

CCP-TP-019

Revision 5

CCP

Waste Assay

Gamma Spectrometer (WAGS)

Operating Procedure

EFFECTIVE DATE: 09/16/2009

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PRINTED NAME

APPROVED FOR USE

RECORD OF REVISION

Revision Number	Date Approved	Description of Revision
0	02/27/2005	Initial issue.
1	04/16/2005	Addressed CBFO adequacy review comments.
2	06/10/2005	Addressed Carlsbad Field Office (CBFO) Document Review Record (DRR) comments.
3	06/15/2006	Revised to implement changes made in CCP-TP-068, <i>CCP Container Management at INL</i> .
4	10/19/2006	Changes made to assure that responses to "Action," "Investigate," "Above," and "Below" flags for background measurements and system performance checks are consistent for procedures using NDA2000 as the operating software.
5	09/16/2009	Deleted language referencing use of operator postings.

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1.0 PURPOSE

This procedure provides instructions for startup, operations, and shutdown of the Waste Assay Gamma Ray Spectrometer (WAGS) using Canberra Nondestructive Assay 2000 (NDA2000) Operations.

1.1 Scope

This procedure applies to personnel responsible for operating and/or supervising the operations of the WAGS System. This procedure applies to operation of the WAGS System and the conveyor system.

2.0 REQUIREMENTS

2.1 References

Baseline Documents

- Canberra Industries, Inc., Publication No. 9231594F, *NDA 2000 Users Manual* (corresponding to current software version)
- Canberra Industries, Inc., Publication No. 9231595C, *NDA 2000 Technical Reference Manual* (corresponding to current software version)
- Document No. 99092, Rev. C, *Automatic Q2 System with 6 Drum Conveyor, Hardware Reference Manual*
- CCP-PO-002, *CCP Transuranic Waste Certification Plan*
- CCP-PO-024, *CCP/INL Interface Document*
- CCP-QP-022, *CCP Software Quality Assurance Plan*

Referenced Documents

- CCP-HSP-013, *CCP Waste Assay Gamma Spectrometer (WAGS) and SWEPP Gamma-Ray Spectrometer (SGRS) Nondestructive Assay Systems Health and Safety Plan*
- CCP-QP-002, *CCP Training and Qualification Plan*
- CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control*
- CCP-QP-008, *CCP Records Management*

- CCP-TP-010, *CCP Waste Assay Gamma Spectrometer (WAGS) and SWEPP Gamma-Ray Spectrometer (SGRS) Calibration Procedure*
- CCP-TP-109, *CCP Data Reviewing, Validating, and Reporting Procedure*
- CCP-INL-WAGS-001, *CCP WAGS Calibration, Confirmation, and Verification Report*
- MP-RS&C-6.16, Radioactive (Non-Nuclear) Source Control

2.2 Training Requirements

- 2.2.1 Personnel must have read CCP-HSP-013, *CCP Waste Assay Gamma Spectrometer (WAGS) and SWEPP Gamma-Ray Spectrometer (SGRS) Nondestructive Assay Systems Health and Safety Plan*.
- 2.2.2 Personnel handling sources must be qualified source handlers in accordance with MP-RS&C-6.16, *Radioactive (Non-Nuclear) Source Control*.
- 2.2.3 Personnel performing this procedure will be trained and qualified in accordance with CCP-QP-002, *CCP Training and Qualification Plan* prior to performing this procedure.

2.3 Precautions and Limitations

- 2.3.1 The daily and weekly performance check drums contain radioactive sealed sources. The sealed sources contain Plutonium (Pu)-239. The sources must remain inside the daily performance check drum, and source physical positioning inside the drum must be preserved to ensure repeatability.
- 2.3.2 The tamper seal on the daily performance check drum must be verified intact before using the drum for quality control (QC) purposes.
- 2.3.3 Any container found to have a Fissile Gram Equivalent (FGE) greater than Host site safety basis limits will be controlled as identified by Host site procedures.
- 2.3.4 Drums containing lead liners should **NOT** be processed through WAGS.

