATTN: Mr. Jeff B	oggs			AQS SITE CO	DDE:	
PHONE: (443) 8	03-8495 <b>FAX:</b> (410	) 266-8912		SITE CODE:	Н	oneywell Hex Chrome Study
Description:	PAM-4	Lab ID:	4062511-07			Sampled: 06/23/14 16:34
Matrix:	Air	Sample \	/olume: 21.5	7 m³		Received: 06/25/14 10:56
Comments:	Start Time 6/22/14 16:36					Analysis Date: 06/26/14 13:01
		I	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	0.233		0.0036	

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Page 9 of 13

# CERTIFICATE OF ANALYSIS

Environmental Re	esources Manageme	ent, Inc		FILE #:	3926.00	
75 Valley Stream	Parkway, Suite 400			REPORTE	ED: 06/30/14 09:	21
Malvern, PA 1935	5			SUBMITT	ED: 06/25/14	
ATTN: Mr. Jeff E	Boggs			AQS SITE	CODE:	
PHONE: (443) 8	803-8495 FAX:	(410) 266-8912		SITE COD	)E: I	Honeywell Hex Chrome Study
Description:	PAM-21	Lab	<b>ID:</b> 4062511-0	8		Sampled: 06/23/14 00:00
Matrix:	Air	San	nple Volume:	21.85 m³		Received: 06/25/14 10:56
Comments:						Analysis Date: 06/26/14 14:13
			Hexavalent (	Chromium		
			<u>Results</u>		MDL	
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	Flag	<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99	ND	U	0.0036	

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Page 10 of 13

# CERTIFICATE OF ANALYSIS

Environmental Re	esources Man	ageme	nt, Inc				FILE #: 39	926.00		
75 Valley Stream	Parkway, Sui	te 400					REPORTED:	: 06/30/14 09	21	
Malvern, PA 1935	55						SUBMITTED	: 06/25/14		
ATTN: Mr. Jeff E	Boggs						AQS SITE C	ODE:		
<b>PHONE:</b> (443)	803-8495	FAX:	(410) 266-8912				SITE CODE:		Honeywell Hex Chrome Study	
Description:	PAM-31			Lab ID:	4062511	09			Sampled: 06/23/14 00:00	
Matrix:	Air			Sample Vo	olume:	21.78	m³		Received: 06/25/14 10:56	
Comments:									Analysis Date: 06/26/14 13:41	
				н	exavalen	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		ND		υ	0.0036		

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Page 11 of 13



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

#### LDC Project #32068:

# SDG Fraction

4062614/4062711 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	L.	DC #32	068	2 / 🗖					CZ. 2	an an an tha				<u>_</u>			1		34 - NA				0.99920		EG GEL (*	2023 - D	<u>,,/</u> 22,	946, SÃO	878758920	<u>1000</u>						2.31.C.) .	200 C
	l	1		ינב	RN	<b>/</b> -	Mo	rris	vil	le,	NC		Har	bo	r Po	oin	t, N	٨D	, He	exa	va	len	t C	hro	omi	um	M	oni	tor	ing	)						
SDG#	DATE REC'D	(3) DATE DUE	Cr( (D76	(VI) 614)																																	
k: Air/Water/Soil			Α	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s	w
4062614/4062711	07/01/14	07/07/14	18	0																																	
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T/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
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# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:	Harbor Point, MD, Hexavalent Chromium Monitoring
Collection Date:	June 24 through June 25, 2014
LDC Report Date:	July 1, 2014
Matrix:	Air
Parameters:	Hexavalent Chromium
Validation Level:	EPA Level IV
Laboratory:	Eastern Research Group
Sample Delivery Group (SDG):	4062614/4062711

### Sample Identification

OAM 1 (06/24/14) OAM 2 (06/24/14)	PAM-1 (06/25/14)DUP PAM-1D (06/25/14)DUP
PAM-1 (06/24/14)	
PAM-1D (06/24/14)	
PAM-2 (06/24/14)	
PAM-3 (06/24/14)	
PAM-4 (06/24/14)	
PAM-21 (06/24/14)	
PAM-31 (06/24/14)	
OAM 1 (06/25/14)	
OAM 2 (06/25/14)	
PAM-1 (06/25/14)	
PAM-1D (06/25/14)	
PAM-2 (06/25/14)	
PAM-3 (06/25/14)	
PAM-4 (06/25/14)	
PAM-21 (06/25/14)	
PAM-31 (06/25/14)	
PAM-1 (06/24/14)DUP	
PAM-1D (06/24/14)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 (06/24/14) and PAM-31 (06/25/14) were identified as trip blanks. No hexavalent chromium was found.

Samples PAM-21 (06/24/14) and PAM-21 (06/25/14) 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 (06/24/14) and PAM-1D (06/24/14) and samples PAM-1 (06/25/14) and PAM-1D (06/25/14) were identified as field duplicates. No hexavalent chromium was detected in any of the samples with the following exceptions:

	Concentrat	ion (ng/m³)			
Analyte	PAM-1 (06/24/14)	PAM-1D (06/24/14)	(Limits)	Flags	A or P
Hexavalent chromium	0.0311	0.0348	11 (≤20)	_	-

	Concentrat	ion (ng/m³)				
Analyte	PAM-1 (06/25/14)	PAM-1D (06/25/14)	(Limits)	Flags	A or P	
Hexavalent chromium	0.0688	0.0651	6 (≤20)	-	-	

#### Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Data Qualification Summary - SDG 4062614/4062711

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

Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG 4062614/4062711

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 4062614/4062711

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

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AL	<b>IDATION</b>	COMPL	<b>ETENESS</b>	WORKSHEET

Level IV

Date: 01/01/14 Page: \of \ Reviewer: 50 2nd Reviewer: 0

#### METHOD: Hexavalent Chromium (ASTM D7614)

Laboratory: Eastern Research Group

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: 06 24 - 25 14
11	Initial calibration	A	
III.	Calibration verification	A	
IV	Blanks	A	
v	Matrix Spike/Matrix Spike Duplicates	N	Not Reg.
VI.	Duplicates	A	Pup
VII.	Laboratory control samples	A	LUSÍD
VIII.	Sample result verification	A	
IX.	Overall assessment of data	A	
Х.	Field duplicates	SW	FD= (3,4), (12,13)
	Field blanks	ND	FB = (8), (11) $TB = (9), (18)$

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: Lir

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

Notes:

LD

LDC #:	32068A6
SDG #:	4062614/4062711

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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.	1							
II. Calibration								
Were all instruments calibrated daily, each set-up time?	~							
Were the proper number of standards used?	<			·····				
Were all initial calibration correlation coefficients $\geq$ 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)								
II. 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.	/			Organly				
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?			4					
Were the performance evaluation (PE) samples within the acceptance limits?			/					

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#### VALIDATION FINDINGS CHECKLIST

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

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

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LDC#<u>32068A6</u>

#### VALIDATION FINDINGS WORKSHEET Field Duplicates

Page: <u>l</u>of Reviewer: <u>50</u> 2nd Reviewer: <u>6</u>

Inorganics: Method See Cover

	Concentra	tion (ng/m3)	
Analyte	3	4	RPD (≤20)
Hexavalent Chromium	0.0311	0.0348	11

	Concentra	ation (ng/m3)	
Analyte	12	13	RPD (≤20)
Hexavalent Chromium	0.0688	0.0651	6

\LDCFILESERVER\Validation\FIELD DUPLICATES\FD\_inorganic\wettemp.WPD

#### LDC #: 3200800

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

Page: of Reviewer: 2nd Reviewer: C

Method: Inorganics, Method See Cover

The correlation coefficient (r) for the calibration of  $\Delta r^{46}$  was recalculated.Calibration date:  $\frac{66/30}{14}$ 

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/L)	Area	r or r <sup>2</sup>	r or r <sup>2</sup>	(Y/N)
Initial calibration		s1	0.05	0.0000203			
		s2	0.10	0.0000428	0.99980	0.99936	
		s3	0.20	0.0000824			
	( the	s4	0.50	0.0002062			$\sim$
		s5	1.00	0.0004042			)
		s6	2.00	0.0008412			
Icu 11.22	ماند ۸		Found	True			1.1
Calibration verification	Cr		0.4792 mg/m)	0.5000ng/wl	95.8%P	95,9%	<u> </u>
Cw 14:25	02 1						17
Calibration verification			0.5033 nghm	0.5000 ng/ml	100.7%R	100.7%R	<u> </u>
Calibration verification							processor and the state of the

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 #: 32068Ab

#### 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 = <u>Found</u> x 100 Where, F 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 %R / RPD	Reported	Acceptable (Y/N)
LLS	Laboratory control sample	Crab	0.9861	1.00 mg/m/	98.6%R	98.6%£	5)
N	Matrix spike sample		(SSR-SR)				
Duq	Duplicate sample	(r+6	0.0706	0.0688.ng/m <sup>3</sup>	2.58%PPD	2-65% RPD	3

