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ENVIROCARE OF UTAH, INC.
THE SAFE ALTERNATIVE

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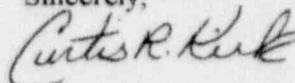
January 14, 1997
QA / 97-008

Mr. Harold Lefevre
United States Nuclear Regulatory Commission
To White Flint North
11545 Rockville Pike
Rockville, Md. 20852-2738

Mr. Lefevre,

Enclosed are the Envirocare of Utah, Inc. Standard Operating Procedures you requested, relating to your upcoming visit. Please note that there are two versions of several procedures, as we have recently made revisions to our Operating Procedures Manual. As a result, some of these revised procedures have been approved for use while many have not. At the time of your visit, all procedures applicable to the management of 11e.(2) waste that have been recently revised should be current in our Operating Procedures Manual. I apologize for the delay in your receiving this information, if you have any questions or other needs, please contact me at (801) 521-9619.

Sincerely,



Curtis R. Kirk
Assistant Quality Assurance Officer

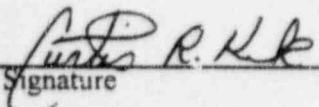
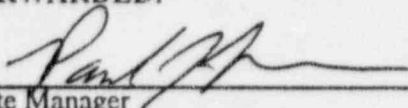
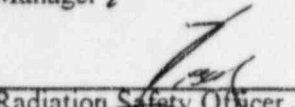


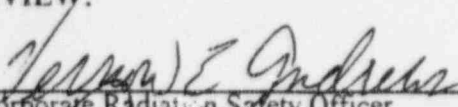
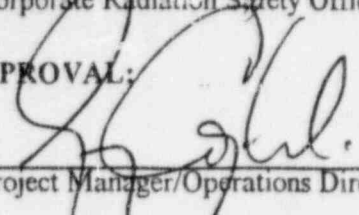
ENCLOSURES

BPW-1 Current copy dated 11/08/96
BPW-2 Revised copy dated 12/10/96- Not approved
BPW-2 Current copy dated 02/21/96
BPW-3 Current copy dated 11/08/96
BPW-4 Revised copy dated 12/10/96- Not approved
BPW-4 Current copy dated 05/09/94
BPW-5 Revised copy dated 12/10/96- Not approved
BPW-5 Current copy dated 05/09/94
BPW-6 Revised copy dated 12/10/96- Not approved
BPW-6 Current copy dated 05/09/94
EMP-10 Current copy dated 11/15/96

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BPW-1 11e.(2) PRE-SHIPMENT WASTE CHARACTERIZATION

MANUAL/PROCEDURE:	BPW-1 11e.(2) PRE-SHIPMENT WASTE CHARACTERIZATION	
REVISION NUMBER:	4	
AFFECTED PAGES:	Page: 1 THROUGH 165 ^{CK 12-4-96}	
PURPOSE:	Incorporate changes from CAP and annual review	
SUBMITTED BY:	Curtis Kirk	
Signature		Date 11/08/96
FORWARDED:		
Site Manager		Date 11/8/96
Site Radiation Safety Officer		Date 11-8-96
Quality Assurance Officer		Date 11/8/96
CONCURRENCE:		
Compliance Engineer	N/A 	Date 11/8/96
REVIEW:		
Corporate Radiation Safety Officer		Date 11/11/96
APPROVAL:		
Project Manager/Operations Director		Date 11/11/96

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ENVIROCARE OF UTAH, INC. OPERATING PROCEDURES MANUAL
BPW-1 11e.(2) PRE-SHIPMENT WASTE CHARACTERIZATION

A. PURPOSE:

This procedure is designed to characterize 11e.(2) wastes destined for disposal at the Envirocare South Clive Site to ensure that: the radioactive characteristics of the material are within license limits; the material is not a liquid waste and does not contain free liquids; the material is not a hazardous waste subject to RCRA regulations; and the waste material to be disposed is only 11e.(2) material.

B. REFERENCES OR AUTHORITY:

1. 11e.(2) Radioactive Material License SMC-1559, as amended
2. Application for 11e.(2) Radioactive Material License SMC-1559, as amended
3. Envirocare of Utah, Inc. Quality Assurance Manual, as revised
4. 40 CFR 261, as revised
5. Ground Water Quality Discharge Permit UGW450005, as amended

C. PRECAUTIONS AND LIMITATIONS:

1. Envirocare must obtain a certified description from the generator of each waste stream of 11e.(2) waste material to be managed at the Envirocare disposal facility prior to shipment.
2. Should a generator or waste owner send a shipment of waste to the Envirocare facility prior to receiving a Notice to Transport (EC-1800) from Envirocare, Envirocare must reject the shipment and provide notice of the rejection to the Nuclear Regulatory Commission (NRC).
3. Any waste which is determined to be a hazardous waste or to exceed the restrictions of Reference 1 shall not be disposed of in the 11e.(2) disposal cells. Such waste must be managed elsewhere in compliance with all other applicable regulations or returned to its place of origin.

D. GENERAL INSTRUCTIONS:

1. This procedure applies to all 11e.(2) waste destined for disposal at the Envirocare South Clive Disposal Facility.
2. Prior to shipment of 11e.(2) material, each generator or owner shall provide each of the following to Envirocare:
 - a. Certification that all waste material is 11e.(2) byproduct material (i.e., it originated from tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed for its source material only).

BPW-1 11e.(2) PRE-SHIPMENT WASTE CHARACTERIZATION

This certification is based upon the generator's or owner's documentation, or other court ordered documentation, of the source or origin of the waste.

- b. Certification that waste material does not contain any radioactive or hazardous wastes, other than that described above.
 - c. License number, licensee, type of license, and date of license under which the waste material was produced.
 - d. Total volume of byproduct material and the regulatory agency under which it was controlled.
3. Prior to shipment, Envirocare shall also obtain a statement of all radiological and non-radiological constituents in the waste, and the maximum and average concentrations of such constituents. This identification shall be documented by the following:
 - a. Form EC-0650: When completed, this form should include a determination by the generator that the characteristics of the material are within those limits outlined in Reference 1 and provide analytical results for radionuclides.
 - b. Form EC-0500: When completed, this form provides a physical description of the waste, including the constituents of the debris.
 - c. Form EC-3200: When completed, this form provides waste profiling of non-radiological constituents for 11e.(2) waste.
 - d. Certification by the generator or owner that the waste characterization was performed by pre-established methods that are either EPA approved, or methods standard in the industry and reasonably designed to identify the hazardous constituents contained in the waste. This certification shall be made by a responsible company authority.
4. Prior to shipment, an independent, third-party laboratory shall provide documentation that the generator's waste material is 11e.(2) byproduct material. Additionally, the third-party laboratory shall also document all nuclides present in the waste.
5. 11e.(2) RSR forms will be used for the documentation of each shipment. The RSR shall include certification that the shipment is 11e.(2) byproduct material, that it is the same type of material described by the generator in the generator's original certification, and that it does not contain other radiological or hazardous waste.

E. OPERATING INSTRUCTIONS:

ENVIROCARE OF UTAH, INC. OPERATING PROCEDURES MANUAL
BPW-1 11e.(2) PRE-SHIPMENT WASTE CHARACTERIZATION

1. Prior to shipment, a description of the material to be managed at the Envirocare facility must be obtained (EC-0500, EC-0650, and EC-3200).

2. Upon receipt and review of all pre-shipment certifications provided by the generator and the independent, laboratory, cognizant corporate authority shall evaluate the certification made by the owner or generator of the waste material. Envirocare shall then verify through independent means that the representations made of the waste are accurate by use of the following:

- a. EC-0025: This form documents the corporate evaluation of the generator's physical waste profile as determined on the form EC-0500.
- b. EC-0675: This form documents the corporate evaluation of the generator's radiological waste profile as determined on the form EC-0650.
- c. EC-0325: This form documents the corporate evaluation of the generator's chemical waste profile.

3. Once the waste certification of characterization and analysis have been determined to meet the requirements of Reference 1, Envirocare Business Development must provide the generator with a Notice of Transport (EC-1800) prior to shipment of the waste to the Envirocare South Clive Site.

4. If any significant differences are discovered between the generator's certification and Envirocare's independent verification, they shall be reconciled prior to waste acceptance. Significant differences include, but are not limited to:

- a. Origins of the material.
- b. Radiological composition.
- c. Hazardous constituents

F. QUALITY CONTROL:

1. QC Process Control: Envirocare must obtain, and maintain on permanent file, certification of all 11e.(2) material from the generator of each waste stream managed at the site disposal facility.
2. Sample Control: None.
3. Data Control: When completed, the following forms associated with pre-shipment waste characterization are retained in the operating record for a minimum of five years: EC-0650, EC-0500, and EC-0800. In addition to copies of the forms noted in F.3. above, the following forms associated with corporate review for acceptability of a generator's waste are retained in the corporate headquarter's files: EC-0025 and EC-0675.
4. Audit Requirements: None.

PROCEDURE: BPW-2 11e.(2) Incoming Waste Acceptance ControlREVISION NUMBER: 5

AFFECTED PAGES: _____

PURPOSE: Incorporate changes from the CAP and annual reviewSUBMITTED BY: CURTIS KIRK

Signature

Date

FORWARDED:

Site Manager

Date

Site Radiation Safety Officer

Date

Quality Assurance Officer

Date

CONCURRENCE:

Date

REVIEW:

Corporate Radiation Safety Officer

Date

APPROVAL:

Project Manager/Operations Director

Date

BPW-2 11e.(2) INCOMING WASTE ACCEPTANCE CONTROL

A. **PURPOSE:** This procedure is designed to provide a consistent method for acceptance control of 11e.(2) incoming-shipment wastes to ensure the waste shipment's condition and parameters comply with governmental regulations for acceptance of the waste.

B. **REFERENCES OR AUTHORITY:**

1. 11e.(2) Radioactive Material License SMC-1559, ~~dated 11/19/93~~, as amended;
2. Application for 11e.(2) Radioactive Material License SMC-1559, ~~dated 12/23/91~~, as amended;
3. Envirocare of Utah, Inc. Quality Assurance Manual, as revised;
4. 49 CFR 173.425, as revised;
5. 40 CFR 264, as revised;
6. 10 CFR 20.1902, as revised;
7. Ground Water Quality Discharge Permit No. UGW450005, ~~dated 9/10/93~~, as amended;
8. 10 CFR 20, Appendix F;
9. Waste Management Plan, ~~dated 9/10/93~~, as amended;
10. Envirocare of Utah, Inc. Operating Procedures Manual, as revised.

C. **PRECAUTIONS AND LIMITATIONS:**

1. Review the ~~generator's pre-shipment analysis and the manifest/shipping papers~~ Waste Profile Record, the Pre-Shipment Waste Profile Evaluation, and the Radioactive Waste Shipment and Disposal Record (RSR) for potential health and safety hazards ~~prior to~~ inspection and sampling activities.
2. Where off-site analysis is required, the samples must be sent to the laboratory within five working days of the shipment's arrival at the South Clive Site. Laboratory results, ~~must be received within 45 days of the applicable shipment's arrival at the Clive Site~~, showing that the material is within the parameters of the license, must be received within 45 days of the shipment's arrival at the South Clive Site.
3. All incoming-shipments should have the proper labeling and marking as required by the U.S. Department of Transportation (DOT). A Problem Report shall be initiated, in accordance with the Problem Reporting Plan, when a problem is identified. ~~If not, the Clive Site ARCS or RSO shall inform Envirocare Business Development via a Problem Report (EC-2700), and Business Development shall notify the generator for resolution.~~
4. Rail cars or trucks which are found on the arrival survey to have external exposure rates of greater than 5 mRrem/hr at 30 cm from any surface will be posted as a Radiation Area, in compliance with reference 6, until disposed. Additional precautions shall be taken for disposal as outlined in reference 10OP Manual, procedure BPW-5.

BPW-2 11E.(2) INCOMING WASTE ACCEPTANCE CONTROL

5. Wear safety eye wear, gloves, protective clothing, a respirator with a HEPA filter, and protective footwear during sampling or handling waste to prevent skin contamination.
6. When sampling inside an enclosed conveyance, the sampling team should be comprised of at least two team members. One team member should be positioned outside the waste conveyance and observe the sampling performed by the other team member. The observer should maintain visual contact with the sampler at all times. The team member performing the actual sampling shall be a qualified sampler in accordance with procedure TRAIN-1 of this manual.

D. GENERAL INSTRUCTIONS:

1. This procedure applies to all 11e.(2) incoming-shipments of waste destined for disposal at the Envirocare South Clive Disposal Facility.
2. When a shipment of 11e.(2) waste arrives, it is not considered to be accepted for disposal until this acceptance procedure has been completed and the material has been documented as acceptable. A transportation vehicle may be physically located on Envirocare site property and still not be considered "accepted" for disposal at Envirocare pending resolution of any outstanding issues. Should non-accepted 11e.(2) waste be dumped or unloaded without direction or permission from Envirocare, a Problem Report shall be initiated in accordance with the Problem Reporting Plan for any discrepancy that is identified. ~~the NRC, the Utah Division of Radiation Control and the Utah Division of Water Quality will be immediately (within 24 hours) contacted.~~
3. The procedure for accepting incoming 11e.(2) waste shipments is outlined as follows:
 - a. File review
 - b. Review of manifest and shipping papers.
 - c. Survey of freight container.
 - d. Smear testing of external surface of the freight container.
 - e. Visual inspection of freight container and packages for physical integrity and/or for signs of visible material on the exterior or loose in the conveyance.
 - f. Inspection and sampling of the waste.
 - g. Sample analysis.
 - h. Acceptance/Rejection of the shipment.

