

## CHAAP Data Verification

Laboratory and SDG#: Eurofins 280-162494

AECOM Chemist: D. Casagrande

Date Verified: 7/20/2022

AECOM ITR: S. Louie

Guidance: DoD QSM Version 5.1 (January 2017)

Applicable QAPP: Cornhusker Army Ammunition Plant QAPP (Brice and AECOM, October 2019)

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

Sample Identification #	Date Collected	Date Received	Matrix	Analysis
PZ001-22A	5/16/2022	5/18/2022	Water	Explosives (8330A), Nitrate, Nitrite (353.2), Ammonia (350.1), TKN (351.2), Methane (RSK-175), DOC (9060A), Sulfate (9056A), Alkalinity (2320B), Sulfide (9034)
PZ005-22A	5/17/2022	5/18/2022	Water	Explosives (8330A), Nitrate, Nitrite (353.2), Ammonia (350.1), TKN (351.2), Methane (RSK-175), DOC (9060A), Sulfate (9056A), Alkalinity (2320B), Sulfide (9034)
PZ009-22A	5/17/2022	5/18/2022	Water	Explosives (8330A), Nitrate, Nitrite (353.2), Ammonia (350.1), TKN (351.2), Methane (RSK-175), DOC (9060A), Sulfate (9056A), Alkalinity (2320B), Sulfide (9034)
G0044-22A	5/17/2022	5/18/2022	Water	Explosives (8330A), Nitrate, Nitrite (353.2), Ammonia (350.1), TKN (351.2), Methane (RSK-175), DOC (9060A), Sulfate (9056A), Alkalinity (2320B), Sulfide (9034)
G0048-22A	5/16/2022	5/18/2022	Water	Explosives (8330A), Nitrate, Nitrite (353.2), Ammonia (350.1), TKN (351.2), Methane (RSK-175), DOC (9060A), Sulfate (9056A), Alkalinity (2320B), Sulfide (9034)
G0023-22A	5/16/2022	5/18/2022	Water	Explosives (8330A), Nitrate, Nitrite (353.2), Ammonia (350.1), TKN (351.2), Methane (RSK-175), DOC (9060A), Sulfate (9056A), Alkalinity (2320B), Sulfide (9034)
G0049-22A	5/16/2022	5/18/2022	Water	Explosives (8330A), Nitrate, Nitrite (353.2), Ammonia (350.1), TKN (351.2), Methane (RSK-175), DOC (9060A), Sulfate (9056A), Alkalinity (2320B), Sulfide (9034)
G0105-22A	5/17/2022	5/18/2022	Water	Explosives (8330A), Nitrate, Nitrite (353.2), Ammonia (350.1), TKN (351.2), Methane (RSK-175), DOC (9060A), Sulfate (9056A), Alkalinity (2320B), Sulfide (9034)
G0106-22A	5/17/2022	5/18/2022	Water	Explosives (8330A), Nitrate, Nitrite (353.2), Ammonia (350.1), TKN (351.2), Methane (RSK-175), DOC (9060A), Sulfate (9056A), Alkalinity (2320B), Sulfide (9034)
G0107-22A	5/17/2022	5/18/2022	Water	Explosives (8330A), Nitrate, Nitrite (353.2), Ammonia (350.1), TKN (351.2), Methane (RSK-175), DOC (9060A), Sulfate (9056A), Alkalinity (2320B), Sulfide (9034)

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## 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	

*Validator comments in italics.*

Method 351.2:

Nitrogen, Total Kjeldahl failed the recovery criteria high for the MS of sample PZ001-22AMS (280-162494-1) in batch 280-576828. Nitrogen, Total Kjeldahl failed the recovery criteria high for the MSD of sample PZ001-22AMSD (280-162494-1) in batch 280-576828. *No data are qualified or affected, since TKN was not detected in associated sample. This issue is further discussed in the ADR report.*

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

## 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	

## 3.0 Initial Calibration

Method 8330A Initial Calibration Criteria			
<b>Instrument:</b>	<b>CHHPLC_X3</b>		
<b>Date of Calibration:</b>	<b>1/4/2022</b>		
	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 $r^2 \geq 0.99$ ?			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

The %RSD was met for all target analytes.