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 #	# 320 KONO	VALIDATION FINDINGS V Sample Calculation Ve	VALIDATION FINDINGS WORKSHEET Page: \of \   Sample Calculation Verification Reviewer:				
метн	IOD: Inorganics, Metho	d See Cover		2nd revie	wer: <u> </u>		
Pleas Y N Y N Y N	e see qualifications belo <u>N/A</u> Have results <u>N/A</u> Are results w <u>N/A</u> Are all detect	ow for all questions answered "N". Not a been reported and calculated correctly? rithin the calibrated range of the instrume tion limits below the CRQL?	pplicable questions ar ents?	e identified as "N	/A".		
Comp recalc	ound (analyte) results f ulated and verified usin	for $\underline{C_{x}}^{+b}$ $(\underline{u})$ g the following equation:	rep	orted with a positi	ve detect were		
Concen	stration = [larea) - (L	(-) $(-)$	.0000297 mAU ma	~)~(~2.64E~			
xren	= 0.0000297 mAU	+min (install (uf)	0.0004	190	- 0.01		
Cu ~	0.000440		(0.0733)(10)	A 57.15	13		
J:/=	\	m <sup>3</sup> ta	22.19	= 0.034	siglm-		
#	Sample ID	Analyte	Reported Concentration (rg/w <sup>3</sup> )	Calculated Concentration (ng/m <sup>3</sup> )	Acceptable (Y/N)		
	١	Crtb	0.0120	810.0	N N		
	2		0.0137	0.0138			
	3		0.0311	0.0311			
	μ		0.0348	0.0348			
	-2		0.0286	0.0287			
	6		0-0765	0.0266			
	1		0.114	0.114			
	8		ND	NO			
	9		ND	04			
	10		0.0313	0.0313			
	11		0.0322	0.0322			
	12		0.0088	0.0628			
	13		0.0651	0.0651			
	μ		0.110	0.110			
	(5		0.0959	0.0959			
	16		0.103	0.0999			
	17		OU	00			
	18	Ψ.	ND	ND	<u> </u>		

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Environmental Resources Management, Inc						FILE #: 3926.00			
75 Valley Stream Parkway, Suite 400						REPORTED: 07/01/14 14:06			
Malvern, PA 19355						D: 06/26/14 t	o 06/27/14		
ATTN: Mr. Jeff B	oggs		AQS SITE						
PHONE: (443) 8	03-8495 <b>FAX:</b> (410	) 266-8912			SITE CODE	:: H	Ioneywell Hex Chrome Study		
Description:	OAM 1	Lab 1	ID: 4062614	-01			Sampled: 06/24/14 16:07		
Matrix:	Air	Sam	ple Volume:	21.74	m³		Received: 06/26/14 12:57		
Comments:	Start Time 6/23/14 15:58						Analysis Date: 06/30/14 14:05		
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	0.0120			0.0036			

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Environmental Resources Management, Inc						FILE #: 3926.00			
75 Valley Stream Parkway, Suite 400						REPORT	REPORTED: 07/01/14 14:06		
Malvern, PA 19355						SUBMITT	SUBMITTED: 06/26/14 to 06/27/14		
ATTN: Mr. Jeff Boggs						AQS SITE	AQS SITE		
PHONE: (443) 8	03-8495 FAX: (410	) 266-8912				SITECO	DE:		Honeywell Hex Chrome Study
Description:	OAM 2		Lab ID:	4062614	1-02				Sampled: 06/24/14 16:44
Matrix:	Air		Sample V	olume:	21.9	9 m³			Received: 06/26/14 12:57
Comments:	Start Time 6/23/14 16:19	_							Analysis Date: 06/30/14 14:15
Hexavalent Chromium									
				<u>Results</u>				<u>MDL</u>	
<u>Analyte</u>		CAS Numbe	er	<u>ng/m³ Ai</u>	1	<u>Flag</u>		<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99		0.0137				0.0036	

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Environmental Reso	ources Management, Ind	2	FILE #: 3926.00						
75 Valley Stream Pa	arkway, Suite 400		REPORTED:	REPORTED: 07/01/14 14:06					
Malvern, PA 19355				SUBMITTED:	06/26/14 t	o 06/27/14			
ATTN: Mr. Jeff Bog PHONE: (443) 80	ggs 3-8495 <b>FAX:</b> (410	) 266-8912		AQS SITE CODE: SITE CODE:	ŀ	Ioneywell Hex Chrome Study			
Description:	PAM-1	Lab ID:	4062614-03			Sampled: 06/24/14 18:08			
Matrix:	Air	Sample	Volume: 22.1	l6 m³		Received: 06/26/14 12:57			
Comments:	Col 1 Start Time 6/23/14 1	7:31		· · · · · · · · · · · · · · · · · · ·		Analysis Date: 06/30/14 12:45			
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	0.0311		0.0036				

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NERC	Ē	CERTIFIC	CATE OF A	ANALYSIS	3				
Environmental Re	sources Management, In	с	FILE #: 3926.00						
75 Valley Stream	Parkway, Suite 400			REPORTED:	<b>REPORTED:</b> 07/01/14 14:06				
Malvern, PA 1935	5			SUBMITTED:	06/26/14 to 06/2	27/14			
ATTN: Mr. Jeff B PHONE: (443) 8	oggs 803-8495 <b>FAX:</b> (410	)) 266-8912		AQS SITE CODE: SITE CODE:	Honey	well Hex Chrome Study			
Description:	PAM-1D	Lab ID:	4062614-04			Sampled: 06/24/14 18:16			
Matrix:	Air	Sample \	Volume: 22.1	19 m³	1	Received: 06/26/14 12:57			
Comments:	Col 2 Start Time 6/23/14	17:37			Analy	/sis Date: 06/30/14 17:06			
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	l de la construcción de la constru	1854-02-99	0.0348		0.0036				

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Environmental Res	sources Management, Ind	5	FILE #:	FILE #: 3926.00					
75 Valley Stream F	<sup>D</sup> arkway, Suite 400		REPORTE	REPORTED: 07/01/14 14:06					
Malvern, PA 1935	5		SUBMITTE	SUBMITTED: 06/26/14 to 06/27/14					
ATTN: Mr. Jeff B	oggs		AQS SITE	AQS SITE					
PHONE: (443) 8	03-8495 <b>FAX:</b> (410	) 266-8912		SITECOD	E:	Honeywell Hex Chrome Study			
Description:	PAM-2	Lab II	<b>D:</b> 4062614-05			Sampled: 06/24/14 17:51			
Matrix:	Air	Samp	le Volume: 22	2.15 m³		Received: 06/26/14 12:57			
Comments:	Start Time 6/23/14 17:14					Analysis Date: 06/30/14 14:45			
Hexavalent Chromium									
			<u>Results</u>		<u>MDL</u>				
<u>Analyte</u>		CAS Number	<u>nq/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>				
Hexavalent Chromium		1854-02-99	0.0286		0.0036				

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Environmental Re	sources Management, In	c	FILE #: 3926.00						
75 Valley Stream I	Parkway, Suite 400		REPORTED:	<b>REPORTED:</b> 07/01/14 14:06					
Malvern, PA 1935	5		SUBMITTED:	TED: 06/26/14 to 06/27/14					
ATTN: Mr. Jeff B	oggs		AQS SITE						
PHONE: (443) 8	03-8495 FAX: (410	) 266-8912		SITE CODE:	F	loneywell Hex Chrome Study			
Description:	PAM-3	Lat	<b>b ID:</b> 4062614-06			Sampled: 06/24/14 17:35			
Matrix:	Air	Sar	mple Volume: 22.0	)9 m³		Received: 06/26/14 12:57			
Comments:	Start Time 6/23/14 17:03	<u>.</u>				Analysis Date: 06/30/14 14:55			
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	0.0265		0.0036				

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NERC	Ì	CERTIFIC	CATE OF	ANALYSIS	6				
Environmental Res	sources Management, In	c	FILE #: 392	FILE #: 3926.00					
75 Valley Stream F	<sup>o</sup> arkway, Suite 400			REPORTED:	REPORTED: 07/01/14 14:06				
Malvern, PA 19355	5		SUBMITTED:	BMITTED: 06/26/14 to 06/27/14					
ATTN: Mr. Jeff Bo PHONE: (443) 8	oggs 03-8495 <b>FAX:</b> (410	) 266-8912		AQS SITE CODE: SITE CODE:	н	oneywell Hex Chrome Study			
Description:	PAM-4	Lab ID:	4062614-07			Sampled: 06/24/14 17:13			
Matrix:	Air	Sample	Volume: 2	2.05 m³		Received: 06/26/14 12:57			
Comments:	Start Time 6/23/14 16:43	. <u></u>				Analysis Date: 06/30/14 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	0.114		0.0036				

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Environmental Resources Management, Inc				6.00
75 Valley Stream Parkway,	Suite 400		REPORTED:	07/01/14 14:06
Malvern, PA 19355			SUBMITTED:	06/26/14 to 06/27/14
ATTN: Mr. Jeff Boggs			AQS SITE	
PHONE: (443) 803-8495	FAX: (410) 266-8912		SITE CODE:	Honeywell Hex Chrome Study
Description: PAM-21	L	ab ID: 4062614-08	·	Sampled: 06/24/14 00:00
Matrix: Air	S	Sample Volume: 22.15	5 m³	Received: 06/26/14 12:57
Comments:				Analysis Date: 06/30/14 15:15
		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	ND	U	0.0036

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Environmental Resources Management, Inc				26.00	
75 Valley Stream Parkway, S	uite 400		REPORTED:	07/01/14 14:06	
Malvern, PA 19355			SUBMITTED:	06/26/14 to 06/27/14	
ATTN: Mr. Jeff Boggs PHONE: (443) 803-8495	<b>FAX:</b> (410) 266-8912		AQS SITE CODE: SITE CODE:	Honeywell F	lex Chrome Study
Description: PAM-31	Lab I	<b>D:</b> 4062614-09		Samp	led: 06/24/14 00:00
Matrix: Air	Samp	ole Volume: 22	.09 m³	Receiv	red: 06/26/14 12:57
Comments:	= · =· · · · · · · · · · · · · · · · ·			Analysis D	ate: 06/30/14 15:24
		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	1854-02-99	ND	υ	0.0036	

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<b>NERC</b>	, J	CERTIFIC	CATE OF	ANALYSIS	6	
Environmental Re	sources Management, In	c		FILE #: 3926	6.00	
75 Valley Stream I	Parkway, Suite 400			REPORTED:	07/01/14 14:06	
Malvern, PA 1935	5			SUBMITTED:	06/26/14 to (	06/27/14
ATTN: Mr. Jeff B	oggs			AQS SITE		
PHONE: (443) 8	03-8495 <b>FAX:</b> (410	) 266-8912		CODE: SITE CODE:	Ho	neywell Hex Chrome Study
Description:	OAM 1	Lab ID:	4062711-01			Sampled: 06/25/14 16:16
Matrix:	Air	Sample	Volume: 21	51 m³		Received: 06/27/14 11:16
Comments:	Start Time 6/24/14 16:22				Ar	nalysis Date: 06/30/14 15:34
			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		1854-02-99	0.0313		0.0036	

