Laboratory and SDG#: TADenver 280-155048 AECOM Chemist: Jared DeSadier

Date Verified: 12/7/2021 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
NW062-7	11/2/2021	11/3/2021	Water	Explosives (8330A), Nitrate, Nitrite (353.2), Ammonia (350.1), TKN (351.2), Methane (RSK-175), DOC (9060A), Sulfate (9056A), Alkalinity (2320B), Sulfide (9034)
CA211-7	11/2/2021	11/3/2021	Water	Explosives (8330A), Nitrate, Nitrite (353.2), Ammonia (350.1), TKN (351.2), Methane (RSK-175), DOC (9060A), Sulfate (9056A), Alkalinity (2320B), Sulfide (9034)
CA212-7	11/2/2021	11/3/2021	Water	Explosives (8330A), Nitrate, Nitrite (353.2), Ammonia (350.1), TKN (351.2), Methane (RSK-175), DOC (9060A), Sulfate (9056A), Alkalinity (2320B), Sulfide (9034)
NW061-7	11/2/2021	11/3/2021	Water	Explosives (8330A), Nitrate, Nitrite (353.2), Ammonia (350.1), TKN (351.2), Methane (RSK-175), DOC (9060A), Sulfate (9056A), Alkalinity (2320B), Sulfide (9034)
G0076-7	11/1/2021	11/3/2021	Water	Explosives (8330A), Nitrate, Nitrite (353.2), Ammonia (350.1), TKN (351.2), Methane (RSK-175), DOC (9060A), Sulfate (9056A), Alkalinity (2320B), Sulfide (9034)
NW060-7	11/2/2021	11/3/2021	Water	Explosives (8330A), Nitrate, Nitrite (353.2), Ammonia (350.1), TKN (351.2), Methane (RSK-175), DOC (9060A), Sulfate (9056A), Alkalinity (2320B), Sulfide (9034)
CA210-7	11/2/2021	11/3/2021	Water	Explosives (8330A), Nitrate, Nitrite (353.2), Ammonia (350.1), TKN (351.2), Methane (RSK-175), DOC (9060A), Sulfate (9056A), Alkalinity (2320B), Sulfide (9034)
G0070-7	11/1/2021	11/3/2021	Water	Explosives (8330A), Nitrate, Nitrite (353.2), Ammonia (350.1), TKN (351.2), Methane (RSK-175), DOC (9060A), Sulfate (9056A), Alkalinity (2320B), Sulfide (9034)

#### 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 case narrative indicated that some MS/MSD recoveries were outside evaluation criteria, and some analytes were detected in method blanks. These issues are discussed further in the ADR report. Some samples were further preserved upon receipt. No qualification was required.

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

#### 2.0 Sample Documentation

Verification Criteria		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?		
Did samples listed on COCs match the sample labels?	X	
Were samples relinquished properly on the COC?	X	

#### 3.0 Initial Calibration

Method 8330A Initial Calibration Criteria				
Instrument:		CHHPLC X3		
Date of Calibration:		3/2/2021		
	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 $r^2 \ge 0.99$ ?			X	
Option 3: If non-linear regression was used was the coefficient of determination $r^2 \ge 0.99$ ?			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:		5/1/2021			
	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 $\leq 20\%$ ?	X				
Option 2: If linear least squares regression was used was the $r^2 \ge 0.99$ ?			X		
Option 3: If non-linear regression was used was the coefficient of determination $r^2 \ge 0.99$ ?			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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Guidance: DoD QSM Version 5.1 (January 2017)

Method 8330A Initial Calibration Criteria					
Instrument:		CHHPLC_X5			
Date of Calibration:		5/1/2021			
	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 $\leq 20\%$ ?	X				
Option 2: If linear least squares regression was used was the $r^2 \ge 0.99$ ?			X		
Option 3: If non-linear regression was used was the coefficient of determination $r^2 \ge 0.99$ ?			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_X5		
Date of Calibration:		5/2/2021		
	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 $\leq 20\%$ ?	X			
Option 2: If linear least squares regression was used was the $r^2 \ge 0.99$ ?			X	
Option 3: If non-linear regression was used was the coefficient of determination $r^2 \ge 0.99$ ?			X	
If non-linear regression was used were 6 points used for second order and 7 points for third order?			X	

Method RSK-175 Initial Calibration Criteria					
Instrument:		VGC_J			
Date of Calibration:	9	9/24/20	21		
	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 $r^2 \ge 0.99$ ?	X				
Option 3: If non-linear regression was used was the coefficient of determination $r^2 \ge 0.99$ ?			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_IonChrom7		
Date of Calibration:	11/	11/11/2021	
	Yes	No	N/A
Was a minimum of three standards and a calibration blank used for ICAL?	X		
Was $r^2 \ge 0.99$ ?	X		