File review;

- ~~b. Review of manifest and shipping papers (Radioactive Waste Shipment and Disposal Record (RSR);~~
- ~~c. Determination that the individual truck or rail car (or string of rail cars) meets the criterion of having an average concentration of no more than 2,000 pCi/g of the Uranium series or 6000 pCi/g of the Thorium series.~~

BPW-2 11E.(2) INCOMING WASTE ACCEPTANCE CONTROL

- ~~_____ d. _____ Survey of freight container;~~
- ~~_____ e. _____ Smear testing of external surface of the freight container;~~
- ~~_____ f. _____ Visual inspection of freight container and packages for physical integrity and/or for signs of visible material on the exterior or loose in the conveyance, and for the presence of any free standing liquid;~~
- ~~_____ g. _____ Inspection for compliance with the Department of Transportation (DOT) shipping regulations. All shipments will be required to meet the packaging requirements for Low Specific Activity Shipments described in reference 4, regardless of the actual radioactivity concentrations.~~

Note--If any shipment has radioactivity concentrations of greater than 2,000 Pci/g, it will be required to meet all DOT regulations of marking, labelling and placarding.

- ~~_____ h. _____ Inspection and sampling (if required) of the waste;~~
- ~~_____ i. _____ Sample analysis (if required) of the waste;~~
- ~~_____ j. _____ Acceptance/Rejection of the shipment.~~

4. Rail cars or trucks which have external exposure rates greater than 5 mrem/h at 30 cm, and which cannot be disposed of within 24 hours, will be posted as a Radiation Area in compliance with 10 CFR 20.1902(a) until disposed. Additional precautions shall be taken for disposal as outlined in OP Manual reference 10, procedure BPW-5.

5. ~~When sampling, use approved sampling and analytical methods as outlined in references 1 and 9 above, and in OP Manual procedure BPW-3.~~

- ~~_____ 6. _____ During the inspection of the shipment, identify discrepancies associated with the shipment. A Problem Report shall be initiated in accordance with the Problem Reporting Plan for any discrepancy that is identified. All discrepancies must be addressed or resolved prior to accepting the shipment. A qualified ARCS Coordinator, the Site RSO, or Site Manager will inform Business Development of any discrepancy and it will be resolved with the generator by Business Development. The shipment should not be unloaded or disposed until such discrepancies have been settled, either through written documentation which reflects the necessary changes in the manifest or through a generator representative visit to the disposal site. The types of these possible discrepancies are described below:~~

- ~~a. Manifest Discrepancies:~~

BPW-2 11E.(2) INCOMING WASTE ACCEPTANCE CONTROL

- 1) incomplete manifests;
 - 2) count discrepancies;
 - 3) significant weight or volume discrepancies; and,
 - 4) other manifest accuracy discrepancies (Phone #, address, names, etc.).
- b. Inspection Discrepancies:
- 1) free liquids present;
 - 2) damaged or open containers;
 - 3) containers with holes or penetrations;
 - 4) waste outside of the container;
 - 5) leaking containers; and,
 - 6) packaging or placarding not in accordance with DOT regulations.
- c. Appearance Discrepancies: Different appearance than is described in the Waste Profile Record and/or Pre-Shipment Wastee Profile Evaluation.

76. Signed manifests (RSR's)(originals or copies) and applicable additional documentation (i.e. EC-18, bBill of Lading-(if applicable), etc.) for shipment acceptance must be kept on file at the Envirocare Site in accordance with reference 10OP Manual, procedure ADMIN-3.

The RSR serves several functions, including:

- a. complies with the requirements of a manifest as outlined in reference 8;
 - b. describes the number, types, and volumes of containers;
 - c. provides estimated weights, activities, and isotopes of the material;
 - d. documents generator's certification of packaging, classification, markings, labels, conditions of containers, and compliance with the applicable regulations and Envirocare's license and permits;
 - e. documents the generator's certification as to the RCRA or non-RCRA status of the material;
 - f. documents the generator's certification that the waste is 11e.(2);
 - g. documents the generator's warranty that the information provided in the RSR is true and correct;
 - h. provides a checklist for Envirocare for inspection of the incoming material and for possible discrepancies;
 - i. documents Envirocare's acceptance or rejection of the shipment;
 - j. identifies the parameters which will be analyzed (if required) by the independent, third-party laboratory; and,
 - k. alerts receiving staff to probable concentrations and gamma exposure rates.
87. Portable instruments may be used to measure the external contamination on the shipment. This direct survey will be performed in addition to the smear survey if determined to be necessary by the Site RSO.

BPW-2 11E.(2) INCOMING WASTE ACCEPTANCE CONTROL

E. OPERATING PROCEDURES:

1. When a shipment of waste arrives at Envirocare, the ARCS Shipping & Receiving Department Coordinator obtains the RSR and applicable shipping papers from the transporter and commences filling out the top of form EC-18. If desired, the form EC-18 may be initiated upon receipt of the facsimile copy of the RSR. The waste shipment is posted with a Bates number into the Incoming Shipment Book to facilitate tracking of the shipment through the acceptance procedure. Where applicable, and as a courtesy, driver should be instructed about the delay expected to perform the detailed acceptance procedures.

(Note: A "shipment" refers to a single rail car, flatbed, dump truck, etc., loaded with incoming waste for possible management at Envirocare. When a shipment includes a trailer or "pup", the trailer or "pup" is considered to be a separate shipment from the primary load and an additional EC-18 needs to be completed.)

2. File Review - (completed by the Shipping & Receiving Department ARCS Coordinator or qualified designee).

- a. Ensure that a completed copy of the generator's characterization and radiologic analysis Waste Profile Records are in the Site operating record files.
- b. Ensure a completed Pre-Shipment Waste Profile Evaluation is in the operating record files. The form should include the Immediate Chemical Screening Parameter Tolerances.
- c. Check to see whether the previous shipment of the same waste material (if not the first shipment) was accepted without special consideration or discrepancies. If so, prepare to deal with the problems encountered previously.

3. Review of manifest (RSR) and shipping papers - (completed by the Shipping & Receiving Department ARCS Coordinator or qualified designee). This review may be performed concurrently with E.2 above:

- a. Before a shipment may be accepted, a completed RSR and Continuation Sheet for the shipment must be received by Envirocare. The RSR may either accompany the shipment or may be received by Envirocare prior to arrival of the time that the shipment is accepted (such as by facsimile).
- b. Complete the top of form EC-18, if not completed previously.
- c. The Site RSO notes the disposal cell location on the EC-18 and signs for completion of this review.

BPW-2 11E.(2) INCOMING WASTE ACCEPTANCE CONTROL

- _____d. _____ The ARCS Coordinator ~~r~~ Reviews the RSR for completeness and ensures the form is properly signed.
4. Survey of Freight Container (completed by a qualified Health Physics Specialist ~~radiation technician~~).
- a. The freight container is externally surveyed for gamma exposure rates for comparison to RSR values and to assure compliance with DOT regulations. ~~Other p~~Portable instruments appropriate to measure the radiation ~~slides~~ expected in the shipment will be used as necessary to measure for external surface contamination. If the external radiation exposure rate exceeds 1,000 m μ R/hr at any point on the freight container surface, the surveyor must contact the Site RSO or the Shipping & Recieving Manager (SRM) ~~ARCS Coordinator~~ for additional verification and direction.
 - b. Compare the gamma survey measurements with those on the RSR Continuation Sheet. The readings should be in reasonable agreement, ~~such as~~ (for example, within a factor of two for shipments with a gamma measurement greater than 100 μ R/h) microRem/hr. ~~If they aren't, d~~Determine the reason if they are not, record it on the form, and report it to the Site RSO.
5. Freight Container Smear Testing (completed by a qualified Health Physics Specialist ~~radiation technician~~).
- a. Each incoming freight container is smear tested for removable contamination. ~~Should the result of a smear test exceed acceptance standards of the Department of Transportation; the Site RSO or the ARCS Coordinator must be contacted for additional verification and direction.~~
 - b. Select an area on the vehicle exterior where surface contamination would likely be found (if present). Obtain a smear sample, using moderate pressure, from an area of 100 cm² square centimeters.
 - c. Identify the smear sample by vehicle number and save it for radiological laboratory counting.
 - d. After all inspections are complete, ~~turn~~deliver smear samples into the radiological counting lab for counting. The data are then entered on the EC-18 and the removable activity in dpm/100 cm² square cm is calculated.
 - e. If excessive removable radioactive contamination is found on the external surfaces of the package as delineated in 49 CFR 173.443, initiate a Problem Report in accordance with the Problem Reporting Plan ~~notify the shipper and Corporate RSO~~

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~~who will immediately notify the final delivering carrier and also inform the Utah Division of Radiation Control.~~

6. Shipment Container Visual Inspection (completed by a qualified Health Physics Specialist~~radiation technician~~).
- a. The information on the RSR shall be verified for accuracy by inspecting the container/car ID numbers and the number of cars or containers.
- b. Each incoming shipment shall be visually inspected to ~~access~~verify whether there is any evidence of physical damage to the container (for example, a packaging breach) that might jeopardize its integrity. ~~This is accomplished by visually examining the containers for any appearance of packaging breach or any such potential problem.~~
- c. Each incoming shipment is also inspected to verify the proper DOT labeling and placarding has been affixed. ~~For any discrepancies, the ARCS Coordinator or Site RSO shall contact Envirocare Business Development who will inform the generator and/or shipper for resolution.~~
- d. ~~If any~~Discrepancies ~~that~~ are found in the documentation, certification, or shipment, shall be documented on a Problem Report, which will be initiated in accordance with the Problem Reporting Plan. ~~the discrepancies must be resolved prior to acceptance of the material by Envirocare. Envirocare will not unload/dispose of a shipment until such discrepancies have been resolved. Resolution must be accomplished either through a generator visit to the disposal site, or through written documentation which reflects necessary changes in the manifest.~~
- ~~e. If there are any problems with the integrity of an incoming shipment, the problems will be immediately reported to the shipper. The Corporate RSO will also provide immediate notification to the regional office of the NRC and the Utah Division of Radiation Control.~~
- ~~f. If a shipment arrives on site that is unacceptable under the conditions of the license, Envirocare will notify the generator and the regional office of the NRC by phone within 24 hours and by letter within one week.~~
7. Waste Inspection and Sampling (completed by a qualified Sample Control Technician~~Officer~~).
- a. Prepare to safely inspect and sample the waste. Follow ~~Precautions and Limitations C.1, 4 and 5, and 6~~ above, prior to inspection of the 11e.(2) waste.

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- b. ~~Open and visually inspect the contents of the containers of waste to be sampled and determine conformance to the Waste Profile Record. Assess whether the shipment contains, to determine if the waste has any free-standing liquids. Any shipment determined to contain free standing liquids or leaking shall be managed in accordance with reference 9. Any container having free standing liquid or which fails a Paint Filter Liquid Test will not be accepted by Envirocare for storage or disposal. For problems with free liquids, the Laboratory Supervisor (or designated alternate) will inform the Site Manager, the Quality Assurance Officer, and Envirocare's Business Development. A Customer Service representative will then notify the generator for resolution. Discrepancies that are found with the incoming shipment shall be documented on a Problem Report, which will be initiated in accordance with the Problem Reporting Plan. The Laboratory Supervisor (or designated alternate) or the Site Manager shall also notify the Utah DRC and the regional office of the NRC.~~

Ensure that the manifest accurately matches the waste on the shipment as far as the number of containers and the kind of waste observed during the forthcoming waste inspection.

- 1) ~~For closed containers, d~~During the initial waste inspection of closed containers, the inspectors must monitor each container with the sniffer after it is opened. The monitoring must be done at the plane of opening of the container (i.e. where the lid sits or where the bag opens). If an equivalent value of 10 ppm benzene is encountered, organic cartridges must be worn with the respirators. If organic cartridges are worn during sampling or inspection, monitoring with the sniffer is not required.
 - 2) ~~In most cases, appearance discrepancy should result in the rejection of the waste since, at the time of the incoming-shipment inspection, pre-shipment samples of the waste have already been observed by Envirocare and complete descriptions of eh waste should have been provided in the Waste Profile Record.~~
 - 3) ~~Appearance discrepancies can be resolved, by makingg a change or addition, when directed by the generator, to the description in the jWaste Profile Record to make the description more complete. However, such a change may not be done where there is an analytical discrepancy with a parameter beyond the established tolerances.~~
- c. Sample the waste according to reference 10, OP Manual procedure BPW-3 "11e(2) Incoming Waste Sampling and Analysis".

