CHAAP Data Verification

Laboratory and SDG#: TADenver 280-129936 **AECOM Chemist: Jared DeSadier**
Date Verified: 11/21/2019 **AECOM ITR: Jeff Aust**
Guidance: DoD QSM Version 5.1 (January 2017)
Applicable QAPP: Cornhusker Army Ammunition Plant QAPP (Brice and AECOM, October 2018)
Applicable Analytical Methods: 8330A, 353.2, 350.1, 351.2, RSK-175, 9060A, 2320B, 9056A, 9034

Sample Identification #	Date Collected	Date Received	Matrix	Analysis
EW7-PM28A-1-25	10/19/2019	10/22/2019	Water	Explosives (8330A), Nitrate, Nitrite (353.2), Ammonia (350.1), TKN (351.2), MEE (RSK-175), DOC (9060A), Sulfate (9056A) Sulfide (9034), Alkalinity (2320B)
EW7-PM28B-1-35	10/20/2019	10/22/2019	Water	Explosives (8330A), Nitrate, Nitrite (353.2), Ammonia (350.1), TKN (351.2), MEE (RSK-175), DOC (9060A), Sulfate (9056A) Sulfide (9034), Alkalinity (2320B)
EW7-PM24B-1-35	10/19/2019	10/22/2019	Water	Explosives (8330A), Nitrate, Nitrite (353.2), Ammonia (350.1), TKN (351.2), MEE (RSK-175), DOC (9060A), Sulfate (9056A) Sulfide (9034), Alkalinity (2320B)
EW7-PM29B-1-35	10/19/2019	10/22/2019	Water	Explosives (8330A), Nitrate, Nitrite (353.2), Ammonia (350.1), TKN (351.2), MEE (RSK-175), DOC (9060A), Sulfate (9056A) Sulfide (9034), Alkalinity (2320B)
EW7-PM29A-1-25	10/19/2019	10/22/2019	Water	Explosives (8330A), Nitrate, Nitrite (353.2), Ammonia (350.1), TKN (351.2), MEE (RSK-175), DOC (9060A), Sulfate (9056A) Sulfide (9034), Alkalinity (2320B)
CA213-1	10/21/2019	10/22/2019	Water	Explosives (8330A), Nitrate, Nitrite (353.2), Ammonia (350.1), TKN (351.2), MEE (RSK-175), DOC (9060A), Sulfate (9056A) Sulfide (9034), Alkalinity (2320B)
G0070-1	10/21/2019	10/22/2019	Water	Explosives (8330A), Nitrate, Nitrite (353.2), Ammonia (350.1), TKN (351.2), MEE (RSK-175), DOC (9060A), Sulfate (9056A) Sulfide (9034), Alkalinity (2320B)
G0081-1	10/21/2019	10/22/2019	Water	Explosives (8330A), Nitrate, Nitrite (353.2), Ammonia (350.1), TKN (351.2), MEE (RSK-175), DOC (9060A), Sulfate (9056A) Sulfide (9034), Alkalinity (2320B)
CA210-1	10/21/2019	10/22/2019	Water	Explosives (8330A), Nitrate, Nitrite (353.2), Ammonia (350.1), TKN (351.2), MEE (RSK-175), DOC (9060A), Sulfate (9056A) Sulfide (9034), Alkalinity (2320B)
CA211-1	10/21/2019	10/22/2019	Water	Explosives (8330A), Nitrate, Nitrite (353.2), Ammonia (350.1), TKN (351.2), MEE (RSK-175), DOC (9060A), Sulfate (9056A) Sulfide (9034), Alkalinity (2320B)
CA212-1	10/21/2019	10/22/2019	Water	Explosives (8330A), Nitrate, Nitrite (353.2), Ammonia (350.1), TKN (351.2), MEE (RSK-175), DOC (9060A), Sulfate (9056A) Sulfide (9034), Alkalinity (2320B)

