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

December 11, 2014

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

Dear Mr. Boggs,

Enclosed is the final validation report for the fraction listed below. This SDG was received on December 9, 2014. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #33248:

SDG	Fraction
4120243/4120332	Hexavalent Chromium

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

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

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

Sincerely,

Christina Rink
Project Manager/Chemist

95 pages-SF 5 DAY TAT

Attachment 1

LDC	SDG#	DATE REC'D	(3) DATE DUE	Cr(VI) (D7614)																																			
Level IV	LDC #33248 (ERM - Morrisville, NC / Harbor Point, MD, Hexavalent Chromium Monitoring)																																						
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
A	4120243/4120332	12/09/14	12/16/14	16	0																																		
Total	A/CR			16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16

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

L:\ERM\Harbor Point_Honeywell\33248ST.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

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

Collection Date: December 1 through December 2, 2014

LDC Report Date: December 10, 2014

Matrix: Air

Parameters: Hexavalent Chromium

Validation Level: EPA Level IV

Laboratory: Eastern Research Group

Sample Delivery Group (SDG): 4120243/4120332

Sample Identification

OAM 1(12/01/14)
PAM-1(12/01/14)
PAM-2(12/01/14)
PAM-3(12/01/14)
PAM-4(12/01/14)
PAM-21(12/01/14)
PAM-31(12/01/14)
OAM 1(12/02/14)
OAM 2(12/02/14)
PAM-1(12/02/14)
PAM-1D(12/02/14)
PAM-2(12/02/14)
PAM-3(12/02/14)
PAM-4(12/02/14)
PAM-21(12/02/14)
PAM-31(12/02/14)
PAM-1(12/01/14)DUP
PAM-1(12/02/14)DUP
PAM-1D(12/02/14)DUP

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

Introduction

This data review covers 19 air samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per ASTM D7614 for Hexavalent Chromium.

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

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

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

NJ Presumptive evidence of presence of the compound at an estimated quantity.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

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

I. Technical Holding Times

All technical holding time requirements were met.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met.

IV. Blanks

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

Samples PAM-31(12/01/14) and PAM-31(12/02/14) were identified as trip blanks. No hexavalent chromium was found.

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

V. Matrix Spike/Matrix Spike Duplicates

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

VI. Duplicates

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

VII. Laboratory Control Samples

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

VIII. Sample Result Verification

All sample result verifications were acceptable.

IX. Overall Assessment of Data

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

X. Field Duplicates

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

Analyte	Concentration (ng/m^3)		RPD (Limits)	Flags	A or P
	PAM-1(12/02/14)	PAM-1D(12/02/14)			
Hexavalent chromium	0.0279	0.0261	7 (≤20)	-	-

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

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

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

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

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

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

LDC #: 33248A6 **VALIDATION COMPLETENESS WORKSHEET** Date: 12/10/14
SDG #: 4120243/4120332 Level IV Page: 1 of 1
Laboratory: Eastern Research Group Reviewer: SD
2nd Reviewer: CA

METHOD: Hexavalent Chromium (ASTM D7614)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 12/01-02/14
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Blanks	A	
V	Matrix Spike/Matrix Spike Duplicates	N	Not Required
VI.	Duplicates	A	DUP
VII.	Laboratory control samples	A	LCSD
VIII.	Sample result verification	A	
IX.	Overall assessment of data	A	
X.	Field duplicates	SW	FD: (10, 11)
XI	Field blanks	ND	FB= (6)(15), TB= (7)(16)

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: All

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

Notes: _____

LDC #: 33248A6

VALIDATION FINDINGS CHECKLIST

Reviewer: JD
2nd Reviewer: AM

Method: Inorganics (EPA Method Se (aqueous))

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

AMS

LDC #: 33248A6 / 33248T / 30

VALIDATION FINDINGS CHECKLIST

Reviewer: SD
2nd Reviewer:

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

LDC# 33248A6

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Reviewer: JD

2nd Reviewer: [signature]

Inorganics: Method See Cover

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

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LDC #: 33248A6

Validation Findings Worksheet
Initial and Continuing Calibration Calculation Verification

Page: 1 of 1
Reviewer: SD
2nd Reviewer: SZ

Method: Inorganics, Method See Cover

The correlation coefficient (r) for the calibration of Cr^{+6} was recalculated. Calibration date: 12/15/14

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

$$\%R = \frac{\text{Found} \times 100}{\text{True}}$$

Where, Found = concentration of each analyte measured in the analysis of the ICV or CCV solution
True = concentration of each analyte in the ICV or CCV source

Type of analysis	Analyte	Standard	Conc. (ng/ml)	Area	Recalculated r or r^2	Reported r or r^2	Acceptable (Y/N)
Initial calibration	Cr^{+6}	s1	0.1	0.0000183	*0.99995*	0.99995	Y
		s2	0.1	0.00004			
		s3	0.2	0.0000847			
		s4	0.5	0.0002128			
		s5	1	0.0004217			
		s6	2	0.0008329			
ICV 11:33 Calibration verification	Cr^{+6}	Found 0.5109 ng/ml	True 0.5 ng/ml		102.2%R	102.2%R	
CCV 12:33 Calibration verification	Cr^{+6}	0.5346 ng/ml	0.5 ng/ml		106.9%R	106.9%R	
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 #: 33248A6

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Page: 1 of 1
Reviewer: JD
2nd Reviewer: G

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

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

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

Sample ID	Type of Analysis	Element	Found / S (units)	True / D (units)	Recalculated %R / RPD	Reported %R / RPD	Acceptable (Y/N)
LCS 12:03	Laboratory control sample	Cr^{+6}	1.09 ng/ml	1.00 ng/ml	109%R	109%R	Y
N	Matrix spike sample		(SSR-SR)				
DUP 13:03	Duplicate sample	Cr^{+6}	0.0363 ng/m³	0.0334 ng/m³	8.32%RPD	8.53%RPD	Y

Comments: _____

TOTCLC.6

LDC #: 33248A6

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: JD
2nd reviewer:

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 (1) Cr^{+6} reported with a positive detect were recalculated and verified using the following equation:

Concentration = $(A-C_0)/C_1$ V_f= 10ml m^3 = 21.72 Recalculation: $\frac{(0.0000174 - 5.12E-07)}{0.0004175} = 0.04045 ng/ml$

A = 0.0000174
C_0 = +5.12E-07
C_1 = 0.0004175

$\frac{(ng/ml)(V_f)}{m^3} = ng/m^3$ $\frac{(0.04045 ng/ml)(10 ml)}{21.72 m^3} = 0.0186$

#	Sample ID	Analyte	Reported Concentration (ng/m^3)	Calculated Concentration (ng/m^3)	Acceptable (Y/N)
	1	Cr^{+6}	0.0186	0.0186	Y
	2		0.0333	0.0334	Y*
	3		0.0256	0.0236 ~~0.0255~~ ~~0.0258~~ 30	30 ~~Y*~~ Y
	4		0.0231	0.0232	Y*
	5		0.0476	0.0476	Y
	6		ND	ND	
	7		ND	ND	
	8		0.0132	0.0132	
	9		0.0234	0.0233	Y*
	10		0.0279	0.0279	Y
	11		0.0261	0.0261	
	12		0.0676	0.0676	
	13		0.0137	0.0137	
	14		0.0215	0.0214	Y*
	15		ND	ND	Y
	16		ND	ND	

Note:

CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc
75 Valley Stream Parkway, Suite 400
Malvern, PA 19355
ATTN: Mr. Jeff Boggs
PHONE: (443) 803-8495 **FAX:** (410) 266-8912

FILE #: 3926.00
REPORTED: 12/09/14 15:13
SUBMITTED: 12/02/14 to 12/03/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: OAM 1 **Lab ID:** 4120243-01 **Sampled:** 12/01/14 15:11
Matrix: Air **Sample Volume:** 21.72 m^3 **Received:** 12/02/14 11:39
Comments: Start Time 11/30/14 15:02 **Analysis Date:** 12/08/14 13:53

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0186		0.0036

DEC 1 1 2014

Initials: CR

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FILE #: 3926.00
REPORTED: 12/09/14 15:13
SUBMITTED: 12/02/14 to 12/03/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-1 **Lab ID:** 4120243-03 **Sampled:** 12/01/14 16:38
Matrix: Air **Sample Volume:** 22.22 m^3 **Received:** 12/02/14 11:39
Comments: Col 1 Start Time 11/30/14 15:50 **Analysis Date:** 12/08/14 12:53

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0333		0.0036

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FILE #: 3926.00
REPORTED: 12/09/14 15:13
SUBMITTED: 12/02/14 to 12/03/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-2 **Lab ID:** 4120243-05 **Sampled:** 12/01/14 16:28
Matrix: Air **Sample Volume:** 22.2 m^3 **Received:** 12/02/14 11:39
Comments: Start Time 11/30/14 15:47 **Analysis Date:** 12/08/14 14:03

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0256		0.0036

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FILE #: 3926.00
REPORTED: 12/09/14 15:13
SUBMITTED: 12/02/14 to 12/03/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-3 **Lab ID:** 4120243-06 **Sampled:** 12/01/14 16:16
Matrix: Air **Sample Volume:** 22.12 m^3 **Received:** 12/02/14 11:39
Comments: Start Time 11/30/14 15:41 **Analysis Date:** 12/08/14 14:12

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m^3 Air	Flag	MDL ng/m^3 Air
Hexavalent Chromium	1854-02-99	0.0231		0.0036

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FILE #: 3926.00
REPORTED: 12/09/14 15:13
SUBMITTED: 12/02/14 to 12/03/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-4 **Lab ID:** 4120243-07 **Sampled:** 12/01/14 16:02
Matrix: Air **Sample Volume:** 22.02 m^3 **Received:** 12/02/14 11:39
Comments: Start Time 11/30/14 15:34 **Analysis Date:** 12/08/14 14:22

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0476		0.0036

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FILE #: 3926.00
REPORTED: 12/09/14 15:13
SUBMITTED: 12/02/14 to 12/03/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-21 **Lab ID:** 4120243-08 **Sampled:** 12/01/14 00:00
Matrix: Air **Sample Volume:** 22.2 m^3 **Received:** 12/02/14 11:39
Comments: **Analysis Date:** 12/08/14 14:52

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

DEC 1 1 2014

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FILE #: 3926.00
REPORTED: 12/09/14 15:13
SUBMITTED: 12/02/14 to 12/03/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-31 **Lab ID:** 4120243-09 **Sampled:** 12/01/14 00:00
Matrix: Air **Sample Volume:** 22.12 m^3 **Received:** 12/02/14 11:39
Comments: **Analysis Date:** 12/08/14 15:02

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

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REPORTED: 12/09/14 15:13
SUBMITTED: 12/02/14 to 12/03/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: OAM 1 **Lab ID:** 4120332-01 **Sampled:** 12/02/14 15:16
Matrix: Air **Sample Volume:** 21.54 m^3 **Received:** 12/03/14 13:06
Comments: Start Time 12/1/14 15:20 **Analysis Date:** 12/08/14 15:12

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0132		0.0036

DEC 1 1 2014

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FILE #: 3926.00
REPORTED: 12/09/14 15:13
SUBMITTED: 12/02/14 to 12/03/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: OAM 2 **Lab ID:** 4120332-02 **Sampled:** 12/02/14 15:34
Matrix: Air **Sample Volume:** 21.44 m^3 **Received:** 12/03/14 13:06
Comments: Start Time 12/1/14 15:45 **Analysis Date:** 12/08/14 15:22

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0234		0.0036

DEC 1 1 2014

Initials: CR

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FILE #: 3926.00
REPORTED: 12/09/14 15:13
SUBMITTED: 12/02/14 to 12/03/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-1 **Lab ID:** 4120332-03 **Sampled:** 12/02/14 16:34
Matrix: Air **Sample Volume:** 21.36 m^3 **Received:** 12/03/14 13:06
Comments: Col 1 Start Time 12/1/14 16:50 **Analysis Date:** 12/08/14 13:13

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0279		0.0036

DEC 1 1 2014

Initials: CR

CERTIFICATE OF ANALYSIS

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FILE #: 3926.00
REPORTED: 12/09/14 15:13
SUBMITTED: 12/02/14 to 12/03/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-1D **Lab ID:** 4120332-04 **Sampled:** 12/02/14 16:38
Matrix: Air **Sample Volume:** 21.37 m^3 **Received:** 12/03/14 13:06
Comments: Col 2 Start Time 12/1/14 16:53 **Analysis Date:** 12/08/14 13:32

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0261		0.0036

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CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc
75 Valley Stream Parkway, Suite 400
Malvern, PA 19355
ATTN: Mr. Jeff Boggs
PHONE: (443) 803-8495 **FAX:** (410) 266-8912

FILE #: 3926.00
REPORTED: 12/09/14 15:13
SUBMITTED: 12/02/14 to 12/03/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-2 **Lab ID:** 4120332-05 **Sampled:** 12/02/14 16:30
Matrix: Air **Sample Volume:** 21.47 m^3 **Received:** 12/03/14 13:06
Comments: Start Time 12/1/14 16:30 **Analysis Date:** 12/08/14 15:32

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0676		0.0036

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FILE #: 3926.00
REPORTED: 12/09/14 15:13
SUBMITTED: 12/02/14 to 12/03/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-3 **Lab ID:** 4120332-06 **Sampled:** 12/02/14 16:09
Matrix: Air **Sample Volume:** 21.44 m^3 **Received:** 12/03/14 13:06
Comments: Start Time 12/1/14 16:20 **Analysis Date:** 12/08/14 15:42

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m^3 Air	Flag	MDL ng/m^3 Air
Hexavalent Chromium	1854-02-99	0.0137		0.0036

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FILE #: 3926.00
REPORTED: 12/09/14 15:13
SUBMITTED: 12/02/14 to 12/03/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-4 **Lab ID:** 4120332-07 **Sampled:** 12/02/14 15:57
Matrix: Air **Sample Volume:** 21.43 m^3 **Received:** 12/03/14 13:06
Comments: Start Time 12/1/14 16:08 **Analysis Date:** 12/08/14 15:51

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0215		0.0036

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FILE #: 3926.00
REPORTED: 12/09/14 15:13
SUBMITTED: 12/02/14 to 12/03/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-21 **Lab ID:** 4120332-08 **Sampled:** 12/02/14 00:00
Matrix: Air **Sample Volume:** 21.47 m^3 **Received:** 12/03/14 13:06
Comments: **Analysis Date:** 12/08/14 16:01

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

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FILE #: 3926.00
REPORTED: 12/09/14 15:13
SUBMITTED: 12/02/14 to 12/03/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-31 **Lab ID:** 4120332-09 **Sampled:** 12/02/14 00:00
Matrix: Air **Sample Volume:** 21.44 m^3 **Received:** 12/03/14 13:06
Comments: **Analysis Date:** 12/08/14 16:12

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

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

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

December 19, 2014

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

Dear Mr. Boggs,

Enclosed is the final validation report for the fraction listed below. This SDG was received on December 18, 2014. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #33307:

SDG	Fraction
4121113/4121205	Hexavalent Chromium

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

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

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

Sincerely,

Christina Rink
Project Manager/Chemist

104 pages-SF 5 DAY TAT

Attachment 1

Level IV

LDC #33307 (ERM - Morrisville, NC / Harbor Point, MD, Hexavalent Chromium Monitoring)

LDC	SDG#	DATE REC'D	(3) DATE DUE	Cr(VI) (D7614)																																	
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
A	4121113/4121205	12/18/14	12/26/14	18	0																																
Total	A/CR			18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18

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

LDC Report# 33307A6

Laboratory Data Consultants, Inc.
Data Validation Report

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

Collection Date: December 10 through December 11, 2014

LDC Report Date: December 19, 2014

Matrix: Air

Parameters: Hexavalent Chromium

Validation Level: EPA Level IV

Laboratory: Eastern Research Group

Sample Delivery Group (SDG): 4121113/4121205

Sample Identification

OAM 1 (12/10/14)
OAM 2 (12/10/14)
PAM-1 (12/10/14)
PAM-1D (12/10/14)
PAM-2 (12/10/14)
PAM-3 (12/10/14)
PAM-4 (12/10/14)
PAM-21 (12/10/14)
PAM-31 (12/10/14)
OAM 1 (12/11/14)
OAM 2 (12/11/14)
PAM-1 (12/11/14)
PAM-1D (12/11/14)
PAM-2 (12/11/14)
PAM-3 (12/11/14)
PAM-4 (12/11/14)
PAM-21 (12/11/14)
PAM-31 (12/11/14)
PAM-1 (12/10/14)DUP
PAM-1D (12/10/14)DUP
PAM-1 (12/11/14)DUP
PAM-1D (12/11/14)DUP

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

Introduction

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

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

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

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

NJ Presumptive evidence of presence of the compound at an estimated quantity.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

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

I. Technical Holding Times

All technical holding time requirements were met.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met.

IV. Blanks

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

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

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

V. Matrix Spike/Matrix Spike Duplicates

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

VI. Duplicates

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

VII. Laboratory Control Samples

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

VIII. Sample Result Verification

All sample result verifications were acceptable.