8. Sample Analysis (completed by a qualified ILab aAnalyst)

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- a. Where off-site analysis is required, the samples must be sent to the laboratory within five working days of the shipment's arrival at the South Clive Site.
 - b. If the established sampling procedures are not followed, the Laboratory Supervisor or Site Manager must sign the laboratory log book and describe the alternative sampling technique which was used ~~must be described~~.
 - c. Analyze the samples (when required if applicable) in accordance with reference 10OP Manual, procedure BPW-3. Ensure that the results are within the established tolerances.
 - d. Notification is made to the Shipping & Recieving Department as to acceptability of the shipment for this section.
9. Acceptance/Rejection of the Shipment (completed by a qualified Shipping & Recieving Department ARCS).
- a. ~~The Lab Analyst notifies the ARCS Coordinator or Site Manager that the shipment is ready for acceptance and management.~~
 - ba. When the waste has been evaluated as outlined above and the EC-18 has been completed and signed (documenting tht the waste is acceptable and may discrepancies have been resolved or addressed), the shipment must then be made ready for movement (i.e. closing the containers, shutting ythe van-body doors, connecting to a locomotive, etc.) to document that the waste is acceptable and that any discrepancies have been resolved or addressed, the shipment must then be made ready for movement (i.e. closing the containers, shutting the van-body doors, connecting to a locomotive, etc.).
 - cb. The shipment proceeds as directed to the correct waste management area of the facility. Truck transports should be escorted to the management area.
 - cd. Not : any discrepancies observed during the acceptance procedure on form EC-18 and on the manifest. The Shipping & Recieving Department ARCS Coordinator signs the RSR.
 - ~~e. Give the yellow copy of the signed manifest to the transporter.~~
 - fd. The Shipping & Recieving Department Clive Administrative Assistant sends (mails) a photocopy of the signed manifest to the generator. The generator's copy of the manifests must be sent to the generator within 7 days of the date of arrival at the South Clive Site.

BPW-2 11E.(2) INCOMING WASTE ACCEPTANCE CONTROL

- ge. The Administrative Assistant Shipping & Receiving Department sends (mails) the pink copy of the signed manifest to the Corporate Controller's office for billing purposes. This pink copy is then returned to the generator with the invoice.
- hf. Place the white copy of the signed manifest in the operating record.
- gi. If the shipment is rejected, document the rejection on a Problem Report and implement the Problem Reporting Plan (EC-2700), and inform Envirocare Business Development who will immediately notify the regional office of the NRC, the Utah Division of Radiation Control, and the generator for resolution.
- hj. If a shipment is found to be in violation of DOT shipping regulations, but is otherwise acceptable it will not be accepted until:
 - 1) the generator or generator's agent has made necessary corrections to bring the shipment into compliance with DOT regulations; or,
 - 2) the Nuclear Regulatory Commission has approved acceptance of the shipment, as is.

Pending such corrective action, the shipment will remain on Envirocare property in order to eliminate the potential risk associated with transporting the waste, but will not be admitted to the Restricted Area.

However, if such a shipment is in violation of DOT regulations due to leakage of radioactive material, it will be placed over an approved (contained) surface in the Restricted Area until the situation is resolved to prevent contamination of the environment.

10. The Facility Operator notes the disposal cell location on the EC-18 and signs for completion of this review.

F. QUALITY CONTROL:

- 1. QC Process Control: Prior to using the instruments for radiological surveys, ensure that they are in current calibration and the daily constancy check has been performed.
- 2. Sample Control:
 - a. Samples are taken directly to Sample Control for distribution to the appropriate lab(s) for analysis. Ensure that Chain of Custody procedures are followed.

BPW-2 11E.(2) INCOMING WASTE ACCEPTANCE CONTROL

- b. The samples are disposed of along with the waste from which the samples were originally drawn after counting data have been recorded on form EC-18.
- 3. Data Control:
 - a. Records of shipments accepted are entered in the "Incoming Shipment Book" with the assigned Bates Numbers.
 - ~~b. For truck deliveries, yellow copies of the signed RSR's are returned to the driver.~~
 - ~~b.~~ The ~~white~~A copy of the signed RSR with the attached acceptance forms is entereddelivered to the Administrative Assistant for entry into the computer data base and filing. ~~Pink and green e~~Copies are sent to the Corporate Office each day where the ~~pink~~a copy is returned to the generator for billing and the ~~green~~a copy is filed.
 - ~~dc.~~ Records are maintained in accordance with reference 109, procedure ADMIN-3.
- 4. Audit Requirements:
 - a. Quarterly, the QA Department will observe the performance of this procedure to ensure compliance, ~~and~~ proper documentation, and records control.
 - b. Semiannually, the QA Department will coordinate a comprehensive review of the filed shipment records and supporting documentation to ensure a complete record exists.

BPW-2 11E.(2) INCOMING WASTE ACCEPTANCE CONTROL

A. PURPOSE: This procedure is designed to provide a consistent method for acceptance control of 11e.(2) incoming-shipment wastes to ensure the waste shipment's condition and parameters comply with governmental regulations for acceptance of the waste.

B. REFERENCES OR AUTHORITY:

1. 11e.(2) Radioactive Material License SMC-1559, dated 11/19/93, as amended;
2. Application for 11e.(2) Radioactive Material License SMC-1559, dated 12/23/91, as amended;
3. Envirocare of Utah, Inc. Quality Assurance Manual;
4. 49 CFR 173.425;
5. 40 CFR 264;
6. 10 CFR 20.1902;
7. Ground Water Quality Discharge Permit No. UGW450005, dated 9/10/93, as amended;
8. 10 CFR 20, Appendix F;
9. Waste Management Plan, dated 9/10/93, as amended;
10. Envirocare of Utah, Inc. Operating Procedures Manual.

C. PRECAUTIONS AND LIMITATIONS:

1. Review the generator's pre-shipment analysis and the manifest/shipping papers for potential health and safety hazards for inspection and sampling.
2. Where off-site analysis is required, the samples must be sent to the laboratory within five working days of the shipment's arrival at the Clive Site. Laboratory results must be received within 45 days of the applicable shipment's arrival at the Clive Site, showing that the material is within the parameters of the license.
3. All incoming-shipments should have the proper labeling and marking as required by the U.S. Department of Transportation (DOT). If not, the Clive Site ARCS or RSO shall inform Envirocare Business Development via a Problem Report (EC-2700), and Business Development shall notify the generator for resolution.
4. Rail cars or trucks which are found on the arrival survey to have external exposure rates of greater than 5 mrem/hr at 30 cm from any surface will be posted as a Radiation Area, in compliance with reference 6, until disposed. Additional precautions shall be taken for disposal as outlined in OP Manual procedure BPW-5.
5. Wear safety eye wear, gloves, protective clothing, a respirator with a HEPA filter, and protective footwear during sampling or handling waste to prevent skin contamination.

BPW-2 11E.(2) INCOMING WASTE ACCEPTANCE CONTROL

6. When sampling inside an enclosed conveyance, the sampling team should be comprised of at least two team members. One team member should be positioned outside the waste conveyance and observe the sampling performed by the other team member. The observer should maintain visual contact with the sampler at all times. The team member performing the actual sampling shall be a qualified sampler in accordance with procedure TRAIN-1 of this manual.

D. GENERAL INSTRUCTIONS:

1. This procedure applies to all 11e.(2) incoming-shipments of waste destined for disposal at the Envirocare South Clive Disposal Facility.

2. When a shipment of 11e.(2) waste arrives, it is not considered to be accepted for disposal until this acceptance procedure has been completed and the material has been documented as acceptable. A transportation vehicle may be physically located on Envirocare site property and still not be considered "accepted" for disposal at Envirocare pending resolution of any outstanding issues. Should non-accepted 11e.(2) waste be dumped or unloaded without direction or permission from Envirocare, the NRC, the Utah Division of Radiation Control and the Utah Division of Water Quality will be immediately (within 24 hours) contacted.

3. The procedure for accepting incoming 11e.(2) waste shipments is outlined as follows:

- a. File review;
- b. Review of manifest and shipping papers (Radioactive Waste Shipment and Disposal Record (RSR));
- c. Determination that the individual truck or rail car (or string of rail cars) meets the criterion of having an average concentration of no more than 2,000 pCi/g of the Uranium series or 6000 pCi/g of the Thorium series.
- d. Survey of freight container;
- e. Smear testing of external surface of the freight container.
- f. Visual inspection of freight container and packages for physical integrity and/or for signs of visible material on the exterior or loose in the conveyance, and for the presence of any free standing liquid;
- g. Inspection for compliance with the Department of Transportation (DOT) shipping regulations. All shipments will be required to meet the packaging

BPW-2 11E.(2) INCOMING WASTE ACCEPTANCE CONTROL

requirements for Low Specific Activity Shipments described in reference 4, regardless of the actual radioactivity concentrations.

Note--If any shipment has radioactivity concentrations of greater than 2,000 Pci/g, it will be required to meet all DOT regulations of marking, labelling and placarding.

- h. Inspection and sampling (if required) of the waste;
 - i. Sample analysis (if required) of the waste;
 - j. Acceptance/Rejection of the shipment.
4. Rail cars or trucks which have external exposure rates greater than 5 mrem/h at 30 cm, and which cannot be disposed of within 24 hours, will be posted as a Radiation Area in compliance with 10 CFR 20.1902(a) until disposed. Additional precautions shall be taken for disposal as outlined in OP Manual BPW-5.
5. When sampling, use approved sampling and analytical methods as outlined in references 1 and 9 above, and in OP Manual procedure BPW-3.
6. During the inspection of the shipment, identify discrepancies associated with the shipment. All discrepancies must be addressed or resolved prior to accepting the shipment. A qualified ARCS Coordinator, the Site RSO, or Site Manager will inform Business Development of any discrepancy and it will be resolved with the generator by Business Development. The shipment should not be unloaded or disposed until such discrepancies have been settled, either through written documentation which reflects the necessary changes in the manifest or through a generator representative visit to the disposal site. The types of these possible discrepancies are described below:
- a. Manifest Discrepancies:
 - 1) incomplete manifests;
 - 2) count discrepancies;
 - 3) significant weight or volume discrepancies; and,
 - 4) other manifest accuracy discrepancies (Phone #, address, names, etc.)
 - b. Inspection Discrepancies:
 - 1) free liquids present;
 - 2) damaged or open containers;
 - 3) containers with holes or penetrations;
 - 4) waste outside of the container;
 - 5) leaking containers; and,

BPW-2 11E.(2) INCOMING WASTE ACCEPTANCE CONTROL

- 6) packaging or placarding not in accordance with DOT regulations.
7. Signed manifests (RSR's)(originals or copies) and applicable additional documentation (i.e. EC-18, bill of lading (if applicable), etc.) for shipment acceptance must be kept on file at the Envirocare Site in accordance with OP Manual procedure ADMIN-3.

The RSR serves several functions, including:

- a. complies with the requirements of a manifest as outlined in reference 8;
 - b. describes the number, types, and volumes of containers;
 - c. provides estimated weights, activities, and isotopes of the material;
 - d. documents generator's certification of packaging, classification, markings, labels, conditions of containers, and compliance with the applicable regulations and Envirocare's license and permits;
 - e. documents the generator's certification as to the RCRA or non-RCRA status of the material;
 - f. documents the generator's certification that the waste is 11e.(2);
 - g. documents the generator's warranty that the information provided in the RSR is true and correct;
 - h. provides a checklist for Envirocare for inspection of the incoming material and for possible discrepancies;
 - i. documents Envirocare's acceptance or rejection of the shipment;
 - j. identifies the parameters which will be analyzed (if required) by the independent, third-party laboratory; and,
 - k. alerts receiving staff to probable concentrations and gamma exposure rates.
8. Portable instruments may be used measure the external contamination on the shipment. This direct survey will be performed in addition to the smear survey if determined to be necessary by the Site RSO.

E. OPERATING PROCEDURES:

1. When a shipment of waste arrives at Envirocare, the ARCS Coordinator obtains the RSR and applicable shipping papers from the transporter and commences filling out the top of form EC-18. If desired, the form EC-18 may be initiated upon receipt of the facsimile copy of the RSR. The waste shipment is posted with a Bates number into the Incoming Shipment Book to facilitate tracking of the shipment through the acceptance procedure. Where applicable, and as a courtesy, the driver should be instructed about the delay expected to perform the detailed acceptance procedures.

(Note: A "shipment" refers to a single rail car, flatbed, dump truck, etc., loaded with incoming waste for possible management at Envirocare. When a shipment includes a

BPW-2 11E.(2) INCOMING WASTE ACCEPTANCE CONTROL

trailer or "pup", the trailer or "pup" is considered to be a separate shipment from the primary load and an additional EC-18 needs to be completed.)

2. File Review - (completed by the ARCS Coordinator or qualified designee).
 - a. Ensure that a completed copy of the generator's characterization and radiologic analysis is in the Site operating record files.
 - b. Check to see whether the previous shipment of the same waste material (if not the first shipment) was accepted without special consideration or discrepancies. If so, prepare to deal with the problems encountered previously.
3. Review of manifest (RSR) and shipping papers - (completed by the ARCS Coordinator or qualified designee). This review may be performed concurrently with E.2 above.
 - a. Before a shipment may be accepted, a completed RSR and Continuation Sheet for the shipment must be received by Envirocare. The RSR may either accompany the shipment or may be received by Envirocare prior to the time that the shipment is accepted (such as by facsimile).
 - b. Complete the top of form EC-18, if not completed previously.
 - c. The Site RSO notes the disposal cell location on EC-18 and signs for completion of this review.
 - d. The ARCS Coordinator reviews the RSR for completeness and ensures the form is properly signed.
4. Survey of Freight Container (completed by a qualified radiation technician).
 - a. The freight container is externally surveyed for gamma exposure rates for comparison to RSR values and to assure compliance with DOT regulations. Other portable instruments appropriate to measure the radionuclides expected in the shipment will be used as necessary to measure for external surface contamination. If the external radiation exposure rate exceeds 1,000 μ R/hr at any point on the freight container surface, the surveyor must contact the Site RSO or the ARCS Coordinator for additional verification and direction.
 - b. Compare the gamma survey measurements with those on the RSR Continuation Sheet. The readings should be in reasonable agreement, such as within a factor of two for shipments with a gamma measurement greater than 100

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microRem/hr. If they aren't, determine the reason, record it on the form, and report it to the Site RSO.

