CHAAP Data Verification

Laboratory and SDG#: TADenver 280-149013 **AECOM Chemist: Jared DeSadier**
Date Verified: 6/17/2021 **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: 8260B, 8330A, 353.2, 350.1, 351.2, RSK-175, 9060A, 2320B, 9056A, 9034

Sample Identification #	Date Collected	Date Received	Matrix	Analysis
PZ016-21A	5/22/2021	5/25/2021	Water	Explosives (8330A), Nitrate, Nitrite (353.2), Ammonia (350.1), TKN (351.2), Methane (RSK-175), DOC (9060A), Sulfate (9056A), Alkalinity (2320B), Sulfide (9034)
G0067-21A	5/22/2021	5/25/2021	Water	Explosives (8330A), Nitrate, Nitrite (353.2), Ammonia (350.1), TKN (351.2), Methane (RSK-175), DOC (9060A), Sulfate (9056A), Alkalinity (2320B), Sulfide (9034)
PZ009-21A	5/22/2021	5/25/2021	Water	Explosives (8330A), Nitrate, Nitrite (353.2), Ammonia (350.1), TKN (351.2), Methane (RSK-175), DOC (9060A), Sulfate (9056A), Alkalinity (2320B), Sulfide (9034)
PZ010-21A	5/22/2021	5/25/2021	Water	Explosives (8330A), Nitrate, Nitrite (353.2), Ammonia (350.1), TKN (351.2), Methane (RSK-175), DOC (9060A), Sulfate (9056A), Alkalinity (2320B), Sulfide (9034)
G0118-21A	5/22/2021	5/25/2021	Water	Explosives (8330A), Nitrate, Nitrite (353.2), Ammonia (350.1), TKN (351.2), Methane (RSK-175), DOC (9060A), Sulfate (9056A), Alkalinity (2320B), Sulfide (9034)
G0110-21A	5/22/2021	5/25/2021	Water	Explosives (8330A), Nitrate, Nitrite (353.2), Ammonia (350.1), TKN (351.2), Methane (RSK-175), DOC (9060A), Sulfate (9056A), Alkalinity (2320B), Sulfide (9034)
PZ011-21A	5/22/2021	5/25/2021	Water	Explosives (8330A), Nitrate, Nitrite (353.2), Ammonia (350.1), TKN (351.2), Methane (RSK-175), DOC (9060A), Sulfate (9056A), Alkalinity (2320B), Sulfide (9034)
PZ013-21A	5/22/2021	5/25/2021	Water	Explosives (8330A), Nitrate, Nitrite (353.2), Ammonia (350.1), TKN (351.2), Methane (RSK-175), DOC (9060A), Sulfate (9056A), Alkalinity (2320B), Sulfide (9034)
G0108-21A	5/22/2021	5/25/2021	Water	Explosives (8330A), Nitrate, Nitrite (353.2), Ammonia (350.1), TKN (351.2), Methane (RSK-175), DOC (9060A), Sulfate (9056A), Alkalinity (2320B), Sulfide (9034)
G0117-21A	5/22/2021	5/25/2021	Water	Explosives (8330A), Nitrate, Nitrite (353.2), Ammonia (350.1), TKN (351.2), Methane (RSK-175), DOC (9060A), Sulfate (9056A), Alkalinity (2320B), Sulfide (9034)
G0114-21A	5/22/2021	5/25/2021	Water	Explosives (8330A), Nitrate, Nitrite (353.2), Ammonia (350.1), TKN (351.2), Methane (RSK-175), DOC (9060A), Sulfate (9056A), Alkalinity (2320B), Sulfide (9034)
G0116-21A	5/22/2021	5/25/2021	Water	Explosives (8330A), Nitrate, Nitrite (353.2), Ammonia (350.1), TKN (351.2), Methane (RSK-175), DOC (9060A), Sulfate (9056A), Alkalinity (2320B), Sulfide (9034)
G0100-21A	5/23/2021	5/25/2021	Water	Explosives (8330A), Nitrate, Nitrite (353.2), Ammonia (350.1), TKN (351.2), Methane (RSK-175), DOC (9060A), Sulfate (9056A), Alkalinity (2320B), Sulfide (9034)
G0113-21A	5/23/2021	5/25/2021	Water	Explosives (8330A), Nitrate, Nitrite (353.2), Ammonia (350.1), TKN (351.2), Methane (RSK-175), DOC (9060A), Sulfate (9056A), Alkalinity (2320B), Sulfide (9034)

