Radioactive Waste Guidance

Waste Container Log Sheet
Use With Single Waste Item Description (WID) Container
Instruction Rev. 3a
Date: 11/8/00

Scope:

A Waste Container Log Sheet is required when multiple discrete items (e.g. large individual waste objects, waste wrapped in plastic, waste contained in inner packaging such as plastic bags, etc.) are in a container and a single WID is being used. In order to use a single WID with multiple discrete items, an approved Waste Stream Profile Sheet (WSPS) has to be in place that describes how the waste will be characterized. When using a single WID per container a Container Packing List (CPL) is not required. Here is one example of where multiple WIDs were used in the past and they are now replaced with a single WID: a B-25 box is being loaded with waste having the same waste stream (i.e. same radionuclide distribution) and a consistent waste form (e.g. PPE from the same contaminated area) then the B-25 box can be modeled in MicroShield to obtain the Dose to Curie relationship for characterization purposes. The above characterization approach is described on a WSPS and approved. For this situation, based upon the requirements of the BJC Master Waste Profiles, a waste container log sheet is required.

A 'Waste Container Log Sheet' has been attached. The log sheet and instructions are also available electronically in Excel and Word format, respectively, at the following address:

Server: ***_nt_server_5*** (most likely designated as *Drive Q:*)
Folder: ***GI_GIE_CalcSpreadSheets***
File (log sheet): ***SingleWID_LogSheet_R#.xls***
File (instructions): ***SingleWID_Inst_R#.doc***

This log sheet contains the *minimum* information that is necessary to be captured. Additional information may be captured based upon your interface requirements with your generators.

This instruction also addresses the situation where a single WID is contained within the outer container and it is the only item in the container. For this instance, a Waste Container Log Sheet is not required because there is only one waste item. However, the instructions for completing the Single WID have been annotated to provide guidance on completion of the single WID for this packaging scheme.

Waste Container Log Sheet Instructions

Logsheet Column	*Logsheet Completion Instructions/Guidance*
Package Number	Assign and mark a unique number on each waste package placed in the container. The package number format is determined by the generator. Example formats can include something as easy as sequential numbering (e.g. 1, 2, 3, etc.); including the container CID# along with a sequential number (e.g. 9901234-01, 9901234-02, etc.); or some other format determined by the generating organization. Record this unique number in this block. This is necessary so that if waste items should ever have to be repackaged there is some form of identification unique to the package/item.
Date Placed In Container	Record the actual date that the waste package/item was placed in the container. If the item is not going to be placed in the container at the time of the radiation protection survey, this block should be left blank.
Generator Last Name or Badge Number	Record the generator's last name or badge number.
Waste Origin Building and Room Number	Record the building number followed by the room number or area designation to indicate the origin of the waste.
Waste Item Description	Two general waste categorizations exist: • Dry Active Waste (DAW) and • Surface Contaminated Objects (SCO). Identify the general waste categorization followed by a short description of the waste itself. Description should be sufficiently detailed such that a physical inspection of the waste contents can be easily matched with the provided description. Examples of waste materials that fall within the general waste categorizations: 1) **DAW Waste Forms:** Examples of this waste form type include; PPE, lab trash, low density and *incidental quantities* of other materials, etc. a) Incidental Quantities refers to the inclusion of minor waste forms incorporated into an individual DAW low density waste package composed primarily of materials fitting the low density waste form (e.g. PPE, wipes, typical laboratory trash, etc.) but are not packaged exclusively by themselves. The following incidental quantity examples are provided for point of reference purposes: i) Metal; bucket bails, snaps or zippers on PPE, small quantities of respirator cartridges, small pieces of sheet metal and/or duct work, etc. ii) Wood; limited number of scrap pieces of dimensional lumber, wedges, etc. iii) Concrete; concrete waste that would comprise a limited weight typical of the other DAW present in the waste container such as rubble, grout, chips, etc. iv) Glass/Plastic; limited number of glassware, beakers, pipettes, etc. v) Rubber; small hose sections, rubber patches, etc. 2) **SCO Waste Forms**: Examples of this waste form type include; metal objects, large wood objects, large pieces of concrete, etc. a) Applicable to waste items categorized as Department of Transportation (DOT) Surface Contaminated Objects (SCO) and not considered 'incidental' quantities.
Waste Weight (lbs) Estimated or Measured	Record the waste package weight. *NOTE*: Waste weights are measured if at all possible or in instances where actual weight measurements are impractical an estimate can be provided.