5. Freight Container Smear Testing (completed by a qualified radiation technician).
 - a. Each incoming freight container is smear tested for removable contamination. Should the result of a smear test exceed acceptance standards of the Department of Transportation; the Site RSO or the ARCS Coordinator must be contacted for additional verification and direction.
 - b. Select an area on the vehicle exterior where surface contamination would likely be found (if present). Obtain a smear sample, using moderate pressure, from an area of 100 square centimeters.
 - c. Identify the smear sample by vehicle number and save it for radiological laboratory counting.
 - d. After all inspections are complete, turn smear samples into the radiological counting lab for counting. The data are then entered on the EC-18 and the removable activity in dpm/100 square cm is calculated.
 - e. If excessive removable radioactive contamination is found on the external surfaces of the package as delineated in 49 CFR 173.443, notify the shipper and Corporate RSO who will immediately notify the final delivering carrier and also inform the Utah Division of Radiation Control.
6. Shipment Container Visual Inspection (completed by a qualified radiation technician).
 - a. The information on the RSR shall be verified for accuracy by inspecting the container/car ID numbers and the number of cars or containers.
 - b. Each incoming shipment shall be visually inspected to verify whether there is any evidence of physical damage to the container that might jeopardize its integrity. This is accomplished by visually examining the containers for any appearance of packaging breach or any such potential problem.
 - c. Each incoming shipment is also inspected to verify the proper DOT labeling and placarding has been affixed. For any discrepancies, the ARCS Coordinator or Site RSO shall contact Envirocare Business Development who will inform the generator and/or shipper for resolution.

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- d. If any discrepancies are found in the documentation, certification, or shipment, the discrepancies must be resolved prior to acceptance of the material by Envirocare. Envirocare will not unload/dispose of a shipment until such discrepancies have been resolved. Resolution must be accomplished either through a generator visit to the disposal site, or through written documentation which reflects necessary changes in the manifest.
 - e. If there are any problems with the integrity of an incoming shipment, the problems will be immediately reported to the shipper. The Corporate RSO will also provide immediate notification to the regional office of the NRC and the Utah Division of Radiation Control .
 - f. If a shipment arrives on site that is unacceptable under the conditions of the license, Envirocare will notify the generator and the regional office of the NRC by phone within 24 hours and by letter within one week.
7. Waste Inspection and Sampling (completed by a qualified Sample Control Officer).
- a. Prepare to safely inspect and sample the waste. Follow Precautions and Limitations 1, 4 and 5 above, prior to inspection of the 11e.(2) waste.
 - b. Open and visually inspect the contents of the containers of waste to be sampled, to determine if the waste has any free-standing liquids. Any container having free-standing liquid or which fails a Paint Filter Liquid Test will not be accepted by Envirocare for storage or disposal. For problems with free liquids, the Laboratory Supervisor (or designated alternate) will inform the Site Manager, the Quality Assurance Officer, and Envirocare's Business Development. A Customer Service representative will then notify the generator for resolution. The Laboratory Supervisor (or designated alternate) or the Site Manager shall also notify the Utah DRC and the regional office of the NRC. Ensure that the manifest accurately matches the waste on the shipment as far as the number of containers and the kind of waste observed during the forthcoming waste inspection.
- For closed containers, during the initial waste inspection, the inspectors must monitor each container with the sniffer after it is opened. The monitoring must be done at the plane of opening of the container (i.e. where the lid sits or where the bag opens). If an equivalent value of 10 ppm benzene is encountered, organic cartridges must be worn with the respirators. If organic cartridges are worn during sampling or inspection, monitoring with the sniffer is not required.

BPW-2 11E.(2) INCOMING WASTE ACCEPTANCE CONTROL

- c. Sample the waste according to OP Manual procedure BPW-3 "11e.(2) Incoming Waste Sampling and Analysis".
8. Sample Analysis (completed by a qualified lab analyst)
- a. Where off-site analysis is required, the samples must be sent to the laboratory within five working days of the shipment's arrival at the Clive Site.
 - b. If the established sampling procedures are not followed, the Laboratory Supervisor or Site Manager must sign the laboratory log book and the alternative sampling technique which was used must be described.
 - c. Analyze the samples (if applicable) in accordance with OP Manual procedure BPW-3. Ensure that the results are within the established tolerances.
9. Acceptance/Rejection of the Shipment (completed by a qualified ARCS).
- a. The Lab Analyst notifies the ARCS Coordinator or Site Manager that the shipment is ready for acceptance and management.
 - b. When the waste has been evaluated as outlined above and the EC-18 has been completed and signed to document that the waste is acceptable and that any discrepancies have been resolved or addressed, the shipment must then be made ready for movement (i.e. closing the containers, shutting the van-body doors, connecting to a locomotive, etc.).
 - c. The shipment proceeds as directed to the correct waste management area of the facility. Truck transports should be escorted to the management area.
 - d. Note any discrepancies observed during the acceptance procedure on form EC-18 and on the manifest. The ARCS Coordinator signs the RSR.
 - e. Give the yellow copy of the signed manifest to the transporter.
 - f. The Clive Administrative Assistant sends (mails) a photocopy of the signed manifest to the generator. The generator's copy of the manifests must be sent to the generator within 7 days of the date of arrival at the Clive Site.
 - g. The Administrative Assistant sends (mails) the pink copy of the signed manifest to the Corporate Controller's office for billing purposes. The pink copy is then returned to the generator with the invoice.

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- h. Place the white copy of the signed manifest in the operating record.
- i. If the shipment is rejected, document the rejection on a Problem Report (EC-2700), and inform Envirocare Business Development who will immediately notify the regional office of the NRC, the Utah Division of Radiation Control, and the generator for resolution.
- j. If a shipment is found to be in violation of DOT shipping regulations, but is otherwise acceptable it will not be accepted until:
 - 1) the generator or generator's agent has made necessary corrections to bring the shipment into compliance with DOT regulations; or,
 - 2) the Nuclear Regulatory Commission has approved acceptance of the shipment, as is.

Pending such corrective action, the shipment will remain on Envirocare property in order to eliminate the potential risk associated with transporting the waste, but will **not** be admitted to the Restricted Area.

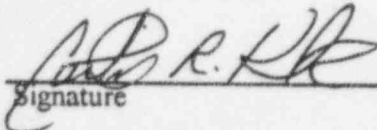
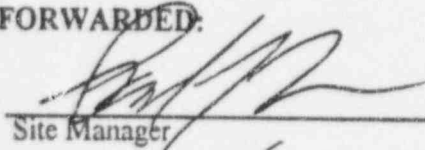
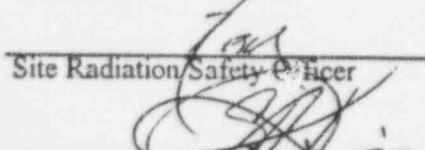
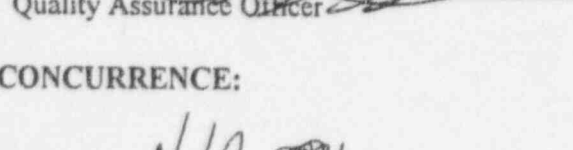
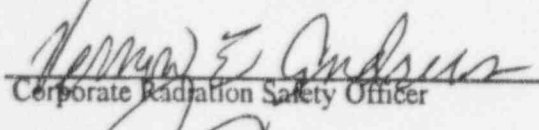
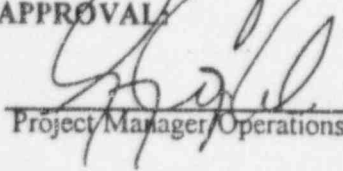
However, if such a shipment is in violation of DOT regulations due to leakage of radioactive materials, it will be placed over an approved (contained) surface in the Restricted Area until the situation is resolved to prevent contamination of the environment.

F. QUALITY CONTROL:

- 1. QC Process Control Checks:
 - a. Prior to using the instruments for radiological surveys, ensure that they are in current calibration and the daily constancy check has been performed.
- 2. Sample Control: Samples are taken directly to Sample Control for distribution to the appropriate lab(s) for analysis. Ensure that Chain of Custody Procedures are followed.
- 3. Data Control:
 - a. Records of shipments accepted are entered in the "Incoming Shipment Book" with the assigned Bates Numbers.
 - b. For truck deliveries, yellow copies of the signed RSR's are returned to the driver.

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- c. The white copy of the signed RSR with the attached acceptance forms is delivered to the Administrative Assistant for entry into the computer data base and filing. Pink and green copies are sent to the Corporate Office each day where the pink copy is returned to the generator for billing and the green copy is filed.
 - d. Records are maintained in accordance with reference 9, procedure ADMIN-3.
- 4. Audit Requirements
 - a. Quarterly, the QA Department will observe the performance of this procedure to ensure compliance, and proper documentation and records control.
 - b. Semiannually, the QA Department will coordinate a comprehensive review of the filed shipment records and supporting documentation to ensure a complete record exists.

MANUAL/PROCEDURE: <u>BPW-3 11e.(2) WASTE SAMPLING AND ANALYSIS</u>	
REVISION NUMBER:	<u>4</u>
AFFECTED PAGES:	<u>PAGE: 1 THROUGH ^{CK 11-26-96} 9</u>
PURPOSE:	<u>Incorporate changes from CAP and annual review</u>
SUBMITTED BY:	<u>Curtis Kirk</u>
 Signature	<u>11/08/96</u> Date
FORWARDED:	
 Site Manager	<u>11/8/96</u> Date
 Site Radiation Safety Officer	<u>11-8-96</u> Date
 Quality Assurance Officer	<u>11/8/96</u> Date
CONCURRENCE:	
<u>N/A</u> Compliance Engineer	<u>11/8/96</u> Date
REVIEW:	
 Corporate Radiation Safety Officer	<u>11/11/96</u> Date
APPROVAL:	
 Project Manager Operations Director	<u>11/11/96</u> Date

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BPW -3 11E.(2) INCOMING WASTE SAMPLING AND ANALYSIS**A. PURPOSE:**

This procedure is designed to provide a consistent method for sampling and analyzing incoming shipment wastes to ensure that: the radioactive characteristics of the material are within the license limits; the material is not a liquid waste and does not contain excessive free liquids; and the material is not a hazardous waste subject to RCRA regulations. This procedure aids in ensuring that representative samples of the incoming-shipments are obtained and that Chemical (as necessary) and Radiological Analyses are performed to characterize incoming wastes.

B. REFERENCES OR AUTHORITY:

1. 11e.(2) Radioactive Material License SMC-1559, as amended
2. Application for 11e.(2) Radioactive Material License SMC-1559, as amended
3. Envirocare of Utah, Inc. Quality Assurance Manual;
4. 40 CFR 261;
5. 10 CFR 40, Appendix A, as revised
6. Ground Water Quality Discharge Permit #UGW450005, as amended
7. Waste Management Plan, as revised
8. Envirocare of Utah, Inc. Operating Procedures Manual, as revised
9. Envirocare of Utah, Inc. Safety and Health Manual, as revised
10. Envirocare of Utah, Inc. Problem Reporting Plan, as revised

C. PRECAUTIONS AND LIMITATIONS:

1. Review the generator's pre-shipment analysis, certification, and the manifest/shipping papers for potential health and safety hazards prior to inspecting and sampling activities.
2. Where off-site analysis is required, the samples should be sent to the laboratory within seven days of the shipment's arrival at the South Clive Site. Laboratory results showing that the material is within the parameters of the license must be received within 45 days of the applicable shipment's arrival at the South Clive Site.
3. Any waste which is determined: to be a hazardous waste; to exceed the Reference 1 restrictions; or to be non-11e.(2) waste shall not be disposed of in the 11e.(2) disposal cells. Such waste must be handled and disposed of elsewhere in compliance with all other applicable regulations of returned to its place of origin.
4. For safety reasons and sample preservation, the photoionization "sniffer" test should be the first chemical analysis run. An organic filter cartridge respirator should be worn when conducting this initial test.

BPW-3 11e.(2) INCOMING WASTE SAMPLING AND ANALYSIS

5. Wear safety eye wear, gloves, protective clothing, a respirator with organic cartridge, and protective footwear during sampling or handling waste to prevent skin contamination or exposure to unknown contaminants.
6. When sampling inside an enclosed conveyance, the sampling team should be comprised of at least two team members. One team member should be positioned outside the waste conveyance and observe the sampling performed by the other team member. The observer should maintain visual contact with the sampler at all times. The team member performing the actual sampling shall be a qualified sampler in accordance with procedure TRAIN-1 of this manual.

D. GENERAL INSTRUCTIONS:

1. This procedure applies to the radioactive component of all 11e.(2) waste destined for disposal at the Envirocare South Clive Disposal Facility.
2. Samples must be submitted to an approved analytical laboratory for radiologic analysis to confirm that the waste has been properly manifested and is within the parameters of Reference 1.
3. Envirocare's Business Development shall be informed of problems or discrepancies with samples or incoming shipments by use of a Problem Report (EC-2702), as detailed in the Problem Reporting Plan. The Problem Report should include, as a minimum, a description of the problem, the date and time of discovery of the problem, the recommended resolution of the problem, and corporate approval of the resolution.
4. Incoming shipments must have samples obtained according to the frequencies noted below:

Note: For counting purposes, one rail car (any type) may represent a nominal 100 cubic yards and one highway shipment (any type) may represent a nominal 20 yards. The actual volumes may also be used for counting purposes.