IX. Overall Assessment of Data

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

X. Field Duplicates

Samples PAM-1 (12/10/14) and PAM-1D (12/10/14) and samples PAM-1 (12/11/14) and PAM-1D (12/11/14) were identified as field duplicates. No hexavalent chromium was detected in any of the samples with the following exceptions:

Analyte	Concentration (ng/m^3)		RPD (Limits)	Flags	A or P
	PAM-1 (12/10/14)	PAM-1D (12/10/14)			
Hexavalent chromium	0.0148	0.0160	8 (≤20)	-	-

Analyte	Concentration (ng/m^3)		RPD (Limits)	Flags	A or P
	PAM-1 (12/11/14)	PAM-1D (12/11/14)			
Hexavalent chromium	0.0235	0.0193	20 (≤20)	-	-

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

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

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

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

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

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

CERTIFICATE OF ANALYSIS

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FILE #: 3926.00
REPORTED: 12/18/14 12:08
SUBMITTED: 12/11/14 to 12/12/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: OAM 1 **Lab ID:** 4121113-01 **Sampled:** 12/10/14 15:06
Matrix: Air **Sample Volume:** 21.42 m^3 **Received:** 12/11/14 10:33
Comments: Start Time 12/9/14 15:18 **Analysis Date:** 12/15/14 14:32

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m^3 Air	Flag	MDL ng/m^3 Air
Hexavalent Chromium	1854-02-99	0.0127		0.0036

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FILE #: 3926.00
REPORTED: 12/18/14 12:08
SUBMITTED: 12/11/14 to 12/12/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: OAM 2 **Lab ID:** 4121113-02 **Sampled:** 12/10/14 15:38
Matrix: Air **Sample Volume:** 21.69 m^3 **Received:** 12/11/14 10:33
Comments: Start Time 12/9/14 15:32 **Analysis Date:** 12/15/14 14:42

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

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FILE #: 3926.00
REPORTED: 12/18/14 12:08
SUBMITTED: 12/11/14 to 12/12/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-1 **Lab ID:** 4121113-03 **Sampled:** 12/10/14 17:02
Matrix: Air **Sample Volume:** 22.05 m^3 **Received:** 12/11/14 10:33
Comments: Col 1 Start Time 12/9/14 16:32 **Analysis Date:** 12/15/14 13:52

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m^3 Air	Flag	MDL ng/m^3 Air
Hexavalent Chromium	1854-02-99	0.0148		0.0036

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FILE #: 3926.00
REPORTED: 12/18/14 12:08
SUBMITTED: 12/11/14 to 12/12/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-1D **Lab ID:** 4121113-04 **Sampled:** 12/10/14 17:08
Matrix: Air **Sample Volume:** 22.11 m^3 **Received:** 12/11/14 10:33
Comments: Col 2 Start Time 12/9/14 16:34 **Analysis Date:** 12/15/14 12:53

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m^3 Air	Flag	MDL ng/m^3 Air
Hexavalent Chromium	1854-02-99	0.0160		0.0036

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FILE #: 3926.00
REPORTED: 12/18/14 12:08
SUBMITTED: 12/11/14 to 12/12/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-2 **Lab ID:** 4121113-05 **Sampled:** 12/10/14 16:47
Matrix: Air **Sample Volume:** 22.09 m^3 **Received:** 12/11/14 10:33
Comments: Start Time 12/9/14 16:15 **Analysis Date:** 12/15/14 14:52

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0124		0.0036

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FILE #: 3926.00
REPORTED: 12/18/14 12:08
SUBMITTED: 12/11/14 to 12/12/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-3 **Lab ID:** 4121113-06 **Sampled:** 12/10/14 16:22
Matrix: Air **Sample Volume:** 21.83 m^3 **Received:** 12/11/14 10:33
Comments: Start Time 12/9/14 16:07 **Analysis Date:** 12/15/14 15:02

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

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FILE #: 3926.00
REPORTED: 12/18/14 12:08
SUBMITTED: 12/11/14 to 12/12/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-4 **Lab ID:** 4121113-07 **Sampled:** 12/10/14 16:08
Matrix: Air **Sample Volume:** 21.79 m^3 **Received:** 12/11/14 10:33
Comments: Start Time 12/9/14 15:55 **Analysis Date:** 12/15/14 15:12

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m^3 Air	Flag	MDL ng/m^3 Air
Hexavalent Chromium	1854-02-99	0.0168		0.0036

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FILE #: 3926.00
REPORTED: 12/18/14 12:08
SUBMITTED: 12/11/14 to 12/12/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-21 **Lab ID:** 4121113-08 **Sampled:** 12/10/14 00:00
Matrix: Air **Sample Volume:** 22.09 m^3 **Received:** 12/11/14 10:33
Comments: **Analysis Date:** 12/15/14 15:21

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

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FILE #: 3926.00
REPORTED: 12/18/14 12:08
SUBMITTED: 12/11/14 to 12/12/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-31 **Lab ID:** 4121113-09 **Sampled:** 12/10/14 00:00
Matrix: Air **Sample Volume:** 21.83 m^3 **Received:** 12/11/14 10:33
Comments: **Analysis Date:** 12/15/14 15:31

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

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FILE #: 3926.00
REPORTED: 12/18/14 12:08
SUBMITTED: 12/11/14 to 12/12/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: OAM 1 **Lab ID:** 4121205-01 **Sampled:** 12/11/14 14:55
Matrix: Air **Sample Volume:** 21.27 m^3 **Received:** 12/12/14 11:18
Comments: Start Time 12/10/14 15:17 **Analysis Date:** 12/15/14 15:41

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

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FILE #: 3926.00
REPORTED: 12/18/14 12:08
SUBMITTED: 12/11/14 to 12/12/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: OAM 2 **Lab ID:** 4121205-02 **Sampled:** 12/11/14 15:13
Matrix: Air **Sample Volume:** 21.15 m^3 **Received:** 12/12/14 11:18
Comments: Start Time 12/10/14 15:43 **Analysis Date:** 12/15/14 15:51

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0182		0.0036

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FILE #: 3926.00
REPORTED: 12/18/14 12:08
SUBMITTED: 12/11/14 to 12/12/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-1 **Lab ID:** 4121205-03 **Sampled:** 12/11/14 16:18
Matrix: Air **Sample Volume:** 20.88 m^3 **Received:** 12/12/14 11:18
Comments: Col 1 Start Time 12/10/14 17:05 **Analysis Date:** 12/15/14 13:12

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0235		0.0036

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FILE #: 3926.00
REPORTED: 12/18/14 12:08
SUBMITTED: 12/11/14 to 12/12/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-1D **Lab ID:** 4121205-04 **Sampled:** 12/11/14 16:20
Matrix: Air **Sample Volume:** 20.82 m^3 **Received:** 12/12/14 11:18
Comments: Col 2 Start Time 12/10/14 17:11 **Analysis Date:** 12/15/14 13:32

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m^3 Air	Flag	MDL ng/m^3 Air
Hexavalent Chromium	1854-02-99	0.0193		0.0036

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FILE #: 3926.00
REPORTED: 12/18/14 12:08
SUBMITTED: 12/11/14 to 12/12/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-2 **Lab ID:** 4121205-05 **Sampled:** 12/11/14 16:04
Matrix: Air **Sample Volume:** 20.87 m^3 **Received:** 12/12/14 11:18
Comments: Start Time 12/10/14 16:52 **Analysis Date:** 12/15/14 16:01

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

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FILE #: 3926.00
REPORTED: 12/18/14 12:08
SUBMITTED: 12/11/14 to 12/12/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-3 **Lab ID:** 4121205-06 **Sampled:** 12/11/14 15:55
Matrix: Air **Sample Volume:** 21.14 m^3 **Received:** 12/12/14 11:18
Comments: Start Time 12/10/14 16:26 **Analysis Date:** 12/15/14 16:31

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

DEC 19 2014

Initials: CR

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FILE #: 3926.00
REPORTED: 12/18/14 12:08
SUBMITTED: 12/11/14 to 12/12/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-4 **Lab ID:** 4121205-07 **Sampled:** 12/11/14 15:43
Matrix: Air **Sample Volume:** 21.15 m^3 **Received:** 12/12/14 11:18
Comments: Start Time 12/10/14 16:13 **Analysis Date:** 12/15/14 16:41

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0376		0.0036

DEC 19 2014

Initials: CR

CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc
75 Valley Stream Parkway, Suite 400
Malvern, PA 19355
ATTN: Mr. Jeff Boggs
PHONE: (443) 803-8495 **FAX:** (410) 266-8912

FILE #: 3926.00
REPORTED: 12/18/14 12:08
SUBMITTED: 12/11/14 to 12/12/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-21 **Lab ID:** 4121205-08 **Sampled:** 12/11/14 00:00
Matrix: Air **Sample Volume:** 20.87 m^3 **Received:** 12/12/14 11:18
Comments: **Analysis Date:** 12/15/14 16:51

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

DEC 19 2014

Initials: CR

CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc
75 Valley Stream Parkway, Suite 400
Malvern, PA 19355
ATTN: Mr. Jeff Boggs
PHONE: (443) 803-8495 **FAX:** (410) 266-8912

FILE #: 3926.00
REPORTED: 12/18/14 12:08
SUBMITTED: 12/11/14 to 12/12/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-31 **Lab ID:** 4121205-09 **Sampled:** 12/11/14 00:00
Matrix: Air **Sample Volume:** 21.14 m^3 **Received:** 12/12/14 11:18
Comments: **Analysis Date:** 12/15/14 17:01

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

DEC 19 2014

Initials: CR

LDC #: 33307A6 **VALIDATION COMPLETENESS WORKSHEET** Date: 12/18/14
SDG #: 4121113/4121205 Level IV Page: 1 of 1
Laboratory: Eastern Research Group Reviewer: SD
2nd Reviewer: DR

METHOD: Hexavalent Chromium (ASTM D7614)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 12/10-11/14
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Blanks	A	
V	Matrix Spike/Matrix Spike Duplicates	N	Not Required
VI.	Duplicates	A	DUP
VII.	Laboratory control samples	A	LCS/D
VIII.	Sample result verification	A	
IX.	Overall assessment of data	A	
X.	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: Airs

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

Notes:

LDC #: 33507A0

VALIDATION FINDINGS CHECKLIST

Reviewer: 3D
2nd Reviewer: JR

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

Airs

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# 33307A6

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Reviewer: JO

2nd Reviewer: AV

Inorganics: Method See Cover

Analyte	Concentration (ng/m3)		RPD (≤20)	Qualifier
	3	4		
Hexavalent Chromium	0.0148	0.0160	8	

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

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

LDC #: 33307A6

Validation Findings Worksheet
Initial and Continuing Calibration Calculation Verification

Page: 1 of 1
Reviewer: JO
2nd Reviewer: CL

Method: Inorganics, Method See Cover

The correlation coefficient (r) for the calibration of Cr^{+6} was recalculated. Calibration date: 12/15/14

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

$$\%R = \frac{\text{Found} \times 100}{\text{True}}$$

Where, Found = concentration of each analyte measured in the analysis of the ICV or CCV solution
True = concentration of each analyte in the ICV or CCV source

Type of analysis	Analyte	Standard	Conc. (ng/ml)	Area	Recalculated r or r^2	Reported r or r^2	Acceptable (Y/N)
Initial calibration	Cr^{+6}	s1	0.05	0.0000117	*0.99985*	0.99982	Y*
		s2	0.10	0.0000283			
		s3	0.20	0.0000714			
		s4	0.50	0.0002096			
		s5	1.00	0.0004147			
		s6	2.00	0.0008252			
ICV 11:13 Calibration verification	Cr^{+6}	Found 0.5195 ng/ml	True 0.5 ng/ml		103.9%R	103.9%R	Y
CCV 12:13 Calibration verification	Cr^{+6}	0.5107 ng/ml	0.5 ng/ml		102.1%R	102.2%R	Y*
Calibration verification							

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

*Rounding

LDC #: 33307A0

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Page: 1 of 1
Reviewer: JD
2nd Reviewer: E

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 / True 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 = concentration of each analyte in the source.

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

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

Sample ID	Type of Analysis	Element	Found / S (units)	True / D (units)	Recalculated %R / RPD	Reported %R / RPD	Acceptable (Y/N)
LCS 11:43	Laboratory control sample	Cr^{+6}	1.126 ng/ml	1.00 ng/ml	113%R	113%R	Y
N	Matrix spike sample		(SSR-SR)				
DUP	Duplicate sample	Cr^{+6}	0.0165 ng/m3	0.0147 ng/m3	11.5%RPD	10.7%RPD	Y *

Comments: * Rounding

LDC #: 33307A6

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: JO
2nd reviewer: CN

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} reported with a positive detect were recalculated and verified using the following equation:

Concentration = $(A-C_0)/C_1$ $V_f = 10ml$ $m^3 = 21.15 m^3$ Recalculation: $\frac{(0.000025 - (-8.33E-06))}{0.0004191} = 0.0795 ng/ml$

$C_0 = -8.33E-06$
$A = 0.000025$
$C_1 = 0.0004191$

$\frac{(ng/ml)(Vf)}{m^3} = ng/m^3$ $\frac{(0.0795 ng/ml)(10ml)}{21.15 m^3} = 0.0376 ng/m^3$

#	Sample ID	Analyte	Reported Concentration (ng/m^3)	Calculated Concentration (ng/m^3)	Acceptable (Y/N)
	1	Cr^{+6}	0.0127	0.0127	Y
	2		ND	ND	↓
	3		0.0148	0.0147	Y*
	4		0.0160	0.0160	Y
	5		0.0124	0.0123	Y*
	6		ND	ND	Y
	7		0.0168	0.0169	Y*
	8		ND	ND	Y
	9		ND	ND	↓
	10		ND	ND	↓
	11		0.0182	0.0181	Y*
	12		0.0235	0.0235	Y
	13		0.0193	0.0193	
	14		ND	ND	
	15		ND	ND	
	16		0.0376	0.0376	
	17		ND	ND	
	18	↓	ND	ND	↓

Note: _____

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

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

December 30, 2014

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

Dear Mr. Boggs,

Enclosed is the final validation report for the fraction listed below. This SDG was received on December 2, 2014. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #33322:

SDG	Fraction
4121626	Hexavalent Chromium

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

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

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

Sincerely,

Christina Rink
Project Manager/Chemist

154 pages-SF 5 DAY TAT Attachment 1

Level IV

LDC #33322 (ERM - Morrisville, NC / Harbor Point, MD, Hexavalent Chromium Monitoring)

LDC	SDG#	DATE REC'D	(3) DATE DUE	Cr(VI) (D7614)																																	
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
A	4121626	12/2/14	12/30/14	27	0																																
Total	A/CR			27	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	27

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

L:\ERM\Harbor Point_Honeywell\33322ST.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

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

Collection Date: December 12 through December 15, 2014

LDC Report Date: December 23, 2014

Matrix: Air

Parameters: Hexavalent Chromium

Validation Level: EPA Level IV

Laboratory: Eastern Research Group

Sample Delivery Group (SDG): 4121626

Sample Identification

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

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

Introduction

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

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

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

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

NJ Presumptive evidence of presence of the compound at an estimated quantity.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

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

I. Technical Holding Times

All technical holding time requirements were met.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met.

IV. Blanks

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

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

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

V. Matrix Spike/Matrix Spike Duplicates

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

VI. Duplicates

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

VII. Laboratory Control Samples

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

VIII. Sample Result Verification

All sample result verifications were acceptable.