	Indicate whether the waste weight is an estimate or an actual measurement by circling the appropriate description (estimated or measured) at the top of the column. If some items are measured and others are estimated, indicate the weight determination by placing a note by the appropriate description and identifying the corresponding package weight using the same note (e.g. ① by 'measured' at top of column and ① placed by those package weights that were measured). 1) **DAW Waste Forms:** a) Because of the radionuclide distribution present in Bldg. 3019 an alternate Method 4 radionuclide activity quantification is used whereby the waste weight is used to determine a maximum hypothetical contaminated surface area for activity calculations. i) An empirical determination was made to correlate the weight of typical lab trash consisting of PPE, wipes, tyvex suits, etc. to a corresponding surface area. This determination was accomplished by loading a standard waste bag with typical lab trash and measuring the corresponding weight and surface area of this material. The results of this determination provided a potential contaminated surface area per pound of waste material. (1) Reference; PPE_CALC.SUF.xls, dated 8/18/98. Typical lab trash containing PPE; determination indicates 612 in^2/lb.
Estimated Waste Vol. (ft^3)	Record the estimated waste volume in units of cubic feet (ft^3).
Absorbent Added To Package (lbs)	If absorbent was added to any of the waste packages, indicate the amount of absorbent that was added to the corresponding waste package. Indicate in a footnote at the bottom of the log sheet the type of absorbent that was added. NOTE: The only absorbent that has been tested and authorized for use at ORNL is a product called Quick-Solid. This absorbent has had its absorption characteristics validated. If any other type of absorbent is being considered for use, contact LWS for assistance prior to use.
Maximum Contact Dose Rate (mrem/hr) (0°/180°)	For all waste items indicate the maximum contact dose rate on the waste item. 1) If the waste item does not have a measurable contact dose rate then record only the less than (<) dose rate (typically < 0.1 mrem/hr) in either the 0° or 180° blank on the form. 2) If the waste item has a measurable maximum contact dose rate (i.e. > 0.1 mrem/hr) then record both the 0°and 180° measurements to accommodate the Rad Characterization Plan Method 4 calculation.
DAW Waste Fixed/Probe (dpm/100 cm^2)	1) Measure frisker readings on the outside of the waste package. The maximum frisker reading, corrected to 100 cm2, (frisker probe area approximately 15 cm2 therefore multiply frisker reading times 6.7) will be recorded. This is a conservative approach based upon the following: a) It is only assumed that the immediate waste area influences the frisker reading when in actuality beta/gamma emissions from waste contained throughout the volume of the waste bag contribute to the frisker reading. b) The assumption is made that the entire waste volume's surface area is contaminated at the maximum frisker readings level. 2) If the waste package has a measurable dose rate (i.e. > 0.1 mr/hr) that results in the frisker exceeding its detection capabilities then the radionuclide content will be determined utilizing Method 4 (Standard Geometry).
SCO Items	The following section is ONLY applicable to Surface Contaminated Objects (SCO) as defined by Department of Transportation (DOT) regulations and associated regulatory guidance direction; NuReg-1608, *Categorizing and Transporting Low*