CHAAP Data Verification

Laboratory and SDG#: TADenver 280-149013 **AECOM Chemist: Jared DeSadier**
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Guidance: DoD QSM Version 5.1 (January 2017)
Applicable QAPP: Cornhusker Army Ammunition Plant QAPP (Brice and AECOM, October 2018)
Applicable Analytical Methods: 8260B, 8330A, 353.2, 350.1, 351.2, RSK-175, 9060A, 2320B, 9056A, 9034

Sample Identification #	Date Collected	Date Received	Matrix	Analysis
G0097-21A	5/23/2021	5/25/2021	Water	Explosives (8330A), Nitrate, Nitrite (353.2), Ammonia (350.1), TKN (351.2), Methane (RSK-175), DOC (9060A), Sulfate (9056A), Alkalinity (2320B), Sulfide (9034)
G0066R-21A	5/23/2021	5/25/2021	Water	Explosives (8330A), Nitrate, Nitrite (353.2), Ammonia (350.1), TKN (351.2), Methane (RSK-175), DOC (9060A), Sulfate (9056A), Alkalinity (2320B), Sulfide (9034)
G0122-21A	5/23/2021	5/25/2021	Water	Explosives (8330A), Nitrate, Nitrite (353.2), Ammonia (350.1), TKN (351.2), Methane (RSK-175), DOC (9060A), Sulfate (9056A), Alkalinity (2320B), Sulfide (9034)
G0098-21A	5/23/2021	5/25/2021	Water	Explosives (8330A), Nitrate, Nitrite (353.2), Ammonia (350.1), TKN (351.2), Methane (RSK-175), DOC (9060A), Sulfate (9056A), Alkalinity (2320B), Sulfide (9034)
PZ014-21A	5/23/2021	5/25/2021	Water	Explosives (8330A), Nitrate, Nitrite (353.2), Ammonia (350.1), TKN (351.2), Methane (RSK-175), DOC (9060A), Sulfate (9056A), Alkalinity (2320B), Sulfide (9034)
G0109-21A	5/23/2021	5/25/2021	Water	Explosives (8330A), Nitrate, Nitrite (353.2), Ammonia (350.1), TKN (351.2), Methane (RSK-175), DOC (9060A), Sulfate (9056A), Alkalinity (2320B), Sulfide (9034)
G0119-21A	5/23/2021	5/25/2021	Water	Explosives (8330A), Nitrate, Nitrite (353.2), Ammonia (350.1), TKN (351.2), Methane (RSK-175), DOC (9060A), Sulfate (9056A), Alkalinity (2320B), Sulfide (9034)
G0095-21A	5/23/2021	5/25/2021	Water	Explosives (8330A), Nitrate, Nitrite (353.2), Ammonia (350.1), TKN (351.2), Methane (RSK-175), DOC (9060A), Sulfate (9056A), Alkalinity (2320B), Sulfide (9034)
PZ012-21A	5/23/2021	5/25/2021	Water	Explosives (8330A), Nitrate, Nitrite (353.2), Ammonia (350.1), TKN (351.2), Methane (RSK-175), DOC (9060A), Sulfate (9056A), Alkalinity (2320B), Sulfide (9034)
G0099-21A	5/23/2021	5/25/2021	Water	Explosives (8330A), Nitrate, Nitrite (353.2), Ammonia (350.1), TKN (351.2), Methane (RSK-175), DOC (9060A), Sulfate (9056A), Alkalinity (2320B), Sulfide (9034)
G0101-21A	5/24/2021	5/25/2021	Water	Explosives (8330A), Nitrate, Nitrite (353.2), Ammonia (350.1), TKN (351.2), Methane (RSK-175), DOC (9060A), Sulfate (9056A), Alkalinity (2320B), Sulfide (9034)
G0121-21A	5/24/2021	5/25/2021	Water	Explosives (8330A), Nitrate, Nitrite (353.2), Ammonia (350.1), TKN (351.2), Methane (RSK-175), DOC (9060A), Sulfate (9056A), Alkalinity (2320B), Sulfide (9034)
G0092-21A	5/24/2021	5/25/2021	Water	Explosives (8330A), Nitrate, Nitrite (353.2), Ammonia (350.1), TKN (351.2), Methane (RSK-175), DOC (9060A), Sulfate (9056A), Alkalinity (2320B), Sulfide (9034)
G0091-21A	5/24/2021	5/25/2021	Water	Explosives (8330A), Nitrate, Nitrite (353.2), Ammonia (350.1), TKN (351.2), Methane (RSK-175), DOC (9060A), Sulfate (9056A), Alkalinity (2320B), Sulfide (9034)