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Environmental Re	sources Management, In	с		FILE #: 392	6.00	
75 Valley Stream	Parkway, Suite 400			REPORTED:	07/01/14 14:0	6
Malvern, PA 1935	5			SUBMITTED:	06/26/14 te	06/27/14
ATTN: Mr. Jeff B PHONE: (443) 8	oggs 303-8495 <b>FAX:</b> (410	)) 266-8912		AQS SITE CODE: SITE CODE:	F	loneywell Hex Chrome Study
Description:	OAM 2	Lab ID	: 4062711-02			Sampled: 06/25/14 16:36
Matrix:	Air	Sample	e Volume: 21	.4 m³		Received: 06/27/14 11:16
Comments:	Start Time 6/24/14 16:50					Analysis Date: 06/30/14 15:44
			Hexavalent Ch <u>Results</u>	romium	MDL	
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	Flag	<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99	0.0322		0.0036	

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Page 13 of 22

Environmental Resources Management, Inc				FILE #: 392	FILE #: 3926.00			
75 Valley Stream F	Parkway, Suite 400			REPORTED:	07/01/14 14:0	06		
Malvern, PA 19355	5			SUBMITTED:	06/26/14 t	o 06/27/14		
ATTN: Mr. Jeff Bo	oggs			AQS SITE				
PHONE: (443) 8	03-8495 <b>FAX:</b> (410	)) 266-8912		SITE CODE:	ł	Ioneywell Hex Chrome Study		
Description:	PAM-1	Lab IC	<b>4062711-03</b>	-		Sampled: 06/25/14 17:39		
Matrix:	Air	Sampl	le Volume: 21.0	)9 m³		Received: 06/27/14 11:16		
Comments:	Col 1 Start Time 6/24/14	18:13				Analysis Date: 06/30/14 13:25		
			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	0.0688		0.0036			

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Page 14 of 22

Environmental Re	Environmental Resources Management, Inc				FILE #: 3926.00			
75 Valley Stream I	Parkway, Suite 400			REPORT	ED: 07/01/14 14	:06		
Malvern, PA 1935	5			SUBMITT	ED: 06/26/14	to 06/27/14		
ATTN: Mr. Jeff B	oggs			AQS SITE	E			
PHONE: (443) 8	803-8495 <b>FAX:</b> (41)	0) 266-8912		SITECO	DE:	Honeywell Hex Chrome Study		
Description:	PAM-1D	Lab ID:	4062711-0	)4		Sampled: 06/25/14 17:44		
Matrix:	Air	Sample	Volume:	20.94 m³		Received: 06/27/14 11:16		
Comments:	Col 2 Start Time 6/24/14	18:28				Analysis Date: 06/30/14 13:45		
			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	0.0651		0.0036			

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Environmental Re	sources Management, In	C		FILE #:	3926.00	
75 Valley Stream I	Parkway, Suite 400			REPORTE	ED: 07/01/14 14	:06
Malvern, PA 1935	5			SUBMITT	ED: 06/26/14	to 06/27/14
ATTN: Mr. Jeff B	oggs			AQS SITE	l .	
PHONE: (443) 8	03-8495 <b>FAX:</b> (410	) 266-8912		SITECOD	)E:	Honeywell Hex Chrome Study
Description:	PAM-2	Lab	4062711-05	5		Sampled: 06/25/14 17:23
Matrix:	Air	San	nple Volume: 2	21.15 m³		Received: 06/27/14 11:16
Comments:	Start Time 6/24/14 17:53					Analysis Date: 06/30/14 15:54
			Hexavalent C	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		1854-02-99	0.110		0.0036	

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Page 16 of 22

Environmental Re	sources Management, Ind	c		FILE #: 392	26.00	
75 Valley Stream I	Parkway, Suite 400			REPORTED:	07/01/14 14:	06
Malvern, PA 1935	5			SUBMITTED:	06/26/14 1	to 06/27/14
ATTN: Mr. Jeff B	oggs			AQS SITE		
PHONE: (443) 8	03-8495 <b>FAX:</b> (410	) 266-8912		SITE CODE:	I	Honeywell Hex Chrome Study
Description:	PAM-3	Lab ID:	4062711-06	_		Sampled: 06/25/14 17:14
Matrix:	Air	Sample	Volume: 21.	22 m³		Received: 06/27/14 11:16
Comments:	Start Time 6/24/14 17:40					Analysis Date: 06/30/14 16:04
			Hexavalent Chi	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		1854-02-99	0.0959		0.0036	

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Environmental Res	sources Management, Ind	c				FILE #:	3926.0	00	
75 Valley Stream F	<sup>p</sup> arkway, Suite 400					REPORTE	ED: (	07/01/14 14	:06
Malvern, PA 19355	5					SUBMITT	ſED:	06/26/14	to 06/27/14
ATTN: Mr. Jeff Bo	oggs					AQS SITE	E		
PHONE: (443) 8	03-8495 <b>FAX:</b> (410	) 266-8912				SITECOL	DE:		Honeywell Hex Chrome Study
Description:	PAM-4		Lab ID:	4062711-(	07				Sampled: 06/25/14 16:58
Matrix:	Air		Sample Volu	ume:	21.33	m³			Received: 06/27/14 11:16
Comments:	Start Time 6/24/14 17:16		<u> </u>						Analysis Date: 06/30/14 16:14
			He	xavalent	Chro	mium			
			I	<u>Results</u>				<u>MDL</u>	
Analyte		CAS Numbe	r n	<u>q/m³ Air</u>		<u>Flaq</u>		<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99		0.103				0.0036	

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Environmental Resources Management, Inc				FILE #: 3926.00			
75 Valley Stream Parkway, Suite 400			REPORTED:	07/01/14 14:	06		
Malvern, PA 19355			SUBMITTED:	06/26/14 t	o 06/27/14		
ATTN: Mr. Jeff Boggs			AQS SITE				
PHONE: (443) 803-8495 FAX: (	410) 266-8912		SITE CODE:	ł	Honeywell Hex Chrome Study		
Description: PAM-21	Lab ID:	4062711-08			Sampled: 06/25/14 00:00		
Matrix: Air	Sample V	<b>/olume:</b> 21.1	15 m³		Received: 06/27/14 11:16		
Comments:					Analysis Date: 06/30/14 16:44		
	I	Hexavalent Chr	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	ND	U	0.0036			

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Environmental Resources Management, Inc				FILE #: 3926.00		
75 Valley Stream Parkway, Suite 40	0		REPORTED:	07/01/14 14:0	6	
Malvern, PA 19355			SUBMITTED:	06/26/14 to	06/27/14	
ATTN: Mr. Jeff Boggs			AQS SITE			
PHONE: (443) 803-8495 FAX	: (410) 266-8912		CODE: SITE CODE:	Н	oneywell Hex Chrome Study	
Description: PAM-31	Lab ID:	4062711-09			Sampled: 06/25/14 00:00	
Matrix: Air	Sample V	/olume: 21	.22 m³		Received: 06/27/14 11:16	
Comments:			<u> </u>		Analysis Date: 06/30/14 16:54	
	I	Hexavalent 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	ND	U	0.0036		

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July 9, 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 July 7, 2014. Attachment 1 is a summary of the samples that were reviewed for each analysis.

## LDC Project #32103:

SDG	<u>Fraction</u>
4070130/41070213	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

Hexavalent Chromium

June 26 through June 30, 2014

Air

LDC Report Date: July 8, 2014

Matrix:

Parameters:

**Collection Date:** 

- Validation Level: EPA Level IV
- Laboratory: Eastern Research Group
- Sample Delivery Group (SDG): 4070130/4070213