	Specific Activity Materials and Surface Contaminated Objects.
Contaminated Surface Area (ft^2) Inaccessible	If the waste item is SCO and has contaminated 'inaccessible' areas (i.e. can not be reached with one's hand), record the associated surface area. As with all cases of reporting surface areas relating to SCO, provide an estimate of the area. Precise measurements are not required, rough estimations are sufficient.
Radiological Contamination Surveys For Inaccessible Surfaces	If the waste item is SCO and has contaminated 'inaccessible' areas, the following general directions are provided: 1) Inaccessible areas; for items identified as having inaccessible areas per Department of Transportation (DOT). ***NOTE**: Report all contamination levels in units of dpm/100 cm2.* a) If the inaccessible area can be probed with a frisker to obtain the fixed contamination levels, measure/record the fixed contamination level for the associated waste item. b) If the inaccessible area can not be probed with a frisker to obtain the fixed contamination levels but a smear or swab can be obtained from the area then smear or swab as appropriate and measure/record the loose contamination level for the associated waste item. i) If loose contamination levels are determined in this manner: (1) Annotate the Waste Container Log Sheet to indicate that the inaccessible area was smeared/swabbed. Record the loose contamination levels in dpm/unit area. (2) Provide an estimate or correlation of the loose/fixed contamination ratio. This correlation should be annotated on the Waste Container Log Sheet. c) If the inaccessible area has been determined to be 'suspect' contaminated by radiation protection personnel performing radiological surveys then the minimum detectable activity for the instrument will be recorded for activity calculations. The entire inaccessible contaminated area will be assumed to be contaminated at the MDA activity level. d) If the inaccessible area can not be probed, has no measurable dose rate, and is not considered 'suspect' but is known to have contamination then radiation protection personnel can provide an estimated fixed beta/gamma contamination level for use in activity calculations based upon their professional judgement. NOTE: Waste items known to have **painted surfaces** for the purposes of fixing radioactive contamination are covered by this step in the instructions. i) If contamination levels are determined in this manner, the Waste Container Log Sheet will be annotated to indicate the fixed contamination levels were estimated based upon professional judgement. e) If the inaccessible area has a measurable dose rate (i.e. > 0.1 mr/hr) on the item then the radionuclide content will be determined utilizing a shielding calculational program such as MicroShield. i) If SCO waste item will be surveyed because it has a measurable dose rate, provide a rough sketch of the item indicating the general dimensions and a description of the

	orientation of the dose rate measurement in relationship to the object. (1) For MicroShield modeling purposes, provide a description of the material type and an estimate of its thickness through which the inaccessible area contamination dose passes prior to being detected by the dose rate instrument. NOTE: An additional worksheet has/will be distributed associated with sketching the SCO item and recording associated pertinent information.
Contaminated Surface Area (ft^2) Accessible	If the waste item is SCO and has contaminated 'accessible' areas, record the associated surface area. As with all cases of reporting surface areas relating to SCO, provide an estimate of the area. Precise measurements are not required, rough estimations are sufficient.
Only Applicable To Accessible Surfaces	If the waste item is SCO and has contaminated 'accessible' areas, the following additional information is required:
Beta/Gamma (dpm/100 cm^2) Loose	Record the smearable levels of beta/gamma loose contamination in units of dpm/100 cm^2.
Beta/Gamma (dpm/100 cm^2) Fixed	1) If the accessible area has measurable fixed contamination levels detected with a frisker probe, measure/record the maximum fixed contamination level for the associated waste item. a) In most instances the maximum detected fixed contamination level will used for conservative activity calculation purposes. Average fixed contamination levels may also be measured/recorded for purposes of providing a more realistic input activity for activity calculations. i) If the average fixed contamination level is reported for a particular waste item, the average level will be determined based upon the first hand knowledge and professional judgement of the radiation protection personnel performing the survey. ii) If average contamination levels are reported, the Waste Container Log Sheet will be annotated to indicate the average fixed contamination level. 2) If the accessible area has been determined to be 'suspect' contaminated by radiation protection personnel performing radiological surveys then the minimum detectable activity for the instrument will be used for activity calculations. The entire waste item available surface area will be assumed to be contaminated at the minimum detectable activity fixed contamination level. 3) If the accessible area has a measurable dose rate (i.e. > 0.1 mr/hr) that results in the frisker exceeding its detection capabilities then the radionuclide content will be determined utilizing a shielding calculational program such as MicroShield. a) If SCO waste item will be surveyed because it has a measurable dose rate, provide a rough sketch of the item indicating the general dimensions and a description of the orientation of the dose rate measurement in relationship to the object. i) For MicroShield modeling purposes, provide a description of the material type and an estimate of its thickness through which the inaccessible area contamination dose passes prior to being detected by the dose rate instrument. NOTE: An additional worksheet has/will be distributed associated with sketching the SCO item and