CHAAP Data Verification

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Date Verified: 6/17/2021 **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: 8260B, 8330A, 353.2, 350.1, 351.2, RSK-175, 9060A, 2320B, 9056A, 9034

Sample Identification #	Date Collected	Date Received	Matrix	Analysis
G0111-21A	5/24/2021	5/25/2021	Water	Explosives (8330A), Nitrate, Nitrite (353.2), Ammonia (350.1), TKN (351.2), Methane (RSK-175), DOC (9060A), Sulfate (9056A), Alkalinity (2320B), Sulfide (9034)
G0311-21A	5/24/2021	5/25/2021	Water	Explosives (8330A), Nitrate, Nitrite (353.2), Ammonia (350.1), TKN (351.2), Methane (RSK-175), DOC (9060A), Sulfate (9056A), Alkalinity (2320B), Sulfide (9034)
Source 2021	5/24/2021	5/25/2021	Water	VOCs (8260B), Explosives (8330A)
TB052421	5/24/2021	5/25/2021	Water	VOCs (8260B)
PZ004-21A	5/24/2021	5/25/2021	Water	Explosives (8330A), Nitrate, Nitrite (353.2), Ammonia (350.1), TKN (351.2), Methane (RSK-175), DOC (9060A), Sulfate (9056A), Alkalinity (2320B), Sulfide (9034)
G0112-21A	5/24/2021	5/25/2021	Water	Explosives (8330A), Nitrate, Nitrite (353.2), Ammonia (350.1), TKN (351.2), Methane (RSK-175), DOC (9060A), Sulfate (9056A), Alkalinity (2320B), Sulfide (9034)
PZ001-21A	5/24/2021	5/25/2021	Water	Explosives (8330A), Nitrate, Nitrite (353.2), Ammonia (350.1), TKN (351.2), Methane (RSK-175), DOC (9060A), Sulfate (9056A), Alkalinity (2320B), Sulfide (9034)
G0044-21A	5/24/2021	5/25/2021	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 surrogate, LCS/LCSD, and MS/MSD recoveries were outside evaluation criteria, and some analytes were detected in method blanks. These issues are discussed further in the ADR report. No qualification of data for blank contamination was required for nondetect analytes or those with a native concentration greater than five times the blank concentration.

Some CCV %Ds were outside of evaluation criteria. This is discussed further in Section 6.0.

The case narrative also indicated that the RPD between the primary and confirmation column for some explosives samples was above evaluation criteria and some sample VOAs had headspace greater than 6mm. These issues are discussed further in Section 7.0.

The cooler receipt form indicated some discrepancies between the COC and a sample label ID.