### Sample Identification

OAM 1 (06/26/14)	PAM-1 (06/28/14)	PAM-1 (06/28/14)DUP
OAM 2 (06/26/14)	PAM-1D (06/28/14)	PAM-1D (06/28/14)DUP
PAM-1 (06/26/14)	PAM-2 (06/28/14)	PAM-1 (06/30/14)DUP
PAM-1D (06/26/14)	PAM-3 (06/28/14)	PAM-1D (06/30/14)DUP
PAM-2 (06/26/14)	PAM-4 (06/28/14)	
PAM-3 (06/26/14)	PAM-21 (06/28/14)	
PAM-4 (06/26/14)	PAM-31 (06/28/14)	
PAM-21 (06/26/14)	OAM 1 (06/30/14)	
PAM-31 (06/26/14)	OAM 2 (06/30/14)	
OAM 1 (06/27/14)	PAM-1 (06/30/14)	
OAM 2 (06/27/14)	PAM-1D (06/30/14)	
PAM-1 (06/27/14)	PAM-2 (06/30/14)	
PAM-1D (06/27/14)	PAM-3 (06/30/14)	
PAM-2 (06/27/14)	PAM-4 (06/30/14)	
PAM-3 (06/27/14)	PAM-21 (06/30/14)	
PAM-4 (06/27/14)	PAM-31 (06/30/14)	
PAM-21 (06/27/14)	PAM-1 (06/26/14)DUP	
PAM-31 (06/27/14)	PAM-1D (06/26/14)DUP	
OAM 1 (06/28/14)	PAM-1 (06/27/14)DUP	
OAM 2 (06/28/14)	PAM-1D (06/27/14)DUP	
	OAM 1 (06/26/14) OAM 2 (06/26/14) PAM-1 (06/26/14) PAM-1D (06/26/14) PAM-2 (06/26/14) PAM-3 (06/26/14) PAM-3 (06/26/14) PAM-4 (06/26/14) PAM-21 (06/26/14) OAM 1 (06/27/14) OAM 2 (06/27/14) PAM-1D (06/27/14) PAM-1D (06/27/14) PAM-2 (06/27/14) PAM-3 (06/27/14) PAM-3 (06/27/14) PAM-31 (06/27/14) PAM-31 (06/27/14) OAM 1 (06/28/14) OAM 1 (06/28/14)	OAM 1 (06/26/14)PAM-1 (06/28/14)OAM 2 (06/26/14)PAM-1D (06/28/14)PAM-1 (06/26/14)PAM-2 (06/28/14)PAM-1D (06/26/14)PAM-3 (06/28/14)PAM-2 (06/26/14)PAM-4 (06/28/14)PAM-3 (06/26/14)PAM-21 (06/28/14)PAM-4 (06/26/14)PAM-31 (06/28/14)PAM-21 (06/26/14)PAM-31 (06/28/14)PAM-31 (06/26/14)OAM 1 (06/30/14)PAM-31 (06/26/14)OAM 1 (06/30/14)PAM-31 (06/27/14)PAM-10 (06/30/14)PAM-1 (06/27/14)PAM-10 (06/30/14)PAM-2 (06/27/14)PAM-3 (06/30/14)PAM-3 (06/27/14)PAM-3 (06/30/14)PAM-3 (06/27/14)PAM-21 (06/30/14)PAM-4 (06/27/14)PAM-31 (06/30/14)PAM-31 (06/27/14)PAM-31 (06/30/14)PAM-31 (06/27/14)PAM-10 (06/26/14)DUPPAM-31 (06/27/14)PAM-10 (06/26/14)DUPPAM-31 (06/27/14)PAM-10 (06/27/14)DUPPAM-31 (06/27/14)PAM-10 (06/27/14)DUPPAM-31 (06/27/14)PAM-10 (06/27/14)DUPPAM-31 (06/27/14)PAM-10 (06/27/14)DUPPAM-31 (06/27/14)PAM-10 (06/27/14)DUPPAM-10 (06/27/14)PAM-10 (06/27/14)DUP

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

#### Introduction

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

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

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

The following are definitions of the data qualifiers:

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

## I. Technical Holding Times

All technical holding time requirements were met.

### II. Initial Calibration

All criteria for the initial calibration were met.

## III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met.

#### IV. Blanks

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

Samples PAM-31 (06/26/14), PAM-31 (06/27/14), PAM-31 (06/28/14), and PAM-31 (06/30/14) were identified as trip blanks. No hexavalent chromium was found.

Samples PAM-21 (06/26/14), PAM-21 (06/27/14), PAM-21 (06/28/14), and PAM-21 (06/30/14) were identified as field blanks. No hexavalent chromium was found.

#### V. Matrix Spike/Matrix Spike Duplicates

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

## VI. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. 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 (06/26/14) and PAM-1D (06/26/14), samples PAM-1 (06/27/14) and PAM-1D (06/27/14), samples PAM-1 (06/28/14) and PAM-1D (06/28/14), and samples PAM-1 (06/30/14) and PAM-3 (06/30/14) were identified as field duplicates. No hexavalent chromium was detected in any of the samples with the following exceptions:

	Concentrati	ion (ng/m³)				
Analyte	PAM-1 (06/26/14)	PAM-1D (06/26/14)	RPD (Limits)	Flags	A or P	
Hexavalent chromium	0.0586	0.0583	1 (≤20)	-	-	

	Concentrat	ion (ng/m³)				
Analyte	PAM-1 (06/27/14)	PAM-1D (06/27/14)	RPD (Limits)	Flags	A or P	
Hexavalent chromium	0.0219	0.0218	0 (≤20)	-	-	

	Concentrat	ion (ng/m³)				
Analyte	PAM-1 (06/28/14)	PAM-1D (06/28/14)	RPD (Limits)	Flags	A or P	
Hexavalent chromium	0.0129	0.0155	18 (≤20)	-	-	

	Concentrat	ion (ng/m³)				
Analyte	PAM-1 (06/30/14)	PAM-3 (06/30/14)	RPD (Limits)	Flags	A or P	
Hexavalent chromium	0.0526	0.0559	6 (≤20)	-	-	

#### Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Data Qualification Summary - SDG 4070130/4070213

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

Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG 4070130/4070213

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 4070130/4070213

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

LDC #: 32103A6

### VALIDATION COMPLETENESS WORKSHEET

Level IV

Date: <u>01/07/</u>14 Page: <u>1</u> of <u>1</u> Reviewer: <u>50</u> 2nd Reviewer: <u>0</u>

SDG #: <u>4070130/4070213</u> Laboratory: <u>Eastern Research 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
1.	Technical holding times	A	Sampling dates: 06/26-28/14, 06/30/14
- 11	Initial calibration	A	
111.	Calibration verification	A	
IV	Blanks	A	
v	Matrix Spike/Matrix Spike Duplicates	N	Not Req.
VI.	Duplicates	A	Duo
VII.	Laboratory control samples	A	LLS/D
VIII.	Sample result verification	A	
IX.	Overall assessment of data	A	
Х.	Field duplicates	Si	FD= (3.4) (12,13) (21,22) (30,33)
XI	Field blanks	NO	FB= (8)(17)(26)(35) TB= (9)(18)(27)(36)

Note: A = Acceptable N = Not provided/applicable SVV = 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 (06/26/14)	11	OAM 2 (06/27/14)	21	PAM-1 (06/28/14)	31	PAM-1D (06/30/14)
2	OAM 2 (06/26/14)	12	PAM-1 (06/27/14)	22	PAM-1D (06/28/14)	32	PAM-2 (06/30/14)
3	PAM-1 (06/26/14)	13	PAM-1D (06/27/14)	23	PAM-2 (06/28/14)	33	PAM-3 (06/30/14)
4	PAM-1D (06/26/14)	14	PAM-2 (06/27/14)	24	PAM-3 (06/28/14)	34	PAM-4 (06/30/14)
5	PAM-2 (06/26/14)	15	PAM-3 (06/27/14)	25	PAM-4 (06/28/14)	35	PAM-21 (06/30/14)
6	PAM-3 (06/26/14)	16	PAM-4 (06/27/14)	26	PAM-21 (06/28/14)	36	PAM-31 (06/30/14)
7	PAM-4 (06/26/14)	17	PAM-21 (06/27/14)	27	PAM-31 (06/28/14)	37	PAM-1 (06/26/14)DUP
8	PAM-21 (06/26/14)	18	PAM-31 (06/27/14)	28	OAM 1 (06/30/14)	38	PAM-1D (06/26/14)DUP
9	PAM-31 (06/26/14)	19	OAM 1 (06/28/14)	29	OAM 2 (06/30/14)	39	PAM-1 (06/27/14)DUP
10	OAM 1 (06/27/14)	20	OAM 2 (06/28/14)	30	PAM-1 (06/30/14)	40	PAM-1D (06/27/14)DUP
			· · · · · · · · · · · · · · · · · · ·	_	•		

## Notes: Date PS appended to sample 7 D to dufferitate

LDC #:	32103A6	VAL
SDG #:	4070130/4070213	
Laborato	ory: Eastern Research	Group

#### VALIDATION COMPLETENESS WORKSHEET

Level IV



#### METHOD: Hexavalent Chromium (ASTM D7614)

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

	Validation Area	Comments
I.	Technical holding times	Sampling dates:
	Initial calibration	
111.	Calibration verification	$ \land $
IV	Blanks	
V	Matrix Spike/Matrix Spike Duplicates	
VI.	Duplicates	5000
VII.	Laboratory control samples	
VIII.	Sample result verification	
IX.	Overall assessment of data	
Х.	Field duplicates	
XI	Field blanks	

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:

41	PAM-1 (06/28/14)DUP	51	 61	71	
42	PAM-1D (06/28/14)DUP	52	62	72	
43	PAM-1 (06/30/14)DUP	53	63	73	
44	PAM-1D (06/30/14)DUP	54	64	74	
45		55	65	75	
46		56	66	76	
47		57	67	77	
48		58	68	78	
49		59	69	79	
50		60	70	80	

Notes:

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Method: Inorganics (EPA Method Sector)				
Validation Area .	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	/			
Cooler temperature criteria was met.	/			
II. Calibration			<b></b> ,	
Were all instruments calibrated daily, each set-up time?	<			
Were the proper number of standards used?				
Were all initial calibration correlation coefficients > 0.995?	/			
Were all initial and continuing calibration verification %Rs within the <del>90-110</del> % QC limits?	/			
Were titrant checks performed as required? (Level IV only)			/	
Were balance checks performed as required? (Level IV only)			1	
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.	/			Dup
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.			/	
Were the MS/MSD or duplicate relative percent differences (RPD) $\leq$ 20% for waters and $\leq$ 35% for soil samples? A control limit of $\leq$ CRDL( $\leq$ 2X CRDL for soil) was used for samples that were $\leq$ 5X the CRDL, including when only one of the duplicate sample values were $\leq$ 5X the CRDL.	/			Pup
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.		/		

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#### LDC#\_\_\_\_\_32103A6\_\_\_\_\_

#### VALIDATION FINDINGS WORKSHEET Field Duplicates



Inorganics: Method See Cover

	Concentrat	tion (ng/m3)	
Analyte	3	4	RPD (≤20)
Hexavalent Chromium	0.0586	0.0583	1

	Concentra	tion (ng/m3)	
Analyte	12	13	RPD (≤20)
Hexavalent Chromium	0.0219	0.0218	0

	Concentrat	ion (ng/m3)	
Analyte	21	22	RPD (≤20)
Hexavalent Chromium	0.0129	0.0155	18

	Concentra	ation (ng/m3)	
Analyte	30	33	RPD (≤20)
Hexavalent Chromium	0.0526	0.0559	6