	recording associated pertinent information.
Alpha (dpm/100 cm^2) Loose	Record the smearable levels of alpha loose contamination in units of dpm/100 cm^2.
Alpha (dpm/100 cm^2) Fixed	Record the fixed levels of alpha fixed contamination in units of dpm/100 cm^2.
Summation: Number Packages Inside Container	Provide a count of the discrete packages in the waste container. The number of waste packages should be identified on the WID Waste Description Block, W29.
Totals: Waste Weight (lbs)	Sum the package estimated/measured weights of the individual waste packages placed in the container. This number may be used to provide the container gross weight,
Totals: Estimated Waste Vol. (ft^3)	Sum the package estimated waste volumes of the individual waste packages placed in the container. The estimated waste volume total should be compared to the container available waste volume. If the estimated waste volume significantly exceeds (e.g. greater than 25%) the container available volume then the associated individual waste package volumes should be adjusted accordingly.
Totals: Absorbent Added To Package (lbs)	Sum the package absorbent addition weights. This weight will be added to the 'Container Level Information; Absorbent Weight' and be recorded on the associated WID Attachment in the Absorbents Block A23.
Container Level Information	The following information is applicable to the entire waste container as it sits fully loaded and ready for 2109 form set submittal to LWS Waste Acceptance.
Burial (External) Vol (ft3)	Record the container burial volume that is stenciled on the outside of the container.
Gross Weight (lbs) Measured/ Estimated	Record the container gross weight. The gross weight includes both the container and waste weight. Circle either 'measured' or 'estimated' to indicate how the weight was determined. Gross weight can be arrived at by taking the summation of the individual package estimated/measured waste weights and adding the associated empty container weight that is stenciled on the outside of the container. Circle the appropriate 'measured' or 'estimated' dependent upon how the individual waste weights were determined.
Container PO Number	Record the Container PO Number that is stenciled on the outside of the container.
Absorbent Type	Record the Absorbent Type that was added to the bottom of the container prior to waste placement. This absorbent addition is accomplished prior to container issue to the generator. The absorbent type is indicated on a sticker attached to the outside of the container. If the sticker can not be located, please contact LWS for assistance.
Absorbent Weight (lbs)	Record the Absorbent Weight that was added to the bottom of the container prior to waste placement. This absorbent addition is accomplished prior to container issue to the generator. The absorbent weight is indicated on a sticker attached to the outside of the container. If the sticker can not be located, please contact LWS for assistance. The Container and Package absorbent totals will be added and recorded on the associated WID Attachment in the Absorbents Block A23.
Radiological Information	Record all container radiological information as established by existing protocol. NOTE: Supplemental guidance has/will be distributed associated with HP required data particular to various packaging schemes.

2109 Form Set Completion Instructions:

When utilizing the Single WID approach for waste containers with multiple discrete items and for Single WID containers with only one waste item the following guidance shall be adhered to:

CPL: None Required

WID Instructions: (WID specified information is applicable to the entire container as a whole. The Waste Container Log Sheet provides additional information regarding the waste for multiple discrete items contained within the Outer Container.):

Block	Description	Instructions Guidance Issues
WID		
W29	Waste Description	1) If a single WID with a Waste Container Log Sheet is being used in cases where multiple WIDs would have been used in the past; a) Provide a general description of the basic waste form and composition based upon a review of the Waste Item Description information recorded on the Waste Container Log Sheet. Be descriptive enough so that if a physical inspection were performed of the waste item, the description for the particular item could be readily attributed to that item. b) Indicate in the waste description the number of discrete waste packages in the container. This information is summarized on the Waste Container Log Sheet under the Package Number column. 2) If a single WID is being used because only a single waste item is in the container; a) Provide a general description of the waste as described in 1)a) above. b) Indicate in the waste description that there is only one waste item in the container.
I7 Att. A; A23	Absorbent Materials Absorbent (grams)	1) In all instances Block I7 will be checked 'Yes' due to the addition of absorbent by LWS prior to container issue. Only in rare instances will this not be the case due to legacy containers that may have been issued prior to the institution of the absorbent addition policy. 2) If a single WID with a Waste Container Log Sheet is being used in cases where multiple WIDs would have been used in the past; a) Record on Att. A, Block A23 the absorbent sum obtained from the Waste Container Log Sheet for the individual waste packages and the container level information. b) Annotate on the WID Block P9, Handling Instructions; "X grams of Y (*specific absorbent type)* absorbent added to container prior to waste placement." 3) If the waste is inside the container in a single waste package WITH or WITHOUT an internal liner or single packaging; a) Record on Att. A, Block A23 the total absorbent quantity added to the waste matrix itself plus the absorbent added to the waste container prior to waste placement. b) Annotate on the WID Block P9, Handling Instructions; "X grams of Y (*specific absorbent type)* absorbent added to container prior to waste placement."