- a. For each waste stream, the minimum number of samples to be analyzed for radiologics is:
 - 1) One sample for each of the first ten (10) shipments (rail or highway); or, one sample for each of the first 100 cubic yards (yd³) up to 1,000 yd³.
 - 2) One sample for each additional 500 yd³ after the conditions of D.4.a.1 have been met.

BPW-3 11e.(2) INCOMING WASTE SAMPLING AND ANALYSIS

- b. For each waste stream, the minimum number of samples to be analyzed for the Immediate Chemical Screening Parameters is:

- 1) One sample from the first shipment received.
- 2) After the first shipment, one sample for each 50,000 tons of 11e.(2) waste received.

5. In order to collect a more representative sample for verification of radionuclide content and Chemical Screening Parameters, the sampling methods noted below should be followed. Although only minimum numbers of aliquots are specified, the samplers should collect enough aliquots to ensure that all portions of the corresponding waste volume are represented.

- a. **Bulk Rail Shipments:** The sample shall be a composite sample consisting of six aliquots from different locations.
- b. **Bulk Highway Shipments:** The sample shall be a composite sample consisting of two aliquots from different locations.
- c. **20-yd³ Boxes:** The sample shall be a composite sample consisting of two aliquots from different locations in the box.
- d. **B-25 Boxes (3.5-yd³):** The sample shall be a composite sample consisting of one aliquot from each of six boxes. Where there are fewer than six boxes, the requirement is a minimum of 6 aliquots from different locations, ensuring that at least one aliquot is taken from each box.
- e. **Drums, Barrels and Smaller Containers:** The sample shall be a composite sample consisting of one aliquot from each of at least six containers in each shipment.
- g. All bulk shipment and container samples should be collected to include material at varying depths throughout the waste.
- h. These sampling methods are summarized below:

Waste Conveyance	Type	Number of Aliquots
Bulk Rail Shipments	composite	6
Bulk Highway Shipments	composite	2
20-yd ³ Boxes	composite	2 per box
B-25 Boxes	composite	6 per shipment

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Drums, Barrels, and Smaller Containers	composite	6
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6. Should the results from the analytical laboratory show that the waste is beyond the limits of References 1, or 4, and the waste has been placed in the embankment, the following Contingency Plan must be implemented:

- a. The Corporate Environmental Engineer is notified immediately of the situation by site personnel.
- b. Within 24 hours of discovering that non-conforming material has been disposed, the regional office of the NRC and the Utah DRC must be notified by the Corporate Environmental Engineer.

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- c. Within seven calendar days of the notification, a written description of the situation must be provided to the NRC and Utah DRC by the Corporate Environmental Engineer. The following information must be included in the written description:
 - 1) name of the generator;
 - 2) name of the non-conforming waste stream;
 - 3) amount of non-conforming waste disposed;
 - 4) location of the non-conforming waste in the disposal cell;
 - 5) date the non-conforming waste was accepted;
 - 6) date the non-conforming waste was placed in the disposal cell;
 - 7) description of the waste placed on and around the non-conforming waste;
 - d. Provide a written plan to the NRC for managing the non-conforming material. The plan must describe alternative actions and the consequences of each action.
 - e. Re-sample the shipment, by means of a core sampler, other device, or removal of portions of subsequent lifts, as necessary, to confirm the initial analytical results.
 - f. If the non-conforming waste is determined to be a hazardous waste and/or a non-11e.(2) waste which is not eligible for placement in the 11e.(2) disposal facility, the recommended course of action will be to remove it and return it to the generator.
 - g. Obtain approval from the NRC for the plan to manage the non-compliance waste. This approval may be obtained as the plan is revised in cooperation with the NRC.
 - h. Carry out the approved management plan.
7. Analytical results of Total 11e.(2) Chemical Screening Parameter Analysis are divided into the following five categories upon review:
- a. Category 1: The results show that no additional constituents or characteristics were detected other than those addressed by the 11e.(2) license.
 - b. Category 2: The results show that additional constituents were detected, but the constituents are not listed in Reference 4 (Appendix VIII), Reference 5 (Appendix A Criterion 13), or Reference 6 (Table 3).
 - c. Category 3. The results show that the waste has the possibility of additional constituents that are not addressed in the 11e.(2) License.

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- d. Category 4: The results show that the waste definitely has additional constituents that are not addressed in the 11e.(2) License, and will need to be added to section 11.1.
- e. Category 5: The results show that the waste is not 11e(2) by-product material.

E. OPERATING INSTRUCTIONS:

1. Upon arrival at the South Clive Site, the waste shipment is controlled in accordance with Reference 8, procedure BPW-2, "Incoming Waste Acceptance Control."
2. Representative samples must be obtained from the waste conveyances for analyses of the waste to confirm that the waste is within the parameters of Reference 1. Samples are obtained in accordance with D.4 and 5 above.
3. A qualified Sample Technician collects the appropriate samples from the shipment as follows:
 - a. Gather the needed sampling equipment including a scoop, shovel, auger or other appropriate tools, and sample containers.
 - b.——Follow the Precautions and Limitations above, prior to inspection and sampling of the 11e.(2) waste.
 - c. Open the container of waste to be sampled and visually inspect the contents to determine if the waste has any free liquids, or, if it needs to be subjected to the Paint Filter Liquids Test. A container having free-standing liquid or which fails a Paint Filter Liquids Test (PFLT) will not be accepted by Envirocare for storage or disposal.
 - d. Gather the samples in an approved sample container using proper chain-of-custody procedures.
4. A Total 11e.(2) Chemical Screening Parameter Analysis is completed by the contracted off-site laboratory for each 50,000 tons of 11e.(2) material. Constituents to be analyzed are determined by the Operations Director, Environmental Engineer, and/or Corporate Radiation Safety Officer. The laboratory analyst documents that the samples have been obtained by signing the EC-18. An analytical request form is forwarded with the samples to the contract laboratory within seven days of sample collection.

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5. Should the results of the Total 11e.(2) Chemical Screening Parameter Analysis indicate that the waste may contain constituents that are not addressed in Reference 1, proceed as follows:
- a. For waste classified as Category 3 (as defined in General Instruction D.7 above), if a constituent is detected above the limit of quantitation, perform the following:
 - 1) Determine if the constituent is listed in Reference 4 (Appendix VIII), Reference 5 (Appendix A, Criterion 13), or Reference 6 (Table 3).
 - 2) Determine if and applicable treatment standard exists in 40 CFR 268 for waste containing the constituent. If the concentration is greater than the treatment standard, then classify the waste as Category 4 waste, and follow instructions E.5.b below.
 - 3. If the concentration is less than the treatment standard, discuss the results with the generator to determine if the waste still exhibits the characteristics of 11e.(2) material.
 - b. For waste classified as Category 4 (as defined in General Instruction D.7 above):
 - 1) Notify the generator of the finding and discuss whether this constituent indicates that the waste is hazardous. If the waste is determined to be hazardous, it is no longer characteristic of 11e.(2) material and is therefore a Category 5 waste.
 - 2) If the constituent is determined to be non-hazardous, sample the next incoming shipment and have it analyzed for the constituent.
 - *- If the constituent does not appear in the sample, the first sample is considered to be an anomaly, and the waste can be accepted for disposal.
 - *- If the constituent is found again, add the constituent to Reference 1, condition 11.1.
 - c. For waste classified as Category 5 (as defined in General Instruction D.7 above):
 - 1) Reject the waste and inform the generator that the waste has not been accepted for disposal at the Envirocare Waste Disposal Facility.

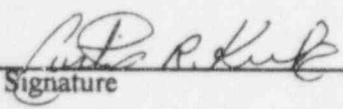
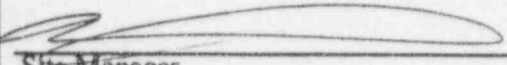

BPW-3 11e.(2) INCOMING WASTE SAMPLING AND ANALYSIS

- 2) Sample the next incoming shipment from this generator and have it undergo the Total 11e.(2) Chemical Screening Analysis.

F. QUALITY CONTROL:

1. QC Process Control: The sample team must ensure that the samples obtained are representative of the incoming-waste. Samples should include any debris, if it can be sampled, which could be scattered throughout the waste shipment.
2. Sample Control: Ensure chain-of-custody procedures are followed for control of the incoming-shipment samples. Fill out and file the corresponding form (EC-0101). Note the dates of sample shipment for off-site laboratory analysis in the Sampling Control Log. Sample material should be disposed when the analyses and data review are completed and the chain-of-custody form should be updated to reflect the disposal.
3. Data Control: The completed Form EC-18, the RSR for the shipment, any Problem Reports (EC-2702), EC-1875 and any additional documents pertaining to the incoming-shipment should be filed in the operating record at the South Clive Site.
4. Audit Requirements:
 - a. Quarterly, the QA Department will review the documentation associated with the incoming-shipments. This includes, but is not limited to, ensuring that: the applicable forms are filled out correctly and filed appropriately; the sampling is being conducted in accordance with the required frequencies; and sample results are obtained within 45 days.
 - b. Semi-annually: The QA Officer will coordinate a comprehensive audit of incoming-shipment waste sampling and analysis practices during the 11e.(2) waste management audit.

ENVIROCARE OF UTAH, INC. OPERATING PROCEDURES MANUAL

PROCEDURE:	<u>BPW-4 11e.(2) Incoming Waste Unloading and Handling</u>	
REVISION NUMBER:	<u>4</u>	
AFFECTED PAGES:		
PURPOSE:	<u>Incorporate changes from the CAP and annual review</u>	
SUBMITTED BY:	<u>Curtis Kirk</u>	
 Signature		Date <u>12-9-96</u>
FORWARDED:		
 Site Manager	<u>ACTING</u>	Date <u>12-16-96</u>
Site Radiation Safety Officer		Date
Quality Assurance Officer		Date
CONCURRENCE:		
<u>N/A</u> 		Date <u>10/9/96</u>
REVIEW:		
Corporate Radiation Safety Officer		Date
APPROVAL:		
Project Manager/Operations Director		Date

BPW-4 11e.(2) INCOMING WASTE UNLOADING AND HANDLING

A. PURPOSE:

~~A. —~~ **PURPOSE:** This procedure is designed to: provide a consistent method for unloading and handling 11e.(2) incoming-shipment wastes; ~~to shipment wastes;~~ ensure the waste is handled in accordance with regulatory requirements; ~~and to;~~ and contain spills of radioactive material during unloading and transportation operation. ~~s. This procedure also aids in ensuring that the incoming incoming-shipment wastes are handled such that the natural soils and/or ground-water are not contaminated with waste material nor and so that uncontrolled release of contaminated material be is~~ not allowed outside of Envirocare's Restricted Areas.

B. REFERENCES OR AUTHORITY:

1. 11e.(2) Radioactive Material License SMC-1559, dated 11/19/93, ~~as amended;~~ as amended
2. Application for Radioactive Material License SMC-1559, dated 12/23/91, ~~as amended;~~ as amended
3. Envirocare of Utah, Inc. Quality Assurance Manual; as revised
4. 40 CFR 261;
- ~~5. 10 CFR 20.1902; as amended~~
- ~~5. 10 CFR 20.1902, as amended~~
6. Ground Water Quality Discharge Permit #UGW450005, dated 9/10/93, ~~as amended;~~ UGW450005, as amended
7. Envirocare of Utah, Inc. Construction QA/QC Manual; as revised
8. Envirocare of Utah, Inc. Operating Procedures Manual; as revised
9. Waste Management Plan; as revised

C. PRECAUTIONS AND LIMITATIONS:

1. Any waste which is determined to be a hazardous waste or to exceed the restrictions of references 1 or 6; ~~Table 3; References 1 or 6 (Table 3)~~ shall not be unloaded or handled in the 11e.(2) Waste Management Facility. Such waste must be handled and disposed of elsewhere in compliance with all other applicable regulations, or returned to its place of origin. If a disposed waste is discovered to be a hazardous waste or to exceed the limits of ~~r~~Reference 1 or 6, Envirocare must follow the Contingency Plan for Non-Conforming Results in reference step D.6 of reference ~~9~~Reference 8, BPW-3.

2. Incoming-shipments are checked for the presence of free liquids in accordance with reference ~~9~~Reference 8, BPW-2 and BPW-3. If a shipment arrives at the site and is observed to contain free liquids or fails the Paint Liquid Filter Test (PFLT), it will not be accepted for storage or disposal.

3. Rail cars or trucks which have external exposure rates greater than 5 mrem/hr at 30 cm; and which cannot be disposed of within 24 hours; will be posted as a Radiation Area, in compliance with

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Reference 5, until disposed. This includes roping off, or otherwise segregating, the shipment to control access to the radiation area.

4. All workers, other than truck drivers in closed trucks, involved in unloading or disposal of waste which has been identified as a Radiation Area will be required to wear appropriate respiratory protection while managing the waste. For those tasks determined to require the use of respirators, half-face respirators will be provided with a minimum protection factor of 10 against airborne particulate activity. Full-face respirators will also be provided (if needed) with a minimum protection factor of 50.