CHAAP Data Verification

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Guidance: DoD QSM Version 5.1 (January 2017)
Applicable QAPP: Cornhusker Army Ammunition Plant QAPP (Brice and AECOM, October 2018)
Applicable Analytical Methods: 8260B, 8330A, 353.2, 350.1, 351.2, RSK-175, 9060A, 2320B, 9056A, 9034

This issue is discussed further in Section 2.0.

Some samples were further preserved by the lab upon receipt. No qualification was required.

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	

The cooler receipt form indicated a discrepancy between the COC and a sample label ID. Per the AECOM chemist, the sample was logged via the COC and no qualification was required.

3.0 Instrument Performance Check (Tuning)

Method 8260B Instrument Tuning Criteria (Filename)	**R62541.D**		
Instrument:	**VMS_R1**		
Date of Tuning:	**5/21/2021**		
	Yes	**No**	**N/A**
Was instrument tuning completed prior to calibration?	X		
Were all samples analyzed under an acceptable 12 hour clock tune?	X		
Were ion relative abundances for each target mass within the required intensity limits listed in Table 4 of SW-846 Method 8260B?	X		

Method 8260B Instrument Tuning Criteria (Filename)	**R63175.D**		
Instrument:	**VMS_P**		
Date of Tuning:	**6/4/2021**		
	Yes	**No**	**N/A**
Was instrument tuning completed prior to calibration?	X		
Were all samples analyzed under an acceptable 12 hour clock tune?	X		
Were ion relative abundances for each target mass within the required intensity limits listed in Table 4 of SW-846 Method 8260B?	X		

CHAAP Data Verification

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Date Verified: 6/17/2021 **AECOM ITR: Jeff Aust**
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Applicable QAPP: Cornhusker Army Ammunition Plant QAPP (Brice and AECOM, October 2018)
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4.0 Initial Calibration

Method 8260B Initial Calibration Criteria			
Instrument:	**VMS_R1**		
Date of Calibration:	**5/21/2021**		
	Yes	**No**	**N/A**
Option 1: RSD for each analyte ≤ 15%?	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:	**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 $r^2 \geq 0.99$?			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:	**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 ≤ 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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Date Verified: 6/17/2021 **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: 8260B, 8330A, 353.2, 350.1, 351.2, RSK-175, 9060A, 2320B, 9056A, 9034

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 ≤ 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:	**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 ≤ 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 RSK-175 Initial Calibration Criteria			
Instrument:	**VGC_J**		
Date of Calibration:	**6/24/2020**		
	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:	**6/14/2021**		
	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		

CHAAP Data Verification

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Date Verified: 6/17/2021 **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: 8260B, 8330A, 353.2, 350.1, 351.2, RSK-175, 9060A, 2320B, 9056A, 9034

Method 9056A Initial Calibration Criteria			
Instrument:	**WC_IonChrom7**		
Date of Calibration:	**6/5/2021**		
	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		

Method 350.1 Initial Calibration Criteria			
Instrument:	**WC_Alp 4**		
Date of Calibration:	**6/9/2021**		
	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		

Method 350.1 Initial Calibration Criteria			
Instrument:	**WC_Alp 4**		
Date of Calibration:	**6/10/2021**		
	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		

Method 350.1 Initial Calibration Criteria			
Instrument:	**WC_Alp 4**		
Date of Calibration:	**6/11/2021**		
	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		

Method 353.2 Initial Calibration Criteria			
Instrument:	**WC_Alp 2**		
Date of Calibration:	**6/2/2021**		
	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		

Method 351.2 Initial Calibration Criteria			
Instrument:	**WC_Astoria**		
Date of Calibration:	**6/2/2021**		
	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		

CHAAP Data Verification

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Date Verified: 6/17/2021 **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: 8260B, 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:	**6/3/2021**		
	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		

Method 9060A Initial Calibration Criteria			
Instrument:	**WC_SHI4**		
Date of Calibration:	**6/7/2021**		
	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		

Method 9060A Initial Calibration Criteria			
Instrument:	**WC_SHI4**		
Date of Calibration:	**6/8/2021**		
	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		

