

August 12, 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 August 8, 2014. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #32402:

SDG Fraction

4080515 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	402	2 (E	RN	/ -	Мо	rris	svil	le,	NC	T	Hai	bo	r P	oin	it, l	٨D	, He	exa	iva	len	t C	hro	omi	um	M	oni	tor	ing)							
_DC	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
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Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:	Harbor Point, MD, Hexavalent Chromium Monitoring
Collection Date:	August 1 through August 4, 2014
LDC Report Date:	August 11, 2014
Matrix:	Air
Parameters:	Hexavalent Chromium
Validation Level:	EPA Level IV
Laboratory:	Eastern Research Group
Sample Delivery Group (SDG):	4080515

Sample Identification

OAM 1 (08/01/14)	PAM-1 (08/04/14)DUP
OAM 2 (08/01/14)	PAM-1D (08/04/14)DUP
PAM-1 (08/01/14)	. , ,
PAM-1D (08/01/14)	
PAM-2 (08/01/14)	
PAM-3 (08/01/14)	
PAM-4 (08/01/14)	
PAM-21 (08/01/14)	
PAM-31 (08/01/14)	
OAM 1 (08/04/14)	
OAM 2 (08/04/14)	
PAM-1 (08/04/14)	
PAM-1D (08/04/14)	
PAM-2 (08/04/14)	
PAM-3 (08/04/14)	
PAM-4 (08/04/14)	
PAM-21 (08/04/14)	
PAM-31 (08/04/14)	
PAM-1 (08/01/14)DUP	
PAM-1D (08/01/14)DUP	

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

Introduction

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

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

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

The following are definitions of the data qualifiers:

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

I. Technical Holding Times

All technical holding time requirements were met.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met.

IV. Blanks

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

Samples PAM-31 (08/01/14) and PAM-31 (08/04/14) were identified as trip blanks. No hexavalent chromium was found.

Samples PAM-21 (08/01/14) and PAM-21 (08/04/14) 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 (08/01/14) and PAM-1D (08/01/14) and samples PAM-1 (08/04/14) and PAM-1D (08/04/14) 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 (08/01/14)	PAM-1D (08/01/14)	(Limits)	Flags	A or P
Hexavalent chromium	0.0844	0.0861	2 (≤20)	-	-

	Concentrat	ion (ng/m³)				
Analyte	PAM-1 (08/04/14)	PAM-1D (08/04/14)	(Limits)	Flags	A or P	
Hexavalent chromium	0.0351	0.0300	16 (≤20)	-	-	

Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Data Qualification Summary - SDG 4080515

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 4080515

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 4080515

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

LDC #:	32402A6	VALIDATION COMPLETENESS WORKSHEET
SDG #: _	4080515	Level IV
Laborato	ory: Eastern I	esearch 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
1.	Technical holding times	A	Sampling dates: 08/0/- 04/14
11	Initial calibration	A	
Ш.	Calibration verification	A	
IV	Blanks	A	
v	Matrix Spike/Matrix Spike Duplicates	2	Not Required
VI.	Duplicates	A	Dup.
VII.	Laboratory control samples	A	LUSID
VIII.	Sample result verification	A	
IX.	Overall assessment of data	A	
Х.	Field duplicates	SW	FD= (3,4) (12,13)
xı	Field blanks	NJ	FB=8,17 TB=9,18

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

Validated Samples:

Airs 1 OAM 1 (08/01/14) 11 OAM 2 (08/04/14) 21 PAM-1 (08/04/14)DUP 31 2 12 22 PAM-1D (08/04/14)DUP 32 OAM 2 (08/01/14) PAM-1 (08/04/14) PAM-1 (08/01/14) 13 PAM-1D (08/04/14) 23 33 3 34 4 PAM-1D (08/01/14) 14 PAM-2 (08/04/14) 24 25 35 5 PAM-2 (08/01/14) 15 PAM-3 (08/04/14) PAM-3 (08/01/14) 16 26 36 6 PAM-4 (08/04/14) 7 PAM-4 (08/01/14) 17 PAM-21 (08/04/14) 27 37 8 PAM-21 (08/01/14) 28 18 PAM-31 (08/04/14) 38 9 PAM-31 (08/01/14) 19 PAM-1 (08/01/14)DUP 29 39 10 OAM 1 (08/04/14) 20 30 40 PAM-1D (08/01/14)DUP Date appended to IDrodiffermiate between samples Notes:

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Method: Inorganics (EPA Method See Cover)										
Validation Area	Yes	No	NA	· Findings/Comments						
I. Technical holding times										
All technical holding times were met.	/									
Cooler temperature criteria was met.	/									
II. Calibration										
Were all instruments calibrated daily, each set-up time?	-									
Were the proper number of standards used?										
Were all initial calibration correlation coefficients > 0.995?										
Were all initial and continuing calibration verification %Rs within the 99-110% QC limits?	/									
Were titrant checks performed as required? (Level IV only)	ļ		\langle							
Were balance checks performed as required? (Level IV only)			/							
III. Blanks										
Was a method blank associated with every sample in this SDG?	\leq									
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		/								
IV. Matrix spike/Matrix spike duplicates and Duplicates										
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	1			Orponly						
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.			/							
Were the MS/MSD or duplicate relative percent differences (RPD) \leq 20% for weters and \leq 35% for soil samples? A control limit of \leq CRDL(\leq 2X CRDL for soil) was used for samples that were \leq 5X the CRDL, including when only one of the duplicate sample values were \leq 5X the CRDL.	/									
V. Laboratory control samples										
Was an LCS anaylzed for this SDG?	/									
Was an LCS analyzed per extraction batch?	1									
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% (85-115% for Method 300.0) QC limits?	1									
VI. Regional Quality Assurance and Quality Control	.									
Were performance evaluation (PE) samples performed?			/							
Were the performance evaluation (PE) samples within the acceptance limits?										



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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.		./								

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LDC#<u>32402A6</u>

VALIDATION FINDINGS WORKSHEET Field Duplicates

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

Inorganics: Method_See Cover_

	Concentra		Qualifiers	
Analyte	3	RPD (≤20)		
Hexavalent Chromium	0.0844	0.0861	2	

	Concentra		Qualifiers			
Analyte	12	12 13				
Hexavalent Chromium	0.0351	0.0300	16			

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LDC #: 3240240

Validation Findings Worksheet Initial and Continuing Calibration Calculation Verification

Page: \ Reviewer: C 2nd Reviewer: On

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

The correlation coefficient (r) for the calibration of $\underline{C^{\star b}}$ was recalculated.Calibration date: $\underline{DS} | \underline{Ob} | \underline{V} |$

Where,

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

%R = Found X 100_

True

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

					Recalculated	Reported	Acceptable
Type of analysis	Analyte	Standard	Conc. (ng/ml)	Area	r or r ²	r or r ²	(Y/N)
Initial calibration		s1	0.50	0.0000209			
		s2	0.10	0.0000437	0.99998	0.99998	
	طد م	s3	0.20	0.0000874			
	Cr	s4	0.50	0.0002041			Ч
		s5	1.00	0.0004104			
		s6	2.00	0.0008175			
ICU 10:56	0 xb	Found	True				
Calibration verification	Cr	0.5047 milmi	0.500mg/ml		100.9%P	100.9%R	
CW 14:20	44						
Calibration verification		0.531 nom	0.500 ng/m		106.2%	106.2%E	Ψ
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 #: 37402Ab

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

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

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

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

Found =

Sample ID	Type of Analysis	Flement	Found / S	True / D (units)	Recalculated	Reported	Acceptable (Y/N)
LUS	Laboratory control sample	Crtb	1.1056 ng/ml	1.00 nogml	111% P	11122P	<u>ر اسم</u>
N	Matrix spike sample		(SSR-SR)				
Duq	Duplicate sample	Crtb	0.0844 ng/m3	0.0844 vg/m3	OBRRD	0.0556280	Y*

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

LDÇ	#:	324	62A.6

VALIDATION FINDINGS WORKSHEET

Sam	ole C	alculatio	n Verification



METHOD: Inorganics, Method See Cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A". Have results been reported and calculated correctly? Y\N_N/A Are results within the calibrated range of the instruments? <u>Y N N/A</u> Y/N_N/A Are all detection limits below the CRQL? reported with a positive detect were Calculated Reported Concentration Acceptable Concentration # Sample ID Analyte (vy/m3) (nalm3) (Y/N) 1-+6 5 0.0299 0.0299 2 0.0326 0.0320 3 0.0844 0.0844 4 0.0861 0.086 2 0.0595 2.0555 6 0.035 0.0368 1 0.122 0.121 8 04 QU RA 9 JUD 0-0145 0.0145 10 0.0214 11 0.0213 12 0.0351 0-0351 13 0.0300 0.0300 0.0374 0.0313 14 0.0251 12 0.0252 16 1.0275 0.0275 20 17 ND 18 NO 20

Note:

NERC		CERTIFIC	ATE OF A	NALYSIS	5	
Environmental Res	sources Management, Inc	c		FILE #: 3926	6.00	
75 Valley Stream F	Parkway, Suite 400			REPORTED:	08/08/14 12:5	7
Malvern, PA 1935	5			SUBMITTED:	08/05/14	
ATTN: Mr. Jeff B	ATTN: Mr. Jeff Boggs AQS SITE CODE:					
PHONE: (443) 8	03-8495 FAX: (410) 266-8912		SITE CODE:	н	oneywell Hex Chrome Study
Description:	OAM 1	Lab ID:	4080515-01			Sampled: 08/01/14 16:36
Matrix:	Air	Sample V	/olume: 21.3	31 m³		Received: 08/05/14 10:51
Comments:	Start Time 7/31/14 16:55					Analysis Date: 08/06/14 14:00
		H	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	0.0299		0.0036	

AUG 1 1 2014

Initials: CR

Eastern Research Group

Environmental Resources Management, Inc				FILE #:	FILE #: 3926.00			
75 Valley Stream F	^D arkway, Suite 400			REPORTE	D: 08/08/14 12:5	7		
Malvern, PA 19355				SUBMITTE	SUBMITTED: 08/05/14			
ATTN: Mr. Jeff B	oggs			AQS SITE	CODE:			
PHONE: (443) 8	03-8495 FAX: (4	410) 266-8912		SITE CODI	E: ⊦	Ioneywell Hex Chrome Study		
Description:	OAM 2	Lab	ID: 4080515-02	2		Sampled: 08/01/14 17:02		
Matrix:	Air	Sam	ple Volume: 2	21.08 m³		Received: 08/05/14 10:51		
Comments:	Start Time 7/31/14 17:	:38				Analysis Date: 08/06/14 14:10		
			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	0.0326		0.0036			

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Initials: CR

Eastern Research Group

NERG

Environmental Res	sources Management,	Inc		FILE #:	3926.00		
75 Valley Stream F	Parkway, Suite 400			REPORTE	D: 08/08/14 12:5	7	
Malvern, PA 19355				SUBMITTE	D: 08/05/14		
ATTN: Mr. Jeff Boggs AQS SITE CODE:							
PHONE: (443) 8	03-8495 FAX: (4	10) 266-8912		SITE CODE	E: H	oneywell Hex Chrome Study	
Description:	PAM-1	Lab IC	4080515-03			Sampled: 08/01/14 19:07	
Matrix:	Air	Sampl	e Volume: 21	.33 m³		Received: 08/05/14 10:51	
Comments:	Col 1 Start Time 7/31/1	4 19:24				Analysis Date: 08/06/14 12:40	
			Hexavalent Ch	romium			
	<u>Results</u> <u>MDL</u>						
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>		
Hexavalent Chromium		1854-02-99	0.0844		0.0036		

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Initials: CR

Eastern Research Group

NERG

NERC		CERTIFIC	CATE OF	- ANALYSI	5	
Environmental Re	sources Management, I	nc		FILE #: 392	6.00	
75 Valley Stream	Parkway, Suite 400			REPORTED:	08/08/14 12:	57
Malvern, PA 19355 SUBMITTED: 08/05/14						
ATTN: Mr. Jeff Boggs AQS SITE CODE:						
PHONE: (443) 8	803-8495 FAX: (4 ⁻	10) 266-8912		SITE CODE:	ł	Honeywell Hex Chrome Study
Description:	PAM-1D	Lab ID:	4080515-0)4		Sampled: 08/01/14 19:12
Matrix:	Air	Sample	Volume:	21.44 m ³		Received: 08/05/14 10:51
Comments:	Col 2 Start Time 7/31/14	19:23				Analysis Date: 08/06/14 13:00
			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	0.0861		0.0036	

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Initials: CR

Eastern Research Group

Environmental Res	sources Management, Ind	2		FILE #: 392	6.00	
75 Valley Stream F	Parkway, Suite 400			REPORTED:	08/08/14 12:5	7
Malvern, PA 19355				SUBMITTED: 08/05/14		
ATTN: Mr. Jeff B	oggs			AQS SITE CO	DE:	
PHONE: (443) 8	03-8495 FAX: (410) 266-8912		SITE CODE:	Н	oneywell Hex Chrome Study
Description:	PAM-2	Lab ID:	4080515-05			Sampled: 08/01/14 18:38
Matrix:	Air	Sample	Volume: 21.1	4 m³		Received: 08/05/14 10:51
Comments:	Start Time 7/31/14 19:08					Analysis Date: 08/06/14 14:40
			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	0.0595		0.0036	

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Initials: CR

Eastern Research Group

NERG

Environmental Re	sources Managemen	it, Inc		FILE	#: 392	26.00	
75 Valley Stream I	Parkway, Suite 400			REP	ORTED:	08/08/14 12:5	7
Malvern, PA 19355				SUB	SUBMITTED: 08/05/14		
ATTN: Mr. Jeff B	oggs			AQS	SITE CO	DE:	
PHONE: (443) 8	03-8495 FAX:	(410) 266-8912		SITE	CODE:	н	oneywell Hex Chrome Study
Description:	PAM-3		Lab ID: 408051	5-06			Sampled: 08/01/14 18:17
Matrix:	Air		Sample Volume:	21.16	m³		Received: 08/05/14 10:51
Comments:	Start Time 7/31/14 1	8:46					Analysis Date: 08/06/14 14:50
			Hexavale	nt Chromiu	m		
			<u>Results</u>			MDL	
<u>Analyte</u>		CAS Numbe	er ng/m³ Ai	r <u>F</u>	lag	<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99	0.0368			0.0036	

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Initials: CR

Eastern Research Group

NERG

Environmental Res	sources Management, Ind	c		FILE #: 39	926.00		
75 Valley Stream F	Parkway, Suite 400			REPORTED	: 08/08/14 12:5	7	
Malvern, PA 19355				SUBMITTED): 08/05/14		
ATTN: Mr. Jeff B	oggs			AQS SITE CODE:			
PHONE: (443) 8	03-8495 FAX: (410) 266-8912		SITE CODE:	: Н	oneywell Hex Chrome Study	
Description:	PAM-4	Lab ID:	4080515-07			Sampled: 08/01/14 17:42	
Matrix:	Air	Sample \	/olume: 20.9	98 m³		Received: 08/05/14 10:51	
Comments:	Start Time 7/31/14 18:23	<u></u>				Analysis Date: 08/06/14 14:59	
			Hexavalent Chr	omium			
			<u>Results</u>		MDL		
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>		
Hexavalent Chromium		1854-02-99	0.122		0.0036		

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Initials: CR

Eastern Research Group

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Environmental Re	esources Managei	nent, Inc		FILE #:	3926.00	
75 Valley Stream	Parkway, Suite 40	0		REPORT	ED: 08/08/14 12	:57
Malvern, PA 19355				SUBMIT	TED: 08/05/14	
ATTN: Mr. Jeff E	Boggs			AQS SIT	E CODE:	
PHONE: (443)	803-8495 FAX	(410) 266-8912		SITE CO	DE:	Honeywell Hex Chrome Study
Description:	PAM-21		Lab ID: 408051	5-08		Sampled: 08/01/14 00:00
Matrix:	Air		Sample Volume:	21.14 m ³	•	Received: 08/05/14 10:51
Comments:						Analysis Date: 08/06/14 15:09
			Hexavaler	nt Chromium		
<u>Results</u> <u>MDL</u>						
<u>Analyte</u>		CAS Number	<u>er ng/m³ Ai</u>	<u>r Flag</u>	<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99	ND	U	0.0036	

AUG 1 1 2014

Initials: CR

Eastern Research Group

NERG

Environmental Re	esources Manage	ment, Inc		FILE #:	3926.00	
75 Valley Stream	Parkway, Suite 4	00		REPORTI	ED: 08/08/14 12:	57
Malvern, PA 1935	55			SUBMITT	ED: 08/05/14	
ATTN: Mr. Jeff E	Boggs			AQS SITE	CODE:	
PHONE: (443)	803-8495 FA	X: (410) 266-8912		SITE COL	DE:	Honeywell Hex Chrome Study
Description:	PAM-31		Lab ID: 4080515-0)9		Sampled: 08/01/14 00:00
Matrix:	Air		Sample Volume:	21.16 m ³		Received: 08/05/14 10:51
Comments:	. <u></u>					Analysis Date: 08/06/14 15:19
			Hexavalent	Chromium		
			<u>Results</u>		MDL	
Analyte		CAS Number	<u>er ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02- 9 9	ND	U	0.0036	

AUG 1 1 2014

Initials: CR

Eastern Research Group

NERG

NERC	Ĵ	CERTIFIC	ATE OF	ANALYSIS	6	
Environmental Res	sources Management, In-	c		FILE #: 392	6.00	
75 Valley Stream F	^o arkway, Suite 400			REPORTED:	08/08/14 12:	57
Malvern, PA 19355	5			SUBMITTED:	08/05/14	
ATTN: Mr. Jeff B	oggs			AQS SITE COL	DE:	
PHONE: (443) 8	03-8495 FAX: (410) 266-8912	_	SITE CODE:	I	Honeywell Hex Chrome Study
Description:	OAM 1	Lab ID:	4080515-10			Sampled: 08/04/14 16:28
Matrix:	Air	Sample V	/olume: 21.	32 m³		Received: 08/05/14 10:51
Comments:	Start Time 8/3/14 16:46					Analysis Date: 08/06/14 15:29
		H	lexavalent Ch	romium		
			<u>Results</u>		<u>MDL</u>	
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99	0.0145		0.0036	

AUG 1 1 2014

Initials: CR

Eastern Research Group

Environmental Res	sources Management,	Inc		FILE #: 392	26.00	
75 Valley Stream F	^D arkway, Suite 400			REPORTED:	08/08/14 12:5	7
Malvern, PA 1935	5			SUBMITTED:	08/05/14	
ATTN: Mr. Jeff B	oggs			AQS SITE CO	DE:	
PHONE: (443) 8	03-8495 FAX: (4	10) 266-8912		SITE CODE:	Н	oneywell Hex Chrome Study
Description:	OAM 2	Lab IC	6: 4080515-11			Sampled: 08/04/14 16:41
Matrix:	Air	Sampl	e Volume: 20.9)4 m³		Received: 08/05/14 10:51
Comments:	Start Time 8/3/14 17:25					Analysis Date: 08/06/14 15:39
			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	0.0213		0.0036	

AUG 1 1 2014

Initials: CR

Eastern Research Group

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Environmental Res	sources Management, In	c		FILE #: 392	6.00	
75 Valley Stream I	Parkway, Suite 400			REPORTED:	08/08/14 12:5	7
Malvern, PA 1935	5			SUBMITTED:	08/05/14	
ATTN: Mr. Jeff B	oggs			AQS SITE CO	DE:	
PHONE: (443) 8	03-8495 FAX: (410)) 266-8912		SITE CODE:	Н	oneywell Hex Chrome Study
Description:	PAM-1	Lab ID:	4080515-12			Sampled: 08/04/14 18:13
Matrix:	Air	Sample V	/olume: 20.7	′ m³		Received: 08/05/14 10:51
Comments:	Col 1 Start Time 8/3/14 1	9:13				Analysis Date: 08/06/14 13:19
		H	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	0.0351		0.0036	

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Initials: CR

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Environmental Res	sources Management, In	с		FILE #: 39	026.00	
75 Valley Stream F	Parkway, Suite 400			REPORTED:	08/08/14 12:	57
Malvern, PA 19355	5			SUBMITTED:	: 08/05/14	
ATTN: Mr. Jeff Bo	oggs			AQS SITE CO	ODE:	
PHONE: (443) 8	03-8495 FAX: (410)) 266-8912		SITE CODE:	ŀ	Ioneywell Hex Chrome Study
Description:	PAM-1D	Lab ID:	4080515-13			Sampled: 08/04/14 18:16
Matrix:	Air	Sample	Volume: 20.7	′ m³		Received: 08/05/14 10:51
Comments:	Col 2 Start Time 8/3/14 1	9:16				Analysis Date: 08/06/14 13:39
			Hexavalent Chro	omium		
			<u>Results</u>		MDL	
<u>Analyte</u>		<u>CAS Number</u>	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99	0.0300		0.0036	

AUG 1 1 2014

Initials: CR

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Environmental Res	sources Management, I	nc		FILE #: 392	6.00	
75 Valley Stream I	Parkway, Suite 400			REPORTED:	08/08/14 12:57	
Malvern, PA 1935	5			SUBMITTED:	08/05/14	
ATTN: Mr. Jeff B	oggs			AQS SITE COI	DE:	
PHONE: (443) 8	03-8495 FAX: (41	10) 266-8912		SITE CODE:	Hor	neywell Hex Chrome Study
Description:	PAM-2	Lab ID:	4080515-14			Sampled: 08/04/14 17:44
Matrix:	Air	Sample	Volume: 20.7	1 m³		Received: 08/05/14 10:51
Comments:	Start Time 8/3/14 18:43				An	alysis Date: 08/06/14 15:49
			Hexavalent Chro	omium		
			Results		MDL	
Analyte		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99	0.0373		0.0036	

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Initials: CR

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Environmental Res	sources Management, In	с				FILE #:	3926.	00		
75 Valley Stream I	^D arkway, Suite 400					REPORTE	ED: (08/08/14 12:5	7	
Malvern, PA 1935	5					SUBMITT	ED:	08/05/14		
ATTN: Mr. Jeff B	oggs					AQS SITE	E CODE	: :		
PHONE: (443) 8	03-8495 FAX: (410) 266-8912				SITE COD	DE:	н	oneywell Hex Chrome Study	
Description:	PAM-3	L	Lab ID:	4080515	-15				Sampled: 08/04/14 17:23	
Matrix:	Air	9	Sample V	olume:	20.7	m³			Received: 08/05/14 10:51	
Comments:	Start Time 8/3/14 18:23				-				Analysis Date: 08/06/14 15:59	
			н	lexavalent	: Chro	mium				
				<u>Results</u>				MDL		
<u>Analyte</u>		CAS Number	:	<u>ng/m³ Air</u>		<u>Flag</u>		<u>nq/m³ Air</u>		
Hexavalent Chromium		1854-02-99		0.0251				0.0036		

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Initials: CR

Eastern Research Group

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Environmental Rea	sources Management, In	с		FILE #: 3	3926.00	
75 Valley Stream F	Parkway, Suite 400			REPORTED	D: 08/08/14 12:	57
Malvern, PA 1935	5			SUBMITTE	D: 08/05/14	
ATTN: Mr. Jeff B	oggs			AQS SITE (CODE:	
PHONE: (443) 8	03-8495 FAX: (410)) 266-8912		SITE CODE	:	Honeywell Hex Chrome Study
Description:	PAM-4	Lab ID:	4080515-16			Sampled: 08/04/14 17:10
Matrix:	Air	Sample	Volume: 20.8	2 m³		Received: 08/05/14 10:51
Comments:	Start Time 8/3/14 18:02					Analysis Date: 08/06/14 16:09
			Hexavalent Chro	omium		
and a second			<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	0.0275		0.0036	

AUG 1 1 2014

Initials: CR

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Environmental Re	esources Manag	gement, Inc		FILE #:	3926.00	
75 Valley Stream	Parkway, Suite	400		REPORTE	ED: 08/08/14 12:	57
Malvern, PA 1935	5			SUBMITT	ED: 08/05/14	
ATTN: Mr. Jeff E	Boggs			AQS SITE	CODE:	
PHONE: (443)	803-8495 F	FAX: (410) 266-8912		SITE COD	DE: I	Honeywell Hex Chrome Study
Description:	PAM-21		Lab ID: 4080515-1	17		Sampled: 08/04/14 00:00
Matrix:	Air		Sample Volume:	20.71 m ³		Received: 08/05/14 10:51
Comments:						Analysis Date: 08/06/14 16:39
			Hexavalent	Chromium		
			<u>Results</u>		MDL	
<u>Analyte</u>		CAS Numb	<u>er ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99	ND	U	0.0036	

AUG 1 1 2014

Initials: CR

Eastern Research Group

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Environmental Re	sources Manageme	ent, Inc			FILE #: 392	26.00	
75 Valley Stream	Parkway, Suite 400				REPORTED:	08/08/14 12:	57
Malvern, PA 1935	5				SUBMITTED:	08/05/14	
ATTN: Mr. Jeff B	loggs				AQS SITE CO	DDE:	
PHONE: (443) 8	303-8495 FAX:	(410) 266-8912			SITE CODE:	ł	Honeywell Hex Chrome Study
Description:	PAM-31		Lab ID: 40805	15-18			Sampled: 08/04/14 00:00
Matrix:	Air		Sample Volume:	20.7	m³		Received: 08/05/14 10:51
Comments:							Analysis Date: 08/06/14 16:48
			Hexavale	nt Chro	mium		
			<u>Results</u>			MDL	
<u>Analyte</u>		CAS Numbe	er <u>ng/m³ A</u>	ir	Flag	<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99	ND		U	0.0036	

AUG 1 1 2014

Initials: CR

Eastern Research Group

NERG



August 13, 2014

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

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

Dear Mr. Boggs,

Enclosed is the final validation report for the fraction listed below. This SDG was received on August 11, 2014. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #32410:

<u>SDG</u>

Fraction

4080619 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

NAMES OF THE OWNER	69 pages-SF	3 DAY	TAT	Attachment 1															Stando-																				
	Level IV	<u> </u>	DC #32	3 #32410 (ERM - Morrisville, NC / Harbor Point, MD, Hexavalent Chromi													Ilent Chromium Monitoring)																						
.DC	SDG#	DATE REC'D	(3) DATE DUE	Cr((D7)	(VI) 614)																																		
Matrix:	Air/Water/Soil		0525 5 2	Α	s	w	s	w	s	w	s	W	S	w	S	w	s	w	S	w	s	w	s	w	s	w	s	w	s	w	s	w	s	W	S	w	s	w	s
A	4080619	08/11/14	08/14/14	9	0		[_										<u> </u>														L
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otal	A/CR	<u> </u>	l	9	0	10	0	U	U	U	υ	U	υ	U	U	U	U	0	U	υ	υ	U	0	0	0	0	U	U	0	U	U	0	0	U	U	U	U	0	9

LDC Report# 32410A6

Laboratory Data Consultants, Inc. Data Validation Report

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

Collection Date: August 5, 2014

LDC Report Date: August 11, 2014

Matrix:

Parameters: Hexavalent Chromium

Air

Validation Level: EPA Level IV

Laboratory: Eastern Research Group

Sample Delivery Group (SDG): 4080619

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 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	0.0445	0.0441	1 (≤20)	-	-

Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Data Qualification Summary - SDG 4080619

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 4080619

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 4080619

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

LDC #:	32410A6	VALIDATION COMPLETENESS WORKSHEET
SDG #: _	4080619	Level IV
Laborato	ry: Eastern	Research Group



METHOD: Hexavalent Chromium (ASTM D7614)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 08/05/14
11	Initial calibration	A	
111.	Calibration verification	A	
IV	Blanks	Ř	
v	Matrix Spike/Matrix Spike Duplicates	2	Not Required
VI.	Duplicates	A	D-P
VII.	Laboratory control samples	A	LUSID
VIII.	Sample result verification	A	
IX.	Overall assessment of data	A	
Х.	Field duplicates	SW	(3,4) = FD
XI	Field blanks	ND	FB=8 TB=9

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

FB = Field blank

D = Duplicate

TB = Trip blank

EB = Equipment blank

Validated Samples: Airs

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

Notes:

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Findings/Comments
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VALIDATION FINDINGS CHECKLIST



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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?	1			
VIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.				
IX. Field duplicates				
Field duplicate pairs were identified in this SDG.	1			
Target analytes were detected in the field duplicates.	(
X. Field blanks				
Field blanks were identified in this SDG.	/			
Target analytes were detected in the field blanks.		. /		

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LDC#<u>32410A6</u>

VALIDATION FINDINGS WORKSHEET Field Duplicates

Page:1_of____ Reviewer:______ 2nd Reviewer:______

Inorganics: Method See Cover

	Concentral	tion (ng/m3)			
Analyte	3	4	RPD (≤20)	Qual.	
Hexavalent Chromium	0.0445	0.0441	1		

\\LDCFILESERVER\Validation\FIELD DUPLICATES\FD_inorganic\32410A6.wpd

LDC #: 32410 AU

Validation Findings Worksheet Initial and Continuing Calibration Calculation Verification

Page: Reviewe 2nd Reviewer:

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

The correlation coefficient (r) for the calibration of 4 was recalculated. Calibration date: 8 |1|/4

Where,

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

%R = Found X 100

True

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

				-	Recalculated	Reported	Acceptable
Type of analysis	Analyte	Standard	Conc. (ng/ml)	Area	r or r ²	r or r ²	(Y/N)
Initial calibration		s1	0.50	0.0000147			
		s2	0.10	0.0000379	0.99989	0.99989	
		s3	0.20	0.0000789			
	Lit b	s4	0.50	0.0001933			1
		s5	1.00	0.0003885			Ĵ
		s6	2.00	0.0008013			
IW 10:20	طاد م	Found	the		_		
Calibration verification		0.5182	0.500 reglm		103.6%E	103.6%F	
CW 11:20	0					2/ 5	
Calibration verification	<u> </u>	0.5519ng/m	O.SOOnafml		106.4%F	106.464	Y
Calibration verification							· · · · · · · · · · · · · · · · · · ·

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

LDC #: 32410A6

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

					Recalculated	Reported	
Sample ID	Type of Analysis	Element	Found / S (units)	True / D (units)	%R / RPD	%R / RPD	Acceptable (Y/N)
LLS	Laboratory control sample						
10:-20		Cr^{+b}	1-1099.ng/m)	1-00 ng/m]	111952	111%E	5
	Matrix spike sample		(SSR-SR)				
N							
Dup.	Duplicate sample						()
11:58		Crtb	0-04832ng/m ³	0.04445vadm ³	8.34%80	8.26%87	Z

Comments: _____

LDC	#: <u>32410</u> 200	
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VALIDATION FINDINGS WORKSHEET

Sample Calculation Verification

Page:_	<u></u>
Reviewer:	20
2nd reviewer:	C_

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?
- <u>Y N N/A</u> Are all detection limits below the CRQL?