- 2.3.5 Containers may be stored in designated storage grids on the east and south sides of the WAGS while the spectrometer is operating. Containers may **NOT** be stored on the west or north side of the spectrometer since the penetrations into the shield would be a leakage path to the detectors.
- 2.3.6 Personnel working around the WAGS conveyor system, door closure, and moving equipment must observe warning devices and postings.
- 2.3.7 Personnel working in the area of elevated cable trays must maintain awareness of surroundings and tripping hazards.
- 2.3.8 Temporary radiation shielding may be used in the WAGS area. Personnel must maintain awareness of surroundings and tripping hazards.
- 2.3.9 Radioactive calibration sources/standards are to be treated and controlled as sealed radioactive sources in accordance with MP-RS&C-6.16. Integrity tests **MUST** be performed on sources/standards per the requirements of MP-RS&C-6.16.
- 2.3.10 Workers who will be working in a radiation area must have read and signed that they understand the applicable authorized documents (e.g., Approved Method of Work [AMOW], etc.) as implemented by the Host site.

2.4 Prerequisite Actions

2.4.1 Planning and Coordination

- [A] Ensure detectors contained liquid nitrogen (LN) for at least four hours before the high voltage (HV) is applied.
- [B] Ensure detector Dewars were filled with LN within the last five calendar days.

2.5 Equipment List

2.5.1 Broad Energy Germanium (BEGe) Detectors

2.5.2 Conveyor mechanism

2.5.3 Sample rotator

2.5.4 Transmission sources

2.5.5 Shutter assembly

2.5.6 An electronics rack housing:

- [A] Reference (quad) pulsers
- [B] Digital Spectrum Analyzer (e.g., DSA1000) units
- [C] An Operators terminal including:
 - [C.1] Personal computer with appropriate software and peripherals
- [D] Uninterruptible power supplies (UPSs)

2.5.7 Software

- [A] NDA 2000, Waste Assay
- [B] Genie 2000, Gamma Acquisition and Analysis

3.0 RESPONSIBILITIES

NOTE

The Nondestructive Assay (NDA) Operator and the NDA Lead Operator (LO) may be the same individual. The NDA LO may perform NDA Operator tasks and functions at any time.

3.1 NDA Lead Operator

3.1.1 Ensures equipment operation prerequisites are met prior to startup.

3.1.2 Ensures Operator qualification and training is current.

3.2 NDA Operator

3.2.1 Performs routine startup, normal operations, and shutdown of the WAGS.

3.2.2 Notifies the NDA LO of abnormal or nonconforming conditions.

3.3 NDA Expert Analyst

3.3.1 Evaluates conditions detrimental to quality.

3.3.2 Provides technical supervision and data evaluation for radioassays.

3.3.3 Prepares and issues weekly performance check six month reports.

3.4 Forklift Operator

3.4.1 Supports WAGS operations, as required.

3.5 Facility Records Custodian

3.5.1 Receives, processes, and transmits all records generated by this procedure in accordance with CCP-QP-008, *CCP Records Management*.

4.0 PROCEDURE

NOTE

The NDA Operator and the NDA LO may be the same individual. The NDA LO may perform NDA Operator tasks and functions at any time.

NOTE

The NDA Operator need **NOT** be continuously present at the WAGS station during operation and may move to other stations, as required.

4.1 General

NOTE

The FO may load/unload drums from the conveyor as needed during procedure performance.

NDA Operator

4.1.1 Ensure all prerequisites have been met.

4.2 Complete WAGS Startup

NOTE

The motion warning horn will sound for five seconds prior to any command mechanism movement. The yellow light will be on during conveyor or shield door movement. If the system detects an error in the Programmable Logic Controller (PLC) operation, the yellow light will flash ON and OFF repeatedly.

NDA Operator

4.2.1 Ensure breaker # 7 in breaker panel N-PP-1006 is ON.

4.2.2 Ensure power is ON to both uninterrupted power supply (UPS) units.

4.2.3 Ensure the reference pulser power toggle switch is ON.

4.2.4 Ensure all six Digital Spectrum Analyzer power rocker switches are ON.

4.2.5 Ensure both surge protector power strips are ON.

4.2.6 Ensure switch N-DSW-1040 is positioned to ON.

4.2.7 Rotate main power rotary switch WAGS-DSW-1001 to ON.

- 4.2.8 Ensure the mechanism mode key switch WAGS-SW-1001 is in the MANUAL position.
- 4.2.9 Rotate the override/reset initialize mechanism key switch WAGS-KSW-1001 clockwise to initialize the system, **AND** release the key switch, as required.
- 4.2.10 Turn the mechanism mode key switch WAGS-SW-1001 to the COMPUTER position.
- 4.2.11 Turn ON the WAGS System Computer.
- 4.2.12 Start NDA2000 Operations.
 - [A] Select Hardware Setup.
 - [B] Select HIGH Voltage Supplies.
 - [C] Select TURN ON.