5.0 Initial Calibration Verification [(ICV) Second Source]

Method 8260B ICV Criteria (Filename)	**R62558.D**		
Instrument:	**VMS_R1**		
Date of Initial Calibration Verification:	**5/21/2021**		
	Yes	**No**	**N/A**
Was the ICV analyzed after each calibration?	X		
Were all reported analytes within ± 20% of true value?	X		

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 ± 15% of the true value?	X		

CHAAP Data Verification

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Date Verified: 6/17/2021 **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: 8260B, 8330A, 353.2, 350.1, 351.2, RSK-175, 9060A, 2320B, 9056A, 9034

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 ± 15% of the true value?	X		

Method 8330A ICV Criteria (Filename)	**019-1401.D**		
Instrument:	**CHHPLC_X5**		
Date of Initial Calibration Verification:	**5/2/2021**		
	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)	**028-2301.D**		
Instrument:	**CHHPLC_X3**		
Date of Initial Calibration Verification:	**5/2/2021**		
	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 RSK-175 ICV Criteria (Filename)	**06242011.D**		
Instrument:	**VGC_J**		
Date of Initial Calibration Verification:	**6/24/2020**		
	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:	**6/14/2021**		
	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 ± 10% of the true value?	X		

Method 9056A ICV	**WC_IonChrom7**		
Date of Initial Calibration Verification:	**6/5/2021**		
	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 ± 10% of the true value?	X		

CHAAP Data Verification

Laboratory and SDG#: TADenver 280-149013 **AECOM Chemist: Jared DeSadier**
Date Verified: 6/17/2021 **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: 8260B, 8330A, 353.2, 350.1, 351.2, RSK-175, 9060A, 2320B, 9056A, 9034

Method 350.1 ICV Criteria	**WC_Alp 4**		
Date of Initial Calibration Verification:	**6/9/2021**		
	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 ± 10% of the true value?	X		

Method 350.1 ICV Criteria	**WC_Alp 4**		
Date of Initial Calibration Verification:	**6/10/2021**		
	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 ± 10% of the true value?	X		

Method 350.1 ICV Criteria	**WC_Alp 4**		
Date of Initial Calibration Verification:	**6/11/2021**		
	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 ± 10% of the true value?	X		

Method 353.2 ICV Criteria	**WC_Alp 2**		
Date of Initial Calibration Verification:	**6/2/2021**		
	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 ± 10% of the true value?	X		

Method 351.2 ICV Criteria	**WC_Astoria**		
Date of Initial Calibration Verification:	**6/2/2021**		
	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 ± 10% of the true value?	X		

Method 351.2 ICV Criteria	**WC_Astoria**		
Date of Initial Calibration Verification:	**6/3/2021**		
	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 ± 10% of the true value?	X		

CHAAP Data Verification

Laboratory and SDG#: TADenver 280-149013 **AECOM Chemist: Jared DeSadier**
Date Verified: 6/17/2021 **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: 8260B, 8330A, 353.2, 350.1, 351.2, RSK-175, 9060A, 2320B, 9056A, 9034

Method 9060A ICV Criteria	WC_SHI4		
Date of Initial Calibration Verification:	6/7/2021		
	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 ± 10% of the true value?	X		

Method 9060A ICV Criteria	WC_SHI4		
Date of Initial Calibration Verification:	6/8/2021		
	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 ± 10% of the true value?	X		

6.0 Continuing Calibration Verification (CCV)

Method 8260B Beginning CCV Criteria (Filename)	R63176.D		
Method 8260B Ending CCV Criteria (Filename)	R63202.D		
Instrument:	VMS_R1		
Date of Calibration Verification:	6/4/2021		
	Yes	No	N/A
Was the CCV analyzed daily before sample analysis?	X		
Was the CCV analyzed every 12 hours of analysis time?	X		
Were all reported analytes and surrogates within ± 20% of true value?		X	
Were all reported analytes and surrogates within ± 50% of true value for the end of analytical batch CCV?	X		

The opening %D for bromomethane (-29.3%) was outside of evaluation criteria.