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Sample Identification #	Date Collected	Date Received	Matrix	Analysis
G0075-1	10/21/2019	10/22/2019	Water	Explosives (8330A), Nitrate, Nitrite (353.2), Ammonia (350.1), TKN (351.2), MEE (RSK-175), DOC (9060A), Sulfate (9056A) Sulfide (9034), Alkalinity (2320B)
G0079-1	10/21/2019	10/22/2019	Water	Explosives (8330A), Nitrate, Nitrite (353.2), Ammonia (350.1), TKN (351.2), MEE (RSK-175), DOC (9060A), Sulfate (9056A) Sulfide (9034), Alkalinity (2320B)
G0080-1	10/21/2019	10/22/2019	Water	Explosives (8330A), Nitrate, Nitrite (353.2), Ammonia (350.1), TKN (351.2), MEE (RSK-175), DOC (9060A), Sulfate (9056A) Sulfide (9034), Alkalinity (2320B)

1.0 Laboratory Case Narrative \ Cooler Receipt Form

Verification Criteria	Yes	No	N/A
Were any DoD QSM deviations noted in the laboratory case narrative?	X		
Were DoD QSM corrective actions followed if deviations were noted?	X		
Were any issues noted in the cooler receipt form?		X	

The laboratory case narrative indicated that some surrogate and MS/MSD recoveries were outside evaluation criteria. These issues are discussed further in the ADR report.

RPD between the primary and confirmation column for some explosives samples was above evaluation criteria. These issues are discussed further in Section 8.0. Some explosives ICV and CCV %Ds were outside of evaluation criteria. These issues are discussed further in Sections 4.0 and 5.0.

No other issues were noted in the case narrative or cooler receipt form.

2.0 Sample Documentation

Verification Criteria	Yes	No
Were all samples documented correctly on the chain-of-custody (COC) and samples labels?	X	
Were all sample identifications (IDs) documented correctly on sample labels?	X	
Did samples listed on COCs match the sample labels?	X	
Were samples relinquished properly on the COC?	X	

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3.0 Initial Calibration

Method 8330A Initial Calibration Criteria			
Instrument:	**CHHPLC_X3**		
Date of Calibration:	**7/1/2019**		
	Yes	**No**	**N/A**
Was at least a five point calibration completed for all analytes prior to sample analysis and one option below?	X		
Option 1: RSD for each analyte ≤ 20%?	X		
Option 2: If linear least squares regression was used was the $r^2 \geq 0.99$?			X
Option 3: If non-linear regression was used was the coefficient of determination $r^2 \geq 0.99$?			X
If non-linear regression was used were 6 points used for second order and 7 points for third order?			X

Method 8330A Initial Calibration Criteria			
Instrument:	**CHHPLC_X3**		
Date of Calibration:	**7/1/2019**		
	Yes	**No**	**N/A**
Was at least a five point calibration completed for all analytes prior to sample analysis and one option below?	X		
Option 1: RSD for each analyte ≤ 20%?	X		
Option 2: If linear least squares regression was used was the $r^2 \geq 0.99$?			X
Option 3: If non-linear regression was used was the coefficient of determination $r^2 \geq 0.99$?			X
If non-linear regression was used were 6 points used for second order and 7 points for third order?			X

Method 8330A Initial Calibration Criteria			
Instrument:	**CHHPLC_G2_LUNA**		
Date of Calibration:	**10/25/2019**		
	Yes	**No**	**N/A**
Was at least a five point calibration completed for all analytes prior to sample analysis and one option below?	X		
Option 1: RSD for each analyte ≤ 20%?	X		
Option 2: If linear least squares regression was used was the $r^2 \geq 0.99$?			X
Option 3: If non-linear regression was used was the coefficient of determination $r^2 \geq 0.99$?			X
If non-linear regression was used were 6 points used for second order and 7 points for third order?			X

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Laboratory and SDG#: TADenver 280-129936 **AECOM Chemist: Jared DeSadier**
Date Verified: 11/21/2019 **AECOM ITR: Jeff Aust**
Guidance: DoD QSM Version 5.1 (January 2017)
Applicable QAPP: Cornhusker Army Ammunition Plant QAPP (Brice and AECOM, October 2018)
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Method RSK-175 Initial Calibration Criteria			
Instrument:	**VGC_J**		
Date of Calibration:	**04/15/2019**		
	Yes	**No**	**N/A**
Was at least a five point calibration completed for all analytes prior to sample analysis and one option below?	X		
Option 1: RSD for each analyte ≤ 25%?	X		
Option 2: If linear least squares regression was used was the $r^2 \geq 0.99$?	X		
Option 3: If non-linear regression was used was the coefficient of determination $r^2 \geq 0.99$?			X
If non-linear regression was used were 6 points used for second order and 7 points for third order?			X