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#### LDC #: 32103Ab

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

Page:\	_ of <u>\</u>
Reviewer:	<u>20</u>
2nd Review	ver: <u>2</u>

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

The correlation coefficient (r) for the calibration of  $Cr^{+6}$  was recalculated. Calibration date: 07|02|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

			nalml	D	Recalculated	Reported	Acceptable
Type of analysis	Analyte	Standard	Conc. ( <del>ng/L)</del>	Area	r or r <sup>2</sup>	r or r <sup>2</sup>	(Y/N)
Initial calibration		s1	0.05	0.0000157			
		s2	0.10	0.0000347	1.00000	0.99936	
-102/11	~ +6	s3	0.20	0.0000715			$\checkmark$
-1102119	Cr	s4	0.50	0.0001887			(
		s5	1.00	0.0003815			
		s6	2.00	0.0007675			
IW 713114		Found	Torve				
Calibration verification		0.5097ng/ml	0.5000ngjml		101.9%F	101.9%8	
دیں ۲۱۲۲۲ رئے مرکم Calibration verification		0.5264 ug/m]	0.5000 Noim1		105.3%R	1053%R	L
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 #: 32103A6

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

 True
 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.	Acceptable
Sample ID	Type of Analysis	Element	(units)	(units)	%R / RPD	%R / RPD	(Y/N)
LLS 7/2/14 11:19	Laboratory control sample	Cv+b	1.047ng/ml	1_00ng/ml	105%R	105%R	Y
N	Matrix spike sample		(SSR-SR)				
Dup 7/2/14 12:09	Duplicate sample	Crth	0.05399.ng)m <sup>3</sup>	0:0587 ng1m3	8.4°%880	8.2% FRD	4

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

LDC	#:32102246	VALIDATION FINDINGS WORKSHEET       Page: \_of 2         Sample Calculation Verification       Reviewer:					
меті	HOD: Inorganics, Metho	d See Carev					
Pleas YN YN YN	e see qualifications belo <u>N/A</u> Have results <u>N/A</u> Are results w <u>N/A</u> Are all detect	ow for all questions answered " been reported and calculated vithin the calibrated range of the tion limits below the CRQL?	'N". Not applicable questions ar correctly? e instruments?	e identified as "N	'A".		
Comp recalc	oound (analyte) results f culated and verified usin	for $Cr^{+6}$ (15)	repo	orted with a positi	ve detect were		
(ngl Concer	L) $f(x) = [(avec) - (co)]$	Recalculation	1: [ (U.0001827 mAU*min	.)-(-4.35=-6)			
173		(ng/m1)(uf)	3 0.000	3859	D.484 M		
Co:	- (-4,35E-6) - 0.0003859 - 0.0001827mau	$\frac{1}{m^3} = \frac{1}{m^3} $	(10m1) (0.4847 ng/m1) +	(10)	0.232 ng/u		
#	Sample ID	Analyte	Reported Concentration ( Mg) w <sup>2</sup> )	Calculated Concentration ( (20)3)	Acceptable (Y/N)		
	• 1	Crtb	0.0507	0.0508	3		
	2		0.0780	0.0780			
	3		0.0586	0.0587			
	ц		0.0583	0.0583			
	2		0.113	0.113			
	6		0.0636	0.0635			
	<u>۲</u>		0.101	0-101			
. <u></u>	8		NO	NO			
	٩		QU	DU			
	10		0.0183	0.0183			
	١١		0.015	0.0176			
	12		0.0219	0.0219			
	13		0.0218	0.0218			
	14		0.0174	0.0174			
	15		0.233	0.233			
	16	· ·	0.0354	0.0354			
	17		04	ND			
	18		ND	ND			
	19		0.0164	0.0164			
		. 1		10 (1)			

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## VALIDATION FINDINGS WORKSHEET

Sample Calculation Verification

Page:	20f 2
Reviewer:	30
2nd reviewer:	on

\_\_\_\_\_reported with a positive detect were

.

METHOD: Inorganics, Method \_\_\_\_

See Cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".  $N = \frac{N}{N} \frac{N}{N} \frac{N}{N}$  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 recalculated and verified using the following equation:

Concentration =

N N/A

Y (N)N/A

Recalculation:

#	Sample ID	Analyt	e	Reported Concentration ( nର୍ବା୴ <sup>3</sup> )	Calculated Concentration (ନନ୍ଦ୍ର)	Acceptable (Y/N)
	. 21	Cr	+6	0.0129	0.0129	5
	22			0.0155	0.0156	
	23			0.0133	0.0133	
	24	, 		0.0163	0.0162	
	25			0.0127	0.0127	
	26			DU	ND	
	27			20	ND	
	28			0.0141	0.0141	
	29			0.0195	0.0195	
	30			0.0526	0-0525	
	3\			0.0559	0.0559	
	32			0.0526	0.0526	
	33			0.0320	0.0320	
	34			0.0795	0.0795	
ľ	35			ND	ND	
	36	· · · ·		DU	ND	

Note:

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<b>NERC</b>		CERTIFIC	CERTIFICATE OF ANALYSIS							
Environmental Re	sources Management, Ind	c	FILE #: 392	6.00						
75 Valley Stream Parkway, Suite 400					REPORTED: 07/07/14 13:16					
Malvern, PA 1935	5		SUBMITTED:	SUBMITTED: 07/01/14 to 07/02/14						
ATTN: Mr. Jeff B	oggs		AQS SITE CODE:							
PHONE: (443) 8	03-8495 <b>FAX:</b> (410	) 266-8912		SITE CODE:	F	Ioneywell Hex Chrome Study				
Description:	OAM 1	Lab ID:	4070130-01			Sampled: 06/26/14 17:06				
Matrix:	Air	Sample V	/olume: 21	.21 m³		Received: 07/01/14 11:56				
Comments:	Start Time 6/25/14 16:20					Analysis Date: 07/02/14 13:30				
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	0.0507		0.0036					

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Environmental Re	sources Management, In	c	FILE #: 39	FILE #: 3926.00								
75 Valley Stream	Parkway, Suite 400		REPORTED:	07/07/14 13:16	3							
Malvern, PA 19355					SUBMITTED: 07/01/14 to 07/02/14							
ATTN: Mr. Jeff B	oggs		AQS SITE CODE:									
PHONE: (443) 8	03-8495 <b>FAX:</b> (410	) 266-8912		SITE CODE:	Ho	oneywell Hex Chrome Study						
Description:	OAM 2	Lab ID:	4070130-02			Sampled: 06/26/14 17:48						
Matrix:	Air	Sample	Volume: 22.	67 m³		Received: 07/01/14 11:56						
Comments:	Start Time 6/25/14 16:40	·			A	nalysis Date: 07/02/14 13:40						
	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	I	1854-02-99	0.0780		0.0036							

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Environmental Res	sources Management, In	0	FILE #: 3926.00							
75 Valley Stream F	Parkway, Suite 400		REPORTED:	07/07/14 13:16						
Malvern, PA 19355		SUBMITTED: 07/01/14 to 07/02/14								
ATTN: Mr. Jeff Bo	oggs			AQS SITE CODE:						
PHONE: (443) 8	03-8495 <b>FAX:</b> (410	) 266-8912		SITE CODE: Honeywell Hex Chrome Study						
Description:	PAM-1	Lab ID:	4070130-03			Sampled: 06/26/14 18:03				
Matrix:	Air	Sample \	<b>/olume:</b> 21.6	7 m³		Received: 07/01/14 11:56				
Comments:	Col 1 Start Time 6/25/14	17:43			A1	naiysis Date: 07/02/14 12:09				
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	0.0586		0.0036					

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Environmental Re	sources Management, li	nc	FILE #:	FILE #: 3926.00				
75 Valley Stream I	Parkway, Suite 400		REPORTE	REPORTED: 07/07/14 13:16				
Malvern, PA 19355					SUBMITTED: 07/01/14 to 07/02/14			
ATTN: Mr. Jeff B	oggs		AQS SITE CODE:					
PHONE: (443) 803-8495 FAX: (410) 266-8912					SITE CODE: Honeywell Hex Chrome Study			
Description:	PAM-1D	Lab ID	<b>4070130-04</b>			Sampled: 06/26/14 18:03		
Matrix:	Air	Sampl	e Volume: 21.	81 m³		Received: 07/01/14 11:56		
Comments:	Col 2 Start Time 6/25/14	17:49				Analysis Date: 07/02/14 12:29		
			Hexavalent Ch	romium				
			<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			0.0583		0.0036			

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Environmental Re	sources Management, In	c	FILE #: 3926.00								
75 Valley Stream I	Parkway, Suite 400		<b>REPORTED:</b> 07/07/14 13:16								
Malvern, PA 19355					SUBMITTED: 07/01/14 to 07/02/14						
ATTN: Mr. Jeff B	oggs			AQS SITE CODE:							
PHONE: (443) 8	03-8495 <b>FAX:</b> (410	) 266-8912		SITE CODE:	Honeywel	I Hex Chrome Study					
Description:	PAM-2	Lab ID:	4070130-05		San	<b>pled:</b> 06/26/14 17:48					
Matrix:	Air	Sample \	/olume: 21.8	9 m³	Rec	eived: 07/01/14 11:56					
Comments:	Start Time 6/25/14 17:29				Analysis	Date: 07/02/14 14:10					
	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	0.113		0.0036						

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Environmental Res	ources Management, Inc	:	FILE #:	FILE #: 3926.00			
75 Valley Stream Parkway, Suite 400					ED: 07/07/14 13:	16	
Malvern, PA 19355	i			SUBMITT	ED: 07/01/14	to 07/02/14	
ATTN: Mr. Jeff Bo	oggs			AQS SITE CODE:			
PHONE: (443) 80	03-8495 <b>FAX:</b> (410	266-8912	SITE COD	SITE CODE: Honeywell Hex Chrome Study			
Description:	PAM-3	Lab I	<b>D:</b> 4070130-06			Sampled: 06/26/14 17:45	
Matrix:	Air	Samp	ole Volume: 22	.01 m³		Received: 07/01/14 11:56	
Comments:	Start Time 6/25/14 17:18					Analysis Date: 07/02/14 14:19	
			Hexavalent Ch	romium			
			<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	0.0636		0.0036		