Sample ID	Analysis	Analyte	Qual
Source 2021	VOCs	Bromomethane	**UJ**

Method 8330A CCV Criteria (Filename)	007-1501b / 05280009.D		
Instrument:	CHHPLC_X3		
Date of Calibration Verification:	5/28/2021		
	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 ± 15% of the true value?	X		

CHAAP Data Verification

Laboratory and SDG#: TADenver 280-149013 **AECOM Chemist: Jared DeSadier**
Date Verified: 6/17/2021 **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: 8260B, 8330A, 353.2, 350.1, 351.2, RSK-175, 9060A, 2320B, 9056A, 9034

Method 8330A CCV Criteria (Filename)	**05280021-2.D**		
Instrument:	**CHHPLC_X3**		
Date of Calibration Verification:	**5/28/2021**		
	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 ± 15% of the true value?	X		

Method 8330A CCV Criteria (Filename)	**05280033-4.D**		
Instrument:	**CHHPLC_X3**		
Date of Calibration Verification:	**5/29/2021**		
	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 ± 15% of the true value?	X		

Method 8330A CCV Criteria (Filename)	**05290007-9.D**		
Instrument:	**CHHPLC_X3**		
Date of Calibration Verification:	**5/29/2021**		
	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 ± 15% of the true value?	X		

Method 8330A CCV Criteria (Filename)	**05290012-3.D**		
Instrument:	**CHHPLC_X3**		
Date of Calibration Verification:	**5/29/2021**		
	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 ± 15% of the true value?	X		

CHAAP Data Verification

Laboratory and SDG#: TADenver 280-149013 **AECOM Chemist: Jared DeSadier**
Date Verified: 6/17/2021 **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: 8260B, 8330A, 353.2, 350.1, 351.2, RSK-175, 9060A, 2320B, 9056A, 9034

Method 8330A CCV Criteria (Filename)	**06020014-5.D**		
Instrument:	**CHHPLC_X3**		
Date of Calibration Verification:	**6/2/2021**		
	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 ± 15% of the true value?	X		

Method 8330A CCV Criteria (Filename)	**06020026-7.D**		
Instrument:	**CHHPLC_X3**		
Date of Calibration Verification:	**6/2-3/2021**		
	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 ± 15% of the true value?	X		

Method 8330A CCV Criteria (Filename)	**06020035-6.D**		
Instrument:	**CHHPLC_X3**		
Date of Calibration Verification:	**6/3/2021**		
	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 ± 15% of the true value?	X		

Method 8330A CCV Criteria (Filename)	**06020047-8.D**		
Instrument:	**CHHPLC_X3**		
Date of Calibration Verification:	**6/3/2021**		
	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 ± 15% of the true value?	X		

CHAAP Data Verification

Laboratory and SDG#: TADenver 280-149013 **AECOM Chemist: Jared DeSadier**
Date Verified: 6/17/2021 **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: 8260B, 8330A, 353.2, 350.1, 351.2, RSK-175, 9060A, 2320B, 9056A, 9034

Method 8330A CCV Criteria (Filename)	**06030007-9.D**		
Instrument:	**CHHPLC_X3**		
Date of Calibration Verification:	**6/3/2021**		
	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 ± 15% of the true value?	X		

Method 8330A CCV Criteria (Filename)	**06030012-3.D**		
Instrument:	**CHHPLC_X3**		
Date of Calibration Verification:	**6/3/2021**		
	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 ± 15% of the true value?	X		

Method 8330A CCV Criteria (Filename)	**0530007-8.D**		
Instrument:	**CHHPLC_X5**		
Date of Calibration Verification:	**5/31/2021**		
	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 ± 15% of the true value?	X		

Method 8330A CCV Criteria (Filename)	**05300020-1.D**		
Instrument:	**CHHPLC_X5**		
Date of Calibration Verification:	**5/31/2021**		
	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 ± 15% of the true value?	X		