IX. Overall Assessment of Data

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

X. Field Duplicates

Samples PAM-1(12/12/14) and PAM-1D(12/12/14), samples PAM-1(12/13/14) and PAM-1D(12/13/14), and samples PAM-1(12/15/14) and PAM-1D(12/15/14) were identified as field duplicates. No hexavalent chromium was detected in any of the samples with the following exceptions:

Analyte	Concentration (ng/m^3)		RPD (Limits)	Flags	A or P
	PAM-1(12/12/14)	PAM-1D(12/12/14)			
Hexavalent chromium	0.0245	0.0260	6 (≤20)	-	-

Analyte	Concentration (ng/m^3)		RPD (Limits)	Flags	A or P
	PAM-1(12/13/14)	PAM-1D(12/13/14)			
Hexavalent chromium	0.0138	0.0125	10 (≤20)	-	-

Analyte	Concentration (ng/m^3)		RPD (Limits)	Flags	A or P
	PAM-1(12/15/14)	PAM-1D(12/15/14)			
Hexavalent chromium	0.0242	0.0261	8 (≤20)	-	-

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

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

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

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

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

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

LDC #: 33322A6
SDG #: 4121626
Laboratory: Eastern Research Group

VALIDATION COMPLETENESS WORKSHEET
Level IV

Date: 12/22/14
Page: 1 of 1
Reviewer: JD
2nd Reviewer: CL

METHOD: Hexavalent Chromium (ASTM D7614)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 12/12-15/14
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Blanks	A	
V	Matrix Spike/Matrix Spike Duplicates	N	Not Required
VI.	Duplicates	A	DUP
VII.	Laboratory control samples	A	LCSD
VIII.	Sample result verification	A	
IX.	Overall assessment of data	A	
X.	Field duplicates	SW	FD=(3,4) (12,13) (21, 22)
XI	Field blanks	ND	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: Airs

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

Notes:

LDC #: 33527A0

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: JD
2nd Reviewer: CR

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

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# 33322A6

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: JD
2nd Reviewer: DL

Inorganics: Method See Cover

Analyte	Concentration (ng/m3)		RPD (≤20)	Qualifier
	3	4		
Hexavalent Chromium	0.0245	0.0260	6	

Analyte	Concentration (ng/m3)		RPD (≤20)	Qualifier
	12	13		
Hexavalent Chromium	0.0138	0.0125	10	

Analyte	Concentration (ng/m3)		RPD (≤20)	Qualifier
	21	22		
Hexavalent Chromium	0.0242	0.0261	8	

LDC #: 33522A10

Validation Findings Worksheet
Initial and Continuing Calibration Calculation Verification

Reviewer: JD
2nd Reviewer: CL

Method: Inorganics, Method See Cover

The correlation coefficient (r) for the calibration of Cr+6 was recalculated.Calibration date: 12/17/14

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

%R = Found X 100 / True

Where, Found = concentration of each analyte measured in the analysis of the ICV or CCV solution
True = concentration of each analyte in the ICV or CCV source

Type of analysis	Analyte	Standard	Conc. (ng/ml)	Area	Recalculated r or r^2	Reported r or r^2	Acceptable (Y/N)
Initial calibration	Cr+6	s1	0.05	0.0000203	*0.99982*	0.99982	y
		s2	0.10	0.0000411			
		s3	0.20	0.0000887			
		s4	0.50	0.0002325			
		s5	1.00	0.0004588			
		s6	2.00	0.0008926			
ICV 11:33 Calibration verification	Cr+6	Found 0.4988 ng/ml	True 0.5 ng/ml		99.8%R	99.7%R	y*
CCV 12:32 Calibration verification	Cr+6	0.5173 ng/ml	0.5 ng/ml		103.5%R	103.5%R	y
Calibration verification							

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

* Rounding

LDC #: 33322A6

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Page: 1 of 1
Reviewer: SQ
2nd Reviewer: [illegible]

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 / True 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 = concentration of each analyte in the source.

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

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

Sample ID	Type of Analysis	Element	Found / S (units)	True / D (units)	Recalculated %R / RPD	Reported %R / RPD	Acceptable (Y/N)
LCS	Laboratory control sample	Cr^{+6}	1.02 ng/ml	1.00 ng/ml	108%R	108%R	Y
N	Matrix spike sample		(SSR-SR)				
DUP	Duplicate sample	Cr^{+6}	0.02683 ng/m^3	0.02445 ng/m^3	9.28%R	9.18%RPD	Y*

Comments:

* Rounding

LDC #: 33322A10

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 2
Reviewer: JD
2nd reviewer: ✓

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 (4) Cr+6 reported with a positive detect were recalculated and verified using the following equation:

Concentration = $\frac{A - C_0}{C_1}$ $\frac{(ng/ml)(Vt)}{m^3}$ Vt = 10 ml, m^3 = 21.67

C_0 = 1.15E-06
C_1 = 0.0004486
A = 0.0000260

Recalculation: $\frac{0.0000260 - (1.15E-06)}{0.0004486} = 0.05629\ ng/ml$

$\frac{(0.05629\ ng/ml)(10\ ml)}{21.67\ m^3} = 0.0260\ ng/m^3$

#	Sample ID	Analyte	Reported Concentration (ng/m^3)	Calculated Concentration (ng/m^3)	Acceptable (Y/N)
	1	Cr+6	0.0091	0.0091	y
	2		0.0113	0.0112	y*
	3		0.0245	0.0245	y
	4		0.0260	0.0260	y
	5		0.0099	0.0100	y*
	6		ND	ND	y
	7		0.0305	0.0305	↓
	8		ND	ND	↓
	9		ND	ND	↓
	10		0.0153	0.0153	↓
	11		0.0174	0.0175	y*
	12		0.0138	0.0138	y
	13		0.0125	0.0124	y*
	14		0.0210	0.0215	y*
	15		0.0108	0.0108	y
	16		0.0122	0.0122	↓
	17		ND	ND	↓
	18		ND	ND	↓
	19		0.0199	0.0198	y*
	20	↓	0.0180	0.0179	y*

JD

Note: *Rounding

LDC #: 33322A6

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 2 of 3
Reviewer: SD
2nd reviewer: GA

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 (22) Cr+6 reported with a positive detect were recalculated and verified using the following equation:

Concentration = $(A - C_o)/C_i$

A = 0.0000227
C_o = -1.4E-06
C_i = 0.0004139

wf = wm
m^3 = 22.34

Recalculation: $\frac{0.0000227 - (-1.4E-06)}{0.0004139} = 0.0582$ ng/ml

$\frac{(ng/ml)(wf)}{m^3} = ng/m^3$

$\frac{(0.0582 ng/ml)(10ml)}{22.34 m^3} = 0.0261 ng/m^3$

#	Sample ID	Analyte	Reported Concentration (ng/m³)	Calculated Concentration (ng/m³)	Acceptable (Y/N)
	21	Cr+6	0.0242	0.0243	y*
	22	↓	0.0261	0.0261	y
	23		0.0401	0.0400	y*
	24		0.0232	0.0232	y
	25		0.0389	0.0388	y*
	26		ND	ND	y
	27	↓	ND	ND	y

Note: * Rounding

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FILE #: 3926.00
REPORTED: 12/22/14 11:14
SUBMITTED: 12/16/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: OAM 1 **Lab ID:** 4121626-01 **Sampled:** 12/12/14 14:51
Matrix: Air **Sample Volume:** 21.48 m^3 **Received:** 12/16/14 11:49
Comments: Start Time 12/11/14 14:59 **Analysis Date:** 12/17/14 14:34

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0091		0.0036

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FILE #: 3926.00
REPORTED: 12/22/14 11:14
SUBMITTED: 12/16/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: OAM 2 **Lab ID:** 4121626-02 **Sampled:** 12/12/14 15:09
Matrix: Air **Sample Volume:** 21.5 m^3 **Received:** 12/16/14 11:49
Comments: Start Time 12/11/14 15:16 **Analysis Date:** 12/17/14 14:44

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0113		0.0036

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FILE #: 3926.00
REPORTED: 12/22/14 11:14
SUBMITTED: 12/16/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-1 **Lab ID:** 4121626-03 **Sampled:** 12/12/14 16:23
Matrix: Air **Sample Volume:** 21.64 m^3 **Received:** 12/16/14 11:49
Comments: Col 1 Start Time 12/11/14 16:21 **Analysis Date:** 12/17/14 12:52

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m^3 Air	Flag	MDL ng/m^3 Air
Hexavalent Chromium	1854-02-99	0.0245		0.0036

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FILE #: 3926.00
REPORTED: 12/22/14 11:14
SUBMITTED: 12/16/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-1D **Lab ID:** 4121626-04 **Sampled:** 12/12/14 16:28
Matrix: Air **Sample Volume:** 21.67 m^3 **Received:** 12/16/14 11:49
Comments: Col 2 Start Time 12/11/14 16:23 **Analysis Date:** 12/17/14 13:12

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0260		0.0036

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FILE #: 3926.00
REPORTED: 12/22/14 11:14
SUBMITTED: 12/16/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-2 **Lab ID:** 4121626-05 **Sampled:** 12/12/14 16:03
Matrix: Air **Sample Volume:** 21.55 m^3 **Received:** 12/16/14 11:49
Comments: Start Time 12/11/14 16:07 **Analysis Date:** 12/17/14 17:33

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m^3 Air	Flag	MDL ng/m^3 Air
Hexavalent Chromium	1854-02-99	0.0099		0.0036

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FILE #: 3926.00
REPORTED: 12/22/14 11:14
SUBMITTED: 12/16/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-3 **Lab ID:** 4121626-06 **Sampled:** 12/12/14 15:53
Matrix: Air **Sample Volume:** 21.52 m^3 **Received:** 12/16/14 11:49
Comments: Start Time 12/11/14 15:58 **Analysis Date:** 12/17/14 15:24

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

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FILE #: 3926.00
REPORTED: 12/22/14 11:14
SUBMITTED: 12/16/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-4 **Lab ID:** 4121626-07 **Sampled:** 12/12/14 15:33
Matrix: Air **Sample Volume:** 21.41 m^3 **Received:** 12/16/14 11:49
Comments: Start Time 12/11/14 15:46 **Analysis Date:** 12/17/14 15:34

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0305		0.0036

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FILE #: 3926.00
REPORTED: 12/22/14 11:14
SUBMITTED: 12/16/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-21 **Lab ID:** 4121626-08 **Sampled:** 12/12/14 00:00
Matrix: Air **Sample Volume:** 21.55 m^3 **Received:** 12/16/14 11:49
Comments: **Analysis Date:** 12/17/14 15:44

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

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FILE #: 3926.00
REPORTED: 12/22/14 11:14
SUBMITTED: 12/16/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-31 **Lab ID:** 4121626-09 **Sampled:** 12/12/14 00:00
Matrix: Air **Sample Volume:** 21.52 m^3 **Received:** 12/16/14 11:49
Comments: **Analysis Date:** 12/17/14 15:53

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

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FILE #: 3926.00
REPORTED: 12/22/14 11:14
SUBMITTED: 12/16/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: OAM 1 **Lab ID:** 4121626-10 **Sampled:** 12/13/14 14:38
Matrix: Air **Sample Volume:** 20.94 m^3 **Received:** 12/16/14 11:49
Comments: Start Time 12/12/14 14:57 **Analysis Date:** 12/17/14 16:03

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0153		0.0036

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FILE #: 3926.00
REPORTED: 12/22/14 11:14
SUBMITTED: 12/16/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: OAM 2 **Lab ID:** 4121626-11 **Sampled:** 12/13/14 14:50
Matrix: Air **Sample Volume:** 21.26 m^3 **Received:** 12/16/14 11:49
Comments: Start Time 12/12/14 15:13 **Analysis Date:** 12/17/14 16:13

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m^3 Air	Flag	MDL ng/m^3 Air
Hexavalent Chromium	1854-02-99	0.0174		0.0036

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FILE #: 3926.00
REPORTED: 12/22/14 11:14
SUBMITTED: 12/16/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-1 **Lab ID:** 4121626-12 **Sampled:** 12/13/14 15:54
Matrix: Air **Sample Volume:** 21.08 m^3 **Received:** 12/16/14 11:49
Comments: Col 1 Start Time 12/12/14 16:28 **Analysis Date:** 12/17/14 13:32

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m^3 Air	Flag	MDL ng/m^3 Air
Hexavalent Chromium	1854-02-99	0.0138		0.0036

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FILE #: 3926.00
REPORTED: 12/22/14 11:14
SUBMITTED: 12/16/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-1D **Lab ID:** 4121626-13 **Sampled:** 12/13/14 15:56
Matrix: Air **Sample Volume:** 21.05 m^3 **Received:** 12/16/14 11:49
Comments: Col 2 Start Time 12/12/14 16:32 **Analysis Date:** 12/17/14 14:14

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m^3 Air	Flag	MDL ng/m^3 Air
Hexavalent Chromium	1854-02-99	0.0125		0.0036

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FILE #: 3926.00
REPORTED: 12/22/14 11:14
SUBMITTED: 12/16/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-2 **Lab ID:** 4121626-14 **Sampled:** 12/13/14 14:50
Matrix: Air **Sample Volume:** 21.26 m^3 **Received:** 12/16/14 11:49
Comments: Start Time 12/12/14 16:08 **Analysis Date:** 12/17/14 16:23

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0216		0.0036

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FILE #: 3926.00
REPORTED: 12/22/14 11:14
SUBMITTED: 12/16/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-3 **Lab ID:** 4121626-15 **Sampled:** 12/13/14 15:32
Matrix: Air **Sample Volume:** 21.23 m^3 **Received:** 12/16/14 11:49
Comments: Start Time 12/12/14 15:57 **Analysis Date:** 12/17/14 16:33

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0108		0.0036

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FILE #: 3926.00
REPORTED: 12/22/14 11:14
SUBMITTED: 12/16/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-4 **Lab ID:** 4121626-16 **Sampled:** 12/13/14 15:15
Matrix: Air **Sample Volume:** 21.27 m^3 **Received:** 12/16/14 11:49
Comments: Start Time 12/12/14 15:37 **Analysis Date:** 12/17/14 17:43

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0122		0.0036

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FILE #: 3926.00
REPORTED: 12/22/14 11:14
SUBMITTED: 12/16/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-21 **Lab ID:** 4121626-17 **Sampled:** 12/13/14 00:00
Matrix: Air **Sample Volume:** 21.26 m^3 **Received:** 12/16/14 11:49
Comments: **Analysis Date:** 12/17/14 17:13

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

DEC 2 3 2014

Initials: CR

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FILE #: 3926.00
REPORTED: 12/22/14 11:14
SUBMITTED: 12/16/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-31 **Lab ID:** 4121626-18 **Sampled:** 12/13/14 00:00
Matrix: Air **Sample Volume:** 21.23 m^3 **Received:** 12/16/14 11:49
Comments: **Analysis Date:** 12/17/14 17:23

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

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FILE #: 3926.00
REPORTED: 12/22/14 11:14
SUBMITTED: 12/16/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: OAM 1 **Lab ID:** 4121626-19 **Sampled:** 12/15/14 15:03
Matrix: Air **Sample Volume:** 22.05 m^3 **Received:** 12/16/14 11:49
Comments: Start Time 12/14/14 14:33 **Analysis Date:** 12/18/14 13:10

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0199		0.0036

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FILE #: 3926.00
REPORTED: 12/22/14 11:14
SUBMITTED: 12/16/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: OAM 2 **Lab ID:** 4121626-20 **Sampled:** 12/15/14 15:20
Matrix: Air **Sample Volume:** 22.1 m^3 **Received:** 12/16/14 11:49
Comments: Start Time 12/14/14 14:47 **Analysis Date:** 12/18/14 13:20

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0180		0.0036

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FILE #: 3926.00
REPORTED: 12/22/14 11:14
SUBMITTED: 12/16/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-1 **Lab ID:** 4121626-21 **Sampled:** 12/15/14 16:26
Matrix: Air **Sample Volume:** 22.31 m^3 **Received:** 12/16/14 11:49
Comments: Col 1 Start Time 12/14/14 15:39 **Analysis Date:** 12/18/14 12:50

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0242		0.0036

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FILE #: 3926.00
REPORTED: 12/22/14 11:14
SUBMITTED: 12/16/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-1D **Lab ID:** 4121626-22 **Sampled:** 12/15/14 16:29
Matrix: Air **Sample Volume:** 22.34 m^3 **Received:** 12/16/14 11:49
Comments: Col 2 Start Time 12/14/14 15:39 **Analysis Date:** 12/18/14 12:30

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m^3 Air	Flag	MDL ng/m^3 Air
Hexavalent Chromium	1854-02-99	0.0261		0.0036

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FILE #: 3926.00
REPORTED: 12/22/14 11:14
SUBMITTED: 12/16/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-2 **Lab ID:** 4121626-23 **Sampled:** 12/15/14 16:03
Matrix: Air **Sample Volume:** 22.14 m^3 **Received:** 12/16/14 11:49
Comments: Start Time 12/14/14 15:27 **Analysis Date:** 12/18/14 13:30

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0401		0.0036

DEC 2 3 2014

Initials: CR

CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc
75 Valley Stream Parkway, Suite 400
Malvern, PA 19355
ATTN: Mr. Jeff Boggs
PHONE: (443) 803-8495 **FAX:** (410) 266-8912

FILE #: 3926.00
REPORTED: 12/22/14 11:14
SUBMITTED: 12/16/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-3 **Lab ID:** 4121626-24 **Sampled:** 12/15/14 15:53
Matrix: Air **Sample Volume:** 22.1 m^3 **Received:** 12/16/14 11:49
Comments: Start Time 12/14/14 15:20 **Analysis Date:** 12/18/14 13:40

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m^3 Air	Flag	MDL ng/m^3 Air
Hexavalent Chromium	1854-02-99	0.0232		0.0036

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

FILE #: 3926.00
REPORTED: 12/22/14 11:14
SUBMITTED: 12/16/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-4 **Lab ID:** 4121626-25 **Sampled:** 12/15/14 15:38
Matrix: Air **Sample Volume:** 21.96 m^3 **Received:** 12/16/14 11:49
Comments: Start Time 12/14/14 15:14 **Analysis Date:** 12/18/14 14:10

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0389		0.0036

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ATTN: Mr. Jeff Boggs
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FILE #: 3926.00
REPORTED: 12/22/14 11:14
SUBMITTED: 12/16/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-21 **Lab ID:** 4121626-26 **Sampled:** 12/15/14 00:00
Matrix: Air **Sample Volume:** 22.14 m^3 **Received:** 12/16/14 11:49
Comments: **Analysis Date:** 12/18/14 14:20

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

DEC 2 3 2014

Initials: CR

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

FILE #: 3926.00
REPORTED: 12/22/14 11:14
SUBMITTED: 12/16/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-31 **Lab ID:** 4121626-27 **Sampled:** 12/15/14 00:00
Matrix: Air **Sample Volume:** 22.1 m^3 **Received:** 12/16/14 11:49
Comments: **Analysis Date:** 12/18/14 14:30

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

DEC 2 3 2014

Initials: CR

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

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

December 30, 2014

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

Dear Mr. Boggs,

Enclosed is the final validation report for the fraction listed below. This SDG was received on December 23, 2014. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #33334:

SDG	Fraction
4121804/4121908	Hexavalent Chromium

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

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

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

Sincerely,

Christina Rink
Project Manager/Chemist

106 pages-SF   5 DAY TAT

Attachment 1

Level IV   **LDC #33334 (ERM - Morrisville, NC / Harbor Point, MD, Hexavalent Chromium Monitoring)**

LDC	SDG#	DATE REC'D	(3) DATE DUE	Cr(VI) (D7614)																																			
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
A	4121804/4121908	12/23/14	12/31/14	18	0																																		
Total	A/CR			18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18

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

L:\ERM\Harbor Point_Honeywell\33334ST.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

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

Collection Date: December 17 through December 18, 2014

LDC Report Date: December 24, 2014

Matrix: Air

Parameters: Hexavalent Chromium

Validation Level: EPA Level IV

Laboratory: Eastern Research Group

Sample Delivery Group (SDG): 4121804/4121908

Sample Identification

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

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

Introduction

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

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

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

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

NJ Presumptive evidence of presence of the compound at an estimated quantity.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

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

I. Technical Holding Times

All technical holding time requirements were met.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met.