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Environmental Res	sources Management, In	c	FILE #: 3926.00								
75 Valley Stream Parkway, Suite 400					07/07/14 13:	16					
Malvern, PA 19355					SUBMITTED: 07/01/14 to 07/02/14						
ATTN: Mr. Jeff Bo	oggs			AQS SITE CODE:							
PHONE: (443) 8	03-8495 <b>FAX:</b> (410	) 266-8912		SITE CODE:	ŀ	Ioneywell Hex Chrome Study					
Description:	PAM-4	Lab ID:	4070130-07	· ·		Sampled: 06/26/14 17:37					
Matrix:	Air	Sample	Volume: 22.1	.2 m³		Received: 07/01/14 11:56					
Comments:	Start Time 6/25/14 17:03					Analysis Date: 07/02/14 14:29					
	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	0.101		0.0036						

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Environmental Resources Management, Inc						FILE #: 3926.00						
75 Valley Stream Parkway, Suite 400					<b>REPORTED:</b> 07/07/14 13:16							
Malvern, PA 19355					SUBMITTED: 07/01/14 to 07/02/14							
ATTN: Mr. Jeff I	ATTN: Mr. Jeff Boggs						AQS SITE CODE:					
PHONE: (443)	803-8495 FAX	(410) 266-8912		:	SITE COD	E:	Honeywell Hex Chrome Study					
Description:	PAM-21		Lab ID: 407	0130-08			Sampled: 06/26/14 00:00					
Matrix:	Air		Sample Volume	21.89	m³		Received: 07/01/14 11:56					
Comments:							Analysis Date: 07/02/14 14:39					
	Hexavalent Chromium											
			Resu	<u>its</u>		MDL						
<u>Analyte</u>		CAS Numbe	er <u>ng/m</u>	<sup>3</sup> Air	<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 Resources Management, Inc F						FILE #: 3926.00					
75 Valley Stream Parkway, Suite 400 F					REPORTED: 07/07/14 13:16						
Malvern, PA 19355					SUBMITTED: 07/01/14 to 07/02/14						
ATTN: Mr. Jeff Boggs						AQS SITE CODE:					
PHONE: (443)	803-8495	FAX:	(410) 266-8912				SITE COE	DE:	Honeywell Hex Chrome Study		
Description:	PAM-31			Lab ID:	4070130-	-09			Sampled: 06/26/14 00:00		
Matrix:	Air			Sample Ve	olume:	22.01	m³		Received: 07/01/14 11:56		
Comments:									Analysis Date: 07/02/14 14:49	_	
	Hexavalent Chromium										
<u>Results</u>								MDL			
<u>Analyte</u>			CAS Numbe	<u>er</u>	<u>ng/m³ Air</u>		<u>Flag</u>	<u>ng/m³ /</u>	Air		
Hexavalent Chromium			1854-02-99		ND		U	0.003	5		

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Environmental Resources Management, Inc				FILE #:	FILE #: 3926.00			
75 Valley Stream Parkway, Suite 400				REPORT	<b>REPORTED:</b> 07/07/14 13:16			
Malvern, PA 19355				SUBMIT	SUBMITTED: 07/01/14 to 07/02/14			
ATTN: Mr. Jeff Boggs					AQS SITE CODE:			
PHONE: (443) 8	03-8495 <b>FAX:</b> (410	) 266-8912			SITE CO	DE:	Honeywell Hex Chrome Study	
Description:	OAM 1	L	Lab ID:	4070130-10			Sampled: 06/27/14 16:09	
Matrix:	Air	5	Sample Vol	l <b>ume:</b> 20	.7 m³		Received: 07/01/14 11:56	
Comments:	Start Time 6/26/14 17:09						Analysis Date: 07/02/14 14:59	
			He	exavalent Ch	romium			
			l	<u>Results</u>			MDL	
<u>Analyte</u>		CAS Number	<u>n</u>	<u>ig/m³ Air</u>	<u>Flag</u>	<u>ng/</u>	<u>m³ Air</u>	
Hexavalent Chromium		1854-02-99		0.0183		I	.0036	

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Environmental Re	Environmental Resources Management, Inc					FILE #: 3926.00			
75 Valley Stream Parkway, Suite 400					REPORTED: 07/07/14 13:16				
Malvern, PA 19355					SUBMITTED: 07/01/14 to 07/02/14				
ATTN: Mr. Jeff Boggs					AQS SITE CODE:				
PHONE: (443) 8	03-8495 <b>FAX:</b> (41	0) 266-8912		SITE CO	DE:	ŀ	loneywell Hex Chrome Study		
Description:	OAM 2	l	Lab ID: 4070130-1	1			Sampled: 06/27/14 16:55		
Matrix:	Air	S	Sample Volume:	20.7 m <sup>a</sup>	3		Received: 07/01/14 11:56		
Comments:	Start Time 6/26/14 17:5	5					Analysis Date: 07/02/14 15:09		
			Hexavalent C	Chromium					
			<u>Results</u>			MDL			
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>		ng/m³ Air			
Hexavalent Chromium		1854-02-99	0.0175			0.0036			

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Environmental Re	Environmental Resources Management, Inc					FILE #: 3926.00			
75 Valley Stream F		REPORTED: 07/07/14 13:16							
Malvern, PA 1935		SUBMITTED: 07/01/14 to 07/02/14							
ATTN: Mr. Jeff B		AQS SITE CODE:							
PHONE: (443) 8	03-8495 FAX: (410	0) 266-8912		SITE CODE:	F	loneywell Hex Chrome Study			
Description:	PAM-1	Lab ID:	4070130-12			Sampled: 06/27/14 18:58			
Matrix:	Air	Sample	Volume: 21.4	m <sup>3</sup>		Received: 07/01/14 11:56			
Comments:	Col 1 Start Time 6/26/14	19:52				Analysis Date: 07/02/14 12:49			
			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	0.0219		0.0036				

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Environmental Re	sources Management, In	c		FILE #:	392	6.00		
75 Valley Stream Parkway, Suite 400				REPOR	REPORTED: 07/07/14 13:16			
Malvern, PA 19355					SUBMITTED: 07/01/14 to 07/02/14			
ATTN: Mr. Jeff Boggs AQS SITE CODE:								
PHONE: (443) 8	303-8495 <b>FAX:</b> (410	)) 266-8912		SITE C	ODE:	Н	oneywell Hex Chrome Study	
Description:	PAM-1D	Lab ID:	4070130-	13			Sampled: 06/27/14 18:32	
Matrix:	Air	Sample \	/olume:	20.75 n	n <sup>3</sup>		Received: 07/01/14 11:56	
Comments:	Col 2 Start Time 6/26/14	19:29					Analysis Date: 07/02/14 13:08	
		I	Hexavalent	Chromium				
			<u>Results</u>			MDL		
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	Flag	l	<u>ng/m³ Air</u>		
Hexavalent Chromium	I	1854-02-99	0.0218			0.0036		

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Environmental Re	Environmental Resources Management, Inc					FILE #: 3926.00			
75 Valley Stream Parkway, Suite 400				REPORTE	REPORTED: 07/07/14 13:16				
Malvern, PA 19355					SUBMITTED: 07/01/14 to 07/02/14				
ATTN: Mr. Jeff Boggs					AQS SITE CODE:				
PHONE: (443) 8	03-8495 <b>FAX:</b> (410	) 266-8912		SITE CODI	E:	Honeywell Hex Chrome Study			
Description:	PAM-2	L	Lab ID: 4070130-14			Sampled: 06/27/14 18:14			
Matrix:	Air	S	Sample Volume: 20	).78 m³		Received: 07/01/14 11:56			
Comments:	Start Time 6/26/14 19:08					Analysis Date: 07/02/14 15:19			
			Hexavalent Ch	nromium					
			Results		<u>MDL</u>				
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>				
Hexavalent Chromium		1854-02-99	0.0174		0.0036				

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#### CERTIFICATE OF ANALYSIS

Environmental Res	c	FILE #: 3926.00						
75 Valley Stream F		<b>REPORTED:</b> 07/07/14 13:16						
Malvern, PA 19355					SUBMITTED: 07/01/14 to 07/02/14			
ATTN: Mr. Jeff B	ATTN: Mr. Jeff Boggs							
PHONE: (443) 8	03-8495 <b>FAX:</b> (410	) 266-8912		SITE CODE:	F	loneywell Hex Chrome Study		
Description:	PAM-3	Lab	ID: 4070130-15			Sampled: 06/27/14 17:51		
Matrix:	Air	Sam	ple Volume: 20.7	′9 m³		Received: 07/01/14 11:56		
Comments:	Start Time 6/26/14 19:08					Analysis Date: 07/02/14 15:29		
			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		1854-02-9 <del>9</del>	0.233		0.0036			

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Page 18 of 41

Environmental Resources Management, Inc					FILE #: 3926.00			
75 Valley Stream Parkway, Suite 400					<b>REPORTED:</b> 07/07/14 13:16			
Malvern, PA 19355					SUBMITTED: 07/01/14 to 07/02/14			
ATTN: Mr. Jeff Boggs AQS SITE CODE:								
PHONE: (443) 8	03-8495 <b>FAX:</b> (410	) 266-8912			SITE COD	E:	Ioneywell Hex Chrome Study	
Description:	PAM-4	Lab	<b>ID:</b> 40701	30-16			Sampled: 06/27/14 17:21	
Matrix:	Air	Sam	ple Volume:	20.7	m³		Received: 07/01/14 11:56	
Comments:	Start Time 6/26/14 18:21						Analysis Date: 07/02/14 15:39	
			Hexavale	nt Chro	mium			
			<u>Results</u>			MDL		
Analyte		CAS Number	<u>ng/m³ A</u>	lir	Flag	<u>ng/m³ Air</u>		
Hexavalent Chromium		1854-02-99	0.0354			0.0036		

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Environmental Resources Mana	agement, Inc	FILE #: 3926.00							
75 Valley Stream Parkway, Suite	e 400	REPORTED: 07/07/14 13:16							
Malvern, PA 19355		SUBMITTED: 07/01/14 to 07/02/14							
ATTN: Mr. Jeff Boggs		AQS SITE CODE:							
PHONE: (443) 803-8495	FAX: (410) 266-8912	SITE CODE: Honeywell Hex Chrome Study							
Description: PAM-21	Lab ID: 4070130-17	Sampled: 06/27/14 00:00							
Matrix: Air	Sample Volume: 20	0.78 m <sup>3</sup> <b>Received:</b> 07/01/14 11:56							
Comments:		Analysis Date: 07/02/14 16:08							
Hexavalent Chromium									
	Results	MDL							
Analyte	CAS Number ng/m³ Air	<u>Flag 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.