CHAAP Data Verification

Laboratory and SDG#: TADenver 280-149013 **AECOM Chemist: Jared DeSadier**
Date Verified: 6/17/2021 **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: 8260B, 8330A, 353.2, 350.1, 351.2, RSK-175, 9060A, 2320B, 9056A, 9034

Method 8330A CCV Criteria (Filename)	**06030013-4.D**		
Instrument:	**CHHPLC_X5**		
Date of Calibration Verification:	**6/3/2021**		
	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 ± 15% of the true value?	X		

Method 8330A CCV Criteria (Filename)	**06030025-6.D**		
Instrument:	**CHHPLC_X5**		
Date of Calibration Verification:	**6/3/2021**		
	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 ± 15% of the true value?	X		

Method 8330A CCV Criteria (Filename)	**06030037-8.D**		
Instrument:	**CHHPLC_X5**		
Date of Calibration Verification:	**6/4/2021**		
	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 ± 15% of the true value?	X		

Method 8330A CCV Criteria (Filename)	**06030043-4.D**		
Instrument:	**CHHPLC_X5**		
Date of Calibration Verification:	**6/4/2021**		
	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 ± 15% of the true value?	X		

CHAAP Data Verification

Laboratory and SDG#: TADenver 280-149013 **AECOM Chemist: Jared DeSadier**
Date Verified: 6/17/2021 **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: 8260B, 8330A, 353.2, 350.1, 351.2, RSK-175, 9060A, 2320B, 9056A, 9034

Method RSK-175 CCV Criteria (Filename)	**033F3301.D**		
Instrument:	**VGC_J**		
Date of Calibration Verification:	**5/26/2021**		
	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 ± 25% of the true value?	X		

Method RSK-175 CCV Criteria (Filename)	**050F5001.D**		
Instrument:	**VGC_J**		
Date of Calibration Verification:	**5/26/2021**		
	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 ± 25% of the true value?	X		

Method RSK-175 CCV Criteria (Filename)	**062F6201.D**		
Instrument:	**VGC_J**		
Date of Calibration Verification:	**5/26/2021**		
	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 ± 25% of the true value?	X		

Method RSK-175 CCVRT Criteria (Filename)	**004F0401.D**		
Instrument:	**VGC_J**		
Date of Calibration Verification:	**5/27/2021**		
	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 ± 25% of the true value?	X		

CHAAP Data Verification

Laboratory and SDG#: TADenver 280-149013 **AECOM Chemist: Jared DeSadier**
Date Verified: 6/17/2021 **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: 8260B, 8330A, 353.2, 350.1, 351.2, RSK-175, 9060A, 2320B, 9056A, 9034

Method RSK-175 CCVRT Criteria (Filename)	**021F2101.D**		
Instrument:	**VGC_J**		
Date of Calibration Verification:	**5/27/2021**		
	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 ± 25% of the true value?	X		

Method RSK-175 CCVRT Criteria (Filename)	**033F3301.D**		
Instrument:	**VGC_J**		
Date of Calibration Verification:	**5/27/2021**		
	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 ± 25% of the true value?	X		

Method 9056A, Instrument: WC_IonChrom10, All CCVs on 6/14/2021	**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 ± 10% of the true value?	X	

Method 9056A, Instrument: WC_IonChrom7, All CCVs on 6/15/2021	**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 ± 10% of the true value?	X	

Method 350.1, Instrument: WC_Alp 4, All CCVs on 6/9/2021	**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 ± 10% of the true value?	X	

Method 350.1, Instrument: WC_Alp 4, All CCVs on 6/10/2021	**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 ± 10% of the true value?	X	

Method 350.1, Instrument: WC_Alp 4, All CCVs on 6/11/2021	**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 ± 10% of the true value?	X	

Method 353.2, Instrument: WC_Alp 2, All CCVs on 6/2/2021	**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 ± 10% of the true value?	X	