Compound (analyte) results for $C_{++6}(-)$ reported with a positive detect were recalculated and verified using the following equation: Concentration = $\left[(area - C_0)/C_{-}\right]$ $V_{\pm}=10m^{1}$ Recalculation: $\left[(0.0000316 - (-5.01\pm-06))/0.000412\right] = 0.09125$ area = 0.0000316 $C_{\pm}=-5.01\pm-06$ $C_{\pm}=-0.000412$ $M^{3}=21.85$ $C_{\pm}=0.000412$ $M^{3}=0.09125$ $O_{\pm}=0.0418$ Mali

#	Sample ID	Analyte	Reported Concentration (va)m ²)	Calculated Concentration (NS/M ³)	Acceptable (Y/N)
	١	Cr+b	0.0310	0.0310	Ч
	Z		0.0254	0.0254	Ĩ
	3		0.0445	0.0445	
	4		0.0441	0.0441	
	2		0.0332	0.0332	
	6		0.0317	0.0316	
	7		0.0418	0.0418	
	8		NO	NO	
	9		NO	ND	\downarrow
	· · · · · · · · · · · · · · · · · · ·				

Note:_

Environmental Rea	sources Management, In	с		FILE #: 39	26.00	
75 Valley Stream F	Parkway, Suite 400			REPORTED:	08/11/14 10:1	2
Malvern, PA 1935	5			SUBMITTED:	08/06/14	
ATTN: Mr. Jeff B	oggs			AQS SITE CO	DDE:	
PHONE: (443) 8	03-8495 FAX: (410)) 266-8912		SITE CODE:	H	ioneywell Hex Chrome Study
Description:	OAM 1	1	Lab ID: 4080619-01			Sampled: 08/05/14 16:32
Matrix:	Air	5	Sample Volume: 21.	.59 m³		Received: 08/06/14 11:29
Comments:	Start Time 8/4/14 16:33					Analysis Date: 08/07/14 12:28
			Hexavalent Ch	romium		
			<u>Results</u>		MDL	
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	Flag	<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99	0.0310		0.0036	

AUG 1 3 2014

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NERG

Environmental Res	sources Management, In	c		FILE #:	3926.00	
75 Valley Stream F	^D arkway, Suite 400			REPORTEI	D: 08/11/14 10:1	2
Malvern, PA 1935	5			SUBMITTE	D: 08/06/14	
ATTN: Mr. Jeff B	oggs			AQS SITE	CODE:	
PHONE: (443) 8	03-8495 FAX: (410)) 266-8912		SITE CODE	≣: ⊦	loneywell Hex Chrome Study
Description:	OAM 2	La	ab ID: 4080619-02			Sampled: 08/05/14 16:54
Matrix:	Air	Sa	ample Volume: 2	1.72 m³		Received: 08/06/14 11:29
Comments:	Start Time 8/4/14 16:46					Analysis Date: 08/07/14 12:38
			Hexavalent C	hromium		
			<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	0.0254		0.0036	

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Environmental Res	sources Managem	ent, Inc		F	ILE #:	3926.00		
75 Valley Stream F	Parkway, Suite 400				R	EPORTE	E D: 08/11/14 1	0:12
Malvern, PA 1935	5				s	UBMITT	ED: 08/06/14	1
ATTN: Mr. Jeff B	oggs				A	QS SITE	CODE:	
PHONE: (443) 8	03-8495 FAX:	(410) 266-8912			s		DE:	Honeywell Hex Chrome Study
Description:	PAM-1		Lab ID:	4080619-0)3			Sampled: 08/05/14 18:37
Matrix:	Air		Sample Volu	ume:	21.93	m³		Received: 08/06/14 11:29
Comments:	Col 1 Start Time 8/	4/14 18:15						Analysis Date: 08/07/14 11:48
			He	xavalent	Chrom	ium		
			<u>F</u>	Results			<u>MDL</u>	
<u>Analyte</u>		CAS Numbe	er no	g/m³ Air		Flag	<u>ng/m³ A</u>	r
Hexavalent Chromium		1854-02-99		0.0445			0.0036	

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Initials: CR

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Environmental Res	sources Management, In	c		FILE #: 3	3926.00	
75 Valley Stream F	^D arkway, Suite 400			REPORTED): 08/11/14 10:	12
Malvern, PA 1935	5			SUBMITTE	D: 08/06/14	
ATTN: Mr. Jeff B	oggs			AQS SITE O	CODE:	
PHONE: (443) 8	03-8495 FAX: (410)) 266-8912		SITE CODE	i: I	Honeywell Hex Chrome Study
Description:	PAM-1D	Lab ID:	4080619-04			Sampled: 08/05/14 18:43
Matrix:	Air	Sample	Volume: 21	96 m³		Received: 08/06/14 11:29
Comments:	Col 2 Start Time 8/4/14 1	8:19				Analysis Date: 08/07/14 12:08
			Hexavalent Ch	romium		
			<u>Results</u>		MDL	
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	Flag	<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99	0.0441		0.0036	

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Initials: CR

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Environmental Res	sources Management, In	с	FILE #: 3926.00								
75 Valley Stream F	Parkway, Suite 400		REPORTED: 08/11/14 10:12								
Malvern, PA 19355	5			SUBMITTED:	08/06/14						
ATTN: Mr. Jeff B	oggs			AQS SITE COL	DE:						
PHONE: (443) 8	03-8495 FAX: (410)) 266-8912		SITE CODE:	Но	neywell Hex Chrome Study					
Description:	PAM-2	Lab ID:	4080619-05			Sampled: 08/05/14 18:15					
Matrix:	Air	Sample	Volume: 21.9	9 m³		Received: 08/06/14 11:29					
Comments:	Start Time 8/4/14 17:50				Α	nalysis Date: 08/07/14 12:48					
			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	0.0332		0.0036						

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CERTIFICATE OF ANALYSIS NERG Environmental Resources Management, Inc FILE #: 3926.00 75 Valley Stream Parkway, Suite 400 REPORTED: 08/11/14 10:12 Malvern, PA 19355 SUBMITTED: 08/06/14 AQS SITE CODE: ATTN: Mr. Jeff Boggs PHONE: (443) 803-8495 FAX: (410) 266-8912 SITE CODE: Honeywell Hex Chrome Study Sampled: 08/05/14 17:54 **Description:** PAM-3 Lab ID: 4080619-06 Sample Volume: Matrix: 21.99 m³ Received: 08/06/14 11:29 Air Analysis Date: 08/07/14 12:58 **Comments:** Start Time 8/4/14 17:28 Hexavalent Chromium

	nexavalent Chromium												
		<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	0.0317		0.0036									

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Initials: CR

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Environmental Res	sources Management, In	c		FILE #:	3926.00	
75 Valley Stream F	Parkway, Suite 400			REPORTI	ED: 08/11/14 10	12
Malvern, PA 1935	5			SUBMITT	ED: 08/06/14	
ATTN: Mr. Jeff B	oggs			AQS SITE	E CODE:	
PHONE: (443) 8	03-8495 FAX: (410) 266-8912		SITE COL	DE:	Honeywell Hex Chrome Study
Description:	PAM-4	Lab II): 4080619-07	7		Sampled: 08/05/14 17:30
Matrix:	Air	Sampl	e Volume:	21.85 m³		Received: 08/06/14 11:29
Comments:	Start Time 8/4/14 17:14					Analysis Date: 08/07/14 13:08
			Hexavalent C	Chromium		
			<u>Results</u>		MDL	
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99	0.0418		0.0036	

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Initials: CR

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Environmental Re	esources Mar	nageme	nt, Inc			FILE #:	3926.00							
75 Valley Stream	Parkway, Su	ite 400				REPORTED: 08/11/14 10:12								
Malvern, PA 1935	55						SUBMITTI	ED: 08/06/14						
ATTN: Mr. Jeff E	Boggs						AQS SITE	CODE:						
PHONE: (443)	803-8495	FAX:	(410) 266-8912				SITE COD)E:	Honeywell Hex Chrome Study					
Description:	PAM-21			Lab ID:	4080619	-08			Sampled: 08/05/14 00:00					
Matrix:	Air			Sample Vo	olume:	21.99	m³		Received: 08/06/14 11:29					
Comments:									Analysis Date: 08/07/14 13:18					
				H	exavalent	t Chro	mium							
					<u>Results</u>			MDL						
<u>Analyte</u>			CAS Numbe	<u>er</u>	ng/m³ Air		<u>Flag</u>	<u>ng/m³ Air</u>						
Hexavalent Chromium			1854-02-99		ND		V	0.0036						

AUG 1 3 2014

Initials: CR

Eastern Research Group

Environmental Re	sources Manage	ment, Inc		FILE #: 3	FILE #: 3926.00								
75 Valley Stream	Parkway, Suite 40	00		REPORTED	REPORTED: 08/11/14 10:12								
Malvern, PA 1935	5			SUBMITTEI	D: 08/06/14								
ATTN: Mr. Jeff E	loggs			AQS SITE O	CODE:								
PHONE: (443) 8	303-8495 FAX	(: (410) 266-8912		SITE CODE	Honeywell Hex Chrome Stud	dy							
Description:	PAM-31		Lab ID: 4080619-09)	Sampled: 08/05/14 00	:00							
Matrix:	Air		Sample Volume:	21.99 m ³	Received: 08/06/14 11	:29							
Comments:					Analysis Date: 08/07/14 13	:48							
			Hexavalent C	Chromium									
			<u>Results</u>		MDL								
Analyte		CAS Numbe	<u>er ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>								
Hexavalent Chromium		1854-02-99	ND	U	0.0036								

AUG 1 3 2014

Initials: CR

Eastern Research Group

NERG



August 19, 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 August 15, 2014. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #32467:

SDG Fraction

4081223 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

	104 pages-SF	3 DAY		167	7 (F	:PA	/	Mo	rric	svil			1	Нат	Atta	r D	nent	1				val	lon		bro	mi	um	M	oni	tor	ino	Ň						
DC	SDG#	DATE REC'D	(3) DATE DUE	Cr (D7	(VI) (614)						,									, 1 13	- • •										my							
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
A	4081223	08/15/14	08/20/14	18	÷03																_																_	
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Laboratory Data Consultants, Inc. Data Validation Report

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

Collection Date: August 8 through August 11, 2014

Air

LDC Report Date: August 19, 2014

Matrix:

Parameters: Hexavalent Chromium

Validation Level: EPA Level IV

Laboratory: Eastern Research Group

Sample Delivery Group (SDG): 4081223

Sample Identification

OAM 1 (08/08/14) OAM 2 (08/08/14) PAM-1 (08/08/14) PAM-1D (08/08/14) PAM-2 (08/08/14) PAM-3 (08/08/14) PAM-4 (08/08/14) PAM-21 (08/08/14) PAM-31 (08/08/14) OAM 1 (08/11/14) OAM 2 (08/11/14) PAM-1 (08/11/14) PAM-1D (08/11/14) PAM-2 (08/11/14) PAM-3 (08/11/14) PAM-4 (08/11/14) PAM-21 (08/11/14) PAM-31 (08/11/14) PAM-1 (08/08/14)DUP PAM-1D (08/08/14)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 initial, continuing and preparation blanks.

Samples PAM-31 (08/08/14) and PAM-31 (08/11/14) were identified as trip blanks. No hexavalent chromium was found.

Samples PAM-21 (08/08/14) and PAM-21 (08/11/14) were identified as field blanks. No hexavalent chromium was found.

V. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) 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 (08/08/14) and PAM-1D (08/08/14) and samples PAM-1 (08/11/14) and PAM-1D (08/11/14) were identified as field duplicates. No hexavalent chromium was detected in any of the samples with the following exceptions:

	Concentrat	tion (ng/m³)				
Analyte	PAM-1 (08/08/14)	PAM-1D (08/08/14)	RPD (Limits)	Flags	A or P	
Hexavalent chromium	0.0143	0.0140	2 (≤20)	-	-	

	Concentrat	tion (ng/m³)			
Analyte	PAM-1 (08/11/14)	PAM-1D (08/11/14)	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.0269	0.0232	15 (≤20)	-	-

Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Data Qualification Summary - SDG 4081223

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 4081223

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 4081223

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

LDC #:	32467A6	VALIDATION COMPLETENESS WORKSHEET	
SDG #:	4081223	Level IV	
Laborato	ry: <u>Eastern I</u>	Research Group	

Date: 🖉	18/14
Page: <u>\</u>	of <u>`</u>
Reviewer:	10
2nd Reviewer:	<u>n</u>

METHOD: Hexavalent Chromium (ASTM D7614)

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

	Validation Area		Comments
Ι.	Technical holding times	A	Sampling dates: 84210 2 8/8-8/11/14
11	Initial calibration	A	
111.	Calibration verification	A	
١V	Blanks	A	
V	Matrix Spike/Matrix Spike Duplicates	N	NR
VI.	Duplicates	Å	Deo.
VII.	Laboratory control samples	A	LUST
VIII.	Sample result verification	A	
IX.	Overall assessment of data	A	
Х.	Field duplicates	Sw	FD=(3,4) (12,13)
XI	Field blanks	ND	FB=8,17 TB=9,18

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

Validated Samples:

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

Notes: Dates a poended to differentiate between samples

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Method: Inorganics (EPA Method See (wer)				•
Validation Area .	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	/			
Cooler temperature criteria was met.	/			
II. Calibration				
Were all instruments calibrated daily, each set-up time?	\langle			
Were the proper number of standards used?				
Were all initial calibration correlation coefficients > 0.995?	\leq			
Were all initial and continuing calibration verification %Rs within the 90-110% QC [limits?	/			
Were titrant checks performed as required? (Level IV only)		 		
Were balance checks performed as required? (Level IV only)				
III. Blanks			, ,	
Was a method blank associated with every sample in this SDG?	\leq			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		/		
IV. Matrix spike/Matrix spike duplicates and Duplicates		r		·
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?	\sim			
Was an LCS analyzed per extraction batch?	1			
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?				

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

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LDC#<u>32467A6</u>

VALIDATION FINDINGS WORKSHEET Field Duplicates

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

Inorganics: Method See Cover

	Concentrat	tion (ng/m3)		Qual.
Analyte	3	4	RPD (≤20)	
Hexavalent Chromium	0.0143	0.0140	2	

	Concentra	tion (ng/m3)		Qual.
Analyte	12	13	RPD (≤20)	
Hexavalent Chromium	0.0269	0.0232	15	

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LDC #: 3246740

Validation Findings Worksheet Initial and Continuing Calibration Calculation Verification

Page:	_of_\
Reviewer:_	30
2nd Review	er:

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

The correlation coefficient (r) for the calibration of G^{++} was recalculated. Calibration date: 8/3/14

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. (mg/L)	Area	r or r ²	r or r ²	(Y/N)
Initial calibration		s1	0.1	0.0000163			
		s2	0.1	0.0000392	0.99999	0.99999	
		s3	0.2	0.0000777			<i>v</i>
	Crib	s4	0.5	0.0001967			C .
		s5	1	0.0003938			1
		s6	2	0.0007851			
IN 10:33	n +6	Found	True				
Calibration verification		0.5073 mg/ml	0.5 ng/ml		101.5%P	101.4%e	
Cev 11:33	مد م						
Calibration verification	LY	0.5515Ng/m	10.5 ng/m		110.3%P	(10.3%P	Y
Calibration verification							

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

LDC #: 32467A6

VALIDATION FINDINGS WORKSHEET Level IV Recalculation Worksheet

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

					Recalculated	Reported	
Sample ID	Type of Analysis	Element	Found / S (units)	True / D (units)	%R / RPD	%R / RPD	Acceptable (Y/N)
LLS	Laboratory control sample						
11:03		Cr+6	1.0016 ng/ml	1.00 mg/ml	ho%E	110%2	Ś
	Matrix spike sample		(SSR-SR)				
\sim							
Dup	Duplicate sample	Crab	0.0167	QOINS	15 50/200	14,9% RR7	5
12-02		_			13.5/24.4		

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.

Page: _of_ Reviewer: <u>5</u> 0 2nd reviewer: LDC #: 32467746 VALIDATION FINDINGS WORKSHEET Sample Calculation Verification METHOD: Inorganics, Method See Cover Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A". Y N. 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? Compound (analyte) results for (16) Cr+6 recalculated and verified using the following equation: reported with a positive detect were $\frac{\left[(0.000079) - (-1.03E-00)\right]}{0.0003935} = 0.0763 \text{ ng/ml}}$ $\frac{\left(0.0763 \text{ ng/ml}\right)(10001)}{272.15} \approx 0.0345 \text{ ng/m}^{3}$ Concentration = [lawer - (co)]/(1 Recalculation: Aven= 0.000029 $C_0 = -1.03 E-06$ $n_3 lm^3 = \frac{(n_3/m_1)(J_1)}{m_3}$ $C_1 = 0.0003935$ $V_1 = 10 m_1$ $m_3^3 = 27.1$ m3=27.15 Reported Calculated Concentration Concentration Acceptable (mg/m3) (ng/m²) # Sample ID Analyte (Y/N) $C_{\star}^{\star 6}$ ١ А 0.0089 0.0089 2 0.0107 0.0107 3 0.0143 0.0143 L 0.0141 0.040 0.0088 0.0088 0.0204 Q0203 $\overline{}$ 1.0178 0.0178 G DU QU S 04 ND $(\hat{\mathbf{0}})$ 0.0135 0.0139 11 0.095 0.0195 12 1.0269 0.0269 3 0.0232 0.0232 14 0.0216 0.0216 15 0.0172 0.0172 16 0.0344 0.0345 5 ND ND ND 18 ND Note:

Environmental Res	sources Management, In	C			FILE #:	3926.00		
75 Valley Stream F	Parkway, Suite 400				REPORTE	ED: 08/15/14	11:41	
Malvern, PA 19355	5				SUBMITT	ED: 08/12/1	4	
ATTN: Mr. Jeff Bo PHONE: (443) 8	oggs 03-8495 FAX: (410) 266-8912			AQS SITE	: DE:	Honeywell Hex Chrome Study	
Description:	OAM 1	Lab	ID: 4081223-	-01			Sampled: 08/08/14 16:15	
Matrix:	Air	Sam	ple Volume:	21.46	m³		Received: 08/12/14 11:02	
Comments:	Start Time 8/7/14 16:25						Analysis Date: 08/13/14 14:02	
Hexavalent Chromium								
			<u>Results</u>			MDL		
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>		<u>Flaq</u>	<u>ng/m³ A</u>	ir	
Hexavalent Chromium		1854-02-99	0.0089			0.0036		

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Environmental Re	sources Management, Ir	nc		FILE #: 3926	5.00			
75 Valley Stream	Parkway, Suite 400			REPORTED:	08/15/14 11:4	1		
Malvern, PA 1935	5			SUBMITTED:	08/12/14			
ATTN: Mr. Jeff B PHONE: (443) 8	oggs 303-8495 FAX: (41	0) 266-8912		AQS SITE CODE: SITE CODE:	н	oneywell Hex Chrome Study		
Description:	OAM 2	Lab ID:	4081223-02			Sampled: 08/08/14 16:22		
Matrix:	Air	Sample \	Volume: 21.	37 m³		Received: 08/12/14 11:02		
Comments:	Start Time 8/7/14 16:38					Analysis Date: 08/13/14 14:12		
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	1	1854-02-99	0.0107		0.0036			

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Environmental Resources Management, Inc				FILE #: 3926.00			
75 Valley Stream I	Parkway, Suite 400				REPORTE	ED: 08/15/14 11	41
Malvern, PA 1935	5				SUBMITT	ED: 08/12/14	
ATTN: Mr. Jeff B PHONE: (443) 8	oggs 03-8495 FAX: (410)) 266-8912			AQS SITE	E:	Honeywell Hex Chrome Study
Description:	PAM-1	Lab ID	: 4081223	-03			Sampled: 08/08/14 17:11
Matrix:	Air	Sample	e Volume:	21.19) m ³		Received: 08/12/14 11:02
Comments:	Col 1 Start Time 8/7/14 1	7:38					Analysis Date: 08/13/14 11:53
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	0.0143			0.0036	

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Environmental Res	sources Management, In	c		FILE #: 392	26.00	
75 Valley Stream F	Parkway, Suite 400			REPORTED:	08/15/14 11:41	I
Malvern, PA 1935	5			SUBMITTED:	08/12/14	
ATTN: Mr. Jeff Be PHONE: (443) 8	oggs 03-8495 FAX: (410)) 266-8912		AQS SITE CODE: SITE CODE:	Но	oneywell Hex Chrome Study
Description:	PAM-1D	Lab ID:	4081223-04			Sampled: 08/08/14 17:12
Matrix:	Air	Sample	Volume: 21.	17 m³		Received: 08/12/14 11:02
Comments:	Col 2 Start Time 8/7/14 1	7:41			A	nalysis Date: 08/13/14 12:12
			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	0.0140		0.0036	

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75 Valley Stream I	^o arkway, Suite 400			RE	PORTE	D: 08/15/14 11:4	1		
Malvern, PA 1935	5			SU	BMITTE	D: 08/12/14			
ATTN: Mr. Jeff B PHONE: (443) 8	oggs 03-8495 FAX: (410)) 266-8912		AC Si	AS SITE	E: ł	Ioneywell Hex Chrome Study		
Description:	PAM-2	Lab	b ID: 4081223-	05			Sampled: 08/08/14 17:01		
Matrix:	Air	Sar	mple Volume:	21.25	m³		Received: 08/12/14 11:02		
Comments:	Start Time 8/7/14 17:25						Analysis Date: 08/13/14 14:22		
			Hexavalent	Chromi	um				
			<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	0.0088			0.0036			

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75 Valley Stream F	^o arkway, Suite 400				REPORTE	ED: (08/15/14 11:4	1	
Malvern, PA 1935	5				SUBMITT	ED:	08/12/14		
ATTN: Mr. Jeff Br PHONE: (443) 8	oggs 03-8495 FAX: (410) 266-8912			AQS SITE	E DE:	H	oneywell Hex Chrome Study	
Description:	PAM-3	Lab ID:	4081223-0	06				Sampled: 08/08/14 16:54	
Matrix:	Air	Sample \	/olume:	21.27	m³			Received: 08/12/14 11:02	
Comments:	Start Time 8/7/14 17:16							Analysis Date: 08/13/14 14:32	
		I	Hexavalent	Chro	nium				
			<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- 9 9	0.0204				0.0036		

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NERC		CERTIFIC	CATE OF /	ANALYSIS	6		
Environmental Re	sources Management, In	c		FILE #: 3920	6.00		
75 Valley Stream I	Parkway, Suite 400		REPORTED: 08/15/14 11:41				
Malvern, PA 19355 SUBMITTED: 08/12/14							
ATTN: Mr. Jeff B PHONE: (443) 8	oggs 03-8495 FAX: (410	0) 266-8912		AQS SITE CODE: SITE CODE:	Ho	oneywell Hex Chrome Study	
Description:	PAM-4	Lab ID:	4081223-07			Sampled: 08/08/14 16:45	
Matrix:	Air	Sample	Volume: 21.	3 m³		Received: 08/12/14 11:02	
Comments:	Start Time 8/7/14 17:05				A	nalysis Date: 08/13/14 14:42	
			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	0.0178		0.0036		

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Environmental Resources Managen	nent, Inc	FILE #: 392	6.00		
75 Valley Stream Parkway, Suite 40	0		REPORTED:	08/15/14 11:41	
Malvern, PA 19355			SUBMITTED:	08/12/14	
ATTN: Mr. Jeff Boggs PHONE: (443) 803-8495 FAX	: (410) 266-8912		AQS SITE CODE: SITE CODE:	Hor	eywell Hex Chrome Study
Description: PAM-21	Lab ID:	4081223-08			Sampled: 08/08/14 00:00
Matrix: Air	Sample Ve	olume: 21.2	5 m³		Received: 08/12/14 11:02
Comments:				An	alysis Date: 08/13/14 14:52
	н	lexavalent Chro <u>Results</u>	mium	MDL	
<u>Analyte</u>	CAS Number	<u>ng/m³ Air</u>	<u>Flaq</u>	<u>ng/m³ Air</u>	
Hexavalent Chromium	1854-02-99	ND	U	0.0036	

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Environmental Re	Environmental Resources Management, Inc					FILE #:	3926	6.00		
75 Valley Stream	Parkway, Suite	e 400					REPORT	ED:	08/15/14 11:	41
Malvern, PA 1935	55						SUBMITT	ED:	08/12/14	
ATTN: Mr. Jeff E	Boggs 803-8495	EAY.	(410) 266-8912					E ne:		Honeywell Hey Chrome Study
			(+10) 200-0012				3112 001			
Description:	PAM-31			Lab ID:	4081223	3-09				Sampled: 08/08/14 00:00
Matrix:	Air			Sample V	/olume:	21.2	7 m³			Received: 08/12/14 11:02
Comments:										Analysis Date: 08/13/14 15:02
				I	Hexavaler	t Chro	mium			
					<u>Results</u>				MDL	
<u>Analyte</u>			CAS Numbe	<u>er</u>	<u>ng/m³ Ai</u>	5	<u>Flaq</u>		<u>ng/m³ Air</u>	
Hexavalent Chromium			1854-02-99		ND		U		0.0036	

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75 Valley Stream F	^p arkway, Suite 400					REPORTE	ED: 0	8/15/14 11:4	1	
Malvern, PA 1935	5					SUBMITT	ED:	08/12/14		
ATTN: Mr. Jeff Bo PHONE: (443) 8	oggs 03-8495 FAX: (410	266-8912				AQS SITE	E DE:	F	loneywell Hex Chrome Study	
Description:	OAM 1	La	ab ID:	4081223-	10				Sampled: 08/11/14 16:22	_
Matrix:	Air	Sa	ample Vo	olume:	21.7	m³			Received: 08/12/14 11:02	
Comments:	Start Time 8/10/14 16:15								Analysis Date: 08/13/14 15:12	_
			H	exavalent	Chro	mium				
				<u>Results</u>				<u>MDL</u>		
<u>Analyte</u>		CAS Number	-	ng/m³ Air		<u>Flag</u>	ļ	<u>ng/m³ Air</u>		
Hexavalent Chromium		1854-02-99		0.0139				0.0036		

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Environmental Re	sources Management, In	с		FILE #: 3920	3.00			
75 Valley Stream I	Parkway, Suite 400		REPORTED:	REPORTED: 08/15/14 11:41				
Malvern, PA 1935	5			SUBMITTED:	08/12/14			
ATTN: Mr. Jeff B	oggs			AQS SITE				
PHONE: (443) 8	03-8495 FAX: (410)) 266-8912		SITE CODE:	Ho	oneywell Hex Chrome Study		
Description:	OAM 2	Lab ID:	4081223-11			Sampled: 08/11/14 16:49		
Matrix:	Air	Sample	Volume: 2	1.95 m³		Received: 08/12/14 11:02		
Comments:	Start Time 8/10/14 16:24				A	nalysis Date: 08/13/14 15:22		
			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	0.0195		0.0036			