IV. Blanks

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

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

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

V. Matrix Spike/Matrix Spike Duplicates

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

VI. Duplicates

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

VII. Laboratory Control Samples

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

VIII. Sample Result Verification

All sample result verifications were acceptable.

IX. Overall Assessment of Data

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

X. Field Duplicates

Samples PAM-1 (12/17/14) and PAM-1D (12/17/14) and samples PAM-1 (12/18/14) and PAM-1D (12/18/14) were identified as field duplicates. No hexavalent chromium was detected in any of the samples with the following exceptions:

Analyte	Concentration (ng/m^3)		RPD (Limits)	Flags	A or P
	PAM-1 (12/17/14)	PAM-1D (12/17/14)			
Hexavalent chromium	0.109	0.0788	32 (≤20)	J (detects)	A

Analyte	Concentration (ng/m^3)		RPD (Limits)	Flags	A or P
	PAM-1 (12/18/14)	PAM-1D (12/18/14)			
Hexavalent chromium	0.0143	0.0109	27 (≤20)	NQ	-

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

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

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

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

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

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

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

LDC #: 33334A6 **VALIDATION COMPLETENESS WORKSHEET** Date: 12/23/14
SDG #: 4121804/4121908 Level IV Page: 1 of 1
Laboratory: Eastern Research Group Reviewer: SD
2nd Reviewer: DL

METHOD: Hexavalent Chromium (ASTM D7614)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 12/17-18/14
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Blanks	A	
V	Matrix Spike/Matrix Spike Duplicates	N	Not Required
VI.	Duplicates	A	DUP
VII.	Laboratory control samples	A	LCSD
VIII.	Sample result verification	A	
IX.	Overall assessment of data	A	
X.	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: Airs

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

Notes:

LDC #: 33334A4

VALIDATION FINDINGS CHECKLIST

Reviewer: 3D
2nd Reviewer: [signature]

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

Validation 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# 33334A6

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: SD
2nd Reviewer: CL

Inorganics: Method See Cover

Analyte	Concentration (mg/L)		RPD (≤20)	Qual. (3, 4, 7, ~~8~~)
	3	4		
Hexavalent Chromium	0.109	0.0788	32	Jdet/A (A)

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

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

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

LDC #: 33334A0

Validation Findings Worksheet
Initial and Continuing Calibration Calculation Verification

Page: 1 of 1
Reviewer: JD
2nd Reviewer: CL

Method: Inorganics, Method See Cover

The correlation coefficient (r) for the calibration of Cr^{+6} was recalculated. Calibration date: 12/22/14

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

%R = Found X 100 / True

Where, Found = concentration of each analyte measured in the analysis of the ICV or CCV solution
True = concentration of each analyte in the ICV or CCV source

Type of analysis	Analyte	Standard	Conc. (ng/ml)	Area	Recalculated r or r^2	Reported r or r^2	Acceptable (Y/N)
Initial calibration	Cr^{+6}	s1	0.05	0.0000263	*0.99996*	0.99996	Y
		s2	0.10	0.0000448			
		s3	0.20	0.0000836			
		s4	0.50	0.0002158			
		s5	1.00	0.0004374			
		s6	2.00	0.0008675			
ICV 11:40 Calibration verification	Cr^{+6}	Found 0.5119 ng/ml	True 0.5 ng/ml		102.4%R	102.4%R	
CCV 12:40 Calibration verification	Cr^{+6}	0.5276 ng/ml	0.5 ng/ml		105.5%R	105.5%R	
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 #: 33334A6

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Page: 1 of 1
Reviewer: SO
2nd Reviewer: [illegible]

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 / True 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 = concentration of each analyte in the source.

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

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

Sample ID	Type of Analysis	Element	Found / S (units)	True / D (units)	Recalculated %R / RPD	Reported %R / RPD	Acceptable (Y/N)
LCS 12:10	Laboratory control sample	Cr^{+6}	1.088 ng/ml	1.00 ng/ml	109%R	109%R	Y
N	Matrix spike sample		(SSR-SR)				
DUP 13:10	Duplicate sample	Cr^{+6}	0.1074 ng/m^3	0.1089 ng/m^3	1.39%RPD	1.37%RPD	Y

Comments: _____

LDC #: 33334A0

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: JD
2nd reviewer: ✓

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) C_{r+6} reported with a positive detect were recalculated and verified using the following equation:

Concentration = $A - C_0 / C_1$ $V_t = 10ml$ $m^3 = 21.16$ $\frac{(ng/ml)(V_t)}{m^3}$

$C_0 = 1.08\text{-}E\text{-}06$

$C_1 = 0.0004335$

$A = 0.0000673$

Recalculation: $\frac{0.0000673 - (-1.08E-06)}{0.0004335} = 0.1528 ng/ml$

$\frac{(0.1528 ng/ml)(10ml)}{21.16 m^3} = 0.0722 ng/m^3$

#	Sample ID	Analyte	Reported Concentration (ng/m^3)	Calculated Concentration (ng/m^3)	Acceptable (Y/N)
	1	C_{r+6}	ND	ND	Y
	2	↓	ND	ND	↓
	3		0.109	0.109	
	4		0.0788	0.0787*	Y*
	5		ND	ND	Y
	6		ND	ND	↓
	7		0.146	0.146	
	8		ND	ND	
	9		ND	ND	
	10		ND	ND	
	11		ND	ND	↓
	12		0.0143	0.0142	Y*
	13		0.0109	0.0109	Y
	14		0.0052	0.0052	↓
	15		ND	ND	
	16		0.0722	0.0722	
	17		ND	ND	
	18	↓	ND	ND	↓

Note: *Rounding

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FILE #: 3926.00
REPORTED: 12/23/14 11:27
SUBMITTED: 12/18/14 to 12/19/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: OAM 1 **Lab ID:** 4121804-01 **Sampled:** 12/17/14 15:05
Matrix: Air **Sample Volume:** 21.55 m^3 **Received:** 12/18/14 10:10
Comments: Start Time 12/16/14 15:09 **Analysis Date:** 12/22/14 14:20

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

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FILE #: 3926.00
REPORTED: 12/23/14 11:27
SUBMITTED: 12/18/14 to 12/19/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: OAM 2 **Lab ID:** 4121804-02 **Sampled:** 12/17/14 15:31
Matrix: Air **Sample Volume:** 21.56 m^3 **Received:** 12/18/14 10:10
Comments: Start Time 12/16/14 15:34 **Analysis Date:** 12/22/14 14:30

Hexavalent Chromium by SOP ERG-MOR-063

		Results		MDL
Analyte	**CAS Number**	**ng/m³ Air**	**Flag**	**ng/m³ Air**
Hexavalent Chromium	1854-02-99	ND	U	0.0036

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FILE #: 3926.00
REPORTED: 12/23/14 11:27
SUBMITTED: 12/18/14 to 12/19/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-1 **Lab ID:** 4121804-03 **Sampled:** 12/17/14 16:58
Matrix: Air **Sample Volume:** 21.67 m^3 **Received:** 12/18/14 10:10
Comments: Col 1 Start Time 12/16/14 16:53 **Analysis Date:** 12/22/14 13:00

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.109	J	0.0036

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FILE #: 3926.00
REPORTED: 12/23/14 11:27
SUBMITTED: 12/18/14 to 12/19/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-1D **Lab ID:** 4121804-04 **Sampled:** 12/17/14 17:05
Matrix: Air **Sample Volume:** 21.75 m^3 **Received:** 12/18/14 10:10
Comments: Col 2 Start Time 12/16/14 16:55 **Analysis Date:** 12/22/14 13:20

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0788 J		0.0036

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FILE #: 3926.00
REPORTED: 12/23/14 11:27
SUBMITTED: 12/18/14 to 12/19/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-2 **Lab ID:** 4121804-05 **Sampled:** 12/17/14 16:39
Matrix: Air **Sample Volume:** 21.68 m^3 **Received:** 12/18/14 10:10
Comments: Start Time 12/16/14 16:34 **Analysis Date:** 12/22/14 15:00

Hexavalent Chromium by SOP ERG-MOR-063

		Results		MDL
Analyte	**CAS Number**	**ng/m³ Air**	**Flag**	**ng/m³ Air**
Hexavalent Chromium	1854-02-99	ND	U	0.0036

DEC 2 4 2014

Initials: CR

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75 Valley Stream Parkway, Suite 400
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ATTN: Mr. Jeff Boggs
PHONE: (443) 803-8495 **FAX:** (410) 266-8912

FILE #: 3926.00
REPORTED: 12/23/14 11:27
SUBMITTED: 12/18/14 to 12/19/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-3 **Lab ID:** 4121804-06 **Sampled:** 12/17/14 16:22
Matrix: Air **Sample Volume:** 21.62 m^3 **Received:** 12/18/14 10:10
Comments: Start Time 12/16/14 16:21 **Analysis Date:** 12/22/14 15:10

Hexavalent Chromium by SOP ERG-MOR-063

		Results		MDL
Analyte	**CAS Number**	**ng/m³ Air**	**Flag**	**ng/m³ Air**
Hexavalent Chromium	1854-02-99	ND	U	0.0036

DEC 2 4 2014

Initials: CR

CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc
75 Valley Stream Parkway, Suite 400
Malvern, PA 19355
ATTN: Mr. Jeff Boggs
PHONE: (443) 803-8495 **FAX:** (410) 266-8912

FILE #: 3926.00
REPORTED: 12/23/14 11:27
SUBMITTED: 12/18/14 to 12/19/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-4 **Lab ID:** 4121804-07 **Sampled:** 12/17/14 16:03
Matrix: Air **Sample Volume:** 21.58 m^3 **Received:** 12/18/14 10:10
Comments: Start Time 12/16/14 16:05 **Analysis Date:** 12/22/14 15:20

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.146		0.0036

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FILE #: 3926.00
REPORTED: 12/23/14 11:27
SUBMITTED: 12/18/14 to 12/19/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-21 **Lab ID:** 4121804-08 **Sampled:** 12/17/14 00:00
Matrix: Air **Sample Volume:** 21.68 m^3 **Received:** 12/18/14 10:10
Comments: **Analysis Date:** 12/22/14 15:30

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m^3 Air	Flag	MDL ng/m^3 Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

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FILE #: 3926.00
REPORTED: 12/23/14 11:27
SUBMITTED: 12/18/14 to 12/19/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-31 **Lab ID:** 4121804-09 **Sampled:** 12/17/14 00:00
Matrix: Air **Sample Volume:** 21.62 m^3 **Received:** 12/18/14 10:10
Comments: **Analysis Date:** 12/22/14 15:40

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

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

FILE #: 3926.00
REPORTED: 12/23/14 11:27
SUBMITTED: 12/18/14 to 12/19/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: OAM 1 **Lab ID:** 4121908-01 **Sampled:** 12/18/14 14:55
Matrix: Air **Sample Volume:** 21.38 m^3 **Received:** 12/19/14 11:32
Comments: Start Time 12/17/14 15:10 **Analysis Date:** 12/22/14 15:49

Hexavalent Chromium by SOP ERG-MOR-063

		Results		MDL
Analyte	**CAS Number**	**ng/m³ Air**	**Flag**	**ng/m³ Air**
Hexavalent Chromium	1854-02-99	ND	U	0.0036

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Initials: CR

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Malvern, PA 19355
ATTN: Mr. Jeff Boggs
PHONE: (443) 803-8495 **FAX:** (410) 266-8912

FILE #: 3926.00
REPORTED: 12/23/14 11:27
SUBMITTED: 12/18/14 to 12/19/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: OAM 2 **Lab ID:** 4121908-02 **Sampled:** 12/18/14 15:16
Matrix: Air **Sample Volume:** 21.26 m^3 **Received:** 12/19/14 11:32
Comments: Start Time 12/17/14 15:39 **Analysis Date:** 12/22/14 15:59

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

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Initials: CR

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Malvern, PA 19355
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PHONE: (443) 803-8495 **FAX:** (410) 266-8912

FILE #: 3926.00
REPORTED: 12/23/14 11:27
SUBMITTED: 12/18/14 to 12/19/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-1 **Lab ID:** 4121908-03 **Sampled:** 12/18/14 16:30
Matrix: Air **Sample Volume:** 21.12 m^3 **Received:** 12/19/14 11:32
Comments: Col 1 Start Time 12/17/14 17:02 **Analysis Date:** 12/22/14 13:40

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m^3 Air	Flag	MDL ng/m^3 Air
Hexavalent Chromium	1854-02-99	0.0143		0.0036

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Malvern, PA 19355
ATTN: Mr. Jeff Boggs
PHONE: (443) 803-8495 **FAX:** (410) 266-8912

FILE #: 3926.00
REPORTED: 12/23/14 11:27
SUBMITTED: 12/18/14 to 12/19/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-1D **Lab ID:** 4121908-04 **Sampled:** 12/18/14 16:32
Matrix: Air **Sample Volume:** 21.05 m^3 **Received:** 12/19/14 11:32
Comments: Col 2 Start Time 12/17/14 17:09 **Analysis Date:** 12/22/14 14:00

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m^3 Air	Flag	MDL ng/m^3 Air
Hexavalent Chromium	1854-02-99	0.0109		0.0036

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Initials: CR

CERTIFICATE OF ANALYSIS

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

FILE #: 3926.00
REPORTED: 12/23/14 11:27
SUBMITTED: 12/18/14 to 12/19/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-2 **Lab ID:** 4121908-05 **Sampled:** 12/18/14 16:10
Matrix: Air **Sample Volume:** 21.11 m^3 **Received:** 12/19/14 11:32
Comments: Start Time 12/17/14 16:43 **Analysis Date:** 12/22/14 16:09

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0052		0.0036

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CERTIFICATE OF ANALYSIS

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Malvern, PA 19355
ATTN: Mr. Jeff Boggs
PHONE: (443) 803-8495 **FAX:** (410) 266-8912

FILE #: 3926.00
REPORTED: 12/23/14 11:27
SUBMITTED: 12/18/14 to 12/19/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-3 **Lab ID:** 4121908-06 **Sampled:** 12/18/14 15:55
Matrix: Air **Sample Volume:** 21.09 m^3 **Received:** 12/19/14 11:32
Comments: Start Time 12/17/14 16:29 **Analysis Date:** 12/22/14 16:19

Hexavalent Chromium by SOP ERG-MOR-063

		Results		MDL
Analyte	**CAS Number**	**ng/m³ Air**	**Flag**	**ng/m³ Air**
Hexavalent Chromium	1854-02-99	ND	U	0.0036

DEC 2 4 2014

Initials: CR

CERTIFICATE OF ANALYSIS

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Malvern, PA 19355
ATTN: Mr. Jeff Boggs
PHONE: (443) 803-8495 **FAX:** (410) 266-8912

FILE #: 3926.00
REPORTED: 12/23/14 11:27
SUBMITTED: 12/18/14 to 12/19/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-4 **Lab ID:** 4121908-07 **Sampled:** 12/18/14 15:38
Matrix: Air **Sample Volume:** 21.16 m^3 **Received:** 12/19/14 11:32
Comments: Start Time 12/17/14 16:08 **Analysis Date:** 12/22/14 16:29

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0722		0.0036

DEC 2 4 2014

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CERTIFICATE OF ANALYSIS

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

FILE #: 3926.00
REPORTED: 12/23/14 11:27
SUBMITTED: 12/18/14 to 12/19/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-21 **Lab ID:** 4121908-08 **Sampled:** 12/18/14 00:00
Matrix: Air **Sample Volume:** 21.11 m^3 **Received:** 12/19/14 11:32
Comments: **Analysis Date:** 12/22/14 16:59

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

DEC 2 4 2014

Initials: CR

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FILE #: 3926.00
REPORTED: 12/23/14 11:27
SUBMITTED: 12/18/14 to 12/19/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-31 **Lab ID:** 4121908-09 **Sampled:** 12/18/14 00:00
Matrix: Air **Sample Volume:** 21.09 m^3 **Received:** 12/19/14 11:32
Comments: **Analysis Date:** 12/22/14 17:09

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

DEC 2 4 2014

Initials: CR

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

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

January 5, 2015

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

Dear Mr. Boggs,

Enclosed is the final validation report for the fraction listed below. This SDG was received on December 30, 2014. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #33369:

SDG	Fraction
4122325	Hexavalent Chromium

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

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

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

Sincerely,

Christina Rink
Project Manager/Chemist

117 pages-SF 1 WEEK TAT

Attachment 1

Level IV LDC #33369 (ERM - Morrisville, NC / Harbor Point, MD, Hexavalent Chromium Monitoring)

LDC	SDG#	DATE REC'D	(3) DATE DUE	Cr(VI) (D7614)																																			
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
A	4122325	12/30/14	01/07/15	18	0																																		
Total	T/CR			18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18

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

L:\ERM\Harbor Point_Honeywell\33369ST.wpd

LDC Report# 33369A6

Laboratory Data Consultants, Inc.
Data Validation Report

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

Collection Date: December 19 through December 20, 2014

LDC Report Date: January 5, 2015

Matrix: Air

Parameters: Hexavalent Chromium

Validation Level: EPA Level IV

Laboratory: Eastern Research Group

Sample Delivery Group (SDG): 4122325

Sample Identification

OAM 1 (12/19/14)
OAM 2 (12/19/14)
PAM-1 (12/19/14)
PAM-1D (12/19/14)
PAM-2 (12/19/14)
PAM-3 (12/19/14)
PAM-4 (12/19/14)
PAM-21 (12/19/14)
PAM-31 (12/19/14)
OAM 1 (12/20/14)
OAM 2 (12/20/14)
PAM-1 (12/20/14)
PAM-1D (12/20/14)
PAM-2 (12/20/14)
PAM-3 (12/20/14)
PAM-4 (12/20/14)
PAM-21 (12/20/14)
PAM-31 (12/20/14)
PAM-1 (12/19/14)DUP
PAM-1D (12/19/14)DUP
PAM-1 (12/20/14)DUP
PAM-1D (12/20/14)DUP

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

Introduction

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

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

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

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

NJ Presumptive evidence of presence of the compound at an estimated quantity.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

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

I. Technical Holding Times

All technical holding time requirements were met.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met.

