2

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Page 1 of 1

1. EDT 161746

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		Cog. Mgr.	<i>[Signature]</i>	8/22/94	Q6-47						
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1	1	D. A. Guettler	<i>[Signature]</i>	8/24/94	Q3-18						

18. Signature of EDT Originator <i>[Signature]</i> J. R. Weidert Date: 8-19-94		19. Authorized Representative for Receiving Organization <i>[Signature]</i> D. R. Lucas Date: 8/22/94		20. Cognizant Manager <i>[Signature]</i> D. E. Ball Date: 8/22/94		21. DOE APPROVAL (if required) Ctrl. No. ☐ Approved ☐ Approved w/comments ☐ Disapproved w/comments	
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* * * * *

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WHC Information Release Administration Specialist:

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WRAP 1 COMPUTER SYSTEM INTERFACE DEFINITION DOCUMENT
PROJECT W026

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1.0 INTRODUCTION

This document has been developed to define the computer software interfaces between Waste Receiving & Processing Module 1 (WRAP 1) computer systems. The interfaces include those data interfaces which exist between the Plant Control System (PCS) and Data Management System (DMS), between the DMS and Non-Destructive Assay (NDA) equipment, and between the DMS and Boxed Waste Assay System (BWAS) equipment.

In addition to the data interfaces between the various WRAP computer systems; there are also a number of control functions between WRAP 1 equipment. These control function interfaces have been specified in WRAP Construction specification 13462 and the associated equipment specifications. The PCS vendor has been listed in the equipment specifications as the responsible party for establishing the final control system interface between the PCS and Non-Destructive Examination (NDE) Equipment, the PCS and Non-Destructive Assay (NDA) Equipment, and the PCS and BWAS equipment.

The primary interface requirements between these systems are addressed in Specification Sections 13462, 13532, 13533, 13026, 13537, and 13538. Additional requirements may be found in other specification sections such as the Automatic Stacker Retriever System (AS/RS) Technical Specification 14520 and the WRAP 1 Data Management System Software Requirements Specification.

2.0 BACKGROUND

The WRAP 1 facility construction has been divided into three construction packages. Construction Package #1 contains all the WRAP 1 work scope except for the NDE and NDA equipment. Construction Package #2 encompasses the NDE equipment while Construction Package #3 covers the NDA equipment. Additionally, the WHC has determined that the software for the Data Management System and the Boxed Waste Assay System for the WRAP 1 project will be furnished by WHC as Government Furnished Equipment. As a result of these multiple contracts, a need exists for a single document that describes the physical and computer interfaces between contracts. This supporting document will address each contract interface and shall be used by the applicable contractors for guidance.

The PCS/DMS interface provided in Section 3.0 will describe the software interfaces by facility area and function. The operating description, PCS Interfaces section and the Data Management section provide information past the actual boundaries of the interface such that interfacing contractors might have a better understanding of the integrated operation of the WRAP facility.

The initial revision of this document shall only address the PCS/DMS interfaces and will not include the communication protocol. Revision 1 of this document will include the DMS/PCS communication protocol that will be developed by the PCS Seller and will also include the DMS database structure

if it is determined that the database structure will be required to support a Special Query Language (SQL) interface over the WRAP Local Area Network (WLAN). Additionally, due to the stage of the design for the DMS and PCS, the error messages and recovery actions that are required between the two systems have not been addressed at this time (e.g. method for resolving PIN discrepancies when bar code readings don't match). These issues will be resolved as part of the software design reviews to be completed at a later date.

Subsequent revisions of this document will incorporate detailed interface definitions between the DMS, PCS, and the NDE, NDA, and BWAS systems (sections 4.0 - 9.0) currently listed as "TBD". These interfaces will be incorporated as they are defined by the responsible organizations.

This document fulfills the Westinghouse Hanford Company (WHC) requirement (specification 13462, 1.05.D) to describe the interface between the WRAP 1 DMS and PCS computer systems. The WRAP 1 contractors will use this information to develop communication drivers for transmitting information between the WRAP 1 computer systems.

Appendix A of this document provides a summary listing of the bar coded commands that are used by the PCS to control facility equipment and update the DMS. This appendix also contains a summary listing of all WRAP 1 waste container locations as defined in the body of the document.

Appendix B of this document summarizes the various message formats that will be used during the communication between the PCS and DMS. This Appendix may be used to facilitate the development of a communication protocol. The interface document parallels the PCS software specification's 17 modules as noted in Figure 1.

Bar coded labels in WRAP 1 will contain data identifiers in all cases and data qualifiers as required. The data identifiers (1-4 characters) will always precede bar coded data and will end with an alpha character. The data qualifiers will follow the bar coded data when they are required and will always consist of the last two alpha characters in the bar code. Appendix C summarizes the list of bar code data identifier and data qualifiers that will be used in the WRAP 1 facility for bar coded data. These identifiers and qualifiers have been assigned and approved by the cognizant Hanford organizations and are consistent with the Federation of Automated Coding Technologies (FACT) standards.

FIGURE 1

3.0 PCS/DMS INTERFACE DEFINITION

3.1 RECEIVING

3.1.1 Drummed Waste Handling

3.1.1.1 Drummed Waste Receipt & Inspection

All retrieved (RET) waste (generated from the W113 Project) will receive NDE, NDA, and headgas analyses prior to leaving the W113 Project. The vented 55-gallon waste drums from the W113 Project will be overpacked in vented 85-gallon drums and sent to interim storage. All characterization data generated at the W113 Project will be uploaded into Solid Waste Information Tracking System (SWITS). The information generated at the W113 Project, and the characterization data contained in the SWITS database will be accessed by WRAP 1 scheduling personnel. The WRAP 1 scheduling personnel will use the accessed data to schedule the waste based on a batch process. All wastes within a single batch will have similar radiological and hazardous characteristics and will follow similar process paths through the WRAP 1 facility.

All newly-generated (NG) wastes will be fully characterized and the characterization data entered into the SWITS database. This data will be reviewed for the purposes of scheduling the NG wastes in the manner described above. To simplify the NDE/NDA exams, it is anticipated that the NG waste will also be received by batch to the maximum extent possible (e.g. NG Transuranic (TRU) processed one week, NG Low Level Waste (LLW) processed the next, etc). Trucks or vans deliver TRU waste and LLW to the waste Shipping and Receiving (S&R) dock in WRAP Module 1.

PCS ACTIVITIES: There are no PCS/DMS interfaces at this point. All activities are associated with the waste processing schedule which is developed and maintained by WRAP.

DATA MANAGEMENT: Supervisor updates the facility schedule to reflect receipt of wastes

The palletized drums are surveyed for radiological surface contamination prior to removal from the vehicles. If contamination is detected, the truck, pallets and drums are decontaminated or the contamination fixed to avoid spreading. The pallets are then unloaded using a fork lift. The pallets of drums are temporarily staged in the WRAP 1 fork lift aisle (just south of the AS/RS) until a more comprehensive contamination/damage inspection is completed. Again, if contamination is detected, it is isolated, cleaned up, and recorded on an Health Physics Technician (HPT) log. If the surveys do not indicate a contamination/damage problem, no data is recorded. The WRAP operators will also review and verify acceptance of the waste manifest data at this time.

PCS ACTIVITIES: There are no PCS/DMS interfaces at this point. All activities and data management are manual operations.

DATA MANAGEMENT: If contamination/damage problems are identified, the information will be recorded manually on an HPT log.

Bar code labels will be printed for drums received with damaged or missing labels. The Package Identification Numbers (PINs) will be obtained from other labels or markings on the container and confirmed against the shipping papers. The labels will be printed using the bar-code label printer in the Shipping/Receiving office (100-BP-12-120), which is attached to the DMS terminal. The PIN will be manually entered at the DMS terminal for labels to be generated.

Drums that do not meet the acceptance criteria (including fissile material inventory considerations) of WRAP Module 1 will not be processed in the facility but will be set aside for return to the generator or transfer to long-term storage pending resolution of identified problems.

PCS ACTIVITIES: There are no PCS/DMS interfaces at this point. Drums have not been accepted by WRAP.

DATA MANAGEMENT: The waste operators will update the facility schedule to note any drums that were rejected at the S&R dock.

Upon satisfactory application of any missing or damaged bar code labels, the operator will scan a bar code (using bar code reader 12-NE-101) to fix the bar code position at the WRAP 1 Receiving Dock. The operator will then scan the bar code for each drum that was received by WRAP. The initial location bar code and all drums bar codes scanned will be maintained in a temporary file in the PCS. Upon scanning the final drum bar code, the operator will scan a termination bar code to note that he has completed his scanning operation. When the termination bar code is scanned, the PCS will transmit all drum PINs and the Receiving Dock location to a temporary table in the DMS. This operation may be performed any time after the truck is docked and damaged bar codes are replaced.

When the DMS receives the drum PINs and Receiving Dock location, a pop-up message will be displayed on the DMS terminal (101-TE-12-108) in the S&R Office. This message will key the operators to create new drum records in a WRAP 1 DMS temporary table, input shipping manifest data for all drums received, update the waste drum location in SWITS (i.e. received at WRAP 1), download the applicable SWITS data, and verify facility fissile material inventory limits are not violated.

Once this function is performed the data will belong to WRAP 1 and will not be available for revision by others until the waste leaves the facility. The DMS data will be transferred from the temporary table to the DMS database once the operator has verified the data (includes comparisons to hard copy manifest

data) and accepted the temporary file. The DMS will notify the PCS that the drums have been accepted by transmitting the location and drum PINs back to the PCS. Drums that have not been accepted at WRAP, will be shipped from the facility and have their PINs removed from the PCS memory as noted in the Shipping section 15.0.

PCS ACTIVITIES: A bar code ("2Y" data identifier with location "RECDCK") is read to fix the bar code reader location. The PCS will recognize the "2Y" as a location designator, strip it from the bar code, and record "RECDCK" as the drum location in a temporary file. Reading this bar code also keys the PCS to expect additional drum bar codes ("S" data identifier followed by a container PIN). The drum PINs will be entered into this same temporary PCS file after having the data identifier stripped from them.

Reading the termination bar code ("Y" data identifier with command "END&TRNSMT") will confirm termination of the receiving ID process. The data identifier is "stripped" from the bar code and the bar code keys the PCS that the current activity is completed and the data (location and drum PINs) will be transmitted to the appropriate DMS temporary file.

Once the DMS drum records are generated, the DMS will transmit the PINs and location back to the PCS which will then update the PCS records with the drum PIN and location data previously transmitted. PCS will not update its permanent files until this point in time such that drums that have been rejected (not accepted into WRAP) will not be reflected as being received by the PCS.

AT THIS POINT THE WASTE HAS BEEN ACCEPTED BY WRAP AND THE PCS/DMS WILL STATUS THE LOCATION AS THE WRAP 1 RECEIVING DOCK.

If facility fissile material inventory limits will be exceeded, the DMS shall transmit a Fissile Material Inventory Limit violation message to the PCS which shall cause the PCS to generate an alarm and record it on the alarm tracking log.

Note: The PCS logic will have to provide for "termination & transmit" and "termination" bar codes to verify specific operating functions are complete prior to initiating a new operating function (e.g a termination bar code from another location such as AS/RS retrieval will be

required to be read prior to reading the initial location bar code at the Receiving Dock).

Additionally, a "cancel last bar code" bar coded command should be provided to allow operator recovery from bar code reads that were accidental.

DATA MANAGEMENT: The drum location and PINs will be logged into a temporary DMS table for receiving drums. The data will be entered into DMS fields for location CHAR(10) and PINs CHAR(14).

Entry of the data noted above into the temporary file will initiate a pop-up message, "Waste Containers Received -- Data Entry Required". The S&R operator will acknowledge the pop-up message, "Waste Containers Received -- Data Entry Required", at terminal 101-TE-12-108 by accessing the listing of drum PINs for those drums listed on the temporary waste receiving table. New records will be generated in the temporary table. SWITS data will be downloaded to this DMS temporary table for the drum records just created and "locked out" of the SWITS system.

The DMS will automatically assign the Receiving Dock as the new drum location. When the operator is satisfied that all SWITS data has been downloaded, all applicable shipping manifest data has been entered, and the records are up to date and ready for use in WRAP; the operator initiates a fissile material inventory limit verification for the new shipment.

The fissile material inventory limit verification will calculate the fissile material inventory of the entire WRAP 1 facility including those drums just received. The DMS will compare this number against the facility limit to verify the limit has not been exceeded.

If the facility fissile material inventory will exceed the established limit, a pop-up message will be generated on the DMS system, displayed on the S&R operator terminal 101-TE-12-108, and an alarm transmitted to the PCS [location CHAR(10) and message type]. If the fissile material inventory limit will be exceeded; the drums received will be prepared for shipment to another facility pending resolution of the fissile material inventory constraints. Drums will be shipped from WRAP 1 per section 3.15.

If the facility fissile material inventory will not exceed the established limit, the S&R operator shall accept the

waste, transfer the newly generated records from the temporary receiving table to the DMS database. The date and time will also be transmitted to the DMS database. The DMS will also transmit the container PINs and location back to the PCS which will update its permanent files to reflect the receipt of the waste containers.

UPSET CONDITIONS: Drums have bar codes read that will not be accepted into WRAP.

Resolution: Drum are segregated from other received wastes and drums are shipped from the facility in accordance with section 3.15.

OPEN ISSUES: Issue: The person receiving the waste needs to use a password/log on sequence to identify himself as the responsible individual.

Resolution: These data fields will need to be tracked in the DMS.

SPEC REFERENCES: 13462-9, 13, 14, Table 1.1, Table 1.2, step 3

A Processing List (see paragraph 3.1.1.3) will be developed for WRAP 1 processing based on a review of SWITS data for drums that are available for processing. Once the Processing List is completed and approved, it will be transmitted to the DMS. Once drums are accepted into the WRAP 1 facility (DMS and PCS list Receiving Dock as location) the S&R operator will verify that the accepted drums are listed on the DMS Processing List.

As the WRAP 1 Operators verify the drums are on the list, the drum PINs and associated Processing List data will be transmitted to a PCS Processing Pick List in the same order that they are listed on the DMS Processing List.

Note: The Processing Lists refer to lists generated and maintained on non-PCS system. The Processing Pick List is the listing which is uploaded from the DMS to the PCS.

The Processing Lists will be made up in a mandatory sequence. The WRAP 1 operators will not be allowed to revise this sequence without supervisory review. Drums must be retrieved from the AS/RS in the sequence specified on the PCS Processing Pick List. This restriction is required in order to support material flows within the WRAP facility.

The PCS Processing Pick List will include process routing data. The processing routing data will determine the route that the waste will travel as it is processed into the facility. This data will be uploaded from the DMS to the PCS at the time the waste is confirmed to be received into the WRAP 1 facility.

PCS ACTIVITIES: The PCS shall receive the following data from the DMS as drums are verified to be received in the WRAP facility:

Drum PIN, CHAR(14)
Process Routing Designation, CHAR(2)
Sample? [(Y) or (N)] LOGIC(1)
Compliant? [(Y) or (N)] LOGIC(1)

As the DMS Processing List is updated and transmitted to the PCS, any existing PCS Processing Pick List will be overwritten with the new listing.

DATA MANAGEMENT: Waste drums will only be transferred between these lists in the order specified on the DMS listing.

3.1.1.2 Drummed Waste Storage in AS/RS

Once the drums have been accepted by the WRAP 1 facility, as noted by generation of drum records in the PCS and DMS databases, the fork lift operator will move the pallets of waste drums to the AS/RS pallet stand. At this location the fork lift operator will verify that the "AS/RS Ready" message is displayed on the local display. The operator will use the portable bar code scanner (12-NE-101) to scan a bar code "PSTND". The PCS will not accept this bar code unless the "AS/RS Ready" signal was previously received from the AS/RS. This "AS/RS Ready" signal will be transmitted (to the local displays and PCS) upon completion of the AS/RS operations generating the (DRM STRPS), (DRM RTVPS), (DRM STRTC), or (DRM RTVTC) signals. Reading of the "PSTND" bar code without the prior receipt of the "AS/RS Ready" signal shall generate an "AS/RS Not Available" message on the local displays. Reading the "PSTND" bar code will transmit a message to the AS/RS that will generate a "Pallet Stand Drums Require Identification" (NO IDPS) message at the locally mounted visual display. The AS/RS will also transmit this message to the PCS thus allowing the drum PINs to be read with the bar code reader.

The fork lift operator will then scan the bar codes of the individual drums on the pallet to identify the drums to be put into the AS/RS. The PCS will maintain the drum PINs in a temporary file until the drums are stored successfully in the AS/RS. The PCS shall also confirm that the PINs exist in the PCS location database (i.e. the drums have been formally accepted into WRAP and PCS database records exist). Once all drum bar codes for the pallet of drums are read, the fork lift operator shall scan a "store drums from the pallet stand" (STR DRMPS) bar code. This "STR DRMPS" bar code is a coded command from the PCS to the AS/RS to store the pallet. This command will be forwarded to the AS/RS (along with the drum PINs) if exactly four drums have been identified. If a number other than four drums have been identified, the PCS shall perform the following actions:

- If less than four drum PINs have been read between the reading of the "PSTND" bar code and the "STR DRMPS" bar code, the PCS shall send a

message to the AS/RS (NUM DRUM) noting the number of drums that have been read. The AS/RS will display the number of drums read to the forklift operator (via the local display) and require (VERF NUM) that:

- . either additional drum PINs be read along with a second reading of the "STR DRMPS" command (drum PINs transmitted to AS/RS upon reading second "STR DRMPS" command)
- . or verification that the proper number of drum PINs have been read via a second reading of the "STR DRMPS" command. (drum PINs transmitted to AS/RS upon second reading "STR DRMPS" command)

- If more than four drum PINs have been read between the reading of the "PSTND" and the "STR DRMPS" bar code, the PCS shall send a message to the AS/RS (NUM DRUM) noting the number of drums that have been read. The AS/RS will display the number of drums that have been read (via the local display) and require the sequence to be restarted (i.e. read the "PSTND" bar code and the drum PINs again followed by the "STR DRMPS" command bar code.) The drum PINs shall be transmitted to the AS/RS upon reading the "STR DRMPS" command as noted above.

Upon receipt of the "STR DRMPS" command and the drum PINs, the AS/RS shall pick up the pallet and select an empty bin location to store it.

Once the AS/RS fills its last available bin location (no bins available), it shall display a "Cannot Find a Location for Pallet" (NOLOCS) message on the visual display. This message shall be displayed until such time as a pallet of drums is removed from the AS/RS, thereby freeing up a bin location for storage of waste.

If the pallet of drums is successfully stored in an AS/RS bin location, the AS/RS shall update its internal database to track the bin location of the drums just stored. The AS/RS shall also send a message (DRM STRPS) to the PCS. Upon receiving this message from the AS/RS, the PCS shall forward the drum PIN numbers and "AS/RS" as the location to the DMS for tracking the drum location. The AS/RS shall also transmit an "AS/RS Ready" (ASRDRDY) message to the local display panel and the PCS. Upon seeing this confirmation, the forklift operator will read a termination bar code ("Y" data identifier with command "END") which will confirm termination of the AS/RS storage process and allow the bar code reader to be used to initiate another S&R activity.

PCS ACTIVITIES: Upon receipt of the "DRM STRPS" message; the PCS shall transmit both the "AS/RS" as the location and the drum PINs to the DMS.

DATA MANAGEMENT: The DMS will log the "AS/RS" in the location field CHAR(10) field of the waste container table for each drum PIN, CHAR(14), received from the PCS. The date and time the relocation occurred will also be recorded. The data currently in the waste container table will be transferred to a relocation history table as the new location is identified. The relocation history record table will be

updated with the drum PINs, locations, dates, and times as the waste is processed through the facility.

SPEC REFERENCES: 13462-26; Table 1.2, step 4 & 5; 14520-5, 21, A2

3.1.1.3 Drummed Waste Retrieval from AS/RS

A number of pick lists will be generated for the AS/RS unit. The pick lists will be loaded onto the DMS and subsequently to the PCS. One of these pick lists will be a Processing Pick List. This list will initially be generated based on a review of the SWITS data prior to the receipt of waste in the WRAP 1 facility. The pick lists may be reviewed and updated as required.

The Processing Pick Lists will support the transfer of drums to the WRAP 1 infeed conveyor and will consider a number of factors including: a proper mix of NG and RET wastes, acceptable combinations of weights and gram loadings, LLW and TRU split, drums requiring sampling and non-compliant item removal, etc. It is these Processing Lists which will assure the waste is transported to the WRAP 1 facility by batch (i.e. like wastes on a pallet). The Processing Lists that are generated by WRAP will identify the drum PINs (grouped by pallet) and the sequence of retrieval from the AS/RS. Route designations for processing the incoming waste drums will also be determined and provided to the PCS upon acceptance of waste into the WRAP 1 facility. It is possible to load the infeed conveyor from three different pallets (eg. RET LLW, RET TRU, and NG) simultaneously allowing any mix of waste to be processed through the facility.

The Processing Pick Lists can be accessed a day or two in advance of processing by WRAP Operations to verify that all drums required to support the Processing Pick List are located in the AS/RS.

PCS ACTIVITIES: The Processing Pick List maintained in the PCS shall be capable of being modified from the DMS (overwrite capability).

DATA MANAGEMENT: The Processing List may be modified on the DMS and transmitted to the PCS.

UPSET CONDITIONS: If a route designation has been changed, the PCS shall be capable of identifying the current location of the waste drum and proceed from that point on for the new route designation.

If the AS/RS retrieval sequence has been revised, the new sequence will only be implemented for those drums still in the AS/RS.

SPEC REFERENCES: 14520-7, 13462-14, Table 1.3

The forklift operator notes that the pallet stand is available (empty) and the AS/RS is available (ASRSRDY) as noted on the local display. The fork lift operator will read a "Retrieve Drum from AS/RS to AS/RS pallet stand" bar code (RTV DRMPS) using bar code reader 12-NE-101. This command requests the next pallet of drums on the Processing Pick List to be retrieved. This request is communicated from the PCS to the AS/RS along with the drum PINs as listed on the Processing Pick List.

Note: The "RTV DRMPS" command may only request the next drum on the top of the Processing Pick List be retrieved but the PCS will log the next four drums out of the AS/RS and update the Processing Pick List by removing the next four drum PINs from the list as they are all removed simultaneously on the same pallet.

The drums will be removed from the PCS Processing Pick List when they are pulled from the AS/RS and placed on the pallet stand. Drums will be "flagged" on the DMS Processing List when they are removed from the AS/RS and placed on the pallet stand. The drum PINs will be permanently removed from the DMS Processing List once their bar codes are read on the Infeed Conveyor.

The AS/RS retrieves the pallet containing the drums requested. The pallet is moved to the AS/RS pallet stand and the drums logged out of the AS/RS. The AS/RS shall inform the PCS (DRM RTVPS) that the drums have been successfully retrieved from the AS/RS. The AS/RS will display a "Drums to be Transferred to Process" message on the local AS/RS visual display. The PCS and DMS will update the retrieved drum location data.

If the AS/RS can not locate the drums identified it shall display a "Cannot Find Pallet/Unable to Retrieve" message (SYSERR) on the visual display and the PCS shall receive a signal noting the lack of task completion.

PCS ACTIVITIES: The PCS Processing Pick List will be updated (PINs removed) as drums are retrieved from the AS/RS and the AS/RS communicates this information to the PCS (DRM RTVPS). It is this updated listing (next set of drum PINs) that the PCS will transmit to the AS/RS when the "RTV DRMPS" bar coded command is received from the bar code reader 12-NE-101. The Processing Pick List data will include the PIN CHAR(14), the process routing designation CHAR(2), and logic flags to determine if the drum is non-compliant or requires sampling.

The AS/RS will log the drums out of the AS/RS and send a message to the PCS (DRM RTVPS) when the drums are successfully retrieved.

Upon receipt of the "Drum Successfully Retrieved" (DRM RTVPS) message, the PCS shall transmit both (PSTND) as the drum location, and the drum PINs to the DMS.

DATA MANAGEMENT: The DMS will log the "PSTND" as the location in the location CHAR(10) field of the waste container table for each drum

PIN CHAR(14) received from the PCS. If the previous location of the waste drum waste "AS/RS, the DMS will "flag" the PINs on the DMS Processing List. The date and time the relocation occurred will also be recorded. The data currently in the waste container table will be transferred to the relocation history table as the new location is identified. The relocation history table will be updated with the drum PINs, locations, dates, and times as the waste is processed through the facility.

OPEN ISSUES:

Issue: What will prevent an operator from erroneously reading a "Retrieve to Pallet Stand" bar code if a pallet currently occupies the pallet stand?
Resolution: AS/RS/Spec references to ANSI standards will require the use of a "pallet detection" switch on the pallet stands. This switch will provide the input to the AS/RS to note when the pallet stand is "busy".

SPEC REFERENCES: 13462-Table 1.3, 14520-A2

In addition to the "Processing Pick List" and waste "Shipment List", the PCS shall provide the capability to retrieve pallets of waste from the AS/RS to the transfer car on a priority basis. See paragraph 3.15.2.2 for a description of this pick list's operation for the Transfer Car operations.

3.1.1.4 Loading Drummed Waste on Infeed Conveyor

The fork lift operator shall pick up the drum pallets and transport them to the pallet stands adjacent to the S&R infeed conveyor 101-CV-05-101A. After delivering the pallet of waste drums, the operator removes the pallet band and uses the drum jib crane to place the drums on the infeed conveyor in a pre-established sequence (i.e. empty, RET, NG). Drums will be batched on the pallets such that the sequence of removing the individual drums from an individual pallet will not impact WRAP 1 operations. The operator's only concern will be properly mixing the RET LLW, RET TRU waste, and the NG wastes on the infeed conveyor. These wastes are readily identified based on the drum type and labelling.

After all drum positions on the infeed conveyor are full, or when ready, the operator advances the first drum onto the weigh conveyor (101-CV-05-103A). Any drums that are not to be processed at this time are returned and logged back into the AS/RS. Empty pallets are moved to the side and stored until needed.

Once the drum is on the weigh conveyor, the infeed conveyor operator scans the drum bar code using bar code reader 12-NE-102. When the PCS receives a bar coded PIN from the weigh conveyor location, the drum location and weight (confirmation) information are recorded automatically. While the drum is on the weigh conveyor, the operator may print a weight label and attach it to the drum. This only occurs if the original weight label is damaged or missing.

Once the weight information is transmitted to the DMS, the DMS will verify the weight is within established tolerances of the generator's weight and the drum weight does not exceed waste container limitations.

Once the drum has been loaded onto the infeed conveyor and had its bar code read, the PCS shall transmit the new location to the DMS which will update the relocation history record and remove the drum PIN from the DMS Processing List (drum has been confirmed to be staged for processing vs. returned to storage).

PCS ACTIVITIES: The PCS shall transmit the drum PIN CHAR(14), "INFDCVYR" location CHAR(10) and the "INFDRMWGT" drum weight NUMBER(10,2) to the DMS for the drum PIN read.

DATA MANAGEMENT: The weight data will be entered into a verification weight field NUMBER(10,2) of the DMS. Upon receipt of the weight data, the DMS will calculate the difference between the certification weight downloaded from the SWITS and the verification weight obtained from the infeed conveyor weight scale.

Upon receipt of the "INFDCVYR" location, the DMS will delete the drum PIN from the DMS Processing List. The date and time the relocation occurred will also be recorded. The data currently in the waste container table will be transferred to the relocation history table as the new location is identified. The relocation history table will be updated with the drum PINs, locations, dates, and times as the waste is processed through the facility.

Additionally, the weights obtained will be compared against an established limit for each container type. This container weight limit NUMBER(10,2) will be in a table which will contain fixed container data.

UPSET CONDITIONS: If the difference between the certification weight in the DMS and the verification weight obtained on the infeed conveyor is greater than a pre-established limit, a pop-up message will be displayed at the TRUPACT terminal 101-TE-12-124. The TRUPACT terminal operator will determine whether or not the drum may be processed in WRAP 1. If the drum can not be processed in WRAP 1, the operator will notify the Control Room operator who will access the AGVCS to redefine the routing for the drum such that the Automatic Guided Vehicle (AGV) will remove the drum from the infeed conveyor and deliver it to the discharge conveyor for storage and or shipment from WRAP. A similar scenario will occur for containers whose weight limit is violated.

OPEN ISSUES: Issue: Weight variation % and method of calculation needs to be resolved.

Resolution: The % variation shall be equal to 2 x the scale accuracy value. $\% \text{ variation} = \frac{(\text{cert wt} - \text{verf wt}) \times 100}{\text{cert wt}}$

SPEC REFERENCES: 13462-Table 1.4, 1.5, 1.6

3.1.1.5 Transferring Drummed Waste to AGV

Once a drum is indexed to the end of the Infeed Conveyor (101-CV-05-101B), the PCS will communicate to the AGV controller that a drum is available to be picked up. The PCS shall also note the destination of the drum based on the routing data maintained by the PCS. The AGV will arrive to transfer the drum based on the destination provided by the PCS and an established priority task assignment programmed into the AGV logic. The PCS and AGV will process the transfer of the drum and update the drum location in the DMS.

PCS ACTIVITIES: Upon initiation of communication between the PCS and the AGV, the PCS shall access the drum routing data previously transmitted from the DMS to determine the routing for the drum PIN identified. This data shall be used to designate the routing of the waste drum through the WRAP 1 process based on established routings defined in the PCS and Automatic Guided Vehicle Computer System (AGVCS) software.

DATA MANAGEMENT: There are no PCS/DMS communications at this time.

UPSET CONDITIONS: If an operator determines during the weighing of the drum that the waste container cannot be processed in WRAP the drum routing will require revision in mid-process as noted in 3.1.1.4 above.

SPEC REFERENCES: 13462, Table 1.6

3.1.2 Boxed Waste Handling

3.1.2.1 Boxed Waste Receipt & Inspection

At this time, it is anticipated that only NG TRU waste will be received in boxes at the WRAP 1 facility. The boxes will be the Standard Waste Boxes (SWBs) to be packaged into TRUPACT II containers. These waste boxes will be fully characterized and the characterization data contained in SWITS. The data contained in SWITS will be reviewed for the purposes of developing a schedule to support the NDE and NDA examinations in the WRAP facility and ultimately shipment of the SWBs to Waste Isolation Pilot Plant (WIPP). Trucks or vans deliver boxed waste to the waste S&R dock in WRAP Module 1.

PCS ACTIVITIES: There are no PCS/DMS interfaces at this point. All activities are associated with the waste processing schedule

which is developed and maintained by WRAP administrative personnel.

DATA MANAGEMENT: Supervisor updates the facility schedule.

The boxed waste is received, inspected, fissile material inventory checks performed, and waste accepted in a manner similar to that specified in section 3.1.1.1 for the drummed waste.

3.1.2.2 Boxed Waste Storage

Once the SWBs have been accepted by the WRAP 1 facility, as noted by the generation of DMS records in the PCS and DMS databases, the fork lift operator will move the SWBs to the SWB Storage Area.

The operator will scan a bar code (using bar code reader 12-NE-101) to fix the bar code position at the SWB Storage Area and key the PCS to expect PIN bar codes to follow. The operator will then scan the bar coded PIN for each box that is transferred to the SWB Storage Area. The box PIN and location will be logged into a temporary PCS file. Upon scanning the final SWB bar code, the operator will scan a termination bar code to note that he has completed his scanning operation. When the termination bar code is scanned to note that the storage function is complete, the PCS will transmit all SWB PINs and the SWB Storage location to the DMS.

PCS ACTIVITIES: A bar code ("2Y" data identifier with location "SWBSTR") is read to fix the bar code reader location. The PCS will recognize the "2Y" as a location designator, "strip" it from the bar code, and record "SWBSTR" as the SWB location in a temporary file. Reading this bar code also keys the PCS to expect additional SWB bar codes ("S" data identifier followed by a container PIN). The SWB PINs will be entered into this same temporary PCS file.

Reading the termination bar code ("Y" data identifier with command "END&TRNSMT") will confirm termination of the SWB storage process. Again the data identifier is "stripped" from the bar code. This bar code keys the PCS to transmit the location and SWB PIN data to the appropriate PCS and DMS files.

DATA MANAGEMENT: The DMS will update the waste container table with the "SWBSTR" location information. The date and time the relocation occurred will also be recorded. The data currently in the waste container table will be transferred to the relocation history table as the new location is identified. The relocation history table will be updated with the drum PINs, locations, dates, and times as the waste is processed through the facility.

SPEC REFERENCES: 13462-9, 13, 14, Table 1.1, Table 1.2, step 3

3.1.2.3 Transfer of Boxed Waste to NDE/NDA

The DMS terminals will have access to a listing of the SWBs awaiting examination. Based on a review of this data, and upon communicating intention to transfer SWBs to the Control Room NDE operators via phone communications, the S&R operators will transfer unexamined SWBs to the NDE/NDA Area for examination. All SWBs will travel from S&R Area to Box NDE, from Box NDE to Box NDA, and finally return to the S&R Area; therefore a routing designation is not required for SWBs.

PCS ACTIVITIES: There are no PCS/DMS interfaces at this point in the boxed waste process. An SWB listing developed by WRAP 1 Operations is only used from the standpoint of scheduling the receipt of waste into WRAP 1.

3.1.3 Empty Drum Handling

3.1.3.1 Empty Drum Receipt & Inspection

Five different types of drums are used in the WRAP 1 Process. 55-gallon Drath & Schrader (D&S) drums will be used to transfer waste within the Processing Area. It will be unusual to require the transfer of these drums between the Processing Area and other areas of the WRAP facility.

There will be a surplus of 85-gallon Entry/Exit (EE) drums generated in the Processing Area. These drums will only be transported from the Processing Area under normal operating conditions. Temporary storage for these drums will be provided in the Restricted Waste Management (RWM) storage carousel pending use at the LLW exit glovebox.

It is anticipated that significant numbers (12/day) of 55-gallon One-Trip (OT) drums will be required to support the TRU glovebox operations while minimal quantities of 85-gallon D&S (1.5/day) and 55-gallon Entry/Exit (E/E), approximately .5/day, will be required to be accessed into the WRAP 1 Processing Area. Based on the numbers involved, the 55-gallon E/E drums will be accessed into the Processing Area on an "as-needed" basis using Control Room-S&R Area communication over the plant phone system. The 55-gallon OT and 85-gallon D&S drums will be accessed into the Processing Area using AGV's which will transport the drums from the S&R Area empty drum conveyor.

The receipt of empty drums will be scheduled on the WRAP 1 processing schedule and will be planned to support the anticipated needs of the process. Trucks or vans deliver pallets of empty drums to the waste S&R dock in WRAP Module 1. These drums might also be delivered by a fork lift transporting the drums from the WRAP 1 loading dock on the east side of the facility to the waste S&R dock on the south side of the facility.

The empty drums are received, inspected, and accepted in a manner similar to that specified in section 3.1.1.1 for the drummed waste. Additional DMS functions as noted below will be performed.

DATA MANAGEMENT: As part of the record generation function, the S&R operator will have to define the type of drum received ("I" in the container status field of the waste container table). Once this field has a value entered into it, a number of other values including, container weight limit, container tare weight, volume, etc will be filled in by the DMS.

3.1.3.2 Empty Drum Storage

Once the empty drums have been accepted by the WRAP 1 facility, as noted by the generation of drum records in the PCS and DMS databases, the fork lift operator will scan a bar code (using bar code reader 12-NE-101) to fix the bar code position at the WRAP 1 Empty Drum Storage Area and key the PCS to expect PIN bar codes to follow. The operator will then scan the bar code for each empty drum that is transported to the Empty Drum Storage Area. The initial location bar code and all empty drums bar codes scanned will be maintained in a temporary file in the PCS. Upon scanning the final empty drum bar code, the operator will scan a termination bar code to note that he has completed his scanning operation. When the termination bar code is scanned to note that the storage function is complete, the PCS will update its database for the new drum locations and transmit all empty drum PINs and the Empty Drum Storage location to the DMS.

PCS ACTIVITIES: A bar code ("2Y" data identifier with location "EMPSTR") is read to fix the bar code reader location. The PCS will recognize the "2Y" as a location designator, "strip" it from the bar code, and record "EMPSTR" as the drum location in a temporary file. Reading this bar code also keys the PCS to expect additional drum bar codes ("S" data identifier followed by a container PIN). The drum PINs will be entered into this same temporary PCS file.

Reading the termination bar code ("Y" data identifier with command "END&TRNSMT") will confirm termination of the empty drum storage process.

Again the data identifier is "stripped" from the bar code. This bar code keys the PCS to record the new location for the identified empty drums and transmit the location and empty drum PIN data to the DMS for drum location updating.

DATA MANAGEMENT: The DMS will update the waste container table with the "EMPSTR" location information. The date and time the relocation occurred will also be recorded. The data currently in the waste container table will be transferred to the relocation history table as the new location is

identified. The relocation history table will be updated with the drum PINs, locations, dates, and times as the container is processed through the facility.

SPEC REFERENCES: 13462-14, Table 1.7

3.1.3.3 Empty Drum Transfer to Infeed Conveyor

The Processing Area 85-gallon empty drum conveyor, 107-09-CV-203 (see AGV spec 14510, App D), will be required to be loaded approximately every three days. The 55-gallon OT conveyor, 107-09-CV-204, will need to be loaded approximately every 4 hours. Based on these needs, it is assumed that the infeed of empty drums to the Processing Area will be handled similar to the other general supplies required for process support; i.e. a Control Room operator will monitor the supply available in the Processing Area and will contact the S&R operator (via WRAP communication system) when 55 or 85-gallon drums are required to be accessed into the Processing Area. This scenario assumes that the empty drum infeed conveyor 101-05-CV-105 will normally contain a minimal number of drums such that the response to this call for drums can be timely.

The PCS shall have three different routings designated for drums leaving the empty drum infeed conveyor (one for 55-gallon E/E drums, one for 55-gallon One Trip drums, and one for 85-gallon D&S drums). The primary routing will route the 55-gallon One Trip drums from the infeed conveyor to 107-09-CV-204. The secondary routing will take the 85-gallon drums from the empty drum infeed conveyor to 107-09-CV-203. The last route designation will route 55-gallon E/E drums from the empty drum infeed conveyor to the LLW RWM exit port (2/week).

Control Room personnel will control this routing designation via the PCS or AGVCS. Drums contained on the Process Area empty drum conveyors (107-09-CV-203 & 204) are considered in storage until their bar codes are read at the process gloveboxes.

Upon receiving a request for empty drums, the S&R forklift operator will pick up the pallet of empty drums as identified (55 or 85). The pallet of drums will be delivered to the jib crane 101-CR-05-102A area. There the pallet band is removed and the drums lifted onto the conveyor using a jib crane. The jib crane operator will place the empty drums on the infeed conveyor. Only one size of drums will be on each pallet, therefore the entire pallet will be loaded onto the conveyor. A specific sequence for loading is not required. This process is continued until the conveyor is full or all drums that are needed are loaded on the conveyor.

The empty drums are indexed down the conveyor until they get to position #9. Note: the drum bar codes and locations have not been updated, the empty drum storage location and all infeed conveyor positions are considered part of the empty drum storage location.

PCS ACTIVITIES: There is no PCS interface associated with this function. The empty drum are still considered to be in a stored condition. All functions are manual.

DATA MANAGEMENT: None

OPEN ISSUES: SII to determine the method for revising the drum routing designation for the empty drums (PCS or AGVCS?)

SPEC REFERENCES: 13462-Table 1.7, 14510 - APP D

3.1.3.4 Transferring Empty Drums to AGV

Once an empty drum is indexed to position #9 on the Empty Drum Infeed Conveyor (101-CV-05-105), the PCS will communicate to the AGV controller that an empty drum is available to be picked up. The PCS and AGV will process the transfer of the drum in accordance with specification sections 13462 and 14510.

PCS ACTIVITIES: The PCS will access the process route designation (See Appendix D) entered for transferring drums from the empty drum conveyor and provide this information to the AGVCS. The AGVCS shall determine the priority for transferring the drum. There are no DMS/PCS interfaces as the empty drum location will be maintained as "Empty drum storage".

DATA MANAGEMENT: The DMS will maintain "empty drum storage" as the empty drum location in the DMS. Empty drum storage will include the storage location in the S&R Area, the empty drum infeed conveyor and the empty drum staging conveyors in the Process Area.

OPEN ISSUES: Issue: There is no method for establishing the drum position on the infeed conveyor. Need to read bar codes somewhere on the empty drum conveyor to identify to the PCS; otherwise the type of drum at a given location in the plant is never established until its bar code is read at the glovebox entry port. Drum type will determine the process routing of the empty drum.
Resolution: Three drum routes will be defined for the empty drum routing; one for 55-gallon One Trip, one for 55-gallon E/E, and one for 85-gallon drums. As noted above, until the empty drum bar code is read at the glovebox, the drums will be considered to be in storage.

SPEC REFERENCES: 13462-Table 1.7

3.2 NDE/NDA AREA INTERNAL TRANSPORT

All waste drums received are subjected to NDE/NDA to ensure compliance with waste certification requirements and to determine appropriate methods for processing non-complaint waste present in the received waste drums. Based on the Functional Design Criteria for the W113 Retrieval Project, it is anticipated that the original NDE & NDA requirements for WRAP 1 will change and, therefore, the PCS shall have the flexibility to readily modify the routing designations for the various waste streams.

3.2.1 WRAP 1 Incoming Waste Containers

The *incoming* feed to the NDE/NDA area consists of:

- a) Uncertified retrieved TRU and LLW drums
- b) Generator certified (but unverified) newly generated drums
- c) Empty drums required to support processing (no NDE/NDA performed)

The NDE/NDA internal transport system transports the drums among the various NDE/NDA stations based on predefined routing contained in the AGVCS.

3.2.1.1 Waste Drum Transfer to NDE/NDA Area

The current version of the technical specifications call for the waste containers to be transferred from the S&R Infeed Conveyor 101-CV-05-101B to the NDE units, Passive Active Neutron Assay (PAN) units, Gamma Energy Assay (GEA) units, and finally into the Processing Area or back to the S&R Area. The PCS will have the process route designations downloaded from the DMS at the time the drums are accepted in WRAP 1. For normal operations, the PCS shall track the location of the waste containers as they are transferred along the predefined process routings. The predefined routings shall be a part of the PCS and AGVCS software. The PCS shall communicate to the AGVCS the next locations the drums are required to be transferred to until the drum is received by the first NDE/NDA component. Once the drum is received by an NDE/NDA component, the AGVCS shall control the routing of the drum among the NDE/NDA components. The PCS will again control the routing once the final NDE/NDA exam is complete. The PCS shall update the DMS each time the AGV transfers a waste drum to a new location.