CAUTION

The DSA units and detectors must warm up and stabilize for at least one hour after the power is applied and HV is turned on prior to drum examination and data acquisition.

- 4.2.13 Ensure that the 1-hour stabilization requirement has been met.

4.3 Shift Startup

NOTE

The motion warning horn will sound for five seconds prior to any command mechanism movement. The yellow light will be on during conveyor or shield door movement. If the system detects an error in the PLC operation, the yellow light will flash ON and OFF repeatedly.

NDA Operator

- 4.3.1 Ensure the main power rotary switch WAGS-DSW-1001 is ON.
- 4.3.2 Ensure the mechanism mode key switch WAGS-SW-1001 is in the MANUAL position.

- 4.3.3 Rotate the override/reset initialize mechanism key switch WAGS-KSW-1001 clockwise to initialize the system, **AND** release the key switch, as required.
- 4.3.4 Turn the mechanism mode key switch WAGS-SW-1001 to the COMPUTER position.
- 4.3.5 Turn the computer ON, **AND** start NDA2000 Operations, as required.
- 4.4 Background/Transmission Check of the WAGS

NOTE

A background/transmission check is performed at least once a day at the beginning of the operational day prior to assaying.

NOTE

The background/transmission check of WAGS is performed with the shield enclosure empty of any drums.

NOTE

Criteria used to develop the background acceptance boundaries are documented in CCP-INL-WAGS-001, *CCP WAGS Calibration, Confirmation, and Verification Report*.

NDA Operator

- 4.4.1 Perform the following operations using NDA2000 Operations:
- [A] Select MANUAL.
 - [B] Select LOAD/UNLOAD/TRANSPORT.
 - [C] Select PREPARE FOR BACKGROUND.
 - [D] Select MANUAL.
 - [E] Select ROTATOR.
 - [F] Select STOP ROTATOR.
 - [G] Select ASSAY.
 - [H] Select ROUTINE ASSAY.

- [I] Select the QC–Background /Transmission Check.
- [J] Select START ASSAY at the start assay screen.
- [K] **IF** necessary,
THEN enter comments in the comment field of the ITEM INFORMATION screen, **AND** the Item ID will default as Background.
- [L] Select DONE.

NOTE

The red light is illuminated when the transmission source shutter is OPEN. If the system detects an error in the PLC operation, the yellow light will flash ON and OFF repeatedly.

4.4.2 Monitor control tower lights on the PLC.

- [A] **IF** the red light fails to come ON, **OR** other error conditions occur during the count,
THEN select abort, **AND** notify the NDA LO.

4.4.3 **WHEN** the analysis is complete,
THEN select VIEW LAST ASSAY REPORT Button on the NDA2000 Operations screen, **AND** observe the QA Last Results Report for any deviation/flags (i.e., Investigate [In], Action [Ac], Above [Ab], or Below [Be]).

4.4.4 **IF** any of the values on the QA Last Results Report indicate a preset "Ab" (Above) or "Be" (Below) boundary flag,
THEN perform the following:

- [A] STOP WORK, **AND** notify the NDA LO and Vendor Project Manager (VPM).
- [B] Note the problem in the NDA Operational Logbook.

NDA LO

- [C] Evaluate the nature of the failure, consulting with the Expert Analyst (EA) as necessary, **AND** determine if a Non-conformance report (NCR) is required.

- [D] **IF** an NCR is required,
THEN initiate an NCR in accordance with CCP-QP-005,
CCP TRU Nonconforming Item Reporting and Control, **AND**
DO **NOT** resume operations until a corrective action plan is
complete.
- [E] **IF** an NCR is **NOT** required,
THEN instruct the NDA Operator to mitigate the problem,
note the resolution in the NDA Operational Logbook, **AND**
repeat the QC Background/Transmission Check.

NDA Operator

4.4.5 Print, sign, and date the Quality Assurance (QA) Last Results
Report(s) for inclusion in the Batch Data Report (BDR).

4.5 Daily Performance Check of the WAGS

NOTE

The background/transmission check is normally performed prior to the required
performance check.

NOTE

A daily performance check is performed at least once per day at the beginning of
the operational day, prior to assaying.

NOTE

Criteria used to develop the acceptance boundaries are documented in
CCP-INL-WAGS-001.