CHAAP Data Verification

Laboratory and SDG#: TADenver 280-149013 **AECOM Chemist: Jared DeSadier**
Date Verified: 6/17/2021 **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: 8260B, 8330A, 353.2, 350.1, 351.2, RSK-175, 9060A, 2320B, 9056A, 9034

Method 351.2, Instrument: WC_Astoria, All CCVs on 6/2/2021	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 ± 10% of the true value?	X	

Method 351.2, Instrument: WC_Astoria, All CCVs on 6/3/2021	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 ± 10% of the true value?	X	

Method 9060A, Instrument: WC_SHI4, All CCVs on 6/7/2021	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 ± 10% of the true value?	X	

Method 9060A, Instrument: WC_SHI4, All CCVs on 6/8/2021	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 ± 10% of the true value?	X	

7.0 Internal Standard (IS) Recoveries

Method 8260B Criteria	Yes	No	N/A
Were internal standards spiked for all samples and standards?	X		
Were internal standard areas within -50% to + 100% of the ICAL midpoint standard area?	X		
Were retention time ± 30 seconds from the retention time of the midpoint standard of the ICAL?	X		

8.0 Sensitivity

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

9.0 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; results were reported from primary column unless otherwise noted.

CHAAP Data Verification

Laboratory and SDG#: TADenver 280-149013 **AECOM Chemist: Jared DeSadier**
Date Verified: 6/17/2021 **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: 8260B, 8330A, 353.2, 350.1, 351.2, RSK-175, 9060A, 2320B, 9056A, 9034

Sample ID	Analysis	Analyte	RPD	Qual
PZ016-21A	Explosives	2-amino-4,6-dinitrotoluene	78.0	**J**
G0095-21A	Explosives	4-amino-2,6-dinitrotoluene	52.9	**J**
G0091-21A	Explosives	4-amino-2,6-dinitrotoluene	61.6	**J**
G0091-21A	Explosives	2-amino-4,6-dinitrotoluene	75.7	**J**
G0118-21A	Explosives	Nitrobenzene	136.1	**J**
PZ011-21A	Explosives	4-amino-2,6-dinitrotoluene	87.4	**J**
G0112-21A	Explosives	4-amino-2,6-dinitrotoluene	133.1	**J**
G0112-21A	Explosives	2-amino-4,6-dinitrotoluene	120.1	**J**
PZ009-21A	Explosives	2-amino-4,6-dinitrotoluene	43.0	**J**
PZ010-21A	Explosives	4-amino-2,6-dinitrotoluene	78.1	**J**
G0097-21A	Explosives	MNX	149.7	**J**
G0097-21A	Explosives	RDX	108.6	**J**
G0066R-21A	Explosives	HMX	70.9	**J**
G0066R-21A	Explosives	RDX	43.4	**J**
G0066R-21A	Explosives	1,3,5-trinitrobenzene	47.2	**J**
G0066R-21A	Explosives	4-amino-2,6-dinitrotoluene	50.8	**J**
G0066R-21A	Explosives	2-amino-4,6-dinitrotoluene	43.6	**J**
G0066R-21A	Explosives	2,4-dinitrotoluene	46.0	**J**
G0099-21A	Explosives	MNX	40.5	**J**
G0111-21A	Explosives	RDX	185.3	**J**
G0111-21A	Explosives	1,3-dinitrobenzene	125.8	**J**
G0311-21A	Explosives	RDX	185.1	**J**
G0311-21A	Explosives	1,3-dinitrotoluene	129.0	**J**
G0100-21A	Explosives	2,6-dinitrotoluene	173.1	**J**
PZ001-21A	Explosives	HMX	45.2	**J**

Some sample VOAs had headspace greater than 6mm. Qualification of data is shown in the table below.

Sample ID	Analysis	Analyte	Qual
G0119-21A	RSK-175	Methane	**J**
G0101-21A	RSK-175	Methane	**J**

10.0 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		