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Environmental Res	Environmental Resources Management, Inc					
75 Valley Stream F	^o arkway, Suite 400			REPORT	ED: 08/15/14 11	:41
Malvern, PA 19355	5			SUBMITT	ED: 08/12/14	
ATTN: Mr. Jeff Bo PHONE: (443) 8	oggs 03-8495 FAX: (410) 266-8912		AQS SITE CODE: SITE COI	E DE:	Honeywell Hex Chrome Study
Description:	PAM-1	Lab ID:	4081223-12			Sampled: 08/11/14 18:11
Matrix:	Air	Sample	Volume: 2	2.27 m³		Received: 08/12/14 11:02
Comments:	Col 1 Start Time 8/10/14	17:26				Analysis Date: 08/13/14 12:32
			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	0.0269		0.0036	

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Environmental Res	Environmental Resources Management, Inc					3926.00		
75 Valley Stream F	Parkway, Suite 400				REPORTE	REPORTED: 08/15/14 11:41		
Malvern, PA 19355					SUBMITTED: 08/12/14			
ATTN: Mr. Jeff Bo PHONE: (443) 8	oggs 03-8495 FAX: (410)) 266-8912			AQS SITE	E:	Honeywell Hex Chrome Study	
Description:	PAM-1D	Lab ID:	4081223	-13			Sampled: 08/11/14 18:11	
Matrix:	Air	Sample	Volume:	22.27	7 m³		Received: 08/12/14 11:02	
Comments:	Col 2 Start Time 8/10/14	17:26					Analysis Date: 08/13/14 12:52	
			Hexavalent	t Chro	mium			
			<u>Results</u>			MDL		
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>		<u>Flag</u>	<u>ng/m³ Air</u>		
Hexavalent Chromium		1854-02-99	0.0232			0.0036		

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Environmental Res	Environmental Resources Management, Inc					
75 Valley Stream P	arkway, Suite 400			REPORTED	D: 08/15/14 11:4	1
Malvern, PA 19355				SUBMITTE	D: 08/12/14	
ATTN: Mr. Jeff Boggs PHONE: (443) 803-8495 FAX: (410) 266-8912		AQS SITE CODE: SITE CODE	E: H	oneywell Hex Chrome Study
Description:	PAM-2	Lab ID	4081223-14			Sampled: 08/11/14 17:53
Matrix:	Air	Sample	e Volume: 22	.18 m³		Received: 08/12/14 11:02
Comments:	Start Time 8/10/14 17:14					Analysis Date: 08/13/14 15:32
			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	0.0216		0.0036	

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Environmental Re	Environmental Resources Management, Inc					FILE #: 3926.00			
75 Valley Stream F	^o arkway, Suite 400					REPORTE	ED:	08/15/14 11:4	41
Malvern, PA 1935	5					SUBMITT	ED:	08/12/14	
ATTN: Mr. Jeff B	oggs					AQS SITE	Ξ		
PHONE: (443) 8	03-8495 FAX: (410) 266-8912				SITECOL	DE:	ł	Honeywell Hex Chrome Study
Description:	PAM-3	Lai	b ID:	4081223-1	.5				Sampled: 08/11/14 17:38
Matrix:	Air	Sar	mple Vo	lume:	22.08	m³			Received: 08/12/14 11:02
Comments:	Start Time 8/10/14 17:06								Analysis Date: 08/13/14 16:01
			Не	exavalent (Chro	mium			
				<u>Results</u>				MDL	
<u>Analyte</u>		CAS Number	I	ng/m³ Air		<u>Flaq</u>		<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99		0.0172				0.0036	

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Environmental Res	sources Management, Ind				FILE #:	3926.00		
75 Valley Stream F	^o arkway, Suite 400				REPORTE	ED: 08/15/	14 11:41	
Malvern, PA 19355	5				SUBMITT	ED: 08/1	2/14	
ATTN: Mr. Jeff Bo PHONE: (443) 8	oggs 03-8495 FAX: (410) 266-8912			AQS SITE	E DE:	Honeywell Hex Chrome Study	
Description:	PAM-4	Lab ID:	4081223-	16		¤	Sampled: 08/11/14 17:26	
Matrix:	Air	Sample	Volume:	22.15	m³		Received: 08/12/14 11:02	
Comments:	Start Time 8/10/14 16:49						Analysis Date: 08/13/14 16:11	
			Hexavalent	Chro	mium			
			<u>Results</u>			<u>M</u>	<u>DL</u>	
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>		<u>Flag</u>	<u>ng/n</u>	1 ³ Air	
Hexavalent Chromium		1854-02-99	0.0344			0.6	0036	

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75 Valley Stream	Parkway, Suite	400				REPORT	ED:	08/15/14 11:	41
Malvern, PA 1935	55					SUBMIT	TED:	08/12/14	
ATTN: Mr. Jeff E PHONE: (443)	Boggs 803-8495 F	AX: (410) 266-8912				AQS SIT	E DE:		Honeywell Hex Chrome Study
Description:	PAM-21		Lab ID:	408122	3-17				Sampled: 08/11/14 00:00
Matrix:	Air		Sample Vo	olume:	22.18	t m ³	•		Received: 08/12/14 11:02
Comments:									Analysis Date: 08/13/14 16:21
			н	exavaler	nt Chro	mium			
				<u>Results</u>				MDL	
<u>Analyte</u>		CAS Numbe	er	<u>ng/m³ Ai</u>	<u>r</u>	<u>Flag</u>		<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99		ND		U		0.0036	

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Environmental Res	sources Manageme	nt, Inc			FILE #:	3926.00)	
75 Valley Stream F	⊃arkway, Suite 400				REPORT	' ED: 08	8/15/14 11:41	
Malvern, PA 1935	5				SUBMITT	TED:	08/12/14	
ATTN: Mr. Jeff Bo PHONE: (443) 8	oggs 03-8495 FAX:	(410) 266-8912			AQS SITE	E DE:	Hone	ywell Hex Chrome Study
Description:	PAM-31		Lab ID: 40	081223-18				Sampled: 08/11/14 00:00
Matrix:	Air		Sample Volum	e: 22.0	8 m³	5		Received: 08/12/14 11:02
Comments:							Ana	lysis Date: 08/13/14 16:31
			Hexa <u>Res</u>	valent Chro <u>sults</u>	omium		<u>MDL</u>	
<u>Analyte</u>		CAS Numbe	r ng/i	m³ Air	<u>Flaq</u>	n	g/m³ Air	
Hexavalent Chromium		1854-02-99	1	ND	U		0.0036	

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

LDC Project #32521:

SDG Fraction

4081934 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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) bc	SDG#	DATE REC'D	(3) DATE DUE	Cr((VI) 614)						,																											Γ
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Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:	Harbor Point, MD, Hexavalent Chromium Monitoring
Collection Date:	August 15 through August 18, 2014
LDC Report Date:	August 25, 2014
Matrix:	Air
Parameters:	Hexavalent Chromium
Validation Level:	EPA Level IV
Laboratory:	Eastern Research Group
Sample Delivery Group (SDG):	4081934

Sample Identification

OAM 1 (08/15/14) OAM 2 (08/15/14) PAM-1 (08/15/14) PAM-2 (08/15/14) PAM-3 (08/15/14) PAM-4 (08/15/14) PAM-21 (08/15/14) PAM-31 (08/15/14) OAM 1 (08/18/14) OAM 2 (08/18/14) PAM-1 (08/18/14) PAM-1D (08/18/14) PAM-2 (08/18/14) PAM-3 (08/18/14) PAM-4 (08/18/14) PAM-21 (08/18/14) PAM-31 (08/18/14) PAM-1 (08/15/14)DUP PAM-1 (08/18/14)DUP PAM-1D (08/18/14)DUP

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

1

Introduction

This data review covers 20 air samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per ASTM D7614 for Hexavalent Chromium.

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

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

The following are definitions of the data qualifiers:

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

2

I. Technical Holding Times

All technical holding time requirements were met.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met.

IV. Blanks

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

Samples PAM-31 (08/15/14) and PAM-31 (08/18/14) were identified as trip blanks. No hexavalent chromium was found.

Samples PAM-21 (08/15/14) and PAM-21 (08/18/14) were identified as field blanks. No hexavalent chromium was found.

V. Matrix Spike/Matrix Spike Duplicates

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

VI. Duplicates

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

VII. Laboratory Control Samples

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

VIII. Sample Result Verification

All sample result verifications were acceptable.

IX. Overall Assessment of Data

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

X. Field Duplicates

Samples PAM-1 (08/18/14) and PAM-1D (08/18/14) were identified as field duplicates. No hexavalent chromium was detected in any of the samples with the following exceptions:

	Concentrat	ion (ng/m³)			
Analyte	PAM-1 (08/18/14)	PAM-1D (08/18/14)	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.0355	0.0363	2 (≤20)	-	-

Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Data Qualification Summary - SDG 4081934

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 4081934

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 4081934

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

LDC #:	32521A6	VALIDATION COMPLETENESS WORKSHEET	
SDG #:	4081934	Level IV	
Laborato	ry: <u>Eastern</u> F	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
Technical holding times	A	Sampling dates: 8/15/14 2 8/18/14
I Initial calibration	A	
I. Calibration verification	A	
V Blanks	k	
Matrix Spike/Matrix Spike Duplicates	Í.N	Not Degsived
I. Duplicates	A	DUR
Laboratory control samples	A	USD
II. Sample result verification	A	
. Overall assessment of data	A	
Field duplicates	SW	F9= (11,12)
Eield blanks	64	FB= 7,16 TB=8,17

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

Validated Samples:

Airs

1	OAM 1 (08/15/14)	11	PAM-1 (08/18/14)	21	31
2	OAM 2 (08/15/14)	12	PAM-1D (08/18/14)	22	32
3	PAM-1 (08/15/14)	13	PAM-2 (08/18/14)	23	33
4	PAM-2 (08/15/14)	14	PAM-3 (08/18/14)	24	34
5	PAM-3 (08/15/14)	15	PAM-4 (08/18/14)	25	35
6	PAM-4 (08/15/14)	16	PAM-21 (08/18/14)	26	36
7	PAM-21 (08/15/14)	17	PAM-31 (08/18/14)	27	37
8	PAM-31 (08/15/14)	18	PAM-1 (08/15/14)DUP	28	38
9	OAM 1 (08/18/14)	19	PAM-1 (08/18/14)DUP	29	39
10	OAM 2 (08/18/14)	20	PAM-1D (08/18/14)DUP	30	40
Notes:	Dates and	enc	led to ID toc	h.Fferonig	te between sontes
				•	

VALIDATION FINDINGS CHECKLIST

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	\langle			
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 20.995?				
Were all initial and continuing calibration verification %Rs within th e 90-110 % QC limits? <u>名くいち</u>				
Were titrant checks performed as required? (Level IV only)			-	
Were balance checks performed as required? (Level IV only)			1	
III. Blanks				
Was a method blank associated with every sample in this SDG?				
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		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.	\			
Nere the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spik concentration by a factor of 4 or more, no action was taken.	e		/	
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				
Nas an LCS anaylzed for this SDG?	1			
Nas an LCS analyzed per extraction batch?				
Nere the LCS percent recoveries (%R) and relative percent difference (RPD) vithin the 80-120% (85-115% for Method 300.0) QC limits?	/			
VI. Regional Quality Assurance and Quality Control				
Nere performance evaluation (PE) samples performed?			1	
Nere the performance evaluation (PE) samples within the acceptance limits?				

VALIDATION FINDINGS CHECKLIST



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

.

LDC#<u>32521A6</u>

VALIDATION FINDINGS WORKSHEET Field Duplicates

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

Inorganics: Method See Cover

	Concentra	tion (ng/m3)			
Analyte	11	12	RPD (≤20)	Qual.	
Hexavalent Chromium	0.0355	0.0363	2		

\LDCFILESERVER\Validation\FIELD DUPLICATES\FD_inorganic\32521A6.wpd

LDC #: 3252146

Validation Findings Worksheet Initial and Continuing Calibration Calculation Verification

Page: \ of \ **Reviewer:** 2nd Reviewer:

Method: Inorganics, Method See Cover

The correlation coefficient (r) for the calibration of $\underline{G^{26}}$ was recalculated.Calibration date: $\underline{8/20(14)}$

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. (mg/L)	Area	r or r ²	r or r ²	(Y/N)
Initial calibration		s1	0.1	0.0000149			
		s2	0.1	0.000037	0.99986	0.99986	
	1-+6	s3	0.2	0.0000854			
		s4	0.5	0.0002009			.2
		s5	1	0.0004002			U
		s6	2	0.0008252			
ICU 11:08	0+	Fand	true				
Calibration verification		0.5098	0.500 ng/ml		102%R	102%2	
ce 12:07	C =10		,				
Calibration verification		0.4897 ng/m)	O.Snglml		98%2	98%E	<u> </u>
Calibration verification							1

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 #: 3252146

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,

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

 True = concentration of each analyte in the source.
 True = concentration of each analyte in the source.

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

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

Sample ID	Type of Analysis	Element	Found / S (units)	True / D (units)	Recalculated	Reported	Acceptable (Y/N)
Les	Laboratory control sample						ŧ.
11:-358		Crie	1-037 ng/ml	1.00ng/ml	104%E	104%E	5
	Matrix spike sample		(SSR-SR)				
		······					
Duo	Duplicate sample	1+6]				
		UT I	0.0204 vg/m3	0,0797 ng/m3	12.6%RRD	12-7%RRD	5
12:40				·			

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 #: SZSZIALO

VALIDATION FINDINGS WORKSHEET

Page:	<u></u>
Reviewer:	50
2nd reviewer:	a

Sample Calculation Verification

See_ 1 mer METHOD: Inorganics, Method __

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?

Concentration = (arec - co)	C. vEIOm Recalculation: (0.0000034- (-0.00000431)) 0.00429= Q01867 malm
aver: 0.0000034	$w^{3} = Z \setminus U^{3}$	
Co =- 0.0000431	(Ng)millor) = Nalun3	(0.0807 mg/ml)(10ml) - 1.0088 malun3
C.= 0.0004129	m3 Juni	21.23 - 0.00001.11

#	Sample ID	Analyte	Reported Concentration (ഗදൂଜ୍ୟ)	Calculated Concentration (ນດປາເປັ	Acceptable (Y/N)
	1	(x^{+6})	0.0087	0.0088	3
	2		0.0087	0.0086	
	3		0.0797	0.0797	
	4		0.0105	0.0104	
	5		0.0080	0.0080	
	6		0.457	0.457	
	7		ND	NO	
	8		ND	NO	
	٩		0.0095	0.0095	
	10		0-0152	D-OISZ	
	11		0.0355	0.0354	
	12		0.0363	0.0363	
	13		D.ONU	0.011	
	14		0.0101	0.0000	
	12		0.0280	0.0280	
	10		NO	NV	
	17	V	NV	<u>d</u> u	J

Note:

Environmental Resources Management, Inc				I	FILE #: 3926.00				
75 Valley Stream Parkway, Suite 400				I	REPORTED	: 08/21/14 15:	01		
Malvern, PA 193	55				9	SUBMITTED): 08/19/14		
ATTN: Mr. Jeff E	Boggs				1	AQS SITE C	ODE:		
PHONE: (443) 803-8495 FAX: (410) 266-8912 SITE CODE: Honeywell Hex Chrome Study									
Description:	OAM 1	L	ab ID:	4081934	-01			Sampled: 08/15/14 16:18	
Matrix:	Air	s	Sample Vo	olume:	21.31	m³		Received: 08/19/14 14:24	
Comments:	Start Time 8/14/14 1	6:37					A	nalysis Date: 08/20/14 13:35	
			Hex	avalent	Chro	mium			
			<u>F</u>	<u>Results</u>			MDL		
<u>Analyte</u>		CAS Number	<u>n</u>	g/m³ Air		<u>Flag</u>	<u>ng/m³ Air</u>		
Hexavalent Chromium 1854-02-99 0.0087					0.0036				

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Environmental Resources Management, Inc				FILE #: 392	FILE #: 3926.00			
75 Valley Stream Parkway, Suite 400				REPORTED:	08/21/14 15:0	1		
Malvern, PA 19355				SUBMITTED:	08/19/14			
ATTN: Mr. Jeff E	Boggs			AQS SITE CO	DDE:			
PHONE: (443) 803-8495 FAX: (410) 266-8912 SITE CODE: Honeywell Hex Chrome Study								
Description:	OAM 2	Lab ID:	4081934-02			Sampled: 08/15/14 16:29		
Matrix:	Air	Sample	Volume: 21.	.33 m³		Received: 08/19/14 14:24		
Comments:	Start Time 8/14/14 1	6:47			Ana	alysis Date: 08/20/14 13:45		
		Н	lexavalent 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 0.0087					0.0036			

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75 Valley Stream Parkway, Suite 400				REPORTED:	08/21/14 15:01			
Malvern, PA 19355 SI				SUBMITTED	: 08/19/14			
ATTN: Mr. Jeff B	Boggs			AQS SITE CO	ODE:			
PHONE: (443) 803-8495 FAX: (410) 266-8912 SITE CODE: Honeywell Hex Chrome					ell Hex Chrome Study			
Description:	PAM-1	Lab ID:	4081934-03		Sai	npled: 08/15/14 17:30		
Matrix:	Air	Sample	Volume: 21	.27 m³	Red	:eived: 08/19/14 14:24		
Comments:	Col 1 Start Time 8/14,	/14 17:52			Analysis	Date: 08/20/14 12:30		
		Н	exavalent Ch	romium				
			<u>Results</u>		<u>MDL</u>			
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>			
Hexavalent Chromium 1854-02-99 0.0797					0.0036			

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Environmental R	esources Ma	anagement, Inc		FILE #	: 3926.0	00		
75 Valley Stream Parkway, Suite 400				REPC	REPORTED: 08/21/14 15:01			
Malvern, PA 19355				SUBN	SUBMITTED: 08/19/14			
ATTN: Mr. Jeff E	ATTN: Mr. Jeff Boggs AQS SITE CODE:							
PHONE: (443)	803-8495	FAX: (410) 266-8912		SITE	CODE:	F	Ioneywell Hex Chrome Study	
Description:	PAM-2		Lab ID: 408193	4-05			Sampled: 08/15/14 17:18	
Matrix:	Air		Sample Volume:	21.41	m³		Received: 08/19/14 14:24	
Comments:	Start Time	8/14/14 17:30				A	nalysis Date: 08/20/14 13:55	
			Hexavalen	t Chromiur	n			
			<u>Results</u>			<u>MDL</u>		
<u>Analyte</u>		<u>CAS Numb</u>	er <u>ng/m³ Ai</u>	<u>r Fla</u>	g i	ng/m³ Air		
Hexavalent Chromium 1854-02-99 0.0105 0.0036								

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75 Valley Stream Parkway, Suite 400				REPORTED:	REPORTED: 08/21/14 15:01			
Malvern, PA 19355 SUBMITTED: 08/19/14								
ATTN: Mr. Jeff E	Boggs			AQS SITE C	ODE:			
PHONE: (443) 803-8495 FAX: (410) 266-8912 SITE CODE: Honeywell Hex Chrome Study					Honeywell Hex Chrome Study			
Description:	PAM-3	Lab ID:	4081934-06			Sampled: 08/15/14 17:10		
Matrix:	Air	Sample	Volume: 21	.4 m³		Received: 08/19/14 14:24		
Comments:	Start Time 8/14/14 17	2:23			A	nalysis Date: 08/20/14 14:05		
		He	exavalent 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 0.0080 0.0036								

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75 Valley Stream Parkway, Suite 400				REPORTED	: 08/21/14 15:01			
Malvern, PA 19355				SUBMITTED	: 08/19/14			
ATTN: Mr. Jeff E	Boggs			AQS SITE C	ODE:			
PHONE: (443) 803-8495 FAX: (410) 266-8912 SITE CODE: Honeywell Hex Chrome Study						ywell Hex Chrome Study		
Description:	PAM-4	Lab ID:	4081934-07		9	Sampled: 08/15/14 16:58		
Matrix:	Air	Sample	Volume: 21	.33 m³	R	Received: 08/19/14 14:24		
Comments:	Start Time 8/14/14 17	7:16		_	Analy	sis Date: 08/20/14 14:35		
		н	exavalent Ch	romium				
			<u>Results</u>		MDL			
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	Flag	<u>ng/m³ Air</u>			
Hexavalent Chromium 1854-02-99 0.457					0.0036			

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Environmental Resources Management, Inc					FILE #: 3926.00		
75 Valley Stream Parkway, Suite 400					REPORTED: 08/21/14 15:01		
Malvern, PA 19355					SUBMITTED: 08/19/14		
ATTN: Mr. Jeff Boggs					AQS SITE CODE:		
PHONE: (443)	803-8495	FAX: (410) 266-8912			SITE CODE:	: H	Ioneywell Hex Chrome Study
Description: PAM-21 Lab ID: 4081934				31934-08			Sampled: 08/15/14 00:00
Matrix:	Air		Sample Volum	ne: 21.4	i m³		Received: 08/19/14 14:24
Comments:					_	A	nalysis Date: 08/20/14 14:45
Hexavalent Chromium							
			<u>Resu</u>	<u>ilts</u>		MDL	
<u>Analyte</u>		CAS Numb	er <u>ng/m</u>	<u>³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99	ND)	U	0.0036	

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Environmental Re	esources Ma	anagement, Inc			FILE #: 392	26.00			
75 Valley Stream	Parkway, S	Suite 400				REPORTED:	08/21/14 1	:01	
Maivern, PA 193	55					SUBMITTED	: 08/19/14		
ATTN: Mr. Jeff E	Boggs					AQS SITE CO	ODE:		
PHONE: (443) 8	803-8495	FAX: (410) 266-8912				SITE CODE:		Honeywell Hex Chrome Study	
Description:	PAM-31	·····	Lab ID:	4081934	4-09			Sampled: 08/15/14 00:00	
Matrix:	Air		Sample V	/olume:	21.4	m³		Received: 08/19/14 14:24	
Comments:								Analysis Date: 08/20/14 14:55	
			He	xavalent	: Chro	omium			
				<u>Results</u>			<u>MDL</u>		
<u>Analyte</u>		CAS Number	<u>er n</u>	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 R	esources Management	, Inc		FILE #: 392	26.00									
75 Valley Stream	Parkway, Suite 400				REPORTED: 08/21/14 15:01									
Malvern, PA 193	55				SUBMITTED	08/19/14								
ATTN: Mr. Jeff E	Boggs				AQS SITE CO	DDE:								
PHONE: (443) 8	803-8495 FAX: (4	0) 266-8912			SITE CODE:	Ho	neywell Hex Chrome Study							
Description:	OAM 1	Lal	b ID: 40819	34-10			Sampled: 08/18/14 16:22							
Matrix:	Air	Sai	mple Volume:	21.26	6 m ³		Received: 08/19/14 14:24							
Comments:	Start Time 8/17/14 1	5:45				An	alysis Date: 08/20/14 15:04							
			Hexavaler	nt Chro	mium									
			<u>Results</u>			<u>MDL</u>								
<u>Analyte</u>		CAS Number	<u>ng/m³ A</u>	ir	<u>Flag</u>	<u>ng/m³ Air</u>								
Hexavalent Chromi	um	1854-02-99	0.0095			0.0036								

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Initials: CR

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Environmental Re	esources Man	agement, Inc		F	FILE #: 3926.00									
75 Valley Stream	Parkway, Sui	te 400		ſ	REPORTED: 08/21/14 15:01									
Malvern, PA 193	55			5	SUBMITTED: 08/19/14									
ATTN: Mr. Jeff E	Boggs			1	AQS SITE CO	ODE:								
PHONE: (443) 8	303-8495 F	FAX: (410) 266-8912		\$	SITE CODE:	Ho	neywell Hex Chrome Study							
Description:	OAM 2		Lab ID: 408193	34-11			Sampled: 08/18/14 16:36							
Matrix:	Air		Sample Volume:	21.23	m³		Received: 08/19/14 14:24							
Comments:	Start Time 8,	/17/14 17:00				Ana	alysis Date: 08/20/14 15:14							
			Hexavalen	it Chro	mium									
			<u>Results</u>			<u>MDL</u>								
<u>Analyte</u>		CAS Numbe	er <u>ng/m³ Ai</u>	ir	<u>Flag</u>	<u>ng/m³ Air</u>								
Hexavalent Chromiu	ım	1854-02-99	0.0152			0.0036								

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Environmental Re	esources Management,	, Inc	FILE #: 392	6.00									
75 Valley Stream	Parkway, Suite 400			REPORTED: 08/21/14 15:01									
Malvern, PA 193	55			SUBMITTED:	08/19/14								
ATTN: Mr. Jeff E	Boggs			AQS SITE CO	DDE:								
PHONE: (443) 8	303-8495 FAX: (41	0) 266-8912		SITE CODE:	Но	oneywell Hex Chrome Study							
Description:	PAM-1	Lab ID:	4081934-12		····	Sampled: 08/18/14 17:50							
Matrix:	Air	Sample	Volume: 21.	29 m³		Received: 08/19/14 14:24							
Comments:	Col 1 Start Time 8/17	/14 18:11			An	alysis Date: 08/20/14 12:50							
		н	exavalent 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 Chromi	um	1854-02-99	0.0355		0.0036								

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Environmental Re	esources Managemen	t, Inc	FILE #: 392	26.00								
75 Valley Stream	Parkway, Suite 400			REPORTED:	08/21/14 15:01							
Malvern, PA 193	55		SUBMITTED	SUBMITTED: 08/19/14								
ATTN: Mr. Jeff E	Boggs			AQS SITE CO	ODE:							
PHONE: (443) 8	803-8495 FAX: (4	10) 266-8912		SITE CODE:	Hon	eywell Hex Chrome Study						
Description:	PAM-1D	Lab ID:	4081934-13	3		Sampled: 08/18/14 17:53						
Matrix:	Air	Sample	Volume: 2	1.23 m³		Received: 08/19/14 14:24						
Comments:	Col 2 Start Time 8/17	7/14 18:18			Anal	ysis Date: 08/20/14 13:09						
		H	exavalent C	hromium								
			<u>Results</u>		<u>MDL</u>							
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>							
Hexavalent Chromit	um	1854-02-99	0.0363		0.0036							

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Environmental Re	esources Management,	Inc		FILE #: 392	6.00								
75 Valley Stream	Parkway, Suite 400			REPORTED: 08/21/14 15:01									
Malvern, PA 193	55			SUBMITTED:	08/19/14								
ATTN: Mr. Jeff E	Boggs			AQS SITE CO	DDE:								
PHONE: (443) 8	803-8495 FAX: (41	0) 266-8912		SITE CODE:	Ho	neywell Hex Chrome Study							
Description:	PAM-2	Lab ID:	4081934-14			Sampled: 08/18/14 17:28							
Matrix:	Air	Sample	Volume: 21.2	25 m³		Received: 08/19/14 14:24							
Comments:	Start Time 8/17/14 17	2:52			An	alysis Date: 08/20/14 15:24							
		He	exavalent Chi	romium									
			<u>Results</u>		<u>MDL</u>								
<u>Analyte</u>		CAS Number	ng/m³ Air	Flag	<u>ng/m³ Air</u>								
Hexavalent Chromic	um	1854-02-99	0.0110		0.0036								

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Environmental Re	esources Management,	Inc	FILE #: 392	26.00									
75 Valley Stream	Parkway, Suite 400		REPORTED:	REPORTED: 08/21/14 15:01									
Malvern, PA 193	55			SUBMITTED: 08/19/14									
ATTN: Mr. Jeff B	Boggs		AQS SITE CODE:										
PHONE: (443) 8	303-8495 FAX: (41	0) 266-8912		SITE CODE:	Ho	neywell Hex Chrome Study							
Description:	PAM-3	Lab II	D: 4081934-15	5		Sampled: 08/18/14 17:16							
Matrix:	Air	Samp	le Volume: 21	L.24 m³		Received: 08/19/14 14:24							
Comments:	Start Time 8/17/14 17	' :40			Ana	alysis Date: 08/20/14 15:34							
			Hexavalent Ch	nromium									
			<u>Results</u>		MDL								
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>								
Hexavalent Chromi	m	1854-02-99	0.0101		0.0036								