5. Any waste material spilled shall be immediately recovered and replaced within contained management. For spills greater than 100 Kg (220 lbs.), the spill must be reported to the NRC, Utah Division of Radiation Control, and the Utah Division of Water Quality within 48 hours of discovery. A follow-up written report of the spill shall be provided to these regulatory agencies within five working days of discovery of the spill. If a spill occurs within the truck staging area of the Truck Unloading Facility, then ~~follow-up clean-up~~ following cleanup the truck staging area will be radiologically surveyed to ensure that all spilled material has been removed.

6. Bulk waste which is accepted for management may not remain in a facility transport vehicle any longer than necessary. This includes overnight, during the lunch period, or to ~~await~~ while awaiting a delayed shift change. The same applies to buckets of earth-moving equipment or any open containers outside of approved storage areas.

7. Bulk wastes at the Rail Car Rollover Facility must be taken to the 11e.(2) Disposal Cell for disposal placement as soon as possible or within 24 hours after the most recent rail car or shipment has been unloaded. Bulk waste from only one generator and one waste type may be managed at any time at the Rail Car Rollover Facility.

8. Wastes in containers may not remain at the Rail Car Rollover Facility, the Truck Unloading Facility, or the concrete decontamination wash-down pads for longer than 48 hours unless additional time is approved by the Executive Secretary of the Radiation Control Board. Waste which does not meet the waste acceptance criteria may remain in the Truck Unloading Facility until the problem is resolved.

9. Containers will be moved within the Container Storage Pad by forklift, dump trucks, flatbed trailers, or other means. Rock trucks or other transport vehicles, which by virtue of their potential axle weight may damage the asphalt surface, will not be allowed on the Container Storage Pad.

10. Containers will be transported in a manner to prevent rupture or release. Containers should be transported as close to the ground as practical to minimize the distance a container could fall in the

BPW-4 11e.(2) INCOMING WASTE UNLOADING AND HANDLING

event of an accident. Containers will be moved only after it has been assured that the lids, covers, etc. have been replaced and the containers are in a closed, tight condition.

11. ~~Vehicles and waste conveyance and waste conveyance drivers shall adhere to all signs, warnings, and postings for traffic management when transporting waste within the Restricted Area. Anyone observed intentionally or deliberately violating posted warnings shall be subject to disciplinary action as deemed appropriate by the Site Manager.~~

12. The truck staging area of the Truck Unloading Facility shall be surveyed weekly when in use. As a precaution, the portion of equipment used to reach across and move containers over the "hot line" shall be radiologically surveyed daily and/or prior to use.

13. ^{WASTE MATERIALS} Bulk ~~shipments~~ may not be unloaded at the Truck Unloading Facility, LARW Container Storage or Bulk Transfer Area. ~~Conversely, cardboard boxes and bags meeting the criteria of strong,~~ ^{THIS IS A SENSITIVE FLUFF} tight containers are allowed to be unloaded at these facilities. However, management of 11e.(2) material in containers at the LARW Container Storage and Bulk Transfer Areas will be limited to transfer between vehicles.

14. Containers of 11e.(2) material may not be opened or set on the ground during the transfer at the LARW Container Storage and Bulk Transfer Areas.

15. The gates accessing the Truck Unloading Facility staging area will remain locked when not in operation. ^{SECURITY CONCERN} When the gates are open, a ~~Radiation Monitor-1~~ will monitor access to ensure security of the Restricted Area. Although the restricted portion of the unloading area (the hot side) is considered ~~a part of Envirocare's Restricted Area~~ ^{part of Envirocare's} Restricted Area with controlled access, the truck staging area will not be a part of the Restricted Area.

16. Any facilities used for both 11e.(2) and LARW waste management (listed in D.1 ~~above~~^{below}) must be cleaned before management of the other waste type (e.g., if 11e.(2) waste was managed last at a facility, the facility involved must be cleaned before management of LARW waste).

D. GENERAL INSTRUCTIONS:

1. This procedure applies to all 11e.(2) waste material received for management at Envirocare's South Clive Disposal Facility. Except during transport, wastes will be managed at the following waste management facilities:

- a. 11e.(2) Disposal Cells;
- b. Container Storage Pad;
- c. Bulk Storage Pad;
- d. Truck Unloading Facility;

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- ~~e. Rail Car Rollover Facility;~~
- ~~c. Bulk Storage Pad~~ *FE CONTAINER AND BULK TRANSFER AREA (CONTAINER TRANSFER ONLY)*
- ~~d. Truck Unloading Facility~~
- ~~e. Rail Car Rollover Facility~~
- ~~f. Decontamination Wash-Down Pads; and;~~
- ~~g. Mixed Waste Facility Run-Off Control Pond;~~
- ~~f. LARW Facility Runoff Control Pond~~

2. Upon ~~waste acceptance; it acceptance, waste~~ is managed as "bulk" or "containerized" waste material. Bulk waste materials are unloaded directly into the 11e.(2) Disposal Cells for placement or at the Rail Car Rollover Facility. Bulk waste unloaded at the Rail Car Rollover Facility is then taken to the 11e.(2) Disposal Cells for disposal placement. Bulk wastes may not be unloaded or handled at the Truck Unloading Facility, LARW Container Storage Pad, or LARW Bulk Transfer Area. The following types of bulk shipments may be received at the South Clive Site:

- a. Gondola Rail Cars;
- b. Intermodals;
- ~~c. Dump Truck Loads;~~
- ~~d. End Dump Transports;~~
- ~~c. Dump Truck Loads~~
- ~~d. End Dump Transports~~

3. 11e.(2) waste material in containers will ~~either be unloaded~~ be unloaded: directly onto the 11e.(2) Disposal Cells for placement; at the LARW Container Storage or Bulk Transfer Areas for management; at the Truck Unloading Facility; ~~or, or at~~ the Rail Car Rollover Pad. The following types of strong and tight containers may be received at the South Clive Site by highway or rail shipment or may be used by Envirocare to containerize bulk wastes:

- a. 96 ft³ B-25 boxes;
- b. 48 ft³ B-12 boxes;
- ~~c. 50 and 55 gallon drums;~~
- ~~d. over-pack drums;~~
- ~~e. various sizes of poly bags;~~
- ~~f. 20 yd³ Seavans; and;~~
- ~~g. other strong and tight containers.~~
- ~~c. 50 and 55 gallon drums~~
- ~~d. over-pack drums~~
- ~~e. various sizes of polyethylene bags~~
- ~~f. 20 yd³ Seavans~~
- ~~g. other strong and tight containers~~

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4. Prior to managing 11e.(2) wastes at any facilities listed in D.1 above, Envirocare will clean the area of LARW waste material until the residue of LARW material has been removed to remove LARW waste residue from the surface area of the facility, as determined by a qualified Radiation Technician Health Physics Specialist. The material removed will be managed as LARW waste material as outlined in reference 9 Reference 8, RW-4.
5. If any of the facilities listed in D.1 above have been used for management of 11e.(2) material, the facilities must be cleaned of 11e.(2) material under the same limitations as D.4 above for LARW waste removal. Waste material removed will be managed as described in section E.4 of this procedure.
6. Brooms, shovels, loaders, or other appropriate means will be used for cleaning until the material residue of the material has been removed from the surface area of the facility, as determined by a qualified Radiation Technician Health Physics Specialist.
7. Equipment and vehicles which are used for management of 11e.(2) waste will be cleaned of any loose material before being used for 11e.(2) management and before being placed into LARW waste management. Portions of equipment which carry the waste, i.e. (i.e., the buckets and beds,) will be cleaned to a limit of 500 grams per square foot average, with a maximum limit of 100 lbs. of waste total over the entire piece of equipment, as determined by a qualified Radiation Technician. This process Health Physics Specialist. This task may be performed at the facility being used for 11e.(2) waste management, the administration decontamination facility, or the 11e.(2) facility for 11e.(2) material removal; and in locations specified in reference 9 RW-4 Reference 8, RW-4, D.1 for LARW material.
8. If waste from shipments identified as Radiation Areas, (as defined in C.3 above, are) is to be placed in storage for longer than 10 days, they must be covered with an additional six inches of low activity waste or clean fill material to reduce gamma exposure and radon emissions.
9. Water generated from the management of 11e.(2) wastes in LARW facilities will be managed as follows:
 - a. Minimize the co-mingling of decontamination water between the LARW and 11e.(2) waste shipments by emptying the decontamination water tanks before initiation of decontamination of 11e.(2) waste shipment vehicles and again before recommending decontamination of LARW waste shipment vehicles.
 - b. Water removed from the decontamination facility that is contaminated with 11e.(2) wastes may be used either upon the 11e.(2) facility for engineering purposes or disposed of at the Mixed Waste Facility Run-Off Control Pond.

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- c. The same water vehicle may be used for both LARW and 11e.(2) decontamination water management if the vehicle has the required labels and is pumped empty between water types.

E. OPERATING INSTRUCTIONS:

1. Waste containers are unloaded and handled at South Clive Site facilities in accordance with Reference 1. Container shipments are unloaded by one of the following methods:

- a. Unloading containers from rail cars at the Container Storage and Bulk Transfer Pads:

- 1) ~~Upon acceptance for management, as signified by the ARCS Coordinator signing the applicable shipment's EC-18, the ARCS Coordinator~~ Shipping and Receiving Manager (SRM) signing the applicable shipment's EC-18, the SRM or Site Manager will direct that specific rail cars may be moved into Envirocare's Restricted Area for unloading and handling.
- 2) ~~A locomotive is used to move the rail cars into position next to the Container or Bulk Storage Pads~~ Storage Pad or LARW Container Bulk Transfer Pad.
- 3) ~~Ensure the storage pad has been cleaned according to General Instruction D.4 of this procedure (if applicable).~~
- 4) ~~Use a crane, forklift, or backhoe to unload the containers from the rail cars onto the Container or Bulk Storage Pads~~ Storage Pad or LARW Container Bulk Transfer Pad for transfer.
- 5) ~~Record the specific~~ Record the time and date of unloading on the Work Permit for the particular EC-18 for that shipment. REMOVE

- b. Unloading containers from trucks at the Container Storage Pads, the Rail Car Rollover Pad, or directly onto the 11e.(2) Disposal Cells:

- 1) ~~Upon acceptance for management, as signified by the ARCS Coordinator~~ SRM signing the applicable shipment's EC-18, the ARCS Coordinator's EC-18, the SRM or Site Manager will direct that specific trucks may be moved to the proper area for unloading and handling.
- 2) ~~Trucks delivering containerized waste are escorted to the unloading location.~~

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- 3) ____ Use a crane, forklift, or other equipment to unload containers from trucks onto the Rail Car Rollover Pad, Container Storage Pad, or Bulk Transfer Pad for management, or directly onto the 11e.(2) Disposal Cells for placement.

Note: Ensure that the sampling requirements have been met or that the designated Disposal Cell has had an elevational survey completed in accordance with rReference 7 prior to placing the waste in the 11e.(2) Disposal Cell.

- 4) ~~Record the specific~~ Record the time and date of unloading on the EC-18 for the particular shipment.

c. Unloading containers from trucks at the Truck Unloading Facility:

- 1) ____ The Truck Unloading Facility is used for unloading and as a staging area for waste inspection, waste sampling, and non-bulk waste transfer in a manner which eliminates the need for decontamination of highway shipment vehicles.

- 2) ____ Delivery trucks are moved into the truck staging area for review of the manifest and shipping papers, survey of the freight containers, smear testing of the external surfaces of the freight container, and the visual inspection of the freight containers and packages for physical integrity and/or for signs of visible material on the exterior or loose in the conveyance.

- 3) ____ If otherwise acceptable, trucks are then unloaded by:

-* ____ container movement across the hot line from the sides or end of the trucks by cranes, backhoes used as a crane, forklifts, or other methods while the unloading equipment remains inside the Restricted Area.

-* ____ container movement from the ends of closed trucks or trailers by forklift or other equipment, where the unloading equipment enters the bed of the truck during unloading.

-* ____ container movement directly onto the Restricted Area of the Truck Unloading Facility to await sampling, or onto trucks for management or for disposal in the 11e.(2) Disposal Cells. For shipments destined to be off-loaded directly onto an embankment disposal cell, a qualified QC Technician must inspect the ~~shipment while still in the container~~ ^{shipment} for volume and debris estimates as outlined in step E.2 of procedure BPW-5. Otherwise, the volume estimation must be based upon the manifested volume.

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Note: Ensure the sampling requirements have been met or that the designated Disposal Cell has had an elevational survey completed in accordance with ~~r~~Reference 7 prior to placing the waste in the 11e.(2) Disposal Cell.

4) ~~Record the specific~~ Record the time and date of unloading on the EC-18 for the ~~particular~~ shipment.

5) After unloading, shipments which require sampling remain in the Restricted Area of the Truck Unloading Facility until sampling and testing are complete. The delivery trucks are released and allowed to leave the truck staging area to ~~allow other trucks to be unloaded.~~

~~-t*~~ The portion of the delivery truck used to transport the waste is surveyed prior to release in accordance with ~~reference 9~~ Reference 8, AC-4. Enter the release information on the EC-18 for the ~~at~~ shipment. If these areas ~~are less than results are below~~ the release limits, the truck will be released without further decontamination or survey.

~~-t*~~ Trucks which fail to meet the applicable release limits are moved within the Restricted Area for decontamination and are then fully released in accordance with ~~p~~ Procedure AC-4 of this manual.

6) Inspect and sample the waste shipment in accordance with reference 9 Reference 8, BPW-3.