- 4.5.1 Request that the Forklift Operator (FO) load the WAGS
performance check drum onto the load side of the conveyor.
- 4.5.2 Advance the performance check drum to the load photoeye
WAGS-PHE-1002, as required.
- 4.5.3 Ensure the mechanism mode key switch WAGS-SW-1001 is in the
COMPUTER position.
- 4.5.4 Perform the QC – Daily Performance Check using NDA2000
Operations:

[A] Select ASSAY.

[B] Select ROUTINE ASSAY.

- [C] Select DAILY PERFORMANCE CHECK.
- [D] Select START ASSAY at the start assay screen.
- [E] Enter the barcode (DPC9999) for the performance check drum in the Item ID section of the Item Information screen.
- [F] Enter Daily Performance Check for Description 2 on the Item Information screen.
- [G] Enter the Percent Full as 65 percent and Gross Weight as 118 Kg in the appropriate sections of the Item Information screen.
- [H] Ensure that "DPC 9999" is selected as the certificate/declaration.
- [I] Select DONE.

NOTE

The yellow light is illuminated when there is any motion during the load or unload process. The red light is illuminated when the transmission source shutter is OPEN. If the system detects an error in the PLC operation, the yellow light will cycle ON and OFF repeatedly.

4.5.5 Monitor control tower lights on the PLC.

- [A] **IF** any of the lights fail to come on **OR** other problems occur during the count,
THEN click on STOP, **AND** notify the NDA LO.

4.5.6 **WHEN** the analysis is complete,
THEN select VIEW LAST ASSAY REPORT Button on the NDA2000 Operations screen, **AND** observe the QA Last Results Report for any deviation/flags (i.e., Investigate [In], Action [Ac], Above [Ab], or Below [Be]).

NDA Operator

4.5.7 **IF** any of the values on the QA Last Results Report indicate a 2 sigma "In" or "Investigate" flag,
THEN perform the following:

- [A] **IF** possible, identify the cause of the failure,
THEN correct the problem.

- [B] Notify the NDA LO, **AND** note the problem and resolution in the NDA Operational Logbook.
- [C] Following the instructions of the NDA LO, repeat the QC measurement and evaluation no more than two times.

NOTE

Calibration verification is accomplished by completing two consecutive successful Daily Performance Check measurements.

- [D] **IF** three successive 2 sigma QC failures occur, **THEN STOP WORK, AND** notify the NDA LO and VPM, **AND** initiate an NCR in accordance with CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control*. **DO NOT** resume operations until a corrective action plan is complete, **AND** calibration verification, as described in the NOTE above, is performed.

- [D.1] **IF** the corrective action plan involved any of the following:

- Major system repairs and/or modifications
- Replacement of the measurement system's components, e.g., detector, neutron generator, or supporting electronic components that have the capacity to affect data
- Significant changes to the system's software
- Relocation of the system

THEN perform a Calibration Verification in accordance with CCP-TP-010, *CCP Waste Assay Gamma Spectrometer (WAGS) and SWEPP Gamma-Ray Spectrometer (SGRS) Calibration Procedure*.

- 4.5.8 **IF** any of the values on the QA Last Results Report indicate a preset "Ab" (Above) or "Be" (Below) boundary flag, or an "Ac" (Action) flag,

THEN perform the following:

- [A] STOP WORK, **AND** notify the NDA LO and VPM.
- [B] Note the problem in the NDA Operational Logbook.

NDA LO

- [C] Evaluate the nature of the failure, consulting with an EA as necessary, **AND** determine if an NCR is required.
- [D] **IF** an NCR is **NOT** required, **THEN** instruct the NDA Operator to mitigate the problem, note the resolution in the NDA Operational Logbook, **AND** repeat the QC Daily Performance Check.
-

NOTE

Calibration verification is accomplished by completing two consecutive successful Daily Performance Check measurements.

NDA Operator

- [E] **IF** an NCR is required, **THEN** initiate an NCR in accordance with CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control*. **DO NOT** resume operations until a corrective action plan is complete, **AND** calibration verification, as described in the NOTE above, is performed.

- [E.1] **IF** the corrective action plan involved any of the following:

- Major system repairs and/or modifications
- Replacement of the measurement system's components, e.g., detector, neutron generator, or supporting electronic components that have the capacity to affect data
- Significant changes to the system's software
- Relocation of the system

THEN perform Calibration Verification in accordance with CCP-TP-010.