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Environmental Re	Environmental Resources Management, Inc					FILE #: 3926.00			
75 Valley Stream Parkway, Suite 400					<b>REPORTED:</b> 07/07/14 13:16				
Malvern, PA 19355					SUBMITTED: 07/01/14 to 07/02/14				
ATTN: Mr. Jeff Boggs					AQS SITE CODE:				
PHONE: (443) 8	03-8495 <b>FA</b>	<b>X:</b> (410) 266-8912		SITE	CODE:	Honeywell Hex Chrome Study			
Description:	PAM-31		Lab ID: 4070130	)-18		Sampled: 06/27/14 00:00			
Matrix:	Air		Sample Volume:	20.79	m³	Received: 07/01/14 11:56			
Comments:						Analysis Date: 07/02/14 16:18			
			Hexavalen	t Chromiun	ì				
			<u>Results</u>			MDL			
<u>Analyte</u>		CAS Numbe	<u>er ng/m³ Air</u>	: <u>Fl</u>	g	<u>ng/m³ Air</u>			
Hexavalent Chromium		1854-02-99	ND		J	0.0036			

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Environmental Resources Management, Inc					FILE #: 3926.00			
75 Valley Stream Parkway, Suite 400					<b>REPORTED:</b> 07/07/14 13:16			
Malvern, PA 19355					SUBMITTED: 07/01/14 to 07/02/14			
ATTN: Mr. Jeff B	oggs		AQS SIT	AQS SITE CODE:				
PHONE: (443) 8	03-8495 FAX: (410	) 266-8912		SITE CO	DE:	Honeywell Hex Chrome Study		
Description:	OAM 1	Lab I	<b>D:</b> 4070130-19			Sampled: 06/28/14 16:02		
Matrix:	Air	Samp	ole Volume: 2	1.49 m <sup>3</sup>		Received: 07/01/14 11:56		
Comments:	Start Time 6/27/14 16:10	······································	- · · · · · · · · · · · · · · · · · · ·			Analysis Date: 07/03/14 15:49		
			Hexavalent C	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		1854-02-99	0.0164		0.0036			

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Environmental Resources Management,	Inc	FILE #: 3926.00				
75 Valley Stream Parkway, Suite 400		REPORTED:	<b>REPORTED:</b> 07/07/14 13:16			
Malvern, PA 19355		SUBMITTED: 07/01/14 to 07/02/14				
ATTN: Mr. Jeff Boggs			AQS SITE CODE:			
PHONE: (443) 803-8495 FAX: (4	10) 266-8912		SITE CODE:	: Honeywell Hex Chrome Study		
Description: OAM 2	Lab ID:	4070130-20		Sampled: 06/28/14 16:27		
Matrix: Air	Sample V	olume: 21.1	.7 m³	Received: 07/01/14 11:56		
Comments: Start Time 6/27/14 16:	56			Analysis Date: 07/03/14 13:00		
	H	lexavalent 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	0.0171		0.0036		

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Environmental Re	IC	FILE #: 3926.00						
75 Valley Stream I		<b>REPORTED:</b> 07/07/14 13:16						
Malvern, PA 19355					SUBMITTED: 07/01/14 to 07/02/14			
ATTN: Mr. Jeff B	oggs			AQS SITE CODE:				
PHONE: (443) 8	03-8495 FAX: (410	0) 266-8912		SITE CODE:	Hone	eywell Hex Chrome Study		
Description:	PAM-1	Lab ID:	4070130-21			Sampled: 06/28/14 18:04		
Matrix:	Air	Sample \	<b>/olume:</b> 21.3	2 m³		Received: 07/01/14 11:56		
Comments:	Col 1 Start Time 6/27/14	19:04			Ana	lysis Date: 07/03/14 11:29		
		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	0.0129		0.0036			

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NERC	CERTIFICATE OF ANALYSIS							
Environmental Resources Management, Inc				FILE #: 3926	FILE #: 3926.00			
75 Valley Stream Parkway, Suite 400				REPORTED:	REPORTED: 07/07/14 13:16			
Malvern, PA 19355				SUBMITTED:	SUBMITTED: 07/01/14 to 07/02/14			
ATTN: Mr. Jeff Boggs AQS SITE CODE:								
PHONE: (443) 8	803-8495 <b>FAX:</b> (410	) 266-8912		SITE CODE:	Honeywell	Hex Chrome Study		
Description:	PAM-1D	Lab ID:	4070130-22		Sam	pled: 06/28/14 17:53		
Matrix:	Air	Sample V	<b>/olume:</b> 20.	.71 m³	Rece	eived: 07/01/14 11:56		
Comments:	Col 2 Start Time 6/27/14	18:52			Analysis	Date: 07/03/14 11:48		
		I	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	I	1854-02-99	0.0155		0.0036			

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<b>NERC</b>	CERTIFICATE OF ANALYSIS							
Environmental Res	sources Management, In	c		FILE #: 3926	3.00			
75 Valley Stream Parkway, Suite 400			REPORTED:	<b>REPORTED:</b> 07/07/14 13:16				
Malvern, PA 19355				SUBMITTED: 07/01/14 to 07/02/14				
ATTN: Mr. Jeff Bo	ATTN: Mr. Jeff Boggs AQS SITE CODE:							
PHONE: (443) 8	03-8495 <b>FAX:</b> (410	) 266-8912		SITE CODE:	H	oneywell Hex Chrome Study		
Description:	PAM-2	Lab ID:	4070130-23			Sampled: 06/28/14 17:23		
Matrix:	Air	Sample \	/olume: 21.0	)7 m³		Received: 07/01/14 11:56		
Comments:	Start Time 6/27/14 18:17				4	Analysis Date: 07/03/14 13:30		
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	0.0133		0.0036			

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CERTIFICATE OF ANALYSIS							
Environmental Re	sources Management, In	c		FILE #: 392	6.00		
75 Valley Stream Parkway, Suite 400			REPORTED:	07/07/14 13:1	6		
Malvern, PA 19355				SUBMITTED:	SUBMITTED: 07/01/14 to 07/02/14		
ATTN: Mr. Jeff Boggs AQS SITE CODE:							
PHONE: (443) 8	03-8495 FAX: (410	) 266-8912		SITE CODE:	F	Ioneywell Hex Chrome Study	
Description:	PAM-3	Lab ID:	4070130-24			Sampled: 06/28/14 17:09	
Matrix:	Air	Sample \	<b>/olume:</b> 20	.92 m³		Received: 07/01/14 11:56	
Comments:	Start Time 6/27/14 17:54					Analysis Date: 07/03/14 13:40	
		I	Hexavalent Ch	romium			
			<u>Results</u>		<u>MDL</u>		
<u>Analyte</u>		CAS Number	ng/m³ Air	Flag	<u>ng/m³ Air</u>		
Hexavalent Chromium		1854-02-99	0.0163		0.0036		

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Environmental Resources Management, Inc				FILE	FILE #: 3926.00			
75 Valley Stream Parkway, Suite 400				REP	REPORTED: 07/07/14 13:16			
Malvern, PA 19355				SUB	SUBMITTED: 07/01/14 to 07/02/14			
ATTN: Mr. Jeff Boggs AQS SITE CODE					DE:			
PHONE:         (443) 803-8495         FAX:         (410) 266-8912         SITE CODE:         Honeywell Hex Chrome Study					oneywell Hex Chrome Study			
Description:	PAM-4	Lab	<b>ID:</b> 4070130-2	25			Sampled: 06/28/14 16:45	
Matrix:	Air	San	nple Volume:	20.92	m³		Received: 07/01/14 11:56	
Comments:	Start Time 6/27/14 17:31					A	nalysis Date: 07/03/14 13:50	
			Hexavalent	Chromiu	n			
			<u>Results</u>			MDL		
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>F</u>	lag	<u>ng/m³ Air</u>		
Hexavalent Chromium		1854-02-99	0.0127			0.0036		

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CERTIFICATE OF ANALYSIS							
Environmental Resources Mana	gement, Inc		FILE #: 3926	5.00			
75 Valley Stream Parkway, Suite	e 400		REPORTED:	07/07/14 13:16			
Malvern, PA 19355		SUBMITTED: 07/01/14 to 07/02/14					
ATTN: Mr. Jeff Boggs AQS SITE CODE:							
PHONE: (443) 803-8495	FAX: (410) 266-8912		SITE CODE:	Honeywell Hex Chrome S	tudy		
Description: PAM-21	Lab ID:	4070130-26		Sampled: 06/28/14 (	00:00		
Matrix: Air	Sample V	Volume: 21.07	7 m³	<b>Received:</b> 07/01/14	11:56		
Comments:				Analysis Date: 07/03/14	14:00		
	·	Hexavalent 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	ND	U	0.0036			