7) Upon acceptance for management, as signified by the ARCS Coordinator SRM signing the applicable shipment's EC-18 ~~upon report from the Laboratory of the waste shipment's acceptability, the ARCS Coordinator's EC-18, the SRM or Site Manager will direct that the waste be moved to the 11e.(2) Disposal Cells, the LARW Container Storage or Bulk Transfer Pads for transfer, or the shipment may remain in the Truck Unloading Facility for no greater~~ more than 48 hours.

8) Wastes determined to be unacceptable must remain in the Truck Unloading Facility until the acceptance problems are resolved or the shipment is reloaded onto a delivery truck for return. The ARCS Coordinator SRM or Site RSO will contact Envirocare Business Development via a Problem Report (EC-27002) concerning the unacceptable shipment. Business Development will notify the generator, NRC, and the Utah Division of Radiation Control for resolution See the Envirocare Problem Reporting Plan for details.

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2. Bulk shipments are unloaded and handled at the South Clive Site in accordance with ~~ref~~Reference 1. Bulk shipments are unloaded by one of the following methods:

a. Unloading rail cars at the Rail Car Rollover Facility:

- 1) ~~Upon acceptance for management, as signified by the ARCS Coordinator~~SRM signing the applicable shipment's ~~EC-18, the ARCS Coordinator's EC-18, the SRM or Site Manager will direct that specific rail cars may be moved into the Envirocare Restricted Area for unloading and handling.~~
- 2) ~~Prior to unloading the rail cars, the lids if used, are removed. Use the spreader bars immediately behind the entrance gate. Rail car lids, if used, are removed prior to unloading. Use spreader bars and a crane or forklift to remove the lids.~~
- 3) ~~Once the requirement of General Instruction Once~~ D.4 above is satisfied, a locomotive moves the rail cars into the Rollover Facility one at a time.
- 4) ~~The Rail Car Rollover Facility operator ensures everyone is clear of the rollover and of the concrete pad beneath the rollover and that all personnel in the vicinity have been informed of the upcoming rollover event.~~
- 5) ~~The cars are unloaded by locking the rail cars into the Rail Car Rollover Facility and rolling the rail cars over. The waste material then falls beneath the rollover onto the concrete pad.~~
- 6) ~~When the Facility operator indicates an all clear condition, a backhoe or front-end loader then loads the waste into dump trucks or Rock trucks which haul the waste directly to the 11e.(2) Disposal Cells. Material that is dumped by the rollover may also be containerized for storage.~~

Note: Ensure the sampling requirements have been met or that the designated Disposal Cell has had an elevational survey completed in accordance with ~~r~~Reference 7 prior to placing the waste in the 11e.(2) Disposal Cell.

- 7) ~~Record the specific~~ Record the time and date of disposal on the Work Permit for the particular ~~EC-18 for that shipment.~~

b. Unloading of Bulk Shipments by Dump Trucks or End Dumps:

BPW-4 11e.(2) INCOMING WASTE UNLOADING AND HANDLING

- 1) ~~Upon acceptance for management, as signified by the ARCS CoordinatorSRM signing the applicable shipment's EC-18, the ARCS Coordinator's EC-18, the SRM or Site Manager will direct that specific trucks may be moved into the Envirocare Restricted Area for unloading and handling.~~
 - 2) ~~Dump-t~~ Dump Trucks or End Dumps bringing waste to the facility should either be unloaded directly onto the 11e.(2) Disposal Cells, or Rail Car Rollover Pad for management.
 - 3) ~~Trucks delivering bulk wastes should be escorted to the unloading location.~~
 - 4) ~~Record the specific~~ Record the time and date of unloading on the EC-18 for the particular shipment.
3. Wastes are stored in accordance with the requirements specified for containerized waste storage in ~~r~~References 1, 8, and 9.

F. QUALITY CONTROL:

1. QC Process Control:
2. Sample Control: ~~None~~
3. Data Control:
 - a. Placement of waste material is controlled by use of Form EC-18 to record the date and time of unloading for management, the date and time of waste disposal, and the location of placement.
 - b. ~~Records are maintained~~ of the daily Health Physics Department facility inspections ~~are maintained~~ in accordance with reference ~~9~~Reference 8, ADMIN-3.
4. Audit Requirements:
 - a. Daily: The South Clive Site Health Physics Department conducts daily inspections of the facility to ensure the ~~r~~Reference 1 requirements are complied with.
 - b. ~~Semi-annually, t~~: The QA Officer will coordinate a comprehensive audit of waste handling and unloading operations.

BPW-4 11e.(2) INCOMING WASTE UNLOADING AND HANDLING

A. **PURPOSE:** This procedure is designed to provide a consistent method for unloading and handling 11e.(2) incoming-shipment wastes, to ensure the waste is handled in accordance with regulatory requirements, and to contain spills of radioactive material during unloading and transportation operation. This procedure also aids in ensuring that the incoming-shipment wastes are handled such that the natural soils and/or ground water are not contaminated with waste material nor that uncontrolled release of contaminated material be allowed outside of Envirocare's Restricted Areas.

B. **REFERENCES OR AUTHORITY:**

1. 11e.(2) Radioactive Material License SMC-1559, dated 11/19/93;
2. Application for Radioactive Material License SMC-1559, dated 12/23/91, as amended;
3. Envirocare of Utah, Inc - Quality Assurance Manual;
4. 40 CFR 261;
5. 10 CFR 20.1902;
6. Ground Water Quality Discharge Permit #UGW450005, dated 9/10/93; and,
7. Envirocare Construction QA/QC Manual.

C. **PRECAUTIONS AND LIMITATIONS:**

1. Any waste which is determined to be a hazardous waste or to exceed the restrictions of references 1 or 6, Table 3, shall not be unloaded or handled in the 11e.(2) Waste Management Facility. Such waste must be handled and disposed of elsewhere in compliance with all other applicable regulations, or returned to its place of origin. If a disposed waste is discovered to be a hazardous waste or to exceed the limits of reference 1 or 6, Envirocare must follow the Contingency Plan for Non-Conforming Results in reference step D.6 of OP Manual Procedure BPW-3.

2. Incoming-shipments are checked for the presence of free liquids in accordance with OP Manual procedures BPW-2 and BPW-3. If a shipment arrives at the site and is observed to contain free liquids or fails the Paint Liquid Filter Test (PFLT), it will not be accepted for storage or disposal.

3. Rail cars or trucks containing more than 1,000 pCi/g of any radionuclide, or which have a gamma dose rate measured at 1 meter from any surface of 5 rem per hour will be considered "**high activity shipments.**" Such rail cars or trucks will be identified on arrival by placing a "Caution, Radiation Area" sign on each side of the waste conveyance, as described in reference 5. If there will be a delay of more than 24 hours in emptying the shipment, it will be roped off, or otherwise segregated, to control access to the radiation area around the shipment.

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4. All workers, other than truck drivers in closed trucks, involved in unloading or disposal of **high activity waste** will be required to wear full-face respirators that provide a respiratory intake protection factor of 50.
5. Any waste material spilled shall be immediately recovered and replaced within contained management. For spills outside of contained management greater than 100 Kg (220 lbs.), the spill must be reported to the NRC, Utah Division of Radiation Control, and the Utah Division of Water Quality within 48 hours of discovery. A follow-up written report of the spill shall be provided to these regulatory agencies within five working days of discovery of the spill. If a spill occurs within the truck staging area of the Truck Unloading Facility, then follow-up clean-up, the truck staging area will be radiologically surveyed to ensure that all spilled material has been removed.
6. Bulk waste which is accepted for management may not remain in a facility transport vehicle any longer than necessary. This includes overnight, during the lunch period, or to await a delayed shift change. The same applies to buckets of earth-moving equipment or any open containers outside of approved storage areas.
7. Bulk wastes at the Rail Car Rollover Facility must be taken to the 11e.(2) Disposal Cell for disposal placement as soon as possible or within 24 hours after the most recent rail car or shipment has been unloaded. Bulk waste from only one generator and one waste type may be managed at a time at the Rail Car Rollover Facility.
8. Wastes in containers may not remain at the Rail Car Rollover Facility, the Truck Unloading Facility, or the concrete decontamination wash-down pads for longer than 48 hours unless additional time is approved by the Executive Secretary of the Radiation Control Board. Waste which does not meet the waste acceptance criteria may remain in the Truck Unloading Facility until the problem is resolved.
9. Containers will be moved within the Container Storage Pad or Truck Unloading Facility by forklift, dump trucks, flatbed trailers, or other means. Rock trucks or other transport vehicles, which by virtue of their potential axle weight may damage the asphalt surface, will not be allowed on the Container Storage Pad.
10. Containers will be transported in a manner to prevent rupture or release. Containers should be transported as close to the ground as practical to minimize the distance a container would fall in the event of an accident. Containers will be moved only after it has been assured that the lids, covers, etc. have been replaced and the containers are in a closed, tight condition.
11. Vehicles and waste conveyances shall adhere to all signs, warnings, and postings for traffic management when transporting waste within the Restricted Area. Anyone observed

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intentionally or deliberately violating posted warnings shall be subject to disciplinary action as deemed appropriate by the Site Manager.

12. The truck staging area of the Truck Unloading Facility shall be surveyed weekly when in use. As a precaution, the portion of equipment used to reach across and move containers over the "hot line" shall be radiologically surveyed daily and/or prior to use.

13. Bulk shipments **may not** be unloaded at the Truck Unloading Facility. Conversely, cardboard boxes and bags meeting the criteria of strong, tight containers **are allowed** to be unloaded at the Truck Unloading Facility.

14. The gates accessing the Truck Unloading Facility staging area will remain locked when not in operation. When the gates are open, a Radiation Monitor-I will monitor access to ensure security of the Restricted Area. Although the radiation restricted portion of the unloading area (the hot side) is considered a part of Envirocare's Restricted Area with controlled access, the truck staging area will not be a part of the radiation Restricted Area.

15. Any facilities used for both 11e.(2) and LARW waste management (listed in D.1 above) must be cleaned before management of the other waste type (e.g. if 11e.(2) waste was managed last at a facility, the facility involved must be cleaned before management of LARW waste).

D. GENERAL INSTRUCTIONS:

1. This procedure applies to all 11e.(2) waste material received for management at Envirocare's Clive Site Disposal Facility. Except during transport, wastes will be managed at the following waste management facilities:

- a. 11e.(2) Disposal Cells;
- b. Container Storage Pad (for transfer);
- c. Bulk Storage Pad (for transfer);
- d. Truck Unloading Facility;
- e. Rail Car Rollover Facility;
- f. Decontamination Wash-Down Pads; and,
- g. Mixed Waste Facility Run-Off Control Pond.

2. Upon waste acceptance, it is managed as "bulk" or "containerized" waste material. Bulk waste materials are unloaded directly into the 11e.(2) Disposal Cells for placement, or at the Rail Car Rollover Facility. Bulk waste unloaded at the Rail Car Rollover Facility may be taken to the 11e.(2) Disposal Cells for disposal placement, the Bulk Storage Pad for transfer, or may be placed into containers for management on the Container Storage Pad. Bulk waste unloaded at the Bulk Storage Pad may be taken to the 11e.(2) Disposal Cells for disposal placement or storage, or may be placed into containers for management on the Container

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Storage Pad. Bulk wastes may not be unloaded or handled at the Truck Unloading Facility. The following types of bulk shipments may be received at the Clive Site:

- | | | | |
|----|--------------------|----|----------------------|
| a. | Gondola Rail Cars; | c. | Intermodals; and, |
| b. | Dump Truck Loads; | d. | End Dump Transports. |

3. 11e.(2) waste material in containers will either be unloaded directly onto the 11e.(2) Disposal Cells for placement, the Container Storage Pad for management, or the Truck Unloading Facility or Rail Car Rollover Pad for interim storage of less than 48 hours duration. The following types of strong and tight containers may be received at the Clive Site by highway or rail shipment or may be used by Envirocare to containerize bulk wastes:

- a. 96 ft³ B-25 boxes;
- b. 48 ft³ B-12 boxes;
- c. 50 and 55 gallon drums;
- d. over-pack drums;
- e. various sizes of poly bags;
- f. 20 yd³ Seavans; and,
- g. other strong and tight containers.

4. Prior to managing 11e.(2) wastes at any of the facilities listed in D.1 above, Envirocare will clean the area of LARW waste material until the residue of LARW material has been removed from the surface area of the facility, as determined by a qualified Radiation Technician. The material removed will be managed as LARW waste material as outlined in OP Manual Procedure RW-4.

5. If any of the facilities listed in D.1 above have been used for management of 11e.(2) material, the facilities must be cleaned of 11e.(2) material under the same limitations as D.4 above for LARW waste removal. Waste material removed will be managed as described in section E.4 of this procedure.

6. Brooms, shovels, loaders, or other appropriate means will be used for cleaning until the residue of the material has been removed from the surface area of the facility, as determined by a qualified Radiation Technician.

7. Equipment and vehicles which are used for management of 11e.(2) waste will be cleaned of any loose material before being used for 11e.(2) management and before being placed into LARW waste management. Portions of equipment which carry the waste, i.e. the buckets and beds, will be cleaned to a limit of 500 grams per square foot average, as determined by a qualified Radiation Technician. This process may be performed at the facility being used for 11e.(2) waste management, the administration decontamination facility, or the

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11e.(2) facility for 11e.(2) material removal, and in locations specified in OP Manual Procedure RW-4 D.1 for LARW material.