IV. Blanks

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

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

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

V. Matrix Spike/Matrix Spike Duplicates

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

VI. Duplicates

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

VII. Laboratory Control Samples

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

VIII. Sample Result Verification

All sample result verifications were acceptable.

IX. Overall Assessment of Data

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

X. Field Duplicates

Samples PAM-1 (12/19/14) and PAM-1D (12/19/14) and samples PAM-1 (12/20/14) and PAM-1D (12/20/14) were identified as field duplicates. No hexavalent chromium was detected in any of the samples with the following exceptions:

Analyte	Concentration (ng/m^3)		RPD (Limits)	Flags	A or P
	PAM-1 (12/19/14)	PAM-1D (12/19/14)			
Hexavalent chromium	0.0612	0.0568	7 (≤20)	-	-

Analyte	Concentration (ng/m^3)		RPD (Limits)	Flags	A or P
	PAM-1 (12/20/14)	PAM-1D (12/20/14)			
Hexavalent chromium	0.0197	0.0190	4 (≤20)	-	-

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

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

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

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

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

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

LDC #: 33369A6
SDG #: 4122325
Laboratory: Eastern Research Group

VALIDATION COMPLETENESS WORKSHEET
Level IV

Date: 1/5/15
Page: 1 of 1
Reviewer: JP
2nd Reviewer: CA

METHOD: Hexavalent Chromium (ASTM D7614)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 12/19/14 - 12/20/14
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Blanks	A	
V	Matrix Spike/Matrix Spike Duplicates	N	Not Required
VI.	Duplicates	A	DUP
VII.	Laboratory control samples	A	LCSD
VIII.	Sample result verification	A	
IX.	Overall assessment of data	A	
X.	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: Airs

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

Notes:

LDC #: 33569A0

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: SD
2nd Reviewer: AR

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

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# 33369A6

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Reviewer: JD
2nd Reviewer: CL

Inorganics: Method See Cover

Analyte	Concentration (ng/ml) 3	Concentration (ng/ml) 4	RPD (≤20)	Qual.
Hexavalent Chromium	0.0612	0.0568	7	

Analyte	Concentration (ng/ml) 12	Concentration (ng/ml) 13	RPD (≤20)	Qual.
Hexavalent Chromium	0.0197	0.0190	4	

\\LDCFILESERVER\Validation\FIELD DUPLICATES\FD_inorganic\33369A6.wpd

LDC #: 33369A6

Validation Findings Worksheet
Initial and Continuing Calibration Calculation Verification

Page: 1 of 1
Reviewer: JD
2nd Reviewer: CR

Method: Inorganics, Method See Cover

The correlation coefficient (r) for the calibration of Cr^{+6} was recalculated. Calibration date: 12/29/14

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

%R = Found X 100 / True

Where, Found = concentration of each analyte measured in the analysis of the ICV or CCV solution
True = concentration of each analyte in the ICV or CCV source

Type of analysis	Analyte	Standard	Conc. (ng/ml)	Area	Recalculated r or r^2	Reported r or r^2	Acceptable (Y/N)
Initial calibration	Cr^{+6}	s1	0.05	0.0000182	*0.99979*	0.99980	Y*
		s2	0.1	0.0000435			
		s3	0.2	0.0000822			
		s4	0.5	0.0002154			
		s5	1	0.0004385			
		s6	2	0.0009141			
ICV 11:33 Calibration verification	Cr^{+6}	Found 0.4936 ng/ml	True 0.5 ng/ml		98.7%R	98.7%R	Y
CCV 12:33 Calibration verification	Cr^{+6}	0.4991 ng/ml	0.5 ng/ml		99.8%R	99.8%R	Y
Calibration verification							

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

LDC #: 33369A6

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Reviewer: JD
2nd Reviewer: CZ

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 / True 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 = concentration of each analyte in the source.

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

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

Sample ID	Type of Analysis	Element	Found / S (units)	True / D (units)	Recalculated %R / RPD	Reported %R / RPD	Acceptable (Y/N)
LCS 12:03	Laboratory control sample	Cr^{+6}	1.006 ng/ml	1.00 ng/ml	101 %R	101 %R	Y
N	Matrix spike sample		(SSR-SR)				
DUP 14:22	Duplicate sample	Cr^{+6}	0.0615 ng/m^3	0.0612 ng/m^3	1.14 %RPD	1.21 %RPD	Y

Comments: _____

LDC #: 33369A6

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: JD
2nd reviewer: CR

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 (15) Cr^{+6} reported with a positive detect were recalculated and verified using the following equation:

Concentration = $(A-C_0)/C_1$

$C_0 = -8.69E-06$
$C_1 = 0.0004582$
$A = 0.000094$

vf = 10ml
$m^3 = 21.33$

$\frac{(ng/ml)(vf)}{m^3} = ng/m^3$

Recalculation: $\frac{(0.000094 - (-8.69E-06))}{0.0004582} = 0.03948 ng/ml$

$\frac{(0.03948\ ng/ml)(10ml)}{21.33\ m^3} = 0.0185 ng/m^3$

#	Sample ID	Analyte	Reported Concentration (ng/m^3)	Calculated Concentration (ng/m^3)	Acceptable (Y/N)
	1	Cr^{+6}	0.0142	0.0141	y*
	2		0.0178	0.0177	y*
	3		0.0612	0.0617	y
	4		0.0568	0.0568	
	5		0.0249	0.0249	
	6		0.0142	0.0142	
	7		0.0658	0.0658	
	8		ND	ND	
	9		ND	ND	
	10		ND	ND	
	11		ND	ND	
	12		0.0197	0.0197	
	13		0.0190	0.0191	y*
	14		0.0289	0.0289	y
	15		0.0185	0.0185	
	16		0.0250	0.0250	
	17		ND	ND	
	18		ND	ND	

Note: *Rounding

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FILE #: 3926.00
REPORTED: 12/30/14 14:57
SUBMITTED: 12/23/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: OAM 1 **Lab ID:** 4122325-01 **Sampled:** 12/19/14 14:58
Matrix: Air **Sample Volume:** 21.58 m^3 **Received:** 12/23/14 12:26
Comments: Start Time 12/18/14 14:59 **Analysis Date:** 12/29/14 18:57

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0142		0.0036

JAN 05 2015

Initials: CR

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FILE #: 3926.00
REPORTED: 12/30/14 14:57
SUBMITTED: 12/23/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: OAM 2 **Lab ID:** 4122325-02 **Sampled:** 12/19/14 15:21
Matrix: Air **Sample Volume:** 21.63 m^3 **Received:** 12/23/14 12:26
Comments: Start Time 12/18/14 15:19 **Analysis Date:** 12/29/14 15:02

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0178		0.0036

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FILE #: 3926.00
REPORTED: 12/30/14 14:57
SUBMITTED: 12/23/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-1 **Lab ID:** 4122325-03 **Sampled:** 12/19/14 16:21
Matrix: Air **Sample Volume:** 21.42 m^3 **Received:** 12/23/14 12:26
Comments: Col 1 Start Time 12/18/14 16:33 **Analysis Date:** 12/29/14 14:12

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m^3 Air	Flag	MDL ng/m^3 Air
Hexavalent Chromium	1854-02-99	0.0612		0.0036

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FILE #: 3926.00
REPORTED: 12/30/14 14:57
SUBMITTED: 12/23/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-1D **Lab ID:** 4122325-04 **Sampled:** 12/19/14 16:25
Matrix: Air **Sample Volume:** 21.42 m^3 **Received:** 12/23/14 12:26
Comments: Col 2 Start Time 12/18/14 16:37 **Analysis Date:** 12/29/14 13:13

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0568		0.0036

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FILE #: 3926.00
REPORTED: 12/30/14 14:57
SUBMITTED: 12/23/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-2 **Lab ID:** 4122325-05 **Sampled:** 12/19/14 16:07
Matrix: Air **Sample Volume:** 21.49 m^3 **Received:** 12/23/14 12:26
Comments: Start Time 12/18/14 16:14 **Analysis Date:** 12/29/14 19:07

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0249		0.0036

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FILE #: 3926.00
REPORTED: 12/30/14 14:57
SUBMITTED: 12/23/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-3 **Lab ID:** 4122325-06 **Sampled:** 12/19/14 15:57
Matrix: Air **Sample Volume:** 21.57 m^3 **Received:** 12/23/14 12:26
Comments: Start Time 12/18/14 15:58 **Analysis Date:** 12/29/14 15:22

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0142		0.0036

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FILE #: 3926.00
REPORTED: 12/30/14 14:57
SUBMITTED: 12/23/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-4 **Lab ID:** 4122325-07 **Sampled:** 12/19/14 15:42
Matrix: Air **Sample Volume:** 21.61 m^3 **Received:** 12/23/14 12:26
Comments: Start Time 12/18/14 15:41 **Analysis Date:** 12/29/14 17:50

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0658		0.0036

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FILE #: 3926.00
REPORTED: 12/30/14 14:57
SUBMITTED: 12/23/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-21 **Lab ID:** 4122325-08 **Sampled:** 12/19/14 00:00
Matrix: Air **Sample Volume:** 21.49 m^3 **Received:** 12/23/14 12:26
Comments: **Analysis Date:** 12/29/14 15:41

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

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FILE #: 3926.00
REPORTED: 12/30/14 14:57
SUBMITTED: 12/23/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-31 **Lab ID:** 4122325-09 **Sampled:** 12/19/14 00:00
Matrix: Air **Sample Volume:** 21.57 m^3 **Received:** 12/23/14 12:26
Comments: **Analysis Date:** 12/29/14 15:51

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

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FILE #: 3926.00
REPORTED: 12/30/14 14:57
SUBMITTED: 12/23/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: OAM 1 **Lab ID:** 4122325-10 **Sampled:** 12/20/14 14:52
Matrix: Air **Sample Volume:** 21.46 m^3 **Received:** 12/23/14 12:26
Comments: Start Time 12/19/14 15:01 **Analysis Date:** 12/29/14 16:01

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

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FILE #: 3926.00
REPORTED: 12/30/14 14:57
SUBMITTED: 12/23/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: OAM 2 **Lab ID:** 4122325-11 **Sampled:** 12/20/14 15:09
Matrix: Air **Sample Volume:** 21.38 m^3 **Received:** 12/23/14 12:26
Comments: Start Time 12/19/14 15:24 **Analysis Date:** 12/29/14 16:11

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

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FILE #: 3926.00
REPORTED: 12/30/14 14:57
SUBMITTED: 12/23/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-1 **Lab ID:** 4122325-12 **Sampled:** 12/20/14 16:11
Matrix: Air **Sample Volume:** 21.38 m^3 **Received:** 12/23/14 12:26
Comments: Col 1 Start Time 12/19/14 16:25 **Analysis Date:** 12/29/14 13:32

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m^3 Air	Flag	MDL ng/m^3 Air
Hexavalent Chromium	1854-02-99	0.0197		0.0036

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FILE #: 3926.00
REPORTED: 12/30/14 14:57
SUBMITTED: 12/23/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-1D **Lab ID:** 4122325-13 **Sampled:** 12/20/14 16:14
Matrix: Air **Sample Volume:** 21.39 m^3 **Received:** 12/23/14 12:26
Comments: Col 2 Start Time 12/19/14 16:28 **Analysis Date:** 12/29/14 13:52

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m^3 Air	Flag	MDL ng/m^3 Air
Hexavalent Chromium	1854-02-99	0.0190		0.0036

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FILE #: 3926.00
REPORTED: 12/30/14 14:57
SUBMITTED: 12/23/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-2 **Lab ID:** 4122325-14 **Sampled:** 12/20/14 15:50
Matrix: Air **Sample Volume:** 21.31 m^3 **Received:** 12/23/14 12:26
Comments: Start Time 12/19/14 16:09 **Analysis Date:** 12/29/14 18:17

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0289		0.0036

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FILE #: 3926.00
REPORTED: 12/30/14 14:57
SUBMITTED: 12/23/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-3 **Lab ID:** 4122325-15 **Sampled:** 12/20/14 15:41
Matrix: Air **Sample Volume:** 21.33 m^3 **Received:** 12/23/14 12:26
Comments: Start Time 12/19/14 15:59 **Analysis Date:** 12/29/14 19:17

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0185		0.0036

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FILE #: 3926.00
REPORTED: 12/30/14 14:57
SUBMITTED: 12/23/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-4 **Lab ID:** 4122325-16 **Sampled:** 12/20/14 15:29
Matrix: Air **Sample Volume:** 21.36 m^3 **Received:** 12/23/14 12:26
Comments: Start Time 12/19/14 15:45 **Analysis Date:** 12/29/14 17:01

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0250		0.0036

JAN 05 2015

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FILE #: 3926.00
REPORTED: 12/30/14 14:57
SUBMITTED: 12/23/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-21 **Lab ID:** 4122325-17 **Sampled:** 12/20/14 00:00
Matrix: Air **Sample Volume:** 21.31 m^3 **Received:** 12/23/14 12:26
Comments: **Analysis Date:** 12/29/14 17:11

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

JAN 05 2015

Initials: CR

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FILE #: 3926.00
REPORTED: 12/30/14 14:57
SUBMITTED: 12/23/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-31 **Lab ID:** 4122325-18 **Sampled:** 12/20/14 00:00
Matrix: Air **Sample Volume:** 21.33 m^3 **Received:** 12/23/14 12:26
Comments: **Analysis Date:** 12/29/14 17:21

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

JAN 05 2015
Initials: CR

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

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

January 5, 2015

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

Dear Mr. Boggs,

Enclosed is the final validation report for the fraction listed below. This SDG was received on December 31, 2014. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #33377:

SDG	Fraction
4122325	Hexavalent Chromium

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

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

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

Sincerely,

Christina Rink
Project Manager/Chemist

79 pages-SF 1 WEEK TAT Attachment 1

Level IV

LDC #33377 (ERM - Morrisville, NC / Harbor Point, MD, Hexavalent Chromium Monitoring)

LDC	SDG#	DATE REC'D	(3) DATE DUE	Cr(VI) (D7614)																																	
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
A	4122325	12/31/14	01/08/15	9	0																																
Total	T/CR			9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9

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

L:\ERM\Harbor Point_Honeywell\33377ST.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Harbor Point, MD, Hexavalent Chromium Monitoring
Collection Date:	December 22, 2014
LDC Report Date:	January 5, 2015
Matrix:	Air
Parameters:	Hexavalent Chromium
Validation Level:	EPA Level IV
Laboratory:	Eastern Research Group
Sample Delivery Group (SDG):	4122325

Sample Identification

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

Introduction

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

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

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

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

NJ Presumptive evidence of presence of the compound at an estimated quantity.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

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

I. Technical Holding Times

All technical holding time requirements were met.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met.