Method 9056A Initial Calibration Criteria			
Instrument:	**WC_IonChrom10**		
Date of Calibration:	**10/16/2019**		
	Yes	**No**	**N/A**
Was a minimum of three standards and a calibration blank used for ICAL?	X		
Was $r^2 \geq 0.99$?	X		

Method 350.1 Initial Calibration Criteria			
Instrument:	**WC_Alp 3**		
Date of Calibration:	**11/6/2019**		
	Yes	**No**	**N/A**
Was a minimum of three standards and a calibration blank used for ICAL?	X		
Was $r^2 \geq 0.99$?	X		

Method 353.2 Initial Calibration Criteria			
Instrument:	**WC_Alp 2**		
Date of Calibration:	**11/4/2019**		
	Yes	**No**	**N/A**
Was a minimum of three standards and a calibration blank used for ICAL?	X		
Was $r^2 \geq 0.99$?	X		

Method 353.2 Initial Calibration Criteria			
Instrument:	**WC_Alp 2**		
Date of Calibration:	**11/5/2019**		
	Yes	**No**	**N/A**
Was a minimum of three standards and a calibration blank used for ICAL?	X		
Was $r^2 \geq 0.99$?	X		

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Date Verified: 11/21/2019 **AECOM ITR: Jeff Aust**
Guidance: DoD QSM Version 5.1 (January 2017)
Applicable QAPP: Cornhusker Army Ammunition Plant QAPP (Brice and AECOM, October 2018)
Applicable Analytical Methods: 8330A, 353.2, 350.1, 351.2, RSK-175, 9060A, 2320B, 9056A, 9034

Method 351.2 Initial Calibration Criteria			
Instrument:	**WC_Astoria**		
Date of Calibration:	**11/5/2019**		
	Yes	**No**	**N/A**
Was a minimum of three standards and a calibration blank used for ICAL?	X		
Was $r^2 \geq 0.99$?	X		

Method 9060A Initial Calibration Criteria			
Instrument:	**WC_SHI3**		
Date of Calibration:	**11/4/2019**		
	Yes	**No**	**N/A**
Was a minimum of three standards and a calibration blank used for ICAL?	X		
Was $r^2 \geq 0.99$?	X		

4.0 Initial Calibration Verification [(ICV) Second Source]

Method 8330A ICV Criteria (Filename)	**07010015.D**		
Instrument:	**CHHPLC_X3**		
Date of Initial Calibration Verification:	**7/1/2019**		
	Yes	**No**	**N/A**
Was the ICV analyzed after each calibration?	X		
Was the ICV for all analytes within ± 15% of the true value?	X		

Method 8330A ICV Criteria (Filename)	**07010033.D**		
Instrument:	**CHHPLC_X3**		
Date of Initial Calibration Verification:	**7/1/2019**		
	Yes	**No**	**N/A**
Was the ICV analyzed after each calibration?	X		
Was the ICV for all analytes within ± 15% of the true value?	X		

Method 8330A ICV Criteria (Filename)	**10250015.D**		
Instrument:	**CHHPLC_G2-LUNA**		
Date of Initial Calibration Verification:	**10/25/2019**		
	Yes	**No**	**N/A**
Was the ICV analyzed after each calibration?	X		
Was the ICV for all analytes within ± 15% of the true value?		X	

The %D for 3-nitrotoluene (33.4%) was outside of evaluation criteria with a high bias. Associated results were nondetect and no qualification of data was required.