Upon receipt of the NDE/NDA component's confirmation that the drum was successfully transferred, the PCS shall send a message to the DMS noting the new location of the waste drum. The DMS will update it's database for the new location identified along with a date and time stamp.

This sequence of actions between the PCS and DMS will occur for transfers to the PAN and GEA units as well.

PCS ACTIVITIES: Upon receiving a confirmation signal from the NDE/NDA components that a drum transfer has been completed successfully (See 13462, Table 2.2; e.g. ND-06-104A/PS), the PCS shall transmit the drum PIN CHAR(14) and new location (e.g. NDE-E (eastern NDE unit), PAN-W (western PAN unit), etc) to the DMS.

DATA MANAGEMENT: The DMS will log the NDE/NDA component ID in the location field CHAR(10) field of the waste container table for each drum PIN, CHAR(14), received from the PCS. The date and time the relocation occurred will also be recorded. The data currently in the waste container table will be transferred to the relocation history table as the new location is identified. The relocation history table will be updated with the drum PINs, locations, dates, and times as the waste is processed through the facility.

DMS will provide for revision of the secondary waste type designation.

UPSET CONDITIONS: NDA determination that waste has been incorrectly identified (e.g. waste assays as TRU waste vs. LLW classification). Resolution: A DMS "pop-up" message shall be generated which will require operator intervention (revision of the process routing prior to proceeding with the drum transfers) PCS shall provide the capability to revise the process route designation for the waste drums. New route designation will pick up from the current location of the waste drum.

SPEC REFERENCES: 13462 - 1.04.A.2.b, Table 2.2, Table 2.3

3.2.1.2 Empty Drum Transfer to NDE/NDA Area

Empty drums will be transferred directly from the empty drum infeed conveyor 101-CV-05-105 to the NDE/NDA airlock conveyor 104-CV-09-103A. The PCS will have the empty drum routing preset (either conveyor 107-CV-09-203, 107-CV-09-204, or the LLW RWM 55-gallon Entry/Exit transfer port (107-LT-09-201E). The predefined routings shall be part of the PCS software. The PCS shall communicate to the AGVCS the next location the drums are required to be transferred to. The processing of the drums once the drum is received on conveyor 104-CV-09-103A is discussed in section 3.7 as part of the Processing Area Internal Transport System.

3.2.1.3 Drum Transfer to NDE/NDA Carousel

Upon completion of the GEA examinations for incoming waste drums, the PCS shall determine (via process route designations) if the next location is either the S&R discharge conveyor 101-CV-05-102 (see paragraph 3.2.2 - Outgoing Waste Containers) or the NDE/NDA airlock conveyor 104-CV-09-103A.

For drums to be accessed to the airlock conveyor, the PCS shall verify that the destination in the Process Area (either the appropriate entry glovebox or the RWM carousel -- limit of four drums pending processing) are available for transfer of the drummed waste (see section 3.7 - Process Area Internal Transport). If none of the destinations are available, the PCS shall initiate the steps required to store the drummed waste into the NDE/NDA storage carousel 104-CV-09-102.

PCS ACTIVITIES: Upon receiving a signal from the AGV (See 13462, Table 2.2; "Drum Dropped Off at Drum Storage Carousel 104-CV-09-102", the PCS shall transmit the drum PIN CHAR(14) and new location "N/NCRSL to the DMS.

DATA MANAGEMENT: The DMS will log the "N/NCRSL" in the location field CHAR (10) field of the waste container table for each drum PIN, CHAR(14), received from the PCS. The date and time the relocation occurred will also be recorded. The data currently in the waste container table will be transferred to the relocation history table as the new location is identified. The relocation history table will be updated with the drum PINs, locations, dates, and times as the waste is processed through the facility.

OPEN ISSUES: Issue: Only the outgoing waste will be stored in the NDE/NDA carousel per original design.
Resolution: The NDE/NDA carousel will not be required to be used to store incoming wastes since the RWM carousel was modelled in the T&M study to have six "processing" drum positions and 18 drum positions reserved for RWM processing. [The six processing positions will be used for processing (4 positions) and empty 85-gallon E/E drum storage (2 positions)]. This model supported WRAP operations per the model, however, CR#105 provides for use of the NDE/NDA Buffer Carousel (average capacity of 2) as a third default location.

SPEC REFERENCES: 13462 - Table 2.2, 2.4, 2.5, and 2.6

3.2.1.4 Verification Drum Transfer in NDE/NDA Area

Two verification "pink" drums which contain mixtures of known isotopic concentration will be stored in the NDE/NDA Area. Because these drums contain contaminated waste matrices, they will be stored in the shielded NDE/NDA carousel. The drums will be removed from the carousel twice a day; at the start of each shift and at the end of each shift. The drums will be processed through the PAN and GEA components to verify the calibration of the units. The drums will be transferred from the carousel to the PAN units, GEA units, and back to the carousel. As the transfers are completed at each of these locations and the PCS receives a signal from the NDA components that the

transfer is complete, the PCS shall transmit the new drum location to the DMS. The DMS will update its database as noted in paragraphs 3.2.1.1 and 3.2.1.3.

3.2.1.5 Background Drum Transfer in NDE/NDA Area

Two background "white" drums which contain waste matrices which are "clean" or only have extremely low levels of contamination will be stored on the background drum storage conveyors 104-CV-09-105A & B. The drums will be removed from the conveyors each morning at the start of each shift. The drums will be processed through the PAN and GEA components to verify the facility background levels have not changed significantly since the last background check. As the transfers are completed at each of these locations and the PCS receives a signal from the NDA components that the transfer is complete, the PCS shall transmit the new drum location to the DMS. The DMS will update its database as noted in paragraphs 3.2.1.1 and 3.2.1.3 with locations "BDCVYR-A" and "BDCVYR-B".

3.2.2 WRAP 1 Outgoing Waste Containers

The *outgoing* feed for the NDE/NDA area consists of:

- a) Processed TRU and LLW drums
- b) Empty drums generated in the Processing Area
- c) Generator certified (and verified) newly generated drums

3.2.2.1 Drum Transfer from NDE/NDA Airlock

Operations personnel in the Process Area will generate drums of waste and load the product drums at glovebox bagless transfer ports. Prior to releasing the drums from the glovebox, the glovebox operators will verify that all appropriate waste data has been entered into the DMS during drum processing, drum surveys have been completed satisfactorily, and the appropriate drum labels have been applied.

The new drum route designation (based on originating location) will be contained in the PCS to allow the PCS to control the transfer of drums from the Processing Area back to the airlock conveyor system and on to the NDE/NDA Area AGV (see sections 3.7-3.11)

Drums removed from the airlock will be monitored and tracked by the PCS and AGV systems, however, there will not be any PCS-DMS interfaces as the DMS will only be updated when a drum is transferred to a new location; not when it is transferred from a location. All material transfer actions up to and including the transfer of the drum from the airlock conveyor onto the AGV are covered under section 3.7

PCS ACTIVITIES: None, all interfaces are between the PCS, AGV, and airlock conveyors

DATA MANAGEMENT: No PCS/DMS interfaces exist for the operation of transferring the waste from the airlock conveyors

Drums coming from the Processing Area to the NDE/NDA Area include: 55-gallon OT drums containing TRU waste, 85-gallon E/E drums containing LLW and LLMW, excess 85-gallon E/E drums, and 85-gallon D&S drums containing empty TRU drum pucks. Those drums which contain compacted wastes (85-gallon D&S from the TRU enclosure and the 85-gallon E/E from the LLW enclosure) will not receive an NDE examination upon exiting the Processing Area. These drums will be sent to a PAN unit, GEA unit, and then on to the S&R Area discharge conveyor. All other wastes will be transferred to an NDE unit, PAN unit, GEA unit, and then on to the S&R discharge conveyor. Empty drums will be transported directly through the NDE/NDA Area to the S&R discharge conveyor.

The PCS system will determine if the NDE/NDA destination for the drum currently on conveyor 104-CV-09-103B is available for drum delivery. If the NDE/NDA component is occupied, the AGV will act as a "bridge" to facilitate the transfer of the waste drum from the airlock conveyor to the NDE/NDA carousel conveyor. Upon notification by the carousel that the drum has been received, the PCS will update the location of the drum within its database and send the applicable data to the DMS for updating the DMS database. The PCS shall also communicate to the AGVCS that the drum in the carousel is available for retrieval (drum pickup request at 104-CV-09-102).

PCS ACTIVITIES: Upon receiving a signal from the AGV (See 13462, Table 2.2; "Drum Dropped Off at Drum Storage Carousel 104-CV-09-102", the PCS shall transmit the drum PIN CHAR(14) and new location "N/NCRSL" to the DMS.

DATA MANAGEMENT: The DMS will log the "N/NCRSL" in the location field CHAR (10) field of the waste container table for each drum PIN, CHAR(14), received from the PCS. The date and time the relocation occurred will also be recorded. The data currently in the waste container table will be transferred to the relocation history table as the new location is identified. The relocation history table will be updated with the drum PINs, locations, dates, and times as the waste is processed through the facility.

SPEC REFERENCES: 13462 - Table 2.2, 2.4, 2.5, and 2.6

3.2.2.2 Drum Transfer through the NDE/NDA Area

Drums will be removed from the NDE/NDA carousel and the airlock conveyors as NDE and NDA units are available for processing the waste. Empty drums will be removed as space is available at the S&R discharge conveyor 101-CV-05-102. As noted in paragraph 3.2.2.1, the PCS will determine the process routing for the

drums based on their originating location. Drums will be processed through the NDE/NDA Area and the PCS and DMS updated as noted in sections 3.2.1.1 and 3.3-3.6. The AGVCS will control the routing of the drums among the NDE/NDA components.

3.2.2.3 Drum Transfer from NDE/NDA Area

Empty drums and drummed wastes in WRAP 1 will be returned to the Shipping Area via the automatically controlled door in the northwest corner of the S&R Area. The drums will be delivered to the S&R discharge conveyor 101-CV-05-102 by an AGV. The drum routings contained in the PCS will direct the AGV to deliver the waste drums to the discharge conveyor upon completion of the NDE/NDA examinations.

As the drums are transferred from the AGV to the S&R Area discharge conveyor, the AGV and PCS initiate communication to effect a transfer to the S&R discharge conveyor. Upon receipt of the discharge conveyor's confirmation that the drum was successfully transferred ("Drum Received"), the PCS shall send a message to the DMS noting the new location of the waste drum. The DMS will update it's database for the new location identified.

PCS ACTIVITIES: Upon receiving a signal from the discharge conveyor (See 13462, Table 15.2; step 7), the PCS shall transmit the drum PIN CHAR(14) and new location ("DISCHCVR") to the DMS.

DATA MANAGEMENT: The DMS will log "DISCHCVR" in the location field CHAR(10) field of the waste container table for the drum PIN, CHAR(14), received from the PCS. The date and time the relocation occurred will also be recorded. The data currently in the waste container table will be transferred to the relocation history table as the new location is identified. The relocation history table will be updated with the drum PINs, locations, dates, and times as the waste is processed through the facility.

SPEC REFERENCES: 13462 - Table 2.2, 15.1, and 15.2

3.3 OPERATE DRUM NDE

The drum NDE operations are initiated at the point where a drum has been accepted into the vault and all internal interlocks have been satisfied to allow the examination to proceed. An initial screening of the drum will be performed by the completion of a linear array examination. If non-compliant waste is suspected, this examination will be followed by an RTR exam which will concentrate on those suspect areas of the drum. A video tape will be made of each container, and the operator can make voice comments onto the video tape. All operations within the NDE station are either automatic or remote manual from an operator console in the control room. To ensure a complete scan, the control room operator, through the PCS, must be capable of

commanding the drum RTR unit to rotate, raise, and lower the drum. The operator must also be able to increase or decrease the power to evaluate different waste items.

To obtain access to the required DMS functions during NDE exams, the operator will cue off a DMS Icon from the PCS screen. Using this icon will provide an NDE menu which the operator may use to pull up the appropriate DMS screens for NDE operations. During NDE exams, the Control Room operator inputs examination data into the data base file of the drum. The NDE operator will utilize a "split" screen to provide access to a DMS data entry screen while maintaining applicable PCS data (such as NDE status and alarms) in the "background". The data base file is stored on the DMS computer. The Control Room operator then informs the PCS that the drum NDE is complete.

PCS ACTIVITIES: The only PCS/DMS interface to be provided will be the use of a DMS Icon on the PCS screen to access a DMS menu for NDE functions. PCS to DMS identification of the drum upon acceptance into the NDE station is discussed in the "NDE/NDA Internal Transport" section.

DATA MANAGEMENT: The DMS menu for NDE operations will be accessed via an icon on the PCS screen. From the DMS menu, the operator will determine the screens that will be required to support NDE operations.

The DMS controls the data base for the drum from the time the drum is accepted into WRAP. During NDE examinations, the Control Room operator inputs examination data into the data base file of the drum. This data will include descriptive data as required to support certification, VHS tape number, inspection start/stop footage, and the WRAP VHS tape storage location. The data base file is stored on the DMS computer.

SPEC REFERENCES: 13462-66, 13532-34

3.4 OPERATE DRUM PAN

A drum has been accepted into the vault and all internal interlocks have been satisfied to allow the examination to proceed. The drum PAN assay units combine active and passive neutron counting methods to detect and measure the quantity of U, Pu, Np, Cm, Am and Cf isotopes. These stations shall determine low-level/TRU activity of 55 and 85-gallon drums.

The active neutron assay primarily provides the information used to sort and categorize the waste as either TRU (>100 nCi/g) or LLW (≤ 100 Nci/g). The active portion of the PAN system shall utilize a neutron generator to provide short (5-10 μ sec) bursts of neutrons to "interrogate" the waste. The passive portion of the PAN system shall use high-efficiency neutron detectors and coincidence counting techniques to quantify the number of time related

neutrons being emitted by spontaneous fissioning isotopes such as Pu-240. This side of the counting equipment shall be utilized for those drums which are determined by active neutron interrogation to be TRU waste, and will produce a "Pu-240 equivalent" value which can then be combined with the characterization data to give a total Pu content.

While NDA exams will routinely be performed without operator intervention, the operator may obtain access to the required DMS functions during NDA exams via, a DMS icon on the PCS screen. Using this icon will provide an NDA menu which the operator may use to pull up the appropriate DMS screens for NDA operations. The NDA operator will utilize a "split" screen to provide access to a DMS data entry screen while maintaining applicable PCS data (such as NDA status and alarms) in the "background".

PCS ACTIVITIES: The only PCS/DMS interface to be provided will be the use of a DMS icon on the PCS screen to access a DMS menu for NDA functions. PCS to DMS identification of the drum upon acceptance into the NDA station is discussed in the "NDE/NDA Internal Transport" section.

DATA MANAGEMENT: The DMS menu for NDA operations will be accessed via an icon on the PCS screen. From the DMS menu, the operator will determine the screens that will be required to support NDA operations.

Data management functions associated with the operation of the PAN occur primarily between the DMS and the PAN via the System Integration Equipment (SIE) as described in section 5.0.

SPEC REFERENCES: 13462-Tables 4.1-4.4; 13538-Tables 3-5

3.5 OPERATE DRUM GEA

A drum has been accepted into the vault and all internal interlocks have been satisfied to allow the examination to proceed. The Gamma Energy Assay (GEA) units (ND-06-102 A/B) shall be provided to obtain isotopic information about the waste in each 55 or 85-gallon drum assayed. The GEA units shall assay U-233, Pu isotopes, Np-237, Am-241, Am-243, U-235 and fission/activation products. Assays shall be performed in segments along the drum vertical axis and cycled through the required segment heights with computer-controlled electronic motors and precision mechanical turntable/elevator hardware in order to achieve segmented measurements.

While NDA exams will routinely be performed without operator intervention, the operator may obtain access to the required DMS functions during NDA exams via, a DMS Icon on the PCS screen. Using this icon will provide an NDA menu which the operator may use to pull up the appropriate DMS screens for NDA operations. The NDA operator will utilize a "split" screen to provide access

to a DMS data entry screen while maintaining applicable PCS data (such as NDA status and alarms) in the "background".

PCS ACTIVITIES: The only PCS/DMS interface to be provided will be the use of a DMS Icon on the PCS screen to access a DMS menu for NDA functions. PCS to DMS identification of the drum upon acceptance into the NDA station is discussed in the "NDE/NDA Internal Transport" section.

DATA MANAGEMENT: The DMS menu for NDA operations will be accessed via an icon on the PCS screen. From the DMS menu, the operator will determine the screens that will be required to support NDA operations.

Data management functions associated with the operation of the GEA occur primarily between the DMS and the GEA via the SIE as described in section 5.0.

SPEC REFERENCES: 13462-Tables 5.1-5.4 13537-Tables 2-5

3.6 CHARACTERIZE AND CERTIFY DRUMS

The facility DMS will download characterization data to the SIE. The SIE in turn will use this characterization data to support both PAN and GEA assay functions. The SIE will evaluate both the PAN and GEA assay data and will provide summary level information/reports back to the DMS which will ultimately upload the data to the SWITS database.

The drum SIE will be used to integrate data from the PAN and the GEA stations to identify containers that do not meet radiological requirements such as fissile material limits, and "flag" those containers on the Data Management System for opening/sorting to remove the non-compliant item(s). Those containers for which non-compliant conditions have not been detected by NDE or NDA may be routed to shipping as certifiable. The interface of the SIE to the PMS is through an Ethernet link onto the WLAN. The SIE will mainly communicate with the DMS to provide certification data for preparation of documentation required by the Waste Acceptance Criteria (WAC) for Hanford and WIPP.

While NDA exams will routinely be performed without operator intervention, the operator may obtain access to the required DMS functions during NDA exams via, a DMS Icon on the PCS screen. Using this icon will provide an NDA menu which the operator may use to pull up the appropriate DMS screens for NDA operations. The NDA operator will utilize a "split" screen to provide access to a DMS data entry screen while maintaining applicable PCS data (such as NDA status and alarms) in the "background".

PCS ACTIVITIES: The only PCS/DMS interface to be provided will be the use of a DMS icon on the PCS screen to access a DMS menu for NDA functions. PCS to DMS identification of the drum upon

acceptance into the NDA station is discussed in the "NDE/NDA Internal Transport" section. Confirmation of drum PIN to be assayed is covered under section 3.2, NDE/NDA Internal Transport System.

DATA MANAGEMENT: The DMS menu for NDA operations will be accessed via an icon on the PCS screen. From the DMS menu, the operator will determine the screens that will be required to support NDA operations. Data Management functions for the SIE interface are covered under section 5.3, "Characterize and Certify Drums".

SPEC REFERENCES: 13462-Table 6.1 through 6.3

3.7 PROCESS AREA INTERNAL TRANSPORT SYSTEM

Note: Sections 3.7.1 and 3.7.2 are written for the normal operating mode with the "A" conveyors feeding the Process Area and the "B" conveyors feeding the NDE/NDA Area. If these conveyors are operated in the reverse direction, applicable location messages shall be transmitted from the PCS to the DMS.

3.7.1 Drum Transfer Through Airlock Conveyors to the Process Area

The PCS notes that conveyor 104-CV-09-103A is available for drum drop off and provides this information to the NDE/NDA Area AGV. As a drum becomes available and the drop off request becomes a priority for the AGV, the PCS/AGV initiate a transfer of a drum to the airlock conveyor feeding the Process Area.

Upon receipt of the "Transfer Complete" signal at conveyor 104-CV-09-103A, the PCS shall send a message to the DMS noting the new location of the waste drum. The DMS will update it's database for the new location identified.

PCS ACTIVITIES: Upon sending a confirmation signal to the AGV, "Transfer Complete", the PCS shall transmit the drum PIN CHAR(14) and new location (AIRCVR_A1) to the DMS.

DATA MANAGEMENT: The DMS will log the airlock conveyor in the location field CHAR(10) field of the waste container table for each drum PIN, CHAR(14), received from the PCS. The date and time the relocation occurred will also be recorded. The data currently in the waste container table will be transferred to the relocation history table as the new location is identified. The relocation history table will be updated with the drum PINs, locations, dates, and times as the container is processed through the facility.

SPEC REFERENCES: Spec 13462, Table 7.3, Part 1, AGV to Conveyor 104-CV-09-103A, step 11

After PCS interlocks for operating the airlock conveyors and doors have been satisfied, the PCS shall initiate the transfer of the drum from conveyor 104-CV-09-103A to 104-CV-09-104A.

Upon receipt of the "Transfer Complete" signal at conveyor 104-CV-09-104A, the PCS shall send a message to the DMS noting the new location of the waste drum. The DMS will update it's database for the new location identified.

PCS ACTIVITIES: Upon sending a confirmation signal to the AGV, "Transfer Complete", the PCS shall transmit the drum PIN CHAR(14) and new location (AIRCVR_A2) to the DMS.

DATA MANAGEMENT: The DMS will log the airlock conveyor in the location field CHAR(10) field of the waste container table for each drum PIN CHAR(14), received from the PCS. The date and time the relocation occurred will also be recorded. The data currently in the waste container table will be transferred to the relocation history table as the new location is identified. The relocation history table will be updated with the drum PINs, locations, dates, and times as the container is processed through the facility.

SPEC REFERENCES: SPEC REFERENCES: Spec 13462, Table 7.3, Part 1, Conveyor 104-CV-09-103A to Conveyor 104-CV-09-104A, step 10

After PCS interlocks for operating the airlock conveyors and doors have been satisfied, the PCS shall initiate the transfer of the drum from conveyor 104-CV-09-104A to 104-CV-09-201A.

Upon receipt of the "Transfer Complete" signal at conveyor 104-CV-09-201A, the PCS shall send a message to the DMS noting the new location of the waste drum. The DMS will update it's database for the new location identified.

PCS ACTIVITIES: Upon sending a confirmation signal to the AGV, "Transfer Complete", the PCS shall transmit the drum PIN CHAR(14) and new location (AIRCVR_A3) to the DMS.

DATA MANAGEMENT: The DMS will log the airlock conveyor in the location field CHAR(10) field of the waste container table for each drum PIN CHAR(14), received from the PCS. The date and time the relocation occurred will also be recorded. The data currently in the waste container table will be transferred to the relocation history table as the new location is identified. The relocation history table will be updated with the drum PINs, locations, dates, and times as the container is processed through the facility.

SPEC REFERENCES: SPEC REFERENCES: Spec 13462, Table 7.3, Part 1, Conveyor 104-CV-09-104A to Conveyor 104-CV-09-201A, step 10

3.7.2 Drum Transfer Through Airlock Conveyors to the NDE/NDA Area

Transfers of waste drums from the Process Area to the NDE/NDA Area are handled identical to those described above for transfers to the Process Area. The transfers to the NDE/NDA Area will normally occur on the "B" airlock train. The only other difference is at the conveyor on the Process Area side of the airlock. When the AGV drops off a drum at this location and the transfer is confirmed by the PCS, the PCS shall use the conveyor weight scale to record the certification weight for the processed waste drum and transfer this data to the DMS.

PCS ACTIVITIES: Upon sending a confirmation signal to the AGV, "Transfer Complete", the PCS shall transmit the drum PIN, new location (AIRCVR_B1), and drum certification weight to the DMS.

DATA MANAGEMENT: The DMS will log the airlock conveyor in the location field CHAR(10) field of the waste container table for each drum PIN, CHAR(14), received from the PCS. The certification weight will also be logged in the Certification Weight NUMBER(10,2) field. The date and time the relocation occurred will also be recorded. The data currently in the waste container table will be transferred to the relocation history table as the new location is identified. The relocation history table will be updated with the drum PINs, locations, dates, and times as the container is processed through the facility.

Subsequent transfers through the airlocks involving conveyors CV-09-104B and CV-09-103B will occur along with the associated PCS location (AIRCVR B2 & AIRCVR B3) updates and location data transmittals to the DMS as noted in section 3.7.1.

3.7.3 Drum Storage in the RWM Carousel

The RWM Storage Carousel (107-CV-09-202) in the Processing Area of WRAP 1 provides buffer storage for four separate functions; RWM drums awaiting sample results, empty RWM drums awaiting access to the LLW and TRU glovebox RWM transfer port, waste drums awaiting access to the LLW and TRU gloveboxes, empty overpack drums from the LLW and TRU gloveboxes awaiting access to the LLW exit or LLW RWM exit gloveboxes.

As drums are transferred to the RWM Storage Carousel and the PCS verifies that the transfer is complete, the PCS shall update the DMS with the drum PIN and RWM Storage Carousel location.

The PCS shall track the drum locations and their ultimate destination in various manners dependant upon the final destination of the drum.

1. For those RWM drums awaiting sample results prior to processing in a RWM glovebox or empty RWM transfer drums awaiting access to the main LLW and TRU gloveboxes, the PCS shall status the drum location as the RWM carousel. The Internal Transport operator shall coordinate the transfer of drums from the RWM Carousel to the Process Area gloveboxes on an as-needed basis. The Internal Transport operator shall add drums in the RWM Storage Carousel to the AGV request listing based on the drum type and status (empty drum, drum sample results available, etc). The AGV input will include the destination of the drum upon removal from the RWM Storage Carousel.
2. For waste drums pending processing in the TRU and LLW gloveboxes (lift table destinations 107-LT-09-202A & 107-LT-09-202B) and empty drums awaiting transfer to the LLW RWM and LLW exit gloveboxes (lift tables 107-LT-09-201D or 107-LT-09-202C) the PCS shall automatically add the drum PIN numbers and destinations to the pick list when the drums are transferred to the RWM Storage Carousel

PCS ACTIVITIES: When the carousel send a "Transfer Complete" message to the AGV, the PCS shall log the new drum location and transmit the drum PIN, new location (RWM CRSL), to the DMS. Additionally, for those drums transferred from the airlock conveyors or the LLW and TRU entry gloveboxes, the PCS shall record the lift table destination for the drum in the carousel pick list.

DATA MANAGEMENT: The DMS will log the RWM Storage Carousel in the location field CHAR(10) field of the waste container table for each drum PIN, CHAR(14), received from the PCS. The date and time the relocation occurred will also be recorded. The data currently in the waste container table will be transferred to the relocation history table as the new location is identified. The relocation history table will be updated with the drum PINs, locations, dates, and times as the container is processed through the facility.

3.7.4 Drum Retrieval from the RWM Carousel

As Process Area glovebox drum access port become available for drum transfers they will provide "drum drop off requests" to the PCS. The PCS shall search the RWM Storage Carousel pick list for drums to fulfill the glovebox requests (Note: drums on the airlock conveyors may also fulfill these requests). Once a drum has been identified on the RWM Storage Carousel pick list, the PCS shall request that the carousel retrieve the drum. The carousel will retrieve the waste drum and transfer it to the AGV. The AGV will then transfer the waste drum to the designated destination.

PCS ACTIVITIES: All communication to support the retrieval of drums from the RWM Storage Carousel is internal to the PCS. No PCS/DMS communications will occur until the drum is delivered to a new destination.

3.7.5 Drum Transfer to RWM Gloveboxes

The Process Area AGV will transfer drums to the RWM gloveboxes as RWM entry ports are available and requests are made to transfer drums from the RWM carousel to the gloveboxes (see 3.7.3). As part of this transfer operation, the PCS notes "Transfer Complete" to the AGV. Upon issuing this message, the PCS will update its location record for the drum and transfers the new location to the DMS for the drum.

PCS ACTIVITIES: Upon sending a confirmation signal to the AGV, "Transfer Complete", the PCS shall transmit the drum PIN CHAR(14) and new location (LLRWMENTRY, LLRWMCMPLT, LLRWEXIT, TRURWMENTRY, TRURWCMPLT, or TRURWEXIT) to the DMS.

DATA MANAGEMENT: The DMS will log the glovebox location in the location field CHAR(10) field of the waste container table for each drum PIN, CHAR(14), received from the PCS. The date and time the relocation occurred will also be recorded. The data currently in the waste container table will be transferred to the relocation history table as the new location is identified. The relocation history table will be updated with the drum PINs, locations, dates, and times as the container is processed through the facility.

3.7.6 Drum Transfer from RWM Gloveboxes

As noted previously, the DMS drum locations will only be updated as drums are delivered to locations. Therefore, there will be no PCS/DMS interface when drums are removed from the RWM gloveboxes.

THE HANDLING AND ROUTING OF THE EMPTY OVERPACKS GENERATED FROM THE LLW AND TRU ENTRY GLOVEBOXES IS COVERED IN SECTIONS 3.8 AND 3.10. THE ROUTING OF THE DRUMS IS HANDLED INTERNAL TO THE PCS AND DOES NOT INVOLVE A PCS/DMS INTERFACE.

3.7.7 Drum Transfer to LLW and TRU Gloveboxes

The Process Area AGV will transfer drums to the LLW and TRU gloveboxes. As part of this transfer operation, the PCS notes "Transfer Complete" to the AGV. Upon issuing this message, the PCS will update its location record for the drum and transfers the new location to the DMS for the drum.

PCS ACTIVITIES: Upon sending a confirmation signal to the AGV, "Transfer Complete", the PCS shall transmit the drum PIN CHAR(14) and

new location (LLW ENTRY, LLW RWMPRT, LLW EXIT, TRU ENTRY, TRU COMPCT, TRU_RWMPRT, TRU_LDOUT1, or TRU_LDOUT2) to the DMS.

DATA MANAGEMENT: The DMS will log the glovebox location in the location field CHAR(10) of the waste container table for each drum PIN, CHAR(14), received from the PCS. The date and time the relocation occurred will also be recorded. The data currently in the waste container table will be transferred to the relocation history table as the new location is identified. The relocation history table will be updated with the drum PINs, locations, dates, and times as the container is processed through the facility.

Once the Process Area operators have received the drum at a glovebox, the operator will read the drum bar code to verify the PCS location. The PCS/DMS interfaces associated with this bar code read are addressed in sections 3.8 thru 3.11.

3.7.8 Drum Transfer from LLW and TRU Gloveboxes

As noted previously, the DMS drum locations will only be updated as drums are delivered to locations. Therefore, there will be no PCS/DMS interface when drums are removed from the LLW and TRU gloveboxes.

3.7.9 Drum Transfer to the Empty Drum Staging Conveyors

Empty drums will be delivered directly from the Shipping and Receiving Infeed Conveyor through the NDE/NDA Area to the appropriate Processing Area Empty Drum Staging Conveyor (107-CV-09-203 [85-gallon drums] or 107-CV-09-204 [55-gallon drums]). A minimum number of drums will be routed to the LLW RWM exit port 107-CV-09-202.

As noted in section 3.1.3, the PCS will maintain a routing from the empty drum infeed conveyor to the 55-gallon drum staging conveyor in the Processing Area. All drums will be routed to this location until an operator in the Central Control Room is notified that another empty drum transfer location will be specified. At the time the operator in the Central Control Room will revise the PCS routing to one of the other two alternate routings.

The Process Area AGV will transfer drums to the Empty Drum Staging Conveyors and the LLW RWM glovebox. As part of this transfer operation, the PCS notes "Transfer Complete" to the AGV.

PCS ACTIVITIES: The bar codes on the empty drums will not be read until they are taken to the "HOLD POINT" to have their lids removed. The drum locations shall be maintained as "Empty drum storage" until this occurs.

DATA MANAGEMENT: No location update occurs at this time for the empty drums

3.7.10 Drum Transfer from the Empty Drum Staging Conveyors

As noted previously, the DMS drum locations will only be updated as drums are delivered to locations. Therefore, there will be no PCS/DMS interface when drums are removed from the Empty Drum Staging Conveyors.

3.8 LLW PROCESS GLOVEBOXES

3.8.1 LLW Entry Glovebox

3.8.1.1 Initialization and Drum Receipt

The process area internal transport has received and acted on the message sent by the PCS and the LLW Process operator that a drum is needed at the LLW Entry glovebox conveyor 107-LT-09-202A. The operator has turned the lift table local panel L-O-R switch to "remote", the limit switches on the lift table indicate that no drum is present, and the table is at AGV height. The AGV delivers the next drum to be processed and commences its handshake with the lift table. Once the delivery is complete, the PCS transmits the location and drum PIN to the DMS.

During this time the entry glovebox equipment is being checked by the PCS for initialization status as a prerequisite to process start. If all of the criteria are met for initialization status then the operator is notified via OIU-12-103A and can proceed to the next step.

After initialization, and the successful delivery of the waste drum (see section 3.7.7), the operator scans the location bar code, drum bar code, and termination bar code using bar code reader 12-NE-310. The PCS will verify that the drum identification and location match that input by the AGV delivery, before any more actions are allowed by the PCS. Once identification and location are verified, the operator will manually remove the clamp band from the overpack drum.

PCS ACTIVITIES: The operator chooses "Auto Mode" and "Initialize System" from OIU-12-103A to begin processing. The PCS then automatically verifies that the switches in the entry glovebox are giving the correct indications for processing to occur. If they are, then "System Initialized" is displayed on the OIU. If not, the message "System Not Initialized" is displayed.

The location bar code ("2Y" data identifier with location "LLW ENTRY") is read to fix the bar code scanner location. The "2Y" is recognized by the PCS as a location designator. Reading this bar code prompts the PCS to expect a drum bar code ("S" data identifier followed by a container PIN) and

record "LLW ENTRY" as the drum location in a temporary file. The drum bar code is then scanned and the PCS compares the current PCS stored value against the actual drum delivered to verify a match. If the PIN numbers match, then operations can continue. If the PIN numbers do not match, the operator will have to access a DMS terminal to review the relocation history record for the drum currently received at the glovebox to verify that PIN is listed as being at the entry glovebox location. The PCS will have to provide the capability to revise the location designation to concur with the DMS listing if it is found to be in error.

Note: This PCS location modification function will have to be provided as a generic function for updating the PCS location should they get out of sync with the actual waste locations.

Then scanning the termination bar code ("Y" data identifier with command -- "END&TRNSMT") will confirm termination of the entry glovebox ID process. The data identifier is "stripped" from the bar code and the bar code keys the PCS that the current activity is complete.

DATA MANAGEMENT: Note that drum location verification discussed above is internal to the PCS. The DMS has previously had the drum location updated in accordance with section 3.7.7 activities.

THERE ARE NO PCS/DMS INTERFACES. THIS STEP ONLY VERIFIES THE PROPER LOCATION HAS BEEN TRACKED IN THE PCS.

UPSET CONDITIONS: Operator bar code scan at drum delivery reveal unmatched drum identifications at entry glovebox. The PCS shall provide an alarm at OIU-12-103A if this occurs and stop entry functions until operator resolves mismatch. Resolution may require modifying the PCS location data as noted above. Upon operator resolution, the entry sequence will be reinitiated via the OIU menu option.

SPEC REFERENCES: 13406 - Appendix A-2
13462 - Table 8.2: 1/1 to 1/End

3.8.1.2 Drum Entry Sequence

The PCS now recognizes that a drum has been successfully received and identified at the LLW entry glovebox. The operator is prompted at OIU-12-103A to choose "Overpack Entry Menu" or "One Drum Entry Menu" depending on whether the drum is overpacked or not. Now the operator selects "Start Entry Sequence" from the current "Drum Entry Menu" on OIU-12-103A. The PCS, after recognizing that the drum is in position, automatically proceeds with the drum

entry sequence. The operator has the ability to "Emergency Stop" the sequence at any step. At this point OIU-12-103A displays, "Drum Entry Sequence Complete".

The operator then prompts the PCS to "Open Port". The PCS automatically mates the drum to the port door, unlocks the port, and opens the overpack drum with the entry port door. The trolley, with attached drum lifter, translates over the overpack drum.

PCS ACTIVITIES: The PCS interfaces solely with the operator during this part of the process. The operator is able to "Emergency Stop" the sequence at any point.

DATA MANAGEMENT: There is no data management associated with this part of the sequence.

SPEC REFERENCES: 13462 - Table 8.2: 2/1 to 3/End

Upon translation of the trolley hoist over the Entry/Exit port the PCS enables the hoist pendant 107-PC-07-001 for operator use. The operator then controls the hoist to lower the drum lifter onto the 55-gallon drum, close the lifter jaws, and begin lifting the drum into the glovebox. Once the drum is high enough to be reached through the gloveports, the operator stops lifting and frisks the top surface of the 55-gallon drum with 12-RE-534 (LLW Line In-Box Frisker) to check for contamination. Then the operator raises the 55-gallon drum to full height and frisks the bottom of the drum for contamination.

Upon lifting the drum to full height, and thus tripping limit switch 07-ZS-702C, the PCS disables the hoist pendant. At this point, the operator selects "Trolley Menu" from OIU-12-103A and translates the drum to the center of the glovebox by selecting "Swab Position". This allows the operator to view the empty 85-gallon overpack, via a TV camera, and check for debris. The operator carries out swab counting of the overpack drum to check for contamination. The operator also verifies the inner drum PIN with that stored by the PCS and DMS via the "Overpack Entry Menu" at the OIU.

The contamination data from the 55-gallon drum and overpack will be used to designate the routing of the overpack drum. The overpack goes to the RWM storage carousel or through the air lock to the Shipping and Receiving area (See Table 7.9 Process Area Internal Transport operation requirement).

PCS ACTIVITIES: The tripping of switch ZS702A (Swab Position) with the hoist trolley, keys the PCS to request the inner drum PIN from the DMS. The inner drum will be tracked separately from the overpack drum. The PCS displays the inner drum PIN on OIU-12-103A for operator verification. The operator visually compares the displayed PIN with the inspected drum PIN and selects "Inner Drum PIN Verified" from the menu if the PINs match. If the PINs do not match, then the operator must solve the problem via the DMS terminal and then select "Inner Drum PIN verified" at the OIU. Once "Inner Drum PIN

Verified" is selected then the drum PIN (CHAR(14)) and location ("LLW ENTRY") are loaded into the new file for the 55-gallon drum. From this point, the current DMS file for the inner drum is handled as a separate drum to be tracked through the LLW glovebox. This drum's location history table is updated according to the position of the inner drum only. The overpack drum is tracked separately.

DATA MANAGEMENT: Upon receipt of the request of the inner drum PIN from the PCS, CHAR(15) the DMS will transmit the PIN and location (LLW ENTRY) for the inner drum to the PCS. The DMS will initiate tracking of the inner drum at the LLW ENTRY location. The date and time the inner drum was removed from the overpack will be recorded in the DMS.

SPEC REFERENCES: 13462 - Table 8.2: 4/1 to 5/End
13462 - Table 7.9 Process Area Internal Transport Operation Requirement

The overpack drum is ready to be detached from the Entry/Exit port. The operator selects the "Overpack Entry Menu" from OIU-12-103A. Based on the contamination data of the 55-gallon and overpack drums, the operator then selects "Close and Relid Clean" or "Close and Relid Contaminated" from OIU-12-103A. Upon making this selection, the PCS shall transmit the drum PIN and contamination status to the DMS. The PCS rotates the port door down and displays "Port Close Sequence in Progress" at OIU-12-103A. The port door is then lowered onto the overpack drum. The PCS de-energizes the port door vacuum system and extends the lid detachment cylinder. The lift table is then lowered back down to its "Drum Centering" height. Once the PCS verifies that the port door is closed, the port door is locked. The PCS then retracts the lid detachment cylinder and releases the drum centering clamps.

The operator then selects "Lower Lift Table" from the "Drum entry Menu". The PCS lowers the table. Once lowered, OIU-12-103A displays "Drum Exit Sequence in Progress". The PCS energizes the lift table conveyor motor until "Drum at End of Conveyor". The operator surveys and decontaminates the top of the overpack. Then the operator switches the lift table to "local" and uses the local control panel 107-PC-07-202A to raise the lift table to "AGV height". At this point the operator switches the lift table control to "remote". The operator manually replaces the clamp band. The operator selects "Drum Ready for Pick Up" from the "Overpack Entry Menu" at OIU-12-103A. This signals the AGV that a drum is ready for pick up.

PCS ACTIVITIES: The PCS interfaces with the operator via OIU-12-103A.

The operator will select "Close and Relid Clean" or "Close and Relid Contaminated". The PCS will determine the proper routing of the overpack drum based upon which menu the operator selects (See Table 7.9 of Specification 13462). The PCS sends the overpack drum PIN, location, and contamination status to the DMS.

DATA MANAGEMENT: The DMS receives the overpack drum PIN CHAR(14), location CHAR(10), and contamination status LOGIC(1) from the PCS. The DMS loads the contamination status into the overpack drum's current file.

SPEC REFERENCES: 13462 - Table 8.2: 6/1 to 6/End

After the overpack drum has successfully detached from the entry glovebox, and is ready for AGV pick-up, the operator selects "Trolley Menu" from OIU-12-103A. Then the operator selects "Transfer Port" and the PCS translates the hoist, with 55-gallon drum attached, over the transfer port for transfer of the drum into the sorting glovebox. Then the operator prompts the PCS to open the transfer port. The operator lowers the 55-gallon drum onto the transfer cart in the sorting glovebox if the PCS indicates that the cart is present below the transfer port. When the cart is present, the hoist pendant is enabled and the operator is notified via OIU-12-103A. The operator releases the drum lifter jaws, raises the drum lifter back to its fully raised position, and prompts the PCS to close the drum transfer port. The PCS notifies the operator that "Drum Transfer Sequence Completed" and the PCS automatically checks initialization status of the entry glovebox. The status of the glovebox is displayed on OIU-12-103A.

PCS ACTIVITIES: The PCS interfaces solely with the operator during this step.

DATA MANAGEMENT: No data is entered via the DMS terminal during this step. No data management occurs during this step.

SPEC REFERENCES: 13462 - Table 8.2: 7/1 to 10/End

3.8.2 LLW Sorting Glovebox

3.8.2.1 Initialization

Once the 55-gallon drum has successfully been transferred to the sorting glovebox, the initialization process begins. The PCS performs a system check of the sorting glovebox equipment to verify that processes can begin. Once complete, the PCS displays "System Initialized" on OIU-12-103B. The PCS checks for the presence of a 55-gallon Drath and Schrader drum on the LLW RWM transfer port lift table 107-LT-09-203A. The operator then enables the hoist pendant 107-PC-003A located over the RWM off-take bulge.