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Environmental Re	esources Management,	Inc		FILE #: 392	6.00								
75 Valley Stream	Parkway, Suite 400			REPORTED: 08/21/14 15:01									
Malvern, PA 193	55			SUBMITTED:									
ATTN: Mr. Jeff E	Boggs			AQS SITE CO	DDE:								
PHONE: (443) 8	303-8495 FAX: (41	0) 266-8912		SITE CODE:	Н	oneywell Hex Chrome Study							
Description:	PAM-4	Lab ID:	4081934-16			Sampled: 08/18/14 17:05							
Matrix:	Air	Sample	Volume: 21.2	23 m³		Received: 08/19/14 14:24							
Comments:	Start Time 8/17/14 17	2:30			An	alysis Date: 08/20/14 15:44							
		He	exavalent Chr	omium									
			<u>Results</u>		MDL								
<u>Analyte</u>		CAS Number	ng/m³ Air	<u>Flag</u>	<u>ng/m³ Air</u>								
Hexavalent Chromit	um	1854-02-99	0.0280		0.0036								

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Environmental R	esources M	anagement, Inc			FILE #: 3926.00									
75 Valley Stream	ı Parkway, S	Suite 400			REPORTED: 08/21/14 15:01									
Malvern, PA 193	55				SUBMITTED:	08/19/14								
ATTN: Mr. Jeff	Boggs				AQS SITE CO	DDE:								
PHONE: (443)	803-8495	FAX: (410) 266-8912			SITE CODE:		Honeywell Hex Chrome Study							
Description:	PAM-21		Lab ID: 4	1081934-17			Sampled: 08/18/14 00:00	-						
Matrix:	Air		Sample Volu	u me: 21.3	25 m³		Received: 08/19/14 14:24							
Comments:						ļ	Analysis Date: 08/20/14 15:54							
			Hexav	valent Chi	romium									
			Re	<u>sults</u>		MDL								
<u>Analyte</u>		CAS Number	er ng/i	<u>m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>								
Hexavalent Chromium		1854-02-99	I	ND	U	0.0036								

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Environmental R	esources Ma	anagement, Inc		FILE #:	3926.00		
75 Valley Stream	ı Parkway, S	Suite 400		REPOR	TED: 08/21/1	4 15:01	
Malvern, PA 193	55			SUBMI	TTED: 08/19	//14	
ATTN: Mr. Jeff E	Boggs			AQS SI	TE CODE:		
PHONE: (443)	803-8495	FAX: (410) 266-8912		SITE C	ODE:	Honeywell Hex Chrome Study	
Description:	PAM-31		Lab ID: 408193	34-18		Sampled: 08/18/14 00:00	
Matrix:	Air		Sample Volume:	21.24 m	3	Received: 08/19/14 14:24	
Comments:						Analysis Date: 08/20/14 16:04	
			Hexavaler	nt Chromium			
			<u>Results</u>		<u>MD</u>	<u>L</u>	
<u>Analyte</u>		<u>CAS Numbe</u>	er <u>ng/m³ A</u>	<u>ir Flag</u>	<u>ng/m³</u>	Air	
Hexavalent Chromium	I	1854-02-99	ND	U	0.00	36	

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Initials: CR

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

LDC Project #32566:

<u>SDG</u>

<u>Fraction</u>

4082017/4082115/4082711 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

9 (S) See	Level IV	L	DC #32	566	6 (E	RN	A -	Мо	rris	svil	le,	NC	: 1	Hai	bo	r P	oin	t, I	ND	, Н	exa	iva	len	t C	hrc	mi	um	M	oni	itor	inc	I)						
bc	SDG#	DATE REC'D	(3) DATE DUE	Cri (D7	(VI) 614)		<u>x 35. 7</u>		<u></u>						<u></u>									3-116 -									<u> </u>		3 <u>4 (</u>)			
latrix	c 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>م</u> .	4082017/4082115/ 4082711	08/28/14	09/03/14	27,	0																																	
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Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:	Harbor Point, MD, Hexavalent Chromium Monitoring
Collection Date:	August 19 through August 21, 2014
LDC Report Date:	August 29, 2014
Matrix:	Air
Parameters:	Hexavalent Chromium
Validation Level:	EPA Level IV
Laboratory:	Eastern Research Group

Sample Delivery Group (SDG): 4082017/4082115/4082711

Sample Identification

OAM 1 (8/19/14)	PAM-1 (8/21/14)
OAM 1 (8/19/14)	PAM-1D (8/21/14)
PAM-1 (8/19/14)	PAM-2 (8/21/14)
PAM-1D (8/19/14)	PAM-3 (8/21/14)
PAM-2 (8/19/14)	PAM-4 (8/21/14)
PAM-3 (8/19/14)	PAM-21 (8/21/14)
PAM-4 (8/19/14)	PAM-31 (8/21/14)
PAM-21 (8/19/14)	PAM-1 (8/19/14)DUP
PAM-31 (8/19/14)	PAM-1D (8/19/14)DUP
OAM 1 (8/20/14)	PAM-1 (8/20/14)DUP
OAM 2 (8/20/14)	PAM-1D (8/20/14)DUP
PAM-1 (8/20/14)	PAM-1 (8/21/14)DUP
PAM-1D (8/20/14)	PAM-1D (8/21/14)DUP
PAM-2 (8/20/14)	
PAM-3 (8/20/14)	
PAM-4 (8/20/14)	
PAM-21 (8/20/14)	
PAM-31 (8/20/14)	
OAM 1 (8/21/14)	
OAM 2 (8/21/14)	

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

Introduction

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

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

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

The following are definitions of the data qualifiers:

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

I. Technical Holding Times

All technical holding time requirements were met.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met.

IV. Blanks

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

Samples PAM-31 (8/19/14), PAM-31 (8/20/14), and PAM-31 (8/21/14) were identified as trip blanks. No hexavalent chromium was found.

Samples PAM-21 (8/19/14), PAM-21 (8/20/14), and PAM-21 (8/21/14) were identified as field blanks. No hexavalent chromium was found.

V. Matrix Spike/Matrix Spike Duplicates

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

VI. Duplicates

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

VII. Laboratory Control Samples

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

VIII. Sample Result Verification

All sample result verifications were acceptable.

IX. Overall Assessment of Data

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

X. Field Duplicates

Samples PAM-1 (8/19/14) and PAM-1D (8/19/14), samples PAM-1 (8/20/14) and PAM-1D (8/20/14), and PAM-1 (8/21/14) and PAM-1D (8/21/14) 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 (8/19/14)	PAM-1D (8/19/14)	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.0381	0.0448	16 (≤20)	-	-

	Concentrat	ion (ng/m³)	g/m³)		
Analyte	PAM-1 (8/20/14)	and PAM-1D (8/20/14)	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.0688	0.0672	2 (≤20)	-	-

	Concentration (ng/m³) te PAM-1 (8/21/14) PAM-1D (8/21/14)				
Analyte			RPD (Limits)	Flags	A or P
Hexavalent chromium	0.0728	0.0691	5 (≤20)	-	-

Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Data Qualification Summary - SDG 4082017/4082115/4082711

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 4082017/4082115/4082711

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 4082017/4082115/4082711

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

LDC #:	32566A6	VALIDATION CON	MPLETENESS WORKSHEET
SDG #:	4082017/4082115/40	082711	Level IV
Laborato	ry: Eastern Research	<u>Group</u>	



METHOD: Hexavalent Chromium (ASTM D7614)

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

	Validation Area		Comments
l.	Technical holding times	A	Sampling dates: 8/9-21/14
1	Initial calibration	A	
Ш.	Calibration verification	A	
IV	Blanks	A	
v	Matrix Spike/Matrix Spike Duplicates	N	Not Required
VI.	Duplicates	A	Dup
VII.	Laboratory control samples	A	Lesly
VIII.	Sample result verification	A	
IX.	Overall assessment of data	A	
Х.	Field duplicates	SW	FD = (3,4)(12,13)(21,22)
х	Field blanks	24	FB=8,17,26 TB=9,18,27

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

Validated Samples: ATVS

1	OAM 1 (8/19/14)	11	OAM 2 (8 (20)14)	21	PAM-1 (8/21/14)	31	(8120115) PAM-1DDUP
2	OAM 1	12	PAM-1	22	PAM-1D	32	58121/14) PAM-1DUP
3	PAM-1	13	PAM-1D	23	PAM-2	33	PAM-1DDUP
4	PAM-1D	14	PAM-2	24	PAM-3	34	
5	PAM-2	15	PAM-3	25	PAM-4	35	
6	PAM-3	16	PAM-4	26	PAM-21	36	
7	PAM-4	17	PAM-21	27	PAM-31	37	
8	PAM-21	18	PAM-31	28	PAM-1DUP	38	
9	PAM-31	19	OAM1 (821/14)	29	PAM-1DDUP	39	
10	OAM1 (820/14)	20	OAM 2	30	PAM-1DUP	40	
	Theredal				``````````````````````````````````````		

Notes: ID appended to differentiat between samples

VALIDATION FINDINGS CHECKLIST

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times	• • • • •		·	
All technical holding times were met.	/			
Cooler temperature criteria was met.	/			
II. Calibration				
Were all instruments calibrated daily, each set-up time?	/			
Were the proper number of standards used?	~			
Were all initial calibration correlation coefficients	\leq			
Were all initial and continuing calibration verification %Rs within the $\frac{90.110}{85-115}$ QC limits?	/			
Were titrant checks performed as required? (Level IV only)			\leq	
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.	2			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.			1	
Were the MS/MSD or duplicate relative percent differences (RPD) \leq 20% for waters and \leq 35% for soil samples? A control limit of \leq CRDL(\leq 2X CRDL for soil) was used for samples that were \leq 5X the CRDL, including when only one of the duplicate sample values were \leq 5X the CRDL.	1			
V. Laboratory control samples				
Was an LCS anaylzed for this SDG?	1			
Was an LCS analyzed per extraction batch?	/			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% (85-115% for Method 300.0) QC limits?	/			
VI. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?			_	
Were the performance evaluation (PE) samples within the acceptance limits?				

VALIDATION FINDINGS CHECKLIST



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

LDC#_32566A6 VALIDATION FINDINGS WORKSHEET Field Duplicates



Inorganics: Method See Cover

	Concentrat			
Analyte	3	4	RPD (≤20)	Qual.
Hexavalent Chromium	0.0381	0.0448	16	

	Concentra			
Analyte	12	13	RPD (≤20)	Qual.
Hexavalent Chromium	0.0688	0.0672	2	

	Concentra			
Analyte	21	22	RPD (≤20)	Qual.
Hexavalent Chromium	0.0728	0.0691	5	

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LDC #: 32566A6

Validation Findings Worksheet Initial and Continuing Calibration Calculation Verification

Page: Reviewer: 2nd Reviewer: C

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

The correlation coefficient (r) for the calibration of $\frac{2\pi^{-6}}{\sqrt{2}}$ was recalculated.Calibration date: $\frac{321}{21}$

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

%R = Found X 100

True

Where,

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

					Recalculated	Reported	Acceptable
Type of analysis	Analyte	Standard	Conc. (mg/L)	Area	r or r ²	r or r ²	(Y/N)
Initial calibration		s1	0.1	0.0000119			
		s2	0.1	0.0000351	0.99960	0.99960	
		s3	0.2	0.0000783			
	42	s4	0.5	0.0002054			3
	\smile	s5	1	0.0003999	-		
		s6	2	0.000855			
ICU 10:41	طلعها	Found	Twe		100.3%2-	100 4%2	نربد
Calibration verification		0.2016 ngm	0.5 mg/ml	[100:3/34		
Calibration verification	Cir+6	0.514nglm	0.5 mg/m		102.8%R	102.7%R	J*
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 #: 3256A6

VALIDATION FINDINGS WORKSHEET Level IV Recalculation Worksheet



METHOD: Inorganics, Method See Cover

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

 $R = Found \times 100$ Where, 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:

 $\begin{array}{cccc} \text{RPD} = \underline{|S-D|} & x \ 100 & \text{Where,} & S = & & \text{Original sample concentration} \\ & (S+D)/2 & & D = & & \text{Duplicate sample concentration} \end{array}$

			Found / S	True / D	Recalculated	Reported	Acceptable
Sample ID	Type of Analysis	Element	(units)	(units)	%R / RPD	%R / RPD	(Y/N)
LCS 11:11	Laboratory control sample	Gr+10	1.055 ng/n/	l nglul	106%P	106%12	J
N	Matrix spike sample		(SSR-SR)				
Dup 12:36	Duplicate sample	Crib	0.0412ng/m3	0.0387 ng/m ³	7.82%RPD	7.94% PPD	2

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 #: 32566A6

VALIDATION FINDINGS WORKSHEET

Sample Calculation Verification

Page:_	l_{of}
Reviewer:	50
	a

METHOD: Inorganics, Method _____

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A". Y/N N/A Are results within the calibrated range of the instruments? Are all detection limits below the CRQL? Y/ N N/A Compound (analyte) results for (13) Cr^{+6} recalculated and verified using the following equation: _____reported with a positive detect were $\frac{\text{Concentration} = (area - c_0)/c_1}{\text{Concentration}} \frac{\sqrt{16} |0m|^{\text{Recalculation}}}{(0.0000589 - (-1.56E-06))} = 0.143 \text{ m}^3 \text{ m}^3$ Reported Calculated Concentration Concentration Acceptable (ng/m3) (ng/m3) (Y/N) Sample ID # Analyte 1,+6 l 0.0271 0.0272 S 0.0275 0.0274 2 0.0381 0.0381 3 4 0.0448 0.0448 0.0298 0.0299 ND DU Ò 0.0269 0.0270 8 NO ND ND 9 ND 10 0.0616 0.0616 11 0.0262 0.0263 0.0688 12 0.0688 13 0.0672 0.0672 14 0.0527 0.0527 15 0.0675 0.0675 16 0.0514 1.0514 17 20 ND บจิ 18 ND 19 0.0214 0.0214 20 0.0220 0.0220

Note:

LDC #: 32566A6

VALIDATION FINDINGS WORKSHEET

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

Sample Calculation Verification

METHOD: Inorganics, Method See Cover

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

MN N/A YIN N/A Y/N N/A

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

Are all detection limits below the CRQL?

Compound (analyte) results for (21) (x+b) reported with a positive detect were recalculated and verified using the following equation: Concentration = $(aren - C_0)/C$, $yf_{-21,81}^{-10,m'}$ Recalculation: (0.0000656 - (-1.56E-06))mer = 0.000065b $L_0 = -1.56E-06$ (ng/m!)(vf) 0.0004227 = 0.159 ng/m! (ng/m!)(vf) (vf) (0.159 ng/m!)(10.m!) $T^3 = ng/m^3$ (0.159 ng/m!)(10.m!)Z = 1.81 = $0.0728 ng/m^3$

#	Sample ID	Analyte	Reported Concentration (hq/m ⁵)	Calculated Concentration (กฤ/เมวี)	Acceptable (Y/N)
	21	Cr+6	0.0728	0.0728	У
	22		0.0691	0.0691	
	23		0.0636	0.0636	
	24		0.0360	0.0360	
	25		0.0925	0.0925	
	2.6		NO	ND	
	27	<u> </u>	ND	ND	J
	·				
				······································	
	·				
	·				
					5,
	······································				

Note:

Environmental Resources Management, Inc						FILE #: 3926.00				
75 Valley Stream Parkway, Suite 400						REPORTED: 08/28/14 15:32				
Malvern, PA 19355						SUBMITTED: 08/20/14 to 08/22/14				
ATTN: Mr. Jeff B PHONE: (443) 8	oggs 103-8495 FAX: (410) 266-8912			AQS SITE CODE: SITE CODE:	:	Honeywell Hex Chrome Study			
Description:	OAM 1	Lab	ID: 4082017-	01			Sampled: 08/19/14 16:22			
Matrix:	Air	Sam	ple Volume:	21.5	m³		Received: 08/20/14 11:50			
Comments:	Start Time 8/18/14 16:29						Analysis Date: 08/21/14 13:07			
Hexavalent Chromium <u>Results</u> <u>MDL</u>										
Analyte		CAS Number	<u>ng/m³ Air</u>		Flag	<u>ng/m³ Air</u>				
Hexavalent Chromium	I	1854-02-99	0.0272			0.0036				

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Environmental Resources Management, Inc					FILE #: 3926.00				
75 Valley Stream Parkway, Suite 400 F						REPORTED: 08/29/14 11:37			37
Malvern, PA 1935	5					SUBMITT	ED:	08/20/14 t	o 08/22/14
ATTN: Mr. Jeff B PHONE: (443) 8	oggs 03-8495 FAX: (410)) 266-8912				AQS SITE	E DE:	ł	Honeywell Hex Chrome Study
Description:	OAM 2		Lab ID:	4082017-0	02				Sampled: 08/19/14 16:48
Matrix:	Air	9	Sample V	olume:	21.69	m³			Received: 08/20/14 11:50
Comments:	Start Time 8/18/14 16:41								Analysis Date: 08/21/14 13:17
Hexavalent Chromium Results MDL									
<u>Analyte</u>		CAS Number	:	<u>ng/m³ Air</u>		<u>Flag</u>	מ	g/m³ Air	
Hexavalent Chromium		1854-02-99		0.0275				0.0036	

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Environmental Res	sources Management, In	с	FILE #: 392	FILE #: 3926.00				
75 Valley Stream Parkway, Suite 400					REPORTED: 08/28/14 15:32			
Malvern, PA 1935	5			SUBMITTED:	08/20/14 to 08/2	22/14		
ATTN: Mr. Jeff B	oggs			AQS SITE				
PHONE: (443) 8	03-8495 FAX: (410) 266-8912		SITE CODE:	Honey	well Hex Chrome Study		
Description:	PAM-1	Lab ID:	4082017-03		5	Sampled: 08/19/14 18:16		
Matrix:	Air	Sample V	Volume: 21	.91 m³	F	Received: 08/20/14 11:50		
Comments:	Col 1 Start Time 8/18/14	17:55			Analy	rsis Date: 08/21/14 12:26		
			Hexavalent Ch	romium				
			<u>Results</u>		MDL			
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	Flag	<u>ng/m³ Air</u>			
Hexavalent Chromium		1854-02-99	0.0381		0.0036			

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Environmental Res	sources Management, In	C	FILE #: 3926.00					
75 Valley Stream Parkway, Suite 400					REPORTED: 08/28/14 15:32			
Malvern, PA 19355					MITTED: 08/20/14 to 08/22/14			
ATTN: Mr. Jeff Bo PHONE: (443) 8	oggs 03-8495 FAX: (410) 266-8912		AQS SITE CODE: SITE CODE:	н	oneywell Hex Chrome Study		
Description:	PAM-1D	Lab ID:	4082017-04			Sampled: 08/19/14 18:19		
Matrix:	Air	Sample	Volume: 21.9	92 m³		Received: 08/20/14 11:50		
Comments:	Col 2 Start Time 8/18/14	17:58				Analysis Date: 08/21/14 12:45		
			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	0.0448		0.0036			

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Environmental Resources Management, Inc					I	FILE #: 3926.00			
75 Valley Stream Parkway, Suite 400					I	REPORTED: 08/28/14 15:32			
Malvern, PA 19355					SUBMITTED: 08/20/14 to 08/22/14				
ATTN: Mr. Jeff Boggs						AQS SITE			
PHONE: (443) 8	03-8495 FAX: (410) 266-8912			1	SITECOD	DE:		Honeywell Hex Chrome Study
Description:	PAM-2	Lal	b ID:	4082017-05	5				Sampled: 08/19/14 18:01
Matrix:	Air	Sa	mple Vo	lume: 2	22.03	m³			Received: 08/20/14 11:50
Comments:	Start Time 8/18/14 17:33								Analysis Date: 08/21/14 13:27
			He	exavalent C	hron	nium			
				<u>Results</u>				<u>MDL</u>	
<u>Analyte</u>		CAS Number	I	ng/m³ Air		Flag		ng/m³ Air	
Hexavalent Chromium		1854-02-99		0.0299				0.0036	

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Environmental Resources Management, Inc					FILE #: 3926.00			
75 Valley Stream Parkway, Suite 400						REPORTED: 08/28/14 15:32		
Malvern, PA 1935	5				SUBMITT	ED: 08/20/14	to 08/22/14	
ATTN: Mr. Jeff B	oggs				AQS SITE	E		
PHONE: (443) 8	03-8495 FAX: (410)) 266-8912			SITECOL)E:	Honeywell Hex Chrome Study	
Description:	PAM-3	La	a b ID: 40	82017-06			Sampled: 08/19/14 17:45	
Matrix:	Air	Sa	ample Volume	21.9	2 m³		Received: 08/20/14 11:50	
Comments:	Start Time 8/18/14 17:23						Analysis Date: 08/21/14 13:37	
			Hexav	alent Chro	omium			
			Res	<u>ults</u>		MDL		
<u>Analyte</u>		<u>CAS Number</u>	<u>nq/n</u>	n ³ Air	<u>Flag</u>	<u>ng/m³ Air</u>		
Hexavalent Chromium		1854-02-99	N	C	U	0.0036		

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75 Valley Stream Parkway, Suite 400						REPORTED: 08/28/14 15:32			
Malvern, PA 19355					SUBMITTED: 08/20/14 to 08/22/14				
ATTN: Mr. Jeff Ba PHONE: (443) 8	oggs 03-8495 FAX: (410) 266-8912			AQS SITE	: F	loneywell Hex Chrome Study		
Description:	PAM-4	L	Lab ID: 4082017-	07			Sampled: 08/19/14 17:23		
Matrix:	Air	S	Sample Volume:	21.8	m³		Received: 08/20/14 11:50		
Comments:	Start Time 8/18/14 17:10						Analysis Date: 08/21/14 13:46		
			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	0.0270			0.0036			

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NER	Ê		CEF	RTIFIC	ATE (DF A	NALYSIS	6		
Environmental R	nageme	nt, Inc		FILE #: 392						
75 Valley Stream	uite 400				REPORTED: 08/28/14 15:32					
Malvern, PA 193	55						SUBMITTED:	08/20/14	o 08/22/1 4	
ATTN: Mr. Jeff I PHONE: (443)	Boggs 803-8495	FAX:	(410) 266-8912				AQS SITE CODE: SITE CODE:	I	Honeywell Hex Chrome Study	
Description:	PAM-21			Lab ID:	408201	.7-08			Sampled: 08/19/14 00:00	
Matrix:	Air			Sample V	olume:	22.03	8 m³		Received: 08/20/14 11:50	
Comments:									Analysis Date: 08/21/14 13:56	
				Н	lexavale	nt Chro	mium			
					<u>Results</u>			<u>MDL</u>		
<u>Analyte</u>			CAS Number	er	<u>ng/m³ Ai</u>	ir	<u>Flaq</u>	<u>ng/m³ Air</u>		
Hexavalent Chromium			1854-02-99		ND		U	0.0036		

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Environmental Res	sources Manageme	ent, Inc	FILE #	FILE #: 3926.00						
75 Valley Stream F	Parkway, Suite 400		REPO	REPORTED: 08/28/14 15:32						
Malvern, PA 19355	5		SUBM	SUBMITTED: 08/20/14 to 08/22/14						
ATTN: Mr. Jeff Bo			AQS S	AQS SITE						
PHONE: (443) 80	03-8495 FAX:	(410) 266-8912		SITE	ODE:	Ho	neywell Hex Chrome Study			
Description:	PAM-31		Lab ID: 408201	7-09			Sampled: 08/19/14 00:00			
Matrix:	Air		Sample Volume:	21.92	m³		Received: 08/20/14 11:50			
Comments:						A	nalysis Date: 08/21/14 14:26			
Hexavalent Chromium										
			<u>Results</u>			MDL				
<u>Analyte</u>		CAS Numbe	<u>ng/m³ Ai</u>	<u>r Fla</u>	9	<u>ng/m³ Air</u>				
Hexavalent Chromium		1854-02-99	ND	L		0.0036				

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Environmental Resources Management, Inc						FILE #: 3926.00				
75 Valley Stream Parkway, Suite 400						REPORTED: 08/28/14 15:32				
Malvern, PA 1935	5		SUBMITT	SUBMITTED: 08/20/14 to 08/22/14						
ATTN: Mr. Jeff Boggs PHONE: (443) 803-8495 FAX: (410) 266-8912	2		AQS SITE	E DE:	Honeywell Hex Chrome Study			
Description:	OAM 1	La	ab ID: 40821	15-01			Sampled: 08/20/14 16:00			
Matrix:	Air	Sa	ample Volume:	21.0	8 m³		Received: 08/21/14 11:18			
Comments:	Start Time 8/19/14 16:34						Analysis Date: 08/25/14 13:48			
Hexavalent Chromium										
			<u>Results</u>			<u>MDL</u>				
<u>Analyte</u>		CAS Number	ng/m³ A	<u>ir</u>	<u>Flaq</u>	<u>ng/m³ Air</u>				
Hexavalent Chromium	1854-02-99	0.0616			0.0036					

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Environmental Resources Management, Inc							FILE #: 3926.00			
75 Valley Stream Parkway, Suite 400							REPORTED: 08/28/14 15:32			
Malvern, PA 19355						SUBMITTED: 08/20/1		08/20/14	to 08/22/14	
ATTN: Mr. Jeff Boggs PHONE: (443) 803-8495 FAX: (410)) 266-8912			AQS SITE CODE: SITE CODE:		Honeywell Hex Chrome Study			
Description:	OAM 2		Lab ID:	4082115-	·02				Sampled: 08/20/14 16:21	
Matrix:	Air		Sample V	olume:	21.05	5 m³			Received: 08/21/14 11:18	
Comments:	Start Time 8/19/14 16:57								Analysis Date: 08/25/14 13:58	
Hexavalent Chromium										
				<u>Results</u>				<u>MDL</u>		
<u>Analyte</u>		CAS Numbe	<u>er</u>	<u>ng/m³ Air</u>		Flag		<u>ng/m³ Air</u>		
Hexavalent Chromium		1854-02-99		0.0262				0.0036		

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Environmental Res	sources Management, Ir	າດ	FILE #:	FILE #: 3926.00			
75 Valley Stream F	Parkway, Suite 400			REPORT	REPORTED: 08/28/14 15:32		
Malvern, PA 19355	5			SUBMITT	ED: 08/20/14	to 08/22/14	
ATTN: Mr. Jeff Bo PHONE: (443) 8	oggs 03-8495 FAX: (41	0) 266-8912		AQS SITI CODE: SITE COI	E DE:	Honeywell Hex Chrome Study	
Description:	PAM-1	Lab ID:	4082115-03			Sampled: 08/20/14 18:00	
Matrix:	Air	Sample	Volume: 2	1.32 m³		Received: 08/21/14 11:18	
Comments:	Col 1 Start Time 8/19/14	18:19				Analysis Date: 08/25/14 12:25	
			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	0.0688		0.0036		

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Environmental Resources Management, Inc						FILE #: 3926.00			
75 Valley Stream Parkway, Suite 400						REPORTED: 08/28/14 15:32			32
Malvern, PA 19355						SUBMITTED: 08/20/14 to 08/22/14		to 08/22/14	
ATTN: Mr. Jeff Boggs						AQS SITE			
PHONE: (443) 8	03-8495 FAX: (410) 266-8912				SITECOL	DE:		Honeywell Hex Chrome Study
Description:	PAM-1D	L	.ab ID:	4082115-0	04				Sampled: 08/20/14 18:02
Matrix:	Air	S	Sample Volu	ume:	21.28	m³			Received: 08/21/14 11:18
Comments:	Col 2 Start Time 8/19/14	18:24							Analysis Date: 08/25/14 12:45
			He	xavalent	Chro	mium			
			Ē	<u>Results</u>				MDL	
<u>Analyte</u>		CAS Number	<u>ne</u>	g/m³ Air		<u>Flag</u>		<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99		0.0672				0.0036	

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Environmental Resources Management, Inc						FILE #: 3926.00			
75 Valley Stream I	Parkway, Suite 400				REPORTI	ED: 08/28/14 15	5:32		
Malvern, PA 1935	5				SUBMITT	ED: 08/20/14	to 08/22/14		
ATTN: Mr. Jeff Ba PHONE: (443) 8	oggs 03-8495 FAX: (410) 266-8912			AQS SITE	E DE:	Honeywell Hex Chrome Study		
Description:	PAM-2		Lab ID: 40821	15-05			Sampled: 08/20/14 17:42		
Matrix:	Air	:	Sample Volume:	21.2	5 m³		Received: 08/21/14 11:18		
Comments:	Start Time 8/19/14 18:06						Analysis Date: 08/25/14 14:28		
			Hexavale	nt Chro	omium				
			Results			MDL			
<u>Analyte</u>		CAS Number	<u>r ng/m³ A</u>	<u>ir</u>	<u>Flag</u>	<u>ng/m³ Air</u>			
Hexavalent Chromium		1854-02-99	0.0527			0.0036			