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Method 9056A Initial Calibration Criteria			
Instrument:	WC_I	onChr	om10
Date of Calibration:	11/	14/202	1
	Yes	No	N/A
Was a minimum of three standards and a calibration blank used for ICAL?	X		
Was $r^2 \ge 0.99$ ?	X		

Method 9056A Initial Calibration Criteria			
Instrument: WC_IonChron			om11
Date of Calibration:	11/	14/202	1
	Yes	No	N/A
Was a minimum of three standards and a calibration blank used for ICAL?	X		
Was $r^2 \ge 0.99$ ?	X		

Method 350.1 Initial Calibration Criteria			
Instrument:	W	/C_Alp	) 4
Date of Calibration:	: 11/21/202		21
	Yes	No	N/A
Was a minimum of three standards and a calibration blank used for ICAL?	X		
Was $r^2 \ge 0.99$ ?	X		

Method 350.1 Initial Calibration Criteria			
Instrument:	W	/C_Alp	4
Date of Calibration:	11/21/2021		21
	Yes	No	N/A
Was a minimum of three standards and a calibration blank used for ICAL?	X		
Was $r^2 \ge 0.99$ ?	X		

Method 350.1 Initial Calibration Criteria			
Instrument:	W	/C_Alp	<b>4</b>
Date of Calibration:	11/22/2021		21
	Yes	No	N/A
Was a minimum of three standards and a calibration blank used for ICAL?	X		
Was $r^2 \ge 0.99$ ?	X		

Method 353.2 Initial Calibration Criteria			
Instrument:	W	/C_Alp	2
Date of Calibration:	11/17/2021		21
	Yes	No	N/A
Was a minimum of three standards and a calibration blank used for ICAL?	X		
Was $r^2 \ge 0.99$ ?	X		

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Date Verified: 12/7/2021 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:	W	C_GA	L1
Date of Calibration:	11/15/2021		21
	Yes	No	N/A
Was a minimum of three standards and a calibration blank used for ICAL?	X		
Was $r^2 \ge 0.99$ ?	X		

Method 9060A Initial Calibration Criteria			
Instrument:	W	C_SH	<b>I</b> 4
Date of Calibration:	11/4/2021		21
	Yes	No	N/A
Was a minimum of three standards and a calibration blank used for ICAL?	X		
Was $r^2 \ge 0.99$ ?	X		

#### 4.0 Initial Calibration Verification [(ICV) Second Source]

Method 8330A ICV Criteria (Filename)	03020037.D		
Instrument:	CHHPLC_X3		
Date of Initial Calibration Verification:	3/3/2021		
	Yes	No	N/A
Was the ICV analyzed after each calibration?	X		
Was the ICV for all analytes within $\pm$ 15% of the true value?	X		

Method 8330A ICV Criteria (Filename)	020-1401.D		
Instrument:	CHHPLC_X3		
Date of Initial Calibration Verification:	5/1/2021		
	Yes	No	N/A
Was the ICV analyzed after each calibration?	X		
Was the ICV for all analytes within $\pm$ 15% of the true value?	X		

Method 8330A ICV Criteria (Filename)	01	019-1401.D		
Instrument:	СН	CHHPLC_X5		
Date of Initial Calibration Verification:		5/2/2021		
	Yes	N/A		
Was the ICV analyzed after each calibration?	X			
Was the ICV for all analytes within $\pm$ 15% of the true value?	X			

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Method 8330A ICV Criteria (Filename)	028-2301.D		
Instrument:	CHHPLC_X5		
Date of Initial Calibration Verification:	5/2/2021		
	Yes No N/		
Was the ICV analyzed after each calibration?	X		
Was the ICV for all analytes within $\pm$ 15% of the true value?	X		

Method RSK-175 ICV Criteria (Filename)	014F1201.D		
Instrument:	VGC_J		
Date of Initial Calibration Verification:	9/24/2021		
	Yes	No	N/A
Was the ICV analyzed after each calibration?	X		
Was the ICV for all analytes within $\pm$ 25% of the true value?	X		

Method 9056A ICV	WC_IonChrom7		
Date of Initial Calibration Verification:	11/11/2021		
	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 $\pm$ 10% of the true value?	X		

Method 9056A ICV	WC_IonChrom10		
Date of Initial Calibration Verification:	11/14/2021		
	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 $\pm$ 10% of the true value?	X		

Method 9056A ICV	WC_IonChrom11			
Date of Initial Calibration Verification:	11	11/14/2021		
	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 $\pm$ 10% of the true value?	X			

Method 350.1 ICV Criteria	WC_Alp 4		
Date of Initial Calibration Verification:	11/21/2021		21
	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 $\pm$ 10% of the true value?	X		