After delivery of the RWM transfer drum, the operator scans the location bar code on the glovebox to fix the location of the next scan. Then the RWM transfer drum bar code is scanned and the termination bar code on the glovebox. The PCS verifies that the bar code that was scanned matches the drum PIN that was tracked to the lift table by the PCS. The operator removes the bolts and outer lid from the 55-gallon RWM transfer drum. The sorting process cannot continue unless a RWM transfer drum is present and its identity is confirmed by the PCS.

Then the operator begins the process of mating the RWM transfer drum to the Drath and Schrader port by selecting "Start Entry" from the "Lift Table Menu" on OIU-12-103B. The PCS energizes the lift table motor until the drum is located under the Drath and Schrader port. Then the PCS lifts the drum which enables the operator to open the RWM transfer drum by way of the Drath and Schrader bagless transfer port control panel. Once the drum has been opened, the operator uses the hoist pendant 107-CR-07-003B to lower the hoist and lift the non-compliant item transfer stand out of drum. The operator then moves the transfer stand to its loading position.

PCS ACTIVITIES: The PCS interfaces with the operator via OIU-12-103B for operator oversight of the glovebox functions. Also, warning signals are displayed on the OIU in the event that an operation fails to be executed successfully.

The location bar code ("2Y" data identifier with location "LLW RWMPRT") is read to fix the bar code scanner location. The "2Y" is recognized by the PCS as a location designator. Reading this bar code prompts the PCS to expect a drum bar code ("S" data identifier followed by a container PIN) and record "LLW RWMPRT" as the drum location in a temporary file. The drum bar code is then scanned and the PCS compares the current PCS stored value against the actual drum delivered to verify a match. If the PIN numbers match, then operations can continue. If the PINs don't match, resolution will occur as noted in 3.8.1.1 above.

Then scanning the termination bar code ("Y" data identifier with command "END&TRNSMT") will confirm termination of the RWM port, sorting glovebox ID process. The data identifier is "stripped" from the bar code and the bar code keys the PCS that the current activity is complete.

DATA MANAGEMENT: Note that drum location verification discussed above is internal to the PCS. The DMS has previously had the drum location updated in accordance with section 3.7.7 activities.

THERE ARE NO PCS/DMS INTERFACES. THIS STEP ONLY VERIFIES THE PROPER LOCATION HAS BEEN TRACKED IN THE PCS.

Based on the new location of the empty RWM transfer drum the DMS will assign the secondary waste type to the transfer drum (i.e. LLW or TRU).

SPEC REFERENCES: 13462 - Table 8.4: 1/1 thru 7/End

3.8.2.2 Delid

After the transfer stand is correctly positioned, the operator selects "Transfer Car Menu" from OIU-12-103B. Then, "Delid/Tipper" is selected to move the drum transfer car from the transfer port location to the delid position in the sorting glovebox. The PCS energizes and holds solenoid valve 07-FEV-737F/F* (forward) until the transfer car trips switch 07-ZS-725C first to decelerate and second to stop. The OIU-12-103B displays "Transfer Car at Delid Position".

Approximately one quarter of the drums entering the LLW line will not be opened and sorted. These drums will proceed directly to the compactor glovebox. When such a drum is located on the transfer car, the operator will select "Compactor Transfer" from the "Transfer Car Menu". The PCS will move the transfer car to the compactor glovebox location. Then the operator proceeds with the transfer of the drum to the compactor glovebox as in section 3.8.3.

PCS ACTIVITIES: The PCS interfaces with the operator via OIU-12-103B.

DATA MANAGEMENT: The operator will have access to the DMS via the local DMS terminal. The fields noting whether or not the drum requires sampling or removal of non-compliance will be reviewed.

SPEC REFERENCES: 13462 - Table 8.4: 8/1 thru 8/End

3.8.2.3 Open and Sort

Once the transfer car has successfully arrived at the delid position, the drum is ready to be opened. The operator selects "Drum Tipper Menu" from OIU-12-103B and selects "Lower and Close Grab". The operator lowers the drum grab by depressing the raise/lower button on the OIU-12-103B keypad. When the drum grab has closed onto the drum the PCS displays "Lower and Close Grab Sequence Completed".

At this point the operator selects "Lid/Delid Menu" from the OIU and selects "Delid Position". When the "Delid Position" option is chosen, the PCS shall update the location of the "oldest LLW_ENTRY" drum to reflect the "LLW SORT" location.

NOTE: ALL DRUMS THAT HAVE BEEN SUPERCOMPACTED SHALL REQUIRE THAT THE PUCK BAR CODE BE READ PRIOR TO ACCESSING ANOTHER DRUM TO THE LID/DELID STATION. THIS WILL MAINTAIN THE PROPER RELATIONSHIP FOR SORTING TABLE PACKETS TRANSFERRED TO RWM TRANSFER DRUMS.

The PCS moves the Lid/Delid Fixture from its park position to the delid position over the waste drum positioned in the drum grab. The operator selects "Saw Operation Menu" from the OIU-12-103B. At this point, the operator must select (from the menu) the locations for the saw to safely cut the clamp band, based on the location of the band bolt. The PCS automatically

cuts the clamp band in one location. The operator then uses the manipulators to hold the clamp band and prompts the PCS to continue with the second cut. The clamp band pieces are then placed onto the sorting table. The saw returns to park position signaling the operator with "Saw Sequence Completed" on OIU-12-103B.

The operator again selects "Lid/Delid Menu" from the OIU and selects "Start Delid Sequence". The PCS lowers the delid fixture, energizes the vacuum system, raises the fixture, and returns the fixture to the park/reload position with the drum lid attached. At this point the PCS displays "Delid Sequence Completed" at OIU-12-103B.

The operator selects "Drum Tipper Menu" and selects "Raise with Grab Closed". If all of the permissives are met, the PCS raises the drum to "raised" position and translates the sorting table beneath the drum indicated by "fully forward". At this point the PCS enables the Drum Tipper Joy Stick Control and signals the operator via the OIU that the drum tipper is enabled. The operator then uses the joy stick to tip the drum and empty the contents onto the sorting table. The manipulator arms are used to assist the emptying of the drum if necessary. The operator uses NDE X-Ray hard copies to pre-locate the non-compliant items before the drum is emptied. By this the operator can decrease sorting time by knowing what portion of the drum that the item(s) is located in.

Once the drum is empty and rotated to vertical position, the operator can select the "Drum Tipper Menu" from the OIU and select "Lower with Grab Closed". With the manipulators back in park position and other permissives met, the PCS translates the sorting table back to its rearward position and lowers the drum to the drum tipper "lowered" position, indicated by switch 07-ZS-332B. The PCS indicates the completion of these steps by displaying "Lower with Drum Grab Sequence Completed".

PCS ACTIVITIES: The PCS interfaces with the operator via OIU-12-103B for operator oversight of the glovebox functions. Also, warning signals are displayed on the OIU in the event that an operation fails to be executed successfully.

When the Lid/Delid menu is accessed, the PCS shall transmit the PIN of the oldest "LLW_ENTRY" drum and the "LLW_SORT" location to the DMS.

DATA MANAGEMENT: The DMS receives the drum PIN CHAR(10) of the drum at the delid station and location CHAR(10) [LLW_SORT] from the PCS. The date and time the relocation occurred will also be recorded. The data currently in the waste container table will be transferred to the relocation history table as the new location is identified. The relocation history table will be updated with the drum PINs, locations, dates, and times as the container is processed through the facility.

SPEC REFERENCES: 13462 - Table 8.4: 9/1 thru 15/End

After the drum has been emptied onto the sorting table and the drum is at the lowered position in the drum grab, the operator uses the manipulator arms to sort the waste. The operator (aided by drum NDE X-Ray hard copies) searches for the packets of waste that are suspected to contain restricted waste items. If the restricted item is clearly visible in the packet, then the packet is ready for identification. If it is not clear which packet contains the restricted item, then the operator selects the "Packet X-Ray Menu" from OIU-12-103B.

The operator selects "Open Packet X-Ray" from the menu. The PCS opens the packet X-Ray door, extends the tray, and notifies the operator when the sequence is complete. The operator places the packet onto the tray and selects "Close Packet X-Ray" from the menu. Then the operator selects "Enable Packet X-Ray" to start the examination process. The PCS gives output ND-07-101/EN to the packet X-Ray. The packet X-Ray gives an output ND-07-101/ES during operation to lock out all other actions. The operator views the X-Ray on video monitor 107-TM-07-331A.

The operator removes the packet from the X-Ray tray by use of the "Packet X-Ray Menu". If the packet X-Ray verifies that the packet contained a non-compliant item, the operator places a bar code label onto the packet and scans the bar code with fixed scanner 12-NE-311. The packet is then placed onto the non-compliant item transfer stand. The operator continues this process until all of the non-compliant items have been removed from the waste.

PCS ACTIVITIES: The PCS interfaces with the operator at OIU-12-103B for control of the Packet X-Ray tray and door. When the newly placed bar codes of non-compliant packets are scanned, the PCS transmits the new packet PIN CHAR(14), the location "LLW SORT", and the RWM Transfer drum PIN (currently located at the LLW sorting glovebox RWM Transfer Port) to the DMS.

The PCS also transmits a second message containing the new packet PIN, the location "LLW SORT", and the packet parent drum PIN (location = "LLW_SORT") to the DMS.

DATA MANAGEMENT: The DMS will receive two messages from the PCS. The first message will be the new packet PIN CHAR(14), "LLW SORT" location CHAR(10), and the corresponding RWM transfer drum PIN CHAR(14).

The second message will be formatted to include the packet PIN CHAR(14), location CHAR(14), and the packet's parent drum PIN CHAR(14).

The DMS will use these two messages to provide traceability ties between the packet of waste, the RWM Transfer drum, and the parent waste drum. The operator must input a brief packet description into the DMS directly via TE-12-103. The operator calls up the file that is being loaded with the non-compliant packet information and adds the information

about the secondary waste type and packet description for each packet that was scanned.

SPEC REFERENCES: 13462 - Table 8.4: 16/End thru 17/End

After all non-compliant packets have been separated from the waste, bar coded, and placed onto the non-compliant item transfer stand, the RWM transfer drum is ready to be loaded and removed from the drum port. The operator uses the trolley/hoist pendant 107-PC-07-003B to lower the Non-compliant item transfer stand back into the restricted waste drum. The operator then disconnects the hoist hook from the transfer stand and raises the hoist to fully raised position.

The operator then uses the local control panel for the Drath & Schrader bagless transfer system to close the RWM transfer drum. The system gives an output to signal that the bagless transfer port is closed and locked, and the RWM transfer drum has been released. The operator then proceeds with the exit sequence by selecting the lift table menu at OIU-12-103B. By selecting "Start Exit" from this menu, the PCS lowers the lift table and translates the drum out to the end of the drum conveyor on the lift table.

A WRAP 1 operator will survey (using frisker 12-RITA-525) the disconnection process and log any contamination found that is out of spec. If contamination is found, the drum will be decontaminated until the contamination levels are within the specified limit. The operator selects "Drum Ready for Pick-up" from the "Lift Table Menu" at OIU-12-103B. This signals the PCS to add the drum on the AGV task list for transfer to the LLW RWM glovebox.

PCS ACTIVITIES: The PCS interfaces with the operator at OIU-12-103B.

DATA MANAGEMENT: During survey and decon, the operator may require the attachment of a numbered seal to the drum. The seal number will be logged on the current RWM transfer drum record via DMS terminal TE-12-103. There are no DMS/PCS interfaces for this operation.

SPEC REFERENCES: 13462 - Table 8.4: 18/1 thru 18/End

When the RWM transfer drum has been successfully detached from the glovebox and is ready for AGV pick-up, the parent drum is ready to be re-filled with the compliant waste packets. The operator requests a copy of the current LLW SORT drum's DMS file via DMS terminal TE-12-103. This file will contain all of the drum's information to date. The waste description will be loaded into the DMS data bank via DMS terminal TE-12-103 and will aid in the final certification of the waste package for final disposal.

The operator sorts through the waste item by item and communicates the necessary information directly to the operator at DMS terminal TE-12-103 who modifies the contents inventory sheet as required for the LLW SORT drum. Once the operator has sorted through all of the items on the sorting table and

communicated the info to the DMS operator, the waste is ready to be re-loaded into the drum.

PCS ACTIVITIES: The operator uses the manipulator arm controls for the duration of this step.

DATA MANAGEMENT: There are no DMS/PCS interfaces associated with this step in the process.

The operator requests a copy of the DMS file for the drum that is currently being sorted via DMS terminal TE-12-103. This DMS contents inventory contains all of the information to date on the waste drum. This file will be modified as required to reflect the product drum contents. The operator will update the current information contained in the file based on the amount of non-compliant waste that was removed. The operator records the following information, to describe the compliant waste on the sorting table, on the contents inventory via DMS pedestal TE-12-103:

1. Material description
2. Estimated volume % of material.
3. Estimated weight of material.
4. Total volume % of waste in drum.
5. Operator's name. (Operator ID and password)
6. Primary waste type group code.
7. Secondary waste type group code.
8. Operator comments.
9. Waste container package date.
10. Total drum weight (recorded in Exit glovebox).
11. Height of compacted puck (recorded in Exit glovebox).

NOTE: The contents inventory remains resident at the DMS terminal until the drum has been refilled, relidded, transferred to supercompaction, compacted, received into the exit glovebox, bar coded with a puck bar code, and the puck bar code scanned. This new bar code is used to support process operations only and will be related to the original PIN which is retained for drum identification. No other contents inventory data files can be accessed via the DMS terminal until the current file is closed. The current file cannot be closed until the puck bar code is recorded, at which point it becomes a current drum record.

SPEC REFERENCES: 13462 - Table 8.4

3.8.2.4 Statistical Sampling

To support certification of the waste for final disposal, statistical samples of the final waste form will be taken. With the waste sorted and ready to be re-loaded into the parent drum, the operator will snip samples from the waste items. The operator must collect enough samples to provide a representative cross section of the waste to the lab which will verify the contents.

Before the operator can load-out the samples from the glovebox, the purge port canister must be mounted to the purge port on the sorting glovebox. The operator removes the empty purge port canister from the pig and connects it to the purge port on the glovebox. The operator scans the location bar code on the side of the glovebox to fix the scanners location as "LLW PP". The purge port bar code is scanned via portable scanner 12-NE-310 and finally, the termination bar code on the glovebox wall is scanned to end the transmission. The PCS shall transmit the Purge Port PIN and the location to the DMS.

Once a sample is taken, the operator loads it into a pre-bar coded container. The operator scans the sample bottle bar code via fixed scanner 12-NE-311. The PCS associates the sample bottle PIN and its parent drum PIN (location = "LLW_SORT") and transmits them to the DMS with the location "LLW_SORT".

When samples are ready to be placed into the purge port, the operator selects "Sample Loadout" from OIU-12-103B. The operator scans the bar codes of the sample bottles with fixed scanner 12-NE-311 as each sample bottle is loaded into the purge port. The PCS recognizes that the bar code belongs to a sample container and then sends the sample PIN, location ("LLW_SORT"), and associated purge port PIN to the DMS. When all of the samples have been placed into the purge port or the purge port is full, the operator stops scanning the bar codes and selects "End Sample Loadout" at the OIU. The operator inputs the needed sample information into the DMS.

PCS ACTIVITIES: The location bar code ("2Y" data identifier with location "LLW PP") is read to fix the bar code scanner location. The "2Y" is recognized by the PCS as a location designator. Reading this bar code prompts the PCS to expect a container bar code (unique data identifier followed by a container PIN) and record "LLW PP" as the purge port location in a temporary file. The purge port bar code is then scanned and the PCS transmits the location and purge port PIN to the DMS.

Then scanning the termination bar code ("Y" data identifier with command "END&TRNSMT") will confirm termination of the purge port ID process. The data identifier is "stripped" from the bar code and the bar code keys the PCS that the current activity is complete.

The scanning of a sample container PIN at 12-NE-311 keys the PCS to make an association between the sample PIN and the parent drum PIN (currently located in the sorting glovebox).

The PCS then transmits these PINs with the location "LLW-SORT" to the DMS.

When "Sample Loadout" is selected via OIU-12-103B, the PCS is prompted to expect sample container bar codes ("S" sample bottle data identifier with PIN CHAR(12) and a "WP" data qualifier). The PCS associates the sample bottle PIN scanned at NE311 with the purge port PIN connected to the sorting glovebox and transmits the two PINs with the location "LLW-SORT" to the DMS. This occurs for each of the samples scanned. If no purge port is currently located at the sorting glovebox location, then the PCS displays the warning "No Purge Port Present" at OIU-12-103B. The operator must attach a purge port canister to the glovebox and start the sample loading process over.

DATA MANAGEMENT: The DMS receives the purge port PIN CHAR(14) and location "LLW PP" CHAR(10) from the PCS and establishes the location of the purge port at the LLW sorting glovebox.

The DMS receives the sample PIN CHAR(14), location CHAR(10), and the parent drum PIN CHAR(14) from the PCS and downloads the association to the appropriate files if the DMS has a purge port container located at the LLW purge port location. If a purge port container is not listed at this location the DMS will reject the data and present an alarm.

The DMS receives the sample PIN CHAR(14), location [LLW SORT] CHAR(10), and purge port PIN CHAR(14) from the PCS and downloads the association to the appropriate files.

The operator must fill out a Chain of Custody/Sample Analysis Request form at the DMS terminal TE-12-103 for the samples that were taken and loaded into the purge port. Applicable sampling collection data may also be entered at this time (descriptions, temperature, etc).

Once all of the samples have been taken from the compliant waste and loaded into the purge port, the purge port door can be closed from the inside of the glovebox. Then the operator can remove the purge port canister from the exterior of the glovebox. An operator surveys the canister at its removal and decontaminates as necessary.

The operator scans the location bar code on the side of the glovebox to fix the scanners location as "LLW PP". Then the purge port bar code is scanned via portable scanner 12-NE-310. The purge port transfer pig's bar code is scanned to indicate which pig will contain the purge port. Finally, the termination bar code on the glovebox wall to end the transmission is scanned.

PCS ACTIVITIES: The location bar code ("2Y" data identifier with location "LLW PP") is read to fix the bar code scanner location at the purge port on the LLW sorting glovebox. The "2Y" is recognized by the PCS as a location designator. Reading this bar code prompts the PCS to initiate a sequence where the container bar codes ("1B" data identifier for purge port canister followed by a PIN CHAR(14) and a "PP" data qualifier), ("1B" data identifier for purge port transfer pig followed by a container PIN CHAR(14) and a "TP" data qualifier) and location "LLW_PP" are recorded in a temporary file.

Reading the termination bar code ("Y" data identifier with command "END&TRNSMT") will confirm termination of the process. The PCS associates the PINs and "LLW_PP" location and transmits them to the DMS.

DATA MANAGEMENT: The DMS receives the purge port PIN CHAR(14), location CHAR(10), and the transfer pig PIN CHAR(14) from the PCS and downloads it into the appropriate files to establish the purge port container/transfer pig relationship.

The operator must fill out a Chain of Custody/Sample Analysis Request form at the DMS terminal TE-12-103 for the samples that were taken and loaded into the purge port. Applicable sampling collection data may also be entered at this time (descriptions, temperature, etc).

3.8.2.5 Re-fill and Re-lid

When the operator has collected all of the data to be recorded for the waste on the sorting table, the sequence for reloading the waste drum can begin. The operator then selects "Sorting Table Menu" from the OIU-12-103B. Then the operator selects "Extend Table" from the menu. The PCS moves the table forward until it reaches tip position. The PCS locks the lift table in tip position. The operator selects "Enable Raise/Lower" from the menu. The operator controls the raising of the sorting table by the Raise and Lower buttons on OIU-12-103B. The operator carefully raises the sorting table until all of the waste slides off into the drum. The operator lowers and retracts the sorting table via the OIU-12-103B.

PCS ACTIVITIES: The PCS interfaces solely with the operator at OIU-12-103B during this step.

DATA MANAGEMENT: There are no DMS/PCS interfaces associated with this step in the process.

SPEC REFERENCES: 13462 - Table 8.4: 19/1 thru 19/End

When the compliant waste has all been loaded into the parent drum, the operator selects "Drum Tipper Menu" from the PCS menu on OIU-12-103B. The operator then selects "Lower with Grab Closed" from the menu. The drum tipper lowers the drum back down onto the transfer cart. The operator then opens the drum grab and raises the drum tipper via the "Drum Tipper Menu".

The operator selects the "Transfer Car Menu" and "Relid" from OIU-12-103B. The PCS drives the transfer car forward by energizing solenoid 07-FEV-737F/F. The transfer car then proceeds to the relid position. Once the PCS indicates that the drum is in the relid position, the operator selects "Lid/Delid Menu" and "Start Relid Sequence" via OIU-12-103B.

The PCS raises the relid fixture and rotates it to the first crimping position. The fixture is lowered, the C-Clips feeder is driven forward, and the jaw swings into place and crimps the clip. The PCS repeats this process in five other locations on the drum and then displays "Relid Sequence Complete".

The operator then selects "Transfer Car Menu" and "Compactor Transfer" from OIU-12-103B. The PCS moves the drum transfer car to the compactor transfer position.

PCS ACTIVITIES: The PCS interfaces with the operator at OIU-12-103B.

DATA MANAGEMENT: There are no DMS/PCS interfaces associated with this step in the process.

SPEC REFERENCES: 13462 - Table 8.4: 20/1 thru 25/End

3.8.3 LLW Super-compactor Glovebox

When the transfer car has reached the compactor transfer position, the operator selects "Compactor Glovebox" from the menu on OIU-12-103B. The PCS communicates with the compactor controller 107-HU-07-103 "Prepare to Carry Out Overall Compaction Cycle" to verify that it is ready to receive a drum. When the compactor is ready to receive the drum, the compactor controller sends the message "Ready to Carry Out Overall Compaction Cycle". The PCS controls the drum transfer automatically. Upon completion, the compactor controller transmits, "Drum Received". Once transfer is complete, the operator moves the drum transfer car back to the entry glovebox location via the "Transfer Car Menu".

When a drum has successfully been transferred to the supercompactor glovebox, the compactor controller automatically takes the drum through the compaction sequence. The compactor then transmits, "Ready to Transfer Puck to LLW Exit Glovebox". When the puck receipt location in the exit glovebox is vacant, the PCS responds, "Transfer Puck to LLW Exit Glovebox". When the puck has been transferred from the compactor glovebox, the compactor controller signals the PCS, "Puck Transferred from Compaction System to LLW Exit Glovebox". The PCS

then awaits the tripping of switch ZS762 indicating that a puck is present at the puck receipt location in the LLW Exit glovebox.

PCS ACTIVITIES: The PCS interfaces with the operator at OIU-12-103B to begin the compaction process and OIU-12-103C to transfer the compacted puck to the exit glovebox. The operator signals the compactor controller via the PCS by selecting the "Compactor Glovebox" on the operator interface unit. The compactor controller stands alone from the PCS besides the interfaces described in the text above and the warning alarms listed in Appendix A of specification 11174.

DATA MANAGEMENT: There are no DMS/PCS interfaces associated with this step in the process.

SPEC REFERENCES: 13462 - Table 8.4: 23/1 thru 25/End
 13462 - Table 8.6: 6/1 thru 6/End
 11174 - Hydraulic Power Unit and Control System; Appendix A

3.8.4 LLW Exit Glovebox

3.8.4.1 Exit Drum Access to the LLW Glovebox

The PCS performs an initialization check before operations proceed in the exit glovebox. The operator prompts the initialization by choosing "Initialize System" from the operator interface unit OIU-12-103C. The drum exit port 107-DO-07-106 must be closed. The lid vacuum system on the exit port must be off. The hoist must be positioned above the compact puck receipt position. The compacted drum lifter must be in its fully raised position. The compactor conveyor 107-CV-07-101 must not be running. The exit port lift table L-O-R switch must be in remote mode and the lift table must be at AGV height.

Once initialization is complete the operator selects "Exit Port Menu" from OIU-12-103C. The PCS checks for presence of a drum on the exit port lift table 107-LT-09-202C. Once the overpack drum is located on the lift table, the operator scans the location bar code on the side of the glovebox, drum bar code, and termination bar code using bar code reader 12-NE-310. The PCS will verify that the drum identification and location match that input by the AGV delivery before any more actions are allowed by the PCS. Once identification and location are verified, the operator will manually remove the clamp band from the overpack drum.

The overpack is now ready to be mated with the exit port. The operator selects "Start Entry Sequence" from the "Exit Port Menu". The PCS lowers the lift table and conveys the overpack to the position underneath the exit port. Then the PCS raises the drum to the "Drum Centering" position, thus completing the drum entry sequence.

The operator then selects "Open Port" at OIU-12-103C. The PCS automatically mates the drum to the port door, unlocks the port, and opens the overpack drum with the exit port door. "Port Open" is then displayed at the OIU.

PCS ACTIVITIES: The location bar code ("2Y" data identifier with location "LLW EXIT") is read to fix the bar code scanner location. The "2Y" is recognized by the PCS as a location designator. Reading this bar code prompts the PCS to expect a drum bar code ("S" data identifier followed by a container PIN) and record "LLW EXIT" as the drum location in a temporary file. The drum bar code is then scanned and the PCS compares the current PCS stored value against the actual drum delivered to verify a match. If the PIN numbers match, then operations can continue. If the PINs don't match, resolution will occur as noted in 3.8.1.1 above.

The scanning of the termination bar code ("Y" data identifier with command "END&TRNSMT") will confirm termination of the exit glovebox ID process. The data identifier is "stripped" from the bar code and the bar code keys the PCS that the current activity is complete.

DATA MANAGEMENT: Note that drum location verification discussed above is internal to the PCS. The DMS has previously had the drum location updated in accordance with section 3.7.7 activities.

THERE ARE NO PCS/DMS INTERFACES. THIS STEP ONLY VERIFIES THE PROPER LOCATION HAS BEEN TRACKED IN THE PCS.

SPEC REFERENCES: 13462 - Table 8.6: 1/1 thru 5/End

3.8.4.2 Puck Receipt and Weight Measurement

After the exit port is open, the operator selects the "Entry Conveyor Menu" from OIU-12-103C. If the compactor is ready to transfer a compacted puck to the Exit Glovebox, then the operator can select "Start Receipt Sequence". The PCS then energizes the conveyor motor 107-CV-07-101/M1 forward until switch ZS-762 is activated. The PCS displays "Compact Receipt Complete".

At this point the operator affixes a bar code label to the compacted puck and scans the bar code with fixed scanner 12-NE-312. The PCS sends the bar code to the DMS with the location. The DMS associates the new bar code number with the original PIN and logs it into the appropriate DMS field.

NOTE: The contents inventory file remains resident at the DMS terminal until the drum has been compacted, received into the exit glovebox, puck bar coded, and the new bar code scanned. This new bar code is used to support process operations only and will be related to the original PIN for the drum. No other contents inventory files can be accessed via the

DMS terminal until the current file is closed. The current carbon copy file cannot be closed until the puck bar code is recorded, at which point it becomes a current drum record.

The operator measures the height of the puck and records it on a temporary data sheet. The operator opens the drum lifter jaws via the open/close button on hoist pendant 107-PC-07-004. The operator lowers the hoist and confirms its alignment with the puck. The operator closes the drum lifter on the puck, raises the puck until the "Raised" LED is activated, and selects "Read Weight" from the "Weigh Menu". The PCS displays the weight of the puck on OIU-12-103C. This weight data is transmitted to the DMS and stored under the original PIN number associated with the puck. The data is sent to the DMS (along with the location) where it is logged into the drum data file designated by the original PIN number. The PCS indicates that the weight of the drum has been stored by displaying "Compact Weight" at OIU-12-103C.

The operator then selects "Hoist Menu" from the OIU and selects the position that the puck is to be placed (i.e. storage positions, load out position). The operator controls the lowering of the puck via the hoist pendant 107-PC-07-004. The PCS transmits the new puck location and the puck PIN to the DMS.

PCS ACTIVITIES: The puck bar code scan via fixed scanner 12-NE-312 automatically fixes the puck's location as "LLW PUCK". The bar code contains an "24T" data identifier for the puck followed by a container PIN). The PCS transmits the puck PIN and location to the DMS.

The PCS downloads the weight of the compacted puck to the DMS along with the location and the new compacted puck PIN.

The PCS tracks the puck PIN from "LLW PUCK" to the storage position selected and transmits the location "LLW-STORE*" (where the * is either 1, 2, or 3) and the puck PIN to the DMS.

DATA MANAGEMENT: The height of the puck must be entered manually via the DMS terminal TE-12-103.

The DMS receives the compacted puck PIN CHAR(6) and location "LLW PUCK" CHAR(10) from the PCS. The DMS associates this information with the original drum PIN (prior to supercompaction) file at the DMS terminal. This location is the initial DMS location established for the puck PIN.

The DMS then receives the puck location CHAR(10), PIN CHAR (6), and weight NUMBER(10,2) from the PCS. The DMS downloads this info to the original drum data file also.

The DMS may receive the storage location "LLW-STORE*" CHAR (10) and puck PIN CHAR(6) from the PCS. The DMS loads this into the parent drum file for the waste. The date and time

the relocation occurred will also be recorded. The data currently in the waste container table will be transferred to a relocation history table as the new location is identified. The relocation history record table will be updated with the drum PINs, locations, dates, and times as the waste is processed through the facility.

SPEC REFERENCES: 13462 - Table 8.6: 6/1 thru 8/End

Once the puck has been successfully delivered to the selected location, the operator continues the process of receiving compacted pucks, re-labeling them, scanning the new label, moving the pucks to any of three storage positions or directly to load-out, and weighing and measuring the pucks.

3.8.4.3 Puck Loadout Into Overpacks

When any puck (from a storage position or from compact receipt) is desired for load out, the operator scans the location bar code label associated with the storage position with fixed scanner 12-NE-316, then scans the bar code on the compacted puck itself, and finally scans the termination bar code on the glovebox wall. The PCS compares the stored PIN at that location with the PIN that was scanned off the bar code. If they do not match then the PCS displays "PIN Mis-match" at OIU-12-103C and the operator will have to resolve the problem by direct interface with the DMS, via terminal TE-12-103 before processes can continue. Modification of the puck location in the PCS may also be required. If they do match, the PCS displays "PIN Match" at the OIU-12-103C and processes continue.

The operator uses the "Hoist Menu" to select the compacted puck that is to be loaded into the overpack drum (the puck that was just scanned), be it from storage locations 1, 2, or 3, or directly from the compactor receipt location. The PCS moves the hoist trolley to that position. The operator lowers the hoist, grabs the puck, and lifts the puck to "raised" position.

PCS ACTIVITIES: The operator interfaces with the PCS via OIU-12-103C.

The location bar code ("2Y" data identifier with location "LLW-STORE*" where the * is either 1, 2, or 3) is read to fix the bar code scanner location. The "2Y" is recognized by the PCS as a location designator. Reading this bar code prompts the PCS to expect a puck bar code ("24T" data identifier followed by a container PIN CHAR (6)) and record "LLW-STORE*" as the puck location in a temporary file. The puck bar code is then scanned and the PCS compares the current PCS stored value against the actual puck delivered to verify a match. If the PIN numbers match, then operations can continue. If not, then the operator will have to solve the problem manually at the DMS terminal.

Then scanning the termination bar code ("Y" data identifier with command "END&TRNSMT") will confirm termination of the exit glovebox storage location ID process. The data identifier is "stripped" from the bar code and the bar code keys the PCS that the current activity is complete.

DATA MANAGEMENT: Note that drum location verification discussed above is internal to the PCS. The DMS has previously had the drum location updated in accordance with section 3.7.7 activities.

THERE ARE NO PCS/DMS INTERFACES. THIS STEP ONLY VERIFIES THE PROPER LOCATION HAS BEEN TRACKED IN THE PCS.

SPEC REFERENCES: 13462 - 9/1 thru 9/End

The operator then selects the "Weigh Menu" from OIU-12-103C. The operator can view the current cumulative weight in the overpack drum and the weight of the puck desired for load out. If the addition of the puck's weight will not exceed the total allowable weight of the overpack drum, then the operator selects "Add to Cumulative". The operator will be warned if the addition if the puck exceeds the allowable. If the allowable weight is not exceeded, the DMS adds the weight to the cumulative weight in the overpack drum, stores this data in a temporary file, and transmits the "new" cumulative weight back to the PCS.

PCS ACTIVITIES: When "Add to Cumulative" is selected from the "Weigh Menu", the PCS transmits the puck PIN CHAR(6), location CHAR(10), and the puck weight NUMBER(10,2) to the DMS.

If the allowable weight limit is not violated, the DMS generates a new cumulative weight and transmits the exit drum PIN CHAR(14), location CHAR(10), and the weight NUMBER(10,2) back to the PCS.

DATA MANAGEMENT: The DMS adds the puck weight NUMBER(10,2) to the cumulative weight in the overpack drum, adds one to the cumulative number of pucks in the overpack, and stores this number in a temporary file.

The DMS then transmits the exit drum PIN CHAR (14), location CHAR (10), and the new "cumulative overpack drum weight" NUMBER(10,2) back to the PCS for use with future loading operations.

If the cumulative is greater than the allowable, the DMS transmits a warning signal "OVERPACK WT LIMIT EXCEEDED" to the PCS along with the location CHAR(10) and the PCS displays it on the OIU.

The operator then selects "Load Out" from the hoist menu. Once "Load Out" is selected from the menu, the PCS removes the puck from the storage position in the PCS file. The puck is moved to the load out position and lowered into the overpack. Once the drum lifter is disconnected from the puck, the PCS updates the DMS with the new location of the puck in the load out drum. The puck PIN is associated with the overpack drum.

The operator continues this process until the load out drum is full by volume or by weight. If the weight limit is reached before the drum volume, then dunnage may have to be added to the overpack. If this is necessary, the operator will make a note of the type of filler that was used.

PCS ACTIVITIES: Once a puck has been loaded into the overpack and the hoist has been released, the PCS sends the puck PIN CHAR (6), location CHAR (10), and the loadout drum PIN CHAR (14) to the DMS. The DMS updates the current location of the puck (relating the puck bar code to the original drum PIN) as being loaded into the loadout drum attached to the exit glovebox. Note: If the last puck placed into the overpack violates height constraints, it will be removed via the puck grab and manual manipulation of the puck. The PCS will have to provide the capability to update the puck location as one of the storage locations.

DATA MANAGEMENT: The DMS will record the puck PIN CHAR(6) and relate it to the overpack PIN CHAR(14).

The operator must load the following information into the DMS via terminal TE-12-103 (unless otherwise specified) for the load out drums:

1. Total weight (from accumulation of individual puck weights)
2. Puck PIN's in overpack (from PCS as each puck is successfully selected for load out)
3. Date of puck loading (from DMS)
4. Time of puck loading (from DMS)
5. Primary waste type code
6. Secondary waste type code
7. Secondary waste type
8. Puck volume percent
9. Total volume percent
10. Void space filler code
11. Name of operator (Operator ID and password)
12. Operator comments
13. Date of overpack loading

3.8.4.4 Overpack Removal from LLW Glovebox

Once all the necessary data has been entered into the DMS, the operator can select "Close and Delid" from the "Exit Port Menu". The PCS rotates the port

door closed, lowers the lid onto the drum, releases the lid vacuum, lowers the drum to the centering location, locks the port door, and releases the drum centering clamps. The PCS then displays "Port Closed" at OIU-12-103C.

The operator then selects "Start Drum Exit Sequence" from the "Exit Port Menu". The PCS then lowers the drum from the port, and conveys the drum out from underneath the glovebox, and raises the drum to AGV height. The operator replaces the clamp band on the overpack drum, scans the location bar code, scans the drum bar code, and then scans the termination bar code with 12-NE-310. The operator then selects "Drum Ready for Pick-up" from the "Exit Port Menu" at OIU-12-103C which signals the AGV that a drum is ready for pick-up.

PCS ACTIVITIES: When the operator selects "Close and Delid" from the "Exit Port Menu" the DMS records that the drum has been closed out.

The location bar code ("2Y" data identifier with location "LLW EXIT") is read to fix the bar code scanner location. The "2Y" is recognized by the PCS as a location designator. Reading this bar code prompts the PCS to expect a drum bar code ("S" data identifier followed by a container PIN) and record "LLW EXIT" as the drum location in a temporary file. The drum bar code is then scanned and the PCS transmits the drum PIN and location to the DMS.

Then scanning the termination bar code ("Y" data identifier with command "END&TRNSMT") will confirm termination of the exit glovebox ID process. The data identifier is "stripped" from the bar code and the bar code keys the PCS that the current activity is complete.

DATA MANAGEMENT: The drum PIN CHAR(14) and location CHAR(10) will be transmitted to the DMS. The DMS will compare the PIN for the bar code just read against the PIN currently contained for the "LLW EXIT" location and verify a match. If the PINs don't match, resolution will occur as noted in 3.8.1.1 above. The operator will enter the seal number into the DMS as required.

The operator will enter the certification dose into the DMS terminal which will be downloaded to the SWITS database as certification data.

SPEC REFERENCES: 13462 - 10/1 thru 12/End

3.9 LLW RWM GLOVEBOX

3.9.1 LLW Restricted Waste Management Drum Entry

3.9.1.1 Restricted Waste Transfer Drum

The Process Area Internal Transport has received and acted on the message sent by the PCS that a drum is needed at the LLW RWM Non-Compliant Items Entry Port (Lift Table 107-LT-09-201F). The lift table local panel L-O-R switch is turned to "remote", the AGV/Panel switch is set to AGV, the limit switches on the lift table indicate that no drum is present, and the table is at AGV height. The AGV delivers the next drum to be processed and commences its handshake with the lift table. Once the delivery is complete, the PCS updates the location stored in the DMS under the file for the drum PIN tracked to the LLW RWM glovebox location (see section 3.7.5)

After the successful delivery of the waste drum, the operator scans the location bar code (on the glovebox wall), RWM transfer drum bar code, and termination bar code using bar code reader 12-NE-313. The PCS will verify that the drum identification and location match that input by the AGV delivery, before any more actions are allowed by the PCS. Once identification and location are verified, the operator will manually remove the outer lid from the RWM transfer drum.

PCS ACTIVITIES: The location bar code ("2Y" data identifier with location "LLRWMENTRY") is read to fix the bar code scanner location at the 55-gallon Drath & Schrader non-compliant item entry port. The "2Y" is recognized by the PCS as a location designator. Reading this bar code prompts the PCS to expect a drum bar code ("S" data identifier followed by a container PIN) and record "LLRWMENTRY" as the drum location in a temporary file. The drum bar code is then scanned and the PCS compares the current PCS stored value against the actual drum delivered to verify a match. If the PIN numbers match, then operations can continue.

Then scanning the termination bar code ("Y" data identifier with command "END&TRNSMT") will confirm termination of the drum ID process. The data identifier is "stripped" from the bar code and the bar code keys the PCS that the current activity is complete.

DATA MANAGEMENT: Note that drum location verification discussed above is internal to the PCS. The DMS has previously had the drum location updated in accordance with section 3.7.5 activities.

THERE ARE NO PCS/DMS INTERFACES. THIS STEP ONLY VERIFIES THE PROPER LOCATION HAS BEEN TRACKED IN THE PCS.

UPSET CONDITIONS: Operator bar code scan and AGV handshake at drum delivery reveal unmatched drum identifications at RWM entry port.
Resolution: The PCS shall provide an alarm at OIU-12-105B if this occurs and stop entry functions until operator resolution.

SPEC REFERENCES: 13461 - Appendix A-1
13462 - Table 9.2: 1/1 to 2/End

The PCS now recognizes that a drum has been successfully received and identified at the RWM entry port. The operator switches the lift table control to "Panel". The operator uses the push buttons on the lift table control panel to lower the drum from AGV height, to move the drum under the RWM port, and to raise the drum to the proper height for mating with the Drath & Schrader port. The operator uses the Drath & Schrader port control panel to open the bagless transfer port.

After the Drath & Schrader port is open, the operator uses hoist pendant 107-PC-07-009A to remove the non-compliant transfer stand from the transfer drum. The operator lowers the hoist, attaches the hoist hook, raises the transfer stand, translates the stand to the tray unloading position, and lowers the stand in this position.

PCS ACTIVITIES: The PCS interfaces with the operator at OIU-12-105B.

DATA MANAGEMENT: There are no DMS/PCS interfaces associated with this step in the process.

SPEC REFERENCES: 13462 - Table 9.2: 3/3 to 4/End

3.9.1.2 Compliant Items 'Load Out Drum' Entry

At this time the LLW RWM glovebox equipment is being checked by the PCS for initialization status as a prerequisite to entry/exit port operation. The following criteria must be met for initialization: Drum entry/exit port DO-07-202 closed and locked and manipulators 107-EM-07-201 in park position.

The Process Area Internal Transport has received and acted on the message sent by the PCS that a drum is needed at the LLW RWM glovebox conveyor 107-LT-09-201E. The operator has turned the lift table local panel L-O-R switch to "remote", the Panel/AGV switch is set to AGV, the limit switches on the lift table indicate that no drum is present, and the table is at AGV height. The AGV delivers a standard 55-gallon drum and commences its handshake with the lift table. Once the delivery is complete, the PCS updates the location information stored in the DMS under the file associated with the drum PIN that was tracked to the LLW RWM lift table location (see section 3.7.5)

After the successful delivery of the waste drum, the operator scans the location bar code, drum bar code, and termination bar code using bar code reader 12-NE-313. The PCS will verify that the scanned drum PIN and location

match that input by the AGV delivery, before any more actions are allowed by the PCS. Once identification and location are verified, the operator will manually remove the clamp band from the drum.

PCS ACTIVITIES: The location bar code ("2Y" data identifier with location "LLRWCMPLT") is read to fix the bar code scanner location. The "2Y" is recognized by the PCS as a location designator. Reading this bar code prompts the PCS to expect a drum bar code ("S" data identifier followed by a container PIN) and record "LLRWCMPLT" as the drum location in a temporary file. The drum bar code is then scanned and the PCS compares the current PCS stored value against the actual drum delivered to verify a match. If the PIN numbers match, then operations can continue.

Then scanning the termination bar code ("Y" data identifier with command "END&TRNSMT") will confirm termination of the drum ID process. The data identifier is "stripped" from the bar code and the bar code keys the PCS that the current activity is complete.

DATA MANAGEMENT: Note that drum location verification discussed above is internal to the PCS. The DMS has previously had the drum location updated in accordance with section 3.7.5 activities.

THERE ARE NO PCS/DMS INTERFACES. THIS STEP ONLY VERIFIES THE PROPER LOCATION HAS BEEN TRACKED IN THE PCS.