IV. Blanks

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

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

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

V. Matrix Spike/Matrix Spike Duplicates

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

VI. Duplicates

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

VII. Laboratory Control Samples

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

VIII. Sample Result Verification

All sample result verifications were acceptable.

IX. Overall Assessment of Data

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

X. Field Duplicates

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

Analyte	Concentration (ng/m^3)		RPD (Limits)	Flags	A or P
	PAM-1	PAM-1D			
Hexavalent chromium	0.0310	0.0276	12 (≤20)	-	-

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

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

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

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

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

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

LDC #: 33377A6 **VALIDATION COMPLETENESS WORKSHEET** Date: 1/05/15

SDG #: 4122325~~(19-27)~~ 30 Level IV Page: 1 of 1

Laboratory: Eastern Research Group Reviewer: JD

2nd Reviewer: AL

METHOD: Hexavalent Chromium (ASTM D7614)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 12/22/14
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Blanks	A	
V	Matrix Spike/Matrix Spike Duplicates	N	Not Required
VI.	Duplicates	A	DUP
VII.	Laboratory control samples	A	LCSD
VIII.	Sample result verification	A	
IX.	Overall assessment of data	A	
X.	Field duplicates	SW	FD = (3,4)
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: Samples (19-27)

LDC #: 33377A6

VALIDATION FINDINGS CHECKLIST

Reviewer: SD
2nd Reviewer: AL

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

Airs

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# 33377A6

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: JD
2nd Reviewer: AV

Inorganics: Method See Cover

Analyte	Concentration (ng/mL)		RPD (≤20)	Qual.
	3	4		
Hexavalent Chromium	0.0310	0.0276	12	

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

LDC #: 33377A6

Validation Findings Worksheet
Initial and Continuing Calibration Calculation Verification

Page: 1 of 1
Reviewer: SD
2nd Reviewer: CL

Method: Inorganics, Method See Cover

The correlation coefficient (r) for the calibration of Cr^{+6} was recalculated. Calibration date: 12/30/14

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

$$\%R = \frac{\text{Found} \times 100}{\text{True}}$$

Where, Found = concentration of each analyte measured in the analysis of the ICV or CCV solution
True = concentration of each analyte in the ICV or CCV source

Type of analysis	Analyte	Standard	Conc. (ng/ml)	Area	Recalculated r or r^2	Reported r or r^2	Acceptable (Y/N)
Initial calibration	Cr^{+6}	s1	0.05	0.0000134	*0.99964*	0.99963	Y
		s2	0.1	0.0000367			
		s3	0.2	0.0000754			
		s4	0.5	0.0002066			
		s5	1	0.0003982			
		s6	2	0.0008472			
ICV 11:17 Calibration verification	Cr^{+6}	Found 0.5228ng/ml	True 0.5ng/ml		104.6%R	104.6%R	Y
CCV 12:16 Calibration verification	Cr^{+6}	0.5244ng/ml	0.5ng/ml		104.9%R	104.9%R	Y
Calibration verification							

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

LDC #: 33377A6

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Page: 1 of 1
Reviewer: JD
2nd Reviewer: _____

METHOD: Inorganics, Method See Cover

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

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

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

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

Sample ID	Type of Analysis	Element	Found / S (units)	True / D (units)	Recalculated %R / RPD	Reported %R / RPD	Acceptable (Y/N)
LCS 11:47	Laboratory control sample	Cr^{+6}	1.112ng/ml	1.00ng/ml	111%R	111%R	Y
N	Matrix spike sample		(SSR-SR)				
DUP 13:27	Duplicate sample	Cr^{+6}	0.0307 ng/m3	0.0310 ng/m3	0.97%RPD	1.20%RPD	Y

Comments: _____

LDC #: 33377A6

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: SO
2nd reviewer: AL

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 (5) Cr+6 reported with a positive detect were recalculated and verified using the following equation:

Concentration = $(A - C_o)/C_i$ Vf = 10ml m^3 = 21.6

A = 0.0000678
C_o = -9.67E-06
C_i = 0.0004248

$\frac{(ng/ml)(Vf)}{m^3} = ng/m^3$

Recalculation: $\frac{(0.0000678 - (-9.67E-06))}{0.0004248} = 0.1824\ ng/ml$

$\frac{30(0.1824)(10ml)}{21.6\ m^3} = 0.0844\ ng/m^3$

#	Sample ID	Analyte	Reported Concentration (ng/m^3)	Calculated Concentration (ng/m^3)	Acceptable (Y/N)
	1	Cr+6	0.0221	0.0221	Y
	2		ND	ND	
	3		0.0310	0.0310	
	4		0.0276	0.0276	
	5		0.0844	0.0844	
	6		0.0291	0.0291	
	7		0.0270	0.0270	
	8		ND	ND	
	9		ND	ND	

Note:

CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc
75 Valley Stream Parkway, Suite 400
Malvern, PA 19355
ATTN: Mr. Jeff Boggs
PHONE: (443) 803-8495 **FAX:** (410) 266-8912

FILE #: 3926.00
REPORTED: 12/31/14 10:56
SUBMITTED: 12/23/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: OAM 1 **Lab ID:** 4122325-19 **Sampled:** 12/22/14 14:52
Matrix: Air **Sample Volume:** 21.33 m^3 **Received:** 12/23/14 12:26
Comments: Start Time 12/21/14 15:10 **Analysis Date:** 12/30/14 13:58

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0221		0.0036

JAN 05 2015

Initials: CR

CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc
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Malvern, PA 19355
ATTN: Mr. Jeff Boggs
PHONE: (443) 803-8495 **FAX:** (410) 266-8912

FILE #: 3926.00
REPORTED: 12/31/14 10:56
SUBMITTED: 12/23/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: OAM 2 **Lab ID:** 4122325-20 **Sampled:** 12/22/14 15:18
Matrix: Air **Sample Volume:** 21.39 m^3 **Received:** 12/23/14 12:26
Comments: Start Time 12/21/14 15:32 **Analysis Date:** 12/30/14 15:28

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

JAN 05 2015
Initials: CR

CERTIFICATE OF ANALYSIS

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FILE #: 3926.00
REPORTED: 12/31/14 10:56
SUBMITTED: 12/23/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-1 **Lab ID:** 4122325-21 **Sampled:** 12/22/14 16:25
Matrix: Air **Sample Volume:** 21.52 m^3 **Received:** 12/23/14 12:26
Comments: Col 1 Start Time 12/21/14 16:30 **Analysis Date:** 12/30/14 13:18

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0310		0.0036

JAN 05 2015

Initials: CR

CERTIFICATE OF ANALYSIS

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FILE #: 3926.00
REPORTED: 12/31/14 10:56
SUBMITTED: 12/23/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-1D **Lab ID:** 4122325-22 **Sampled:** 12/22/14 16:27
Matrix: Air **Sample Volume:** 21.53 m^3 **Received:** 12/23/14 12:26
Comments: Col 2 Start Time 12/21/14 16:32 **Analysis Date:** 12/30/14 13:37

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0276		0.0036

JAN 05 2015

Initials: CR

CERTIFICATE OF ANALYSIS

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FILE #: 3926.00
REPORTED: 12/31/14 10:56
SUBMITTED: 12/23/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-2 **Lab ID:** 4122325-23 **Sampled:** 12/22/14 16:10
Matrix: Air **Sample Volume:** 21.6 m^3 **Received:** 12/23/14 12:26
Comments: Start Time 12/21/14 16:10 **Analysis Date:** 12/30/14 15:37

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0844		0.0036

JAN 05 2015

Initials: CR

CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc
75 Valley Stream Parkway, Suite 400
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ATTN: Mr. Jeff Boggs
PHONE: (443) 803-8495 **FAX:** (410) 266-8912

FILE #: 3926.00
REPORTED: 12/31/14 10:56
SUBMITTED: 12/23/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-3 **Lab ID:** 4122325-24 **Sampled:** 12/22/14 15:59
Matrix: Air **Sample Volume:** 21.57 m^3 **Received:** 12/23/14 12:26
Comments: Start Time 12/21/14 16:01 **Analysis Date:** 12/30/14 15:47

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0291		0.0036

JAN 05 2015

Initials: CR

CERTIFICATE OF ANALYSIS

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

FILE #: 3926.00
REPORTED: 12/31/14 10:56
SUBMITTED: 12/23/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-4 **Lab ID:** 4122325-25 **Sampled:** 12/22/14 15:37
Matrix: Air **Sample Volume:** 21.39 m^3 **Received:** 12/23/14 12:26
Comments: Start Time 12/21/14 15:51 **Analysis Date:** 12/30/14 14:58

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0270		0.0036

JAN 0 5 2015

Initials: CR

CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc
75 Valley Stream Parkway, Suite 400
Malvern, PA 19355
ATTN: Mr. Jeff Boggs
PHONE: (443) 803-8495 **FAX:** (410) 266-8912

FILE #: 3926.00
REPORTED: 12/31/14 10:56
SUBMITTED: 12/23/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-21 **Lab ID:** 4122325-26 **Sampled:** 12/22/14 00:00
Matrix: Air **Sample Volume:** 21.6 m^3 **Received:** 12/23/14 12:26
Comments: **Analysis Date:** 12/30/14 15:08

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

JAN 0 5 2015

Initials: CR

CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc
75 Valley Stream Parkway, Suite 400
Malvern, PA 19355
ATTN: Mr. Jeff Boggs
PHONE: (443) 803-8495 **FAX:** (410) 266-8912

FILE #: 3926.00
REPORTED: 12/31/14 10:56
SUBMITTED: 12/23/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-31 **Lab ID:** 4122325-27 **Sampled:** 12/22/14 00:00
Matrix: Air **Sample Volume:** 21.57 m^3 **Received:** 12/23/14 12:26
Comments: **Analysis Date:** 12/30/14 15:18

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

JAN 05 2015

Initials: CR

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

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

January 9, 2015

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

Dear Mr. Boggs,

Enclosed is the final validation report for the fraction listed below. This SDG was received on January 6, 2015. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #33420:

SDG	Fraction
4123037/4123101	Hexavalent Chromium

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

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

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

Sincerely,

Christina Rink
Project Manager/Chemist

113 pages-SF 1 WEEK TAT Attachment 1

Level IV

LDC #33420 (ERM - Morrisville, NC / Harbor Point, MD, Hexavalent Chromium Monitoring)

LDC	SDG#	DATE REC'D	(3) DATE DUE	Cr(VI) (D7614)																																	
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
A	4123037/4123101	01/06/15	01/13/15	18	0																																
Total	A/CR			18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18

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

L:\ERM\Harbor Point_Honeywell\33420ST.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

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

Collection Date: December 29 through December 30, 2014

LDC Report Date: January 9, 2015

Matrix: Air

Parameters: Hexavalent Chromium

Validation Level: EPA Level IV

Laboratory: Eastern Research Group

Sample Delivery Group (SDG): 4123037/4123101

Sample Identification

OAM 1 (12/29/14)
OAM 2 (12/29/14)
PAM-1 (12/29/14)
PAM-1D (12/29/14)
PAM-2 (12/29/14)
PAM-3 (12/29/14)
PAM-4 (12/29/14)
PAM-21 (12/29/14)
PAM-31 (12/29/14)
OAM 1 (12/30/14)
OAM 2 (12/30/14)
PAM-1 (12/30/14)
PAM-1D (12/30/14)
PAM-2 (12/30/14)
PAM-3 (12/30/14)
PAM-4 (12/30/14)
PAM-21 (12/30/14)
PAM-31 (12/30/14)
PAM-1 (12/29/14)DUP
PAM-1D (12/29/14)DUP
PAM-1 (12/30/14)DUP
PAM-1D (12/30/14)DUP

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

Introduction

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

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

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

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

NJ Presumptive evidence of presence of the compound at an estimated quantity.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

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

I. Technical Holding Times

All technical holding time requirements were met.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met.

IV. Blanks

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

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

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

V. Matrix Spike/Matrix Spike Duplicates

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

VI. Duplicates

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

DUP ID (Associated Samples)	Analyte	Difference (Limits)	Flag	A or P
PAM-1D (12/30/14)DUP (PAM-1D (12/30/14))	Hexavalent chromium	0.0088 ng/m^3 (≤0.0036)	J (all detects)	A

VII. Laboratory Control Samples

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

VIII. Sample Result Verification

All sample result verifications were acceptable.

IX. Overall Assessment of Data

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

X. Field Duplicates

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

Analyte	Concentration (ng/m^3)		RPD (Limits)	Flags	A or P
	PAM-1 (12/29/14)	PAM-1D (12/29/14)			
Hexavalent chromium	0.0207	0.0170	20 (≤20)	-	-

Analyte	Concentration (ng/m^3)		RPD (Limits)	Flags	A or P
	PAM-1 (12/30/14)	PAM-1D (12/30/14)			
Hexavalent chromium	0.0127	0.0157	21 (≤20)	NQ	-

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

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

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

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

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

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

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

LDC #: 33420A6 **VALIDATION COMPLETENESS WORKSHEET** Date: 1/6/14

SDG #: 412303/4123101 Level IV Page: 1 of 1

Laboratory: Eastern Research Group Reviewer: JD

2nd Reviewer: CL

METHOD: Hexavalent Chromium (ASTM D7614)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 12/29-30/14
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Blanks	A	
V	Matrix Spike/Matrix Spike Duplicates	N	Not Required
VI.	Duplicates	SW	DUP
VII.	Laboratory control samples	A	LCS/D
VIII.	Sample result verification	A	
IX.	Overall assessment of data	A	
X.	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: Airs

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

Notes: _____

LDC #: 33320AV

VALIDATION FINDINGS CHECKLIST

Reviewer: SR
2nd Reviewer: CK

Method: Inorganics (EPA Method Se Low)

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

LDC #: 33470D1P

VALIDATION FINDINGS CHECKLIST

Reviewer: 3D
2nd Reviewer: CL

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

LDC #: 33420A6

VALIDATION FINDINGS WORKSHEET
Duplicate Analysis

Page: 1 of 1
Reviewer: 3D
2nd Reviewer:

METHOD: Inorganics (See Cover)

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

(Y) N N/A Was a duplicate sample analyzed for each matrix in this SDG?

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

LEVEL IV ONLY:

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

#	Date	Duplicate ID	Matrix	Analyte	RPD (Limits)	(ng/m3) Difference (Limits)	Associated Samples	Qualifications
		22	Airs	Cr+6		0.0088 (0.0036)	13*	J/UJ/A (det/nd)

Comments: *Parent only because other Dup in SDG ok

LDC# 33420A6

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Reviewer: SD
2nd Reviewer: ac

Inorganics: Method See Cover

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

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

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

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

LDC #: 33420A6

Validation Findings Worksheet
Initial and Continuing Calibration Calculation Verification

Page: 1 of 1
Reviewer: SD
2nd Reviewer: G

Method: Inorganics, Method See Cover

The correlation coefficient (r) for the calibration of Cr^{+6} was recalculated. Calibration date: 01/05/15

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

%R = Found X 100 / True

Where, Found = concentration of each analyte measured in the analysis of the ICV or CCV solution

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

Type of analysis	Analyte	Standard	Conc. (ng/ml)	Area	Recalculated r or r^2	Reported r or r^2	Acceptable (Y/N)
Initial calibration	Cr^{+6}	s1	0.05	0.0000162	*0.99998*	0.99998	Y
		s2	0.1	0.0000395			
		s3	0.2	0.0000852			
		s4	0.5	0.0002205			
		s5	1	0.0004368			
		s6	2	0.0008784			
ICV 11:28 Calibration verification	Cr^{+6}	Found 0.5043 ng/ml	True 0.5 ng/ml		100.9%R	100.9%R	
CCV 12:28 Calibration verification	Cr^{+6}	0.5109 ng/ml	0.5 ng/ml		102.2%R	102.2%R	
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 #: 33420A6

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Page: 1 of 1
Reviewer: JD
2nd Reviewer: CR

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 / True 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 = concentration of each analyte in the source.