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Applicable QAPP: Cornhusker Army Ammunition Plant QAPP (Brice and AECOM, October 2018)
Applicable Analytical Methods: 8330A, 353.2, 350.1, 351.2, RSK-175, 9060A, 2320B, 9056A, 9034

Method RSK-175 ICV Criteria (Filename)	04151911.D		
Instrument:	VGC_J		
Date of Initial Calibration Verification:	4/15/2019		
	Yes	No	N/A
Was the ICV analyzed after each calibration?	X		
Was the ICV for all analytes within ± 25% of the true value?	X		

Method 9056A ICV	WC_IonChrom10		
Date of Initial Calibration Verification:	10/16/2019		
	Yes	No	N/A
Was the ICV analyzed after each ICAL, prior to the beginning of a sample analysis?	X		
Was the ICV for all analytes within ± 10% of the true value?	X		

Method 350.1 ICV Criteria	WC_Alp 3		
Date of Initial Calibration Verification:	11/6/2019		
	Yes	No	N/A
Was the ICV analyzed after each ICAL, prior to the beginning of a sample analysis?	X		
Was the ICV for all analytes within ± 10% of the true value?	X		

Method 353.2 ICV Criteria	WC_Alp 2		
Date of Initial Calibration Verification:	11/4/2019		
	Yes	No	N/A
Was the ICV analyzed after each ICAL, prior to the beginning of a sample analysis?	X		
Was the ICV for all analytes within ± 10% of the true value?	X		

Method 353.2 ICV Criteria	WC_Alp 2		
Date of Initial Calibration Verification:	11/5/2019		
	Yes	No	N/A
Was the ICV analyzed after each ICAL, prior to the beginning of a sample analysis?	X		
Was the ICV for all analytes within ± 10% of the true value?	X		

Method 351.2 ICV Criteria	WC_Astoria		
Date of Initial Calibration Verification:	11/5/2019		
	Yes	No	N/A
Was the ICV analyzed after each ICAL, prior to the beginning of a sample analysis?	X		
Was the ICV for all analytes within ± 10% of the true value?	X		

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Method 9060A ICV Criteria	WC_SHI3		
Date of Initial Calibration Verification:	11/4/2019		
	Yes	No	N/A
Was the ICV analyzed after each ICAL, prior to the beginning of a sample analysis?	X		
Was the ICV for all analytes within ± 10% of the true value?	X		

5.0 Continuing Calibration Verification (CCV)

Method 8330A CCV Criteria (Filename)	10280033_5.D		
Instrument:	CHHPLC_X3		
Date of Calibration Verification:	10/28/2019		
	Yes	No	N/A
Was the CCV analyzed daily before sample analysis?	X		
Was the CCV analyzed every 10 field samples and at the end of the analysis sequence?	X		
Was the CCV for all analytes within ± 15% of the true value?	X		

Method 8330A CCV Criteria (Filename)	10280046_8.D		
Instrument:	CHHPLC_X3		
Date of Calibration Verification:	10/28/2019		
	Yes	No	N/A
Was the CCV analyzed daily before sample analysis?	X		
Was the CCV analyzed every 10 field samples and at the end of the analysis sequence?	X		
Was the CCV for all analytes within ± 15% of the true value?	X		

Method 8330A CCV Criteria (Filename)	10280059_61.D		
Instrument:	CHHPLC_X3		
Date of Calibration Verification:	10/29/2019		
	Yes	No	N/A
Was the CCV analyzed daily before sample analysis?	X		
Was the CCV analyzed every 10 field samples and at the end of the analysis sequence?	X		
Was the CCV for all analytes within ± 15% of the true value?	X		

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Applicable Analytical Methods: 8330A, 353.2, 350.1, 351.2, RSK-175, 9060A, 2320B, 9056A, 9034

Method 8330A CCV Criteria (Filename)	**10280064.D**		
Instrument:	**CHHPLC_X**		
Date of Calibration Verification:	**10/29/2019**		
	Yes	**No**	**N/A**
Was the CCV analyzed daily before sample analysis?	X		
Was the CCV analyzed every 10 field samples and at the end of the analysis sequence?	X		
Was the CCV for all analytes within ± 15% of the true value?	X		

Method 8330A CCV Criteria (Filename)	**10300023.D**		
Instrument:	**CHHPLC_G2_LUNA**		
Date of Calibration Verification:	**10/30/2019**		
	Yes	**No**	**N/A**
Was the CCV analyzed daily before sample analysis?	X		
Was the CCV analyzed every 10 field samples and at the end of the analysis sequence?	X		
Was the CCV for all analytes within ± 15% of the true value?		X	

The %D for 3-nitrotoluene (44.8%) was outside of evaluation criteria with a high bias. Associated results were nondetect and no qualification of data was required.