UPSET CONDITIONS: Operator bar code scan and AGV handshake at drum delivery reveal unmatched drum identifications at entry glovebox. Resolution: The PCS shall provide an alarm at OIU-12-103A if this occurs and stop entry functions until operator resolution.

SPEC REFERENCES: 13462 - Table 9.4: 1/1 to 3/End

The PCS now recognizes that a drum has been successfully received and identified at the compliant item load out lift table, and the glovebox equipment is initialized. Now the operator switches the lift table control to "Panel". The operator transfers the drum under the port and raises the drum to "Drum Centering" height.

The operator then prompts the PCS to "Open Port" via OIU-12-105B. The PCS automatically mates the drum to the port door, attaches the drum lid to the port door, unlocks the port, raises the drum and port door, and opens the drum with the entry port door. Once complete, OIU-12-105B displays "Port 107-DO-07-202 Open".

PCS ACTIVITIES: The PCS interfaces solely with the operator during this part of the process. The operator is able to "Emergency Stop" the sequence at any point.

DATA MANAGEMENT: There are no DMS/PCS interfaces associated with this step in the process.

SPEC REFERENCES: 13462 - Table 9.4: 4/1 to 4/End

3.9.1.3 Treated Non-Compliant Items 'Load Out Drum' Entry

At this time the LLW RWM glovebox equipment is being checked by the PCS for initialization status as a prerequisite to entry/exit port operation. The following criteria must be met for initialization: Drum entry/exit port DO-07-203 closed and locked and manipulators 107-EM-07-201 in park position.

The process area internal transport has received and acted on the message sent by the PCS that a drum is needed at the LLW RWM glovebox conveyor 107-LT-09-201D. The operator has turned the lift table local panel L-O-R switch to "remote", the Panel/AGV switch is set to AGV, the limit switches on the lift table indicate that no drum is present, and the table is at AGV height. The AGV delivers a standard 85-gallon drum and commences its handshake with the lift table. Once the delivery is complete (PCS verifies drum transfer), the PCS updates the location information stored in the DMS under the file associated with the drum PIN that was tracked to the LLW RWM lift table location (see section 3.7.5).

After the successful delivery of the waste drum, the operator scans the location bar code, drum bar code, and termination bar code using bar code reader 12-NE-313. The PCS will verify that the scanned drum PIN and location match that input by the AGV delivery, before any more actions are allowed by the PCS. Once identification and location are verified, the operator will manually remove the clamp band from the drum.

PCS ACTIVITIES: The location bar code ("2Y" data identifier with location "LLRWMEXIT") is read to fix the bar code scanner location. The "2Y" is recognized by the PCS as a location designator. Reading this bar code prompts the PCS to expect a drum bar code ("S" data identifier followed by a container PIN) and record "LLRWMEXIT" as the drum location in a temporary file. The drum bar code is then scanned and the PCS compares the current PCS stored value against the actual drum delivered to verify a match. If the PIN numbers match, then operations can continue.

Then scanning the termination bar code ("Y" data identifier with command "END&TRNSMT") will confirm termination of the drum ID process. The data identifier is "stripped" from the bar code and the bar code keys the PCS that the current activity is complete.

DATA MANAGEMENT: Note that drum location verification discussed above is internal to the PCS. The DMS has previously had the drum location updated in accordance with section 3.7.5 activities.

THERE ARE NO PCS/DMS INTERFACES. THIS STEP ONLY VERIFIES THE PROPER LOCATION HAS BEEN TRACKED IN THE PCS.

UPSET CONDITIONS: Operator bar code scan and AGV handshake at drum delivery reveal unmatched drum identifications at entry glovebox. Resolution: The PCS shall provide an alarm at OIU-12-103A if this occurs and stop entry functions until operator resolution.

SPEC REFERENCES: 13462 - Table 9.6: 1/1 to 3/End

The PCS now recognizes that a drum has been successfully received and identified at the treated item load out lift table, and the glovebox equipment is initialized. Now the operator switches the lift table control to "Panel". The operator lowers the drum to "lowered position", transfers the drum under the port and raises the drum to "Drum Centering" height.

The operator then prompts the PCS to "Open Port" via OIU-12-105B. The PCS automatically mates the drum to the port door, attaches the drum lid to the port door, unlocks the port, raises the drum and port door, and opens the drum with the entry port door. Once complete, OIU-12-105B displays "Port 107-DO-07-202 Open".

PCS ACTIVITIES: The PCS interfaces solely with the operator during this part of the process. The operator is able to "Emergency Stop" the sequence at any point.

DATA MANAGEMENT: There are no DMS/PCS interfaces associated with this step in the process.

SPEC REFERENCES: 13462 - Table 9.4: 4/1 to 4/End

3.9.2 LLW RWM Processing (Stage 1)

3.9.2.1 Adding/Removing Items from Transfer Stand

Before any item is removed from the non-compliant item transfer stand, the operator selects "Remove Item(s) from X-fer Stand" from the "Transfer Stand Menu" at OIU-12-105B. The item bar code is then scanned with fixed scanner 12-NE-314. The PCS sends a message to the DMS to remove the item from the RWM transfer drum's inventory. The operator then ends the removal process by selecting "End Remove" from the "Transfer Stand Menu".

The item bar code is then scanned with fixed scanner 12-NE-314. The PCS sends a message to the DMS to remove the item from the RWM transfer drum's

inventory. The operator then ends the removal process by selecting "End Remove" from the "Transfer Stand Menu".

OR: Before any item is placed back onto the transfer stand, the operator selects "Add Item(s) to X-fer Stand" from the "Transfer Stand Menu" at OIU-12-105B.

PCS ACTIVITIES: The PCS interfaces with the operator at OIU-12-105B.

When "Remove Item from X-fer Stand" is selected, the PCS is prompted to receive any type of container bar code. When the bar code ("XX" data identifier with container PIN) is scanned, the PCS sends the Container PIN, the location "LLRWMSAMPL", the RWM Transfer Drum PIN, and the message to remove the item from the RWM Transfer Drum inventory, to the DMS. When "End Remove" is selected the PCS is notified that the current action is complete.

OR: When "Add Item to X-fer Stand" is selected, the PCS is prompted to receive any type of container bar code. When the bar code ("XX" data identifier with container PIN) is scanned, the PCS sends the Container PIN, location "LLRWMSAMPL", the RWM Transfer Drum PIN, and the message to add the item to the RWM Transfer Drum inventory, to the DMS. When "End Add" is selected the PCS is notified that the current action is complete.

DATA MANAGEMENT: The DMS receives the container PIN CHAR(14), the location CHAR(10), the RWM Transfer Drum PIN CHAR(14), and message to remove the container from the RWM Transfer Drum inventory. The DMS removes the PIN from the Transfer Drum inventory.

OR: The DMS receives the container PIN CHAR(14), the location CHAR(10), the RWM Transfer Drum PIN CHAR(14), and message to add the container from the RWM Transfer Drum inventory. The DMS adds the PIN to the Transfer Drum inventory.

SPEC REFERENCES: 13462 - Table 9.2: 6/1 thru 6/2

3.9.2.2 Separate Compliant from Non-Compliant

The operator removes a packet to be processed from the transfer stand as outlined in section 3.9.2.1.

The operator then scans the Packet bar code again at 12-NE-314 to begin processing. The PCS stores the Packet PIN and location (fixed by the bar code scanner) in a temporary file. The operator then removes the Packet wrapping to begin processing the non-compliant item(s) (if the Packet is not the non-compliant item in and of itself). The compliant portions of the Packet are

disposed of via entry/exit port 107-DO-07-202 (see section 3.9.1.2 for mating of this drum to the glovebox). A description of the compliant waste that is disposed of must be entered into the DMS.

The non-compliant items (i.e. liquids, reactives, aerosol cans, HEPA filters, acids/bases, fines) that are removed from the packets and do not need to be containerized or recontainerized will receive a non-compliant item PIN label (i.e. aerosol cans, sufficiently contained liquids). The non-compliant items that need to be collected or recontainerized from the waste packet will be collected into collection containers and then labelled with a non-compliant item PIN. The emptied container can be disposed of in the compliant waste drum at port DO-07-202.

The non-compliant item PIN is then scanned using fixed scanner 12-NE-314. The PCS associates the scanned non-compliant item PIN with the last Packet PIN scanned by 12-NE-314 and transmits the PINs and location to the DMS. Any non-compliant item that is read after a packet PIN code will be associated with that packet and transmitted to the DMS. If a non-compliant item PIN is not scanned, the PCS and DMS will associate samples taken with the non-compliant packet PIN that was scanned (i.e. packet is the non-compliant item and a new bar code is not required).

The operator may choose to add the non-compliant items to the transfer stand after identifying them. This is done by following the process outlined in section 3.9.2.1.

Liquids will be field screened for pH level before sampling to assure that the liquids are handled and stored appropriately.

PCS ACTIVITIES: The PCS interfaces with the operator at the hoist pendant 107-PC-07-009A and at OIU-12-105B.

Scanning the bar code of a non-compliant packet prompts the PCS to store the packet PIN and expect non-compliant item PINs ("21T" non-compliant item data identifier with PIN CHAR(14) or no PIN at all if the packet and non-compliant item are one in the same. All of the non-compliant item PINs that are scanned (after the Packet bar code) are associated with the Packet that they were removed from (See section 3.9.2.2). The PCS sends the non-compliant item PIN, location "LLRWMSAMPL", and Packet PIN to the DMS for each non-compliant item scanned after a Packet.

DATA MANAGEMENT: The DMS receives the association of the non-compliant item PIN CHAR (14), location CHAR(10), and the Packet PIN CHAR(14) from the PCS. The DMS records the non-compliant item PIN as coming from the Packet PIN.

The operator must input a description of the compliant waste that has been disposed of via exit port DO-07-202 into the DMS terminal TE-12-103. The data will be input into the DMS

Contents Inventory Sheet file for the 55-gallon standard drum that is currently attached to the compliant load out port.

The pH results (if acquired) will be input to the DMS system via DMS terminal TE-12-103. The name of the person performing the field screening, the operator's comments, and the date will also accompany the pH results.

SPEC REFERENCES: 13462 - Table 9.2: 6/3

3.9.2.3 Puncture Aerosol Cans

When an aerosol can is separated as a non-compliant item, the operator places a non-compliant item PIN label onto the can and scans the bar code with 12-NE-314. The PCS relates the non-compliant item PIN to the Packet that was scanned previously and the parent drum (See section 3.9.2.2).

When the operator is ready to puncture and drain an aerosol can, an Aerosol Can Collection Container must be selected. The Aerosol Can Collection Container mates specifically with the aerosol can puncture device and is pre-bar coded with a unique label that specifies it as an Aerosol Can Collection Container. The operator then scans the bar code of the Collection Container to be filled, followed by scanning the non-compliant item (aerosol can) bar code of the aerosol can to be punctured. The PCS relates the non-compliant item (Aerosol Can) to the Aerosol Can Collection Container and transmits the association to the DMS. The DMS labels the non-compliant item as an aerosol can when it is associated with an Aerosol Can Collection Container and thus will not expect a sample to be associated with the non-compliant item PIN. The operator then places the can into the puncture device and proceeds with manual operations to drain the can into the Aerosol Can Collection Container.

The operator then opens the lid and removes the aerosol can. The empty can is disposed of in the compliant waste load out drum 107-D0-07-202. The liquid effluent from the can puncture is collected in the Aerosol Can Collection Container attached to the puncture device. The aerosol can is the only "non-compliant item" that will not be sampled directly. Instead, the contents of the Aerosol Can Collection Container will be sampled if required.

PCS ACTIVITIES: The scanning of Aerosol Can Collection Container PIN CHAR(14) (with "22T" data identifier) at the "LLRWMSAMPL" location shall prompt the PCS to expect a non-compliant item PIN ("21T" data identifier with non-compliant item PIN CHAR(14)). The aerosol can (non-compliant item) bar code is then scanned. The PCS then sends the Aerosol Can Collection Container PIN, location, and the non-compliant item (aerosol can) PIN to the DMS.

DATA MANAGEMENT: The DMS receives the Aerosol Can Collection Container PIN CHAR(14), location CHAR(10), and the non-compliant item PIN CHAR(14) (aerosol can) from the PCS. The DMS records the

association between the Collection Container and the non-compliant item. The DMS labels the non-compliant item PIN as an "aerosol can" when it is preceded by a Aerosol Can Collection Container PIN. This provides an explanation in the data base for not receiving a Sample for the non-compliant item (aerosol can).

The operator must input the following information into the DMS whenever liquids are collected from an aerosol can via terminal TE-12-103:

1. Name of operator collecting the liquids.
2. Operator comments.

SPEC REFERENCES: 13462 - Table 9.2: 6/4

3.9.2.4 Sample Non-Compliance

Each non-compliant item that is identified may be sampled. In the case of aerosol cans, the Aerosol Can Collection Container will be sampled instead of the emptied can. Analysis of the samples will provide waste characterization information and therefore waste treatment guidance. The operator scans the bar code of a sample container that is to be filled with a sample at scanner 12-NE-314. The sample containers are pre-bar coded with a unique bar code label. The operator scans the bar code of the non-compliant item or the Aerosol Can Collection Container that is to be sampled. The appropriate sample is taken and placed into the sample container. The operator is required to record some information to be entered into the DMS whenever a sample is taken.

PCS ACTIVITIES: The scanning of the unique sample container PIN CHAR(12) ("S" data identifier and "WP" data qualifier) inputs to the PCS the sample container PIN CHAR(12) and the location "LLRWMSAMPL". This prompts the PCS to expect a non-compliant item PIN CHAR(14) ("21T" data identifier) or a Aerosol Can Collection Container PIN. The non-compliant item or Aerosol Can Collection Container PIN is then scanned. The PCS then sends the sample container PIN, location, and the non-compliant item/Collection Container PIN to the DMS.

DATA MANAGEMENT: The DMS receives the sample container PIN CHAR(12), location CHAR(10), and the non-compliant item PIN CHAR(14) from the PCS and downloads the association to the appropriate files. The DMS associates the sample container PIN CHAR(12) with the non-compliant item PIN (or the Aerosol Can Collection Container PIN in the case of aerosol cans).

The operator must fill out a Chain of Custody/Sample Analysis Request form at the DMS terminal TE-12-103 for the

samples that were taken and loaded into the purge port. Applicable sampling collection data may also be entered at this time (descriptions, temperature, etc).

SPEC REFERENCES: 13462 - Table 9.2: 6/8

Before the operator can load-out the samples from the glovebox, the Purge Port canister must be mounted to the Purge Port on the LLW RWM glovebox. The operator removes the Purge Port canister from the Transfer Pig and connects it to the Purge Port on the glovebox. The operator scans the location bar code on the side of the glovebox to fix the scanners location as "LLRWM PP". Then the Purge Port bar code is scanned via portable scanner 12-NE-313 and finally, the termination bar code on the glovebox wall to end the transmission. The PCS shall transmit the Purge Port PIN CHAR(14) and the location to the DMS.

The operator selects "Sample Loadout" from OIU-12-105B. Then the operator scans each sample container bar code via 12-NE-314 that is to be sent to sample management as it is loaded into the Purge Port container. The PCS sends the sample container PIN, location "LLRWMSAMPL", and Purge Port canister PIN to the DMS. The DMS records the association of the sample container with the Purge Port. The operator must assure that all of the sample containers that were scanned were placed into the Purge Port that is currently attached to the glovebox. Then the operator selects "End Sample Loadout" from the OIU to signal the PCS that the loading activity is complete.

Once the Purge Port is full of sample containers, the Purge Port door can be closed from the inside of the glovebox. Then the operator can remove the Purge Port canister from the exterior of the glovebox. An operator surveys the canister at its removal and decontaminates as necessary.

The operator scans the location bar code on the side of the glovebox to fix the scanners location as "LLRWM PP". Then the Purge Port bar code is scanned via portable scanner 12-NE-313. The Purge Port Transfer Pig's bar code is scanned (if used) to indicate which Transfer Pig will contain the samples. Finally, the termination bar code on the glovebox wall to end the transmission is scanned.

PCS ACTIVITIES: The PCS interfaces with the operator via OIU-12-105B.

To attach Purge Port canister to the glovebox, the location bar code ("2Y" data identifier with location "LLRWM_PP") is read to fix the bar code scanner location at the Purge Port on the LLW RWM glovebox. The "2Y" is recognized by the PCS as a location designator. Reading this bar code prompts the PCS to expect the container bar code ("1B" data identifier for purge port canister followed by a PIN CHAR(14) and a "PP" data qualifier). The Purge Port canister bar code is scanned via 12-NE-313. The operator then scans the termination bar code ("Y" data identifier with command "END&TRNSMT") to confirm termination of the LLW RWM glovebox Purge Port ID process. The data identifier is

"stripped" from the bar code and the bar code keys the PCS that the current activity is complete. The PCS transmits the purge port PIN and location to the DMS.

When "Sample Loadout" is selected via OIU-12-105B, the PCS is prompted to expect sample container bar codes ("S" sample bottle data identifier with PIN CHAR(12) and a "WP" data qualifier). The PCS associates the sample bottle PIN scanned with the purge port PIN connected to the LLW RWM glovebox and transmits the two PINs with the location "LLRWMSAMPL" to the DMS. This occurs for each of the samples scanned. If no purge port is currently located at the LLW RWM glovebox location, then the PCS displays the warning "No Purge Port Present" at OIU-12-105B. The operator must attach a purge port canister to the glovebox and start the sample loading process over.

The location bar code ("2Y" data identifier location "LLRWM_PP") is read to fix the bar code scanner location at the purge port on the LLW RWM glovebox. The "2Y" is recognized by the PCS as a location designator. Reading this bar code prompts the PCS to initiate a sequence where the container bar codes ("1B" data identifier for purge port canister followed by a PIN CHAR(14) and a "PP" data qualifier), ("1B" data identifier for purge port transfer pig followed by a container PIN CHAR(14) and a "TP" data qualifier) and record "LLRWM_PP" as the purge port transfer pig location in a temporary file.

Reading the termination bar code ("Y" data identifier with command "END&TRNSMT") will confirm termination of the process. The PCS associates the PIN's and "LLRWM_PP" location and transmits them to the DMS.

DATA MANAGEMENT: The DMS receives the purge port PIN CHAR(14) and location "LLRWM_PP" CHAR(10) from the PCS and establishes the location of the purge port at the LLW RWM glovebox.

The DMS receives the sample PIN CHAR(14), location "LLRWMSAMPL" CHAR(10), and the purge port PIN CHAR(14) from the PCS and downloads the association to the appropriate files.

The operator must fill out a Chain of Custody/Sample Analysis Request form at the DMS terminal TE-12-103 for the samples that were taken and loaded into the purge port. Applicable sampling collection data may also be entered at this time (descriptions, temperature, etc).

The DMS receives the purge port PIN CHAR(14), location [LLRWM_PP] CHAR (10), and the transfer pig PIN CHAR(14) from

the PCS and downloads it into the appropriate files to establish the purge port container/transfer pig relationship.

The following data is entered by the operator into the DMS via terminal TE-12-103 when the Purge Port is disconnected from the glovebox (unless otherwise specified):

1. Name of the operator disconnecting the Purge Port from the glovebox. Note: Operator retains custody of the Transfer Pig until it is transferred to sample management.
2. Comments about the transfer.
3. Date (from DMS date stamp)
4. Time (from DMS time stamp)
5. Interim storage flag
6. Purge Port PIN number (from bar code scan)
7. Sample Container PIN numbers (from DMS association with Purge Port PIN).
8. Transfer Pig PIN number (from bar code scan).
9. Name of person receiving the Transfer Pig in Sample Management

3.9.2.5 Load Out Non-Compliance to Buffer Storage

After all non-compliant items have been separated from the waste, containerized (if necessary), bar coded and scanned, sampled, and placed back onto the non-compliant item transfer stand (see 3.9.2.1), the RWM transfer drum is ready to be loaded and removed from the RWM transfer port and sent to buffer storage to await sample analysis results. The operator uses the trolley/hoist pendant 107-PC-07-009A to lower the non-compliant item transfer stand back into the restricted waste drum.

The operator then uses the local control panel for the Drath & Schrader bagless transfer system to close the RWM transfer drum. The system gives an output to signify that the bagless transfer port is closed and locked, and the RWM transfer drum has been released. The operator then switches the lift table local control to "Panel" and uses the pushbutton controls to lower the lift table, move the drum to the end of the conveyor, and lift the table to AGV height.

An operator will survey the disconnected drum and log any contamination found that is out of spec. If contamination is found, the drum will be decontaminated until the dose is within the specified limit. The operator then attaches the outer lid of the Drath and Schrader drum. The operator then switches the lift control to "AGV". This step signals the PCS to add the drum on the AGV task list for transfer to RWM buffer storage.

PCS ACTIVITIES: The PCS recognizes that a drum is ready for pick-up at lift table LT-09-201F (See Spec 13462 Table 7.9). At this point, the DMS shall have a complete inventory of the items that

are on the transfer stand. This inventory was maintained by following the process outlined in section 3.9.2.1.

DATA MANAGEMENT: There are no DMS/PCS interfaces associated with this step in the process.

For each new non-compliant item or Aerosol Can Collection Container PIN that is associated with the RWM transfer drum, the operator must input the following data into the DMS via terminal TE-12-103:

1. Storage category code.
2. Non-compliant item status (pending processing)

During survey and de-con the operator may require the attachment of a numbered seal to the drum. The seal number will be logged on the DMS via DMS terminal TE-12-103.

SPEC REFERENCES: 13462 - Table 9.2: 8/1 thru 9/End

3.9.3 LLW RWM Processing (Stage 2)

3.9.3.1 Receive Analysis and Treat

The PCS has recognized that a drum is needed at lift table 107-LT-09-201F. The AGV is tasked to deliver a RWM transfer drum from buffer storage that has received sample analysis results, and whose samples have returned to the LLW RWM glovebox location. The drum entry process is outlined in section 3.9.1.1.

The transfer stand, now located in the LLW RWM glovebox, has been placed in the treatment location. The operator removes the non-compliant items to be treated from the transfer stand by the process outlined in section 3.9.2.1. Then the operator scans the non-compliant item/Aerosol Can Collection Container bar code with fixed scanner 12-NE-315. The PCS sends this PIN and location "LLRWMTREAT" to the DMS which records the non-compliant item as being treated. The sample analysis results, complete with the directions for proper treatment of the non-compliant item, are displayed on the video terminal OIU-12-105A through the back window of the glovebox. The sample container PIN, Purge Port canister PIN, and Transfer Pig PIN will accompany this display.

The operator then locates the Purge Port canister that contains the sample for the non-compliant item being treated. The canister is removed from the Transfer Pig and attached to the glovebox. The operator scans the location bar code on the side of the glovebox to fix the scanner's location as "LLRWM PP". The Purge Port PIN is scanned via portable scanner 12-NE-313, the Transfer Pig PIN is scanned, and finally, the termination bar code on the glovebox wall to end the transmission.

The operator removes the samples from the Purge Port (inside of the glovebox) and locates the one that corresponds to the non-compliant item being treated. The sample container bar code is then scanned via fixed scanner 12-NE-315.

The DMS is receives the sample container PIN and location "LLRWMTREAT" from the PCS.

The operator treats the non-compliant item (or Aerosol Can Collection Container) and Sample according to the instructions displayed on OIU-12-105A. Any containers that are emptied during this process (and qualify as compliant) can be disposed of as compliant waste via port DO-07-202. Otherwise the empty containers may have to undergo limited treatment and be disposed of via port DO-07-203. The operator continues the process of scanning the non-compliant item PINs, locating the sample, scanning the sample container bar code, and treating them as specified. When treatment of one non-compliant item is complete, the operator writes down the necessary information for load out of the treated item for input into the DMS.

The treatment process may require that a larger "Treatment Container" be used instead of the original non-compliant item container. If a Treatment Container is needed, then the unique Treatment Container's bar code will be scanned via fixed scanner 12-NE-15. This prompts the PCS to expect the bar codes from the non-compliant items, Aerosol Can Collection Containers, and sample containers that are to be processed in that particular Treatment Container. The operator then scans these bar codes and the PCS transmits each of these PINs with the Treatment Container PIN to the DMS where the association between the two is recorded.

When treated items are ready for load out the operator selects "Treated Item Loadout" from OIU-12-105B. The operator then scans the bar code via 12-NE-315 of all of the items that are being loaded into the drum at port DO-07-203. The operator loads the treated waste into the 85-gallon standard drum at the port. When finished with this task, the operator selects "End Treated Item Loadout" from the OIU.

PCS ACTIVITIES: When a non-compliant item/Collection Container bar code is scanned via 12-NE-315, the PCS sends the PIN and location "LLRWMTREAT" to the DMS which records the non-compliant item/Collection Container as being treated. The sample analysis results, complete with the directions for proper treatment of the non-compliant item, are displayed on the DMS video terminal OIU-12-105A.

The purge port container is attached to the glovebox and the location updated as noted in paragraph 3.9.2.4.

When the sample container PIN ("S" sample bottle data identifier with PIN CHAR(12) and a "WP" data qualifier) is scanned at fixed scanner 12-NE-315, the PCS sends the Sample PIN, location "LLRWMTREAT", and Purge Port PIN to the DMS.

When a Treatment Container PIN is scanned at fixed scanner 12-NE-315 ("23T" data identifier), the PCS is prompted to accept non-compliant item PINs, Collection Container PINs, and Sample PINs from 12-NE-315. The PCS associates each PIN

that is scanned after the Treatment Container with the Treatment Container PIN. The PCS transmits the Treatment Container PIN, location "LLRWMTREAT", and other container PIN to the DMS.

When "Treated Item Loadout" is selected at the OIU, the PCS is prompted to expect container PIN's of any type. Upon bar code scan at fixed scanner 12-NE-315, the PCS transmits the PIN, location "LLRWMTREAT", and the waste drum PIN at the "LLRWMEXIT" location, to the DMS. The DMS associates all of the PIN's scanned with the 85-gallon standard drum PIN at this location.

DATA MANAGEMENT: The DMS receives the non-compliant item/Collection Container PIN CHAR(14) and location CHAR(10) [LLRWMTREAT] from the PCS. The DMS records the item as being treated and displays the treatment instructions on the LLW RWM DMS monitor.

The purge port container is attached to the glovebox and the location updated as noted in paragraph 3.9.2.4.

The DMS receives a Sample PIN CHAR(14) and location "LLRWMTREAT" CHAR(10), and Purge Port PIN CHAR(14). The DMS subtracts the Sample PIN from the Purge Port inventory and records the Sample as being treated.

The DMS receives a Treatment Container PIN CHAR(14), location [LLRWMTREAT] CHAR(10), and other item PIN CHAR(14) from the PCS. The DMS records that the contents of the item have been placed into the Treatment Container.

The DMS receives a container PIN CHAR(14) of any type, the treated item loadout location CHAR(10) [LLRWMTREAT], and the waste drum PIN CHAR(14) at location "LLRWMTREAT" from the PCS. The DMS associates the container PIN received with the loadout drum PIN currently attached to the glovebox location "LLRWMEXIT".

When treatment occurs, the following data must be entered into the DMS via DMS terminal TE-12-103 for reuniting the sample to the parent material:

1. Non-compliant item PIN (From bar code scan)
2. Method of Treatment (Already in DMS file from Sample Management).
3. Date Treatment completed.
4. Name of Operator performing treatment.
5. Name of Operator reuniting sample with parent material.
6. Date materials were reunited.
7. Sample container PIN returned to non-compliant item (From bar code scan).

8. Time material was reunited.

When the treatment is complete and the waste is ready for disposal into the drum at port DO-07-203, the following data must be entered into the DMS via terminal TE-12-103:

1. Container PIN (from bar code scan at 12-NE-315).
2. Name of operator.
3. Primary waste type code.
4. Secondary waste type code.
5. Secondary waste type group.
6. Storage category.
7. Operator comments.
8. Article description.
9. Estimated volume percent.
10. Estimated item weight.
11. Total volume %.
12. Total weight.
13. Date container packaged.
14. Time.

UPSET CONDITIONS: The PCS is keyed to accept container PIN types in a certain order depending upon the first PIN scanned or the menu selection made by the operator. If a bar code is scanned out of this sequence, the PCS will not transmit that bar code to the DMS. Instead, a warning will be displayed on the OIU, the last two bar codes scanned will be displayed with it, and the fixed scanner will be locked out until the message is acknowledged. After acknowledgment, the operator must start the last scanning process over.

3.9.3.2 Loadout of Compliant Waste

When the compliant waste drum has been filled with the compliant portions of the incoming Packets, the operator selects "Port 107-DO-07-202" from OIU-12-105B. Then the operator selects "Close Port" from the menu. The PCS rotates the port door closed, lowers the lid onto the drum, releases the lid vacuum, lowers the drum to the centering location, locks the port door, and releases the drum centering clamps. The PCS then displays "Port 107-DO-07-202 Closed and Locked" at OIU-12-105B.

The operator then switches the lift table local control to "Panel" and uses the pushbuttons to lower the drum from the port, and convey the drum out from underneath the glovebox. The operator replaces the clamp band. The operator then switches the lift control to "AGV" which signals the AGV that a drum is ready for pick-up. This drum will be sent to the LLW process line for supercompaction.

PCS ACTIVITIES: The PCS interfaces with the operator at OIU-12-105B.

DATA MANAGEMENT: There are no DMS/PCS interfaces associated with this step in the process. The operator will enter the seal number into the DMS as required.

SPEC REFERENCES: 13462 - Table 9.4: 5/1 thru 6/End

3.9.3.3 Loadout of Treated Waste

When the non-compliant waste has been treated and loaded into the 85-gallon waste drum, the operator selects "Port 107-DO-07-203" from OIU-12-105B. Then the operator selects "Close Port" from the menu. The PCS rotates the port door closed, lowers the lid onto the drum, releases the lid vacuum, lowers the drum to the centering location, locks the port door, and releases the drum centering clamps. The PCS then displays "Port 107-DO-07-203 Closed and Locked" at OIU-12-105B.

The operator then switches the lift table local control to "Panel" and uses the pushbuttons to lower the drum from the port and convey the drum out from underneath the glovebox. The operator replaces the clamp band. The operator then switches the lift control to "AGV" which signals the AGV that a drum is ready for pick-up. This drum will be sent to the NDE/NDA area for certification.

PCS ACTIVITIES: The PCS interfaces with the operator at OIU-12-105B.

DATA MANAGEMENT: There are no DMS/PCS interfaces associated with this step in the process. The operator will enter the seal number into the DMS as required.

SPEC REFERENCES: 13462 - Table 9.6: 6/1 thru 7/End

3.10 TRU PROCESS GLOVEBOXES

3.10.1 TRU Entry Glovebox

3.10.1.1 Initialization and Drum Receipt

The Process Area Internal Transport has received and acted on the message sent by the PCS and the TRU Process operator that a drum is needed at the TRU Entry glovebox conveyor 107-LT-09-202B. The operator has turned the lift table local panel L-O-R switch to "remote", the limit switches on the lift table indicate that no drum is present, and the table is at AGV height. The AGV delivers the next drum to be processed and commences its handshake with the lift table. Once the delivery is complete, the PCS transmits the location and drum PIN to the DMS. (See section 3.7.7 and Technical Specification 13462, Internal Transport Table 7.9). The DMS checks that the addition of the drum's fissile content will not exceed the inventory allowed in the TRU glovebox line. If this fissile material inventory check verifies limits are not exceeded, then operations can continue.

If the glovebox fissile material inventory limits will be exceeded, the DMS shall transmit a "Fissile Material Inventory Limit Exceeded" message to the PCS which shall cause the PCS to generate an alarm and record it on the alarm tracking log.

During this time the entry glovebox equipment is being checked by the PCS for initialization status as a prerequisite to start processing. If all of the criteria are met for initialization status then the operator is notified via OIU-12-104A and can proceed to the next step.

After initialization, and the successful delivery of the waste drum, the operator scans the location bar code, drum bar code, and termination bar code using bar code reader 12-NE-300. The PCS will verify that the drum identification and location match that input by the AGV delivery, before any more actions are allowed by the PCS. Once identification and location are verified, the operator will manually remove the clamp band from the overpack drum.

PCS ACTIVITIES: If glovebox fissile material inventory limits will be exceeded, the DMS shall transmit a "Fissile Material Inventory Limit Exceeded" message to the PCS which shall cause the PCS to generate an alarm and record it on the alarm tracking log.

The location bar code ("2Y" data identifier with location "TRU ENTRY") is read to fix the bar code scanner location. The "2Y" is recognized by the PCS as a location designator. Reading this bar code prompts the PCS to expect a drum bar code ("S" data identifier followed by a container PIN) and record "TRU ENTRY" as the drum location in a temporary file. The drum bar code is then scanned and the PCS compares the current PCS stored value against the actual drum delivered to verify a match. If the PIN numbers match, then operations can continue.

Scanning the termination bar code ("Y" data identifier with command "END&TRNSMT") will confirm termination of the entry glovebox ID process. The data identifier is "stripped" from the bar code and the bar code keys the PCS that the current activity is complete.

DATA MANAGEMENT: The fissile material inventory limit verification will calculate the fissile material inventory for the glovebox including the drum just received at the entry port. The DMS will compare this number against the glovebox limit to verify the limit has not been exceeded.

If the glovebox fissile material inventory limit will be exceeded a pop-up message will be generated on the DMS system, displayed on DMS operator terminal TE-12-104, and an alarm transmitted to the PCS [location CHAR(10) and message

type]. If the fissile material inventory limit will be exceeded; the drum just received at the entry port will not be accessed to the glovebox until the fissile inventory of the glovebox can be reduced to a level that will prevent a fissile inventory limit violation.

Note that drum location verification discussed above is internal to the PCS. The DMS has previously had the drum location updated in accordance with section 3.7.7 activities.

THERE ARE NO PCS/DMS INTERFACES. THIS STEP ONLY VERIFIES THE PROPER LOCATION HAS BEEN TRACKED IN THE PCS.

UPSET CONDITIONS: Operator bar code scan at drum delivery reveal unmatched drum identifications at entry glovebox.
Resolution: The PCS shall provide an alarm at OIU-12-104A if this occurs and stop entry functions until operator resolution.

SPEC REFERENCES: 13462 - Table 10.2: 1/1 to 2/End

3.10.1.2 Drum Entry Sequence

The PCS now recognizes that a drum has been successfully received and identified at the TRU entry glovebox. The operator is prompted at OIU-12-104A to choose "Overpack Entry Menu" or "One Drum Entry Menu" depending on whether the drum is overpacked or not. Now the operator selects "Start Entry Sequence" from the current "Drum Entry Menu" on OIU-12-104A. The PCS, after recognizing that the drum is in position, automatically proceeds with the drum entry sequence. The operator has the ability to "Emergency Stop" the sequence at any step. At this point OIU-12-104A displays, "Drum Entry Sequence Complete".

The operator then prompts the PCS to "Open Port". The PCS automatically mates the drum to the port door, unlocks the port, and opens the overpack drum with the entry port door. The trolley, with attached drum lifter, translates over the overpack drum.

PCS ACTIVITIES: The PCS interfaces solely with the operator during this part of the process. The operator is able to "Emergency Stop" the sequence at any point.

DATA MANAGEMENT: There are no DMS/PCS interfaces associated with this step in the process.

SPEC REFERENCES: 13462 - Table 10.2: 3/1 to 3/End

Upon translation of the trolley hoist over the Entry/Exit port the PCS enables the hoist pendant 107-PC-07-001 for operator use. The operator then controls

the hoist to lower the drum lifter onto the 55-gallon drum, close the lifter jaws, and begin lifting the drum into the glovebox. Once the drum is high enough to be reached through the gloveports, the operator stops lifting and frisks the top surface of the 55-gallon drum with 12-RE-533 (TRU Line In-Box Frisker) to check for contamination. Then the operator raises the 55-gallon drum to full height and frisks the bottom of the drum for contamination.

Upon lifting the drum to full height, the PCS disables the hoist pendant. At this point, the operator selects "Trolley Menu" from OIU-12-104A and translates the drum to the center of the glovebox by selecting "Swab Position". This allows the operator to view the empty 85-gallon overpack, via a TV camera, and check for debris. Also, the operator carries out swab counting of the overpack drum to check for contamination.

The contamination data from the 55-gallon drum and overpack will be used to designate the routing of the overpack drum. The overpack goes to the RWM storage carousel or through the air lock to the Shipping and Receiving area (See Table 7.9 Process Area Internal Transport operation requirement).

PCS ACTIVITIES: The tripping of the Swab Position switch with the hoist trolley, keys the PCS to request the inner drum PIN from the DMS. The inner drum will be tracked separately from the overpack drum. The PCS displays the inner drum PIN on OIU-12-104A for operator verification. The operator visually compares the displayed PIN with the inspected drum PIN and selects "Inner Drum PIN Verified" from the menu if the PINs match. If the PINs do not match, then the operator must solve the problem via the DMS terminal and then select "Inner Drum PIN verified" at the OIU. Once "Inner Drum PIN Verified" is selected then the drum PIN (CHAR(14)) and location ("TRU_ENTRY") are loaded into the new file for the 55-gallon drum. From this point, the current DMS file for the inner drum is handled as a separate drum to be tracked through the LLW glovebox. This drum's location history table is updated according to the position of the inner drum only. The overpack drum is tracked separately.

DATA MANAGEMENT: Upon receipt of the request of the inner drum PIN from the PCS CHAR(15), the DMS will transmit the PIN and location (TRU_ENTRY) for the inner drum to the PCS. The DMS will initiate tracking of the inner drum at the TRU_ENTRY location. The date and time the inner drum was removed from the overpack will be recorded in the DMS.

SPEC REFERENCES: 13462 - Table 10.2: 4/1 to 5/End
13462 - Table 7.9 Process Area Internal Transport Operation Requirement

The operator selects the "Overpack Entry Menu" from OIU-12-104A. Based on the contamination data of the 55-gallon and overpack drums, the operator will select "Close and Relid Clean" or "Close and Relid Contaminated". The

threshold for qualifying a surface as contaminated will be determined by operations. Based on which menu the operator selects, the PCS will determine the proper routing of the overpack drum. A clean overpack will be transported to NDE/NDA area if there are two overpacks already available in the RWM storage carousel. A contaminated overpack will be transferred to RWM storage unless there are two overpacks already stored in the RWM storage.

The PCS rotates the port door down and displays "Port Close Sequence in Progress" at OIU-12-104A. The port door is then lowered onto the overpack drum. The PCS de-energizes the port door vacuum system and extends the lid detachment cylinder. The operator then selects "Lower Lift Table" from the "Drum entry Menu". The PCS lowers the table. Once lowered, OIU-12-104A displays "Drum Exit Sequence in Progress". The PCS energizes the lift table conveyor motor until "Drum at End of Conveyor". The operator surveys and decontaminates the top of the overpack. Then the operator switches the lift table to "local" and uses the local control panel 107-PC-07-202B to raise the lift table to "AGV height". At this point the operator switches the lift table control to "remote". The operator manually replaces the clamp band. The operator selects "Drum Ready for Pick Up" at OIU-12-104A. This signals the AGV that a drum is ready for pick up.

PCS ACTIVITIES: The PCS interfaces with the operator via OIU-12-104A. Once the permissives are met to signal the internal transport system to pick up the overpack drum, the PCS retrieves the contamination status (input via OIU-12-104A) of the overpack. The AGV path is tasked based on the contamination information of the overpack and the number of overpacks already present on the RWM storage carousel (See Spec 13462 Table 7.9 Process Area Internal Transport Operation Requirement).

DATA MANAGEMENT: There are no DMS/PCS interfaces associated with this step in the process.

SPEC REFERENCES: 13462 - Table 10.2: 6/1 to 6/End

After the overpack drum has successfully detached from the entry glovebox, and is ready for AGV pick-up, the operator selects "Trolley Menu" from OIU-12-104A. Then the operator selects "Transfer Assembly" and the PCS translates the hoist, with 55-gallon drum attached, over the transfer port for transfer of the drum into the sorting glovebox. Then the PCS begins the transfer process and displays "Drum to Drum Transfer Assembly in Progress" at the OIU. Once the drum is present in the upper grab, the PCS displays "Drum to Drum Transfer Assembly Sequence Completed, Drum at Upper Grab". The operator then uses the hoist pendant to provide slack in the drum lifter chain, open the lifter jaws, and lift the drum lifter up to fully raised position.

The operator then selects "Lower to Car" from the "Transfer Assembly Menu". The PCS opens the sphincter port door, lowers the top drum to a position over the lower drum, and then the two drums are lowered in tandem until the lower drum is placed onto the transfer car. The operator then transfers the lower

drum into the sorting glovebox. The operator selects "Handover" from the "Transfer Assembly Menu". The top drum in the transfer assembly is then handed over to the lower drum grab. The drum is lowered so that the sphincter door can be closed and sealed.

At this point, the entry sequence is complete and the Entry Glovebox automatically checks for initialization status.

PCS ACTIVITIES: The PCS interfaces with the operator via OIU-12-104A.

The operator will select "Close and Relid Clean" or "Close and Relid Contaminated". The PCS will determine the proper routing of the overpack drum based upon which menu the operator selects (See Table 7.9 of Specification 13462). The PCS sends the overpack drum PIN, location, and contamination status to the DMS.

DATA MANAGEMENT: The DMS receives the overpack drum PIN CHAR(14), location CHAR(10), and contamination status LOGIC(1) from the PCS. The DMS loads the contamination status into the overpack drum's current file.

SPEC REFERENCES: 13462 - Table 10.2: 7/1 to 10/End

3.10.2 TRU Empty Drum Loadout Glovebox

3.10.2.1 Empty Puck Overpack Entry Sequence

The Process Area Internal Transport has received and acted on the message sent by the PCS that a drum is needed at the TRU empty drum load out conveyor 107-LT-09-203C. The lift table local panel L-O-R switch is in "remote", the limit switches on the lift table indicate that no drum is present, and the table is at AGV height. The AGV delivers the next empty drum and commences its handshake with the lift table. Once the delivery is complete, the PCS transmits the location and drum PIN to the DMS. The drum bar code has previously been scanned and the outer lid removed at the AGV hold point location at the west end of the glovebox line (See Technical Specification 13462, Internal Transport Table 3.7.7).

PCS ACTIVITIES: The PCS interfaces with the operator at OIU-12-104C and OIU-12-104A.

Upon notification that a successful drum transfer has occurred, the PCS shall transmit the overpack drum PIN and location to the DMS as noted in section 3.7.7.