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

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

Sample ID	Type of Analysis	Element	Found / S (units)	True / D (units)	Recalculated %R / RPD	Reported %R / RPD	Acceptable (Y/N)
LCS 11:58	Laboratory control sample	Cr+6	0.9160 mg/kg	1.00 mg/kg	91.6%R	91.6%R	Y
N	Matrix spike sample		(SSR-SR)				
DUP	Duplicate sample	Cr+6	0.0200 mg/kg	0.0208 mg/kg	3.92%RPD	3.38%RPD	Y*

Comments: *Rounding

LDC #: 33420A6

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: SD
2nd reviewer: CM

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 (10) Cr^{+6} reported with a positive detect were recalculated and verified using the following equation:

Concentration = $(A-C_0)/C_1$

Area = 0.0000077 ng/ml
C_0 = -3.47E-06
C_1 = 0.00044413

Vf = 10ml
m^3 = 21.47

Recalculation: $\frac{(0.0000077 \text{ ng/ml} - (-3.47E\text{-}06))}{0.00044413} = 0.0259 \text{ ng/ml}$

$\frac{(\text{ng/ml})(\text{vf})}{m^3} = \text{ng/m}^3$

$\frac{(0.0259 \text{ ng/ml})(10\text{ml})}{21.47 m^3} = 0.0121 \text{ ng/m}^3$

#	Sample ID	Analyte	Reported Concentration (ng/m^3)	Calculated Concentration (ng/m^3)	Acceptable (Y/N)
	1	Cr^{+6}	ND	ND	y
	2		ND	ND	y
	3		0.0207	0.0208	y*
	4		0.0170	0.0171	y*
	5		0.0234	0.0234	y
	6		0.0118	0.0117	y*
	7		0.0230	0.0230	y
	8		ND	ND	y
	9		ND	ND	
	10		0.0121	0.0121	
	11		0.0118	0.0117	y*
	12		0.0127	0.0127	y
	13		0.0159	0.0158	y*
	14		0.0208	0.0208	y
	15		0.0157	0.0157	
	16		0.0232	0.0232	
	17		ND	ND	
	18		ND	ND	

Note:

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ATTN: Mr. Jeff Boggs
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FILE #: 3926.00
REPORTED: 01/06/15 15:14
SUBMITTED: 12/30/14 to 12/31/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: OAM 1 **Lab ID:** 4123037-01 **Sampled:** 12/29/14 14:52
Matrix: Air **Sample Volume:** 21.81 m^3 **Received:** 12/30/14 12:01
Comments: Start Time 12/28/14 14:38 **Analysis Date:** 01/05/15 14:47

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

JAN 07 2015

Initials: CR

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FILE #: 3926.00
REPORTED: 01/06/15 15:14
SUBMITTED: 12/30/14 to 12/31/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: OAM 2 **Lab ID:** 4123037-02 **Sampled:** 12/29/14 15:12
Matrix: Air **Sample Volume:** 21.81 m^3 **Received:** 12/30/14 12:01
Comments: Start Time 12/28/14 14:58 **Analysis Date:** 01/05/15 14:57

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

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FILE #: 3926.00
REPORTED: 01/06/15 15:14
SUBMITTED: 12/30/14 to 12/31/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-1 **Lab ID:** 4123037-03 **Sampled:** 12/29/14 16:07
Matrix: Air **Sample Volume:** 21.77 m^3 **Received:** 12/30/14 12:01
Comments: Col 1 Start Time 12/28/14 15:56 **Analysis Date:** 01/05/15 14:07

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0207		0.0036

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FILE #: 3926.00
REPORTED: 01/06/15 15:14
SUBMITTED: 12/30/14 to 12/31/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-1D **Lab ID:** 4123037-04 **Sampled:** 12/29/14 16:11
Matrix: Air **Sample Volume:** 21.83 m^3 **Received:** 12/30/14 12:01
Comments: Col 2 Start Time 12/28/14 15:56 **Analysis Date:** 01/05/15 17:46

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0170		0.0036

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FILE #: 3926.00
REPORTED: 01/06/15 15:14
SUBMITTED: 12/30/14 to 12/31/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-2 **Lab ID:** 4123037-05 **Sampled:** 12/29/14 15:55
Matrix: Air **Sample Volume:** 21.94 m^3 **Received:** 12/30/14 12:01
Comments: Start Time 12/28/14 15:31 **Analysis Date:** 01/05/15 15:07

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0234		0.0036

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FILE #: 3926.00
REPORTED: 01/06/15 15:14
SUBMITTED: 12/30/14 to 12/31/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-3 **Lab ID:** 4123037-06 **Sampled:** 12/29/14 15:45
Matrix: Air **Sample Volume:** 21.91 m^3 **Received:** 12/30/14 12:01
Comments: Start Time 12/28/14 15:24 **Analysis Date:** 01/05/15 15:17

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0118		0.0036

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FILE #: 3926.00
REPORTED: 01/06/15 15:14
SUBMITTED: 12/30/14 to 12/31/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-4 **Lab ID:** 4123037-07 **Sampled:** 12/29/14 15:29
Matrix: Air **Sample Volume:** 21.81 m^3 **Received:** 12/30/14 12:01
Comments: Start Time 12/28/14 15:15 **Analysis Date:** 01/05/15 15:27

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0230		0.0036

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FILE #: 3926.00
REPORTED: 01/06/15 15:14
SUBMITTED: 12/30/14 to 12/31/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-21 **Lab ID:** 4123037-08 **Sampled:** 12/29/14 00:00
Matrix: Air **Sample Volume:** 21.94 m^3 **Received:** 12/30/14 12:01
Comments: **Analysis Date:** 01/05/15 15:37

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

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FILE #: 3926.00
REPORTED: 01/06/15 15:14
SUBMITTED: 12/30/14 to 12/31/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-31 **Lab ID:** 4123037-09 **Sampled:** 12/29/14 00:00
Matrix: Air **Sample Volume:** 21.91 m^3 **Received:** 12/30/14 12:01
Comments: **Analysis Date:** 01/05/15 15:46

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

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FILE #: 3926.00
REPORTED: 01/06/15 15:14
SUBMITTED: 12/30/14 to 12/31/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: OAM 1 **Lab ID:** 4123101-01 **Sampled:** 12/30/14 14:46
Matrix: Air **Sample Volume:** 21.47 m^3 **Received:** 12/31/14 10:38
Comments: Start Time 12/29/14 14:55 **Analysis Date:** 01/05/15 17:25

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0121		0.0036

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FILE #: 3926.00
REPORTED: 01/06/15 15:14
SUBMITTED: 12/30/14 to 12/31/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: OAM 2 **Lab ID:** 4123101-02 **Sampled:** 12/30/14 15:09
Matrix: Air **Sample Volume:** 21.51 m^3 **Received:** 12/31/14 10:38
Comments: Start Time 12/29/14 15:15 **Analysis Date:** 01/05/15 18:46

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0118		0.0036

JAN 07 2015

Initials: CR

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FILE #: 3926.00
REPORTED: 01/06/15 15:14
SUBMITTED: 12/30/14 to 12/31/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-1 **Lab ID:** 4123101-03 **Sampled:** 12/30/14 16:27
Matrix: Air **Sample Volume:** 21.84 m^3 **Received:** 12/31/14 10:38
Comments: Col 1 Start Time 12/29/14 16:11 **Analysis Date:** 01/05/15 13:27

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0127		0.0036

JAN 07 2015
Initials: CR

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FILE #: 3926.00
REPORTED: 01/06/15 15:14
SUBMITTED: 12/30/14 to 12/31/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-1D **Lab ID:** 4123101-04 **Sampled:** 12/30/14 16:29
Matrix: Air **Sample Volume:** 21.82 m^3 **Received:** 12/31/14 10:38
Comments: Col 2 Start Time 12/29/14 16:15 **Analysis Date:** 01/05/15 18:06

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0159 J		0.0036

JAN 07 2015

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FILE #: 3926.00
REPORTED: 01/06/15 15:14
SUBMITTED: 12/30/14 to 12/31/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-2 **Lab ID:** 4123101-05 **Sampled:** 12/30/14 16:07
Matrix: Air **Sample Volume:** 21.74 m^3 **Received:** 12/31/14 10:38
Comments: Start Time 12/29/14 15:58 **Analysis Date:** 01/05/15 16:16

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0208		0.0036

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FILE #: 3926.00
REPORTED: 01/06/15 15:14
SUBMITTED: 12/30/14 to 12/31/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-3 **Lab ID:** 4123101-06 **Sampled:** 12/30/14 15:56
Matrix: Air **Sample Volume:** 21.71 m^3 **Received:** 12/31/14 10:38
Comments: Start Time 12/29/14 15:48 **Analysis Date:** 01/05/15 16:46

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0157		0.0036

JAN 07 2015

Initials: CR

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FILE #: 3926.00
REPORTED: 01/06/15 15:14
SUBMITTED: 12/30/14 to 12/31/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-4 **Lab ID:** 4123101-07 **Sampled:** 12/30/14 15:33
Matrix: Air **Sample Volume:** 21.61 m^3 **Received:** 12/31/14 10:38
Comments: Start Time 12/29/14 15:32 **Analysis Date:** 01/05/15 16:56

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0232		0.0036

JAN 07 2015

Initials: CR

CERTIFICATE OF ANALYSIS

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FILE #: 3926.00
REPORTED: 01/06/15 15:14
SUBMITTED: 12/30/14 to 12/31/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-21 **Lab ID:** 4123101-08 **Sampled:** 12/30/14 00:00
Matrix: Air **Sample Volume:** 21.74 m^3 **Received:** 12/31/14 10:38
Comments: **Analysis Date:** 01/05/15 17:06

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

JAN 0 7 2015

Initials: CR

CERTIFICATE OF ANALYSIS

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FILE #: 3926.00
REPORTED: 01/06/15 15:14
SUBMITTED: 12/30/14 to 12/31/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-31 **Lab ID:** 4123101-09 **Sampled:** 12/30/14 00:00
Matrix: Air **Sample Volume:** 21.71 m^3 **Received:** 12/31/14 10:38
Comments: **Analysis Date:** 01/05/15 17:16

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

JAN 07 2015

Initials: CR

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

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

January 15, 2015

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

Dear Mr. Boggs,

Enclosed is the final validation report for the fraction listed below. This SDG was received on January 13, 2015. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #33488:

SDG	Fraction
5010643	Hexavalent Chromium

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

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

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

Sincerely,

Christina Rink
Project Manager/Chemist

214 pages-SF 1 WEEK TAT Attachment 1

Level IV

LDC #33488 (ERM - Morrisville, NC / Harbor Point, MD, Hexavalent Chromium Monitoring)

LDC	SDG#	DATE REC'D	(3) DATE DUE	Cr(VI) (D7614)																																			
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
A	5010643	01/13/15	01/20/15	35	0																																		
Total	T/CR			35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	35

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

L:\ERM\Harbor Point_Honeywell\33488ST.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

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

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

LDC Report Date: January 15, 2015

Matrix: Air

Parameters: Hexavalent Chromium

Validation Level: EPA Level IV

Laboratory: Eastern Research Group

Sample Delivery Group (SDG): 5010643

Sample Identification

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

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

Introduction

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

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

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

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

NJ Presumptive evidence of presence of the compound at an estimated quantity.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

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

I. Technical Holding Times

All technical holding time requirements were met.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met.

IV. Blanks

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

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

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

V. Matrix Spike/Matrix Spike Duplicates

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

VI. Duplicates

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

VII. Laboratory Control Samples

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

VIII. Sample Result Verification

All sample result verifications were acceptable.

IX. Overall Assessment of Data

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

X. Field Duplicates

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

Analyte	Concentration (ng/m^3)		RPD (Limits)	Flags	A or P
	PAM-1 (12/31/14)	PAM-1D (12/31/14)			
Hexavalent chromium	0.0261	0.0251	4 (≤20)	-	-

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

Analyte	Concentration (ng/m^3)		RPD (Limits)	Flags	A or P
	PAM-1 (1/03/15)	PAM-1D (1/03/15)			
Hexavalent chromium	0.0571	0.0641	12 (≤20)	-	-

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

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

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

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

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

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

LDC #: 33488A6
SDG #: 5010643
Laboratory: Eastern Research Group

VALIDATION COMPLETENESS WORKSHEET
Level IV

Date: 1/14/15
Page: 1 of 1
Reviewer: JO
2nd Reviewer: CL

METHOD: (Analyte) Hexavalent Chromium (ASTM D7614)

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

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	12/31/14 - 1/5/15
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Laboratory Blanks	A	
V	Field blanks	ND	FB=(8)(17)(26)(34) TB=(9)(18)(27)(35)
VI.	Matrix Spike/Matrix Spike Duplicates	N	Not Required
VII.	Duplicate sample analysis	A	DUP
VIII.	Laboratory control samples	A	LCSD
IX.	Field duplicates	SW	FD=(3,4) (12,13) (21,22) (30,31)*
X.	Sample result verification	A	
XI.	Overall assessment of data	A	

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

	Client ID	Lab ID	Matrix	Date
1	OAM 1(12/31/14)	5010643-01	air	12/31/14
2	OAM 2(12/31/14)	5010643-02	air	12/31/14
3	PAM-1(12/31/14)	5010643-03	air	12/31/14
4	PAM-1D(12/31/14)	5010643-04	air	12/31/14
5	PAM-2(12/31/14)	5010643-05	air	12/31/14
6	PAM-3(12/31/14)	5010643-06	air	12/31/14
7	PAM-4(12/31/14)	5010643-07	air	12/31/14
8	PAM-21(12/31/14)	5010643-08	air	12/31/14
9	PAM-31(12/31/14)	5010643-09	air	12/31/14
10	OAM 1(01/02/15)	5010643-10	air	01/02/15
11	OAM 2(01/02/15)	5010643-11	air	01/02/15
12	PAM-1(01/02/15)	5010643-12	air	01/02/15
13	PAM-1D(01/02/15)	5010643-13	air	01/02/15
14	PAM-2(01/02/15)	5010643-14	air	01/02/15
15	PAM-3(01/02/15)	5010643-15	air	01/02/15
16	PAM-4(01/02/15)	5010643-16	air	01/02/15
17	PAM-21(01/02/15)	5010643-17	air	01/02/15

LDC #: 33488A6
SDG #: 5010643
Laboratory: Eastern Research Group

VALIDATION COMPLETENESS WORKSHEET
Level IV

Date: 1/14/15

Reviewer: SD
2nd Reviewer: CL

METHOD: (Analyte) Hexavalent Chromium (ASTM D7614)

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

LDC #: 33488A6

VALIDATION FINDINGS CHECKLIST

Reviewer: SD
2nd Reviewer: AV

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

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# 33488A6

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Reviewer: SD
2nd Reviewer: CA

Inorganics: Method See Cover

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

Analyte	Concentration (ng/m3)		RPD (≤20)	Qual.
	12	13		
Hexavalent Chromium	0.0320	0.0329	3	

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

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

LDC #: 33488A6

Validation Findings Worksheet
Initial and Continuing Calibration Calculation Verification

Page: 1 of 1
Reviewer: JD
2nd Reviewer: 2

Method: Inorganics, Method See Cover

The correlation coefficient (r) for the calibration of Cr+6 was recalculated. Calibration date: 1/07/15

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

%R = Found X 100 / True

Where, Found = concentration of each analyte measured in the analysis of the ICV or CCV solution
True = concentration of each analyte in the ICV or CCV source

Type of analysis	Analyte	Standard	Conc. (ng/ml)	Area	Recalculated r or r^2	Reported r or r^2	Acceptable (Y/N)
Initial calibration	Cr+6	s1	0.05	0.0000123	*0.99920*	0.99920	Y
		s2	0.1	0.0000323			
		s3	0.2	0.0000784			
		s4	0.5	0.0002107			
		s5	1	0.0003887			
		s6	2	0.0008471			
ICV 11:27 Calibration verification	Cr+6	Found 0.5139ng/ml	True 0.5ng/ml		102.8%R	102.8%R	↓
CCV 12:26 Calibration verification	Cr+6	0.5165ng/ml	0.5ng/ml		103.3%R	103.3%R	↓
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 #: 33488A10

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Page: 1 of 1
Reviewer: JD
2nd Reviewer: [illegible]

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 / True 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 = concentration of each analyte in the source.