4.5.9 Instruct the FO to remove the drum from the conveyor, as necessary.

4.5.10 Print, sign, and date the QA Last Results Report(s) for inclusion in the BDR.

4.6 Weekly Performance Check of the WAGS

NOTE

Criteria used to develop the acceptance criteria are documented in CCP-INL-WAGS-001.

NDA Operator

- 4.6.1 Ensure a Weekly Performance Check (WPC) drum has been source loaded per Attachment 3, Weekly Measurement Control Standards Used for WAGS, and is available.
- 4.6.2 Request that the FO load the WPC drum onto the load side of the conveyor.
- 4.6.3 Advance the performance check drum to the load photoeye WAGS-PHE-1002, as required.
- 4.6.4 Ensure the Mechanism Mode Key Switch WAGS-SW-1001 is in the COMPUTER position.
- 4.6.5 Perform QC - Weekly Performance Check using NDA2000 Operations:
- [A] Select ASSAY.
 - [B] Select ROUTINE ASSAY.
 - [C] Select WEEKLY PERFORMANCE CHECK.
 - [D] Select START ASSAY at the start assay screen.
 - [E] Enter the Weekly Performance Check Drum ID number (e.g., COM1).
 - [F] Enter Weekly Performance Check for Description 2 on the ITEM INFORMATION screen.
 - [G] Enter the PERCENT FULL in the Percent Full Field.
 - [H] Sum the WPC Drum Net Weight, plus the NDA2000 Operations pre-determined Container Tare Weight, **AND** enter the summed value in the Gross Weight Field.
 - [I] Ensure that the correct certificate/declaration is selected.
 - [J] Select DONE.

NOTE

The yellow light is illuminated when there is any motion during the load or unload process. The red light is illuminated when the transmission source shutter is OPEN. If the system detects an error in the PLC operation, the yellow light will cycle ON and OFF repeatedly.

4.6.6 Monitor control tower lights on the PLC.

[A] **IF** any of the lights fail to come on **OR** other problems occur during the count,
THEN click on STOP, **AND** notify the NDA LO.

4.6.7 **WHEN** the analysis is complete,
THEN select the VIEW LAST ASSAY REPORT Button on the NDA2000 Operations screen, **AND** observe the QA Last Results Report for any deviation/flags (i.e., Investigate [In], Action [Ac], Above [Ab], or Below [Be]).

4.6.8 **IF** any of the values on the QA Last Results Report indicate any deviation/flags (i.e., "In", "Ac", "Ab", or "Be"),
THEN perform the following:

[A] **IF** possible, identify the cause of the failure,
THEN correct the problem.

[B] Notify the NDA LO and VPM, **AND** note the problem and resolution in the NDA Operational Logbook.

NDA LO

[C] Confer with the NDA EA to determine whether the assay results indicate an instrument problem or other condition detrimental to quality, **AND** note any action taken in the NDA Operational Logbook.

NOTE

The NDA EA will prepare an evaluation report at six month intervals documenting the interfering weekly matrix drum measurement results. This report shall summarize the matrices and ranges that have been tested, note any operational problems and include an evaluation of system performance during that period.

4.6.9 Instruct the FO to remove the drum from the conveyor, as necessary.

4.6.10 Print, sign, and date the QA Last Results Report(s) for inclusion in the BDR.

4.7 Routine Drum Assaying

NDA Operator

4.7.1 Ensure Sections 4.4 and 4.5 have been completed during the operational day.

4.7.2 Ensure the drum(s) is loaded on the load side of the conveyor.

4.7.3 Ensure the mechanism mode key switch WAGS-SW-1001 is in the COMPUTER position.

4.7.4 Advance the drum(s) to the load photoeye WAGS-PHE-1002, as required.

4.7.5 Ensure the Container Traveler is on the drum, **AND** the following information is available (e.g., from the Real-Time Radiography [RTR] or Visual Examination [VE] data sheet):

[A] Drum ID Number.

[B] Waste Stream Code.

[C] Net Weight.

[D] Percent (%) Full.

NOTE

The software will not recognize an incorrect selection of the Waste Matrix Code. The assay will run as selected and if incorrect the assay run will be invalid.

4.7.6 Review the Waste Matrix Code from the RTR or VE datasheet attached to the Container Traveler to determine if it is solids (S3000), soil (S4000) or debris (S5000) waste.

4.7.7 Perform Assay-Solids/Soil or Assay-Debris according to the Waste Matrix Code located on the RTR or VE datasheet attached to the Container Traveler, using NDA2000 Operations:

[A] Select ASSAY.