DATA MANAGEMENT: See section 3.7.7 for drum transfer location updates in the DMS.

3.10.2.2 Loading Empty Pucks Into Overpack

The operator selects "Start Entry" from the "Empty Drum Port Menu" at OIU-12-104C. The PCS automatically lowers the drum, moves the drum under port, and raises the drum to the bagless transfer port. The operator then selects "Open Port" from the menu. The 85-gallon Drath & Schrader port controller then delids the drum and opens the port.

The operator has compacted an empty drum by moving the transfer car to the compactor position and selecting "Start Compact" from OIU-12-104C. The operator then selects "Transfer Car Menu" from OIU-12-104C and moves the transfer car to "Empty Drum Loadout" from the empty drum compactor location. The operator then uses hoist pendant PC-07-011A to move the hoist over the compacted drum and pick up the drum. The operator then selects the "Empty Drum Loadout Menu" from OIU-12-104C. The operator views the weight of the compacted drum and the current cumulative weight in the load out drum and decides if the compact can be added to the cumulative. If the allowable weight will not be exceeded, the operator selects "Add to Cumulative". The PCS will warn the operator if the addition of the compact will exceed the total allowable weight in the load out drum. If the puck addition will exceed the load out drum weight limits, the PCS shall not provide the load out drum as the updated puck location.

The PCS shall track the location of the empty compacted puck as it is relocated to the loadout port. When the operator selects "Add to Cumulative" the PCS shall transmit the puck PIN and location to the DMS which will status the puck as being loaded into the overpack. The operator then uses the hoist pendant to lower the compact into the load out drum and disconnect the hoist.

PCS ACTIVITIES: When "Add to Cumulative" is selected, the PCS transmits the puck PIN CHAR(6), location CHAR(10), and puck weight NUMBER(10,2) to the DMS.

DATA MANAGEMENT: The DMS adds the puck weight to the cumulative weight in the overpack drum, adds one to the cumulative number of pucks in the overpack, and stores this number in a temporary file.

The DMS then transmits the new "cumulative overpack drum weight" NUMBER(10,2) back to the PCS along with the overpack PIN CHAR(14), and the location CHAR(10) for use with future loading operations.

If the cumulative is greater than the allowable, the DMS transmits a warning signal "OVERPACK WT LIMIT EXCEEDED" to the PCS along with the location CHAR(10) and the PCS displays it on the OIU.

The DMS will record the puck PIN CHAR(6) and relate it to the overpack PIN CHAR (14).

The height of the compacted empty drum may be entered into the DMS via DMS terminal TE-12-104.

SPEC REFERENCES: 13462 - Table 10.4: 1/1 to 11/End
13462 - Table 10.6: 1/1 to 2/End

When the load out drum is sufficiently full, the operator selects "Close Port" from the "Empty Drum Port Menu". The bagless transfer port controller automatically closes the port door. The operator then selects "Start Exit" from the menu. The PCS lowers the lift table, translates the drum to the end of the conveyor, and raises the lift table to AGV height. This signals the operator that the sequence is complete, and signals the AGV that a drum is ready for pick up.

The AGV arrives at the lift table with an empty replacement drum for the drum that is being picked up. The AGV transfers the full 85-gallon load out drum onto the AGV and moves to the entry hold point at the west end of the TRU glovebox line. The operator manually replaces the outer lid and clamp band on the drum exiting the glovebox and surveys and decons the drum exterior.

The operator then selects "Advance AGV" from the "Entry Hold Point Menu" at OIU-12-104A. The AGV moves to locate the empty drum to the hold point location so the operator can remove the outer lid and clamp band and scan the bar code of the empty drum being accessed to the glovebox. The operator scans the location bar code, the drum bar code, and then the termination bar code to properly identify the drum and location. The operator then selects "Release AGV" from the menu and the AGV proceeds to deliver the empty drum to lift table LT-09-203C.

PCS ACTIVITIES: The location bar code ("2Y" data identifier with location "HOLD POINT") is read to fix the bar code scanner location. The "2Y" is recognized by the PCS as a location designator. Reading this bar code prompts the PCS to expect a drum bar code ("S" data identifier followed by a container PIN) and record "HOLD POINT" as the drum location in a temporary file. The empty drum bar code is then scanned and the PCS compares the current PCS stored value against the actual drum delivered (indicated by bar code scan) to verify a match. If the PIN numbers match, then operations can continue.

Scanning the termination bar code ("Y" data identifier with command "END&TRNSMT") will confirm termination of the drum ID process. The data identifier is "stripped" from the bar code and the bar code keys the PCS that the current activity is complete and the drum PIN and location shall be transmitted to the DMS.

DATA MANAGEMENT: The DMS will log "HOLD POINT" in the location field CHAR(10) field of the waste container table for the empty drum PIN, CHAR(14), received from the PCS. The date and time the

relocation occurred will also be recorded. The data currently in the waste container table will be transferred to a relocation history table as the new location is identified. The relocation history record table will be updated with the drum PINs, locations, dates, and times as the waste is processed through the facility.

3.10.3 TRU Sorting Glovebox

3.10.3.1 Initialization and Delid

Once the 55-gallon drum has successfully been transferred to the sorting glovebox, the initialization process begins. The PCS performs a system check of the sorting glovebox equipment to verify that processes can begin. Once complete, the PCS displays "System Initialized" on OIU-12-104B. The PCS checks for the presence of a 55-gallon Drath and Schrader drum on the TRU RWM transfer port lift table 107-LT-09-203B. The operator then enables the hoist pendant 107-PC-008B located over the RWM off-take bulge.

The operator begins the process of mating the RWM drum to the Drath and Schrader port by selecting "Start Entry" from the "RWM Port Menu" on OIU-12-104B. The PCS energizes the lift table motor until the drum is located under the Drath and Schrader port. The PCS lifts the drum which enables the operator to open the RWM drum by selecting "Open Port" from the "RWM Port Menu" at the OIU. Once the drum has been opened, the operator uses the hoist pendant 107-CR-07-008B to lower the hoist and lift the non-compliant item transfer stand out of the drum. The operator then moves the transfer stand to its loading position.

After the transfer stand is correctly positioned, the operator selects "Transfer Car Menu" from OIU-12-104B. Then, "Delid/Tipper" is selected to move the drum transfer car from the transfer port location to the delid position in the sorting glovebox. The PCS energizes and holds solenoid valve (forward) until the transfer car arrives at the delidding location. The OIU-12-104B displays "Transfer Car at Delid Position".

PCS ACTIVITIES: The PCS interfaces with the operator via OIU-12-104B for operator oversight of the glovebox functions. Also, warning signals are displayed on the OIU in the event that an operation fails to be executed successfully.

DATA MANAGEMENT: There are no DMS/PCS interfaces associated with this step in the process.

SPEC REFERENCES: 13462 - Table 10.8: 1/1 thru 8/End

3.10.3.2 Open and Sort

Once the transfer car has successfully arrived at the delid position, the drum is ready to be opened. The operator selects "Drum Tipper Menu" from OIU-12-104B and selects "Lower and Close Grab". The operator lowers the drum grab by depressing the raise/lower button on the OIU-12-104B keypad. When the drum grab has closed onto the drum the PCS displays "Lower and Close Grab Sequence Completed".

At this point the operator selects "Lid/Delid Menu" from the OIU and selects "Delid Position". The PCS moves the Lid/Delid Fixture from its park position to the delid position over the waste drum positioned in the drum grab. The operator selects "Saw Operation Menu" from the OIU-12-104B. At this point, the operator must select from the menu, the locations for the saw to safely cut the clamp band, based on the location of the band bolt. The PCS automatically cuts the clamp band in one location. The operator uses the manipulators to hold the clamp band and prompts the PCS to continue with the second cut. The clamp band pieces are placed onto the sorting table. The saw returns to park position signaling the operator with "Saw Sequence Completed" on OIU-12-104B.

The operator again selects "Lid/Delid Menu" from the OIU and selects "Start Delid Sequence". The PCS lowers the delid fixture, energizes the vacuum system, raises the fixture, and returns the fixture to the park/reid position with the drum lid attached. At this point the PCS displays "Delid Sequence Completed" at OIU-12-104B.

The operator selects "Drum Tipper Menu" and selects "Raise with Grab Closed". If all of the permissives are met, the PCS raises the drum to "raised" position. The operator selects "Tipper Position" from the "Sorting Table Menu" and the PCS translates the sorting table to this position. At this point the PCS enables the Drum Tipper Joy Stick Control and signals the operator via the OIU that the drum tipper is enabled.

The operator then uses the joy stick to tip the drum and empty the contents onto the sorting table. The manipulator arms are used to assist the emptying of the drum if necessary. The operator uses NDE X-Ray hard copies to pre-locate the non compliant items before the drum is emptied. By this the operator can decrease sorting time by knowing what portion of the drum that the item(s) is located in. Once the drum is empty and rotated to vertical position, the operator selects the "Sorting Table Menu" from OIU-12-104B. Then "Assay Position" is selected and the PCS translates the sorting table to move to the assay position.

When the sorting table is located at the assay location, the operator selects the "Drum Tipper Menu" from the OIU and "Lower with Grab Closed". With the manipulators back in park position and other permissives met, the operator/PCS lowers the drum to the drum tipper "lowered" position. The PCS indicates the completion of these steps by displaying "Lower with Drum Grab Sequence Completed".

PCS ACTIVITIES: The PCS interfaces with the operator via OIU-12-104B for operator oversight of the glovebox functions. Also, warning signals are displayed on the OIU in the event that an operation fails to be executed successfully.

The PCS output to the OIU, "Raise with Grab Closed Sequence Completed, Rotation Enabled" also sends the message to the DMS to begin the transmission of drum content data to the PCS for the drum PIN that has been tracked to the sorting glovebox.

With the completion of the "Raise with Grab Closed" sequence, the PCS transmits the drum PIN and location to the DMS.

DATA MANAGEMENT: The DMS logs the drum PIN CHAR(14) and location [TRU_SORT] CHAR(10) to indicate that the drum is being sorted on the TRU sorting table.

SPEC REFERENCES: 13462 - Table 10.8: 9/1 thru 15/End

After the drum has been emptied onto the sorting table and the drum is at the lowered position in the drum grab, the operator uses the manipulator arms to sort the waste. The operator (aided by drum NDE X-Ray hard copies and drum content data shown on the DMS screen at the TRU glovebox terminal) searches for the packets of waste that are suspected to contain restricted waste items or high fissile quantities. If the restricted item is clearly visible in the packet, then the packet is ready for identification. The data on the glovebox DMS terminal will also note whether the drum is a non-compliant drum or one that requires sampling. If it is not clear which packet contains the restricted item or the high fissile quantity, then the operator selects the "Packet Assay/X-Ray Menu" from OIU-12-104B.

If the packet is suspected to contain a restricted item, then the operator selects "Open Packet X-Ray" from the menu. The PCS opens the packet X-Ray door, extends the tray, and notifies the operator when the sequence is complete. The operator places the packet onto the tray and selects "Close Packet X-Ray" from the menu. The operator selects "Enable Packet X-Ray" to start the examination process. The packet X-Ray gives an output during operation to lock out all other actions. The operator views the X-Ray on associated video monitor. The operator then removes the packet from the X-Ray tray by use of the "Packet X-Ray Menu".

PCS ACTIVITIES: There are no DMS/PCS interfaces associated with these steps

DATA MANAGEMENT: There are no DMS/PCS interfaces associated with this step in the process.

If the packet X-Ray verifies that the packet contained a non-compliant item then the operator must assay the package before transferring the TRU waste to the TRU RWM glovebox. If the packet obviously contained restricted items and

does not require X-Ray, it must still be assayed. If a drum contains a packet that is suspected to contain high fissile content, it must be found by assaying each packet individually until its identity is determined.

The operator uses the "Packet Assay/X-Ray Menu" to "Extend Packet Assay Tray" and place the packet onto the tray and then to "Close Packet Assay". The operator uses local dedicated controls to operate the packet assay machine. When complete, the menu at the OIU will be re-enabled. The operator determines if the packet is compliant with fissile quantities or non-compliant and executes one of the following:

1. If compliant (below fissile upper limit and contains no restricted items), the operator signals the PCS of the packet's status by selecting "Compliant Packet" from the "Packet Assay/X-Ray Menu". The DMS then prompts the assay monitor to reset and the operator places the packet back onto the sorting table.
2. If non-compliant (above fissile upper limit and/or contains restricted items), the operator selects "Non-Compliant Packet" from the menu. The PCS then extracts the packet assay data from the assay monitor. The packet is removed from the packet assay monitor and destined for the non-compliant item transfer stand. The operator (immediately after removing the item) places a Non-Compliant Packet bar code label onto the packet and scans the bar code with fixed scanner 12-NE-301. The PCS transmits the packet PIN and location to the DMS which associates the PIN with the packet assay data last extracted.

The packet is placed onto the non-compliant item transfer stand. The operator continues this process until all of the non-compliant items have been removed from the waste.

PCS ACTIVITIES: The PCS interfaces with the operator at OIU-12-104B for control of the Packet Assay/X-Ray units, trays, and drawers.

Upon full closure of the packet assay door (indicated by switch ZS327A) the PCS signals the PAM "Enable PAM". The PAM responds "Assay in Progress" and then "PAM Assay Complete".

After selection of "Compliant Packet" at OIU-12-104B, the PCS signals the PAM to "Reset Monitor" and the PAM responds "Monitor Reset".

After selection of "Non-Compliant Packet" at OIU-12-104B, the PCS signals the packet assay monitor "Transmit Assay Data to PCS". The PAM then sends the assay results (Pu240 Equivalent Mass and Uncertainty) to the PCS. The PCS shall forward these results on to the DMS.

DATA MANAGEMENT: When the newly placed bar codes of non-compliant packets are scanned, the PCS transmits the new packet PIN CHAR(14), the

location "TRU_SORT", and the RWM Transfer drum PIN (currently located at the TRU sorting glovebox RWM Transfer Port) to the DMS.

The PCS also transmits a second message containing the new packet PIN, the location "TRU_SORT", and the packet's parent drum PIN (location = TRU_SORT) to the DMS.

The DMS will use these two messages to provide traceability ties between the packet of waste, the RWM Transfer drum, and the parent waste drum. The operator must input the a brief packet description into the DMS directly via TE-12-104. The operator calls up the file that is being loaded with the non-compliant packet information and adds the information about the secondary waste type and packet description for each packet that was scanned. The DMS receives the assay data from the PCS and logs it against the packet PIN just read with the bar code reader.

SPEC REFERENCES: 13462 - Table 10.8: 16/End thru 17/End

3.10.3.3 Loadout of Non-Compliance

After all non-compliant packets have been separated from the waste, bar coded, and placed onto the non-compliant item transfer stand, the RWM drum is ready to be loaded and removed from the drum port. The operator uses the trolley/hoist pendant 107-PC-07-008B to lower the Non-compliant item transfer stand back into the restricted waste drum. The operator then disconnects the hoist hook from the transfer stand and raises the hoist to fully raised position.

The operator then selects "Close Port" from the RWM port menu and the PCS sends a signal to the local controller for the Drath & Schrader bagless transfer system to close the RWM drum. The system gives an output to signify that the bagless transfer port is closed and locked, and the RWM drum has been released. The operator then proceeds with the exit sequence by selecting the lift table menu at OIU-12-104B. By selecting "Start Exit" from this menu, the PCS lowers the lift table, translates the drum out to the end of the drum conveyor, and raises the lift table to AGV height. This signals the AGV that a drum is ready for pick-up.

The AGV arrives at the lift table with an empty replacement drum for the drum that is being picked up. The AGV transfers the full 55-gallon RWM drum onto the AGV and moves to the entry hold point at the west end of the TRU glovebox line. The operator manually replaces the outer lid and retaining bolts on the full drum and surveys and decons the drum exterior. The operator then selects "Advance AGV" from the "Entry Hold Point Menu" at OIU-12-104A. The AGV moves to locate the empty drum to the hold point location so the operator can remove the outer lid and retaining bolts from the empty drum and scan the bar code. The operator scans the location bar code, the empty drum bar code, and then

the termination bar code to properly identify the drum and location. The operator then selects "Release AGV" from the menu and the AGV proceeds to deliver the empty drum to lift table LT-09-203B.

PCS ACTIVITIES: The PCS interfaces with the operator at OIU-12-104A & B.

The location bar code ("2Y" data identifier with location "HOLD POINT") is read to fix the bar code scanner location. The "2Y" is recognized by the PCS as a location designator. Reading this bar code prompts the PCS to expect a drum bar code ("S" data identifier followed by a container PIN) and record "HOLD POINT" as the drum location in a temporary file. The drum bar code is then scanned and the PCS compares the current PCS stored value against the actual drum delivered (indicated by bar code scan) to verify a match. If the PIN numbers match, then operations can continue.

Scanning the termination bar code ("Y" data identifier with command "END&TRNSMT") will confirm termination of the drum ID process. The data identifier is "stripped" from the bar code and the bar code keys the PCS that the current activity is complete.

DATA MANAGEMENT: The DMS will log "HOLD POINT" in the location field CHAR(10) field of the waste container table for the empty drum PIN, CHAR(14), received from the PCS. The date and time the relocation occurred will also be recorded. The data currently in the waste container table will be transferred to a relocation history table as the new location is identified. The relocation history record table will be updated with the drum PINs, locations, dates, and times as the waste is processed through the facility.

When the DMS receives the "HOLD POINT" location for the RWM Transfer drum, the DMS subtracts the total packet radionuclide content contained in the RWM transfer drum from the TRU glovebox line and the appropriate parent drums that the packets was removed from.

During survey and decon the operator may require the attachment of a numbered seal to the drum. The seal number will be logged on the current RWM drum record via DMS terminal TE-12-103.

SPEC REFERENCES: 13462 - Table 10.4: 18/1 thru 18/End

3.10.3.4 Statistical Sampling

To support certification of the waste for final disposal, statistical samples of the final waste form will be taken. With the waste sorted and ready to be re-loaded into the loadout drums, the operator will snip samples from the waste items. The operator must collect enough samples to provide a representative cross section of the waste to the lab which will verify the contents.

Before the operator can load-out the samples from the glovebox, the purge port canister must be mounted to the purge port on the sorting glovebox. The operator removes the empty purge port canister from the pig and connects it to the purge port on the glovebox. The operator scans the location bar code on the side of the glovebox to fix the scanners location as "TRU PP". The purge port bar code is scanned via portable scanner 12-NE-300 and finally, the termination bar code on the glovebox wall is scanned to end the transmission. The PCS shall transmit the Purge Port PIN and the location to the DMS.

Once a sample is taken, the operator loads it into a pre-bar coded container. The operator scans the sample bottle bar code via fixed scanner 12-NE-301. The PCS associates the sample bottle PIN and its parent drum PIN (location = "TRU_SORT") and transmits them to the DMS with the location "TRU_SORT".

When samples are ready to be placed into the purge port the operator selects "Sample Loadout" from OIU-12-104B. The operator scans the bar codes of the sample bottles with fixed scanner 12-NE-301 as each sample bottle is loaded into the purge port. The PCS recognizes that the bar code belongs to a sample container and then sends the sample PIN, location ("TRU_SORT"), and associated Purge Port PIN to the DMS. When all of the samples have been placed into the purge port or the purge port is full, the operator stops scanning the bar codes and selects "End Sample Loadout" at the OIU. The operator inputs into the DMS the needed sample information.

PCS ACTIVITIES: The location bar code ("2Y" data identifier with location "TRU PP") is read to fix the bar code scanner location. The "2Y" is recognized by the PCS as a location designator. Reading this bar code prompts the PCS to expect a container bar code (unique data identifier followed by a container PIN) and record "TRU-PP" as the purge port location in a temporary file. The purge port bar code is then scanned and the PCS transmits the location and purge port PIN to the DMS.

Then scanning the termination bar code ("Y" data identifier with command "END&TRNSMT") will confirm termination of the purge port ID process. The data identifier is "stripped" from the bar code and the bar code keys the PCS that the current activity is complete.

The scanning of a sample container PIN at 12-NE-301 keys the PCS to make an association between the sample PIN and the

parent drum PIN (currently located in the sorting glovebox). The PCS then transmits these PINs with the location "TRU_SORT" to the DMS.

When "Sample Loadout" is selected via OIU-12-104B, the PCS is prompted to expect sample container bar codes ("S" sample bottle data identifier with PIN CHAR(12) and a "WP" data qualifier). The PCS associates the sample bottle PIN scanned at NE301 with the purge port PIN connected to the sorting glovebox and transmits the two PINs with the location "TRU_SORT" to the DMS. This occurs for each of the samples scanned. If no purge port is currently located at the sorting glovebox location, then the PCS displays the warning "No Purge Port Present" at OIU-12-104B. The operator must attach a purge port canister to the glovebox and start the sample loading process over.

DATA MANAGEMENT: The DMS receives the purge port PIN CHAR(14) and location "TRU PP" CHAR(10) from the PCS and establishes the location of the purge port at the LLW sorting glovebox.

The DMS receives the sample PIN CHAR(14), location CHAR(10), and the parent drum PIN CHAR(14) from the PCS and downloads the association to the appropriate files.

The DMS receives the sample PIN CHAR(14), location [TRU_SORT] CHAR(10), and purge port PIN CHAR(14) from the PCS and downloads the association to the appropriate files.

The operator must fill out a Chain of Custody/Sample Analysis Request form at the DMS terminal TE-12-103 for the samples that were taken and loaded into the purge port. Applicable sampling collection data may also be entered at this time (descriptions, temperature, etc).

Once all of the samples have been taken from the compliant waste and loaded into the purge port, the purge port door can be closed from the inside of the glovebox. Then the operator can remove the purge port canister from the exterior of the glovebox. An operator surveys the canister at its removal and decontaminates as necessary.

The operator scans the location bar code on the side of the glovebox to fix the scanners location as "TRU PP". Then the purge port bar code is scanned via portable scanner 12-NE-300. The purge port transfer pig's bar code is scanned to indicate which pig will contain the purge port. Finally, the termination bar code on the glovebox wall to end the transmission is scanned and the purge port canister is placed into the pig.

PCS ACTIVITIES: The location bar code ("2Y" data identifier with location "TRU PP") is read to fix the bar code scanner location at the purge port on the TRU sorting glovebox. The "2Y" is

recognized by the PCS as a location designator. Reading this bar code prompts the PCS to initiate a sequence where the container bar codes ("1B" data identifier for purge port canister followed by a PIN CHAR(14) and a "PP" data qualifier), ("1B" data identifier for purge port transfer pig followed by a container PIN CHAR(14) and a "TP" data qualifier) and location "TRU_PP" are recorded in a temporary file.

Reading the termination bar code ("Y" data identifier with command "END&TRNSMT") will confirm termination of the process. The PCS associates the PINs and the "TRU_PP" locations and transmits these to the DMS.

DATA MANAGEMENT: The DMS receives the purge port PIN CHAR(14), location CHAR(10), and pig PIN CHAR(14) association from the PCS and downloads it into the appropriate files to establish the purge port container/transfer pig relationship.

The operator must fill out a Chain of Custody/Sample Analysis Request form at the DMS terminal TE-12-103 for the samples that were taken and loaded into the purge port. Applicable sampling collection data may also be entered at this time (descriptions, temperature, etc).

3.10.3.5 Re-lid

When the operator has collected all of the data to be recorded for the waste on the sorting table, the sequence for loading out the waste can begin. The operator then selects "Sorting Table Menu" from the OIU-12-104B. Then the operator selects "Waste Loadout 1" from the menu. The PCS moves the table until it reaches the first load out position.

The operator then selects "Drum Tipper Menu" and "Lower with Grab Closed" from the OIU. The operator uses push button controls to lower the drum onto the transfer car. The operator then selects "Open Grab and Park" and the PCS opens the grab and raises the drum tipper to the raised position. The operator then selects "Transfer Car Menu" at OIU-12-104B and selects "Relid". The PCS moves the transfer car to the relid position.

The operator then selects "Lid/Delid Menu" and "Start Relid Sequence". The PCS raises the relid fixture and rotates it to the first crimping position. Then the fixture is lowered, the C-Clips feeder is driven forward, and the jaw swings into place and crimps. The PCS repeats this process in five other locations on the drum and then displays "Relid Sequence Complete".

The operator then selects "Transfer Car Menu" and "Compactor" from OIU-12-104B. The PCS moves the drum transfer car to the empty drum compactor position.

PCS ACTIVITIES: The PCS interfaces with the operator at OIU-12-104B.

DATA MANAGEMENT: There are no DMS/PCS interfaces associated with this step in the process.

SPEC REFERENCES: 13462 - Table 10.8: 19/1 thru 23/End

3.10.4 TRU Waste Loadout

The PCS checks the loadout port initial conditions and also the presence of One Trip drums on the exit port lift tables 107-LT-09-202D and 107-LT-09-202E. The load out ports DO-07-309 and DO-07-310 are identical in operation and therefore will be handled simultaneously in the following description. The operator selects the loadout port menu from OIU-12-104D. Then "Start Entry" is selected and the PCS lowers the lift table, drives the drum under the loadout port, and raises the drum until the "lid in position" switch is tripped on the One-Trip System port door.

The operator then selects "Open Port" from the "Port Menu". The PCS energizes the vacuum system to attach the One Trip drum inner lid to the port door. The PCS then unlocks the port door, raises the port door, translates the door away from the port opening, and puts the door in park position. The PCS displays "Port 107-DO-07-3XX Open and Parked".

The operator selects "Waste Chute Menu" and then "Engage Chute" from the OIU-12-104D. This step can only occur if the sorting table is not positioned over the chute, so the operator may have to move the table before this step. The waste chute rotates to its engaged position over the open One-Trip System port. The operator then moves the sorting table over the chute by selecting "Waste Loadout 1" or "Waste Loadout 2" depending on which port is desired for loadout.

PCS ACTIVITIES: The PCS interfaces with the operator at OIU-12-104D.

DATA MANAGEMENT: There are no DMS/PCS interfaces associated with this step in the process.

SPEC REFERENCES: 13462 - Table 10.10: 1/1 thru 6/End
13462 - Table 10.12: 1/1 thru 6/End

When the exit port is set up for loadout, the operator uses the manipulators or the hoist/trolley to move the waste from the sorting table to the waste chute located over the port opening. If the compliant waste from one parent drum is being segregated into two different categories and disposed of in two different exit ports, the operator must be careful to record the necessary information to accurately fill out a contents inventory sheet for each loadout drum.

When a One Trip drum at an exit port is full, the operator must move the sorting table to "Assay Position". The operator then rotates the chute to

park position by selecting "Park Chute" from the "Waste Chute Menu" at the OIU. The operator selects the appropriate port menu and selects "Close Port". The PCS controls the port closure sequence and displays "Port Closed and Locked" when complete.

The operator selects "Swage Lid" from the port menu. The PCS energizes the swaging head cylinders until full stroke is indicated by limit switches which signals the PCS to display "Drum Head Swaged".

The operator selects "Start Exit" from the port menu. The PCS lowers the lift table, translates the drum to the end of the conveyor, and raises the drum to AGV height. This signals the AGV that a drum is ready for pick-up at lift table 107-LT-09-202X.

The AGV transfers the full 55-gallon One Trip drum onto the AGV and moves to the entry hold point at the west end of the TRU glovebox line. The operator manually replaces the outer lid and clamp band and surveys and decons the drum exterior. The operator then selects "Advance AGV" from the "Entry Hold Point Menu" at OIU-12-104A. The AGV moves to locate the empty drum to the "HOLD POINT" location so the operator can remove the outer lid and clamp band and scan the bar code. The operator scans the location bar code, the drum bar code, and then the termination bar code to properly identify the empty drum and location. The operator then selects "Release AGV" from the menu and the AGV proceeds to deliver the empty drum to lift table LT-09-202X. The AGV arrives at the lift table with an empty replacement drum for the drum that has been picked up (See section 3.7.7 for location update of drums delivered to the TRU glovebox).

PCS ACTIVITIES: The PCS interfaces with the operator at OIU-12-104D.

The location bar code ("2Y" data identifier with location "HOLD-POINT") is read to fix the bar code scanner location. The "2Y" is recognized by the PCS as a location designator. Reading this bar code prompts the PCS to expect a drum bar code ("S" data identifier followed by a container PIN) and record "HOLD-POINT" as the drum location in a temporary file. The drum bar code is then scanned and the PCS compares the current PCS stored value against the actual drum delivered (indicated by bar code scan) to verify a match. If the PIN numbers match, then operations can continue.

Scanning the termination bar code ("Y" data identifier with command "END&TRNSMT") will confirm termination of the drum ID process. The data identifier is "stripped" from the bar code and the bar code keys the PCS that the current activity is complete and the drum PIN and location shall be transmitted to the DMS.

DATA MANAGEMENT: The DMS will log "HOLD POINT" in the location field CHAR(10) field of the waste container table for the drum PIN,

CHAR(14), received from the PCS. The date and time the relocation occurred will also be recorded. The data currently in the waste container table will be transferred to a relocation history table as the new location is identified. The relocation history record table will be updated with the drum PINs, locations, dates, and times as the waste is processed through the facility.

During survey and decon the operator may require the attachment of a numbered seal to the drum. The seal number shall be logged on the current RWM transfer drum record via DMS terminal TE-12-104.

When the full One Trip loadout drum has been transferred to NDE/NDA Area and undergone its certification assay, the DMS subtracts the drum's certification radionuclide content from the TRU glovebox line inventory.

Upon filling a loadout drum, the operator must fill out a contents inventory sheet at the DMS terminal TE-12-104. The operator kept accurate accounts of what items went into which load out drum.

SPEC REFERENCES: 13462 - Table 10.10: 7/1 thru 15/End
13462 - Table 10.12: 7/1 thru 15/End

3.11 TRU RWM GLOVEBOX

3.11.1 TRU Restricted Waste Management Drum Entry

3.11.1.1 Restricted Waste Transfer Drum

The Process Area Internal Transport has received and acted on the message sent by the PCS that a drum is needed at the TRU RWM Non-Compliant Entry Port (Lift Table 107-LT-09-201C). The lift table local panel L-O-R switch is turned to "remote", the AGV/Panel switch is set to AGV, the limit switches on the lift table indicate that no drum is present, and the table is at AGV height. The AGV delivers the next drum to be processed and commences its handshake with the lift table. Once the delivery is complete, the PCS updates the location stored in the DMS under the file for the drum PIN tracked to the TRU RWM glovebox location (See section 3.7.5).

The DMS checks that the addition of the drum's fissile material content will not exceed the inventory allowed in the TRU RWM glovebox. If this criticality check verifies that limits are not exceeded, then the DMS adds the drum's content to the glovebox inventory and operations can continue.

If the glovebox fissile material inventory limits will be exceeded, the DMS shall transmit a "Fissile Material Inventory Limit Exceeded" message to the

PCS which shall cause the PCS to generate an alarm and record it on the alarm tracking log.

NOTE: If the RWM transfer drum has returned to the TRU RWM glovebox for the second stage of processing (transfer stand contains non-compliant items instead of packets) then the RWM transfer drum radionuclide content is not added to the glovebox inventory, since the glovebox inventory has already accounted for these items. Inventory will be subtracted from the glovebox upon completion of the drum assays only.

After the successful delivery of the waste drum, the operator scans the location bar code (on the glovebox wall), RWM transfer drum bar code, and termination bar code using bar code reader 12-NE-303. The PCS will verify that the drum identification and location match that input by the AGV delivery, before any more actions are allowed by the PCS. Once identification and location are verified, the operator will manually remove the outer lid from the RWM transfer drum.

PCS ACTIVITIES: If glovebox fissile material inventory limits will be exceeded, the DMS shall transmit a "Fissile Material Inventory Limit Exceeded" message to the PCS which shall cause the PCS to generate an alarm and record it on the alarm tracking log.

The location bar code ("2Y" data identifier with location "TRURWENTRY") is read to fix the bar code scanner location at the 55-gallon Drath & Schrader non-compliant item entry port. The "2Y" is recognized by the PCS as a location designator. Reading this bar code prompts the PCS to expect a drum bar code ("S" data identifier followed by a container PIN) and record "TRURWENTRY" as the drum location in a temporary file. The drum bar code is then scanned and the PCS compares the current PCS stored value against the actual drum delivered to verify a match. If the PIN numbers match, then operations can continue.

Then scanning the termination bar code ("Y" data identifier with command "END&TRNSMT") will confirm termination of the drum ID process. The data identifier is "stripped" from the bar code and the bar code keys the PCS that the current activity is complete.

DATA MANAGEMENT: The fissile material inventory limit verification will calculate the fissile material inventory for the glovebox including the drum just received at the entry port. The DMS will compare this number against the glovebox limit to verify the limit has not been exceeded.

If the glovebox fissile material inventory limit will be exceeded a pop-up message will be generated on the DMS system, displayed on DMS operator terminal TE-12-103, and an

alarm transmitted to the PCS [location CHAR(10) and message type]. If the fissile material inventory limit will be exceeded; the drum just received at the entry port will not be accessed to the glovebox until the fissile inventory of the glovebox can be reduced to a level that will prevent a fissile inventory limit violation.

Note that drum location verification discussed above is internal to the PCS. The DMS has previously had the drum location updated in accordance with section 3.7.5 activities.

THERE ARE NO PCS/DMS INTERFACES. THIS STEP ONLY VERIFIES THE PROPER LOCATION HAS BEEN TRACKED IN THE PCS.

UPSET CONDITIONS: Operator bar code scan and AGV handshake at drum delivery reveal unmatched drum identifications at RWM entry port.
Resolution: The PCS shall provide an alarm at OIU-12-106B if this occurs and stop entry functions until operator resolution.

SPEC REFERENCES: 13461 - Appendix A-1
13462 - Table 11.2: 1/1 to 2/End

The PCS now recognizes that a drum has been successfully received and identified at the RWM entry port. The operator switches the lift table control to "Panel". The operator uses the push buttons on the lift table control panel to lower the drum from AGV height, to move the drum under the RWM port, and to raise the drum to the proper height for mating with the Drath & Schrader port. The operator uses the Drath & Schrader port control panel to open the bagless transfer port.

After the Drath & Schrader port is open, the operator uses hoist pendant 107-PC-07-010A to remove the non-compliant transfer stand from the transfer drum. The operator lowers the hoist, attaches the hoist hook, raises the transfer stand, translates the stand to the tray unloading position, and lowers the stand in this position.

PCS ACTIVITIES: The PCS interfaces with the operator at OIU-12-106B.

DATA MANAGEMENT: There are no DMS/PCS interfaces associated with this step in the process.

SPEC REFERENCES: 13462 - Table 11.2: 3/3 to 4/End

3.11.1.2 Compliant Items 'Load Out Drum' Entry

At this time the TRU RWM glovebox equipment is being checked by the PCS for initialization status as a prerequisite to entry/exit port operation. The

following criteria must be met for initialization: Drum entry/exit port DO-07-402A closed and locked and manipulators in park position.

The process area internal transport has received and acted on the message sent by the PCS that a drum is needed at the TRU RWM glovebox conveyor 107-LT-09-201B. The operator has turned the lift table local panel L-O-R switch to "remote", the Panel/AGV switch is set to AGV, the limit switches on the lift table indicate that no drum is present, and the table is at AGV height. The AGV delivers a standard 55-gallon drum and commences its handshake with the lift table. Once the delivery is complete, the PCS updates the location information stored in the DMS under the file associated with the drum PIN that was tracked to the TRU RWM lift table location.

After the successful delivery of the waste drum, the operator scans the location bar code, drum bar code, and termination bar code using bar code reader 12-NE-303. The PCS will verify that the scanned drum PIN and location match that input by the AGV delivery, before any more actions are allowed by the PCS. Once identification and location are verified, the operator will manually remove the clamp band from the drum.

PCS ACTIVITIES: The location bar code ("2Y" data identifier with location "TRURWCMPLT") is read to fix the bar code scanner location. The "2Y" is recognized by the PCS as a location designator. Reading this bar code prompts the PCS to expect a drum bar code ("S" data identifier followed by a container PIN) and record "TRURWCMPLT" as the drum location in a temporary file. The drum bar code is then scanned and the PCS compares the current PCS stored value against the actual drum delivered to verify a match. If the PIN numbers match, then operations can continue.

Then scanning the termination bar code ("Y" data identifier with command "END&TRNSMT") will confirm termination of the drum ID process. The data identifier is "stripped" from the bar code and the bar code keys the PCS that the current activity is complete.

DATA MANAGEMENT: Note that drum location verification discussed above is internal to the PCS. The DMS has previously had the drum location updated in accordance with section 3.7.5 activities.

THERE ARE NO PCS/DMS INTERFACES. THIS STEP ONLY VERIFIES THE PROPER LOCATION HAS BEEN TRACKED IN THE PCS.

UPSET CONDITIONS: Operator bar code scan and AGV handshake at drum delivery reveal unmatched drum identifications at entry glovebox. Resolution: The PCS shall provide an alarm at OIU-12-103A if this occurs and stop entry functions until operator resolution.

SPEC REFERENCES: 13462 - Table 11.4: 1/1 to 3/End

The PCS now recognizes that a drum has been successfully received and identified at the compliant item load out lift table, and the glovebox equipment is initialized. Now the operator switches the lift table control to "Panel". The operator transfers the drum under the port and raises the drum to "Drum Centering" height.

The operator then prompts the PCS to "Open Port" via OIU-12-106B. The PCS automatically mates the drum to the port door, attaches the drum lid to the port door, unlocks the port, raises the drum and port door, and opens the drum with the entry port door. Once complete, OIU-12-106B displays "Port 107-DO-07-402A Open".

PCS ACTIVITIES: The PCS interfaces solely with the operator during this part of the process. The operator is able to "Emergency Stop" the sequence at any point.

DATA MANAGEMENT: There are no DMS/PCS interfaces associated with this step in the process.

SPEC REFERENCES: 13462 - Table 11.4: 4/1 to 4/End

3.11.1.3 Treated Non-compliant Items 'Loadout Drum' Entry

At this time the TRU RWM glovebox equipment is being checked by the PCS for initialization status as a prerequisite to entry/exit port operation. The following criteria must be met for initialization: Drum entry/exit port DO-07-402B closed and locked and manipulators 107-EM-07-401 in park position.

The Process Area Internal Transport has received and acted on the message sent by the PCS that a drum is needed at the TRU RWM glovebox conveyor 107-LT-09-201A. The operator has turned the lift table local panel L-O-R switch to "remote", the Panel/AGV switch is set to AGV, the limit switches on the lift table indicate that no drum is present, and the table is at AGV height. The AGV delivers a standard 85-gallon drum and commences its handshake with the lift table. Once the delivery is complete, the PCS updates the location information stored in the DMS under the file associated with the drum PIN that was tracked to the TRU RWM lift table location (See section 3.7.5).

After the successful delivery of the waste drum, the operator scans the location bar code, drum bar code, and termination bar code using bar code reader 12-NE-303. The PCS will verify that the scanned drum PIN and location match that input by the AGV delivery, before any more actions are allowed by the PCS. Once identification and location are verified, the operator will manually remove the clamp band from the drum.

PCS ACTIVITIES: The location bar code ("2Y" data identifier with location "TRURWEXIT") is read to fix the bar code scanner location. The "2Y" is recognized by the PCS as a location designator.

Reading this bar code prompts the PCS to expect a drum bar code ("S" data identifier followed by a container PIN) and record "TRURWEXIT" as the drum location in a temporary file. The drum bar code is then scanned and the PCS compares the current PCS stored value against the actual drum delivered to verify a match. If the PIN numbers match, then operations can continue.

Then scanning the termination bar code ("Y" data identifier with command "END&TRNSMT") will confirm termination of the drum ID process. The data identifier is "stripped" from the bar code and the bar code keys the PCS that the current activity is complete.

DATA MANAGEMENT: Note that drum location verification discussed above is internal to the PCS. The DMS has previously had the drum location updated in accordance with section 3.7.5 activities.

THERE ARE NO PCS/DMS INTERFACES. THIS STEP ONLY VERIFIES THE PROPER LOCATION HAS BEEN TRACKED IN THE PCS.

UPSET CONDITIONS: Operator bar code scan and AGV handshake at drum delivery reveal unmatched drum identifications at entry glovebox. Resolution: The PCS shall provide an alarm at OIU-12-103A if this occurs and stop entry functions until operator resolution.

SPEC REFERENCES: 13462 - Table 11.6: 1/1 to 3/End

The PCS now recognizes that a drum has been successfully received and identified at the treated item load out lift table, and the glovebox equipment is initialized. Now the operator switches the lift table control to "Panel". The operator lowers the drum to "lowered position", transfers the drum under the port and raises the drum to "Drum Centering" height.

The operator then prompts the PCS to "Open Port" via OIU-12-106B. The PCS automatically mates the drum to the port door, attaches the drum lid to the port door, unlocks the port, raises the drum and port door, and opens the drum with the entry port door. Once complete, OIU-12-106B displays "Port 107-DO-07-402A Open".

PCS ACTIVITIES: The PCS interfaces solely with the operator during this part of the process. The operator is able to "Emergency Stop" the sequence at any point.

DATA MANAGEMENT: There are no DMS/PCS interfaces associated with this step in the process.

SPEC REFERENCES: 13462 - Table 11.4: 4/1 to 4/End

3.11.2 TRU RWM Processing (Stage 1)

3.11.2.1 Adding/Removing Items from Transfer Stand

Before any item is removed from the non-compliant item transfer stand, the operator selects "Remove Item(s) from X-fer Stand" from the "Transfer Stand Menu" at OIU-12-106B. The item bar code is then scanned with fixed scanner 12-NE-304. The PCS sends a message to the DMS to remove the item from the RWM transfer drum's inventory. The operator then ends the removal process by selecting "End Remove" from the "Transfer Stand Menu". The drum radionuclide content remains unchanged from its original value (when it was loaded with packets in the TRU glovebox) until the drum is completely empty.

OR: Before any item is placed back onto the transfer stand, the operator selects "Add Item(s) to X-fer Stand" from the "Transfer Stand Menu" at OIU-12-106B. The item bar code is then scanned with fixed scanner 12-NE-304. The PCS sends a message to the DMS to add the item back onto the RWM transfer drum's inventory. The operator then ends the addition process by selecting "End Add" from the "Transfer Stand Menu".

PCS ACTIVITIES: The PCS interfaces with the operator at OIU-12-106B.