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Method 8330A Initial Calibration Criteria			
Instrument:	CHHPLC_X3		
Date of Calibration:	1/5/2022		
	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 $r^2 \geq 0.99$ ?			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_X5		
Date of Calibration:	3/2/2022		
	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 $r^2 \geq 0.99$ ?	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_X5		
Date of Calibration:	3/3/2022		
	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 $r^2 \geq 0.99$ ?			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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Method RSK-175 Initial Calibration Criteria			
Instrument:	VGC J		
Date of Calibration:	9/24/2021		
	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 $\leq 25\%$ ?			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

A %RSD was not provided for methane; however, r2 was met.

Method 9056A Initial Calibration Criteria			
Instrument:	WC_IonChrom11		
Date of Calibration:	5/26/2022		
	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 9056A Initial Calibration Criteria			
Instrument:	WC_IonChrom13		
Date of Calibration:	5/16/2022		
	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_SKALAR_01		
Date of Calibration:	6/1/2022		
	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_Alps 2		
Date of Calibration:	6/3/2022		
	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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Method 351.2 Initial Calibration Criteria			
Instrument:	WC_GAL1		
Date of Calibration:	6/1/2022		
	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_SHI5		
Date of Calibration:	12/10/2021		
	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)			
Instrument:	280-562503/20		
Date of Initial Calibration Verification:	CHHPLC_X3		
	1/4/2022		
	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)			
Instrument:	280-562503/38		
Date of Initial Calibration Verification:	CHHPLC_X3		
	1/5/2022		
	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)			
Instrument:	280-567560/19		
Date of Initial Calibration Verification:	CHHPLC_X5		
	3/3/2022		
	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)			
Instrument:	280-567560/28		
Date of Initial Calibration Verification:	CHHPLC_X5		
	3/3/2022		
	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		

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<b>Method RSK-175 ICV Criteria (Filename)</b>	<b>280-550959/13</b>		
<b>Instrument:</b>	<b>VGC J</b>		
<b>Date of Initial Calibration Verification:</b>	<b>9/24/2021</b>		
	<b>Yes</b>	<b>No</b>	<b>N/A</b>
Was the ICV analyzed after each calibration?	X		
Was the ICV for all analytes within $\pm 25\%$ of the true value?	X		

<b>Method 9056A ICV</b>	<b>WC IonChrom11</b>		
<b>Date of Initial Calibration Verification:</b>	<b>5/26/2022</b>		
	<b>Yes</b>	<b>No</b>	<b>N/A</b>
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		

<b>Method 9056A ICV</b>	<b>WC IonChrom13</b>		
<b>Date of Initial Calibration Verification:</b>	<b>5/16/2022</b>		
	<b>Yes</b>	<b>No</b>	<b>N/A</b>
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		

<b>Method 350.1 ICV Criteria</b>	<b>WC SKALAR 01</b>		
<b>Date of Initial Calibration Verification:</b>	<b>6/1/2022</b>		
	<b>Yes</b>	<b>No</b>	<b>N/A</b>
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		

<b>Method 353.2 ICV Criteria</b>	<b>WC Alp 2</b>		
<b>Date of Initial Calibration Verification:</b>	<b>6/3/2022</b>		
	<b>Yes</b>	<b>No</b>	<b>N/A</b>
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		

<b>Method 351.2 ICV Criteria</b>	<b>WC GAL1</b>		
<b>Date of Initial Calibration Verification:</b>	<b>6/1/2022</b>		
	<b>Yes</b>	<b>No</b>	<b>N/A</b>
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 9060A ICV Criteria	WC_SHI5		
Date of Initial Calibration Verification:	5/31/2022		
	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		