I9	Est. Net. Vol.	1) For all single WID applications, record the Container Burial (External) Volume (ft3); a) If a single WID with a Waste Container Log Sheet is being used in cases where multiple WIDs would have been used in the past; the Container Burial (External) Volume is recorded in the Container Level Information Section. b) If the waste is inside the container in a single waste package the container burial volume is stenciled on the outside of the container.
I13	Est. Gross Wt.	1) If a single WID with a Waste Container Log Sheet is being used in cases where multiple WIDs would have been used in the past; a) Obtain and record the estimated gross weight from the applicable Waste Container Log Sheet, Container Level Information Section. 2) If the waste is inside the container in a single waste package WITH or WITHOUT an internal liner or single packaging; a) Measure the gross weight of the container by the use of a weight measuring device, b) Measure the waste weight by the use of a weight measuring device and add the container empty/tare weight to the waste weight to obtain the gross weight, or c) Estimate the gross weight based upon the associated process knowledge of the physical aspects of the waste form. NOTE: Both the container empty/tare weight and container maximum gross weight are unique to specific container fabricator. These weights are stenciled on the outside of the container by the box fabricator. NOTE: The recorded Est. Gross Weight shall not exceed the design waste weight capacity of the container. The design waste weight capacity of the container is the 'Maximum Gross Weight' minus the 'Tare Weight'. The last several procurements have required that the fabricator design a container with a payload capacity of 10,000 lbs.
I14	Inner Container Type	1) If a single WID with a Waste Container Log Sheet is being used in cases where multiple WIDs would have been used in the past; a) If all waste item packages are identical; then enter the specific package container designation. b) If waste item packages are not all identical; enter 'Multiple.' 2) If the waste is inside the container in a single waste package WITH an internal liner or single packaging (i.e. inside a container liner); enter the inner liner type designation. 3) If the waste is inside the container in a single waste package WITHOUT an internal liner or single packaging; enter "NA."
I15	Outer Container Type	1) If older container type typically fabricated prior to 2/1/99; a) Record generic container type code (e.g. BOXM96). Refer to GI/GIE Guidance distributed 3/8/99 subject, "Radwaste; Outer Container Type Code Guidance," which provides empty container weights based upon fabricator and generic burial volume usage of 96 ft^3.

		2) If newer container type fabricated after 2/1/99 and fabricator identified as CPC; a) Record specified container type code as identified in GI/GIE Guidance distributed 6/30/99 subject, "New ORNL B-25 Boxes; GES Update Needed." 3) If new container type fabricated after 2/1/99 and fabricator identified as CTI; a) Record specified container type code as identified in GI/GIE Guidance distributed 10/29/99 subject, "Vendor Change For ORNL Stores B-25 Boxes; GES CLUE Tables Update Needed."
I16	HP Tag No.	1) If a single WID with a Waste Container Log Sheet is being used in cases where multiple WIDs would have been used in the past; a) Obtain and record the radiological information from the applicable Waste Container Log Sheet, Container Level Information Section. 2) If the waste is inside the container in a single waste package WITH or WITHOUT an internal liner or single packaging; a) Record all container radiological information as established by existing protocol. NOTE: Supplemental guidance has/will be distributed associated with HP required data particular to various packaging schemes.