When "Remove Item from X-fer Stand" is selected, the PCS is prompted to receive any type of container bar code. When the bar code ("XX" data identifier with container PIN) is scanned, the PCS sends the Container PIN, location "TRURWSAMPL", the RWM Transfer Drum PIN, and the message to remove the item from the RWM Transfer Drum inventory, to the DMS. When "End Remove" is selected the PCS is notified that the current action is complete.

OR: When "Add Item to X-fer Stand" is selected, the PCS is prompted to receive any type of container bar code. When the bar code ("XX" data identifier with CHAR(14) container PIN) is scanned, the PCS sends the container PIN, location "TRURWSAMPL", the RWM Transfer Drum PIN, and the message to add the item to the RWM Transfer Drum inventory, to the DMS. When "End Add" is selected the PCS is notified that the current action is complete.

DATA MANAGEMENT: The DMS receives the container PIN CHAR(14), the location CHAR(10), the RWM Transfer Drum PIN CHAR(14), and message to remove the container from the RWM Transfer Drum inventory. The DMS removes the PIN from the Transfer Drum inventory.

OR: The DMS receives the container PIN CHAR(14), the location CHAR(10), the RWM Transfer Drum PIN CHAR(14), and message to add the container from the RWM

Transfer Drum inventory. The DMS adds the PIN to the Transfer Drum inventory.

SPEC REFERENCES: 13462 - Table 11.2: 6/1 thru 6/2

3.11.2.2 Separate Compliant from Non-Compliant

The operator removes a packet to be processed from the transfer stand as outlined in section 3.11.2.1.

The operator then scans the Packet bar code again at 12-NE-304 to begin processing. The PCS stores the Packet PIN and location (fixed by the bar code scanner) in a temporary file. The operator then removes the Packet wrapping to begin processing the non-compliant item(s) (if the Packet is not the non-compliant item in and of itself). The compliant portions of the Packet are disposed of via entry/exit port 107-DO-07-402A (see section 3.11.1.2 for mating of this drum to the glovebox). A description of the compliant waste that is disposed of must be entered into the DMS.

The non-compliant items (i.e. liquids, reactives, aerosol cans, HEPA filters, acids/bases, fines) that are removed from the Packets and do not need to be containerized or recontainerized will receive a non-compliant item PIN label (i.e. aerosol cans, sufficiently contained liquids, and Packets as non-compliant containers). The non-compliant items that need to be collected or recontainerized from the waste Packet will be collected into collection containers and then labelled with a non-compliant item PIN. The emptied container can be disposed of in the compliant waste drum at port DO-07-402A.

The non-compliant item PIN is then scanned using fixed scanner 12-NE-304. The PCS associates the scanned non-compliant item PIN with the last Packet PIN scanned by 12-NE-304 and transmits the PINs and location to the DMS. Any non-compliant item that is read after a packet PIN will be associated with that Packet and transmitted to the DMS. If a non-compliant item PIN is not scanned, the PCS and DMS will associate samples taken with the non-compliant packet PIN that was scanned (i.e. packet is the non-compliant item and a new bar code is not required).

The operator may choose to add the non-compliant items to the transfer stand after identifying them. This is done by following the process outlined in section 3.11.2.1.

Liquids will be field screened for pH level before sampling to assure that the liquids are handled and stored appropriately.

PCS ACTIVITIES: The PCS interfaces with the operator at the hoist pendant 107-PC-07-010A and at OIU-12-106B.

Scanning the bar code of a non-compliant Packet prompts the PCS to store the Packet PIN and expect non-compliant item PINs ("21T" non-compliant item data identifier with PIN

CHAR(14). or no PIN at all if the packet and non-compliant item are one in the same. All of the non-compliant item PINs that are scanned (after the Packet bar code) are associated with the Packet that they were removed from (See section 3.11.2.2). The PCS sends the non-compliant item PIN, location "TRURWSAMPL", and Packet Item PIN to the DMS for each non-compliant item scanned after a Packet.

DATA MANAGEMENT: The DMS receives the association of the non-compliant item PIN CHAR (14), location CHAR(10), and the Packet PIN CHAR(14) from the PCS. The DMS records the non-compliant item PIN as coming from the Packet PIN.

The operator must input the compliant waste description into the DMS terminal TE-12-103 that has been disposed of via exit port DO-07-402A. The data will be input into the DMS Contents Inventory Sheet file for the 55-gallon standard drum that is currently attached to the compliant load out port.

The pH results (if required) will be input to the DMS system via DMS terminal TE-12-103. The name of the person performing the field screening, the operator's comments, and the date will also accompany the pH results.

SPEC REFERENCES: 13462 - Table 11.2: 6/3

3.11.2.3 Puncture Aerosol Cans

When an aerosol can is separated as a non-compliant item, the operator places a non-compliant item PIN label onto the can and scans the bar code with 12-NE-304. The PCS relates the non-compliant item PIN to the Packet that was scanned previously and the parent drum (See section 3.11.2.2).

When the operator is ready to puncture and drain an aerosol can, an Aerosol Can Collection Container must be selected. The Aerosol Can Collection Container mates specifically with the aerosol can puncture device and is pre-bar coded with a unique label that specifies it as an Aerosol Can Collection Container. The operator then scans the bar code of the Collection Container to be filled followed by scanning the non-compliant item (aerosol can) bar code of the aerosol can to be punctured. The PCS relates the non-compliant item (aerosol can) to the Aerosol Can Collection Container and transmits the association to the DMS. The DMS labels the non-compliant item as an aerosol can when it is associated with an Aerosol Can Collection Container and thus will not expect a sample to be associated with the non-compliant item PIN. The operator then places the can into the puncture device and proceeds with manual operations to drain the can into the Aerosol Can Collection Container.

The operator then opens the lid and removes the aerosol can. The empty can is disposed of in the compliant waste load out drum 107-DO-07-402A. The liquid effluent from the can puncture is collected in the Aerosol Can Collection

Container attached to the puncture device. The aerosol can is the only "non-compliant item" that will not be sampled directly. Instead, the contents of the Aerosol Can Collection Container will be sampled.

PCS ACTIVITIES: The scanning of Aerosol Can Collection Container PIN CHAR(14) (with "22T" data identifier) at the "TRURWSAMPL" location shall prompt the PCS to expect a non-compliant item PIN ("21T" data identifier with non-compliant item PIN CHAR(14) "PARENT PIN"). The aerosol can (non-compliant item) bar code is then scanned. The PCS then sends the Aerosol Can Collection Container PIN, location, and the non-compliant item (aerosol can) PIN to the DMS.

DATA MANAGEMENT: The DMS receives the Aerosol Can Collection Container PIN CHAR(14), location CHAR(10), and the non-compliant item PIN CHAR(14) (aerosol can) from the PCS. The DMS records the association between the Collection Container and the non-compliant item. The DMS labels the non-compliant item PIN as an "aerosol can" when it is preceded by a Aerosol Can Collection Container PIN. This provides an explanation in the data base for not receiving a Sample for the non-compliant item (aerosol can).

The operator must input the following information into the DMS whenever liquids are collected from an aerosol can via terminal TE-12-103:

1. Name of operator collecting the liquids.
2. Operator comments.

SPEC REFERENCES: 13462 - Table 11.2: 6/4

3.11.2.4 Sample Non-Compliance

Each non-compliant item that is identified may be sampled. In the case of aerosol cans, the Aerosol Can Collection Container will be sampled instead of the emptied can. Analysis of the samples will provide waste characterization information and therefore waste treatment guidance. The operator scans the bar code of a sample container that is to be filled with a sample at scanner 12-NE-304. The sample containers are pre-bar coded with a unique bar code label. The operator scans the bar code of the non-compliant item or the Aerosol Can Collection Container that is to be sampled. The appropriate sample is taken and placed into the sample container. The operator is required to record some information to be entered into the DMS whenever a sample is taken.

PCS ACTIVITIES: The scanning of the unique sample container PIN ("S" sample bottle data identifier with PIN CHAR(12) and a "WP" data qualifier) inputs to the PCS the sample container PIN CHAR(14) and the location "TRURWSAMPL". This prompts the PCS to expect a non-compliant item PIN CHAR(14) ("21T" data

identifier) or a Aerosol Can Collection Container PIN. The non-compliant item or Aerosol Can Collection Container PIN is then scanned. The PCS then sends the sample container PIN, location, and the non-compliant item/Collection Container PIN to the DMS.

DATA MANAGEMENT: The DMS receives the sample container PIN CHAR(12), location CHAR (10), and the non-compliant item PIN CHAR(14) from the PCS and downloads the association to the appropriate files. The DMS associates the sample container PIN CHAR(12) with the non-compliant item PIN (or the Aerosol Can Collection Container PIN in the case of aerosol cans).

The operator must fill out a Chain of Custody/Sample Analysis Request form at the DMS terminal TE-12-103 for the samples that were taken and loaded into the purge port. Applicable sampling collection data may also be entered at this time (descriptions, temperature, etc).

SPEC REFERENCES: 13462 - Table 11.2: 6/8

Before the operator can loadout the samples from the glovebox, the Purge Port canister must be mounted to the Purge Port on the TRU RWM glovebox. The operator removes the Purge Port canister from the Transfer Pig and connects it to the Purge Port on the glovebox. The operator scans the location bar code on the side of the glovebox to fix the scanners location as "TRURWM PP". Then the Purge Port bar code is scanned via portable scanner 12-NE-303 and finally, the termination bar code on the glovebox wall to end the transmission. The PCS shall transmit the Purge Port PIN CHAR(14) and the location to the DMS.

The operator selects "Sample Loadout" from OIU-12-106B. Then the operator scans each sample container bar code via 12-NE-304 that is to be sent to sample management as it is loaded into the Purge Port container. The PCS sends the sample container PIN, location "TRURWSAMPL", and Purge Port canister PIN to the DMS. The DMS records the association of the sample container with the Purge Port. The operator must assure that all of the sample containers that were scanned were placed into the Purge Port that is currently attached to the glovebox. Then the operator selects "End Sample Loadout" from the OIU to signal the PCS that the loading activity is complete.

Once the Purge Port is full of sample containers, the Purge Port door can be closed from the inside of the glovebox. Then the operator can remove the Purge Port canister from the exterior of the glovebox. An operator surveys the canister at its removal and decontaminates as necessary.

The operator scans the location bar code on the side of the glovebox to fix the scanners location as "TRU-RWMP". Then the Purge Port bar code is scanned via portable scanner 12-NE-303. The Purge Port Transfer Pig's bar code is scanned (if used) to indicate which Transfer Pig will contain the samples. Finally, the termination bar code on the glovebox wall to end the transmission is scanned.

PCS ACTIVITIES: The PCS interfaces with the operator via OIU-12-106B.

To attach Purge Port canister to the glovebox, the location bar code ("2Y" data identifier with location "TRU-RWMPP") is read to fix the bar code scanner location at the Purge Port on the TRU RWM glovebox. The "2Y" is recognized by the PCS as a location designator. Reading this bar code prompts the PCS to expect the container bar code ("1B" data identifier for purge port canister followed by a PIN CHAR(14) and a "PP" data qualifier). The Purge Port canister bar code is scanned via 12-NE-304. The operator then scans the termination bar code ("Y" data identifier with command "END&TRNSMT") to confirm termination of the TRU RWM glovebox Purge Port PIN process. The data identifier is "stripped" from the bar code and the bar code keys the PCS that the current activity is complete. The PCS transmits the purge port PIN and location to the DMS.

When "Sample Loadout" is selected via OIU-12-106B, the PCS is prompted to expect sample container bar codes ("S" sample bottle data identifier with PIN CHAR(12) and a "WP" data qualifier). The PCS associates the sample bottle PIN scanned with the purge port PIN connected to the TRU RWM glovebox and transmits the two PINs with the location "TRURWSAMPL" to the DMS. This occurs for each of the samples scanned. If no purge port is currently located at the TRU RWM glovebox location, then the PCS displays the warning "No Purge Port Present" at OIU-12-106B. The operator must attach a purge port canister to the glovebox and start the sample loading process over.

The location bar code ("2Y" data identifier with location "TRURWM PP") is read to fix the bar code scanner location at the Purge Port on the TRU RWM glovebox. The "2Y" is recognized by the PCS as a location designator. Reading this bar code prompts the PCS to initiate a sequence where the container bar codes ("1B" data identifier for purge port canister followed by a PIN CHAR(14) and a "PP" data qualifier), ("1B" data identifier for purge port transfer pig followed by a container PIN CHAR(14) and a "TP" data qualifier) and record "TRURWM PP" as the purge port transfer pig location in a temporary file.

Reading the termination bar code ("Y" data identifier with command "END&TRNSMT") will confirm termination of the process. The PCS associates the PIN's and "TRU-RWMPP" location and transmits them to the DMS.

DATA MANAGEMENT: The DMS receives the Purge Port PIN CHAR(14), location "TRURWM PP" CHAR(10) from the PCS and established the location of the purge port at the TRU RWM glovebox.

The DMS receives a Sample PIN CHAR(14), location "TRURWSAMPL" CHAR(10), and purge port PIN CHAR(14), and from the PCS and downloads the association to the appropriate files.

The operator must fill out a Chain of Custody/Sample Analysis Request form at the DMS terminal TE-12-103 for the samples that were taken and loaded into the purge port. Applicable sampling collection data may also be entered at this time (descriptions, temperature, etc).

The DMS receives the purge port PIN CHAR(14), location [TRURWM_PP] CHAR(10), and the transfer pig PIN CHAR(14) from the PCS and downloads it into the appropriate files to establish the purge port container/transfer pig relationship.

The following data is entered by the operator into the DMS via terminal TE-12-103 when the Purge Port is disconnected from the glovebox (unless otherwise specified):

1. Name of the operator disconnecting the Purge Port from the glovebox. Note: Operator retains custody of the Transfer Pig until it is transferred to sample management.
2. Comments about the transfer.
3. Date (from DMS date stamp)
4. Time (from DMS time stamp)
5. Interim storage flag
6. Purge Port PIN number (from bar code scan)
7. Sample container PIN numbers (from DMS association with Purge Port PIN).
8. Transfer Pig PIN number (from bar code scan).
9. Name of person receiving the Transfer Pig in Sample Management

3.11.2.5 Loadout of Non-Compliance to Buffer Storage

After all non-compliance items have been separated from the waste, containerized (if necessary), bar coded and scanned, sampled, and placed back onto the non-compliance item transfer stand (see 3.11.2.1), the RWM transfer drum is ready to be loaded and removed from the RWM transfer port and sent to buffer storage to await sample analysis results. The operator uses the trolley/hoist pendant 107-PC-07-010A to lower the non-compliance item transfer stand back into the restricted waste drum.

The operator then uses the local control panel for the Drath & Schrader bagless transfer system to close the RWM transfer drum. The system gives an output to signify that the bagless transfer port is closed and locked, and the RWM transfer drum has been released. The operator then switches the lift table local control to "Panel" and uses the pushbutton controls to lower the

lift table, move the drum to the end of the conveyor, and lift the table to AGV height.

An operator will survey the disconnected drum and log any contamination found that is out of spec. If contamination is found, the drum will be decontaminated until the dose is within the specified limit. The operator then attaches the outer lid of the Drath and Schrader drum. The operator then switches the lift control to "AGV". This step signals the PCS to add the drum on the AGV task list for transfer to RWM buffer storage.

Note: The Internal Transport System Operator will be required to route these drums (those going to interim storage in the RWM Carousel) to the NDE/NDA Area for assay on an as available basis. Performing this activity will allow the fissile inventory of these drums to be subtracted from the TRU RWM glovebox. Drums will be returned to the RWM Carousel for storage after assay.

PCS ACTIVITIES: The PCS recognizes that a drum is ready for pick-up at lift table LT-09-201C (See Spec 13462 Table 7.9). At this point, the DMS will have a complete inventory of the items that are on the transfer stand. This inventory was maintained by following the process outlined in section 3.11.2.1.

DATA MANAGEMENT: For each new non-compliant item or Aerosol Can Collection Container PIN that is associated with the RWM transfer drum, the operator must input the following data into the DMS via terminal TE-12-103:

1. Storage category code.
2. Non-compliant item status (pending sampling or pending processing)

During survey and de-con the operator may require the attachment of a numbered seal to the drum. The seal number will be logged on the DMS via DMS terminal TE-12-103.

SPEC REFERENCES: 13462 - Table 11.2: 8/1 thru 9/End

3.11.3 TRU RWM Processing (Stage 2)

3.11.3.1 Receive Analysis and Treat

The PCS has recognized that a drum is needed at lift table 107-LT-09-201C. The AGV is tasked to deliver a RWM transfer drum from buffer storage that has received sample analysis results, and whose samples have returned to the TRU RWM glovebox location. The drum entry process is outlined in section 3.11.1.1.

If the glovebox fissile material inventory limits will be exceeded upon accessing the waste drum to the TRU RWM glovebox, the DMS shall transmit a

"Fissile Material Inventory Limit Exceeded" message to the PCS which shall cause the PCS to generate an alarm and record it on the alarm tracking log.

The transfer stand, now located in the TRU RWM glovebox, has been placed in the treatment location. The operator removes the non-compliant items to be treated from the transfer stand by the process outlined in section 3.11.2.1. Then the operator scans the non-compliant item/Aerosol Can Collection Container bar code with fixed scanner 12-NE-305. The PCS sends this PIN and location "TRURWTREAT" to the DMS which records the non-compliant item as being treated. The sample analysis results, complete with the directions for proper treatment of the non-compliant item, are displayed on the video terminal OIU-12-106A through the back window of the glovebox. The sample container PIN, Purge Port canister PIN, and Transfer Pig PIN will accompany this display.

NOTE: The DMS will record if the transfer stand was completely emptied of non-compliant items. The drum fissile material content is zeroed from its original value when loaded with non-compliant packets. The empty RWM transfer drum is now available for return to the TRU glovebox to be reloaded.

The operator then locates the Purge Port canister that contains the sample for the non-compliant item being treated. The canister is removed from the Transfer Pig and attached to the glovebox. The operator scans the location bar code on the side of the glovebox to fix the scanners location as "TRU-RWMPP". The Purge Port PIN is scanned via portable scanner 12-NE-303, the Transfer Pig PIN is scanned, and finally, the termination bar code on the glovebox wall to end the transmission.

The operator removes the samples from the Purge Port (inside of the glovebox) and locates the one that corresponds to the non-compliant item being treated. The sample container bar code is then scanned via fixed scanner 12-NE-305. The DMS receives the sample container PIN and location "TRURWTREAT" from the PCS.

The operator treats the non-compliant item (or Aerosol Can Collection Container) and Sample according to the instructions displayed on OIU-12-106A. Any containers that are emptied during this process (and qualify as compliant) can be disposed of as compliant waste via port DO-07-402A. Otherwise the empty containers may have to undergo limited treatment and be disposed of via port DO-07-402B. The operator continues the process of scanning the non-compliant item PINs, locating the sample, scanning the sample container bar code, and treating them as specified. When treatment of one non-compliant item is complete, the operator writes down the necessary information for load out of the treated item for input into the DMS.

The treatment process may require that a larger "Treatment Container" be used instead of the original non-compliant item container. If a Treatment Container is needed, then the unique Treatment Container's bar code will be scanned via fixed scanner 12-NE-15. This prompts the PCS to expect the bar codes from the non-compliant items, Aerosol Can Collection Containers, and sample containers that are to be processed in that particular Treatment

Container. The operator then scans these bar codes and the PCS transmits each of these PINs with the Treatment Container PIN to the DMS where the association between the two is recorded.

When treated items are ready for load out the operator selects "Treated Item Loadout" from OIU-12-106B. The operator then scans the bar code via 12-NE-305 of all of the items that are being loaded into the drum at port DO-07-402B. Then the operator loads the treated waste into the 85-gallon standard drum at the port. When finished with this task, the operator selects "End Treated Item Loadout" from the OIU.

PCS ACTIVITIES: If glovebox fissile material inventory limits will be exceeded, the DMS shall transmit a "Fissile Material Inventory Limit Exceeded" message to the PCS which shall cause the PCS to generate an alarm and record it on the alarm tracking log.

When a non-compliant item/Collection Container bar code is scanned via 12-NE-305, the PCS sends the PIN and location "TRURWTREAT" to the DMS which records the non-compliant item/Collection Container as being treated. The sample analysis results, complete with the directions for proper treatment of the non-compliant item, are displayed on the DMS video terminal OIU-12-106A.

The purge port container is attached to the glovebox and the location updated as noted in paragraph 3.11.2.4.

When the sample container PIN ("S" sample bottle data identifier with PIN CHAR(12) and a "WP" data qualifier) is scanned at fixed scanner 12-NE-305, the PCS sends the Sample PIN, location "TRURWTREAT", and Purge Port PIN to the DMS.

When a Treatment Container PIN is scanned at fixed scanner 12-NE-305 ("23T" data identifier), the PCS is prompted to accept non-compliant item PINs, Collection Container PINs, and Sample PINs from 12-NE-305. The PCS associates each PIN that is scanned after the Treatment Container with the Treatment Container PIN. The PCS transmits the Treatment Container PIN, location "TRURWTREAT", and other container PIN to the DMS.

When "Treated Item Loadout" is selected at the OIU, the PCS is prompted to expect container PIN's of any type. Upon bar code scan at fixed scanner 12-NE-305, the PCS transmits the PIN, location "TRURWTREAT", and the waste drum PIN at the "TRURWEXIT" location, to the DMS. The DMS associates all of the PIN's scanned with the 55-gallon One Trip drum PIN at this location.

DATA MANAGEMENT: The fissile material inventory limit verification will calculate the fissile material inventory for the glovebox including the drum just received at the entry port. The DMS will compare this number against the glovebox limit to verify the limit has not been exceeded.

If the glovebox fissile material inventory limit will be exceeded a pop-up message will be generated on the DMS system, displayed on DMS operator terminal TE-12-103, and an alarm transmitted to the PCS [location CHAR(10) and message type]. If the fissile material inventory limit will be exceeded; the drum just received at the entry port will not be accessed to the glovebox until the fissile inventory of the glovebox can be reduced to a level that will prevent a fissile inventory limit violation.

The DMS receives the non-compliant item/Collection Container PIN CHAR(14) and location CHAR(10) [TRURWTREAT] from the PCS. The DMS records the item as being treated and displays the treatment instructions on the TRU RWM DMS monitor.

The purge port container is attached to the glovebox and the location updated as noted in paragraph 3.11.2.4.

The DMS receives a Sample PIN CHAR(14) and location "TRURWTREAT" CHAR(10), and Purge Port PIN CHAR(14). The DMS subtracts the Sample PIN from the Purge Port inventory and records the Sample as being treated.

The DMS receives a Treatment Container PIN CHAR(14), location [TRURWTREAT] CHAR(10), and other item PIN CHAR(14) from the PCS. The DMS records that the contents of the item have been placed into the Treatment Container.

The DMS receives a container PIN CHAR(14) of any type, the treated item loadout location CHAR(10) [TRURWTREAT], and the waste drum PIN CHAR(14) at location "TRURWTREAT" from the PCS. The DMS associates the container PIN received with the loadout drum PIN currently attached to the glovebox location "TRURWEXIT".

When treatment occurs, the following data must be entered into the DMS via DMS terminal TE-12-103 for reuniting the sample to the parent material:

1. Non-compliant item PIN (From bar code scan)
2. Method of Treatment (Already in DMS file from Sample Management).
3. Date Treatment completed.
4. Name of Operator performing treatment.
5. Name of Operator reuniting sample with parent material.

6. Date materials were reunited.
7. Sample container PIN returned to non-compliant item (From bar code scan).
8. Time material was reunited.

When the treatment is complete and the waste is ready for disposal into the drum at port DO-07-402B, the following data must be entered into the DMS via terminal TE-12-103:

1. Container PIN (from bar code scan at 12-NE-305).
2. Name of operator.
3. Primary waste type code.
4. Secondary waste type code.
5. Secondary waste type group.
6. Storage category.
7. Operator comments.
8. Article description.
9. Estimated volume percent.
10. Estimated item weight.
11. Total volume %.
12. Total weight.
13. Date container packaged.
14. Time.

UPSET CONDITIONS: The PCS is keyed to accept container PIN types in a certain order depending upon the first PIN scanned or the menu selection made by the operator. If a bar code is scanned out of this sequence, the PCS will not transmit that bar code to the DMS. Instead, a warning will be displayed on the OIU, the last two bar codes scanned will be displayed with it, and the fixed scanner will be locked out until the message is acknowledged. After acknowledgment, the operator must start the last scanning process over.

3.11.3.2 Loadout of Compliant Waste

When the compliant waste drum has been filled with the compliant portions of the incoming Packets, the operator selects "Port 107-DO-07-402A" from OIU-12-106B. Then the operator selects "Close Port" from the menu. The PCS rotates the port door closed, lowers the lid onto the drum, releases the lid vacuum, lowers the drum to the centering location, locks the port door, and releases the drum centering clamps. The PCS then displays "Port 107-DO-07-402A Closed and Locked" at OIU-12-106B.

The operator then switches the lift table local control to "Panel" and uses the pushbuttons to lower the drum from the port, and convey the drum out from underneath the glovebox. The operator replaces the clamp band. The operator then switches the lift control to "AGV" which signals the AGV that a drum is ready for pick-up. This drum will be sent to the NDE/NDA Area for examination.

Note: The fissile material inventory of these waste drums will be subtracted from the glovebox fissile material inventory once the drum is assayed in the NDE/NDA Area.

PCS ACTIVITIES: The PCS interfaces with the operator at OIU-12-106B.

DATA MANAGEMENT: There are no DMS/PCS interfaces associated with this step in the process. The operator will enter the seal number into the DMS as required.

At the time that the load out drum receives its certification assay, the DMS will subtract the derived drum fissile material content from the TRU RWM glovebox inventory.

SPEC REFERENCES: 13462 - Table 11.4: 5/1 thru 6/End

3.11.3.3 Loadout of Treated Waste

When the non-compliant waste has been treated and loaded into the 85-gallon waste drum, the operator selects "Port 107-DO-07-402B" from OIU-12-106B. Then the operator selects "Close Port" from the menu. The PCS rotates the port door closed, lowers the lid onto the drum, releases the lid vacuum, lowers the drum to the centering location, locks the port door, and releases the drum centering clamps. The PCS then displays "Port 107-DO-07-402B Closed and Locked" at OIU-12-106B.

The operator then switches the lift table local control to "Panel" and uses the pushbuttons to lower the drum from the port and convey the drum out from underneath the glovebox. The operator replaces the clamp band. The operator then switches the lift control to "AGV" which signals the AGV that a drum is ready for pick-up. This drum will be sent to the NDE/NDA area for certification.

Note: The fissile material inventory of these waste drums will be subtracted from the glovebox fissile material inventory once the drum is assayed in the NDE/NDA Area.

PCS ACTIVITIES: The PCS interfaces with the operator at OIU-12-106B.

DATA MANAGEMENT: There are no DMS/PCS interfaces associated with this step in the process. The operator will enter the seal number into the DMS as required.

At the time that the loadout drum receives its certification assay, the DMS will subtract the derived drum fissile material content from the TRU RWM glovebox inventory.

SPEC REFERENCES: 13462 - Table 11.6: 6/1 thru 7/End

3.12 SAMPLE MANAGEMENT

3.12.1 Sample Transfer from the Process Area to the Sample Management Area

Operators in the WRAP 1 Processing Area will place samples from glovebox waste inside a sample container, transfer the sample container to a purge port container attached to the applicable glovebox, and then place the purge port container inside a purge port container transport pig. All three of these containers will have unique bar code identifier which will be "tied together" in the DMS. The loading of these containers and initiating of transport pig location tracking in both the PCS and the DMS is addressed in the glovebox sections of this document (3.8-3.11). The sample management function will begin at the point that the Process Area operator turns the custody of the purge port transfer pig over to the WRAP operator in the Sample Management Area (SMA).

The purge port transfer pig will be noted as being located at the applicable glovebox purge port location. When the glovebox operator is ready to transfer custody of the transfer pig to the SMA operator, he will notify the operator of his intent to transport the transfer pig to the SMA. The glovebox operator will access a local DMS terminal and complete the appropriate Chain of Custody form blocks for relinquishing custody of the transfer pig. The Process Area operator will then manually transport the transfer pig to the SMA pass-thru. The SMA operator will open the SMA pass-thru (note door are interlocked and require the outside door to be shut prior to opening the inside door) and remove the transfer pig.

The SMA operator will use bar code wand 12-NE-317 in the SMA to read the transfer pig bar code or enter the PIN manually via the DMS terminal. The reading of this bar code shall prompt the DMS terminal TE-12-107 to display a screen which will allow the SMA operator to complete the appropriate Chain of Custody form blocks for receiving custody of the transfer pig. Once the SMA operator accepts custody of the transfer pig the DMS will update the location of the transfer pig to note it is in the SMA. The DMS will provide this updated location information to the PCS and the PCS will update its tracking database.

Transfer pigs received from the laboratories exterior to the WRAP facility may be accessed into the SMA via personnel door, however the reading of the transfer pig bar code and updating of the Chain of Custody and DMS database will occur in a manner similar to the receipt of transfer pigs from the Processing Area of WRAP 1.

PCS ACTIVITIES: The PCS shall receive two pieces of data from the DMS upon verification by the SMA operator that a transfer pig has been delivered to the SMA. The data will include the SMA location CHAR(10) and the transfer pig PIN CHAR(14). The PCS shall use this data to update the transfer pig location for transfer pigs whose bar code was previously read in the Process Area. For transfer pigs just received in the WRAP

facility, the PCS shall generate a PCS entry noting the initial transfer pig location as the SMA.

- DATA MANAGEMENT: Upon acknowledgement of the SMA operator that he has accepted custody of the transfer pig, the DMS will perform the following actions:
- A. For transfer pigs transferred from the Process Area -- Log the SMA in the location field CHAR(10) field of the waste container table for the transfer pig PIN, CHAR(14) read by the SMA wand bar code reader. The data currently in the waste container table will be transferred to a relocation history table as the location is identified. The relocation history record table will be updated with the pig PINs, locations, dates, and times as the pig is processed through the facility. Transfer the PIN and location data to the PCS.
 - B. For transfer pigs transferred to the WRAP facility -- Initiate a DMS screen for the generation of a transfer pig record in the DMS. Applicable data will be entered and the DMS location established as the SMA. Transfer the PIN and location data to the PCS.

In addition to the location and custody data noted above, the SMA operator will enter data required to support the sample analysis at the applicable Hanford labs.

SPEC REFERENCES: 13462 - 1.04.B.12

3.12.2 Sample Shipment from the Sample Management Area

Upon completion of the applicable DMS documentation and arranging the shipment of the transfer pigs with the appropriate laboratory facility, the SMA operator will perform additional data management functions to prepare the samples for shipment to an laboratory facility exterior to WRAP. Chain of Custody forms and applicable shipping documentation will be printed in the SMA to support shipment of the transfer pigs. Once a shipper has arrived at the WRAP facility and accepted custody of the transfer pig(s), the SMA operator will update the appropriate location data in the DMS to note the transfer pig(s) have been transferred to the laboratory for analysis. Upon completing this function, the SMA operator will generate a message to the PCS noting that the transfer pig(s) are no longer in the WRAP facility.

PCS ACTIVITIES: The DMS will transmit a message to the PCS noting that the transfer pig(s) are in transit [transfer pig(s) PINs and an "In Transit" location] The PCS will log this information, noting that the appropriate transfer pig(s) have left the facility (i.e. remove the appropriate PINs from the PCS memory stack).

DATA MANAGEMENT: Upon acknowledgement of the SMA operator that he has relinquished custody of the transfer pig, the operator will update the DMS to note the location of the applicable transfer pig PINs as the laboratory where the waste will be analyzed. The data currently in the waste container table will be transferred to a relocation history table as the location is identified. The relocation history record table will be updated with the pig PINs, locations, dates, and times as the pig is processed through the facility. Transfer the PIN and "In_Transit" location data to the PCS.

SPEC REFERENCES: 13462 - 1.04.B.12

3.13 OPERATE BOX NDE

The Box NDE station is a stand alone system including a computer and control system. The NDE interfaces to the PCS through an I/O link between input and output modules of the PCS and the NDE controller. Software to control the NDE station resides in the NDE computer and controller. Operator control commands will be from an operator control station in the Control Room through the PCS.

A fork lift operator delivers a box from S&R and places it on the NDE station box conveyor/scale. The fork lift operator scans the bar code of the box NDE station and the box using bar code reader (12-NY-101). When the PCS receives this bar code location information, the weight information (confirmation weight for direct-certified SWB) is recorded automatically. Once the weight information is transmitted to the DMS, the DMS will verify the weight is within established tolerances of the generator's weight and the SWB weight does not exceed waste container limitations. Upon reading these bar codes and transmitting the data to the DMS, both the PCS and DMS will update their respective databases to indicate the new location (BOXNDE) for the SWB. Note that relocation of the SWBs for NDE/NDA is covered in Section 3.13 and 3.14, not section 3.7.

PCS ACTIVITIES: The PCS shall transmit the location (BOXNDE), SWB PIN, and the SWB weight (SWBWGT) to the DMS for the PIN read. Applicable fields in the DMS are:
 PIN CHAR(14)
 Location CHAR(10)
 Verification Weight NUMBER(10,2)

DATA MANAGEMENT: The weight data will be entered into a verification weight field NUMBER(10,2) of the DMS. Upon receipt of the weight data, the DMS will calculate the difference between the certification weights downloaded from the SWITS and the verification weights obtained from the infeed conveyor weight scale.

Additionally, the weights obtained will be compared against an established limit for the SWBs. This container weight

limit NUMBER(10,2) will be in a table which will contain fixed container data. If either the certification weight/verification weight varies past a predetermined limit or the container weight limit is exceeded, the DMS shall generate a "pop-up" message at the appropriate DMS NDE terminal noting the condition.

The DMS will log "BOXNDE" in the DMS location CHAR(10) field of the waste container table as PINs are received from the PCS. The date and time the relocation occurred will also be recorded. The data currently in the waste container table will be transferred to the relocation history table as the new location is identified. The relocation history table will be updated with the SWB PINs, locations, dates, and times as the waste is processed through the facility.

The fork lift operator pushes a local button (tag ref. 09-HS-219) which signals to the PCS and the NDE equipment: "Ready to send box". The PCS and NDE equipment then operate the vault door and conveyors necessary to move the box into the vault.

PCS ACTIVITIES: There are no PCS/DMS interfaces at this point. All communication is between the NDE equipment and the PCS.

DMS INTERFACES: None

To obtain access to the required DMS functions during NDE exams, the operator will cue off a DMS icon from the PCS screen. Using this icon will provide an NDE menu which the operator may use to pull up the appropriate DMS screens for NDE operations. During NDE exams, the Control Room operator inputs examination data into the data base file of the drum. The NDE operator will utilize a "split" screen to provide access to a DMS data entry screen while maintaining applicable PCS data (such as NDE status and alarms) in the "background". The data base file is stored on the DMS computer. The Control Room operator then informs the PCS that the drum NDE is complete.

The control room operator manually starts the examination. Control Room instrumentation and logic controllers are provided as part of the NDE equipment to perform operating functions such as X-ray generator operation, detector movements, and camera controls. A video tape is made of each container and the operator can make voice comments onto the video tape. All operations at the NDE station are remote manual from an operator console in the Control Room. During the course of the examination, the operator completes the text fields on his DMS display as appropriate. A mandatory field for completion shall include "Box compliant or non-compliant". Pertinent information (e.g. dense or non-compliant waste items identified) will be entered into the Data Management System by the operator.

PCS ACTIVITIES: The only PCS/DMS interface to be provided will be the use of a DMS icon on the PCS screen to access a DMS menu for NDE functions.

DATA MANAGEMENT: The DMS menu for NDE operations will be accessed via an icon on the PCS screen. From the DMS menu, the operator will determine the screens that will be required to support NDE operations.

The DMS controls the data base for the drum from the time the drum is accepted into WRAP. During NDE examinations, the Control Room operator inputs examination data into the data base file of the drum. This data will include descriptive data as required to support certification, VHS tape number, inspection start/stop footage, and the WRAP VHS tape storage location. The data base file is stored on the DMS computer.

OPEN ISSUES: Issue: pg 13462-24 has the operator in the control room remotely moving the box into the NDE vault. pg 13462-485 has the fork truck operator pushing a local button which signal the PCS and the NDE to move the box into the vault. Resolution: Normal operation will be described to indicate the fork lift operator initiating box loading activities.

On completion of the examination, the operator switches off the X-ray generator and returns the box and NDE manipulation equipment to the reference position. The operator then remotely removes the box from the NDE chamber and requests that the box be picked up. If required, the box may be picked up by the fork lift operator taken to the BWAS unit and rotated 180 degrees and then returned to the NDE vault for examination of the "other side" of the box.

PCS ACTIVITIES: There are no PCS/DMS interfaces at this point. All communication is between the NDE equipment and the PCS.

OPEN ISSUES: Issue: Should there be a PCS/DMS to bar code reader message for the portable reader in S&R, "Box exam complete"? Resolution: No. This will generate another PCS interface that will only be used 70 times a year. This function can be met via the telephone behind the infeed conveyor jib crane operator.

3.14 OPERATE BOXED WASTE ASSAY SYSTEM

A box is manually loaded from the Box NDE conveyor tag reference 104-CV-09-106 onto a fork lift truck and driven to the BWAS station, tag reference 104-ND-06-106. The fork lift operator scans the BWAS station bar code and the box bar code using the bar code reader 12-NY-101. The BWAS station bar code and the box bar code are loaded into the PCS. The PCS transfers the bar code information to the DMS. The PCS display shall be updated showing the box PIN and the box in the BWAS assembly. See "PCS display requirements". The DMS locates the database for the box and signals BWAS "Prepare to Receive Database". BWAS replies with "Ready to Accept Database". DMS transfers the database to the box BWAS. Database to include, but not limited to, bar code

information, box weight, and box characterization data. BWAS accepts the database and acknowledges with "Database Received" to the DMS. A local GREEN indicator light tells the forklift operator BWAS ready to accept box. The forklift operator loads the box onto the BWAS turntable.

PCS ACTIVITIES: The PCS shall transmit the location (BOXNDA) and SWB PIN to the DMS for the PIN read. Applicable fields in the DMS are:
PIN CHAR(14)
Location CHAR(10)

DATA MANAGEMENT: The DMS will log "BOXNDA" in the DMS location CHAR(10) field of the waste container table as PINs are received from the PCS. The date and time the relocation occurred will also be recorded. The data currently in the waste container table will be transferred to the relocation history table as the new location is identified. The relocation history table will be updated with the SWB PINs, locations, dates, and times as the waste is processed through the facility.

Once the DMS has identified the box, it locates the database and sends it to the BWAS for use during the assay.

After the Forklift operator has verified proper alignment of the box on the transfer tray, he pushes the Buyer's "START ASSAY" button on the BWAS which provides an internal permissive to load box from the turntable into the Buyer's BWAS chamber and commence the assay. This signal is relayed to the DMS via the communication network. The DMS will in turn transmit this signal to the PCS. Receipt of this signal by the PCS shall cause the BWAS icon to change from MAGENTA to GREEN. The BWAS responds by turning on a horn to warn of impending box/turntable movement. The Buyer's BWAS status light changes from green to yellow, indicating an assay is in progress. The BWAS verifies proper alignment of the box, moves it into the assay chamber and initiates assay.

PCS ACTIVITIES: The PCS shall receive a message from the DMS that the assay has been initiated by the BWAS operator. Upon receiving this message, the PCS shall revise the color of the BWAS icon from MAGENTA to GREEN.

DATA MANAGEMENT: The DMS will act as an intermediary for the BWAS/PCS status/communication signals. The DMS will forward the status signals it receives from the BWAS to the PCS.

SPEC REFERENCES: 13462-Table 14.5

NDA operations for boxed waste will be performed by a stand alone Boxed Waste Assay System (BWAS). The BWAS has an internal computer and controller which perform all the assay algorithms and control functions. The BWAS is interfaced to the DMS through an Ethernet link onto the WLAN. The BWAS has a dedicated operator console located in the control room in the Transport/NDA operator Control Station #2 CNS-12-104 which is also connected to the WLAN.

The BWAS performs all NDA functions including PAN, GEA and system integration. Waste characterization information is downloaded from the DMS through the WLAN. Assay results are provided at the dedicated operator console in the control room. Assay results are transferred from the BWAS to the DMS through the WLAN.

PCS ACTIVITIES: There are no PCS/DMS interfaces at this point. All operations pertaining to the actual assay are performed by the BWAS internal computer.

DATA MANAGEMENT: The DMS provides the BWAS with the current information received from SWITS for use during the assay (see section 6.0)

SPEC REFERENCES: 13462-Table 14.5, WH-S-033, Rev 5 (BWAS Specification)

If the BWAS system detects a system fault or failure, an "ABORT ASSAY" message shall be transmitted to the DMS. This message may also be transmitted to the DMS if the BWAS operator at the Control Room console should abort the assay. If the assay is aborted and the DMS receives the abort message, the DMS will forward the message on to the PCS which will respond by changing the BWAS icon color to RED.

If the box assay is completed without incident and the data is acceptable, the BWAS operator will send a signal to the DMS noting the assay is complete. The DMS will forward this message on to the PCS which will respond by change the BWAS icon color to MAGENTA.

PCS ACTIVITIES: The PCS shall receive a message from the DMS that the assay has been aborted or completed. Upon receiving this message, the PCS shall revise the color of the BWAS icon from GREEN to RED or RED to MAGENTA as appropriate.

DATA MANAGEMENT: The DMS will act as an intermediary for the BWAS/PCS status/communication signals. The DMS will forward the status signals it receives from the BWAS to the PCS.

3.15 SHIPPING

The WRAP 1 Shipping function will handle numerous waste/container streams. Wastes that have been processed through the WRAP 1 NDE/NDA and Processing Areas will be returned to the S&R Area. The waste containers will be stored in the S&R Area until WRAP 1 operators can determine that all WRAP 1 processing is complete and the DMS database has been appropriately updated. The waste will be scheduled for shipment upon verification that applicable transportation requirements can be met. The TRU waste containers will be shipped to Head Gas (HG) analysis. Upon completion of the HG analysis, the TRU waste will be placed into interim storage outside of WRAP 1 pending acceptance by the Waste Isolation Pilot Project (WIPP). The LLW will be

shipped to interim storage outside of WRAP 1 pending acceptance by a LLW disposal facility at Hanford.