### 5.0 Continuing Calibration Verification (CCV)

Method 8330A CCV Criteria (Filename)	280-576176/13-14		
Instrument:	CHHPLC_X5		
Date of Calibration Verification:	5/26/2022		
	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)	280-576176/25-26		
Instrument:	CHHPLC_X5		
Date of Calibration Verification:	5/26/2022		
	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)	280-576028/7,9		
Instrument:	CHHPLC_X3		
Date of Calibration Verification:	5/24/2022		
	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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<b>Method 8330A CCV Criteria (Filename)</b>	<b>280-576028/21-22</b>		
<b>Instrument:</b>	<b>CHHPLC X3</b>		
<b>Date of Calibration Verification:</b>	<b>5/24/2022</b>		
	<b>Yes</b>	<b>No</b>	<b>N/A</b>
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		

<b>Method 8330A CCV Criteria (Filename)</b>	<b>280-576028/33-34</b>		
<b>Instrument:</b>	<b>CHHPLC X3</b>		
<b>Date of Calibration Verification:</b>	<b>5/25/2022</b>		
	<b>Yes</b>	<b>No</b>	<b>N/A</b>
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		

<b>Method RSK-175 CCVRT Criteria (Filename)</b>	<b>280-576349/2</b>		
<b>Instrument:</b>	<b>VGC J</b>		
<b>Date of Calibration Verification:</b>	<b>5/26/2022</b>		
	<b>Yes</b>	<b>No</b>	<b>N/A</b>
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		

<b>Method RSK-175 CCV Criteria (Filename)</b>	<b>280-576349/89</b>		
<b>Instrument:</b>	<b>VGC J</b>		
<b>Date of Calibration Verification:</b>	<b>5/27/2022</b>		
	<b>Yes</b>	<b>No</b>	<b>N/A</b>
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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<b>Method RSK-175 CCV Criteria (Filename)</b>	<b>280-576349/106</b>		
<b>Instrument:</b>	<b>VGC J</b>		
<b>Date of Calibration Verification:</b>	<b>5/27/2022</b>		
	<b>Yes</b>	<b>No</b>	<b>N/A</b>
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		

<b>Method RSK-175 CCV Criteria (Filename)</b>	<b>280-576349/123</b>		
<b>Instrument:</b>	<b>VGC J</b>		
<b>Date of Calibration Verification:</b>	<b>5/27/2022</b>		
	<b>Yes</b>	<b>No</b>	<b>N/A</b>
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		

The CCV was met for all target analytes.

<b>Method RSK-175 CCVRT Criteria (Filename)</b>	<b>280-576446/2</b>		
<b>Instrument:</b>	<b>VGC_J</b>		
<b>Date of Calibration Verification:</b>	<b>5/27/2022</b>		
	<b>Yes</b>	<b>No</b>	<b>N/A</b>
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		

<b>Method RSK-175 CCV Criteria (Filename)</b>	<b>280-576446/19</b>		
<b>Instrument:</b>	<b>VGC J</b>		
<b>Date of Calibration Verification:</b>	<b>5/27/2022</b>		
	<b>Yes</b>	<b>No</b>	<b>N/A</b>
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		

<b>Method 9056A, Instrument: WC IonChrom11, All CCVs on 6/1/2022-6/2/2022</b>	<b>Yes</b>	<b>No</b>
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 9056A, Instrument: WC IonChrom13, All CCVs on 6/2/2022	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 SKALAR_01, All CCVs on 6/1/2022	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 6/3/2022	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 6/1/2022	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 SHI5, All CCVs on 5/31/2022- 6/1/2022	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 2320B, Instrument: WC AT4, All CCVs on 5/25/2022	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	

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Guidance: DoD QSM Version 5.1 (January 2017)

Applicable QAPP: Cornhusker Army Ammunition Plant QAPP (Brice and AECOM, October 2019)

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

## 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		