Method 8330A CCV Criteria (Filename)	**10300034.D**		
Instrument:	**CHHPLC_G2_LUNA**		
Date of Calibration Verification:	**10/31/2019**		
	Yes	**No**	**N/A**
Was the CCV analyzed daily before sample analysis?	X		
Was the CCV analyzed every 10 field samples and at the end of the analysis sequence?	X		
Was the CCV for all analytes within ± 15% of the true value?		X	

The %Ds for 2-nitrotoluene (-16.2%, low bias) and 3-nitrotoluene (45.5%, high bias) were outside of evaluation criteria. Qualification of data is shown in the table below.

Field ID	Parameter	Analyte	Qualification
EW7-PM24B-1-35	Explosives	2-nitrotoluene	**UJ**
EW7-PM29B-1-35	Explosives	2-nitrotoluene	**UJ**
EW7-PM29A-1-25	Explosives	2-nitrotoluene	**UJ**
EW7-PM28A-1-25	Explosives	2-nitrotoluene	**UJ**
EW7-PM28B-1-35	Explosives	2-nitrotoluene	**UJ**
G0081-1	Explosives	2-nitrotoluene	**UJ**
G0075-1	Explosives	2-nitrotoluene	**UJ**
G0079-1	Explosives	2-nitrotoluene	**UJ**
G0080-1	Explosives	2-nitrotoluene	**UJ**

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Method 8330A CCV Criteria (Filename)	**10300044.D**		
Instrument:	**CHHPLC_G2_LUNA**		
Date of Calibration Verification:	**10/31/2019**		
	Yes	**No**	**N/A**
Was the CCV analyzed daily before sample analysis?	X		
Was the CCV analyzed every 10 field samples and at the end of the analysis sequence?	X		
Was the CCV for all analytes within ± 15% of the true value?		X	

The %Ds for 4-nitrotoluene (-24.0%, low bias) and 3-nitrotoluene (36.3%, high bias) were outside of evaluation criteria. Qualification of data is shown in the table below.

Field ID	Parameter	Analyte	Qualification
G0081-1	Explosives	4-nitrotoluene	**UJ**
G0075-1	Explosives	4-nitrotoluene	**UJ**
G0079-1	Explosives	4-nitrotoluene	**UJ**
G0080-1	Explosives	4-nitrotoluene	**UJ**

Method 8330A CCV Criteria (Filename)	**10310020_2.D**		
Instrument:	**CHHPLC_X**		
Date of Calibration Verification:	**10/31/2019**		
	Yes	**No**	**N/A**
Was the CCV analyzed daily before sample analysis?	X		
Was the CCV analyzed every 10 field samples and at the end of the analysis sequence?	X		
Was the CCV for all analytes within ± 15% of the true value?	X		

Method 8330A CCV Criteria (Filename)	**10310027_9.D**		
Instrument:	**CHHPLC_X**		
Date of Calibration Verification:	**10/31/2019**		
	Yes	**No**	**N/A**
Was the CCV analyzed daily before sample analysis?	X		
Was the CCV analyzed every 10 field samples and at the end of the analysis sequence?	X		
Was the CCV for all analytes within ± 15% of the true value?	X		

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Method RSK-175 CCVRT Criteria (Filename)	004F0401.D		
Instrument:	VGC_J		
Date of Calibration Verification:	10/31/2019		
	Yes	No	N/A
Was the CCV analyzed daily before sample analysis?	X		
Was the CCV analyzed every 10 field samples and at the end of the analysis sequence?	X		
Was the CCV for all analytes within ± 25% of the true value?	X		

Method RSK-175 CCV Criteria (Filename)	021F1401.D		
Instrument:	VGC_J		
Date of Calibration Verification:	10/31/2019		
	Yes	No	N/A
Was the CCV analyzed daily before sample analysis?	X		
Was the CCV analyzed every 10 field samples and at the end of the analysis sequence?	X		
Was the CCV for all analytes within ± 25% of the true value?	X		

Method RSK-175 CCVRT Criteria (Filename)	032F2501.D		
Instrument:	VGC_J		
Date of Calibration Verification:	10/31/2019		
	Yes	No	N/A
Was the CCV analyzed daily before sample analysis?	X		
Was the CCV analyzed every 10 field samples and at the end of the analysis sequence?	X		
Was the CCV for all analytes within ± 25% of the true value?	X		