[B] Select ROUTINE ASSAY.

- [C] Select SOLIDS/SOIL **OR** DEBRIS according to the Waste Matrix Code located on the RTR or VE datasheet attached to the Container Traveler.
- [D] Select START ASSAY at the start assay screen.
- [E] Enter the Drum ID Number at the Item ID field of the ITEM INFORMATION screen.
- [F] Enter the BDR number in the Description 1 field.
- [G] Enter the Waste Matrix Code from the RTR or VE datasheet attached to the Container Traveler in the Description 2 field.
- [H] Enter the PERCENT FULL from the RTR or VE datasheet attached to the Container Traveler in the Percent Full field.
- [I] Sum the Net Weight from the RTR or VE datasheet attached to the Container Traveler, plus NDA2000 Operations pre-determined Container Tare Weight, **AND** enter the summed value in the Gross Weight field.
- [J] Ensure that WG Pu is selected as the certificated/declaration.

NOTE

The density is automatically calculated by NDA2000 Operations for each assay.

4.7.8 Select DONE.

4.7.9 Monitor control tower light on the PLC.

- [A] **IF** any of the lights fail to come on, **OR** other problems occur during the count,
THEN click on ABORT, **AND** notify the NDA LO.

4.7.10 **WHEN** the analysis is complete,
THEN select the VIEW LAST ASSAY REPORT Button on the NDA2000 Operations screen, **AND** ensure that the Drum ID Number on the analysis report matches the Drum ID Number on the drum.

- [A] **IF** the Drum ID numbers **DO NOT** match,
THEN notify the NDA LO.

- [B] Print the report, **AND** sign and date the Radioassay Data Sheet for inclusion in the BDR.

NOTE

In cases where the preliminary NDA result exceeds the Host site safety basis limits, authorization is required from the Host site management personnel with concurrence from the VPM prior to moving the container.

- 4.7.11 **IF** the preliminary NDA result indicates that the drum contents have a FGE greater than Host site safety basis limits.
THEN notify the VPM and Host site management personnel,
AND manage the drum in accordance with Host site procedures.

- [A] The drum **SHALL NOT** be removed without specific authorization from the Host site management personnel with concurrence from the VPM prior to moving the container.

- 4.7.12 Request that the FO unload assayed drums, as needed.

4.8 Partial Shutdown of WAGS

- 4.8.1 CLOSE NDA2000 Operations.

- 4.8.2 Shut down the computer.

- 4.8.3 Shut down the conveyor by rotating the main power rotary switch WAGS-DSW-1001 to OFF.

- 4.8.4 Forward all records generated by this procedure to the Facility Records Custodian.

Facility Records Custodian

- 4.8.5 Receive, process, and transmit all records generated by this procedure in accordance with CCP-QP-008.

4.9 Complete Shutdown of WAGS

NDA Operator

- 4.9.1 Perform the following operations using NDA2000 Operations:

- [A] Select HARDWARE SETUP.

- [B] Select HIGH VOLTAGE SUPPLIES.

- [C] Select TURN OFF.

- 4.9.2 CLOSE all programs, **AND** shut down the computer, if required.
- 4.9.3 Turn the Reference Pulser Power Toggle switch OFF.
- 4.9.4 Turn both surge protector power strips OFF.
- 4.9.5 Shut down the conveyor by rotating the main power rotary switch WAGS-DSW-1001 to OFF.
- 4.10 Abnormal Conditions Procedures
 - 4.10.1 **IF** a loss of commercial power occurs, **THEN** perform the following:
 - [A] Immediate Actions
 - [A.1] STOP the count in progress.
 - [A.2] Notify the NDA LO and VPM.
 - [B] Follow-up Action
 - [B.1] Proceed as directed by the NDA LO.
 - 4.10.2 **IF** Re-initialization of the conveyor is required, **THEN** perform the following:
 - [A] Immediate Action
 - [A.1] None.
 - [B] Follow-up Actions
 - [B.1] Rotate the main power rotary switch WAGS-DSW-1001 to OFF, **AND** rotate the main power rotary switch WAGS-DSW-1001 to ON.
 - [B.2] Rotate mechanism mode key switch WAGS-SW-1001 to MANUAL position.
 - [B.3] Rotate the override/reset initialize mechanism key switch WAGS-KSW-1001 clockwise, **AND** hold for five seconds, **AND** release the key switch.