3.15.1 SWB Shipment to Interim Storage

3.15.1.1 SWB Receipt & Storage in S&R Area

The NDE/NDA function within WRAP 1 will perform SWB NDE and NDA exams and then return the waste to the Shipping area. This transfer between the S&R and NDE/NDA area will occur via an SWB fork lift operating through a large roll-up door in the southwest corner of the S&R Area.

The S&R fork lift operator will be verbally informed by the BWAS operator that the SWB is ready to be picked up from the BWAS vault. The fork lift operator will pick up the BWAS and return it to the SWB Storage Area in the WRAP 1 S&R Area.

PCS ACTIVITIES: There are no PCS/DMS interfaces at this point. The SWB is merely being transported via manual means from the NDE/NDA Area to the S&R Area.

SPEC REFERENCES: 13462-Table 14.5

Once the SWB is placed in an area designated for SWB Storage, the operator will scan a bar code (using bar code reader 12-NE-101) to fix the bar code position at the SWB Storage Area and key the PCS to expect PIN bar codes to follow. The operator will then scan the bar code for the SWB returned from the NDE/NDA Area. The box PIN and location will be logged into a temporary PCS file. The operator shall then scan a termination bar code to note that he has completed his scanning operation. When the termination bar code is scanned to note that the storage function is complete, the PCS will transmit the SWB PIN and the SWB Storage location to the PCS and DMS databases to update the SWB location.

When the DMS receives the SWB PIN and SWB Storage location, it will check to see if the previous SWB location was the BWAS. If the previous location was the BWAS, the DMS will update the DMS container status field to note "Processing Complete".

PCS ACTIVITIES: A bar code ("2Y" data identifier with location "SWBSTR") is read to fix the bar code reader location. The PCS will recognize the "2Y" as a location designator, "strip" it from the bar code, and record "SWBSTR" as the SWB location in a temporary file. Reading this bar code also keys the PCS to expect additional SWB bar codes ("S" data identifier followed by a container PIN). The SWB PINs will be entered into this same temporary PCS file.

Reading the termination bar code ("Y" data identifier with command "END&TRNSMT") will confirm termination of the SWB

storage process. The data identifier is "stripped" from the bar code. This bar code keys the PCS to transmit the location and SWB PIN data to the appropriate PCS and DMS files.

DATA MANAGEMENT: The DMS will update the waste container table with the "SWBSTR" location information. The date and time the relocation occurred will also be recorded. The data currently in the waste container table will be transferred to the relocation history table as the new location is identified. The relocation history table will be updated with the drum PINs, locations, dates, and times as the waste is processed through the facility.

The S&R operator will acknowledge the pop-up message in the S&R Office at terminal 101-TE-12-108. The operator will update the container status field to "Processing Complete". At this time the operator may verify that the appropriate DMS data exists for the SWBs listed. When this activity is completed, the operator will update the container status field to "Data Review Completed Satisfactorily" or "Data Review Completed Unsatisfactorily". Once the data review has been completed satisfactorily, the operator will initiate the generation of the required shipping documentation. Once the appropriate shipping documentation is complete the container status field will be updated to "Ready for Shipment". At that time, the SWBs will be placed on the SWB Shipping Pick List on the DMS.

AT THIS POINT THE WASTE EXAMINATIONS ARE COMPLETE AND THE PCS/DMS WILL STATUS THE LOCATION AS THE WRAP 1 SWB STORAGE AREA. ONCE THE SHIPPING DOCUMENTATION IS COMPLETED, THE WASTE CAN BE SHIPPED TO HG ANALYSIS.

SPEC REFERENCES: 13462-9, 13, 14, Table 1.1, Table 1.2, step 3

3.15.1.2 SWB Shipment

WRAP 1 S&R operators will review the records in the WRAP DMS and identify any SWBs contained on the SWB Shipment Pick List. As these SWBs are identified, the S&R operators will move the SWBs to the shipping dock area. The SWBs will be surveyed for radiological surface contamination prior to transfer onto transport vehicles. If contamination is detected, the SWBs are decontaminated or the contamination fixed to avoid spreading.

PCS ACTIVITIES: There are no PCS/DMS interfaces at this point. All activities and data management are manual operations.

DATA MANAGEMENT: If contamination/damage problems are identified, the information will be recorded manually on an HPT log.

Upon satisfactory application of any missing or damaged bar code labels, the operator will scan a bar code (using bar code reader 12-NE-101) to fix the bar code position at the WRAP 1 Shipping Dock. The operator will then scan the bar code for each SWB that is to be shipped from WRAP. The initial location bar code and all SWB bar codes scanned will be maintained in a temporary file in the PCS. Upon scanning the final SWB bar code, the operator will scan a termination bar code to note that he has completed his scanning operation. When the termination bar code is scanned, the PCS will transmit all SWB PINs and the Shipping Dock location to a "temporary" table in the DMS.

When the DMS receives the SWB PINs and Shipping Dock location, a pop-up message will be displayed on the DMS terminal (101-TE-12-108) in the S&R Office. This message will key the operators that SWBs are on the Shipping Dock ready to be shipped.

After the waste transport vehicle leaves the shipping dock, the DMS will be updated to reflect the waste is "In Transit". Upon receiving the "In Transit" location in the DMS, the DMS will automatically send an "In Transit" message and the appropriate PINs to the PCS which will be updated to reflect the shipment of the SWBs. The DMS records will be uploaded to SWITS and will not be available for modification by WRAP 1 personnel. The SWBs are loaded onto the transport vehicle using a fork lift.

PCS ACTIVITIES: A bar code ("2Y" data identifier with location "SHPDCK") is read to fix the bar code reader location. The PCS will recognize the "2Y" as a location designator, "strip" it from the bar code, and record "SHPDCK" as the SWB location in a temporary file. Reading this bar code also keys the PCS to expect additional SWB bar codes ("S" data identifier followed by a container PIN). The SWB PINs will be entered into this same temporary PCS file.

Reading the termination bar code ("Y" data identifier with command "END&TRNSMT") will confirm termination of the shipping ID process. The data identifier is "stripped" from the bar code. This bar code keys the PCS to transmit the temporary file with the location and SWB PIN data to the DMS.

AT THIS POINT THE WASTE HAS BEEN LOADED ONTO THE TRUCK AND IS READY TO BE SHIPPED FROM WRAP. THE PCS/DMS WILL STATUS THE LOCATION AS THE "S&R DOCK".

Once the SWB transport vehicle leaves the dock, the DMS will automatically send the SWB PINs and an "In Transit" message to the PCS noting that the waste is in transit. The PCS will log this information, noting that the appropriate SWBs have left the facility (i.e. remove the appropriate PINs from the PCS memory stack).

DATA MANAGEMENT: The SWB location and PINs will be logged into a temporary DMS table for shipping SWBs. The data will be entered into DMS fields for location CHAR(10) and PINs CHAR(14).

The DMS will automatically update the waste container table with the Shipping Dock location information. The location data currently in this table will be transferred to a relocation history table as new locations are identified. The relocation history table fields for location, date out, time out, and PIN will be updated when the new entry is made.

The S&R operator will acknowledge the message "Waste Containers on Truck -- Ready for Shipment" at terminal 101-TE-12-108. When the SWB transport vehicle leaves the shipping dock, the S&R operator will update the DMS database to note that the waste is "In Transit". Upon receiving the "In Transit" location in the DMS, the DMS will automatically send an "In Transit" message and the appropriate PINs to the PCS which will be updated to reflect the shipment of the SWBs.

The applicable SWB data will be uploaded to SWITS and "locked" to prevent modification in the WRAP DMS. Some of the DMS data generated will be archived only in WRAP. Other data (duplicated in SWITS) may be maintained for a period of time in WRAP for review purposes only! No modification of certification data will be allowed as the official records now belong to SWITS.

SPEC REFERENCES: 13462 - Table 15.8

3.15.2 Drum Shipment

3.15.2.1 Drum Weighing at the Discharge Conveyor

The discharge conveyor operator will use the conveyor control panel to index drums from the discharge conveyor (101-CV-05-102) to the drum scale conveyor (101-CV-05-103B). The PCS conveyor controls will allow the conveyors to run until a drum is indexed to the ready position on the drum scale conveyor. Once this is accomplished the conveyor run contact is de-energized.

Once the drum is on the weigh conveyor and the conveyor is de-energized, the operator scans the drum bar code using bar code reader 12-NE-103. When the PCS receives this bar code location information, the weight information (2nd confirmation weight for direct-certified NG waste, 1st confirmation weight for processed wastes) is recorded automatically. While the drum is on the weigh conveyor, the operator may apply any applicable labels that are required. Once the location, PIN, and weight information is transmitted to the DMS, the

DMS will verify the weight is within established tolerances of the generator's weight and the drum weight does not exceed waste container limitations.

PCS ACTIVITIES: The PCS shall transmit the drum PIN CHAR(14), "DISCHCVR" location CHAR(10) and the "DISCHWGT" drum weight NUMBER (10,2) to the DMS for the drum PIN read.

DATA MANAGEMENT: The weight data will be entered into a verification weight field NUMBER(10,2) of the DMS. Upon receipt of the weight data, the DMS will calculate the difference between the certification weights downloaded from the SWITS and the verification weights obtained from the infeed conveyor weight scale.

The date and time the relocation occurred will also be recorded. The data currently in the waste container table will be transferred to the relocation history table as the new location is identified. The relocation history table will be updated with the drum PINs, locations, dates, and times as the waste is processed through the facility.

Additionally, the weights obtained will be compared against an established limit for each container type. This container weight limit will be in a table which will contain fixed container data.

As the location field in the DMS is revised to reflect the discharge conveyor location, the DMS will automatically update the container status field of the drum to indicate "Processing Complete".

UPSET CONDITIONS: If the difference between the certification weight in the DMS and the verification weight obtained on the discharge conveyor is greater than a pre-established limit, a pop-up message will be displayed at the TRUPACT terminal 101-TE-12-124. The TRUPACT terminal operator will determine the corrective actions to be taken prior to processing the drum any further. A similar scenario will occur for containers whose weight limit is violated.

SPEC REFERENCES: 13462-Table 1.4, 1.5, 1.6

3.15.2.2 Interim Drum Storage in WRAP 1

The drums on the drum scale conveyor 101-CV-05-103B will be sorted by waste type and container size when they are palletized from the weight conveyor. The types of drums and approximate numbers to be handled each day by the conveyor are summarized in the table below.

INTERFACE DOCUMENT OUTGOING STREAM DEFINITION

DRUM TYPE	WASTE TYPE	#/DAY
55 EE	NG TRU (HF)	11
55 OT	TRU PRODUCT (HF)	11
55 OT	TRU RWM PRODUCT (HF)	1
	TRU TO HG ANALYSIS	23

55 EE	NG LLW TO INT STORAGE	11
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85 EE	LLW RWM PRODUCT TO STORAGE	.5
85 EE	LLW PRODUCT TO STORAGE	3
85 D&S*	LLW PUCKS (HF)	1.5
	85-GAL LLW TO INT STORAGE	5.0

85 EE	UNUSED SALVAGE TO W113	14
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(HF) = Nucfil filter in drum lid

* Empty drum pucks from the TRU line (assumed to be LLW)

There will not be a need to segregate the TRU waste drums which are palletized from the discharge weight conveyor. All TRU waste that is "incompatible" will be stabilized/treated within the WRAP 1 Process Area. TRU waste and TRU mixed waste (TRUM) will generally be treated identically by Hanford and the WIPP sites though some additional reporting requirements exist for the TRUM wastes. All TRU drums exiting the facility will be 55-gallon waste drums.

The LLW will need to be segregated into various streams based on the waste type (LLW 1, LLW 3, LLW >3, LLMW (incompatibles) and the drum size (55 or 85-gallon drums). Different waste types will be shipped to different locations. Pallets of drums will be stacked in interim storage and, therefore, will be required to be made up of drums of equal size (height).

As a drum arrives at the discharge weight conveyor and is weighed, the operator will have the ability to request DMS data on the drum. Anticipated DMS data to be displayed at the TRUPACT DMS terminal will include as a minimum: drum PIN, drum type, drum secondary waste code (for storage).

Once the drum type and storage category are determined, the operator will review the DMS data for all drums contained in the AS/RS to identify any

partial pallets of like waste that could accept the drum currently on the discharge weight conveyor. If no partial pallets exist in the AS/RS, the operator will request the fork truck operator to place a new empty pallet on the transfer car. If a partial pallet does exist in the AS/RS, the discharge conveyor operator will place one of the drum PINs from this pallet on the "Transfer Car Priority Pick List" which will then be forwarded to the PCS.

The discharge conveyor operator notes that the transfer car is available (empty). The operator will then read a bar coded command to retrieve the desired drums/pallet to the transfer car (RTV DRMTC). Bar code reader 12-NE-103 will be used for this function. This command requests the next drum on the Transfer Car Priority Pick List to be retrieved to the transfer car. This request is communicated from the PCS to the AS/RS along with the next drum PIN as listed on the Transfer Car Priority Pick List.

The AS/RS retrieves the pallet containing the drums requested. The pallet is moved to the transfer car and all the drums on the pallet logged out of the AS/RS. The transfer car will move north to put the pallet into a position such that the drum on the weight conveyor can be loaded onto the pallet. The AS/RS shall inform the PCS that the drums have been successfully retrieved from the AS/RS. The AS/RS will display a "Drums to be Transferred to Discharge Jib Crane" message on the local AS/RS visual display. The PCS and DMS will update the retrieved drum location data.

If the AS/RS can not locate the drums identified it shall display a "Cannot Find Pallet/Unable to Retrieve" message (SYSERR) on the visual display and the PCS will receive a signal noting the lack of task completion.

PCS ACTIVITIES: The Transfer Car Priority Pick List will be updated (entry deleted) as retrieval commands "DRM RTVTC" are received and drums are retrieved from the AS/RS. The Transfer Car Priority Pick List will only include the PIN CHAR(14) of the drum to be retrieved and will only include a single PIN.

Upon receipt of the "Drum Successfully Retrieved" (DRM RTVTC) message, the PCS shall transmit both "XFRCAR" as the location, and all drum PINs on the pallet to the DMS.

DATA MANAGEMENT: The DMS will log the "XFRCAR" as the location in the location CHAR(10) field of the waste container table for each drum PIN CHAR(14) received from the PCS. The date and time the relocation occurred will also be recorded. The data currently in the waste container table will be transferred to the relocation history table as the new location is identified. The relocation history table will be updated with the drum PINs, locations, dates, and times as the waste is processed through the facility.

SPEC REFERENCES: 13462-Table 15.1, 15.4

Once the transfer car is in its northern position, the discharge jib crane operator will move the drum from the discharge weight conveyor to the pallet on the transfer car. The discharge conveyor operator will verify that the "AS/RS Ready" message is displayed on the local display (needs to be visible from the jib crane control location). The operator will use bar code scanner (12-NE-103) to scan a bar code "XFRCAR". The PCS will not accept this bar code unless the "AS/RS Ready" signal was previously received from the AS/RS. This "AS/RS Ready" signal will be transmitted (to the local displays and PCS) upon completion of the AS/RS operations generating the "DRM STRPS", "DRM RTVPS", "DRM STRTC", or "DRM RTVTC" signals. Reading of the "XFRCAR" bar code without the prior receipt of the "AS/RS Ready" signal shall generate an "AS/RS Not Available" message on the local displays. Reading the "XFRCAR" bar code will transmit a message to the PCS to expect drum PINs to be transmitted next. This message will also be forwarded to the AS/RS computer which in turn will display a "Transfer Car Drums Require Identification" message at the locally mounted visual display. The PCS will be requested to ID the drums (NO IDTC).

The discharge conveyor jib crane operator will then scan the bar codes of the individual drums on the transfer car pallet to identify the drums to be put into the AS/RS. The PCS will maintain the drum PINs in a temporary file until the drums are stored successfully in the AS/RS. Once all the drum bar codes on the pallet have been read, the jib crane operator shall scan a "Store Drums" bar code. This "Store Drums" (STR DRMTC) bar code is a coded command from the PCS to the AS/RS to store the pallet. This command will be forwarded to the AS/RS (along with the drum PINs) if exactly four drums have been identified. If a number other than four drums have been identified, the PCS shall perform the following actions:

- If less than four drum PINs have been read between the reading of the "XFRCAR" bar code and the "STR DRMTC" bar code, the PCS shall send a message to the AS/RS (NUM DRUM) noting the number of drums that have been read. The AS/RS will display the number of drums read to the discharge conveyor operator (via the local display) and require (VERF NUM) that:
 - . either additional drum PINs be read along with a second reading of the "STR DRMTC" command (drum PINs transmitted to AS/RS upon reading second "STR DRMTC" command)
 - . or verification that the proper number of drum PINs have been read via a second reading of the "STR DRMTC" command. (drum PINs transmitted to AS/RS upon second reading "STR DRMTC" command)
- If more than four drum PINs have been read between the reading of the "XFRCAR" and the "STR DRMTC" bar code, the PCS shall send a message to the AS/RS (NUM DRUM) noting the number of drums that have been read. The AS/RS will display the number of drums that have been read (via the local display) and require the sequence to be restarted (i.e. read the "XFRCAR" bar code and the drum PINs again followed by the "STR DRMTC" command bar code.) The drum PINs shall be transmitted to the AS/RS upon along with the "STR DRMTC" command.

Upon receipt of the "Store Drums" command, the AS/RS shall pick up the pallet and select an empty bin location to store it. Once the AS/RS fills its last available bin location (no bins available), it shall display a "Cannot Find a Location for Pallet" (NOLOCS) message on the visual display. This message shall be displayed until such time as a pallet of drums is removed from the AS/RS.

If the pallet of drums is successfully stored in an AS/RS bin location, the AS/RS will send a message (DRM STRTC) to the PCS. Upon receiving this message from the AS/RS, the PCS shall forward the drum PIN numbers and "AS/RS" as the location to the DMS for tracking the drum location. The PCS shall also transmit the drum PINs to the AS/RS so that the AS/RS can update its internal database to track the specific bin location the identified drums are stored in.

PCS ACTIVITIES: Upon receipt of the "DRM STRTC" message, the PCS shall transmit both the "AS/RS" as the location and the drum PINs to the DMS.

DATA MANAGEMENT: The DMS will log "AS/RS" in the location field CHAR(10) field of the waste container table for each drum PIN, CHAR(14), received from the PCS. The date and time the relocation occurred will also be recorded. The data currently in the waste container table will be transferred to the relocation history table as the new location is identified. The relocation history table will be updated with the drum PINs, locations, dates, and times as the waste is processed through the facility.

SPEC REFERENCES: 13462-Table 15.1 & 15.4

If exactly four drum bar codes have been read for storing drums from the transfer car location and a successful "DRM STRTC" message has been received, the DMS will recognize the pallet as being full.

Once a pallet of four drums has been stored in the AS/RS, a WRAP operator shall verify that all applicable data has been entered into the WRAP 1 DMS. When this activity is completed, the operator will update the container status field to "Data Review Completed Satisfactorily" or "Data Review Completed Unsatisfactorily".

Once the data review has been completed satisfactorily, the operator will initiate the generation of the required shipping documentation. Once the appropriate shipping documentation is complete the container status field will be updated to "Ready for Shipment". At that time, the drums will be placed on a DMS Shipping List by transmitting the drum PINs, drum type, and associated shipping manifest number to a DMS Shipping List. Manifest numbers and drum types will assure common retrieval and shipment of drums (LLW-1 LLW-3, TRU, etc).

The drums contained on the full pallets will be placed onto the DMS Shipping List. The drum data will remain on the DMS Shipping List until such time as the shipment vehicle arrives at WRAP 1 and is ready to receive waste containers. When WRAP Operations is ready to remove the waste drums from the AS/RS, the appropriate DMS Shipping List data (PINs) are transferred from the DMS to the appropriate PCS Shipping Pick List; either the "LLW" or "TRU" shipping list.

PCS ACTIVITIES: The DMS will transmit the PIN number CHAR(14) to the appropriate PCS Shipping Pick List once the shipping vehicle is ready for waste receipt.

The PCS shall add these drum PINs to the appropriate PCS Shipping Pick List which will be accessed via bar code reader. Drums will be retrieved from the AS/RS on a first in-first out basis.

The Shipping Pick Lists maintained in the PCS will be capable of being modified from the PCS if it is determined that the standard procedure of first in-first out will not be followed.

DATA MANAGEMENT: The DMS will update the applicable DMS Shipping List (delete drums from listing) as the PINs are provided to the PCS Shipping Pick Lists.

SPEC REFERENCES: 13462-Table 15.4

3.15.2.3 Waste Drum Retrieval from AS/RS

Once a WRAP operator determines that an adequate number of pallets/drums exist have been flagged as "Ready for Shipment", the operator will schedule a transport vehicle to transport the waste from the WRAP facility to its next destination and will transfer the PINs to either the LLW or TRU Shipping Pick List on the PCS as noted above.

To retrieve drums from the AS/RS unit for shipment, the forklift operator will note that the transfer car is available (empty) and the AS/RS is available (ASRSRDY) as noted on the local display. The fork lift operator will read either a "LLW to Offsite Storage" bar code (RTV DRMTC1) or a "TRU to Temporary Storage" bar code (RTV DRMTC2) using bar code reader 12-NE-101. These commands request the next pallet of drums on the applicable PCS Shipping Pick List to be retrieved. This request is communicated from the PCS to the AS/RS along with the next four drum PINs as listed on the applicable Shipping Pick List.

The AS/RS retrieves the pallet containing the drums requested. The pallet is moved to the AS/RS transfer car and the are drums logged out of the AS/RS. The AS/RS shall inform the PCS (DRUM RTVTC) that the drums have been successfully retrieved from the AS/RS. The AS/RS will display a "LLW to

Offsite Storage" or "TRU to Temporary Storage" message on the local AS/RS visual display. The PCS and DMS will update the retrieved drum location data.

If the AS/RS can not locate the drums identified it shall display a "Cannot Find Pallet/Unable to Retrieve" message (SYSERR) on the visual display the PCS will receive a signal noting the lack of task completion.

PCS ACTIVITIES: The applicable Shipping Pick List will be updated as drums are retrieved from the AS/RS and the AS/RS communicates this information to the PCS (DRM RTVTC). It is this updated listing (next set of drum PINs) that the PCS will transmit to the AS/RS when the "Retrieve Drums for Shipping" bar codes are received from the bar code reader 12-NE-101. The Shipping Pick List data will consist of a sequential listing of the PINs CHAR(14).

The AS/RS will log the drums out of the AS/RS and send a message to the PCS (DRM RTVTC) when the drums are successfully retrieved.

Upon receipt of the "Drum Successfully Retrieved" (DRM RTVTC) message, the PCS shall transmit both transfer car as the location (XFCAR), and the drum PINs to the DMS.

DATA MANAGEMENT: The DMS will log the "XFCAR" as the location in the location CHAR(10) field of the waste container table for each drum PIN CHAR(14) received from the PCS. The date and time the relocation occurred will also be recorded. The data currently in the waste container table will be transferred to the relocation history table as the new location is identified. The relocation history table will be updated with the drum PINs, locations, dates, and times as the drum moves through the plant.

SPEC REFERENCES: 13462-Table 15.5 AND 15.6

3.15.2.4 Waste Drum Shipment

The fork lift operator will pick up the pallets of drums to be shipped and transport them from the AS/RS transfer car to the Shipping Dock area. Upon satisfactory application of any missing or damaged bar code labels (TRU, DOT, mixed waste labels, etc) the operator will scan a bar code (using bar code reader 12-NE-101) to fix the bar code position at the WRAP 1 Shipping Dock. The operator will then scan the bar code for each drum that is to be shipped from WRAP. The initial location bar code and all drum bar codes scanned will be maintained in a file in the PCS. Upon scanning the final drum bar code, the operator will scan a termination bar code to note that he has completed his scanning operation. When the termination bar code is scanned, the PCS will update its database for the drum PINs that were read and transmit all drum PINs and the Shipping Dock location to table in the DMS. The drums will

be surveyed for radiological surface contamination prior to transfer onto transport vehicles. If contamination is detected, the drums are decontaminated or the contamination fixed to avoid spreading.

When the DMS receives the drum PINs and S&R dock location, a pop-up message will be generated on the DMS terminal (101-TE-12-108) in the S&R Office. This message will key the operators to update the drum records in the WRAP DMS table as required (verify all drums are actually loaded onto the transport vehicle and all shipping data is completed accurately). The operator will upload the data to the DMS.

After the waste transport vehicle leaves the Shipping Dock, the DMS will be updated to reflect the waste is "In Transit". Upon receiving the "In Transit" location in the DMS, the DMS will automatically send an "In Transit" message and the appropriate PINs to the PCS which will be updated to reflect the shipment of the waste. The DMS records will be uploaded to SWITS and will not be available for modification by WRAP 1 personnel. The drums will be loaded onto the transport vehicle using a fork lift.

PCS ACTIVITIES: A bar code ("2Y" data identifier with location "SHPDCK") is read to fix the bar code reader location. The PCS will recognize the "2Y" as a location designator, "strip" it from the bar code, and record "SHPDCK" as the drum location in a file. Reading this bar code also keys the PCS to expect additional drum bar codes ("S" data identifier followed by a container PIN).

Reading the termination bar code ("Y" data identifier with command "END&TRNSMT") will confirm termination of the shipping ID process. Again the data identifier is "stripped" from the bar code. This bar code keys the PCS to update its database for the new drum locations and transmit the data file with the location and SWB PIN data to the DMS.

AT THIS POINT THE WASTE HAS BEEN LOADED ONTO THE TRUCK AND IS READY TO BE SHIPPED FROM WRAP. THE PCS/DMS WILL STATUS THE LOCATION AS THE "SHIPPING DOCK".

Once the drum transport vehicle leaves the dock and the DMS receives the "In Transit" location, the DMS will automatically send the drum PINs and an "In Transit" message to the PCS noting that the waste is in transit. The PCS will log this information, noting that the appropriate drums have left the facility (i.e. remove the appropriate PINs from the PCS memory stack).

DATA MANAGEMENT: The S&R operator will acknowledge the message "Waste Containers on Truck -- Ready for Shipment" at terminal 101-TE-12-108. The drum locations and PINs will be logged into a DMS table for shipping drums. The data will be entered into DMS fields for location CHAR(10) and PINs CHAR(14).

The S&R operator will verify that the drums are loaded onto the shipping vehicle and all shipping manifest data is complete. Once this is done the location and PIN data will be uploaded to the DMS database. The date and time the relocation occurred will also be recorded. The location data currently in this table will be transferred to a relocation history table as new locations are identified. The relocation history table fields for location, date out, time out, and PIN will be updated when the new entry is made.

When the drum transport vehicle leaves the shipping dock, the S&R operator will update the DMS database to note that the waste is "In Transit". Upon receiving the "In Transit" location in the DMS, the DMS will automatically send an "In Transit" message and the appropriate PINs to the PCS which will be updated to reflect the shipment of the waste. The drum records will be uploaded to SWITS and "locked" to prevent modification in the WRAP DMS. Some of the DMS data generated will be archived only in WRAP 1. Other data (duplicated in SWITS) may be maintained for a period of time in WRAP for review purposes only! No modification of certification data will be allowed as the official records now belong to SWITS.

SPEC REFERENCES: 13462-Table 15.5 & 15.6

3.15.2.5 Empty Drum Storage in WRAP

The 14 empty overpack drums coming out of the Processing Area each day will not be placed into the AS/RS via the transfer car but will palletized on the southern pallet stand next to the discharge conveyor. Note: the northern pallet stand by the discharge conveyor will be used to stage pallets of TRU drums to be assembled into TRUPACT II payload assemblies (see section 3.15.4).

PCS ACTIVITIES: There are no PCS/DMS interfaces at this point. All activities are manual operations associated with transferring the empty drums from the weight conveyor to the empty drum pallet stand. Both the PCS and the DMS will maintain the empty drum location as the discharge conveyor.

The transfer of the empty drum pallets from the empty drum pallet stand to the empty drum storage area (anticipated to be on the south side of the AS/RS storage area) will occur via the drum fork lift operator. The fork lift operator will make this pallet transfer any time he notices that the empty drum pallet stand contains a pallet with four drums on it.

PCS ACTIVITIES: There are no PCS/DMS interfaces at this point. The empty drums are merely being transported via manual means from the

NDE/NDA Area to the S&R Area. Both the PCS and the DMS will maintain the empty drum location as the discharge conveyor.

SPEC REFERENCES: 13462-Table 15.10

Once the empty drums are placed in an area designated for Empty Drum Storage pending shipment, the operator will scan a bar code (using bar code reader 12-NE-101) to fix the bar code position and key the PCS to expect PIN bar codes to follow. The operator will then scan the bar code for the drums that have been stored. The empty drum PINs and location will be used to update the PCS. The operator will scan a termination bar code to note that he has completed his scanning operation. When the termination bar code is scanned to note that the storage function is complete, the PCS will transmit the empty drum PINs and location data to the DMS.

PCS ACTIVITIES: A bar code ("2Y" data identifier with location "SHIPEMPSTR") is read to fix the bar code reader location. The PCS will recognize the "2Y" as a location designator, "strip" it from the bar code, and record "SHIPEMPSTR" as the empty drum location in a file. Reading this bar code also keys the PCS to expect additional empty drum bar codes ("S" data identifier followed by a container PIN). The empty drum PINs will then be read. The location and drum PINs together identify the location of the empty drums to the PCS.

Reading the termination bar code ("Y" data identifier with command "END&TRNSMT") will confirm termination of the ID process. The data identifier is "stripped" from the bar code. This bar code keys the PCS to transmit the location and empty drum PINs to the DMS. Reading this bar code will also generate a DMS "pop-up" message. This message will be acknowledged in the S&R Office at terminal 101-TE-12-108.

DATA MANAGEMENT: The empty drum locations and PINs will be logged into the DMS. Location fields CHAR(10) and PIN data CHAR(14) will be used to update the DMS location status.

The location data currently in this table will be transferred to a relocation history table as new locations are identified. The date and time the relocation occurred will also be recorded. The data currently in the waste container table will be transferred to the relocation history table as the new location is identified. The relocation history table will be updated with the drum PINs, locations, dates, and times as the waste is processed through the facility.

As the DMS receives the "SHIPEMPSTR" locations for empty drum PINs, the DMS will automatically update the container status field to "Processing Complete". All DMS data for the

drums may then be reviewed and the container status field updated to either "Data Review Completed Satisfactorily" or "Data Review Completed Unsatisfactorily".

SPEC REFERENCES: 13462-Table 15.10

AT THIS POINT THE EMPTY DRUMS ARE AVAILABLE FOR SHIPMENT AND THE PCS/DMS WILL STATUS THE LOCATION AS THE WRAP 1 EMPTY DRUM STORAGE PENDING SHIPMENT. ONCE THE SHIPPING DOCUMENTATION IS COMPLETED, THE EMPTY DRUMS CAN BE SHIPPED TO THE W113 RETRIEVAL PROJECT OR OTHER STORAGE LOCATION.

3.15.2.6 Empty Drum Shipment from WRAP

WRAP 1 S&R operators will review the records in the WRAP DMS and identify any drums in Empty Drum Storage Pending Shipment which are available for return to the W113 Retrieval Project. Once an adequate number of empty drums exists to support a shipment to the W113 project, the S&R operators will generate any required shipping manifests/records, update the appropriate DMS container status fields to "Ready for Shipment", and then move the empty drums to the shipping dock area. The empty drums will be surveyed for radiological surface contamination prior to transfer onto transport vehicles. If contamination is detected, the empty drums are decontaminated or the contamination fixed to avoid spreading.

PCS ACTIVITIES: There are no PCS/DMS interfaces at this point. All activities and data management are manual operations.

DATA MANAGEMENT: If contamination/damage problems are identified, the information will be recorded manually on an HPT log.

Upon satisfactory application of any missing or damaged bar code labels, the operator will scan a bar code (using bar code reader 12-NE-101) to fix the bar code position at the WRAP 1 S&R Dock. The operator will then scan the bar code for each empty drum that is to be shipped from WRAP. The initial location bar code and all empty drum bar codes scanned will be maintained in a file in the PCS. Upon scanning the final drum bar code, the operator will scan a termination bar code to note that he has completed his scanning operation. When the termination bar code is scanned, the PCS will update its own internal database and transmit all empty drum PINs and the Shipping Dock location to a table in the DMS.

When the DMS receives the drum PINs and S&R dock location, an pop-up message will be generated on the DMS terminal (101-TE-12-108) in the S&R Office. This message will key the operators to update the empty drum records in the WRAP DMS table (verify drums are placed on a truck and the shipping documentation is correct). The operator will upload the drum PIN and location data to the DMS.

After the empty drum transport vehicle leaves the Shipping Dock, the DMS will be updated to reflect the drums as "In_Transit". Upon receiving the

"In Transit" location in the DMS, the DMS will automatically send an "In Transit" message and the appropriate PINs to the PCS which will be updated to reflect the shipment of the waste. The DMS records will be uploaded to SWITS and will not be available for modification by WRAP 1 personnel. The drums will be loaded onto the transport vehicle using a fork lift.

PCS ACTIVITIES: A bar code ("2Y" data identifier with location "SHPDCK") is read to fix the bar code reader location. The PCS will recognize the "2Y" as a location designator, "strip" it from the bar code, and record "SHPDCK" as the empty drums' location in a file. Reading this bar code also keys the PCS to expect additional empty drum bar codes ("S" data identifier followed by a container PIN). The empty drum PINs will be entered into this same PCS file.

Reading the termination bar code ("Y" data identifier with command "END&TRNSMT") will confirm termination of the shipping ID process. Again the data identifier is "stripped" from the bar code. This bar code keys the PCS to update its database and transmit the file with the location and empty drum PIN data to the DMS.

AT THIS POINT THE EMPTY DRUMS HAVE BEEN LOADED ONTO THE TRUCK AND ARE READY TO BE SHIPPED FROM WRAP. THE PCS/DMS WILL STATUS THE LOCATION AS THE "S&R DOCK".

Upon receiving the "In Transit" location in the DMS, the DMS will automatically send an "In Transit" message and the appropriate PINs to the PCS which will be updated to reflect the shipment of the waste. The PCS will log this information, noting that the appropriate drums have left the facility.

DATA MANAGEMENT: The empty drum location and PINs will be logged into a DMS table for shipping empty drums. The data will be entered into DMS fields for location CHAR(10) and PINs CHAR(14).

The S&R operator will update the waste container table with the S&R dock location information (verify drums are loaded onto the truck and the manifest data is correct). The location data currently in this table will be transferred to a relocation history table as new locations are identified. The date and time the relocation occurred will also be recorded. The data currently in the waste container table will be transferred to the relocation history table as the new location is identified. The relocation history table will be updated with the drum PINs, locations, dates, and times as the waste is processed through the facility.

When the drum transport vehicle leaves the shipping dock, the S&R operator will update the DMS database to note that

the waste is "In Transit". Upon receiving the "In Transit" location in the DMS, the DMS will automatically send an "In Transit" message and the appropriate PINs to the PCS which will be updated to reflect the shipment of the waste.

The drum records will be uploaded to SWITS and "locked" to prevent modification in the WRAP DMS. Some of the DMS data generated will be archived only in WRAP 1. Other data (duplicated in SWITS) may be maintained for a period of time in WRAP for review purposes only! No modification of certification data will be allowed as the official records now belong to SWITS.

SPEC REFERENCES: 13462-Table 15.10

3.15.3 Certified & Accepted TRU SWBs

3.15.3.1 TRU SWB Receipt & Storage at WRAP

TRU SWBs that have been through the WRAP 1 NDE/NDA function will be shipped to the W112 Project (interim storage). The SWBs will receive a head-gas analysis in this facility and will remain in interim storage until such time as the waste package certification documentation has been accepted by the WIPP facility. Once the WIPP facility accepts the waste for shipment, the SWBs will be scheduled for delivery to the WRAP facility for shipment in TRUPACT II containers. Trucks or vans deliver boxed waste to the waste S&R dock in WRAP Module 1.

PCS ACTIVITIES: There are no PCS/DMS interfaces at this point. All activities are associated with the waste processing schedule which is developed and maintained by WRAP on the FMS.

DATA MANAGEMENT: Supervisor updates the facility schedule.

SPEC REFERENCES: 13462-Table 15.7 and 15.8

See paragraphs 3.1.2.1 and 3.1.2.2 for the activities associated with receiving TRU SWBs into WRAP 1 and placing them into storage.

3.15.3.2 TRU SWB Assembly into TRUPACT Payloads

The scheduling function within WRAP 1 will use a TRUPACT Payload Selection software program to select the proper SWBs to be packaged together in the TRUPACT II containers. This software will designate which SWBs will be packaged together, which SWB will be placed on the bottom of the assembly, and what the tare weight limitations of the TRUPACT II container used to ship the waste payload will be. This payload selection software will be run prior to scheduling the SWBs to be returned to the WRAP 1 facility. The results of the analysis will be available to the S&R operators for input into the DMS prior

to returning the SWBs to WRAP 1 for shipment to WIPP. This SWB assembly data will be used to generate an SWB Shipment Pick List.

It is anticipated that an entire TRUPACT tractor/trailer assembly (three TRUPACT containers in all) will be loaded with either drums or SWBs to minimize the different rigging operations at both Hanford and the WIPP site.

PCS ACTIVITIES: There are no PCS/DMS interfaces at this point in the boxed waste process. An SWB listing developed by WRAP 1 Operations and downloaded to the DMS will be used to key the operators performing the TRUPACT II payload assembly.

The S&R operators will review the SWB Shipping Pick List on the DMS terminal in the S&R Office. The operators will retrieve the SWBs in the order designated. The bottom SWB for the first TRUPACT will be retrieved first. The SWB fork lift operator will transfer the first SWB from the SWB storage area to the SWB payload assembly area underneath the TRUPACT bridge crane.

The operator will scan a bar code (using bar code reader 12-NE-101) to fix the bar code position as the TRUPACT loading bay and key the PCS to expect PIN bar codes to follow. The operator will then scan the bar coded PIN for the SWB transferred to the TRUPACT Bay Area. The second SWB to be placed into the TRUPACT II container will be retrieved from storage and placed on top of the first. Its bar coded PIN will also be read. Upon scanning the second SWB bar code, the operator will scan a termination bar code to note that he has completed his scanning operation. When the termination bar code is scanned to note that the scanning function is complete, the PCS will transmit the SWB PINs and the SWB TRUPACT Bay location to the PCS and DMS.

PCS ACTIVITIES: A bar code ("2Y" data identifier with location "TRUBAY") is read to fix the bar code reader location. The PCS will recognize the "2Y" as a location designator, "strip" it from the bar code, and record "TRUBAY" as the SWB location in a PCS file. Reading this bar code also keys the PCS to expect additional SWB bar codes ("S" data identifier followed by a container PIN). The SWB PINs will be entered into the PCS file.

Reading the termination bar code ("Y" data identifier with command "END&TRNSMT") will confirm termination of the shipping ID process. The data identifier is "stripped" from the bar code. This bar code keys the PCS to transmit the location and SWB PIN data acquired to the appropriate PCS and DMS files.

DATA MANAGEMENT: The box location and PINs will be logged into the appropriate DMS table. Note: this table may be a table that will "hold" the shipping data until the data is validated and the shipment occurs. Location fields CHAR(10) and PIN data CHAR(14) will be completed. The date and time the relocation occurred will also be recorded. The data

currently in the waste container table will be transferred to the relocation history table as the new location is identified. The relocation history table will be updated with the drum PINs, locations, dates, and times as the waste is processed through the facility.

3.15.3.3 TRUPACT SWB Payload Shipment

Once the SWBs are located in the TRUPACT Bay Area; and appropriate ratchet rigging installed to connect the two SWBs into a single package for rigging, the TRUPACT II assembly operators will use the TRUPACT II bridge crane, Automatic Center of Gravity Lift Fixture (ACGLF), and SWB lift fixture to rig the SWBs from the staging area into a TRUPACT II container. Once the payload has been rigged into a TRUPACT II container, the TRUPACT II assembly operators will use the Shipping & Receiving Office DMS terminal (101-TE-12-108) to enter the shipping data required to support shipment of the SWBs. This manifest data includes such things as the shipment #, shipping date, TRUPACT II serial number, etc.

This process will continue until all TRUPACT II containers have been loaded. The TRUPACT II assembly operators will use the bridge crane and associated equipment to install/test the TRUPACT II lids. The results of the TRUPACT II assembly/test inspections will be recorded on manual logs. Any incidents of contamination and associated cleanup actions will likewise be recorded on manual logs.

PCS ACTIVITIES: There are no PCS/DMS interfaces for these operations. The WRAP 1 operators will enter the appropriate data directly into the DMS using the S&R DMS terminal.

AT THIS POINT THE WASTE HAS BEEN LOADED ONTO THE TRUPACT TRACTOR/TRAILER AND IS READY TO BE SHIPPED FROM WRAP. THE PCS/DMS WILL STATUS THE LOCATION AS THE "TRUBAY".

When the WRAP 1 TRUPACT assembly operators are satisfied that all TRUPACT containers have been properly packaged and the appropriate data entered into the WRAP DMS, the TRUPACT shipment will be released for transport. The DMS system (possibly via a table) will be updated to note that the waste containers location is "In Transit" to WIPP. Upon receiving the "In Transit" location in the DMS, the DMS will automatically send an "In Transit" message and the appropriate PINs to the PCS which will be updated to reflect the shipment of the waste. The DMS data will be verified to be correct. The DMS fissile material inventory tables will be updated as required to reflect the change in the facility fissile material inventory, and the appropriate DMS data will be uploaded to the SWITS and will not be available for modification by WRAP 1 personnel.

PCS ACTIVITIES: Once the TRUPACT tractor/trailer vehicle leaves the dock, the DMS will send the SWB PINs and an "In Transit" message to the PCS noting that the waste is in transit. The PCS

will log this information, noting that the appropriate SWBs have left the facility (i.e. remove the appropriate PINs from the PCS memory stack).

DATA MANAGEMENT: When the TRUPACT tractor/trailer vehicle leaves the shipping dock, the S&R operator will update the DMS database to note that the waste is "In Transit". The date and time the relocation occurred will also be recorded. The data currently in the waste container table will be transferred to the relocation history table as the new location is identified.

Upon receiving the "In Transit" location in the DMS, the DMS will automatically send an "In Transit" message and the appropriate PINs to the PCS which will be updated to reflect the shipment of the waste.

The applicable SWB data will be uploaded to SWITS and "locked" to prevent modification in the WRAP DMS. Some of the DMS data generated will be archived only in WRAP. Other data (duplicated in SWITS) may be maintained for a period of time in WRAP for review purposes only! No modification of certification data will be allowed as the official records now belong to SWITS.