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Environmental Resources Management, In	nc	FILE #: 3926.00	FILE #: 3926.00			
75 Valley Stream Parkway, Suite 400		REPORTED: 07/07/14	<b>REPORTED:</b> 07/07/14 13:16			
Malvern, PA 19355		SUBMITTED: 07/01/1	SUBMITTED: 07/01/14 to 07/02/14			
ATTN: Mr. Jeff Boggs		AQS SITE CODE:				
PHONE: (443) 803-8495 FAX: (410	0) 266-8912	SITE CODE:	Honeywell Hex Chrome Study			
Description: PAM-31	Lab ID: 4070130-27		Sampled: 06/28/14 00:00			
Matrix: Air	Sample Volume: 20.9	92 m³	Received: 07/01/14 11:56			
Comments:			Analysis Date: 07/03/14 14:10			
	Hexavalent Chr	omium				
	Results	<u>MDL</u>				
Analyte	CAS Number ng/m³ Air	<u>Flag ng/m³ A</u>	<u>ir</u>			
Hexavalent Chromium	1854-02-99 ND	U 0.0036				

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NERC	Ē	CERTIFIC	CATE OF A	ANALYSIS	6		
Environmental Re	sources Management, In	c		FILE #: 392	6.00		
75 Valley Stream Parkway, Suite 400			REPORTED:	REPORTED: 07/07/14 13:16			
Malvern, PA 19355				SUBMITTED:	SUBMITTED: 07/01/14 to 07/02/14		
ATTN: Mr. Jeff Boggs AQS SITE CODE:							
PHONE: (443) 8	303-8495 <b>FAX:</b> (410	) 266-8912		SITE CODE:	Н	oneywell Hex Chrome Study	
Description:	OAM 1	Lab ID:	4070213-01			Sampled: 06/30/14 15:58	
Matrix:	Air	Sample \	Volume: 21	.4 m³		Received: 07/02/14 11:35	
Comments:	Start Time 6/29/14 16:11					Analysis Date: 07/03/14 14:20	
		I	Hexavalent Ch	romium			
			<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	0.0141		0.0036		

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NERC	CERTIFICATE OF ANALYSIS							
Environmental Re	sources Management, In	c		FILE #: 3920	6.00			
75 Valley Stream Parkway, Suite 400			REPORTED:	REPORTED: 07/07/14 13:16				
Malvern, PA 19355				SUBMITTED: 07/01/14 to 07/02/14				
ATTN: Mr. Jeff Boggs AQS SITE CODE:								
PHONE:         (443) 803-8495         FAX:         (410) 266-8912         SITE CODE:         Honeywell Hex Chrome Study								
Description:	OAM 2	Lab ID:	4070213-02			Sampled: 06/30/14 16:27		
Matrix:	Air	Sample V	<b>/olume:</b> 21.	33 m³		Received: 07/02/14 11:35		
Comments:	Start Time 6/29/14 16:46				A	nalysis Date: 07/03/14 14:29		
		I	Hexavalent Chi	romium				
			<u>Results</u>		MDL			
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	Flag	<u>ng/m³ Air</u>			
Hexavalent Chromium	l	1854-02-99	0.0195		0.0036			

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Environmental Resources Management, Inc				FILE #:	FILE #: 3926.00			
75 Valley Stream Parkway, Suite 400				REPORT	REPORTED: 07/07/14 13:16			
Malvern, PA 19355				SUBMIT	SUBMITTED: 07/01/14 to 07/02/14			
ATTN: Mr. Jeff Boggs AQS SITE CODE:								
PHONE: (443) 8	303-8495 <b>FAX:</b> (41	0) 266-8912		SITE CO	DE:	Honeywell Hex Chrome Study		
Description:	PAM-1	Lab ID	4070213-0	)3		Sampled: 06/30/14 17:55		
Matrix:	Air	Sample	Volume:	21.62 m	3	Received: 07/02/14 11:35		
Comments:	Col 1 Start Time 6/29/14	17:54				Analysis Date: 07/03/14 12:08		
			Hexavalent	Chromium				
			<u>Results</u>		<u>M</u>	<u>)L</u>		
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	Flag	<u>ng/m</u>	<sup>3</sup> Air		
Hexavalent Chromium	I	1854-02-99	0.0526		0.0	036		

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# Environmental Resources Management, Inc FILE #: 3926.00 75 Valley Stream Parkway, Suite 400 REPORTED: 07/07/14 13:16 Malvern, PA 19355 SUBMITTED: 07/01/14 to 07/02/14 ATTN: Mr. Jeff Boggs PHONE: (442) 802 8495

<b>PHONE:</b> (443)	803-8495 FAX: (+	410) 266-8912		SITI	E CODE:	1	Honeywell Hex Chrome Study	
Description:	PAM-1D	Lab I	<b>D:</b> 407021	3-04			Sampled: 06/30/14 18:00	
Matrix:	Air	Samp	le Volume:	21.66	m³		Received: 07/02/14 11:35	
Comments:	Col 2 Start Time 6/29/	14 17:56					Analysis Date: 07/03/14 12:28	
			Hexavaler	nt Chromiu	m			
			<u>Results</u>			MDL	,	
<u>Analyte</u>		CAS Number	<u>ng/m³ Ai</u>	r i	Flag	<u>ng/m³ Air</u>		
Hexavalent Chromiu	m	1854-02-99	0.0559			0.0036		

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Environmental Resources	s Management, Inc	FILE #: 3926.00			
75 Valley Stream Parkwa	ay, Suite 400	REPORTED: 07/07/14 13:16			
Malvern, PA 19355		SUBMITTED: 07/01/14 to 07/02/14			
ATTN: Mr. Jeff Boggs AQS SITE CODE:					
PHONE: (443) 803-849	95 <b>FAX:</b> (410) 266-8912		SITE CODE: Honeywell Hex Chrome Study		
Description: PAM-2	2	Lab ID: 4070213-05		Sampled: 06/30/14 17:36	
Matrix: Air	s	Sample Volume: 21.88	m³	Received: 07/02/14 11:35	
Comments: Start T	Time 6/29/14 17:37			Analysis Date: 07/03/14 14:39	
		Hexavalent Chro	mium		
		<u>Results</u>		MDL	
<u>Analyte</u>	CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	ng/m³ Air	
Hexavalent Chromium	1854-02-99		0.0036		

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NERC	Ē	CERTIFIC	ATE OF A	ANALYSIS	5		
Environmental Re	sources Management, In	с		FILE #: 3926	6.00		
75 Valley Stream	Parkway, Suite 400			REPORTED:	07/07/14 13:16	i	
Malvern, PA 19355				SUBMITTED:	SUBMITTED: 07/01/14 to 07/02/14		
ATTN: Mr. Jeff Boggs AQS SITE CODE:							
PHONE: (443) 8	303-8495 <b>FAX:</b> (410	)) 266-8912		SITE CODE:	Ho	neywell Hex Chrome Study	
Description:	PAM-3	Lab ID:	4070213-06			Sampled: 06/30/14 17:16	
Matrix:	Air	Sample V	<b>olume:</b> 21.	5 m³		Received: 07/02/14 11:35	
Comments:	Start Time 6/29/14 17:23				A	nalysis Date: 07/03/14 14:49	
		H	lexavalent Chr	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	I	1854-02-99	0.0320		0.0036		

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CERTIFICATE OF ANALYSIS									
Environmental Re	c	FILE #: 3926.00							
75 Valley Stream		REPORTED: 07/07/14 13:16							
Malvern, PA 1935		SUBMITTED:	ED: 07/01/14 to 07/02/14						
ATTN: Mr. Jeff Boggs AQS SITE CODE:									
PHONE:         (443) 803-8495         FAX:         (410) 266-8912         SITE CODE:         Honeywell Hex Chrome Study									
Description:	PAM-4	Lab ID:	4070213-07			Sampled: 06/30/14 16:55			
Matrix:	Air	Sample V	<b>/olume:</b> 21.	37 m³		Received: 07/02/14 11:35			
Comments:	Start Time 6/29/14 17:10				4	Analysis Date: 07/03/14 14:59			
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	0.0795		0.0036				

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#### CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc					FILE #: 3926.00				
75 Valley Stream Parkway, Suite 400					REPORTED: 07/07/14 13:16				
Malvern, PA 19355					SUBMITTED: 07/01/14 to 07/02/14				
ATTN: Mr. Jeff Boggs					AQS SITE CODE:				
PHONE: (443) 8	803-8495 FAX:	(410) 266-8912		SITE COD	E:	Honeywell Hex Chrome Study			
Description:	PAM-21	La	<b>b ID:</b> 4070213-0	8		Sampled: 06/30/14 00:00			
Matrix:	Air	Sa	mple Volume:	21.88 m <sup>3</sup>		Received: 07/02/14 11:35			
Comments:					······	Analysis Date: 07/03/14 15:29			
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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#### CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc					FILE #: 3926.00				
75 Valley Stream Parkway, Suite 400					REPORTED: 07/07/14 13:16				
Malvern, PA 19355					SUBMITTED: 07/01/14 to 07/02/14				
ATTN: Mr. Jeff Boggs				AQS SITE CODE:					
PHONE: (443) 8	803-8495 FAX:	(410) 266-8912			SITE CODE:	H	oneywell Hex Chrome Study		
Description:	PAM-31		Lab ID;	4070213-09			Sampled: 06/30/14 00:00		
Matrix:	Air		Sample Volu	me: 21.5	m³		Received: 07/02/14 11:35		
Comments:			<u></u>				Analysis Date: 07/03/14 15:39		
Hexavalent Chromium									
			<u>Re</u>	<u>esults</u>		<u>MDL</u>			
<u>Analyte</u>		CAS Numbe	<u>er ng</u>	<u>/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>			
Hexavalent Chromium		1854-02-99		ND	U	0.0036			

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