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Method 350.1 ICV Criteria	WC_Alp 4		4
Date of Initial Calibration Verification:	11/21/2021		21
	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 $\pm$ 10% of the true value?	X		

Method 350.1 ICV Criteria	WC_Alp 4		
Date of Initial Calibration Verification:	11/22/2021		
	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 $\pm$ 10% of the true value?	X		

Method 353.2 ICV Criteria	WC_Alp 2		
Date of Initial Calibration Verification:	11	11/17/2021	
	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 $\pm$ 10% of the true value?	X		

Method 351.2 ICV Criteria	WC_GAL1		
Date of Initial Calibration Verification:	11/15/2021		
	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 $\pm$ 10% of the true value?	X		

Method 9060A ICV Criteria	WC_SHI4		[4
Date of Initial Calibration Verification:	11	11/4/2021	
	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 $\pm$ 10% of the true value?	X		

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#### 5.0 Continuing Calibration Verification (CCV)

Method 8330A CCV Criteria (Filename)	11050021-2.D			
Instrument:	СН	CHHPLC_X3		
Date of Calibration Verification:	1	11/5/2021		
	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 $\pm$ 15% of the true value?	X			

Method 8330A CCV Criteria (Filename)	11050033-4.D		
Instrument:	CHHPLC_X3		
Date of Calibration Verification:	11/5/2021		
	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 $\pm$ 15% of the true value?	X		

Method 8330A CCV Criteria (Filename)	11050041-2.D			
Instrument:	СН	CHHPLC_X3		
Date of Calibration Verification:	1	11/6/2021		
	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 $\pm$ 15% of the true value?	X		·	

Method 8330A CCV Criteria (Filename)	110	11050048-9.D		
Instrument:	CH	CHHPLC X3		
Date of Calibration Verification:	1	11/6/2021		
	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 $\pm$ 15% of the true value?	X			

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Method 8330A CCV Criteria (Filename)	11050035-6.D			
Instrument:	СН	CHHPLC_X5		
Date of Calibration Verification:	1	11/6/2021		
	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 $\pm$ 15% of the true value?	X			

Method 8330A CCV Criteria (Filename)	110	11050055-6.D				
Instrument:	СН	CHHPLC_X5				
Date of Calibration Verification:	1	11/6/2021			11/6/2021	
	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 $\pm$ 15% of the true value?	X					

Method RSK-175 CCVRT Criteria (Filename)	0	001F0101.D			
Instrument:		VGC_J			
Date of Calibration Verification:		11/9/2021		11/9/2021	
	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 $\pm$ 25% of the true value?	X				

Method RSK-175 CCV Criteria (Filename)	0	014F1401.D		
Instrument:		VGC_J		
Date of Calibration Verification:		11/9/2021		
	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 $\pm$ 25% of the true value?	X			

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Method RSK-175 CCV Criteria (Filename)	0:	028F2801.D			
Instrument:		VGC_J			
Date of Calibration Verification:		11/9/2021		11/9/2021	
	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 $\pm$ 25% of the true value?	X				

Method RSK-175 CCVRT Criteria (Filename)	016F1601.D		1.D		
Instrument:		VGC_J			
Date of Calibration Verification:	1	11/10/2021		11/10/2021	
	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 $\pm$ 25% of the true value?	X				

Method RSK-175 CCVRT Criteria (Filename)	0.	030F3001.D			
Instrument:		VGC_J			
Date of Calibration Verification:	1	11/10/2021		11/10/2021	
	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 $\pm$ 25% of the true value?	X				

Method 9056A, Instrument: WC_IonChrom7, All CCVs on 11/19/2021	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 $\pm$ 10% of the true value?	X	

Method 9056A, Instrument: WC_IonChrom10, All CCVs on 11/19/2021	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 $\pm$ 10% of the true value?	X	

Method 9056A, Instrument: WC_IonChrom11, All CCVs on 11/24/2021	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 $\pm$ 10% of the true value?	X	

Method 350.1, Instrument: WC_Alp 4, All CCVs on 11/21/2021	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 $\pm$ 10% of the true value?	X	

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Method 350.1, Instrument: WC_Alp 4, All CCVs on 11/21/2021	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 $\pm$ 10% of the true value?	X	

Method 350.1, Instrument: WC_Alp 4, All CCVs on 11/22/2021	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 $\pm$ 10% of the true value?	X	

Method 353.2, Instrument: WC_Alp 2, All CCVs on 11/17/2021	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 $\pm$ 10% of the true value?	X	

Method 351.2, Instrument: WC_GAL1, All CCVs on 11/15/2021	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 $\pm$ 10% of the true value?	X	

Method 9060A, Instrument: WC_SHI4, All CCVs on 11/4/2021	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 $\pm$ 10% of the true value?	X	

#### 6.0 Sensitivity

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

#### 7.0 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	

#### 8.0 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		