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

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

Sample ID	Type of Analysis	Element	Found / S (units)	True / D (units)	Recalculated %R / RPD	Reported %R / RPD	Acceptable (Y/N)
LCS 11:57	Laboratory control sample	Cr+6	1.05ng/ml	1.00ng/ml	105%R	105%R	Y
N	Matrix spike sample		(SSR-SR)				
DUP 12:56	Duplicate sample	Cr+6	0.0252ng/m3	0.0262ng/m3	3.89%RPD	3.53%RPD	Y

Comments: _____

LDC #: 33488A6

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 2
Reviewer: SD
2nd reviewer: CV

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 (2) Cr^{+6} reported with a positive detect were recalculated and verified using the following equation:

Concentration = $(A-C_o)/C_i$ vf = 10ml m^3 = 21.34

A = 0.0000098
C_o = -1.05E-05
C_i = 0.0004240

Recalculation: $\frac{(0.0000098)-(-1.05E-05)}{0.0004240} = 0.0479$ ng/ml

$\frac{(ng/ml)(vf)}{m^3}$

$\frac{(0.0479\ ng/ml)(10ml)}{21.34\ m^3} = 0.224\ ng/m^3$

#	Sample ID	Analyte	Reported Concentration (ng/m^3)	Calculated Concentration (ng/m^3)	Acceptable (Y/N)
	1	Cr^{+6}	ND	ND	y
	2		0.0224	0.0224	y
	3		0.0261	0.0262	y*
	4		0.0251	0.0252	y*
	5		0.0312	0.313	y*
	6		ND	ND	y
	7		0.0316	0.0316	
	8		ND	ND	
	9		ND	ND	
	10		ND	ND	
	11		0.0238	0.0238	
	12		0.0320	0.0321	y*
	13		0.0329	0.0329	y
	14		0.0220	0.0221	y*
	15		ND	ND	y
	16		0.0401	0.0401	
	17		ND	ND	
	18		ND	ND	
	19		0.0403	0.0403	y
	20		0.0536	0.0536	

Note: *Rounding

LDC #: 33488A0

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 2 of 2
Reviewer: 3D
2nd reviewer: [illegible]

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 (21) Cr+6 reported with a positive detect were recalculated and verified using the following equation:

Concentration = (A-Co)/C1

Co = -1.25E-05
C1 = 0.00038826
A = 0.000035

Vf = 10 ml
m3 = 21.73

(ng/ml)(Vf) / m3

Recalculation: (0.000035) - (-1.25E-05) / 0.00038826 = 0.1242 ng/ml

(0.1242 ng/ml)(10 ml) / 21.73 m3 = 0.0571 ng/m3

#	Sample ID	Analyte	Reported Concentration (ng/m3)	Calculated Concentration (ng/m3)	Acceptable (Y/N)
	21	Cr+6	0.0571	0.0571	y
	22		0.0641	0.0641	y
	23		0.0792	0.0792	y
	24		0.0454	0.0453	y*
	25		0.0600	0.0599	y*
	26		ND	ND	y
	27		ND	ND	
	28		0.0188	0.0188	
	29		ND	ND	
	30		ND	ND	
	31		ND	ND	
	32		ND	ND	
	33		0.0253	0.0253	
	34		ND	ND	
	35		ND	ND	

Note: * Rounding

CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc
75 Valley Stream Parkway, Suite 400
Malvern, PA 19355
ATTN: Mr. Jeff Boggs
PHONE: (443) 803-8495 **FAX:** (410) 266-8912

FILE #: 3926.00
REPORTED: 01/13/15 13:17
SUBMITTED: 01/06/15
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: OAM 1 **Lab ID:** 5010643-01 **Sampled:** 12/31/14 14:25
Matrix: Air **Sample Volume:** 21.24 m^3 **Received:** 01/06/15 11:49
Comments: Start Time 12/30/14 14:49 **Analysis Date:** 01/07/15 14:47

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

JAN 15 2015

Initials: CR

CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc
75 Valley Stream Parkway, Suite 400
Malvern, PA 19355
ATTN: Mr. Jeff Boggs
PHONE: (443) 803-8495 FAX: (410) 266-8912

FILE #: 3926.00
REPORTED: 01/13/15 13:17
SUBMITTED: 01/06/15
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: OAM 2 **Lab ID:** 5010643-02 **Sampled:** 12/31/14 14:57
Matrix: Air **Sample Volume:** 21.34 m^3 **Received:** 01/06/15 11:49
Comments: Start Time 12/30/14 15:14 **Analysis Date:** 01/07/15 14:57

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0224		0.0036

JAN 15 2015

Initials: CR

CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc
75 Valley Stream Parkway, Suite 400
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FILE #: 3926.00
REPORTED: 01/13/15 13:17
SUBMITTED: 01/06/15
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-1 **Lab ID:** 5010643-03 **Sampled:** 12/31/14 15:37
Matrix: Air **Sample Volume:** 20.97 m^3 **Received:** 01/06/15 11:49
Comments: Col 1 Start Time 12/30/14 16:31 **Analysis Date:** 01/07/15 14:06

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m^3 Air	Flag	MDL ng/m^3 Air
Hexavalent Chromium	1854-02-99	0.0261		0.0036

JAN 15 2015

Initials: CR

CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc
75 Valley Stream Parkway, Suite 400
Malvern, PA 19355
ATTN: Mr. Jeff Boggs
PHONE: (443) 803-8495 **FAX:** (410) 266-8912

FILE #: 3926.00
REPORTED: 01/13/15 13:17
SUBMITTED: 01/06/15
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-1D **Lab ID:** 5010643-04 **Sampled:** 12/31/14 15:38
Matrix: Air **Sample Volume:** 20.79 m^3 **Received:** 01/06/15 11:49
Comments: Col 2 Start Time 12/30/14 16:32 **Analysis Date:** 01/07/15 13:06

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m^3 Air	Flag	MDL ng/m^3 Air
Hexavalent Chromium	1854-02-99	0.0251		0.0036

JAN 15 2015

Initials: CR

CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc
75 Valley Stream Parkway, Suite 400
Malvern, PA 19355
ATTN: Mr. Jeff Boggs
PHONE: (443) 803-8495 **FAX:** (410) 266-8912

FILE #: 3926.00
REPORTED: 01/13/15 13:17
SUBMITTED: 01/06/15
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-2 **Lab ID:** 5010643-05 **Sampled:** 12/31/14 15:28
Matrix: Air **Sample Volume:** 20.97 m^3 **Received:** 01/06/15 11:49
Comments: Start Time 12/30/14 16:10 **Analysis Date:** 01/07/15 15:06

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0312		0.0036

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FILE #: 3926.00
REPORTED: 01/13/15 13:17
SUBMITTED: 01/06/15
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-3 **Lab ID:** 5010643-06 **Sampled:** 12/31/14 15:21
Matrix: Air **Sample Volume:** 21.04 m^3 **Received:** 01/06/15 11:49
Comments: Start Time 12/30/14 15:58 **Analysis Date:** 01/07/15 15:16

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

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FILE #: 3926.00
REPORTED: 01/13/15 13:17
SUBMITTED: 01/06/15
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-4 **Lab ID:** 5010643-07 **Sampled:** 12/31/14 15:13
Matrix: Air **Sample Volume:** 21.25 m^3 **Received:** 01/06/15 11:49
Comments: Start Time 12/30/14 15:36 **Analysis Date:** 01/07/15 17:25

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0316		0.0036

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FILE #: 3926.00
REPORTED: 01/13/15 13:17
SUBMITTED: 01/06/15
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-21 **Lab ID:** 5010643-08 **Sampled:** 12/31/14 00:00
Matrix: Air **Sample Volume:** 20.97 m^3 **Received:** 01/06/15 11:49
Comments: **Analysis Date:** 01/07/15 15:36

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

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FILE #: 3926.00
REPORTED: 01/13/15 13:17
SUBMITTED: 01/06/15
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-31
Matrix: Air
Comments:

Lab ID: 5010643-09
Sample Volume: 21.04 m^3

Sampled: 12/31/14 00:00
Received: 01/06/15 11:49
Analysis Date: 01/07/15 15:46

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

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FILE #: 3926.00
REPORTED: 01/13/15 13:17
SUBMITTED: 01/06/15
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: OAM 1 **Lab ID:** 5010643-10 **Sampled:** 01/02/15 14:30
Matrix: Air **Sample Volume:** 21.36 m^3 **Received:** 01/06/15 11:49
Comments: Start Time 1/1/15 14:46 **Analysis Date:** 01/07/15 15:56

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

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FILE #: 3926.00
REPORTED: 01/13/15 13:17
SUBMITTED: 01/06/15
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: OAM 2 **Lab ID:** 5010643-11 **Sampled:** 01/02/15 14:52
Matrix: Air **Sample Volume:** 21.46 m^3 **Received:** 01/06/15 11:49
Comments: Start Time 1/1/15 15:01 **Analysis Date:** 01/07/15 16:06

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0238		0.0036

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FILE #: 3926.00
REPORTED: 01/13/15 13:17
SUBMITTED: 01/06/15
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-1 **Lab ID:** 5010643-12 **Sampled:** 01/02/15 15:52
Matrix: Air **Sample Volume:** 21.52 m^3 **Received:** 01/06/15 11:49
Comments: Col 1 Start Time 1/1/15 15:57 **Analysis Date:** 01/07/15 13:26

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m^3 Air	Flag	MDL ng/m^3 Air
Hexavalent Chromium	1854-02-99	0.0320		0.0036

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FILE #: 3926.00
REPORTED: 01/13/15 13:17
SUBMITTED: 01/06/15
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-1D **Lab ID:** 5010643-13 **Sampled:** 01/02/15 15:56
Matrix: Air **Sample Volume:** 21.58 m^3 **Received:** 01/06/15 11:49
Comments: Col 2 Start Time 1/1/15 15:57 **Analysis Date:** 01/07/15 17:56

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0329		0.0036

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FILE #: 3926.00
REPORTED: 01/13/15 13:17
SUBMITTED: 01/06/15
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-2 **Lab ID:** 5010643-14 **Sampled:** 01/02/15 15:40
Matrix: Air **Sample Volume:** 21.48 m^3 **Received:** 01/06/15 11:49
Comments: Start Time 1/1/15 15:48 **Analysis Date:** 01/07/15 16:16

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0220		0.0036

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FILE #: 3926.00
REPORTED: 01/13/15 13:17
SUBMITTED: 01/06/15
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-3 **Lab ID:** 5010643-15 **Sampled:** 01/02/15 15:30
Matrix: Air **Sample Volume:** 21.65 m^3 **Received:** 01/06/15 11:49
Comments: Start Time 1/1/15 15:27 **Analysis Date:** 01/07/15 16:46

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

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FILE #: 3926.00
REPORTED: 01/13/15 13:17
SUBMITTED: 01/06/15
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-4 **Lab ID:** 5010643-16 **Sampled:** 01/02/15 15:08
Matrix: Air **Sample Volume:** 21.45 m^3 **Received:** 01/06/15 11:49
Comments: Start Time 1/1/15 15:18 **Analysis Date:** 01/07/15 16:55

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0401		0.0036

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FILE #: 3926.00
REPORTED: 01/13/15 13:17
SUBMITTED: 01/06/15
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-21 **Lab ID:** 5010643-17 **Sampled:** 01/02/15 00:00
Matrix: Air **Sample Volume:** 21.48 m^3 **Received:** 01/06/15 11:49
Comments: **Analysis Date:** 01/07/15 17:05

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

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FILE #: 3926.00
REPORTED: 01/13/15 13:17
SUBMITTED: 01/06/15
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-31 **Lab ID:** 5010643-18 **Sampled:** 01/02/15 00:00
Matrix: Air **Sample Volume:** 21.65 m^3 **Received:** 01/06/15 11:49
Comments: **Analysis Date:** 01/07/15 17:15

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

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FILE #: 3926.00
REPORTED: 01/13/15 13:17
SUBMITTED: 01/06/15
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: OAM 1 **Lab ID:** 5010643-19 **Sampled:** 01/03/15 14:11
Matrix: Air **Sample Volume:** 21.27 m^3 **Received:** 01/06/15 11:49
Comments: Start Time 1/2/15 14:33 **Analysis Date:** 01/08/15 16:44

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0403		0.0036

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FILE #: 3926.00
REPORTED: 01/13/15 13:17
SUBMITTED: 01/06/15
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: OAM 2 **Lab ID:** 5010643-20 **Sampled:** 01/03/15 14:56
Matrix: Air **Sample Volume:** 21.36 m^3 **Received:** 01/06/15 11:49
Comments: Start Time 1/2/15 14:55 **Analysis Date:** 01/08/15 14:25

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0536		0.0036

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FILE #: 3926.00
REPORTED: 01/13/15 13:17
SUBMITTED: 01/06/15
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-1 **Lab ID:** 5010643-21 **Sampled:** 01/03/15 16:04
Matrix: Air **Sample Volume:** 21.73 m^3 **Received:** 01/06/15 11:49
Comments: Col 1 Start Time 1/2/15 15:56 **Analysis Date:** 01/08/15 12:16

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m^3 Air	Flag	MDL ng/m^3 Air
Hexavalent Chromium	1854-02-99	0.0571		0.0036

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FILE #: 3926.00
REPORTED: 01/13/15 13:17
SUBMITTED: 01/06/15
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-1D **Lab ID:** 5010643-22 **Sampled:** 01/03/15 16:00
Matrix: Air **Sample Volume:** 21.74 m^3 **Received:** 01/06/15 11:49
Comments: Col 2 Start Time 1/2/15 15:59 **Analysis Date:** 01/08/15 13:35

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0641		0.0036

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FILE #: 3926.00
REPORTED: 01/13/15 13:17
SUBMITTED: 01/06/15
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-2 **Lab ID:** 5010643-23 **Sampled:** 01/03/15 15:44
Matrix: Air **Sample Volume:** 21.59 m^3 **Received:** 01/06/15 11:49
Comments: Start Time 1/2/15 15:44 **Analysis Date:** 01/08/15 16:54

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m^3 Air	Flag	MDL ng/m^3 Air
Hexavalent Chromium	1854-02-99	0.0792		0.0036

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FILE #: 3926.00
REPORTED: 01/13/15 13:17
SUBMITTED: 01/06/15
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-3 **Lab ID:** 5010643-24 **Sampled:** 01/03/15 15:34
Matrix: Air **Sample Volume:** 21.51 m^3 **Received:** 01/06/15 11:49
Comments: Start Time 1/2/15 15:34 **Analysis Date:** 01/08/15 14:45

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0454		0.0036

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FILE #: 3926.00
REPORTED: 01/13/15 13:17
SUBMITTED: 01/06/15
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-4 **Lab ID:** 5010643-25 **Sampled:** 01/03/15 15:05
Matrix: Air **Sample Volume:** 21.5 m^3 **Received:** 01/06/15 11:49
Comments: Start Time 1/2/15 15:11 **Analysis Date:** 01/08/15 14:55

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0600		0.0036

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FILE #: 3926.00
REPORTED: 01/13/15 13:17
SUBMITTED: 01/06/15
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-21 **Lab ID:** 5010643-26 **Sampled:** 01/03/15 00:00
Matrix: Air **Sample Volume:** 21.59 m^3 **Received:** 01/06/15 11:49
Comments: **Analysis Date:** 01/08/15 15:05

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

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FILE #: 3926.00
REPORTED: 01/13/15 13:17
SUBMITTED: 01/06/15
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-31 **Lab ID:** 5010643-27 **Sampled:** 01/03/15 00:00
Matrix: Air **Sample Volume:** 21.51 m^3 **Received:** 01/06/15 11:49
Comments: **Analysis Date:** 01/08/15 15:15

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

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FILE #: 3926.00
REPORTED: 01/13/15 13:17
SUBMITTED: 01/06/15
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: OAM 1 **Lab ID:** 5010643-28 **Sampled:** 01/05/15 15:13
Matrix: Air **Sample Volume:** 21.64 m^3 **Received:** 01/06/15 11:49
Comments: Start Time 1/4/15 15:10 **Analysis Date:** 01/08/15 17:04

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0188		0.0036

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FILE #: 3926.00
REPORTED: 01/13/15 13:17
SUBMITTED: 01/06/15
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: OAM 2 **Lab ID:** 5010643-29 **Sampled:** 01/05/15 15:35
Matrix: Air **Sample Volume:** 21.81 m^3 **Received:** 01/06/15 11:49
Comments: Start Time 1/4/15 15:21 **Analysis Date:** 01/08/15 15:35

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

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FILE #: 3926.00
REPORTED: 01/13/15 13:17
SUBMITTED: 01/06/15
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-1 **Lab ID:** 5010643-30 **Sampled:** 01/05/15 16:34
Matrix: Air **Sample Volume:** 22.23 m^3 **Received:** 01/06/15 11:49
Comments: Col 1 Start Time 1/4/15 15:52 **Analysis Date:** 01/08/15 12:55

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

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FILE #: 3926.00
REPORTED: 01/13/15 13:17
SUBMITTED: 01/06/15
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-1D **Lab ID:** 5010643-31 **Sampled:** 01/05/15 16:37
Matrix: Air **Sample Volume:** 22.27 m^3 **Received:** 01/06/15 11:49
Comments: Col 2 Start Time 1/4/15 15:52 **Analysis Date:** 01/08/15 13:15

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m^3 Air	Flag	MDL ng/m^3 Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

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FILE #: 3926.00
REPORTED: 01/13/15 13:17
SUBMITTED: 01/06/15
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-3 **Lab ID:** 5010643-33 **Sampled:** 01/05/15 16:17
Matrix: Air **Sample Volume:** 22.15 m^3 **Received:** 01/06/15 11:49
Comments: Start Time 1/4/15 15:40 **Analysis Date:** 01/08/15 15:45

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

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FILE #: 3926.00
REPORTED: 01/13/15 13:17
SUBMITTED: 01/06/15
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-4 **Lab ID:** 5010643-34 **Sampled:** 01/05/15 15:52
Matrix: Air **Sample Volume:** 21.87 m^3 **Received:** 01/06/15 11:49
Comments: Start Time 1/4/15 15:34 **Analysis Date:** 01/08/15 17:37

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0253		0.0036

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FILE #: 3926.00
REPORTED: 01/13/15 13:17
SUBMITTED: 01/06/15
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-21 **Lab ID:** 5010643-35 **Sampled:** 01/05/15 00:00
Matrix: Air **Sample Volume:** 22.15 m^3 **Received:** 01/06/15 11:49
Comments: **Analysis Date:** 01/08/15 16:24

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

JAN 15 2015

Initials: CR

CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc
75 Valley Stream Parkway, Suite 400
Malvern, PA 19355
ATTN: Mr. Jeff Boggs
PHONE: (443) 803-8495 **FAX:** (410) 266-8912

FILE #: 3926.00
REPORTED: 01/13/15 13:17
SUBMITTED: 01/06/15
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-31 **Lab ID:** 5010643-36 **Sampled:** 01/05/15 00:00
Matrix: Air **Sample Volume:** 22.15 m^3 **Received:** 01/06/15 11:49
Comments: **Analysis Date:** 01/08/15 16:34

Hexavalent Chromium by SOP ERG-MOR-063

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

JAN 15 2015
Initials: CR