Method 9056A, Instrument: WC_IonChrom10, All CCVs on 11/14/2019	Yes	No
Was a CCV analyzed after every 10 field samples and at the end of the analysis sequence?	X	
Were the CCVs for all analytes within ± 10% of the true value?	X	

Method 350.1, Instrument: WC_Alp 3, All CCVs on 11/6/2019	Yes	No
Was a CCV analyzed after every 10 field samples and at the end of the analysis sequence?	X	
Were the CCVs for all analytes within ± 10% of the true value?	X	

Method 353.2, Instrument: WC_Alp 2, All CCVs on 11/4/2019	Yes	No
Was a CCV analyzed after every 10 field samples and at the end of the analysis sequence?	X	
Were the CCVs for all analytes within ± 10% of the true value?	X	

Method 353.2, Instrument: WC_Alp 2, All CCVs on 11/5/2019	Yes	No
Was a CCV analyzed after every 10 field samples and at the end of the analysis sequence?	X	
Were the CCVs for all analytes within ± 10% of the true value?	X	

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Applicable QAPP: Cornhusker Army Ammunition Plant QAPP (Brice and AECOM, October 2018)
Applicable Analytical Methods: 8330A, 353.2, 350.1, 351.2, RSK-175, 9060A, 2320B, 9056A, 9034

Method 351.2, Instrument: WC_Astoria, All CCVs on 11/5/2019	Yes	No
Was a CCV analyzed after every 10 field samples and at the end of the analysis sequence?	X	
Were the CCVs for all analytes within ± 10% of the true value?	X	

Method 9060A, Instrument: WC_SHI3, All CCVs on 11/4/2019	Yes	No
Was a CCV analyzed after every 10 field samples and at the end of the analysis sequence?	X	
Were the CCVs for all analytes within ± 10% of the true value?	X	

6.0 Blank Samples

Blank Criteria	Yes	No	N/A
Were method blanks analyzed with every preparatory batch?	X		
Were target analytes detected > ½ the LOQ and > 1/10 the amount measured in any sample or 1/10 the regulatory limit (whichever is greater)?		X	
Were target analytes detected in method, trip or calibration blanks?		X	

7.0 Sensitivity

Sensitivity Criteria	Yes	No	N/A
Was the laboratory sensitivity consistent with project (QAPP) requirements?	X		
Did all analytes meet sensitivity requirements?	X		

8.0 Additional Qualifications

Additional Qualification Criteria	Yes	No	N/A
Were common laboratory contaminants detected?		X	
Was professional judgment used to qualify data (if yes, list below)?	X		

The RPD between the primary and confirmation column for some explosives samples was above evaluation criteria. Qualification of data is shown in the table below.

Sample ID	Analysis	Analyte	RPD	Qual
EW7-PM24B-1-35	Explosives	2,4,6-trinitrotoluene	49.6	**J**
EW7-PM29B-1-35	Explosives	HMX	55.8	**J**
EW7-PM29A-1-25	Explosives	4-amino-2,6-dinitrotoluene	45.9	**J**
G0081-1	Explosives	4-amino-2,6-dinitrotoluene	102.7	**J**
G0081-1	Explosives	2-amino-4,6-dinitrotoluene	56.1	**J**
G0075-1	Explosives	4-amino-2,6-dinitrotoluene	112.2	**J**
G0080-1	Explosives	2-amino-4,6-dinitrotoluene	42.7	**J**

CHAAP Data Verification

Laboratory and SDG#: TADenver 280-129936 **AECOM Chemist: Jared DeSadier**
Date Verified: 11/21/2019 **AECOM ITR: Jeff Aust**
Guidance: DoD QSM Version 5.1 (January 2017)
Applicable QAPP: Cornhusker Army Ammunition Plant QAPP (Brice and AECOM, October 2018)
Applicable Analytical Methods: 8330A, 353.2, 350.1, 351.2, RSK-175, 9060A, 2320B, 9056A, 9034

9.0 Completeness

Completeness Criteria	Yes	No	N/A
Were any data rejected during the verification process?		X	
Were any samples lost, broken, or in any other manner in not verified?		X	
Were requested sample analyses performed, the correct analyte lists used, and correct sample preparation and analyses methods and units utilized?	X		