[B.4] **AFTER** the WAGS system has completed all actions, **THEN** rotate the mechanism mode key switch WAGS-SW-1001 to COMPUTER position to resume normal activities (i.e., routine drum assaying).

4.10.3 **IF** a detector loss occurs, **THEN** do the following:

[A] Immediate Actions

[A.1] STOP the count.

[A.2] Notify the NDA LO.

[B] Follow-up Action

[B.1] Proceed as directed by the NDA LO.

4.10.4 **IF** a DSA module has any Fault light illuminated during normal operations, **THEN** perform the following:

[A] Immediate Actions

[A.1] STOP the count if one is in progress.

[A.2] Notify the NDA LO.

[B] Follow-up Action

[B.1] Proceed as directed by the NDA LO.

5.0 RECORDS

5.1 Records generated during the performance of this procedure (as listed in step 5.2.1) will be compiled into the BDR in accordance with CCP-TP-109, *CCP Data Reviewing, Validating, and Reporting Procedure*.

5.2 Records generated during the performance of this procedure are maintained as QA records in accordance with CCP-QP-008. The records are the following:

5.2.1 QA/Lifetime

[A] QA Last Results Report

[B] NDA Radioassay Data Sheet

Attachment 1 –QA Last Results Report (Example)

Last Measurement Q.A. Report 04/05/05 11:57:01 AM Page 1

***** G E N I E Q U A L I T Y A S S U R A N C E *****

Last Results Report
04/05/05 11:57:01 AM

QA File: D:\Temp\QA\CNTR0001_DCAT0001_PRO
Sample ID: DPC9999
Sample Quantity: 1.0000E+000
Sample Date: 03/17/05 4:02:45 PM
Measurement Date: 04/05/05 9:40:32 AM
Elapsed Live Time: 1129.9 seconds
Elapsed Real Time: 1200.0 seconds

Parameter Description [Mean +/- Std. Dev.]	Value	Deviation/Flags < LU : SD : UD : BS >
DPC Pu-239 [UD: 1.1464E+001 +/- 0.148]	1.1553E+001	6.0223E-001 < : : : >

Flags Key: LU = Lower/Upper Bounds Test (Ab = Above, Be = Below)
 SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
 UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
 BS = Measurement Bias Test (In = Investigate, Ac = Action)

Operator Review/Date: _____

Attachment 3 – Weekly Measurement Control Standards Used for WAGS

Drum ID	Source ID	Pu Mass	Source Matrix	Source Position	Drum Matrix
COM1	CEP 003 CEP 004 CEP 005 CEP 006 TOTAL	1.98772 2.00861 1.99287 1.99099 7.98019 g	Diatomaceous Earth	Tube 3, Ht: 10" Tube 2, Ht: 19" Tube 2, Ht: 10" Tube 2, Ht: 1" Fill portion of tubes without standards with combustibles matrix plugs.	Combustibles PDP Style Surrogate Drum
COM2	NTP-0147 NTP-0155 NTP-0139 TOTAL	30.046 49.976 15.035 95.057 g	Diatomaceous Earth	Tube 1, Ht: 9" Tube 2, Ht: 12" Tube 3, Ht: 9" Fill portion of tubes without standards with combustibles matrix plugs.	Combustibles PDP Style Surrogate Drum
COM3	NTP-0123 NTP-0102 NTP-0095 NTP-0109 NTP-0139 NTP-0116 NTP-0155 NTP-0163 TOTAL	3.0514 0.29858 0.30376 2.9686 15.035 2.933 49.976 64.993 139.559 g	Diatomaceous Earth	Tube 1, Ht: 1" Tube 1, Ht: 11" Tube 1, Ht: 21" Tube 2, Ht: 1" Tube 2, Ht: 11" Tube 2, Ht: 21" Tube 3, Ht: 6" Tube 3, Ht: 16" Fill portion of tubes without standards with combustibles matrix plugs.	Combustibles PDP Style Surrogate Drum

Attachment 3 – Weekly Measurement Control Standards Used for WAGS (Continued)