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Environmental Resources Management, Inc						FILE #: 3926.00			
75 Valley Stream F	Parkway, Suite 400			F	REPORTED: 08/28/14 15:32				
Malvern, PA 1935	5			S	UBMITTE	ED: 08/20/14	to 08/22/14		
ATTN: Mr. Jeff Br PHONE: (443) 8	oggs 03-8495 FAX: (410) 266-8912		ہر و	AQS SITE	E:	Honeywell Hex Chrome Study		
Description:	PAM-3	La	ab ID: 4082115-	06			Sampled: 08/20/14 17:22		
Matrix:	Air	Sa	ample Volume:	21.09	m³		Received: 08/21/14 11:18		
Comments:	Start Time 8/19/14 17:56						Analysis Date: 08/25/14 14:38		
			Hexavalent	Chron	nium				
			<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	0.0675			0.0036			

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Environmental Res	sources Management, Ind	;	FILE #:	FILE #: 3926.00			
75 Valley Stream F	^o arkway, Suite 400			REPORT	REPORTED: 08/28/14 15:32		
Malvern, PA 19355	5			SUBMITT	ED: 08/20/14	to 08/22/14	
ATTN: Mr. Jeff Bo PHONE: (443) 8	oggs 03-8495 FAX: (410) 266-8912		AQS SITE	E DE:	Honeywell Hex Chrome Study	
Description:	PAM-4	La	ab ID: 4082115-07			Sampled: 08/20/14 17:02	
Matrix:	Air	Sa	ample Volume: 2	1.08 m³		Received: 08/21/14 11:18	
Comments:	Start Time 8/19/14 17:36					Analysis Date: 08/25/14 14:48	
			Hexavalent Cl <u>Results</u>	nromium	MDL		
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>		
Hexavalent Chromium		1854-02-99	0.0514		0.0036		

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Environmental Resources Management, Inc						FILE #: 3926.00				
75 Valley Stream	Parkway, Su	uite 400					REPOR	TED:	08/28/14 15	:32
Malvern, PA 1938	55						SUBMIT	TED:	08/20/14	to 08/22/14
ATTN: Mr. Jeff PHONE: (443)	Boggs 803-8495	FAX:	(410) 266-8912				AQS SI	TE DDE:		Honeywell Hex Chrome Study
Description:	PAM-21			Lab ID:	408211	5-08				Sampled: 08/20/14 00:00
Matrix:	Air			Sample V	olume:	21.2	5 m	3		Received: 08/21/14 11:18
Comments:										Analysis Date: 08/25/14 14:57
				ŀ	lexavaler	nt Chro	mium			
					<u>Results</u>				MDL	
<u>Analyte</u>			CAS Numb	<u>er</u>	<u>ng/m³ Ai</u>	<u>r</u>	<u>Flag</u>		<u>ng/m³ Air</u>	
Hexavalent Chromium			1854-02-99		ND		U		0.0036	

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Page 20 of 32

Environmental Resources Management, Inc					FILE #:	3926.00		
75 Valley Stream Parkway, Suite 400					REPORTE	D: 08/28/14 15	:32	
Malvern, PA 1935	5				SUBMITTI	ED: 08/20/14	to 08/22/14	
ATTN: Mr. Jeff E PHONE: (443) 8	Boggs 803-8495 FAX	: (410) 266-8912			AQS SITE)E:	Honeywell Hex Chrome Study	
Description:	PAM-31		Lab ID: 408	82115-09			Sampled: 08/20/14 00:00	
Matrix:	Air		Sample Volume	21.09) m³		Received: 08/21/14 11:18	
Comments:							Analysis Date: 08/25/14 15:07	
Hexavalent Chromium Results MDI								
<u>Analyte</u>		CAS Numbe	er ng/m	<u>n³ Air</u>	<u>Flaq</u>	<u>ng/m³ Air</u>		
Hexavalent Chromium		1854-02-99	N	2	U	0.0036		

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Environmental Resources Management, Inc						FILE #: 3926.00			
75 Valley Stream F	75 Valley Stream Parkway, Suite 400						15:32		
Malvern, PA 19355	5				SUBMITT	ED: 08/20/1	4 to 08/22/14		
ATTN: Mr. Jeff Bo PHONE: (443) 8	oggs 03-8495 FAX: (410	266-8912			AQS SITE CODE: SITE COD	E:	Honeywell Hex Chrome Study		
Description:	OAM 1		Lab ID: 40827	/11-01			Sampled: 08/21/14 16:12		
Matrix:	Air	9	Sample Volume:	21.6	3 m³		Received: 08/22/14 14:37		
Comments:	Start Time 8/20/14 16:10						Analysis Date: 08/25/14 15:17		
			Hexaval	ent Chro	omium				
			Result	ž		<u>MDL</u>			
<u>Analyte</u>		CAS Number	<u>ng/m³ /</u>	<u>Air</u>	<u>Flag</u>	<u>ng/m³ A</u>	ir		
Hexavalent Chromium		1854-02-99	0.0214			0.0036			

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Environmental Res	sources Management, Ind	2	FILE #: 3926.00				
75 Valley Stream I	Parkway, Suite 400			REPORTED:	REPORTED: 08/28/14 15:32		
Malvern, PA 1935	5			SUBMITTED:	08/20/14 to	08/22/14	
ATTN: Mr. Jeff Br PHONE: (443) 8	oggs 03-8495 FAX: (410) 266-8912		AQS SITE	Ho	neywell Hex Chrome Study	
Description:	OAM 2	Lab ID:	4082711-02			Sampled: 08/21/14 16:32	
Matrix:	Air	Sample V	/olume: 21.6	51 m³		Received: 08/22/14 14:37	
Comments:	Start Time 8/20/14 16:31	- <u></u>			A	nalysis Date: 08/25/14 15:27	
		H	lexavalent 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	0.0270		0.0036		

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Environmental Res	5	FIL	FILE #: 3926.00				
75 Valley Stream F	75 Valley Stream Parkway, Suite 400						32
Malvern, PA 19355					SUBMITTED: 08/20/14 to 08/22/14		
ATTN: Mr. Jeff Bo PHONE: (443) 8	oggs 03-8495 FAX: (410) 266-8912		AQ SIT	S SITE	ŀ	Ioneywell Hex Chrome Study
Description:	PAM-1	Lab ID	4082711-)3			Sampled: 08/21/14 18:18
Matrix:	Air	Sampl	e Volume:	21.81	m³		Received: 08/22/14 14:37
Comments:	Col 1 Start Time 8/20/14	18:04					Analysis Date: 08/25/14 13:05
			Hexavalent	Chromiu	um		
			<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	0.0728			0.0036	

SEP 0 2 2014

Initials: CR

Eastern Research Group

NERG

Environmental Resources Management, Inc						FILE #: 3926.00			
75 Valley Stream F	75 Valley Stream Parkway, Suite 400						32		
Malvern, PA 19355	5			SI	UBMITTE	ED: 08/20/14	to 08/22/14		
ATTN: Mr. Jeff Bo PHONE: (443) 8	oggs 03-8495 FAX: (410)) 266-8912		A0 Si	QS SITE ODE: TECODI	E:	Honeywell Hex Chrome Study		
Description:	PAM-1D	Lab ID	: 4082711-0)4			Sampled: 08/21/14 18:23		
Matrix:	Air	Sample	e Volume:	21.86	m³		Received: 08/22/14 14:37		
Comments:	Col 2 Start Time 8/20/14	18:06					Analysis Date: 08/25/14 13:25		
			Hexavalent	Chromi	ium				
			<u>Results</u>			MDL			
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>		<u>Flaq</u>	<u>ng/m³ Air</u>			
Hexavalent Chromium		1854-02-99	0.0691			0.0036			

SEP 0 2 2014

Initials: CR

Eastern Research Group

NERG

Environmental Resources Management, I	nc	FILE #: 3926.00			
75 Valley Stream Parkway, Suite 400			REPORTED: 08/28/14 15:32		
Malvern, PA 19355			SUBMITTED: 08/20/14 to 08/22/14		
ATTN: Mr. Jeff Boggs PHONE: (443) 803-8495 FAX: (47	0) 266-8912		AQS SITE CODE: SITE CODE:	Н	oneywell Hex Chrome Study
Description: PAM-2	Lab ID:	4082711-05			Sampled: 08/21/14 17:52
Matrix: Air	Sample V	olume: 21.6	4 m³		Received: 08/22/14 14:37
Comments: Start Time 8/20/14 17:5	0				nalysis Date: 08/25/14 15:37
	H	lexavalent Chro <u>Results</u>	omium	MDL	
Analyte	CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>	
Hexavalent Chromium	1854-02-99	0.0636		0.0036	

SEP 0 2 2014

Initials: CR

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Environmental Re	sources Management, In	C		FILE #: 3	3926.00	
75 Valley Stream F	^D arkway, Suite 400			REPORTED): 08/28/14 15:3	32
Malvern, PA 1935	5			SUBMITTE	D: 08/20/14 to	o 08/22/14
ATTN: Mr. Jeff Br PHONE: (443) 8	oggs 03-8495 FAX: (410) 266-8912		AQS SITE	:: ⊦	loneywell Hex Chrome Study
Description:	PAM-3	Lab ID:	4082711-06			Sampled: 08/21/14 17:33
Matrix:	Air	Sample	Volume: 21.5	58 m³		Received: 08/22/14 14:37
Comments:	Start Time 8/20/14 17:35					Analysis Date: 08/25/14 15:47
			Hexavalent Chr <u>Results</u>	omium	<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	0.0360		0.0036	

SEP 0 2 2014

Initials: CR

Eastern Research Group

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Environmental Re	sources Management, Ind	•		FILE #: 392	26.00	
75 Valley Stream I	Parkway, Suite 400			REPORTED:	08/28/14 15:32	
Malvern, PA 1935	5			SUBMITTED:	08/20/14 to 0	8/22/14
ATTN: Mr. Jeff B PHONE: (443) 8	oggs 103-8495 FAX: (410) 266-8912		AQS SITE CODE: SITE CODE:	Hor	neywell Hex Chrome Study
Description:	PAM-4	Lab II	D: 4082711-07			Sampled: 08/21/14 17:16
Matrix:	Air	Samp	le Volume: 21.	68 m³		Received: 08/22/14 14:37
Comments:	Start Time 8/20/14 17:11				An	alysis Date: 08/25/14 15:57
			Hexavalent Chr	omium		
			<u>Results</u>		MDL	
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>	
Hexavalent Chromium	I	1854-02-99	0.0925		0.0036	

SEP 0 2 2014

Initials: CR

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Environmental Re	esources Man	ageme	ent, Inc				FILE #:	3926.00	
75 Valley Stream	Parkway, Suit	te 400					REPORT	ED: 08/29/14	13:34
Malvern, PA 1935	55						SUBMITT	ED: 08/20/	14 to 08/22/14
ATTN: Mr. Jeff E	Boggs						AQS SITE	E	
PHONE: (443)	803-8495	FAX:	(410) 266-8912				SITECO	DE:	Honeywell Hex Chrome Study
Description:	PAM-21			Lab ID:	408271	1-08			Sampled: 08/21/14 00:00
Matrix:	Air			Sample V	olume:	21.64	ł m³		Received: 08/22/14 14:37
Comments:						_			Analysis Date: 08/25/14 16:27
				н	exavaler	nt Chro	mium		
					<u>Results</u>			MDL	
<u>Analyte</u>			CAS Number	er	ng/m³ Ai	Ľ	<u>Flag</u>	ng/m³	Air
Hexavalent Chromium			1854-02-99		ND		U	0.0036	5

SEP 0 2 2014

Initials: CR

Eastern Research Group

NERG

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

Page 29 of 32

Environmental Re	esources Manager	nent, Inc				FILE #: 3	3926.00	
75 Valley Stream	Parkway, Suite 40	0				REPORTED	D: 08/29/14 13	:34
Malvern, PA 1935	5					SUBMITTE	D: 08/20/14	to 08/22/14
ATTN: Mr. Jeff E PHONE: (443)	3oggs 803-8495 FAX	: (410) 266-8912				AQS SITE	Ē:	Honeywell Hex Chrome Study
Description:	PAM-31		Lab ID:	4082711	09			Sampled: 08/21/14 00:00
Matrix:	Air		Sample V	olume:	21.58	3 m³		Received: 08/22/14 14:37
Comments:							_	Analysis Date: 08/25/14 16:36
			н	exavalen	t Chro	mium		
				<u>Results</u>			MDL	
<u>Analyte</u>		CAS Number	er	<u>ng/m³ Air</u>		<u>Flag</u>	<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99		ND		U	0.0036	

SEP 0 2 2014

Initials: CR

Eastern Research Group

NERG



September 3, 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 August 29, 2014. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #32569:

<u>SDG</u>

Fraction

4082746/4082759 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

-	169 pages-SF	3 DAY	ТАТ												Atta	achn	nent	t 1								<u> </u>													
	Level IV	L	DC #32	569	9 (E	RN	n	Mo	rris	svil	le,	NC		Ha	rbc	or P	oir	nt, I	MD	, H	exa	iva	len	t C	hrc	omi	um	M	oni	tor	ing	I) {							
LDC	SDG#	DATE REC'D	(3) DATE DUE	Cr((D7)	(VI) 614)														-						_														
Matri	x: 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
А	4082746/4082759	08/29/14	09/04/14	36.	0						 				-	-	<u> </u>	-		-			-										╞					┝	┡
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Total	A/CR			36	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	36

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:	Harbor Point, MD, Hexavalent Chromium Monitoring
Collection Date:	August 22 through August 26, 2014
LDC Report Date:	September 2, 2014
Matrix:	Air
Parameters:	Hexavalent Chromium
Validation Level:	EPA Level IV
Laboratory:	Eastern Research Group

Sample Delivery Group (SDG): 4082746/4082759

Sample Identification

OAM 1 (08/22/14)	PAM-2 (08/25/14)
OAM 2 (08/22/14)	PAM-3 (08/25/14)
PAM-1 (08/22/14)	PAM-4 (08/25/14)
PAM-1D (08/22/14)	PAM-21 (08/25/14)
PAM-2 (08/22/14)	PAM-31 (08/25/14)
PAM-3 (08/22/14)	OAM 1 (08/26/14)
PAM-4 (08/22/14)	OAM 2 (08/26/14)
PAM-21 (08/22/14)	PAM-1 (08/26/14)
PAM-31 (08/22/14)	PAM-1D (08/26/14)
OAM 1 (08/23/14)	PAM-2 (08/26/14)
OAM 2 (08/23/14)	PAM-3 (08/26/14)
PAM-1 (08/23/14)	PAM-4 (08/26/14)
PAM-1D (08/23/14)	PAM-21 (08/26/14)
PAM-2 (08/23/14)	PAM-31 (08/26/14)
PAM-3 (08/23/14)	PAM-1 (08/22/14)DUP
PAM-4 (08/23/14)	PAM-1D (08/22/14)DUP
PAM-21 (08/23/14)	PAM-1 (08/23/14)DUP
PAM-31 (08/23/14)	PAM-1D (08/23/14)DUP
OAM 1 (08/25/14)	PAM-1 (08/25/14)DUP
OAM 2 (08/25/14)	PAM-1D (08/25/14)DUP
PAM-1 (08/25/14)	
PAM-1D (08/25/14)	

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

Introduction

This data review covers 42 air samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per ASTM D7614 for Hexavalent Chromium.

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

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

The following are definitions of the data qualifiers:

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

I. Technical Holding Times

All technical holding time requirements were met.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met.

IV. Blanks

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

Samples PAM-31 (08/22/14), PAM-31 (08/23/14), PAM-31 (08/25/14), and PAM-31 (08/26/14) were identified as trip blanks. No hexavalent chromium was found.

Samples PAM-21 (08/22/14), PAM-21 (08/23/14), PAM-21 (08/25/14), and PAM-21 (08/26/14) 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 (08/22/14) and PAM-1D (08/22/14), samples PAM-1 (08/23/14) and PAM-1D (08/23/14), samples PAM-1 (08/25/14) and PAM-1D (08/26/14), and samples PAM-1 (08/26/14) and PAM-1D (08/26/14) 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 (08/22/14)	PAM-1D (08/22/14	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.0183	0.0207	12 (≤20)	-	-

	Concentrat	ion (ng/m³)			
Analyte	PAM-1 (08/23/14)	PAM-1D (08/23/14)	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.0312	0.0355	13 (≤20)	-	-

	Concentrat	ion (ng/m³)			
Analyte	PAM-1 (08/25/14)	PAM-1D (08/25/14)	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.0175	0.0182	4 (≤20)	-	-

	Concentrati	ion (ng/m³)			
Analyte	PAM-1 (08/26/14)	PAM-1D (08/26/14)	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.0186	0.0221	17 (≤20)	-	-

Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Data Qualification Summary - SDG 4082746/4082759

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 4082746/4082759

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 4082746/4082759

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

Date: <u>9/2/14</u>
Page:of
Reviewer: M-
2nd Reviewer:

METHOD: Hexavalent Chromium (ASTM D7614)

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

	Validation Area		, Comments
I.	Technical holding times	A	Sampling dates: 8/22/14 -8/23/14 and 8/25/14 - 8/2/14
11	Initial calibration	A	
111.	Calibration verification	SW A	
IV	Blanks	A	,
v	Matrix Spike/Matrix Spike Duplicates	N	es" Notrequired
VI.	Duplicates	A	DVP C
VII.	Laboratory control samples	A	LOSID
VIII.	Sample result verification	A	
IX.	Overall assessment of data	A	
Х.	Field duplicates	SW	(3, 4) $(12, 13)$ $(21, 22)$ $(30, 31)$
XI	Field blanks	ND	FB=817,26,35 TB=9,18,27,36

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

Validated Samples:

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



Method: Inorganics (EPA Method & (wer)								
Validation Area	Yes	No	NA	Findings/Comments				
I. Technical holding times								
All technical holding times were met.								
Cooler temperature criteria was met.								
II. Calibration								
Were all instruments calibrated daily, each set-up time?	/							
Were the proper number of standards used?								
Were all initial calibration correlation coefficients <a> 0.995?								
Were all initial and continuing calibration verification %Rs within the 99-110% QC limits?	V	ø	~					
Were titrant checks performed as required? (Level IV only)			/					
Were balance checks performed as required? (Level IV only)		<u></u>	/					
III. Blanks								
Was a method blank associated with every sample in this SDG?	/							
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		/						
IV. Matrix spike/Matrix spike duplicates and Duplicates								
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.		/						
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.			/					
Were the MS/MSD or duplicate relative percent differences (RPD) \leq 20% for waters and \leq 35% for soil samples? A control limit of \leq CRDL(\leq 2X CRDL for soil) was used for samples that were \leq 5X the CRDL, including when only one of the duplicate sample values were \leq 5X the CRDL.			/					
V. Laboratory control samples	·							
Was an LCS anaylzed for this SDG?	/							
Was an LCS analyzed per extraction batch?	/							
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% (85-115% for Method 300.0) QC limits?	/							
VI. Regional Quality Assurance and Quality Control								
Were performance evaluation (PE) samples performed?			/					
Were the performance evaluation (PE) samples within the acceptance limits?			1					



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

LDC#<u>32569A6</u> VALIDATION FINDINGS WORKSHEET Field Duplicates

Page:	1	_of_	1
Reviewer:	ł	< <u>K</u>	
2nd Reviewer:		or	\leq

Inorganics: Method See Cover

	Concentra		Qual.	
Analyte	3	4	RPD (≤20)	(>5xMDL)
Hexavalent Chromium	0.0183	0.0207	12	

	Concentra		Qual.	
Analyte	12	13	RPD (≤20)	(>5xMDL)
Hexavalent Chromium	0.0312	0.0355	13	

	Concentra		Qual.	
Analyte	21	22	RPD (≤20)	(>5xMDL)
Hexavalent Chromium	0.0175	0.0182	4	

	Concentra	tion (ng/m³)		Qual.
Analyte	30	31	RPD (≤20)	(>5xMDL)
Hexavalent Chromium	0.0186	0.0221	17	

\\LDCFILESERVER\Validation\FIELD DUPLICATES\FD_inorganic\32569A6.wpd

LDC #: 325691A6

Validation Findings Worksheet Initial and Continuing Calibration Calculation Verification

Page: Reviewer: 2nd Reviewer

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

The correlation coefficient (r) for the calibration of C_{r} was recalculated.Calibration date: $\frac{8(27)}{14}$

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

				(mAU*min)	Recalculated	Reported	Acceptable
Type of analysis	Analyte	Standard	Conc. (ng/mL)	Area	r or r ²	r or r ²	(Y/N)
Initial calibration		s1	0.05	0.0000149			
	Hexavalent	s2	0.10	0.0000361	0.99988	0.99988	Y
	Chromium	s3	0.20	0.0000783			
		s4	0.50	0.0002077		1	
		s5	1.00	0.0004036			
		s6	2.00	0.0008351			L
Calibration verification	\downarrow	ссу	0.5059 ng/mL	0.5 ng/mL	101.2	101.2	Y
Calibration verification	<u> </u>		<u> </u>	-	-	-	H
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 #32569AU

VALIDATION FINDINGS WORKSHEET Level IV Recalculation Worksheet

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



METHOD: Inorganics, Method See Cover

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

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

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

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

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

Found =

			(ng/m ³) Found/S	(ng/m ³) True / D	Recalculated	Reported	Acceptable
Sample ID	Type of Analysis	Element	(units)	(units)	%R / RPD	%R / RPD	(Y/N)
LCS	Laboratory control sample	Cr6+	(.081 mg/ml	1.00 ng/ml	108	108	Y
~	Matrix spike sample	-	(SSR-SR)		-	(~
3/4	Duplicate sample	Cr 6+	0.0183	0.0207	12.31	12.41	Y Ye be n/z/14

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.

METHOD: Inorganics, Method See Cover

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



Are results within the calibrated range of the instruments?

Are all detection limits below the CRQL?

Compound (analyte) results for <u>Hexavalent Chromium</u> reported with a positive detect were recalculated and verified using the following equation:

 $\frac{\text{Concentration}}{(\text{Area})(\text{x Gefficient}) + \text{Constant}} \frac{\text{Final Volume}}{\text{Sample Wind}} \frac{\text{Recalculation:}}{(0.0000203 \text{ mAU*min})(\frac{40000}{24}2451.434) + 0.004017} \frac{(10 \text{ ml})}{(21.39 \text{ m}^3)} = 0.025219 \text{ ng}/\text{m}^3}$ Recalculation: Concentration =

#	Sample ID	Analyte	Reported Concentration (ng/m³)	Calculated Concentration (ng/m³)	Acceptable (Y/N)
	1	Cr6+	0.0204	0.0205	Ý
	2	Cr6+	0.0179	0.0180	
	3	Cr6+	0.0183	0.0183	
	4	Cr6+	0.0207	0.0207	
	5	Cr6+	0.0180	0.0181	
	6	Cr6+	0.0252	0.0254	
	7	Cr6+	0.0237	0.0238	
	10	Cr6+	0.0323	0.0323	
	11	Cr6+	0.0496	0.0497	
	12	Cr6+	0.0312	0.0312	
	13	Cr6+	0.0355	0.0355	
	14	Cr6+	0.0268	0.0269	
	15	Cr6+	0.0390	0.0392	
	16	Cr6+	0.0314	0.0315	
	19	Cr6+	0.0100	0.0100	
	20	Cr6+	0.0098	0.0098	
	21	Cr6+	0.0175	0.0175	
	22	Cr6+	0.0182	0.0183	
	23	Cr6+	0.203	0.203	
	24	Cr6+	0.0252	0.0251	
	25	Cr6+	0.0191	0.0191	
	28	Cr6+	0.0103	0.0103	\downarrow

Note:

VALIDATION FINDINGS WORKSHEET

Sample Calculation Verification

Page: 2_of_2_ Reviewer: <u>4</u> 2nd reviewer: <u>0</u>

Calculated Reported Concentration Concentration Acceptable (Y/N) # Sample ID Analyte (ng/m³) (ng/m³) V 0.0107 0.0107 29 Cr6+ 0.0186 0.0186 30 Cr6+ 31 Cr6+ 0.0221 0.0222 0.0195 32 Cr6+ 0.0195 0.0163 0.0162 33 Cr6+ 34 Cr6+ 0.0252 0.0252

Note:__

NERC	Ĵ	CEF	RTIFICATE	OF ANA	LYSI	S			
Environmental Re	sources Mana	gement, Inc		FILE	FILE #: 3926.00				
75 Valley Stream	Parkway, Suite	e 400		REP	REPORTED: 08/29/14 13:37				
Malvern, PA 1935	5			SUB	MITTED:	08/26/14 to 08/27/14			
ATTN: Mr. Jeff B	oggs								
PHONE: (443) 8	303-8495 I	FAX: (410) 266-8912		SITE	E: CODE:	He	oneywell Hex Chrome Study		
Description:	OAM 1		Lab ID: 4082	2746-01			Sampled: 08/22/14 16:09	_	
Matrix:	Air		Sample Volume:	21.41	m³		Received: 08/26/14 16:05		
Comments:	Start Time 8/2	21/14 16:22				A	malysis Date: 08/27/14 13:24	_	
			Hexava	lent Chromiur	n				
			Result	<u>ts</u>		MDL			
<u>Analyte</u>		CAS Numb	<u>er ng/m³</u>	<u>Air</u> <u>F</u>	ag	<u>ng/m³ Air</u>			
Hexavalent Chromium	1	1854-02-99	•02-99 0.0204		0.0036				

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Environmental Res	sources Management, Ind	C	FILE #: 3926.00			
75 Valley Stream	^o arkway, Suite 400		REPORTED: 08/29/14 13:37			
Malvern, PA 1935	5		SUBMITTED: 08/26/14 to 08/27/14			
ATTN: Mr. Jeff B PHONE: (443) 8	oggs 03-8495 FAX: (410) 266-8912	AQS SITE STECODE: Honeywell Hex Chrome Study			
Description:	OAM 2	Lab ID:	4082746-02			Sampled: 08/22/14 16:31
Matrix:	Air	Sample \	/olume: 21.3	4 m³		Received: 08/26/14 16:05
Comments:	Start Time 8/21/14 16:48	Moth observed in cartrid	ge			Analysis Date: 08/27/14 13:34
		I	Hexavalent Chro	omium		
			<u>Results</u>		MDL	
Analyte CAS Number ng/m³ Air					<u>ng/m³ Air</u>	
Hexavalent Chromium	1854-02-99		0.0036			

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Environmental Res	sources Management, In	c		FILE #: 3926.00			
75 Valley Stream F	^p arkway, Suite 400			REPORTED: 08/29/14 13:37			
Malvern, PA 19355	i			SUBMITTED: 08/26/14 to 08/27/14			
ATTN: Mr. Jeff Bo	oggs			AQS SITE			
PHONE: (443) 8	03-8495 FAX: (410)) 266-8912			SITE CODE:		Honeywell Hex Chrome Study
Description:	PAM-1	Lab	ID: 4082746-	·03			Sampled: 08/22/14 18:20
Matrix:	Air	Sam	ple Volume:	21.52	m³		Received: 08/26/14 16:05
Comments:	Col 1 Start Time 8/21/14	18:25					Analysis Date: 08/27/14 12:03
			Hexavalent	Chro	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	9 0.0183			0.0036	

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Environmental Re	sources Mar	nagemer	nt, Inc			FILE #: 3926.00					
75 Valley Stream	ite 400					REPORTED: 08/29/14 13:37					
Malvern, PA 1935	5						SUBMITTED: 08/26/14 to 08/27/14				
ATTN: Mr. Jeff B PHONE: (443) 8	loggs 303-8495	FAX:	(410) 266-8912				AQS SITE	I	Honeywell Hex Chrome Study		
Description:	PAM-1D			Lab ID:	408274	6-04			Sampled: 08/22/14 18:26		
Matrix:	Air			Sample V	olume:	21.52	2 m³		Received: 08/26/14 16:05		
Comments:	Col 2 Start T	"ime 8/2	l/14 18:32						Analysis Date: 08/27/14 12:23		
				F	łexavaler	nt Chro	mium				
					<u>Results</u>			<u>MDL</u>			
Analyte CAS			CAS Number	<u>er</u>	<u>ng/m³ Ai</u>	r	<u>Flag</u>	<u>ng/m³ Air</u>			
Hexavalent Chromium 185					0.0207			0.0036			

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Environmental Res	sources Management, Ind	2	FILE #: 392	FILE #: 3926.00				
75 Valley Stream F	^D arkway, Suite 400		REPORTED:	REPORTED: 08/29/14 13:37				
Malvern, PA 1935	5		SUBMITTED:	TED: 08/26/14 to 08/27/14				
ATTN: Mr. Jeff Be PHONE: (443) 8	oggs 03-8495 FAX: (410) 266-8912	AQS SITE SITECODE:		ł	Honeywell Hex Chrome Study		
Description:	PAM-2	Lab ID:	4082746-05			Sampled: 08/22/14 17:52		
Matrix:	Air	Sample	Volume: 21.	47 m³		Received: 08/26/14 16:05		
Comments:	Start Time 8/21/14 18:01					Analysis Date: 08/27/14 14:04		
Hexavalent Chromium								
			<u>Results</u>		<u>MDL</u>			
Analyte CAS Number ng/m³ A				<u>Flag</u>	<u>ng/m³ Air</u>			
Hexavalent Chromium		0.0180		0.0036				