When the operator uploads the data to SWITS, the operator will request the DMS system to subtract the fissile material inventory of the shipped SWBs from the fissile material inventory of all waste currently in WRAP.

SPEC REFERENCES: 13462 - Table 15.7

3.15.4 Certified & Accepted TRU Drums

3.15.4.1 Certified TRU Drum Receipt at WRAP

Pallets with repackaged TRU waste drums are sent to the W112 Storage Facility where they receive a head-gas analysis. While in the W112 Storage Facility, the TRU drums will be sorted using the TRUPACT Payload Assembly Software. This software will identify drums which may be shipped together in a single TRUPACT II container. The software will also designate the location in the TRUPACT II payload for each of the drums. Once this data is obtained, it will be transmitted to WIPP along with the drum certification data. The drums will remain in W112 interim storage until such time as the waste package certification documentation has been accepted by the WIPP facility. Once the WIPP facility accepts the waste for shipment, the drums will be assembled into pallets of four (based upon the designated position in the TRUPACT II payload) and will be scheduled for delivery to the WRAP facility. Trucks or vans deliver TRU drums to the waste S&R dock in WRAP Module 1.

The TRU drums are received as noted in section 3.1.1.1. Drums of certified TRU waste awaiting assembly into TRUPACT II payloads will be stored in the WRAP 1 AS/RS as noted in paragraph 3.1.1.2.

PCS ACTIVITIES: There are no PCS/DMS interfaces at this point. All activities are associated with the waste processing schedule which is developed and maintained by WRAP.

DATA MANAGEMENT: Supervisor updates the facility schedule.

SPEC REFERENCES: 13462-Table 15.4 & 15.7

A TRUPACT Assembly List will be developed on the WRAP 1 scheduling system based on the drums that have been accepted by WIPP. Once the TRUPACT Assembly List is completed and approved, it will be transmitted to the DMS. Once drums are accepted into the WRAP 1 facility (DMS and PCS list Receiving Dock as location) the S&R operator will verify that the accepted drums are listed on the TRUPACT Assembly List.

As the S&R Operator verifies the drums are on the TRUPACT Assembly List, the drum PINs and associated TRUPACT Assembly List data will be transmitted to a PCS TRUPACT Assembly Pick List (to be used to pick pallets of drums from the AS/RS) in the same order that they are listed on the DMS pick list.

Note: The TRUPACT Assembly Pick List will be made up in a mandatory sequence. The S&R operator will verify that all drums slated for shipment in a single TRUPACT are received. Drums must be retrieved from the AS/RS in the sequence specified on the TRUPACT Assembly Pick List to assure proper assembly of the TRUPACT II payload.

PCS ACTIVITIES: The PCS shall receive the following data from the DMS as drums are verified to be received in the WRAP facility:
Drum PIN, CHAR(14)

This data will be added to any existing items on the PCS TRUPACT Assembly Pick List on a first-in/first-out basis. All PCS pick lists will be modified in this manner. The PCS shall provide the capability to delete entries from the pick lists.

DATA MANAGEMENT: As waste drums are transferred from the DMS TRUPACT Assembly List to the PCS TRUPACT Assembly Pick List, they shall be deleted from the DMS listing. Waste drums will only be allowed to be transferred between these lists in the order specified on the DMS listing.

3.15.4.2 Certified TRU Drum Retrieval from AS/RS

The TRUPACT II Assembly Pick List will be updated as Certified TRU waste drums are received back from the W112 facility. This pick list will list the drums in the order they are to be retrieved for TRUPACT II package assembly. Once the TRUPACT II assembly operators determine that they are ready to commence assembly of a TRUPACT II payload, the operators will notify the fork lift operator to retrieve a pallet of TRU drums for assembly into a TRUPACT payload.

The WRAP 1 forklift operator will note that the AS/RS transfer car is available (empty) and the AS/RS is available (ASRSRDY) as noted on the local display. The fork lift operator will also verify that the TRUPACT staging pallet stand (immediately adjacent to the discharge conveyor 101-CV-05-102) is also available for receipt of a pallet.

The fork lift operator will read a "TRU to TRUPACT" bar code (RTV DRMTC3) using bar code reader 12-NE-101. This command requests the next pallet of drums on the TRUPACT Assembly Pick List to be retrieved. This request is communicated from the PCS to the AS/RS along with the next four drum PINs as listed on the applicable TRUPACT Assembly Pick List.

The AS/RS retrieves the pallet containing the drums requested. The pallet is moved to the AS/RS transfer car and the drums logged out of the AS/RS. The AS/RS shall inform the PCS (DRUM RTVTC) that the drums have been successfully retrieved from the AS/RS. The AS/RS will display a "TRU to TRUPACT" message on the local AS/RS visual display. The PCS and DMS will update the retrieved drum location data.

If the AS/RS can not locate the drums identified it shall display a "Cannot Find Pallet/Unable to Retrieve" message (SYSERR) on the visual display the PCS will receive a signal noting the lack of task completion.

PCS ACTIVITIES: The applicable TRUPACT Assembly Pick List will be updated (PINs deleted) as drums are retrieved from the AS/RS and the AS/RS communicates this information to the PCS (DRM RTVTC). It is this updated listing (next set of drum PINs) that the PCS will transmit to the AS/RS when the "TRU to TRUPACT" bar codes are received from the bar code reader 12-NE-101. The TRUPACT Assembly Pick List data will include the PIN CHAR(14).

The AS/RS will log the drums out of the AS/RS and send a message to the PCS (DRM RTVTC) when the drums are successfully retrieved.

Upon receipt of the "Drum Successfully Retrieved" (DRM RTVTC) message, the PCS shall transmit both "TRU Pallet Stand" as the location (TPSTND), and the drum PINs to the DMS.

DATA MANAGEMENT: The DMS will log the "TPSTND" as the location in the location CHAR(10) field of the waste container table for each drum PIN CHAR(14) received from the PCS. The date and time the relocation occurred will also be recorded. The data currently in the waste container table will be transferred to the relocation history table as the new location is identified. The relocation history table will be updated with the drum PINs, locations, dates, and times as the waste is processed through the facility.

SPEC REFERENCES: 13462-Table 15.1, 15.5 AND 15.6

Once the pallet of TRU drums has been retrieved to the AS/RS transfer car, the fork lift operator will pick up the pallet of drums and transport it to the TRUPACT staging pallet stand immediately adjacent to the discharge conveyor.

PCS ACTIVITIES: There are no PCS interfaces at this time as the transfer of the TRU drums from the transfer car to the TRUPACT pallet stand is strictly a manual operation.

DATA MANAGEMENT: The drum location "TPSTND" has been logged as the TRU drum location and does not require updating at this time.

3.15.4.3 TRU Drum Assembly into TRUPACT Payloads

The TRUPACT operators will read a TRUPACT assembly bar code using reader 12-NE-103. Reading this bar code sets the location as "101-CV-05-104" (TRUPACT Accumulation Conveyor) and will key the PCS to expect additional drum PIN numbers to be transmitted during the payload assembly process. As the TRU drums are removed from the pallet located on the TRU staging pallet stand, the drum PIN numbers will be read using reader 12-NE-103. The initial location bar code and all drums bar codes scanned will be maintained in a file in the PCS. Upon scanning the final drum bar code, the operator will scan a termination bar code to note that he has completed his scanning operation. When the termination bar code is scanned, the PCS will transmit all drum PINs and the TRUPACT Accumulation Conveyor location to the DMS.

The drums will be placed onto the pallet stretch wrapper using jib crane 101-CR-05-102B. Operators will be capable of reviewing the TRUPACT II payload assembly sequence/requirements via terminal 101-TE-12-124. If the TRUPACT assembly process is interrupted to perform other functions in the area of the discharge conveyor, a termination bar code shall be read to indicate that the TRUPACT II assembly operation has been terminated for the time being and only those bar codes read will be transmitted to the DMS.

As the TRUPACT II payload is assembled, the operators will install the required slip sheets, reinforcing plates, guide tubes, and stretch wrapping. Once the entire 14-drum payload is assembled, the TRUPACT assembly operators will inspect the assembly to verify it is properly assembled and all required data has been entered into the PCS/DMS. Once the verification occurs, a final

"TRUPACT Assembly Complete" bar code will be read using bar code reader 12-NE-103. Reading of this final bar code will generate a pop-up message which will be displayed at DMS terminal 101-TE-12-124. The TRUPACT assembly operators will acknowledge the message and input any additional shipping data that is available. Once this function is complete the payload will be transported from the stretch wrap unit to the accumulation conveyor.

PCS ACTIVITIES: A bar code ("2Y" data identifier with location "ACCVYR") is read to fix the bar code reader location. The PCS will recognize the "2Y" as a location designator, "strip" it from the bar code, and record "ACCVYR" as the drum location in a file. Reading this bar code also keys the PCS to expect additional drum bar codes ("S" data identifier followed by a container PIN). The drum PINs will be entered into this same PCS file.

Reading the termination bar code ("Y" data identifier with command "END&TRNSMT") will confirm termination of the TRUPACT assembly process. Again the data identifier is "stripped" from the bar code. This bar code terminates the process currently underway and allows other processes to be initiated with bar code reader 12-NE-103. The PCS will log the new location for the drums and transmit the location and PINs to the DMS.

DATA MANAGEMENT: The DMS will log "ACCVYR" as the location in the DMS location CHAR(10) field of the waste container table for each drum PIN, CHAR(14) read as the drums are moved from the TRU staging pallet stand to the stretch wrap unit. The date and time the relocation occurred will also be recorded. The data currently in the waste container table will be transferred to the relocation history table as the new location is identified. The relocation history table will be updated with the drum PINs, locations, dates, and times as the waste is processed through the facility.

Operators will acknowledge the "TRUPACT Assembly Complete" message at terminal 101-TE-12-124 and enter any additional shipping data into the DMS.

SPEC REFERENCES: 13462-Table 15.1 and 15.7

3.15.4.4 TRUPACT Drum Payload Shipment

Once the payloads are accessed to the end of the accumulation conveyor, they will be rigged into a TRUPACT II container using the TRUPACT bridge crane and the AGLF. The TRUPACT II assembly operators will use the Shipping & Receiving Office DMS terminal (101-TE-12-108) to enter the shipping data required to support shipment of the TRU drum payloads. This manifest data

includes such things as the shipment #, shipping date, TRUPACT II serial number, etc.

As TRUPACT payloads are removed from the accumulation conveyor, the PCS shall index the remaining payloads towards the TRUPACT loading bay. As the payloads are indexed, the PCS shall send a message to the DMS noting the drums that were at the end of the accumulation conveyor have been relocated to the TRUPACT loading bay.

PCS ACTIVITIES: The PCS shall transmit the location CHAR(10) and the PINs CHAR(14) of the drums that are loaded into the TRUPACT containers to the DMS.

DATA MANAGEMENT: The drum location and PINs will be logged into the appropriate DMS table. Note: this table may be a table that will "hold" the shipping data until the data is validated and the shipment occurs. Location fields CHAR(10) and PIN data CHAR(14) will be completed. The date and time the relocation occurred will also be recorded. The data currently in the waste container table will be transferred to the relocation history table as the new location is identified. The relocation history table will be updated with the drum PINs, locations, dates, and times as the waste is processed through the facility.

This process will continue until all TRUPACT II containers have been loaded. The TRUPACT II assembly operators will use the bridge crane and associated equipment to install/test the TRUPACT II lids. The results of the TRUPACT II assembly/test inspections will be recorded on manual logs. Any incidents of contamination and associated cleanup actions will likewise be recorded on manual logs.

AT THIS POINT THE WASTE HAS BEEN LOADED ONTO THE TRUPACT TRACTOR/TRAILER AND IS READY TO BE SHIPPED FROM WRAP. THE PCS/DMS WILL STATUS THE LOCATION AS THE "TRUBAY".

When the WRAP 1 TRUPACT assembly operators are satisfied that all TRUPACT containers have been properly packaged and the appropriate data entered into the WRAP DMS, the TRUPACT shipment will be released for transport. The DMS system (possibly via a table) will be updated to note that the waste containers location is "In Transit" to WIPP. The PCS will also be updated to reflect the shipped status of the waste containers. The DMS data will be verified to be correct. The DMS fissile material inventory tables will be updated as required to reflect the change in the facility fissile material inventory, and the appropriate DMS data will be uploaded to the SWITS and will not be available for modification by WRAP 1 personnel.

PCS ACTIVITIES: Once the TRUPACT tractor/trailer vehicle leaves the dock, the DMS will send the drum PINs and an "In Transit" message to the PCS noting that the waste is in transit. The PCS will log this information, noting that the appropriate SWBs

have left the facility (i.e. remove the appropriate PINs from the PCS memory stack).

DATA MANAGEMENT: When the TRUPACT tractor/trailer vehicle leaves the shipping dock, the S&R operator will update the DMS database to note that the waste is "In Transit". The data will be entered into DMS fields for location CHAR(10) and PINs CHAR(14). The date and time the relocation occurred will also be recorded. The data currently in the waste container table will be transferred to the relocation history table as the new location is identified. The relocation history table will be updated with the drum PINs, locations, dates, and times as the waste is processed through the facility.

Upon receiving the "In Transit" location in the DMS, the DMS will automatically send an "In Transit" message and the appropriate PINs to the PCS which will be updated to reflect the shipment of the waste.

When the operator uploads the data to SWITS, the operator will request the DMS system to subtract the fissile material inventory of the shipped drums from the fissile material inventory of all waste currently in WRAP.

Some of the DMS data generated will be archived only in WRAP. Other data (duplicated in SWITS) may be maintained for a period of time in WRAP for review purposes only! No modification of certification data will be allowed as the official records now belong to SWITS.

3.16 OPERATE HVAC

The HVAC system will be controlled by local loop controllers supplied with the HVAC equipment. The local controllers will be connected to an HVAC network controller via digital link. The network controller communicates the status of the facility HVAC equipment to the WRAP 1 Plant Control System. Graphic displays mimicking the HVAC system will be available in the Central Control Room for operator monitoring and for remote manual override control. The Control Room operator will have the capability to start and stop the HVAC system and to change setpoints. Alarms and out-of-tolerance conditions will be annunciated in the Control Room. All data recorded such as alarms, trending data, etc is internal to the PCS, therefore, there will be no PCS/DMS interface.

3.17 FACILITY MONITORING

The facility monitoring function of the WRAP 1 PCS shall be used to monitor the facility subsystems. The subsystems will provide data to the PCS to allow facility operations personnel in the Control Room to adequately monitor the

facility utility operations. Alarm recording functions will also be supported by this interface. The subsystems are described below.

- 1) The Fire Detection System will be a stand alone system. Alarms and indications will be routed to the Plant Control System for monitoring by the Control Room operator. The fire control panel will be located in the main lobby. The fire alarm system will be tied into Hanford Fire Department via a Radio Fire Alarm Repeater box.
- 2) The Electrical system will not be under Plant Control System control. Power loss alarms and/or indications will be routed to the Plant Control System.
- 3) Air Systems will be operated locally through hard wired control panels. Alarms and indications will be routed to the Plant Control System for monitoring by the Control Room operator.
- 4) The Stack Effluent Monitoring System will provide data to the PCS to accommodate supervisory functions and alarm tracking.
- 5) The Health Physics system consists of area radiation and air sample monitors. These HP monitors detect and measure for area radiation and airborne radioactive contamination. The monitors provide an analog measure of concentrations as well as alarm contacts when preset limits are detected. The PCS will monitor outputs from the HP instrumentation and display concentration measurements and alarms on CRT displays in the control room. The stack sampling system shall be monitored and annunciated in the same manner.

All monitoring and recording of data will be between the utility subsystems and the PCS. No DMS/PCS interfaces will exist for this data.

4.0 DMS/NDE INTERFACE DEFINITION

4.1 OPERATE DRUM NDE

TBD

4.2 OPERATE BOX NDE

TBD

5.0 DMS/NDA INTERFACE DEFINITION

5.1 OPERATE DRUM PAN

TBD

5.2 OPERATE DRUM GEA

TBD

5.3 CHARACTERIZE AND CERTIFY DRUMS

TBD

6.0 DMS/BWAS INTERFACE DEFINITION

6.1 OPERATE BOXED WASTE ASSAY SYSTEM

TBD

7.0 PCS/NDE INTERFACE DEFINITION

7.1 OPERATE DRUM NDE

TBD

7.2 OPERATE BOX NDE

TBD

8.0 PCS/NDA INTERFACE DEFINITION

8.1 OPERATE DRUM PAN

TBD

8.2 OPERATE DRUM GEA

TBD

8.3 CHARACTERIZE AND CERTIFY DRUMS

TBD

9.0 PCS/BOX NDA INTERFACE DEFINITION

9.1 OPERATE BOXED WASTE ASSAY SYSTEM

TBD

10.0 REFERENCES

1. WHC-SD-W026-TI-008, Rev. 0, WRAP Module 1 - Data Identification Document, B. A. Mayancsik, April 1994.
2. WHC-CM-6-1, Standard Engineering Practices.
3. WHC-SD-W026-FDC-001, Rev. 2, Functional Design Criteria (FDC) for the Waste Receiving And Processing (WRAP) Facility Module 1, B. A. Mayancsik, April 1993.
4. WHC-SD-W026-SD-001, Rev. 0, Waste Receiving and Processing Module 1 Operating Plan, B. A. Mayancsik, May 20, 1994.
5. WHC-SD-W026-SDRD-001, Rev. 3, WRAP 1 Supplemental Design Requirements Document, J. R. Weidert, October 13, 1993.
6. WRAP 1 Construction Specification 13462, Plant Management System Software, Rev. May 1994, Raytheon Engineers & Constructors
7. WHC-SD-W026-CSRS-001, REV 0, WRAP Module 1 Data Management System Software Requirements Specification, E. C. Brann II, August 1994

APPENDIX A

PCS BAR CODED COMMANDS AND LOCATION DESIGNATIONS

PCS BAR CODED COMMANDS

INITIAL DOCUMENT PARAGRAPH	PCS/DMS LABEL	NOUN DESCRIPTION
3.1.1.1	END&TRNSMT	CURRENT BAR CODE ACTIVITY IS COMPLETED, TRANSMIT DATA TO DMS
3.1.1.1	CNCL PREV READ	CANCEL THE PREVIOUS BAR CODE READ
3.1.1.2	END	CURRENT BAR CODE ACTIVITY IS COMPLETED, NEXT ACTIVITY MAY COMMENCE
3.1.1.2	STR DRMPS	STORE THE DRUMS ON THE PALLET STAND INTO THE AS/RS UNIT
3.1.1.3	RTV DRMPS	RETRIEVE DRUM FROM AS/RS TO PALLET STAND
3.15.2.2	RTV DRMTC1	RETRIEVE DRUM FOR LLW STORAGE
3.15.2.2	STR DRMTC	STORE DRUMS FROM THE TRANSFER CAR LOCATION
3.15.2.2	RTV DRMTC	RETRIEVE DRUM TO TRANSFER CAR
3.15.2.2	RTV DRMTC2	RETRIEVE DRUM FOR TEMPORARY TRU STORAGE
3.15.2.3	DRM RTVTC	DRUMS SUCCESSFULLY RETRIEVED TO TRANSFER CAR; UPDATE LOCATION
3.15.4.2	RTV DRMTC3	RETRIEVE DRUM FOR TRUPACT ASSEMBLY

INTERFACE DOCUMENT LOCATION DESIGNATIONS FOR WRAP 1

INITIAL DOCUMENT PARAGRAPH	PCS/DMS LABEL	NOUN DESCRIPTION
3.1.1.1	RECDCK	WRAP 1 RECEIVING DOCK
3.1.1.2	SWBSTR	SWB STORAGE AREA ON SOUTH SIDE OF AS/RS SHIELD WALL
3.1.1.2	PSTND	AS/RS PALLET STAND
3.1.1.2	AS/RS	AS/RS LOCATION
3.1.1.4	INFDCVYR	S&R DRUM INFEEED CONVEYOR 101-CV-05-101A
3.1.3.2	EMPSTR	EMPTY DRUM STORAGE AREA ON SOUTH SIDE OF AS/RS SHIELD WALL
3.2.1.1	GEA-W	WESTERN GEA UNIT 104-ND-06-102B
3.2.1.1	NDE-W	WESTERN NDE UNIT 104-ND-06-104B
3.2.1.1	PAN-W	WESTERN PAN UNIT 104-ND-06-101B
3.2.1.1	NDE-E	EASTERN NDE UNIT 104-ND-06-104A
3.2.1.1	PAN-E	EASTERN PAN UNIT 104-ND-06-101A
3.2.1.1	GEA-E	EASTERN GEA UNIT 104-ND-06-102A
3.2.1.3	N/NCRSL	NDE/NDA CAROUSEL 104-CV-09-102
3.2.1.4	BDCVYR-A	BACKGROUND DRUM STORAGE CONVEYOR 104-CV-09-105A
3.2.1.4	BDCVYR-B	BACKGROUND DRUM STORAGE CONVEYOR 104-CV-09-105B
3.7.1	AIRCVR_A1	AIRLOCK CONVEYOR IN AIRLOCK (XFR TO PROCESS) CV-09-104A
3.7.1	AIRCVR_A2	AIRLOCK CONVEYOR IN NDE/NDA AREA (XFR TO PROCESS) CV-09-103A
3.7.1	AIRCVR_A3	AIRLOCK CONVEYOR IN PROCESS (XFR TO PROCESS) CV-09-201A
3.7.2	AIRCVR_B1	AIRLOCK CONVEYOR IN NDE/NDA AREA (XFR TO NDE/NDA) CV-09-103B
3.7.2	AIRCVR_B2	AIRLOCK CONVEYOR IN AIRLOCK (XFR TO NDE/NDA) CV-09-104B
3.7.2	AIRCVR_B3	AIRLOCK CONVEYOR IN PROCESS AREA (XFR TO NDE/NDA) CV-09-201B
3.7.3	RWM_CRSL	RWM CAROUSEL IN PROCESSING AREA 107-CV-09-202

INTERFACE DOCUMENT PARAGRAPH	PCS/DMS LABEL	NOUN DESCRIPTION
3.7.5	TRURWCMLT	TRU RWM COMPLIANT WASTE LOADOUT PORT/LIFT TABLE LT-09-201B
3.7.5	LLRWMENTRY	LLW RWM TRANSFER DRUM PORT/LIFT TABLE LT-09- 201F
3.7.5	LLRWMEXIT	LLW RWM TREATED WASTE LOADOUT PORT/LIFT TABLE LT-09-201D
3.7.5	TRURWENTRY	TRU RWM TRANSFER DRUM PORT/LIFT TABLE LT-09- 201C
3.7.5	LLRWMCMPLT	LLW RWM COMPLIANT WASTE LOADOUT PORT/LIFT TABLE LT-09-201E
3.7.5	TRURWEXIT	TRU RWM TREATED WASTE LOADOUT PORT/LIFT TABLE LT-09-201A
3.7.7	TRU-LDOUT2	TRU EXIT GLOVEBOX LOADOUT POSITION #2/LIFT TABLE LT-09-202E
3.7.7	TRU_ENTRY	TRU ENTRY GLOVEBOX PORT/LIFT TABLE LT-09-202B
3.7.7	TRU_COMPCT	TRU EMPTY DRUM COMPACTION LOADOUT PORT/LIFT TABLE LT-09-203C
3.7.7	LLW_EXIT	LLW EXIT GLOVEBOX LOADOUT POSITION/LIFT TABLE LT-09-202C
3.7.7	LLW_RWMPRT	LLW TRANSFER PORT/LIFT TABLE FOR RWM TRANSFER DRUMS LT-09-203A
3.7.7	LLW_ENTRY	LLW ENTRY GLOVEBOX PORT/LIFT TABLE LT-09-202A
3.7.7	TRU_LDOUT1	TRU EXIT GLOVEBOX LOADOUT POSITION #1/LIFT TABLE LT-09-202D
3.7.7	TRU_RWMPRT	TRU TRANSFER PORT/LIFT TABLE FOR RWM TRANSFER DRUMS LT-09-203B
3.7.9	STGCVR_85G	85-GALLON D&S DRUM STAGING CONVEYOR 107-CV-09- 203
3.7.9	STGCVR_55G	55-GALLON ONE TRIP DRUM STAGING CONVEYOR 107- CV-09-204
3.8.2.3	LLW_SORT	LLW SORTING GLOVEBOX
3.8.2.4	LLW_PP	EXTERIOR OF LLW SORTING GLOVEBOX AT PURGE PORT LOCATION
3.8.4.2	LLW_STORE2	LLW EXIT GLOVEBOX PUCK STORAGE LOCATION #2

INTERFACE DOCUMENT PARAGRAPH	PCS/DMS LABEL	NOUN DESCRIPTION
3.8.4.2	LLW_PUCK	LLW EXIT GLOVEBOX PUCK RECEIPT POSITION
3.8.4.2	LLW_STORE3	LLW EXIT GLOVEBOX PUCK STORAGE LOCATION #3
3.8.4.2	LLW_STORE1	LLW EXIT GLOVEBOX PUCK STORAGE LOCATION #1
3.9.2.1	LLRWMSAMPL	LLW RWM GLOVEBOX SAMPLE LOCATION
3.9.2.4	LLRWM_PP	LLW RWM GLOVEBOX PURGE PORT LOCATION
3.9.3.1	LLRWMTREAT	LLW RWM GLOVEBOX TREATMENT LOCATION
3.10.2.2	HOLD_POINT	GLOVEBOX AGV HOLD POINT LOCATION AT WEST END OF PROCESS GLOVEBOX LINES
3.10.3.2	TRU_SORT	TRU SORTING GLOVEBOX
3.10.3.4	TRU_PP	EXTERIOR OF TRU SORTING GLOVEBOX AT THE PURGE PORT LOCATION
3.11.2.1	TRURWSAMPL	TRU RWM GLOVEBOX SAMPLE LOCATION
3.11.2.4	TRURWM_PP	TRU RWM GLOVEBOX PURGE PORT LOCATION
3.11.3.1	TRURWTREAT	TRU RWM GLOVEBOX TREATMENT LOCATION
3.12.2	IN_TRANSIT	WASTE CONTAINERS ARE IN TRANSIT FROM WRAP
3.13	BOXNDE	BOX NDE UNIT IN THE NDE/NDA AREA
3.14	BOXNDA	BOX NDA UNIT IN THE NDE/NDA AREA
3.15.1.2	SHPDCK	WRAP 1 SHIPPING DOCK
3.15.2.1	DISHCVR	S&R DRUM DISCHARGE CONVEYOR 101-CV-05-102
3.15.2.2	XFRCAR	AS/RS TRANSFER CAR
3.15.2.5	SHIPEMPSTR	STORAGE AREA FOR EXCESS 85-GALLON DRUMS
3.15.3.2	TRUBAY	TRUPACT SHIPPING BAY LOCATION FOR SWB STAGING
3.15.4.2	TPSTAND	TRUPACT PAYLOAD STAGING PALLET STAND (IMMEDIATELY ADJACENT TO DISCHARGE CONVEYOR)
3.15.4.3	ACCVYR	TRUPACT PAYLOAD ACCUMULATION CONVEYOR 101-CV- 05-104

APPENDIX B
DMS/PCS MESSAGE SUMMARY

PMS MESSAGE FORMATS
PCS TO DMS TRANSMISSION

INTERFACE DOCUMENT STEP NUMBERS	MESSAGE TYPE	FIELD NAME	FIELD NAME	FIELD NAME	FIELD NAME	COMMENTS
		FIELD SIZE	FIELD SIZE	FIELD SIZE	FIELD SIZE	
3.1.1.1, 3.1.1.2, 3.1.1.3, 3.1.2.1, 3.1.2.2, 3.1.3.1, 3.1.3.2, 3.2.1.1, 3.2.1.3, 3.2.1.4, 3.2.1.5, 3.2.2.1, 3.2.2.2, 3.2.2.3, 3.7.1, 3.7.2, 3.7.3, 3.7.5, 3.7.7, 3.7.9, 3.8.2.3, 3.8.4.1, 3.8.4.2, 3.8.4.4, 3.9.3.1, 3.10.2.1, 3.10.2.2, 3.10.3.2, 3.10.3.3	WASTE CONTAINER LOCATION UPDATE	LOCATION		PIN		
		CHAR(10)		CHAR(14)		

PCS TO DMS TRANSMISSION

INTERFACE DOCUMENT STEP NUMBERS	MESSAGE TYPE	FIELD NAME	FIELD NAME	FIELD NAME	FIELD NAME	COMMENTS
		FIELD SIZE	FIELD SIZE	FIELD SIZE	FIELD SIZE	
3.10.4, 3.11.3.1, 3.14, 3.15.1.1, 3.15.1.2, 3.15.2.2, 3.15.2.3, 3.15.2.4, 3.15.2.5, 3.15.2.6, 3.15.3.2, 3.15.4.1, 3.15.4.2, 3.15.4.3, 3.15.4.4	WASTE CONTAINER LOCATION UPDATE	LOCATION		PIN		
		CHAR(10)		CHAR(14)		
3.1.1.4, 3.7.2, 3.8.4.2 3.13, 3.15.2.1	WASTE CONTAINER LOCATION UPDATE & WEIGHT DATA ACQUISITION	LOCATION		PIN	WEIGHT	
		CHAR(10)		CHAR(14)	NUMBER(10,2)	
3.3, 3.13	PROVIDE DMS NDE MENU	TERMINAL LOCATION				Use of the DMS icon on the PCS screen will provide a command to the DMS to display the menu
		TBD				

PCS TO DMS TRANSMISSION

INTERFACE DOCUMENT STEP NUMBERS	MESSAGE TYPE	FIELD NAME	FIELD NAME	FIELD NAME	FIELD NAME	COMMENTS
		FIELD SIZE	FIELD SIZE	FIELD SIZE	FIELD SIZE	
3.4, 3.5, 3.6, 3.7	PROVIDE DMS NDA MENU	TERMINAL LOCATION				Use of the DMS icon on the PCS screen will provide a command to the DMS to display the menu
		TBD				
3.8.1.2, 3.10.1.2	REQUEST INNER DRUM PIN	MESSAGE				Send drum PIN
		CHAR(15)				
3.8.1.2 3.10.1.2	CONTAMINAT'N STATUS (CST)	PIN	LOCATION	STATUS		Contamination status of the overpack drum is transmitted from the PCS to the DMS
		CHAR(14)	CHAR(10)			
3.8.2.3, 3.10.3.2	PACKET/RWM RELATIONSHIP (PRW)	PIN	LOCATION	PIN		This message establishes the relationship between a waste packet on the sorting table and the RWM Transfer drum
		CHAR(14)	CHAR(10)	CHAR(14)		
3.8.2.3, 3.10.3.2	PACKET/PARNT DRUM RELATIONSHIP (PPD)	PIN	LOCATION	PIN		This message establishes the relationship between a waste packet on the sorting table and the parent waste drum
		CHAR(14)	CHAR(10)	CHAR(14)		
3.8.2.4, 3.9.2.4, 3.9.3.1, 3.10.3.4, 3.11.2.4, 3.11.3.1	PURGE PORT LOCATION UPDATE (PP)	PIN	LOCATION			This message establishes the initial glovebox location of the purge port container
		CHAR(14)	CHAR(10)			
3.8.2.4, 3.9.2.4, 3.10.3.4, 3.11.2.4	SAMPLE/PARNT ITEM RELATIONSHIP (SPD)	PIN	LOCATION	PIN		This message establishes the relationship between a waste sample and the non-compliant item (either drum or non-compliant packet) that the sample was taken from
		CHAR(12)	CHAR(10)	CHAR(14)		

PCS TO DMS TRANSMISSION

INTERFACE DOCUMENT STEP NUMBERS	MESSAGE TYPE	FIELD NAME		FIELD NAME		FIELD NAME		COMMENTS
		FIELD SIZE	FIELD NAME	FIELD SIZE	FIELD NAME	FIELD SIZE	FIELD NAME	
3.8.2.4, 3.9.2.4, 3.10.3.4, 3.11.2.4	SAMPLE/PURGE PORT RELATIONSHIP (SPP)	PIN	LOCATION	PIN				This message establishes the relationship between a waste sample and the purge port container currently connected to the glovebox
		CHAR(12)	CHAR(10)	CHAR(14)				
3.8.2.4, 3.9.2.4, 3.10.3.4, 3.11.2.4	PURGE PORT/ TRANSFER PIG RELATIONSHIP (PPTP)	PIN	LOCATION	PIN				This message establishes the relationship between a purge port and the transfer pig that it is loaded into for transfer
		CHAR(14)	CHAR(10)	CHAR(14)				
3.8.4.3, 3.10.2.2	PUCK WEIGHT ADDITION (PWT)	PIN	LOCATION	WEIGHT				The puck weight transmitted to the DMS will be added to the cumulative wt of the overpack at the exit port
		CHAR(14)	CHAR(10)	NUMBER(10,2)				
3.8.4.3, 3.10.2.1	PUCK/ OVERPACK RELATIONSHIP (PUK)	PIN	LOCATION	PIN				This message establishes the relationship between a puck and a loadout overpack drum
		CHAR(14)	CHAR(10)	CHAR(14)				
3.9.2.1, 3.9.3.1, 3.11.2.1, 3.11.3.1	REMOVE ITEMS FROM TRANSFER STAND (REM)	PIN	LOCATION	PIN				This message removes a waste packet, parent bottle, treatment container, etc from an RWM Transfer drum
		CHAR(14)	CHAR(10)	CHAR(14)				
3.9.2.1, 3.11.2.1	ADD ITEMS TO THE TRANSFER STAND (ADD)	PIN	LOCATION	PIN				This message adds a waste packet, parent bottle, treatment container, etc from an RWM Transfer drum
		CHAR(14)	CHAR(10)	CHAR(14)				
3.9.2.2, 3.11.2.2	NON- COMPLIANT ITEM/ PACKET RELATIONSHIP (LIM)	PIN	LOCATION	PIN				This message associates the non-compliant items in the RWM glovebox with the packet that it was removed from
		CHAR(14)	CHAR(10)	CHAR(14)				

PCS TO DMS TRANSMISSION

INTERFACE DOCUMENT STEP NUMBERS	MESSAGE TYPE	FIELD NAME	FIELD NAME	FIELD NAME	FIELD NAME	COMMENTS
		FIELD SIZE	FIELD SIZE	FIELD SIZE	FIELD SIZE	
3.9.2.3, 3.11.2.3	AEROSOL CAN/ COLLECTION CNTNR RELATIONSHIP (ACC)	PIN	LOCATION	PIN		This message associates the aerosol collection container and the aerosol cans that have been vented into it
		CHAR(14)	CHAR(10)	CHAR(14)		
3.9.3.1, 3.11.3.1	NON- COMPLIANT ITEMS PRESENTED FOR TREATMENT (TRT)	PIN	LOCATION			This message notifies the DMS that treatment instructions for the PIN read will be displayed on the DMS terminal at the glovebox
		CHAR(14)	CHAR(10)			
3.9.3.1, 3.11.3.1	SAMPLES PRESENTED FOR TREATMENT (SIRT)	PIN	LOCATION	PIN		The sample PIN, location, and purge port PIN are transmitted to DMS to note treatment of samples and adjust purge port inventory of samples
		CHAR(12)	CHAR(10)	CHAR(14)		
3.9.3.1, 3.11.3.1	TREATMENT CONTAINER RELATIONSHIP (TC)	PIN	LOCATION	PIN		The treatment container PIN, location, and constituent container PINs are transmitted to DMS to note treatment multiple containers in one treatment container
		CHAR(14)	CHAR(10)	CHAR(14)		
3.9.3.1, 3.11.3.1	TREATED WASTE INVENTORY (TW)	PIN	LOCATION	PIN		The treated waste container PIN, location, and loadout drum PIN are transmitted to DMS to establish the relationship of treated waste to the loadout drum
		CHAR(14)	CHAR(10)	CHAR(14)		

INTERFACE DOCUMENT STEP NUMBERS	MESSAGE TYPE	FIELD NAME	FIELD NAME	FIELD NAME	FIELD NAME	COMMENTS
		FIELD SIZE	FIELD SIZE	FIELD SIZE	FIELD SIZE	
3.10.3.2	PAM DATA (PAM)	PU240 EQUIV	UNCERTAINTY			PAM assay results shall be transmitted to the DMS for association with the appropriate packet PIN.
		NUMBER(6,2)	NUMBER(6,2)			

**PMS MESSAGE FORMATS
DMS TO PCS TRANSMISSION**

INTERFACE DOCUMENT STEP NUMBERS	MESSAGE TYPE	FIELD NAME	FIELD NAME	FIELD NAME	FIELD NAME	COMMENTS
		FIELD SIZE	FIELD SIZE	FIELD SIZE	FIELD SIZE	
3.1.1.1, 3.1.2.1, 3.1.3.1, 3.8.1.2, 3.10.1.2, 3.12.1, 3.12.2, 3.15.1.2, 3.15.2.4, 3.15.2.6, 3.15.3.1, 3.15.3.3, 3.15.4.1, 3.15.4.4	WASTE CONTAINER LOCATION UPDATE	LOCATION		PIN		
		CHAR(10)		CHAR(14)		
3.1.1.1, 3.1.2.1, 3.10.1.1, 3.11.1.1, 3.11.3.1, 3.15.3.1, 3.15.4.1	FISSILE ALARM MESSAGE	LOCATION				
		CHAR(10)				
3.1.1.1	PROCESSING PICK LIST	PIN	PROCESS ROUTE	SAMPLE [(T) OR (F)]	COMPLIANT [(T) OR (F)]	Not required for SWBs since all SWBs follow the same route and are not opened in WRAP 1
		CHAR(14)	CHAR(2)	LOGIC (1)	LOGIC (1)	
3.1.1.3	PALLET STAND PRIORITY PICK LIST	PIN				This pick list will be used to retrieve pallets to the pallet stand on an ad hoc basis
		CHAR(14)				
3.15.2.2	TRANSFER CAR PRIORITY PICK LIST	PIN				
		CHAR(14)				

DMS TO PCS TRANSMISSION

INTERFACE DOCUMENT STEP NUMBERS	MESSAGE TYPE	FIELD NAME	FIELD NAME	FIELD NAME	FIELD NAME	COMMENTS
		FIELD SIZE	FIELD SIZE	FIELD SIZE	FIELD SIZE	
3.15.2.2	LLW SHIPPING PICK LIST	PIN				
		CHAR(14)				
3.15.2.2	TRU SHIPPING PICK LIST	PIN				
		CHAR(14)				
3.15.4.1	TRUPACT ASSEMBLY PICK LIST	PIN				PCS to maintain pick list in the same order as received from the DMS
		CHAR(14)				
3.14	BWAS ASSAY STARTED					Status signal transmitted from the BWAS to the DMS and on to the PCS.
		TBD				
3.14	ABORT BWAS ASSAY					Status signal transmitted from the BWAS to the DMS and on to the PCS.
		TBD				
3.14	BWAS ASSAY COMPLETE					Status signal transmitted from the BWAS to the DMS and on to the PCS.
		TBD				
3.8.4.3, 3.10.2.2	OVERPACK WEIGHT EXCEEDS LIMITS (PWA)	MESSAGE	LOCATION			Message to the PCS that the puck added to the overpack will cause a weight limit violation
		CHAR(30)	CHAR(10)			
3.8.4.3, 3.10.2.2	OVERPACK CUMULATIVE WEIGHT (OCW)	PIN	LOCATION	WEIGHT		After calculating the new cumulative weight, the DMS will transmit it back to the PCS
		CHAR(14)	CHAR(10)	NUMBER(10,2)		

Note: A number of the messages will be sent in groups and there is a need to identify the start and end of these messages as well as the number of messages included. Examples are receipt of waste containers, drums on the same pallet when put in the AS/RS, and pick lists. The method with which these messages will be grouped and tracked shall be part of the communication protocol provided by SII.

APPENDIX C

WRAP 1 BAR CODE DATA IDENTIFIER/QUALIFIER SUMMARY

BAR CODE DATA IDENTIFIERS AND DATA QUALIFIERS FOR WRAP 1

DATA NAME	DATA FORMAT	DATA IDENTIFIER	DATA QUALIFIER	DESCRIPTION/COMMENTS
Container Package ID - Purge-port Container	CHAR(14) 2336-YY-XXXXXX	1B	PP	The unique package identification number that is assigned to a purge port container.
Container Package ID - Transfer Pig	CHAR(14) 2336-YY-XXXXXX	1B	TP	The unique package identification number that is assigned to a transfer pig.
Container Package ID - Packet	CHAR(14) 2336-YY-XXXXXX	20T	none	The unique package identification number that is assigned to a waste packet.
Container Package ID - Sample Non-compliant Item	CHAR(14) 2336-YY-XXXXXX	21T	none	The unique package identification number that is assigned to a sample non-compliant item.
Container Package ID - Collection Container	CHAR(14) 2336-YY-XXXXXX	22T	none	The unique package identification number that is assigned to an aerosol can collection container.
Container Package ID - Treatment Container	CHAR(14) 2336-YY-XXXXXX	23T	none	The unique package identification number that is assigned to a treatment container.
Compacted Waste Puck ID	CHAR(6) PXXXXX	24T	none	The unique package identification number that is assigned to a compacted waste puck as an operations aid. The original puck PIN is retained as the identification for the drum.
Container Package ID - Drum or Box	CHAR(14) YYXXXXX (CIN) or 2336-YY-XXXXXX (PIN)	S	none	The unique package identification number that is assigned to the outer waste package. SWITS uses "S" data identifier for Container Package ID.

DATA NAME	DATA FORMAT	DATA IDENTIFIER	DATA QUALIFIER	DESCRIPTION/COMMENTS
DATA NAME	DATA FORMAT	DATA IDENTIFIER	DATA QUALIFIER	DESCRIPTION/COMMENTS
Sample ID	CHAR(12)	S	WP	The unique identification number that is assigned to a sample container/vial. The bar code label will also used by the analytical laboratory.
Command	CHAR(10) Examples: END END&TRNSMT	Y	none	Bar coded command to the PCS to perform a specific action such as send data to the DMS. May also be used to indicate the completion of a series of bar code inputs.
Location ID	CHAR(10) Example: SHPDCK	2Y	none	Location within WRAP 1 where a waste item or empty drum is stored or processed.

APPENDIX D
WRAP 1 PROCESS FLOW ROUTES

WHC-SD-W026-CSWD-001 REV 0