Drum ID	Source ID	Pu Mass	Source Matrix	Source Position	Drum Matrix
MET1	CEP 003 CEP 004 CEP 005 CEP-006 TOTAL	1.98772 2.00861 1.99287 1.99099 7.98019 g	Diatomaceous Earth	Tube 3, Ht: 10" Tube 2, Ht: 19" Tube 2, Ht: 10" Tube 2, Ht: 1" Fill portion of tubes without standards with metals matrix plugs.	Metals PDP Style Surrogate Drum
MET2	NTP-0147 NTP-0155 NTP-0139 TOTAL	30.046 49.976 15.035 95.057 g	Diatomaceous Earth	Tube 1, Ht: 9" Tube 2, Ht: 12" Tube 3, Ht: 9" Fill portion of tubes without standards with metals matrix plugs.	Metals PDP Style Surrogate Drum
MET3	NTP-0123 NTP-0102 NTP-0095 NTP-0109 NTP-0139 NTP-0116 NTP-0155 NTP-0163 TOTAL	3.0514 0.29858 0.30376 2.9686 15.035 2.933 49.976 64.993 139.559 g	Diatomaceous Earth	Tube 1, Ht: 1" Tube 1, Ht: 11" Tube 1, Ht: 21" Tube 2, Ht: 1" Tube 2, Ht: 11" Tube 2, Ht: 21" Tube 3, Ht: 6" Tube 3, Ht: 16" Fill portion of tubes without standards with metals matrix plugs.	Metals PDP Style Surrogate Drum

Attachment 3 – Weekly Measurement Control Standards Used for WAGS (Continued)

Drum ID	Source ID	Pu Mass	Source Matrix	Source Position	Drum Matrix
SLU1	CEP 006 CEP 005 CEP 004 CEP 003 TOTAL	1.99099 1.99287 2.00861 1.98772 7.98019 g	Diatomaceous Earth	Tube 4, Ht: 1" Tube 4, Ht: 10" Tube 3, Ht: 5" Tube 3, Ht:14" Fill portion of tubes without standards with sludge matrix plugs.	Sludge PDP Style Surrogate Drum
SLU2	NTP-0147 NTP-0155 NTP-0139 TOTAL	30.046 49.976 15.035 95.057 g	Diatomaceous Earth	Tube 4, Ht: 4" Tube 3, Ht: 13" Tube 4, Ht: 13" Fill portion of tubes without standards with sludge matrix plugs.	Sludge PDP Style Surrogate Drum
SLU3	NTP-0123 NTP-0102 NTP-0095 NTP-0109 NTP-0139 NTP-0116 NTP-0155 NTP-0163 TOTAL	3.0514 0.29858 0.30376 2.9686 15.035 2.933 49.976 64.993 139.559 g	Diatomaceous Earth	Tube 1, Ht: 1" Tube 1, Ht: 11" Tube 1, Ht: 21" Tube 2, Ht: 1" Tube 2, Ht: 11" Tube 2, Ht: 21" Tube 3, Ht: 10" Tube 4, Ht: 10" Fill portion of tubes without standards with sludge matrix plugs.	Sludge PDP Style Surrogate Drum

Attachment 3 – Weekly Measurement Control Standards Used for WAGS (Continued)

Drum ID	Source ID	Pu Mass	Source Matrix	Source Position	Drum Matrix
GLA1	CEP 003 CEP 004 CEP 005 CEP 006 TOTAL	1.98772 2.00861 1.99287 1.99099 7.98019 g	Diatomaceous Earth	Tube 3, Ht: 10" Tube 2, Ht: 19" Tube 2, Ht: 10" Tube 2, Ht: 1" Fill portion of tubes without standards with glass matrix plugs.	Glass PDP Style Surrogate Drum
GLA2	NTP-0147 NTP-0155 NTP-0139 TOTAL	30.046 49.976 15.035 95.057 g	Diatomaceous Earth	Tube 1, Ht: 9" Tube 2, Ht: 12" Tube 3, Ht: 9" Fill portion of tubes without standards with glass matrix plugs.	Glass PDP Style Surrogate Drum
GLA3	NTP-0123 NTP-0102 NTP-0095 NTP-0109 NTP-0139 NTP-0116 NTP-0155 NTP-0163 TOTAL	3.0514 0.29858 0.30376 2.9686 15.035 2.933 49.976 64.993 139.559 g	Diatomaceous Earth	Tube 1, Ht: 1" Tube 1, Ht: 11" Tube 1, Ht: 21" Tube 2, Ht: 1" Tube 2, Ht: 11" Tube 2, Ht: 21" Tube 3, Ht: 6" Tube 3, Ht: 16" Fill portion of tubes without standards with glass matrix plugs.	Glass PDP Style Surrogate Drum