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Environmental Resources Management, Inc						FILE #: 3926.00				
75 Valley Stream P	arkway, Suite 400				REPORT	TED:	08/29/14 13:3	37		
Malvern, PA 19355					SUBMIT	TED:	08/26/14 t	o 08/27/14		
ATTN: Mr. Jeff Bo PHONE: (443) 80	9gs)3-8495 FAX: (410)) 266-8912			AQS SIT	E DE:	ŀ	Honeywell Hex Chrome Study		
Description:	PAM-3		Lab ID:	4082746-06				Sampled: 08/22/14 17:31		
Matrix:	Air	9	Sample Volu	u me: 21	.45 m ^a	3		Received: 08/26/14 16:05		
Comments:	Start Time 8/21/14 17:41							Analysis Date: 08/27/14 14:14		
			He	xavalent Ch	romium					
			E	<u>Results</u>			<u>MDL</u>			
<u>Analyte</u>		CAS Number	: <u>n</u> a	g/m³ Air	<u>Flag</u>		<u>ng/m³ Air</u>			
Hexavalent Chromium		1854-02-99		0.0252			0.0036			

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75 Valley Stream I	Parkway, Suite 400		REPORTE	REPORTED: 08/29/14 13:37		
Malvern, PA 1935	5			SUBMITTE	ED: 08/26/14	to 08/27/14
ATTN: Mr. Jeff B PHONE: (443) 8	oggs 103-8495 FAX: (410) 266-8912		AQS SITE CODE: SITE CODI	E:	Honeywell Hex Chrome Study
Description:	PAM-4	Lab ID:	4082746-07			Sampled: 08/22/14 17:12
Matrix:	Air	Sample	Volume: 2:	1.42 m³		Received: 08/26/14 16:05
Comments:	Start Time 8/21/14 17:24					Analysis Date: 08/27/14 14:24
			Hexavalent Cl <u>Results</u>	nromium	MDL	
Analyte		CAS Number	ng/m³ Air	<u>Flag</u>	<u>ng/m³ Air</u>	
Hexavalent Chromium	I	1854-02-99	0.0237		0.0036	

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Environmental Resources Management, Inc					. E #: 3	926.00	
75 Valley Stream	Parkway, Suite 400			RE	PORTED	: 08/29/14 13 :	37
Malvern, PA 1935	5			SL	IBMITTED	D: 08/26/14	to 08/27/14
ATTN: Mr. Jeff B	loggs			AC	QS SITE		
PHONE: (443) 8	303-8495 FAX:	(410) 266-8912		Ş	E CODE	:	Honeywell Hex Chrome Study
Description:	PAM-21		Lab ID: 408274	46-08			Sampled: 08/22/14 00:00
Matrix:	Air		Sample Volume:	21.47	m³		Received: 08/26/14 16:05
Comments:							Analysis Date: 08/27/14 14:33
			Hexavale	nt Chromi	um		
			<u>Results</u>			MDL	
<u>Analyte</u>		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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Environmental Re	esources Manag	jeme	ent, Inc				FILE #:	3926	6.00	
75 Valley Stream	Parkway, Suite	400					REPORT	ED:	08/29/14 13	:37
Malvern, PA 1935	5						SUBMITT	TED:	08/26/14	to 08/27/14
ATTN: Mr. Jeff E	Boggs						AQS SIT	E		
PHONE: (443)	803-8495 F	AX:	(410) 266-8912				SITECO	DE:		Honeywell Hex Chrome Study
Description:	PAM-31			Lab ID:	4082746	5-09				Sampled: 08/22/14 00:00
Matrix:	Air			Sample V	/olume:	21.4	5 m³			Received: 08/26/14 16:05
Comments:										Analysis Date: 08/27/14 14:43
				ŀ	Hexavalen	t Chro	mium			
					<u>Results</u>				<u>MDL</u>	
<u>Analyte</u>			CAS Number	<u>er</u>	ng/m³ Air	<u>r</u>	Flag		<u>ng/m³ Air</u>	
Hexavalent Chromium			1854-02-99		ND		U		0.0036	

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Environmental Resources Management, Inc						FILE #: 3926.00			
75 Valley Stream F	Parkway, Suite 400					REPORTI	ED:	08/29/14 13	:37
Malvern, PA 1935	5					SUBMITT	ED:	08/26/14	to 08/27/14
ATTN: Mr. Jeff B	oggs					AQS SITE	E		
PHONE: (443) 8	03-8495 FAX: (410) 266-8912				SITECOL	DE:		Honeywell Hex Chrome Study
Description:	OAM 1	L	Lab ID:	4082746	-10				Sampled: 08/23/14 16:14
Matrix:	Air	S	Sample Vo	olume:	21.48	3 m³			Received: 08/26/14 16:05
Comments:	Start Time 8/22/14 16:23								Analysis Date: 08/27/14 14:53
			Н	lexavalent	t Chro	mium			
				<u>Results</u>				MDL	
Analyte		CAS Number		<u>ng/m³ Air</u>		<u>Flaq</u>		<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99		0.0323				0.0036	

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Environmental Resources Management, Inc					FILE #: 3926.00		
75 Valley Stream F	Parkway, Suite 400				REPORT	ED: 08/29/14 13	:37
Malvern, PA 1935	5				SUBMITT	ED: 08/26/14	to 08/27/14
ATTN: Mr. Jeff B	oggs				AQS SITE		
PHONE: (443) 8	03-8495 FAX: (410) 266-8912			SITECOL	DE:	Honeywell Hex Chrome Study
Description:	OAM 2	Lab	ID: 408	2746-11			Sampled: 08/23/14 16:30
Matrix:	Air	Sam	nple Volume	21.4	6 m³		Received: 08/26/14 16:05
Comments:	Start Time 8/22/14 16:39						Analysis Date: 08/27/14 15:03
			Hexava	lent Chro	mium		
			<u>Resu</u>	<u>lts</u>		MDL	
<u>Analyte</u>		CAS Number	<u>ng/m</u>	³ Air	<u>Flag</u>	<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99	0.04	16		0.0036	

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Environmental Res	sources Management, In	с	FILE #:	FILE #: 3926.00				
75 Valley Stream F	75 Valley Stream Parkway, Suite 400						37	
Malvern, PA 19355	5			SUBMI	TED:	08/26/14 te	08/27/14	
ATTN: Mr. Jeff Bo PHONE: (443) 8	oggs 03-8495 FAX: (410)) 266-8912		AQS SI CODE: SITE CO	TE DDE:	F	ioneywell Hex Chrome Study	
Description:	PAM-1	Lab ID:	4082746-1	.2			Sampled: 08/23/14 17:47	
Matrix:	Air	Sample	Volume:	21.02 m	3		Received: 08/26/14 16:05	
Comments:	Col 1 Start Time 8/22/14	18:26					Analysis Date: 08/27/14 12:42	
			Hexavalent <u>Results</u>	Chromium		<u>MDL</u>		
<u>Analyte</u>		<u>CAS Number</u>	<u>ng/m³ Air</u>	<u>Flag</u>		<u>ng/m³ Air</u>		
Hexavalent Chromium		1854-02-99	0.0312			0.0036		

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Environmental Re	sources Management, In	c		FILE #: 3926	3.00	
75 Valley Stream I	Parkway, Suite 400			REPORTED:	08/29/14 13:37	
Malvern, PA 1935	5			SUBMITTED:	08/26/14 to 08/2	//14
ATTN: Mr. Jeff B PHONE: (443) 8	oggs 303-8495 FAX: (410)) 266-8912		AQS SITE CODE: SITE CODE:	Honeyv	/ell Hex Chrome Study
Description:	PAM-1D	Lab ID:	4082746-13		S	ampled: 08/23/14 17:46
Matrix:	Air	Sample V	'olume: 20.9) m ³	R	e ceived: 08/26/14 16:05
Comments:	Col 2 Start Time 8/22/14	18:33			Analys	sis Date: 08/27/14 13:02
		ŀ	lexavalent Chro	omium		
			<u>Results</u>		MDL	
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flaq</u>	<u>ng/m³ Air</u>	
Hexavalent Chromium	I	1854-02-99	0.0355		0.0036	

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Environmental Re	Environmental Resources Management, Inc						FILE #: 3926.00			
75 Valley Stream	Parkway, Suite 400					REPORT	ED: 0	8/29/14 13	:37	
Malvern, PA 1935	5					SUBMITT	FED:	08/26/14	to 08/27/14	
ATTN: Mr. Jeff B	oggs					AQS SITE	E			
PHONE: (443) 8	03-8495 FAX: (410) 266-8912				SITECOL	DE:		Honeywell Hex Chrome Study	
Description:	PAM-2		Lab ID:	4082746	5-14	, , , , , , , , , , , , , , , , , , ,			Sampled: 08/23/14 17:28	
Matrix:	Air		Sample V	olume:	21.1	3 m³			Received: 08/26/14 16:05	
Comments:	Start Time 8/22/14 18:00								Analysis Date: 08/27/14 16:22	
			ŀ	lexavalen	t Chro	mium				
				<u>Results</u>				MDL		
<u>Analyte</u>		CAS Numbe	<u>er</u>	<u>ng/m³ Air</u>		<u>Flag</u>	ļ	ng/m³ Air		
Hexavalent Chromium		1854-02-99		0.0268				0.0036		

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Environmental Res	sources Management, In	c		FILE #: 392	26.00	
75 Valley Stream F	^o arkway, Suite 400			REPORTED:	08/29/14 13:37	
Malvern, PA 19355	5			SUBMITTED:	08/26/14 to 08/27/14	
ATTN: Mr. Jeff Bo PHONE: (443) 8	oggs 03-8495 FAX: (410) 266-8912		AQS SITE CODE: SITE CODE:	Honeywell Hex Chrome Stud	ły
Description:	PAM-3	Lab IC): 4082746-15		Sampled: 08/23/14 17	18
Matrix:	Air	Sampl	e Volume: 21.3	31 m³	Received: 08/26/14 16	:05
Comments:	Start Time 8/22/14 17:37				Analysis Date: 08/27/14 15	:23
			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	0.0390		0.0036	

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Environmental Res	sources Management, Ind	•		FILE #: 3926.00				
75 Valley Stream F	Parkway, Suite 400				REPORTE	E D: 08/	/29/14 13	:37
Malvern, PA 19355	5				SUBMITT	ED: C)8/26/14	to 08/27/14
ATTN: Mr. Jeff Bo PHONE: (443) 8	oggs 03-8495 FAX: (410) 266-8912			AQS SITE	E DE:		Honeywell Hex Chrome Study
Description:	PAM-4	Lab II	D: 4082746	-16				Sampled: 08/23/14 15:06
Matrix:	Air	Samp	le Volume:	21.38	3 m³			Received: 08/26/14 16:05
Comments:	Start Time 8/22/14 17:20							Analysis Date: 08/27/14 15:33
			Hexavalen	t Chro	mium			
	•		<u>Results</u>				<u>MDL</u>	
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>		<u>Flag</u>	<u>nc</u>	<u>ı/m³ Air</u>	
Hexavalent Chromium		1854-02-99	0.0314				0.0036	

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Environmental Resources Managemer	nt, Inc	FILE #: 3926.00			
75 Valley Stream Parkway, Suite 400			REPORTED:	08/29/14 13:37	
Malvern, PA 19355			SUBMITTED:	08/26/14 to	08/27/14
ATTN: Mr. Jeff Boggs			AQS SITE		
PHONE: (443) 803-8495 FAX:	(410) 266-8912		SITE CODE:	Ho	neywell Hex Chrome Study
Description: PAM-21	Lab ID:	4082746-17			Sampled: 08/23/14 00:00
Matrix: Air	Sample V	/olume: 21.1	3 m³		Received: 08/26/14 16:05
Comments:				A	nalysis Date: 08/27/14 16:03
	H	Hexavalent Chro	omium		
		Results		<u>MDL</u>	
<u>Analyte</u>	CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>	
Hexavalent Chromium	1854-02-99	ND	U	0.0036	

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Environmental Re	nvironmental Resources Management, Inc						FILE #: 3926.00			
75 Valley Stream	Parkway, Suite	400					REPORTED: 08/29/14 13:37			:37
Malvern, PA 1935	5						SUBMITT	SUBMITTED: 08/26/14 to 08/27/14		
ATTN: Mr. Jeff B PHONE: (443) 8	8oggs 803-8495 (AX: (410) 266-8912				AQS SITE	E DE:		Honeywell Hex Chrome Study
Description:	PAM-31			Lab ID:	4082746	5-18				Sampled: 08/23/14 00:00
Matrix:	Air			Sample V	/olume:	21.3	l m³	l		Received: 08/26/14 16:05
Comments:										Analysis Date: 08/27/14 16:13
				ł	Hexavalen	t Chro	mium		MDI	
					Results				MDL	
<u>Analyte</u>			<u>CAS Numbe</u>	<u>er</u>	<u>ng/m³ Air</u>	5	Flag		<u>ng/m³ Air</u>	
Hexavalent Chromium			1854-02-99		ND		U		0.0036	

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Environmental Res	sources Management, In	c	Environmental Resources Management, Inc							
75 Valley Stream F	Parkway, Suite 400				R	REPORTED: 08/29/14 13:37			37	
Malvern, PA 19355	5				S	SUBMITTED: 08/26/14 to 08/27/14			to 08/27/14	
ATTN: Mr. Jeff B		A	AQS SITE							
PHONE: (443) 8	03-8495 FAX: (410) 266-8912			Ş	ITE COD	DE:		Honeywell Hex Chrome Study	
Description:	OAM 1	Lab I	(D:	4082746-19					Sampled: 08/25/14 16:19	
Matrix:	Air	Samp	ple Vo	lume: 2:	l.79	m³			Received: 08/26/14 16:05	
Comments:	Start Time 8/24/14 16:06								Analysis Date: 08/28/14 13:09	
			He	exavalent Ch	nrom	ium				
				<u>Results</u>				<u>MDL</u>		
<u>Analyte</u>		CAS Number	r	ng/m³ Air		<u>Flaq</u>		<u>ng/m³ Air</u>		
Hexavalent Chromium		1854-02-99		0.0100				0.0036		

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Environmental Re	sources Management, Ir	nc		FIL	FILE #: 3926.00			
75 Valley Stream F	^o arkway, Suite 400			REI	PORTED:	: 08/29/14 13:3	7	
Malvern, PA 1935	5			SU	BMITTED	: 08/26/14 to	08/27/14	
ATTN: Mr. Jeff Be PHONE: (443) 8	oggs 03-8495 FAX: (41	0) 266-8912		AQ: CO SIT	S SITE DE: E CODE:	н	oneywell Hex Chrome Study	
Description:	OAM 2		Lab ID: 4082746-2	20			Sampled: 08/25/14 16:35	
Matrix:	Air		Sample Volume:	21.71	m³		Received: 08/26/14 16:05	
Comments:	Start Time 8/24/14 16:27	1					Analysis Date: 08/28/14 13:19	
			Hexavalent	Chromiu	ım			
			<u>Results</u>			MDL		
<u>Analyte</u>		CAS Numbe	<u>er ng/m³ Air</u>	ļ	Flag	<u>ng/m³ Air</u>		
Hexavalent Chromium		1854-02-99	0.0098			0.0036		

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Environmental Re	sources Mar	nagemer	nt, Inc				FILE #: 3926.00					
75 Valley Stream	75 Valley Stream Parkway, Suite 400							REPORTED: 08/29/14 13:37				
Malvern, PA 1935	5					SUBMITTED: 08/26/14 to 08/27/14						
ATTN: Mr. Jeff Boggs AQS SITE												
PHONE: (443) 8	303-8495	FAX:	(410) 266-8912				SITE CODE:	ł	Honeywell Hex Chrome Study			
Description:	PAM-1			Lab ID:	408274	6-21			Sampled: 08/25/14 18:19			
Matrix:	Air			Sample V	olume:	22.26	5 m ³		Received: 08/26/14 16:05			
Comments:	Col 1 Start 1	fime 8/24	1/14 17:35						Analysis Date: 08/28/14 11:48			
				F	lexavaler	nt Chro	mium					
					<u>Results</u>			<u>MDL</u>				
<u>Analyte</u>			CAS Numb	<u>er</u>	<u>ng/m³ Ai</u>	<u>r</u>	<u>Flag</u>	<u>ng/m³ Air</u>				
Hexavalent Chromium	1		1854-02-99		0.0175			0.0036				

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Environmental Res	sources Management, Ir	IC .	FILE #:	FILE #: 3926.00			
75 Valley Stream F	Parkway, Suite 400			REPORT	REPORTED: 08/29/14 13:37		
Malvern, PA 1935	5			SUBMIT	TED: 08/26/	14 to 08/27/14	
ATTN: Mr. Jeff Bo PHONE: (443) 8	oggs 03-8495 FAX: (41)	D) 266-8912			E DE:	Honeywell Hex Chrome Study	
Description:	PAM-1D	Lab	ID: 4082746-2	22		Sampled: 08/25/14 18:20	
Matrix:	Air	Sam	ple Volume:	22.26 m	3	Received: 08/26/14 16:05	
Comments:	Col 2 Start Time 8/24/14	17:36				Analysis Date: 08/28/14 12:08	
			Hexavalent <u>Results</u>	Chromium	MDI		
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³</u>	Air	
Hexavalent Chromium		1854-02-99	0.0182		0.003	6	

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75 Valley Stream I	Parkway, Suite 400			REPORT	ED: 08/29/14 13	:37	
Malvern, PA 1935	5		SUBMITT	SUBMITTED: 08/26/14 to 08/27/14			
ATTN: Mr. Jeff B	oggs		AQS SITE	AQS SITE			
PHONE: (443) 8	03-8495 FAX: (410) 266-8912		SITECOL	DE:	Honeywell Hex Chrome Study	
Description:	PAM-2	Lab ID	4082746-23			Sampled: 08/25/14 17:55	
Matrix:	Air	Sample	e Volume: 22	.07 m³		Received: 08/26/14 16:05	
Comments:	Start Time 8/24/14 17:23					Analysis Date: 08/28/14 13:49	
			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	0.0203		0.0036		

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Environmental Res	sources Management, In	C		FILE #: 3926.00			
75 Valley Stream F	Parkway, Suite 400				REPORTED: 08/29/14 13:37		3:37
Malvern, PA 19355					SUBMITTED: 08/26/14 to 08/27/		to 08/27/14
ATTN: Mr. Jeff B			AQS SITE	E			
PHONE: (443) 8	03-8495 FAX: (410) 266-8912			SITECOL)E:	Honeywell Hex Chrome Study
Description:	PAM-3	Lab I	D: 408274	6-24			Sampled: 08/25/14 17:31
Matrix:	Air	Samp	ole Volume:	21.86	5 m³		Received: 08/26/14 16:05
Comments:	Start Time 8/24/14 17:14						Analysis Date: 08/28/14 13:58
			Hexavaler	nt Chro	mium		
			<u>Results</u>			MDL	
<u>Analyte</u>		CAS Number	<u>ng/m³ Ai</u>	r	<u>Flag</u>	ng/m³ Air	
Hexavalent Chromium		1854-02-99	0.0252			0.0036	

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Initials: CR

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Environmental Res	sources Management, Ind	;	FILE #:	FILE #: 3926.00			
75 Valley Stream F	Parkway, Suite 400			REPORT	REPORTED: 08/29/14 13:37		
Malvern, PA 19355	5			SUBMITT	SUBMITTED: 08/26/14 to 08/27/14		
ATTN: Mr. Jeff Bo PHONE: (443) 8	oggs 03-8495 FAX: (410) 266-8912		AQS SITE CODE: SITE COL	E DE:	Honeywell Hex Chrome Study	
Description:	PAM-4	Lab 1	ID: 4082746-25	5		Sampled: 08/25/14 17:15	
Matrix:	Air	Sam	ple Volume: 2	21.78 m³		Received: 08/26/14 16:05	
Comments:	Start Time 8/24/14 17:02					Analysis Date: 08/28/14 14:08	
			Hexavalent C	hromium			
			<u>Results</u>		MDL		
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flaq</u>	<u>ng/m³ Air</u>		
Hexavalent Chromium		1854-02-99	0.0191		0.0036		

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75 Valley Stream	Parkway, Suite 400)		RE	REPORTED: 08/29/14 13:37		
Malvern, PA 1935	Malvern, PA 19355						to 08/27/14
ATTN: Mr. Jeff E	loggs			AC	AQS SITE		
PHONE: (443) 8	803-8495 FAX	(410) 266-8912		Si	ECODE:		Honeywell Hex Chrome Study
Description:	PAM-21		Lab ID: 408274	16-26			Sampled: 08/25/14 00:00
Matrix:	Air		Sample Volume:	22.07	m³		Received: 08/26/14 16:05
Comments:							Analysis Date: 08/28/14 14:18
			Hexavale	nt Chromi	um		
			<u>Results</u>			<u>MDL</u>	
<u>Analyte</u>		CAS Numbe	er <u>ng/m³ A</u>	ir	<u>Flag</u>	<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99	ND		U	0.0036	

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75 Valley Stream	Parkway, Suite	e 400					REPORT	ED:	08/29/14 13:	37
Malvern, PA 1935	5						SUBMITT	ED:	08/26/14	to 08/27/14
ATTN: Mr. Jeff E PHONE: (443) {	3oggs 803-8495	FAX:	(410) 266-8912				AQS SITI	E DE:	I	Honeywell Hex Chrome Study
Description:	PAM-31		· · · · · · · · · · · · · · · · · · ·	Lab ID:	4082746	5-27				Sampled: 08/25/14 00:00
Matrix:	Air			Sample \	Volume:	21.86	5 m³			Received: 08/26/14 16:05
Comments:										Analysis Date: 08/28/14 14:28
					Hexavalen	t Chro	mium			
					<u>Results</u>				MDL	
<u>Analyte</u>			CAS Numbe	<u>er</u>	<u>ng/m³ Air</u>		Flag		<u>nq/m³ Air</u>	
Hexavalent Chromium			1854-02-99		ND		U		0.0036	

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Environmental Re	sources Management, Ir	nc		FILE #: 3926.00				
75 Valley Stream I	Parkway, Suite 400			REPORTED:	08/29/14 13:37			
Malvern, PA 1935	5			SUBMITTED: 08/26/14 to 08/27/14				
ATTN: Mr. Jeff B PHONE: (443) 8	oggs 03-8495 FAX: (41	0) 266-8912		AQS SITE CODE: SITE CODE:	neywell Hex Chrome Study			
Description:	OAM 1	Lab ID:	4082759-01			Sampled: 08/26/14 16:24		
Matrix:	Air	Sample	Volume: 21.	55 m³		Received: 08/27/14 16:39		
Comments:	Start Time 8/25/14 16:27	,			Ar	alysis Date: 08/28/14 14:38		
			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	0.0103		0.0036			

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75 Valley Stream F	Parkway, Suite 400			RI	REPORTED: 08/29/14 13:37			
Malvern, PA 19355	5			SI	UBMITTE	ED: 08/26/14	to 08/27/14	
ATTN: Mr. Jeff Bo PHONE: (443) 8	oggs 03-8495 FAX: (41)	0) 266-8912		A0 Si	QS SITE ODE: TECOD	E:	Honeywell Hex Chrome Study	
Description:	OAM 2	Lab	ID: 4082759-	-02			Sampled: 08/26/14 16:37	
Matrix:	Air	Sam	nple Volume:	21.45	m³		Received: 08/27/14 16:39	
Comments:	Start Time 8/25/14 16:47						Analysis Date: 08/28/14 14:48	
			Hexavalent	: Chromi	ium			
			<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	0.0107			0.0036		

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75 Valley Stream F	Parkway, Suite 400					REPORTI	ED: 08	8/29/14 13:	37
Malvern, PA 19355	5					SUBMITT	TED:	08/26/14 t	to 08/27/14
ATTN: Mr. Jeff Bo PHONE: (443) 8	oggs 03-8495 FAX: (410) 266-8912				AQS SITE	E DE:	ł	Honeywell Hex Chrome Study
Description:	PAM-1		Lab ID:	4082759-	03				Sampled: 08/26/14 17:56
Matrix:	Air	1	Sample Vo	olume:	21.1	m³			Received: 08/27/14 16:39
Comments:	Col 1 Start Time 8/25/14	18:29							Analysis Date: 08/28/14 12:27
			Н	exavalent <u>Results</u>	Chro	omium		<u>MDL</u>	
<u>Analyte</u>		CAS Number	r	<u>ng/m³ Air</u>		<u>Flaq</u>	r	<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99		0.0186				0.0036	

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75 Valley Stream I	^D arkway, Suite 400			RE	PORTED:	08/29/14 13:	37
Malvern, PA 1935	5			SU	BMITTED:	08/26/14	o 08/27/14
ATTN: Mr. Jeff B	oggs			AQ	S SITE		
PHONE: (443) 8	03-8495 FAX: (41)	0) 266-8912		Si	ECODE:	I	Ioneywell Hex Chrome Study
Description:	PAM-1D	Lab	ID: 4082759-	04			Sampled: 08/26/14 17:59
Matrix:	Air	Sam	ple Volume:	21.13	m³		Received: 08/27/14 16:39
Comments:	Col 2 Start Time 8/25/14	18:30					Analysis Date: 08/28/14 12:47
			Hexavalent	Chromiu	um		
			<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	0.0221			0.0036	

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75 Valley Stream F	arkway, Suite 400			REPORTED:	08/29/14 13:37	
Malvern, PA 19355	5			SUBMITTED:	08/26/14 to 08/27/14	
ATTN: Mr. Jeff Bo	oggs			AQS SITE		
PHONE: (443) 8	03-8495 FAX: (410) 266-8912		SITE CODE:	Honeywell Hex Chrome	Study
Description:	PAM-2	Lab ID	4082759-05		Sampled: 08/26/14	17:36
Matrix:	Air	Sample	Volume: 21.1	l4 m³	Received: 08/27/14	4 16:39
Comments:	Start Time 8/25/14 18:07				Analysis Date: 08/28/14	4 14:58
			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	0.0195		0.0036	

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75 Valley Stream F	^o arkway, Suite 400				REPORTE	ED: 08/29/14 13	37
Malvern, PA 1935	5				SUBMITTE	ED: 08/26/14	to 08/27/14
ATTN: Mr. Jeff Be PHONE: (443) 8	oggs 03-8495 FAX: (410) 266-8912			AQS SITE	E:	Honeywell Hex Chrome Study
Description:	PAM-3	La	ab ID: 4082759-	06			Sampled: 08/26/14 17:23
Matrix:	Air	Sa	ample Volume:	21.25	m³		Received: 08/27/14 16:39
Comments:	Start Time 8/25/14 17:46						Analysis Date: 08/28/14 15:08
			Hexavalent <u>Results</u>	Chro	mium	MDL	
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>		<u>Flaq</u>	<u>nq/m³ Air</u>	
Hexavalent Chromium		1854-02-99	0.0163			0.0036	

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Environmental Res	sources Management, Ind	c				FILE #:	3926.	00	
75 Valley Stream F	Parkway, Suite 400					REPORT	ED:	08/29/14 13	:37
Malvern, PA 1935	5					SUBMITT	ED:	08/26/14	to 08/27/14
ATTN: Mr. Jeff Br PHONE: (443) 8	oggs 03-8495 FAX: (410) 266-8912				AQS SITE	E DE:		Honeywell Hex Chrome Study
Description:	PAM-4		Lab ID:	4082759	-07				Sampled: 08/26/14 17:09
Matrix:	Air		Sample Vo	olume:	21.39) m³			Received: 08/27/14 16:39
Comments:	Start Time 8/25/14 17:23								Analysis Date: 08/28/14 15:18
			н	lexavalent	t Chro	mium			
				<u>Results</u>				MDL	
<u>Analyte</u>		CAS Numbe	r	<u>ng/m³ Air</u>		<u>Flag</u>		<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99		0.0252				0.0036	

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75 Valley Stream	Parkway, Sui	te 400					REPORT	ED:	08/29/14 13	:37
Malvern, PA 1935	5						SUBMITT	FED:	08/26/14	to 08/27/14
ATTN: Mr. Jeff E	Boggs						AQS SITE	E		
PHONE: (443) 8	803-8495	FAX:	(410) 266-8912				SITECOL	DE:		Honeywell Hex Chrome Study
Description:	PAM-21			Lab ID:	4082759	9-08				Sampled: 08/26/14 00:00
Matrix:	Air			Sample V	olume:	21.14	l m³			Received: 08/27/14 16:39
Comments:										Analysis Date: 08/28/14 15:47
				ŀ	lexavalen	nt Chro	mium			
					<u>Results</u>				<u>MDL</u>	
<u>Analyte</u>			CAS Numbe	er	<u>ng/m³ Ai</u>	<u>r</u>	<u>Flag</u>		<u>ng/m³ Air</u>	
Hexavalent Chromium			1854-02-99		ND		U		0.0036	

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75 Valley Stream	Parkway, Suit	e 400				REPORT	ED: 08/29/14	13:37
Malvern, PA 1935	55					SUBMITT	ED: 08/26/	14 to 08/27/14
ATTN: Mr. Jeff E PHONE: (443)	3oggs 803-8495	FAX: (410) 266-8912				AQS SITE	E DE:	Honeywell Hex Chrome Study
Description:	PAM-31		Lab ID:	4082759	-09			Sampled: 08/26/14 00:00
Matrix:	Air		Sample Vol	ume:	21.25	m³		Received: 08/27/14 16:39
Comments:								Analysis Date: 08/28/14 15:57
			He	xavalen	t Chroi	mium		
			1	<u>Results</u>			MDL	
<u>Analyte</u>		CAS Number	er n	g/m³ Air	:	Flag	<u>ng/m³ /</u>	<u>Air</u>
Hexavalent Chromium		1854-02-99		ND		U	0.0036	5

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September 8, 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 September 3, 2014. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #32592:

<u>SDG</u>

Fraction

4082806/4082902

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

	169 pages-SF 3 DAY TAT Attachment 1																																						
	Level IV	L	DC #32	592	2 (E	RN	/ -	Mo	rris	svil	le,	NC		Ha	rbo	r P	oir	nt, I	ИD	, He	exa	iva	len	t C	hro	omi	um	M	oni	tor	ing)						이 가지 같이 가슴 같이 가슴	aien Aien
LDC	SDG#	DATE REC'D	(3) DATE DUE	Cr((D7	(VI) 614)																_		-																
Matr	x: 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
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Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:	Harbor Point, MD, Hexavalent Chromium Monitoring
Collection Date:	August 27 through August 28, 2014
LDC Report Date:	September 4, 2014
Matrix:	Air
Parameters:	Hexavalent Chromium
Validation Level:	EPA Level IV
Laboratory:	Eastern Research Group
Sample Delivery Group (SDG):	4082806/4082902

Sample Identification

OAM 1 (08/27/14)	PAM-1 (08/28/14) DUP
OAM 2 (08/27/14)	PAM-1D (08/28/14) DUP
PAM-1 (08/27/14)	
PAM-1D (08/27/14)	
PAM-2 (08/27/14)	
PAM-3 (08/27/14)	
PAM-4 (08/27/14)	
PAM-21 (08/27/14)	
PAM-31 (08/27/14)	
OAM 1 (08/28/14)	
OAM 2 (08/28/14)	
PAM-1 (08/28/14)	
PAM-1D (08/28/14)	
PAM-2 (08/28/14)	
PAM-3 (08/28/14)	
PAM-4 (08/28/14)	
PAM-21 (08/28/14)	
PAM-31 (08/28/14)	
PAM-1 (08/27/14) DUP	
PAM-1D (08/27/14) DUP	

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

1

Introduction

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

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

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

The following are definitions of the data qualifiers:

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

2

I. Technical Holding Times

All technical holding time requirements were met.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met.

IV. Blanks

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

Samples PAM-31 (08/27/14) and PAM-31 (08/28/14) were identified as trip blanks. No hexavalent chromium was found.

Samples PAM-21 (08/27/14) and PAM-21 (08/28/14) were identified as field blanks. No hexavalent chromium was found with the following exceptions:

Biank ID	Sampling Date	Analyte	Concentration	Associated Samples
PAM-21 (08/28/14)	8/28/14	Hexavalent chromium	0.0130 ng/m ³	OAM 1 (08/28/14) OAM 2 (08/28/14) PAM-1 (08/28/14) PAM-1D (08/28/14) PAM-2 (08/28/14) PAM-3 (08/28/14) PAM-4 (08/28/14)

Sample concentrations were compared to concentrations detected in the field blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated field blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
OAM 1 (08/28/14)	Hexavalent chromium	0.0146 ng/m ³	0.0146U ng/m ³
OAM 2 (08/28/14)	Hexavalent chromium	0.0154 ng/m ³	0.0154U ng/m ³
PAM-1 (08/28/14)	Hexavalent chromium	0.0331 ng/m ³	0.0331U ng/m ³
PAM-1D (08/28/14)	Hexavalent chromium	0.0243 ng/m ³	0.0243U ng/m ³
Sample	Analyte	Reported Concentration	Modified Final Concentration
------------------	---------------------	---------------------------	---------------------------------
PAM-3 (08/28/14)	Hexavalent chromium	0.0108 ng/m ³	0.0108U ng/m ³
PAM-4 (08/28/14)	Hexavalent chromium	0.0330 ng/m ³	0.0330U ng/m ³

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 (08/27/14) and PAM-1D (08/27/14) and samples PAM-1 (08/28/14) and PAM-1D (08/28/14) 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 (08/27/14)	PAM-1D (08/27/14)	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.0688	0.0683	1 (≤20)	-	-

	Concentrat				
Analyte	PAM-1 (08/28/14)	RPD (Limits)	Flags	A or P	
Hexavalent chromium	0.0331	0.0243	31 (≤20)	J (all detects)	A

Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Data Qualification Summary - SDG 4082806/4082902

SDG	Sample	Analyte	Flag	A or P	Reason
4082806/ 4082902	PAM-1 (08/28/14) PAM-1D (08/28/14) PAM-2 (08/28/14) PAM-4 (08/28/14)	Hexavalent chromium	J (all detects)	A	Field duplicates (RPD)

Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG 4082806/4082902

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 4082806/4082902

SDG	Sample	Analyte	Modified Final Concentration	A or P
4082806/ 4082902	OAM 1 (08/28/14)	Hexavalent chromium	0.0146U ng/m ³	A
4082806/ 4082902	OAM 2 (08/28/14) Hexavalent chromium		0.0154U ng/m ³	A
4082806/ 4082902	PAM-1 (08/28/14)	Hexavalent chromium	0.0331U ng/m ³	A
4082806/ 4082902	PAM-1D (08/28/14)	Hexavalent chromium	0.0243U ng/m ³	A
4082806/ 4082902	PAM-3 (08/28/14)	Hexavalent chromium	0.0108U ng/m ³	A
4082806/ 4082902	PAM-4 (08/28/14)	Hexavalent chromium	0.0330U ng/m ³	A

LDC #:	<u>32592A6</u>	VALIDATION COMPLETENESS WORKSHEET				
SDG # <u>:</u>	4082806/4082902	Level IV				
Laboratory: Eastern Research Group						



METHOD: Hexavalent Chromium (ASTM D7614)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/27 - 28/14
11	Initial calibration	A	
HI.	Calibration verification	A	
١V	Blanks	A	
v	Matrix Spike/Matrix Spike Duplicates	N	Not Reguired
VI.	Duplicates	A	$\mathcal{D}_{\mathcal{O}\mathcal{P}}$
VII.	Laboratory control samples	A	LUSID
VIII.	Sample result verification	A	
IX.	Overall assessment of data	A	
Х.	Field duplicates	SW	FD=(3,4) (12,13)
XI	Field blanks	50	FB= 8,17 TB= 9,18

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

ANS

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

Validated Samples:

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

Notes:_

3259224 LDC #: 32594

r=

VALIDATION FINDINGS CHECKLIST



Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	\square			
Cooler temperature criteria was met.				
II. Calibration				
Were all instruments calibrated daily, each set-up time?				
Were the proper number of standards used?		<u> </u>		
Were all initial calibration correlation coefficients ≥ 0.995?				
Were all initial and continuing calibration verification %Rs within the 90 410% QC limits?		 		
Were titrant checks performed as required? (Level IV only)			$\downarrow \downarrow'$	
Were balance checks performed as required? (Level IV only)				
III. Blanks				
Was a method blank associated with every sample in this SDG?				
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		<		
IV. Matrix spike/Matrix spike duplicates and Duplicates				······
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	/			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.	e			
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	<u> </u>			
Were performance evaluation (PE) samples performed?	<u> </u>			
Were the performance evaluation (PE) samples within the acceptance limits?	1		[1]	

Method: Inorganics (EPA Method See Cover)

VALIDATION FINDINGS CHECKLIST

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

LDC #: 32592A6

VALIDATION FINDINGS WORKSHEET Field Blanks

Page:_	<u> </u>
Reviewer:	50
2nd Reviewer:	$\overline{\mathcal{O}}$

IETHOD: Inorganics, EPA Method See Cover										
Blank units: ng/m3 A	lank units: <u>ng/m3</u> Associated sample units: <u>ng/m3</u>									
Sampling date: 8/28/	14 Soil facto	or applied <u>NA</u>	<u>\</u>							
Field blank type: (circle	e one) F ield Blank	/ Rinsate / Ot	her:		Associated Sa	amples: <u>10-</u>	<u>16</u>			
Analyte	Blank ID	Action Limit				Sample Ide	entification			
	17		10	11	12	13	15	16		
Hexavalent Chromium	0.0130	0.065	0.0146	0.0154	0.0331	0.0243	0.0108	0.0330		

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:

Samples with analyte concentrations within five times the associated field blank concentration are listed above, these sample results were qualified as not detected, "U".

LDC#<u>32592A6</u>

VALIDATION FINDINGS WORKSHEET Field Duplicates

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

Inorganics: Method__See Cover__

	Concentra	PPD		
Analyte	3	4	(≤20)	(Samples 1-7, 12-14, 16)- 01
Hexavalent Chromium	0.0688	0.0683	1	

	Concentra	tion (ng/m3)			
Analyte	12	13	(≤20)	(Samples 1-7; 12-14, 16)	r
Hexavalent Chromium	0.0331	0.0243	31	Jdet/A	

\LDCFILESERVER\Validation\FIELD DUPLICATES\FD_inorganic\32592A6.wpd

LDC #: 32592A6

Validation Findings Worksheet Initial and Continuing Calibration Calculation Verification

Page: 1 of ____ Reviewer: 2nd Reviewer:

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

The correlation coefficient (r) for the calibration of $\underline{C} \underline{C}^{\mu}$ was recalculated.Calibration date: $\frac{9/2}{14}$

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. (mg/L)	Area	r or r ²	r or r ²	(Y/N)				
Initial calibration		s1	0.1	0.0000174							
		s2	0.1	0.0000372	0.99992	0.99992	0.99992	0.99992	0.99992 0.99992	0.99992 0.99992	
	1 +6	s3	0.2	0.00008							
	Cr	<u>s4</u>	0.5	0.0002019							
		s5	1	0.0003993			\mathbb{Z}				
		s6	2	0.0008213			-				
In 10.53	0 110	Found	True								
Calibration verification	Cr ⁺⁰	0.522 norm	0.sng/m)		104.4%R	104.5%R	7*				
Cer 11:52	1-+6						الارز				
Calibration verification		0.530m/ml	0.5 Ng/ml		106%p	106.1%r	\mathcal{I}_{\star}				
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 Guer

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

			Found / S	True / D	Recalculated	Reported	Acceptable
Sample ID	Type of Analysis	Element	(units)	(units)	%R / RPD	%R / RPD	(Y/N)
LLS	Laboratory control sample	64 1	$\sum_{i=1}^{n}$			1.59%0	~
11:23		Cr	1. Or hegen	1.00 ng/m/	109%2	101/0K	Ċ
	Matrix spike sample		(SSR-SR)				
					[
Dur	Duplicate sample		0 DETHONOLUZ			1079/070	
12:23		Cri	U. Colorgim	0.068\$sng/m²	1.766PPV	1.55/2412	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

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.

	e see qualifications bel	low for all questions answered "N" s been reported and calculated co	". Not applic	cable questions ar	e identified as "N	/A".
Y/N	<u>N/A</u> Are results v <u>N/A</u> Are all detect	ction limits below the CRQL?	nsuuments	ť		
/ Comp	ound (analyte) results	for $Cr^{+6}(-1)$		rep	orted with a positi	ive detect we
ecalc	ulated and verified usin	ng the following equation:				
oncen	ntration = (aven - Co)/ W=10ml Recalculation:	(0.000	00692-(-4	.29E-06)	e : . 0 mt
a .	- 1 000067			0.000411	=	0.178-16
are	1.29 × 02	(hglm)(v+) ml 3	[n	instenal	1) (10 m)	
C. ~	- 0 00041113	=2112 h ³ $=$ hg/m	(0	21		(0.0821)
#	Sample ID			Reported Concentration	Calculated Concentration	Acceptable (Y/N)
		(x+6		0.0527	0.0527	14
	2-			0.0418	0.0417	1
	2			0.0688	0.0688	
	Ч			0,0683	0.0684	
	2			0.0816	0.0815	
	6			0.0822	0.0823	
	7			00827	0.0827	
	8			ND	ND	
	٩			ND	ND	
	10			0.046	0.0146	
	1			0.0154	0.0155	
	12			0.0331	0.031	
	13			0.0243	0.0243	
	14			0.0782	0.0782	
	12			0.0108	0.0109	
	16			D. 0330	0.0330	
	<u> </u>			0.0130	0.0129	
	10	1				

Note:____

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Environmental Resources Management, Inc					FILE #: 3926.00				
75 Valley Stream F	Parkway, Suite 400					REPORT	ED:	09/03/14 13:	26
Malvern, PA 19355	5					SUBMITT	ED:	08/28/14 t	o 08/29/14
ATTN: Mr. Jeff Bo	oggs					AQS SITE	E		
PHONE: (443) 8	03-8495 FAX: (410) 266-8912				Sifecor	DE:	ŀ	Honeywell Hex Chrome Study
Description:	OAM 1		Lab ID:	4082806	-01				Sampled: 08/27/14 16:07
Matrix:	Air		Sample V	olume:	21.26	5 m³			Received: 08/28/14 10:47
Comments:	Start Time 8/26/14 16:30								Analysis Date: 09/02/14 14:47
			F	lexavalent	t Chro	mium			
				<u>Results</u>				<u>MDL</u>	
<u>Analyte</u>		CAS Numbe	ſ	<u>ng/m³ Air</u>		<u>Flag</u>		<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99		0.0527				0.0036	

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Initials: CR

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Environmental Resources Management, Inc					FILE #: 3926.00			
75 Valley Stream F	^o arkway, Suite 400				REPORTE	D: 09/03/14 13	:26	
Malvern, PA 1935	5				SUBMITTE	ED: 08/28/14	to 08/29/14	
ATTN: Mr. Jeff B	oggs	N 000 0010			AQS SITE	_	the second little of the second of the second se	
PHONE: (443) 8	03-8495 FAX: (410) 266-8912			SITE COD	E:	Honeywell Hex Chrome Study	
Description:	OAM 2	Lab I	D: 4082806	5-02			Sampled: 08/27/14 16:28	
Matrix:	Air	Samp	ole Volume:	21.38	s m³		Received: 08/28/14 10:47	
Comments:	Start Time 8/26/14 16:42						Analysis Date: 09/02/14 14:57	
			Hexavalen	t Chro	mium			
			<u>Results</u>			<u>MDL</u>		
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>		<u>Flag</u>	<u>ng/m³ Air</u>		
Hexavalent Chromium		1854-02-99	0.0418			0.0036		

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Environmental Resources Management, Inc						FILE #: 3926.00			
75 Valley Stream F	^D arkway, Suite 400				F	EPORTE	E D: 09/0	03/14 13	26
Malvern, PA 19355						SUBMITTED: 08/28/14 to 08/29/14			to 08/29/14
ATTN: Mr. Jeff Br PHONE: (443) 8	oggs 03-8495 FAX: (4	10) 266-8912			Ş	QS SITE	E DE:		Honeywell Hex Chrome Study
Description:	PAM-1		Lab ID:	4082806-0)3				Sampled: 08/27/14 18:06
Matrix:	Air		Sample Volu	me:	21.68	m³			Received: 08/28/14 10:47
Comments:	Col 1 Start Time 8/26/1	4 18:01							Analysis Date: 09/02/14 12:13
			Hex	avalent	Chron	nium			
			<u>R</u>	<u>esults</u>				MDL	
Analyte		CAS Number	r ng	/m³ Air		<u>Flag</u>	ng	<u>/m³ Air</u>	
Hexavalent Chromium		1854-02-99	(0.0688				0.0036	

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Environmental Resources Management, Inc					FILE #: 3926.00			
75 Valley Stream F	arkway, Suite 400				REPORTE	D: 09/03/14 13	:26	
Malvern, PA 19355	i				SUBMITTE	ED: 08/28/14	to 08/29/14	
ATTN: Mr. Jeff Bo PHONE: (443) 86	oggs 03-8495 FAX: (41)	0) 266-8912			AQS SITE	E:	Honeywell Hex Chrome Study	
Description:	PAM-1D	Li	ab ID: 4	1082806-04			Sampled: 08/27/14 18:10	
Matrix:	Air	Si	ample Volun	ne: 21.7	m³		Received: 08/28/14 10:47	
Comments:	Col 2 Start Time 8/26/14	18:03					Analysis Date: 09/02/14 12:32	
			Hexa	avalent Chro	omium			
			<u>Re</u>	sults		MDL		
Analyte		CAS Number	<u>ng/</u>	<u>'m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>		
Hexavalent Chromium		1854-02-99	0.	0683		0.0036		

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Initials: CR

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Environmental Re	sources Management, In-	C	FILE #: 3926	6.00						
75 Valley Stream I	Parkway, Suite 400			REPORTED:	09/03/14 13:26					
Malvern, PA 1935	5			SUBMITTED:	08/28/14 to 08/29	/14				
ATTN: Mr. Jeff B PHONE: (443) 8	oggs 303-8495 FAX: (410) 266-8912		AQS SITE CODE: SITE CODE:	Honeyw	ell Hex Chrome Study				
Description:	PAM-2	Lab ID:	4082806-05		Si	ampled: 08/27/14 17:44				
Matrix:	Air	Sample \	/olume: 21.	66 m ³	Re	ceived: 08/28/14 10:47				
Comments:	Start Time 8/26/14 17:40				Analys	is Date: 09/02/14 15:06				
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	0.0816		0.0036					

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Initials: CR

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Environmental Res	sources Management, Ind	;			FILE #: 3926.00				
75 Valley Stream F	Parkway, Suite 400				REPORTED: 09/03/14 13:26				
Malvern, PA 19355	5				SUBMITTED: 08/28/14 to 08/29/14				
ATTN: Mr. Jeff Bo PHONE: (443) 8	oggs 03-8495 FAX: (410) 266-8912			AQS SITE SITECODE: Honeywell Hex Chrome Study				
Description:	PAM-3	Lat	b ID: 4082806	-06			Sampled: 08/27/14 17:28		
Matrix:	Air	Sar	mple Volume:	21.61	. m³		Received: 08/28/14 10:47		
Comments:	Start Time 8/26/14 17:28						Analysis Date: 09/02/14 15:16		
			Hexavalent Results	: Chro	mium	MDL			
Analyte		CAS Number	<u>ng/m³ Air</u>		<u>Flag</u>	<u>ng/m³ Ai</u>	۲.		
Hexavalent Chromium		1854-02-99	0.0822			0.0036			

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Environmental Res	sources Management, In	C ·			FILE #: 3926.00			
75 Valley Stream F	Parkway, Suite 400				REPORTED: 09/03/14 13:26			
Malvern, PA 19355	5				SUBMITTED: 08/28/14 to 08/29/14			
ATTN: Mr. Jeff Bo PHONE: (443) 8			AQS SITE CODE: SITE COD	Honeywell Hex Chrome Study				
Description:	PAM-4	Lab	ID: 4082806-	-07			Sampled: 08/27/14 17:13	
Matrix:	Air	Sam	ple Volume:	21.62	m³		Received: 08/28/14 10:47	
Comments:	Start Time 8/26/14 17:12						Analysis Date: 09/02/14 15:26	
			Hexavalent	: Chron	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	0.0827			0.0036		

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Initials: CR

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Environmental Re	esources Ma	nagemei	nt, Inc				FILE #: 392	6.00		
75 Valley Stream	Parkway, Su	ite 400					REPORTED:	09/03/14 13:	26	
Malvern, PA 1935	5						SUBMITTED:	08/28/14	o 08/29/14	
ATTN: Mr. Jeff E	ATTN: Mr. Jeff Boggs AQS SITE									
PHONE: (443)	803-8495	FAX:	(410) 266-8912				SITE CODE:		Honeywell Hex Chrome Study	
Description:	PAM-21			Lab ID:	408280	6-08			Sampled: 08/27/14 00:00	
Matrix:	Air			Sample V	olume:	21.66	6 m³		Received: 08/28/14 10:47	
Comments:									Analysis Date: 09/02/14 15:36	
				H	lexavaler	nt Chro	mium			
					<u>Results</u>			<u>MDL</u>		
<u>Analyte</u>			CAS Number	<u>er</u>	<u>ng/m³ Ai</u>	<u>r</u>	<u>Flag</u>	<u>ng/m³ Air</u>		
Hexavalent Chromium			1854-02-99		ND		U	0.0036		

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Environmental Res	sources Manageme	nt, Inc		FILE	FILE #: 3926.00			
75 Valley Stream F	Parkway, Suite 400			REPO	REPORTED: 09/03/14 13:26			
Malvern, PA 1935	5			SUBN	SUBMITTED: 08/28/14 to 08/29/14			
ATTN: Mr. Jeff Be PHONE: (443) 8	oggs 03-8495 FAX:	(410) 266-8912		AQS SITE SITECODE:			oneywell Hex Chrome Study	
Description:	PAM-31		Lab ID: 4082806	5-09			Sampled: 08/27/14 00:00	
Matrix:	Air		Sample Volume:	21.61	m³		Received: 08/28/14 10:47	
Comments:							Analysis Date: 09/02/14 15:46	
			Hexavalen <u>Results</u>	t Chromium		MDL		
Analyte		CAS Numbe	er <u>ng/m³ Air</u>	: <u>Fla</u>	g	<u>ng/m³ Air</u>		
Hexavalent Chromium		1854-02-99	ND			0.0036		

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Environmental Re	nvironmental Resources Management, Inc							FILE #: 3926.00				
75 Valley Stream I	^o arkway, Suite 400					REPORTED: 09/03/14 13:26						
Malvern, PA 1935	5					SUBMITTED: 08/28/14 to 08/29/14			to 08/29/14			
ATTN: Mr. Jeff Boggs PHONE: (443) 803-8495 FAX: (410) 266-8912						AQS SITE SITE CODE: Honeywell Hex Chrome Study						
Description:	OAM 1		Lab ID:	4082902	2-01				Sampled: 08/28/14 16:09			
Matrix:	Air		Sample V	olume:	21.4	5 m³			Received: 08/29/14 11:32			
Comments:	Start Time 8/27/14 16:19								Analysis Date: 09/02/14 15:56			
			н	lexavalen <u>Results</u>	t Chro	omium		MDL				
<u>Analyte</u>		CAS Numbe	er.	<u>ng/m³ Air</u>		<u>Flag</u>	r	ng/m³ Air				
Hexavalent Chromium		1854-02-99		0.0146 ()			0.0036				

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Environmental Res	sources Management, Ind			FILE #: 3926.00						
75 Valley Stream I	Parkway, Suite 400					REPORTED: 09/03/14 13:26				
Malvern, PA 1935	5			SUBMITTED: 08/28/14 to 08/29/14						
ATTN: Mr. Jeff Boggs PHONE: (443) 803-8495 FAX: (410) 266-8912							AQS SITE STECODE: Honeywell Hex Chrome Study			
Description:	OAM 2		Lab ID:	4082902	-02				Sampled: 08	8/28/14 16:27
Matrix:	Air		Sample V	olume:	21.3	3 m³			Received: 0	8/29/14 11:32
Comments:	Start Time 8/27/14 16:39							A	nalysis Date: 0	9/02/14 16:26
			F	lexavalen	t Chro	mium				
				<u>Results</u>				<u>MDL</u>		
<u>Analyte</u>		CAS Numbe	r	<u>ng/m³ Air</u>		<u>Flag</u>	<u>ng</u>	/m³ Air		
Hexavalent Chromium	I	1854-02-99		0.0154 (J			0.0036		

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Environmental Res	sources Management, In	с	FILE #:	FILE #: 3926.00					
75 Valley Stream F	Parkway, Suite 400			REPORT	REPORTED: 09/03/14 13:26				
Malvern, PA 19355	5			SUBMIT	SUBMITTED: 08/28/14 to 08/29/14				
ATTN: Mr. Jeff Bo PHONE: (443) 8	Honeywell Hex Chrome Study								
Description:	PAM-1	Lab ID	: 4082902-0	13		Sampled: 08/28/14 18:11			
Matrix:	Air	Sample	Volume:	21.58 m ³	3	Received: 08/29/14 11:32			
Comments:	Col 1 Start Time 8/27/14	18:12				Analysis Date: 09/02/14 12:52			
			Hexavalent	Chromium					
			<u>Results</u>		<u>MDL</u>				
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flaq</u>	<u>ng/m³ A</u>	i <u>r</u>			
Hexavalent Chromium		1854-02-99	0.0331 ()	5	0.0036				

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Environmental Res	sources Management, In	ic		FILE #: 3926.00			
75 Valley Stream	Parkway, Suite 400			REPORTED:	REPORTED: 09/03/14 13:26		
Malvern, PA 1935	5			SUBMITTED:	SUBMITTED: 08/28/14 to 08/29/14		
ATTN: Mr. Jeff B PHONE: (443) 8	oggs 03-8495 FAX: (410	0) 266-8912	AQS SITE CODE: SITE CODE:	well Hex Chrome Study			
Description:	PAM-1D	Lab ID	4082902-04		5	Sampled: 08/28/14 18:14	
Matrix:	Air	Sample	e Volume: 21.	56 m³	F	Received: 08/29/14 11:32	
Comments:	Col 2 Start Time 8/27/14	18:17			Analy	ysis Date: 09/02/14 13:12	
			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	0.0243 UJ		0.0036		

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Environmental Res	Environmental Resources Management, Inc							FILE #: 3926.00				
75 Valley Stream F	Parkway, Suite 400					REPORT	REPORTED: 09/03/14 13:26					
Malvern, PA 1935	Malvern, PA 19355							SUBMITTED: 08/28/14 to 08/29/14				
ATTN: Mr. Jeff B PHONE: (443) 8			AQS SITE	E DE:	Honeywell Hex Chrome Study							
Description:	PAM-2		Lab ID:	4082902	-05				Sampled: 08/28/14 17:52			
Matrix:	Air		Sample V	olume:	21.63	l m³			Received: 08/29/14 11:32			
Comments:	Start Time 8/27/14 17:52								Analysis Date: 09/02/14 16:36			
			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>Flag</u>		<u>ng/m³ Air</u>				
Hexavalent Chromium		1854-02-99		0.0782	2			0.0036				

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Environmental Re	sources Management, In	c		F	FILE #: 3926.00				
75 Valley Stream I	Parkway, Suite 400			R	REPORTED: 09/03/14 13:26				
Malvern, PA 1935	5			S	SUBMITTED: 08/28/14 to 08/29/14				
ATTN: Mr. Jeff B PHONE: (443) 8	oggs 303-8495 FAX: (410) 266-8912		A Ç	AQS SITE CODE: Honeywell Hex Chrome Study				
Description:	PAM-3	La	ab ID: 4082902-	06			Sampled: 08/28/14 17:39		
Matrix:	Air	Sa	ample Volume:	21.66	m³		Received: 08/29/14 11:32		
Comments:	Start Time 8/27/14 17:35						Analysis Date: 09/02/14 16:46		
			Hexavalent <u>Results</u>	Chrom	ium	MDL			
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>		<u>Flag</u>	<u>ng/m³ Air</u>			
Hexavalent Chromium		1854-02-99	ن 0.0108	,		0.0036			

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Environmental Res	sources Management, In	c		FILE #: 392	FILE #: 3926.00			
75 Valley Stream F	Parkway, Suite 400			REPORTED:	REPORTED: 09/03/14 13:26			
Malvern, PA 19355	5			SUBMITTED:	SUBMITTED: 08/28/14 to 08/29/14			
ATTN: Mr. Jeff Boggs AQS SITE								
PHONE: (443) 8	03-8495 FAX: (410) 266-8912		SITE CODE:	Ho	neywell Hex Chrome Study		
Description:	PAM-4	Lab	4082902-07			Sampled: 08/28/14 17:24		
Matrix:	Air	San	mple Volume: 21.	65 m³		Received: 08/29/14 11:32		
Comments:	Start Time 8/27/14 17:21				Ai	nalysis Date: 09/02/14 16:55		
			Hexavalent Ch	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	0.0330 () 🗍	-	0.0036			

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Environmental Resou	urces Manageme	nt, Inc		FILE #:	FILE #: 3926.00					
75 Valley Stream Par	rkway, Suite 400			REPOR	REPORTED: 09/03/14 13:26					
Malvern, PA 19355			SUBMIT	SUBMITTED: 08/28/14 to 08/29/14						
ATTN: Mr. Jeff Bogg	gs		AQS SI	AQS SITE						
PHONE: (443) 803	-8495 FAX:	(410) 266-8912		SITECO	DE:	Honeywell He	x Chrome Study			
Description: P/	AM-21	Lab II	D: 4082902-0	08		Sample	d: 08/28/14 00:00			
Matrix: Ai	r	Samp	le Volume:	21.61 m	3	Receive	d: 08/29/14 11:32			
Comments:						Analysis Dat	e: 09/02/14 17:05			
			Hexavalent	Chromium						
	<u>Results</u> <u>MDL</u>									
Analyte		CAS Number	<u>Flag</u>	nc	g/m³ Air					
Hexavalent Chromium		1854-02-99	0.0130			0.0036				

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Initials: CR

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Environmental Reso	ources Manageme	nt, Inc		F	ILE #:	3926.00	
75 Valley Stream Pa	arkway, Suite 400			R	REPORTE	D: 09/03/14 13	:26
Malvern, PA 19355				s	UBMITTE	ED: 08/28/14	to 08/29/14
ATTN: Mr. Jeff Bog	ggs			A	QS SITE		
PHONE: (443) 803	3-8495 FAX:	(410) 266-8912		S		E:	Honeywell Hex Chrome Study
Description:	PAM-31		Lab ID: 4082	2902-09			Sampled: 08/28/14 00:00
Matrix: A	Air		Sample Volume:	21.66	m³		Received: 08/29/14 11:32
Comments:							Analysis Date: 09/02/14 17:15
			Hexava	lent Chrom	nium		
			<u>Resul</u>	<u>ts</u>		MDL	
<u>Analyte</u>		CAS Number	<u>r ng/m³</u>	Air	<u>Flag</u>	<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99	ND		U	0.0036	

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September 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 September 5, 2014. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #32613:

<u>SDG</u>

Fraction

4090338

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	613	3 (E	RN	/ -	Mo	rris	svil	le,	NC	: /	Ha	rbo	or P	oir	nt, I	MD	, H	exa	iva	len	t C	hro	omi	um	M	oni	tor	ing	J)							
LDC	SDG#	DATE REC'D	(3) DATE DUE	Cr((D7	(VI) 614)		_																																
Matri	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	wε	s
A	4090338	09/05/14	09/10/14	18	0							<u> </u>				<u> </u>						<u> </u>		<u> </u>			_					<u> </u>	L			\vdash			
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Shaded cells indicate Level IV validation (all other cells are Level II validation). These sample counts do not include MS/MSD, and DUPs

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:	Harbor Point, MD, Hexavalent Chromium Monitoring
Collection Date:	August 29 through September 2, 2014
LDC Report Date:	September 8, 2014
Matrix:	Air
Parameters:	Hexavalent Chromium
Validation Level:	EPA Level IV
Laboratory:	Eastern Research Group

Sample Delivery Group (SDG): 4090338

Sample Identification

OAM 1 (08/29/14)	PAM-1 (09/02/14)DUP
OAM 2 (08/29/14)	PAM-1D (09/02/14)DUP
PAM-1 (08/29/14)	`
PAM-1D (08/29/14)	
PAM-2 (08/29/14)	
PAM-3 (08/29/14)	
PAM-4 (08/29/14)	
PAM-21 (08/29/14)	
PAM-31 (08/29/14)	
OAM 1 (09/02/14)	
OAM 2 (09/02/14)	
PAM-1 (09/02/14)	
PAM-1D (09/02/14)	
PAM-2 (09/02/14)	
PAM-3 (09/02/14)	
PAM-4 (09/02/14)	
PAM-21 (09/02/14)	
PAM-31 (09/02/14)	
PAM-1 (08/29/14)DUP	
PAM-1D (08/29/14)DUP	

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

1

Introduction

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

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

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

The following are definitions of the data qualifiers:

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

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 (08/29/14) and PAM-31 (09/02/14) were identified as trip blanks. No hexavalent chromium was found.

Samples PAM-21 (08/29/14) and PAM-21 (09/02/14) were identified as field blanks. No hexavalent chromium was found.

V. Matrix Spike/Matrix Spike Duplicates

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

VI. Duplicates

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

VII. Laboratory Control Samples

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

VIII. Sample Result Verification

All sample result verifications were acceptable.

IX. Overall Assessment of Data

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

X. Field Duplicates

Samples PAM-1 (08/29/14) and PAM-1D (08/29/14) and samples PAM-1 (09/02/14) and PAM-1D (09/02/14) 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 (08/29/14)	PAM-1D (08/29/14)	(Limits)	Flags	A or P	
Hexavalent chromium	0.0185	0.0155	18 (≤20)	-	-	

	Concentrati	ion (ng/m³)	222		
Analyte	PAM-1 (09/02/14)	PAM-1D (09/02/14)	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.0486	0.0462	5 (≤20)	-	-

Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Data Qualification Summary - SDG 4090338

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 4090338

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 4090338

No Sample Data Qualified in this SDG

Level IV

SDG #: 4090338 Laboratory: Eastern Research Group

LDC #: 32613A6

Date:<u>9/8/14</u> Page:<u>1</u>of<u>1</u> Reviewer:<u>44</u> 2nd Reviewer:<u>01</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
I.	Technical holding times	A	Sampling dates: 8/29/14 and 9/2/14
11	Initial calibration	A	
III.	Calibration verification	A	
IV	Blanks	Ŕ	
v	Matrix Spike/Matrix Spike Duplicates	N	25ª Not required
VI.	Duplicates	A	DUP
VII.	Laboratory control samples	A	LCS/D
VIII.	Sample result verification	A	
IX.	Overall assessment of data	A	
Х.	Field duplicates	SW	FD= (34) (12,13) +k (12,13)
XI	Field blanks	ND	FB = 0,17 TB = 9,18

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

D = Duplicate TB = Trip blank EB = Equipment blank

Validated Samples: Air-

1	OAM 1 (08/29/14)	11	OAM 2 (09/02/14)	21	PAM-1 (09/02/14)DUP	31
2	OAM 2 (08/29/14)	12	PAM-1 (09/02/14)	22	PAM-1D (09/02/14)DUP	32
3	PAM-1 (08/29/14)	13	PAM-1D (09/02/14)	23		33
4	PAM-1D (08/29/14)	14	PAM-2 (09/02/14)	24		34
5	PAM-2 (08/29/14)	15	PAM-3 (09/02/14)	25		35
6	PAM-3 (08/29/14)	16	PAM-4 (09/02/14)	26		36
7	PAM-4 (08/29/14)	17	PAM-21 (09/02/14)	27		37
8	PAM-21 (08/29/14)	18	PAM-31 (09/02/14)	28		38
9	PAM-31 (08/29/14)	19	PAM-1 (08/29/14)DUP	29		39
10	OAM 1 (09/02/14)	20	PAM-1D (08/29/14)DUP	30		40

Notes: Dates appended to ID to different, at between samples
.

Method: Inorganics (EPA Methode Cover)				
Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	\checkmark			
Cooler temperature criteria was met.	1			
II. Calibration				
Were all instruments calibrated daily, each set-up time?	\checkmark			
Were the proper number of standards used?	1			
Were all initial calibration correlation coefficients <a> 0.995?	1			
Were all initial and continuing calibration verification %Rs within the 90-110% QC limits?	1			
Were titrant checks performed as required? (Level IV only)			\checkmark	
Were balance checks performed as required? (Level IV only)			/	
III. Blanks				
Was a method blank associated with every sample in this SDG?	1			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		\checkmark		
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.	1			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 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?			1	
Were the performance evaluation (PE) samples within the acceptance limits?				

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?	\checkmark			
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.	1			
Target analytes were detected in the field duplicates.				
X. Field blanks				
Field blanks were identified in this SDG.	/	_		
Target analytes were detected in the field blanks.		7		

•

LDC#<u>32613A6</u>

VALIDATION FINDINGS WORKSHEET Field Duplicates

Page: 1_of_1 Reviewer: <u>KK</u> 2nd Reviewer: <u>/</u>

Inorganics: Method See Cover

	Concentra		
Analyte	3	4	RPD (≤20)
Hexavalent Chromium	0.0185	0.0155	18

	Concentra		
Analyte	12	13	RPD (≤20)
Hexavalent Chromium	0.0486	0.0462	5

\LDCFILESERVER\Validation\FIELD DUPLICATES\FD_inorganic\32613A6.wpd

LDC #: 32613A6

Validation Findings Worksheet Initial and Continuing Calibration Calculation Verification

Page:	of
Reviewer:	KR
2nd Review	wer:

Method: Inorganics, Method See Cover____

The correlation coefficient (r) for the calibration of $Cr (p^+)$ was recalculated. Calibration date: q |u| |u|

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

%R = Found X 100

True

Where,

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

				(mAU*min)	Recalculated	Reported	Acceptable
Type of analysis	Analyte	Standard	Conc. (ng/mL)	Area	r or r ²	r or r ²	(Y/N)
Initial calibration		s1	0.05	0.0000163			
	Hexavalent	s2	0.10	0.0000369	0.99999	0.99999	Y
	Chromium	s3	0.20	0.0000796			
		s4	0.50	0.0001989			
		s5	1.00	0.0003998			
		s6	2.00	0.0008012			
		221/			400.4	(00.4	
Calibration verification		CCV	0.5321	0.500	106.4	106.4	Y
Calibration verification		-	-		-	-	
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 Couse

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	NO / M ³ Found / S (units)	ng/m ³ Tride / D (units)	Recalculated	Reported	Acceptable (Y/N)
LCS	Laboratory control sample	Cr(+	1.0875 refnu	- 1.00 ng/mL	109 -108 re	109	Ŷ
tou	Matrix spike sample		(SSR-SR)	_	_	_	-
19	Duplicate sample	C-4+ 0.0380000	0.0390 0.0436	0.0436	12.2	11.9	Ý

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

VALIDATION FINDINGS WORKSHEET Sample Calculation Verification

Page:_	of
Reviewer:	KI
2nd reviewer:	or-

0.01971

1113

(over **METHOD:** Inorganics, Method Ke

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A". Have results been reported and calculated correctly?



Are results within the calibrated range of the instruments? Are all detection limits below the CRQL?

rlo+ Compound (analyte) results for _ recalculated and verified using the following equation:

_reported with a positive detect were

Concentration = **Recalculation:** $\left[\left(0.0000146 \text{ mAV}^{\dagger} \text{min} \right) \left(2487.324 \right) + \left(0.006280 \right) \right]$ 10ml + Constant 1: Area) (X Coefficient 21:61 Vair(m³

#	Sample ID	Analyte	Reported Concentration (M/m³)	Calculated Concentration (NQM ³)	Acceptable (Y/N)
)	Cr. 4+	0.0197	0.0197	Ý
	2		0.0200	0.0200	
	3		0.0185	0.0185	
	4		0.0155	6.0154	
	5		0.0255	0.02.55	
	0		0.0409	0.0409	
	7		0.0333	0.0333	
	10		0.0127	0.0126	
	11		0.0105	0.0104	
	12		0.0486	0.0480	
	13		0.0462	0.0461	
	14		0.0214	0.0214	
	15		0.0238	0.0238	
	10	↓	0.0893	0.0893	

Note:

NERC	, ,	CERTIFIC	CATE OF A	ANALYSIS	3			
Environmental Re	sources Management, In	c		FILE #: 3926	6.00			
75 Valley Stream	Parkway, Suite 400			REPORTED:	09/05/14 13:01			
Malvern, PA 1935	5			SUBMITTED:	09/03/14			
ATTN: Mr. Jeff B	oggs			AQS SITE				
PHONE: (443) 8	303-8495 FAX: (41)	0) 266-8912		SITE CODE:	Honeywell Hex Chrome Study			
Description:	OAM 1	Lab ID:	4090338-01		Sampled: 08/29/14 16:18			
Matrix:	Air	Sample	Volume: 21.	61 m³	Received: 09/03/14 13:15			
Comments:	Start Time 8/28/14 16:18				Analysis Date: 09/04/14 13:04			
	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	1	1854-02-99	0.0197		0.0036			

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Environmental Re	sources Management, In	2				FILE #: 3	3926.00	
75 Valley Stream	Parkway, Suite 400					REPORTED	D: 09/05/14 13	:01
Malvern, PA 1935	5					SUBMITTE	D: 09/03/14	
ATTN: Mr. Jeff B PHONE: (443) 8	oggs 03-8495 FAX: (410) 266-8912				AQS SITE	Ξ:	Honeywell Hex Chrome Study
Description:	OAM 2	La	ab ID:	4090338-	02			Sampled: 08/29/14 16:34
Matrix:	Air	Sa	ample Vo	olume:	21.2	m³		Received: 09/03/14 13:15
Comments:	Start Time 8/28/14 17:00						_	Analysis Date: 09/04/14 13:14
			Н	exavalent	Chro	mium		
				<u>Results</u>			MDL	
<u>Analyte</u>		CAS Number		<u>nq/m³ Air</u>		<u>Flag</u>	<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99		0.0200			0.0036	

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Environmental Re	sources Management, In	C		FILE #: 3	FILE #: 3926.00			
75 Valley Stream I	Parkway, Suite 400			REPORTED	REPORTED: 09/05/14 13:01			
Malvern, PA 1935	5			SUBMITTEI	SUBMITTED: 09/03/14			
ATTN: Mr. Jeff B PHONE: (443) 8	oggs 03-8495 FAX: (410	0) 266-8912		AQS SITE CODE: SITE CODE	AQS SITE CODE: Honeywell Hex Chrome Study			
Description:	PAM-1	Lab ID:	4090338-03			Sampled: 08/29/14 17:35		
Matrix:	Air	Sample	Volume: 20	.88 m³		Received: 09/03/14 13:15		
Comments:	Col 1 Start Time 8/28/14	18:23				Analysis Date: 09/04/14 11:43		
			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	0.0185		0.0036			

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Environmental Re	esources Man	agement, Inc				FILE #: 3926.00				
75 Valley Stream	Parkway, Sui	te 400				REPORTED:	09/05/14 13:0	1		
Malvern, PA 1935	5					SUBMITTED:	09/03/14			
ATTN: Mr. Jeff B PHONE: (443) 8	3oggs 803-8495	FAX: (410) 266-8912				AQS SITE CODE: SITE CODE:	F	oneywell Hex Chrome Study		
Description:	PAM-1D		Lab ID:	4090338	3-04			Sampled: 08/29/14 17:33		
Matrix:	Air		Sample Vol	ume:	20.84	m³		Received: 09/03/14 13:15		
Comments:	Col 2 Start T	ime 8/28/14 18:23						Analysis Date: 09/04/14 12:03		
			Не	xavalen	t Chro	mium				
			ļ	<u>Results</u>			<u>MDL</u>			
<u>Analyte</u>		CAS Numb	<u>er n</u>	<u>q/m³ Air</u>	<u>.</u>	<u>Flag</u>	<u>ng/m³ Air</u>			
Hexavalent Chromiun	n	1854-02-99		0.0155			0.0036			

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Environmental Re	sources Management, I	nc		FILE #: 3920	FILE #: 3926.00				
75 Valley Stream I	Parkway, Suite 400			REPORTED: 09/05/14 13:01					
Malvern, PA 1935	5			SUBMITTED:	09/03/14				
ATTN: Mr. Jeff B	oggs			AQS SITE					
PHONE: (443) 8	03-8495 FAX: (41	0) 266-8912		SITE CODE:	Honeyv	vell Hex Chrome Study			
Description:	PAM-2	Lab ID:	4090338-05		S	ampled: 08/29/14 17:18			
Matrix:	Air	Sample	Volume: 20	1.98 m³	R	eceived: 09/03/14 13:15			
Comments:	Start Time 8/28/14 17:5	9			Analys	sis Date: 09/04/14 13:44			
			Hexavalent Ch	romium					
			<u>Results</u>		MDL				
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	Flag	<u>ng/m³ Air</u>				
Hexavalent Chromium		1854-02-99	0.0255		0.0036				

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Environmental Res	sources Management, Ind	c			FILE #: 3926.00				
75 Valley Stream F	^p arkway, Suite 400					REPORT	REPORTED: 09/05/14 13:01		
Malvern, PA 19355	Malvern, PA 19355						SUBMITTED: 09/03/14		
ATTN: Mr. Jeff Bo PHONE: (443) 8) 266-8912	2			AQS SITE	E DE:	ŀ	loneywell Hex Chrome Study	
Description:	PAM-3		Lab ID:	4090338	8-06				Sampled: 08/29/14 17:08
Matrix:	Air		Sample V	olume:	21.02	2 m³			Received: 09/03/14 13:15
Comments:	Start Time 8/28/14 17:46								Analysis Date: 09/04/14 13:54
			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		0.0409				0.0036	

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Environmental Res	ources Management, Inc	:		FILE #: 39	26.00		
75 Valley Stream P	arkway, Suite 400			REPORTED:	REPORTED: 09/05/14 13:01		
Malvern, PA 19355				SUBMITTED:	SUBMITTED: 09/03/14		
ATTN: Mr. Jeff Bo PHONE: (443) 80	oggs 03-8495 FAX: (410) 266-8912	AQS SITE CODE: SITE CODE:	AQS SITE CODE: Honeywell Hex Chrome Study			
Description:	PAM-4	Lab ID	4090338-07	 		Sampled: 08/29/14 16:58	
Matrix:	Air	Sampl	e Volume: 21.0	09 m³		Received: 09/03/14 13:15	
Comments:	Start Time 8/28/14 17:31					Analysis Date: 09/04/14 14:04	
			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	0.0333		0.0036		

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Environmental Re	nvironmental Resources Management, Inc							FILE #: 3926.00				
75 Valley Stream	Parkway, Sui	ite 400					REPORTED: 09/05/14 13:01			01		
Malvern, PA 1935	55						SUBMIT	TED:	09/03/14			
ATTN: Mr. Jeff E PHONE: (443)	3oggs 803-8495	FAX:	(410) 266-8912				AQS SIT	TE DDE:		Honeywell Hex Chrome Study		
Description:	PAM-21			Lab ID:	409033	8-08				Sampled: 08/29/14 00:00		
Matrix:	Air			Sample V	olume:	20.98	3 m	3		Received: 09/03/14 13:15		
Comments:										Analysis Date: 09/04/14 14:14		
				н	exavaler	nt Chro	mium					
					<u>Results</u>				<u>MDL</u>			
<u>Analyte</u>			CAS Numb	<u>er</u>	<u>nq/m³ Ai</u>	r	<u>Flag</u>		<u>ng/m³ Air</u>			
Hexavalent Chromium			1854-02-99		ND		IJ		0.0036			

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Environmental Re	nvironmental Resources Management, Inc							FILE #: 3926.00			
75 Valley Stream	Parkway, Suite	400					REPORT	ED:	09/05/14 13:	01	
Malvern, PA 1935	5						SUBMITT	SUBMITTED: 09/03/14			
ATTN: Mr. Jeff B PHONE: (443) 8	80ggs 803-8495 I	AX:	(410) 266-8912				AQS SITE	E DE:	ł	Honeywell Hex Chrome Study	
Description:	PAM-31			Lab ID:	4090338	3-09				Sampled: 08/29/14 00:00	
Matrix:	Air			Sample V	olume:	21.02	2 m³			Received: 09/03/14 13:15	
Comments:										Analysis Date: 09/04/14 14:23	
				н	lexavalen <u>Results</u>	t Chro	mium		MDL		
<u>Analyte</u>			CAS Numbe	e <u>r</u>	<u>ng/m³ Air</u>	5	<u>Flag</u>		<u>ng/m³ Air</u>		
Hexavalent Chromium			1854-02-99		ND		U		0.0036		

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Environmental Re	sources Management, In	с			FILE #:	FILE #: 3926.00			
75 Valley Stream I	Parkway, Suite 400				REPORTI	REPORTED: 09/05/14 13:01			
Malvern, PA 1935	5				SUBMITT	SUBMITTED: 09/03/14			
ATTN: Mr. Jeff Br PHONE: (443) 8	oggs 03-8495 FAX: (410		AQS SITE CODE: SITE CODE:			Honeywell Hex Chrome Study			
Description:	OAM 1		Lab ID: 40903	338-10			Sampled: 09/02/14 16:04		
Matrix:	Air		Sample Volume:	21.3	8 m³		Received: 09/03/14 13:15		
Comments:	Start Time 9/1/14 16:18						Analysis Date: 09/04/14 14:33		
			Hexaval	ent Chro	omium				
			Result	<u>5</u>		<u> </u>	<u>1DL</u>		
<u>Analyte</u>		CAS Numbe	<u>r ng/m³</u>	<u>Air</u>	<u>Flag</u>	ng/r	n ³ Air		
Hexavalent Chromium		1854-02-99	0.0127			0.	0036		

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Environmental Re	sources Management, In	с			FILE #: 3	FILE #: 3926.00			
75 Valley Stream	Parkway, Suite 400				REPORTED	REPORTED: 09/05/14 13:01			
Malvern, PA 1935	5				SUBMITTE	SUBMITTED: 09/03/14			
ATTN: Mr. Jeff B PHONE: (443) 8	oggs 03-8495 FAX: (410		AQ SH		E: ł	Honeywell Hex Chrome Study			
Description:	OAM 2	·	Lab ID: 40903	338-11			Sampled: 09/02/14 16:28		
Matrix:	Air		Sample Volume:	21.3	33 m ³		Received: 09/03/14 13:15		
Comments:	Start Time 9/1/14 16:46						Analysis Date: 09/04/14 14:43		
			Hexaval	ent Chr	omium				
			<u>Result</u>	<u>s</u>		<u>MDL</u>			
<u>Analyte</u>		CAS Numbe	er <u>nq/m³</u>	<u>Air</u>	<u>Flaq</u>	<u>ng/m³ Air</u>			
Hexavalent Chromium	I	1854-02-99	0.0105			0.0036			

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Environmental Re	sources Management, I	'nc		FILE #: 39	FILE #: 3926.00					
75 Valley Stream	Parkway, Suite 400			REPORTED:	REPORTED: 09/05/14 13:01					
Malvern, PA 1935	5									
ATTN: Mr. Jeff B PHONE: (443) 8	oggs 303-8495 FAX: (41	0) 266-8912		AQS SITE CODE: SITE CODE:	ł	Honeywell Hex Chrome Study				
Description:	PAM-1	Lab ID:	4090338-12	2		Sampled: 09/02/14 17:55				
Matrix:	Air	Sample	Volume:	21.71 m³		Received: 09/03/14 13:15				
Comments:	Col 1 Start Time 9/1/14	17:48				Analysis Date: 09/04/14 12:22				
			Hexavalent C	Chromium						
			<u>Results</u>		MDL					
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>					
Hexavalent Chromiun	1	1854-02-99	0.0486		0.0036					

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NERC	Ì	CERTIFIC	ATE O	F ANALYSI	5					
Environmental Re	sources Management, In	c		FILE #: 392	FILE #: 3926.00					
75 Valley Stream	Parkway, Suite 400			REPORTED:	REPORTED: 09/05/14 13:01					
Malvern, PA 1935	5		SUBMITTED:	SUBMITTED: 09/03/14						
ATTN: Mr. Jeff Boggs AQS SITE PHONE: (443) 803-8495 FAX: (410) 266-8912 STE CODE: Honeywell Hex Chrome Study										
Description:	PAM-1D	Lab ID:	4090338-	-13		Sampled: 09/02/14 17:57				
Matrix:	Air	Sample \	/olume:	21.74 m³		Received: 09/03/14 13:15				
Comments:	Col 2 Start Time 9/1/14 1	7:47				Analysis Date: 09/04/14 12:42				
Hexavalent Chromium										
			<u>Results</u>		MDL					
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flaq</u>	<u>ng/m³ Air</u>					
Hexavalent Chromium		1854-02-99	0.0462		0.0036					

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Environmental Re	nvironmental Resources Management, Inc							FILE #: 3926.00			
75 Valley Stream I	Parkway, Suite 400					REPORT	REPORTED: 09/05/14 13:01				
Malvern, PA 1935	Malvern, PA 19355							SUBMITTED: 09/03/14			
ATTN: Mr. Jeff B PHONE: (443) 8		AQS SITE SITE CODE:		E DE:	Honeywell Hex Chrome Study						
Description:	PAM-2	L	Lab ID:	4090338	-14				Sampled: 09/02/14 17:33		
Matrix:	Air	S	Sample Vo	olume:	21.6	5 m³			Received: 09/03/14 13:15		
Comments:	Start Time 9/1/14 17:30								Analysis Date: 09/04/14 14:53		
			H	exavalent	t Chro	mium					
				<u>Results</u>				<u>MDL</u>			
<u>Analyte</u>		<u>CAS Number</u>	: !	<u>ng/m³ Air</u>		<u>Flag</u>		<u>ng/m³ Air</u>			
Hexavalent Chromium	I	1854-02-99		0.0214				0.0036			

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Environmental Resources Management, Inc					FILE #: 3926.00			
75 Valley Stream Parkway, Suite 400					REPORTED: 09/05/14 13:01			
Malvern, PA 19355					SUBMITTED: 09/03/14			
ATTN: Mr. Jeff Boggs PHONE: (443) 803-8495 FAX: (410) 26) 266-8912		AQS SITE CODE: SITE CODE:		F	Ioneywell Hex Chrome Study	
Description:	PAM-3	Lab	ID: 4090338-	-15			Sampled: 09/02/14 17:20	
Matrix:	Air	San	nple Volume:	21.6	m³		Received: 09/03/14 13:15	
Comments:	Start Time 9/1/14 17:20					·	Analysis Date: 09/04/14 15:03	
Hexavalent Chromium <u>Results</u> <u>MDL</u>								
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>		<u>Flaq</u>	<u>ng/m³ Air</u>		
Hexavalent Chromium		1854-02-99	0.0238			0.0036		

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Environmental Resources Management, Inc					FILE #: 3926.00				
75 Valley Stream Parkway, Suite 400					REPORTED: 09/05/14 13:01				
Malvern, PA 19355					SUBMITT	SUBMITTED: 09/03/14			
ATTN: Mr. Jeff Boggs PHONE: (443) 803-8495 FAX: (410) 24) 266-8912		AQS SITE CODE: SITE CODE:		E:	Honeywell Hex Chrome Study		
Description:	PAM-4	Lab ID	: 4090338	8-16			Sampled: 09/02/14 16:58		
Matrix:	Air	Sample	e Volume:	21.37	7 m ³		Received: 09/03/14 13:15		
Comments:	Start Time 9/1/14 17:13						Analysis Date: 09/04/14 15:13		
Hexavalent Chromium									
			Results			MDL			
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>		<u>Flag</u>	<u>ng/m³ A</u>	<u>ir</u>		
Hexavalent Chromium		1854-02-99	0.0893			0.0036			

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Environmental Resources Ma	inagement, Inc	FILE #	FILE #: 3926.00						
75 Valley Stream Parkway, S	uite 400	REPO	REPORTED: 09/05/14 13:01						
Malvern, PA 19355		SUBM	SUBMITTED: 09/03/14						
ATTN: Mr. Jeff Boggs PHONE: (443) 803-8495	FAX: (410) 266-8912	AQS S CODE SITE C	ITE ODE:	Honeywell Hex Chrome Study					
Description: PAM-21	Lab ID:	4090338-17		Sampled: 09/02/14 00:00					
Matrix: Air	Sample V	olume: 21.65	n³	Received: 09/03/14 13:15					
Comments:				Analysis Date: 09/04/14 15:43					
Hexavalent Chromium									
		<u>Results</u>	<u>MDL</u>						
<u>Analyte</u>	CAS Number	<u>ng/m³ Air</u> <u>Fla</u>	<u>ng/m³ Air</u>						
Hexavalent Chromium	1854-02-99	ND U	0.0036						

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Environmental Resources Management, Inc					FILE #: 3926.00				
75 Valley Stream Parkway, Suite 400					REPORTED: 09/05/14 13:01				
Malvern, PA 1935	55					SUBMITTED:	09/03/14		
ATTN: Mr. Jeff E PHONE: (443)	3oggs 803-8495 FAX	(: (410) 266-8912				AQS SITE CODE: SITE CODE:		Honeywell Hex Chrome Study	
Description:	PAM-31		Lab ID:	4090338	-18			Sampled: 09/02/14 00:00	
Matrix:	Air		Sample Vol	iume:	21.6	m³		Received: 09/03/14 13:15	
Comments:								Analysis Date: 09/04/14 15:53	
Hexavalent Chromium									
				<u>Results</u>			<u>MDL</u>		
<u>Analyte</u>		CAS Number	<u>er r</u>	ig/m³ Air		Flag	<u>ng/m³ Air</u>		
Hexavalent Chromium		1854-02-99		ND		U	0.0036		

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