8. If "**high activity wastes**", as defined in C.3 above, are to be placed in the storage area, they must be covered with an additional six inches of low activity waste or clean fill material to reduce gamma exposure and radon emissions.

9. Water generated from the management of 11e.(2) wastes in LARW facilities will be managed as follows:

- a. Minimize the co-mingling of decontamination water between the LARW and 11e.(2) waste shipments by emptying the decontamination water tanks before initiation of decontamination of 11e.(2) waste shipment vehicles and again before recommending decontamination of LARW waste shipment vehicles.
- b. Water removed from the decontamination facility that is contaminated with 11e.(2) wastes may be used either upon the 11e.(2) facility for engineering purposes or disposed of at the Mixed Waste Facility Run-Off Control Pond.
- c. The same water vehicle may be used for both LARW and 11e.(2) decontamination water management if the vehicle has the required labels and is pumped empty between water types.

E. OPERATING INSTRUCTIONS:

1. Waste containers are unloaded and handled at Clive Site facilities in accordance with reference 1. Container shipments are unloaded by one of the following methods:

- a. **Unloading containers from rail cars at the Container Bulk Storage Pads.**
 - 1) Upon acceptance for management, as signified by the ARCS Coordinator signing the applicable shipment's EC-18, the ARCS Coordinator or Site Manager will direct that specific rail cars may be moved into Envirocare's Restricted Area for unloading and handling.
 - 2) A locomotive is used to move the rail cars into position next to the Container or Bulk Storage Pads.
 - 3) Ensure the storage pad has been cleaned according to General Instruction D.4 of this procedure (if applicable).

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- 4) Use a crane, forklift, or backhoe to unload the containers from the rail cars onto the Container or Bulk Storage Pads for transfer.
 - 5) Record the specific time and date of unloading on the Work Permit for the particular shipment.
- b. Unloading containers from trucks at the Container Storage Pads, the Rail Car Rollover Pad, or directly onto the 11e.(2) Disposal Cells.**
- 1) Upon acceptance for management, as signified by the ARCS Coordinator signing the applicable shipment's EC-18, the ARCS Coordinator or Site Manager will direct that specific trucks may be moved to the proper area for unloading and handling.
 - 2) Trucks delivering containerized waste are escorted to the unloading location.
 - 3) Use a crane, forklift, or other equipment to unload containers from trucks onto the Rail Car Rollover Pad for interim storage of less than 48 hours, onto the Container Storage Pad for management, or directly onto the 11e.(2) Disposal Cells for placement. For shipments destined to be off-loaded directly onto an embankment disposal cell, a qualified QC Technician must inspect the shipment while still in the container for volume and debris estimates as outlined in step E.2 of procedure BPW-5. Otherwise, the volume estimation must be based upon the manifested volume. Ensure General Instruction D.4 has been satisfied.
- Note: Ensure the sampling requirements have been met or that the designated Disposal Cell has had an elevational survey completed in accordance with reference 7 prior to placing the waste in the 11e.(2) Disposal Cell. Ensure the QC Technicians have determined the amount of debris fill needed (if any) prior to placement of the waste material into a disposal cell.**
- 4) Record the specific time and date of unloading on the Work Permit for the particular shipment.
- c. Unloading containers from trucks at the Truck Unloading Facility.**
- 1) The Truck Unloading Facility is used for unloading and as a staging area for waste inspection, waste sampling, and non-bulk waste transfer in a manner which eliminates the need for decontamination of highway shipment vehicles.

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2) Delivery trucks are moved into the truck staging area for review of the manifest and shipping papers, survey of the freight containers, smear testing of the external surfaces of the freight containers, and the visual inspection of the freight containers and packages for physical integrity and/or for signs of visible material on the exterior or loose in the conveyance.

3) If otherwise acceptable, trucks are then unloaded by:

- container movement across the hot line from the sides or end of the trucks by cranes, backhoes used as a crane, forklifts, or other methods while the unloading equipment remains inside the Restricted Area.

- container movement from the ends of closed trucks or trailers by forklift or other equipment, where the unloading equipment enters the bed of the truck during unloading.

- container movement directly onto the Restricted Area of the Truck Unloading Facility to await sampling, or onto trucks for management or for disposal in the 11e.(2) Disposal Cells. For shipments destined to be off-loaded directly onto an embankment disposal cell, a qualified QC Technician must inspect the shipment while still in the container for volume and debris estimates as outlined in step E.2 of procedure BPW-5. Otherwise, the volume estimation must be based upon the manifested volume.

Note: Ensure the sampling requirements have been met or that the designated Disposal Cell has had an elevational survey completed in accordance with reference 7 prior to placing the waste in the 11e.(2) Disposal Cell. Ensure the QC Technicians have determined the amount of debris fill needed (if any) prior to placement of the waste material into a disposal cell.

4) Record the specific time and date of unloading on the Work Permit for the particular shipment.

5) After unloading, shipments which require sampling remain in the Restricted Area of the Truck Unloading Facility until sampling and testing are complete. The delivery trucks are released and allowed to leave the truck staging area to allow other trucks to be unloaded.

- the portion of the delivery truck used to transport the waste is surveyed prior to release in accordance with OP Manual procedure AC-4. Enter

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the release information on the EC-18 for the shipment. If these areas are less than the release limits, the truck will be released without further decontamination or survey.

- trucks which fail to meet the applicable release limits are moved within the Restricted Area for decontamination and are then fully released in accordance with procedure AC-4 of this manual.

6) Inspect and sample the waste shipment in accordance with OP Manual procedure BPW-3.

7) Upon acceptance for management, as signified by the ARCS Coordinator signing the applicable shipment's EC-18 upon report from the Laboratory of the waste shipment's acceptability, the ARCS Coordinator or Site Manager will direct that the waste be moved to the 11e.(2) Disposal Cells, the Container Storage Pad, or the shipment may remain in the Truck Unloading Facility for no greater than 48 hours.

8) Wastes determined to be unacceptable must remain in the Truck Unloading Facility until the acceptance problems are resolved or the shipment is reloaded onto a delivery truck for return. The ARCS Coordinator or Site RSO will contact Envirocare Business Development via Problem Report (EC-2700) concerning the unacceptable shipment. Business Development will notify the generator, NRC, and the Utah Division of Radiation Control for resolution.

2. Bulk shipments are unloaded and handled at the Clive Site in accordance with ref. 1. Bulk shipments are unloaded by one of the following methods:

a. Unloading rail cars at the Rail Car Rollover Facility.

1) Upon acceptance for management, as signified by the ARCS Coordinator signing the applicable shipment's EC-18, the ARCS Coordinator or Site Manager will direct that specific rail cars may be moved into the Envirocare Restricted Area for unloading and handling.

2) Prior to unloading the rail cars, the lids if used, are removed. Use the spreader bars immediately behind the entrance gate and a crane or forklift to remove the lids.

3) Once the requirement of General Instruction D.4 above is satisfied, a locomotive moves the rail cars into the Rollover Facility one at a time.

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- 4) The Rail Car Rollover Facility operator ensures everyone is clear of the rollover and of the concrete pad beneath the rollover and that all personnel in the vicinity have been informed of the upcoming rollover event.
- 5) The cars are unloaded by locking the rail cars into the Rail Car Rollover Facility and rolling the rail cars over. The waste material then falls beneath the rollover onto the concrete pad.
- 6) When the Facility operator indicates an all clear condition, a backhoe or front-end loader then loads the waste into dump trucks or Rock trucks which haul the waste directly to the 11e.(2) Disposal Cells. Material that is dumped by the rollover may also be containerized for storage.

Note: Ensure the sampling requirements have been met or that the designated Disposal Cell has had an elevational survey completed in accordance with reference 7 prior to placing the waste in the 11e.(2) Disposal Cell. Ensure the QC Technicians have determined the amount of debris fill needed (if any) prior to placement of the waste material into a disposal cell.

- 7) Record the specific time and date of disposal on the Work Permit for the particular shipment.

b. Unloading rail cars at the Bulk Storage Pad.

- 1) Upon acceptance for management, as signified by the ARCS Coordinator signing the applicable shipment's EC-18, the ARCS Coordinator or Site Manager will direct that specific rail cars may be moved into the Envirocare Restricted Area for unloading and handling.
- 2) A locomotive moves the rail cars adjacent to the Bulk Storage Pad.
- 3) Prior to unloading the rail cars, the lids are removed. Use the spreader bars immediately behind the entrance gate and a crane or forklift to remove the lids.
- 4) Using care not to spill waste material, the rail cars are unloaded by backhoe into trucks which haul the waste to the 11e.(2) Disposal Cells, or into containers for management. If waste material is spilled outside the Bulk Storage Pad, it shall be immediately reclaimed in accordance with Precaution and Limitation 5.

Note: Ensure the sampling requirements have been met or that the designated Disposal Cell has had an elevational survey completed in accordance with reference 7 prior to placing the waste in the 11e.(2) Disposal Cell. Ensure the QC

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Technicians have determined the amount of debris fill needed (if any) prior to placement of the waste material into a disposal cell.

5) Record the specific time and date of unloading on the Work Permit for the particular shipment.

c. Unloading of Bulk Shipments by Dump Trucks or End Dumps.

1) Upon acceptance for management, as signified by the ARCS Coordinator signing the applicable shipment's EC-18, the ARCS Coordinator or Site Manager will direct that specific trucks may be moved into the Envirocare Restricted Area for unloading and handling.

2) Dump trucks or End Dumps bringing waste to the facility should either be unloaded directly onto the 11e.(2) Disposal Cells, or Rail Car Rollover Pad for management.

3) Trucks delivering bulk wastes should be escorted to the unloading location.

4) For shipments off-loaded directly onto an embankment disposal cell, a qualified QC Technician must inspect the shipment while still in the container for volume and debris estimates. Otherwise, the volume estimation must be based upon the manifested volume.

5) Record the specific time and date of unloading on the Work Permit for the particular shipment.

3. Wastes are stored in accordance with the requirements specified for containerized waste storage in reference 1 and OP Manual procedure BPW-6.

F. QUALITY CONTROL:

1. Sample Control: None

2. Data Control:

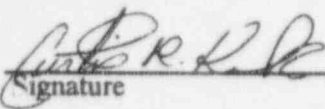
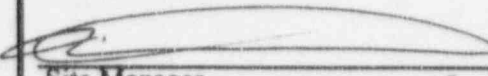
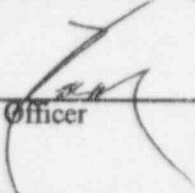
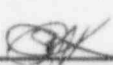
a. Placement of waste material is controlled by use of Form EC-18 to record the date and time of unloading for management, the date and time of waste disposal, and the location of placement.

b. Records are maintained of the daily Health Physics Department facility inspections in accordance with OP Manual procedure ADMIN-3.

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3. Audit Requirements:
 - a. The Clive Site Health Physics Department conducts daily inspections of the facility to ensure the reference 1 requirements are complied with.
 - b. Semi-annually, the QA Officer will coordinate a comprehensive audit of waste handling and unloading operations.

ENVIROCARE OF UTAH, INC. OPERATING PROCEDURES MANUAL

PROCEDURE:	<u>BPW-5 11e.(2) Waste Disposal</u>
REVISION NUMBER:	<u>4</u>
AFFECTED PAGES:	<u></u>
PURPOSE:	<u>Revise with new license requirements</u>
SUBMITTED BY:	<u>Curtis Kirk</u>
<u></u> Signature	Date <u>12-9-96</u>
FORWARDED:	
<u></u> Site Manager	ACTING Date <u>12-16-96</u>
<u></u> Site Radiation Safety Officer	Date <u>12-20-96</u>
<u></u> Quality Assurance Officer	Date <u></u>
CONCURRENCE:	
<u>N/A </u>	Date <u>12/9/96</u>
REVIEW:	
<u></u> Corporate Radiation Safety Officer	Date <u></u>
APPROVAL:	
<u></u> Project Manager/Operations Director	Date <u></u>

9702140259

BPW-5 11e.(2) WASTE DISPOSAL

A. PURPOSE:

_____ This procedure provides guidelines for proper placement of radioactive waste material into the appropriate 11e.(2) disposal embankment. -

B. REFERENCE OR AUTHORITY:

1. 11e.(2) Radioactive Material License SMC-1559, dated 11/19/93, as amended;
2. Application for 11e.(2) Radioactive Material License SMC-1559, dated 12/23/91, as amended;
3. Groundwater Quality Discharge Permit # UGW450005, as amended, dated 03/20/92;
4. Envirocare of Utah, Inc. Construction QA/QC Manual, as revised
5. Envirocare of Utah, Inc. Operating Procedures Manual; ~~Construction~~, as revised QA/QC Manual;
6. Envirocare of Utah, Inc. Quality Assurance Manual, as revised;
7. Envirocare of Utah Waste Management Plan, as amended.

C. PRECAUTIONS AND LIMITATIONS:

1. Always wear gloves when handling waste material to prevent possible skin contamination.
2. All workers, other than truck drivers in closed trucks, involved in unloading or disposal of waste from shipments identified as Radiation Areas, as defined in OP Manual BPW-4 C.3, will be; will be required to wear appropriate respiratory protection. -For those tasks determined to required the use of respirators, half-face respirators will be provided with a minimum protection factor of 10 against airborne particulates. -Full-face respirators will also be provided (if necessary) with a minimum protection factor of 50. ~~involved in unloading or disposal of high activity waste, as defined in OP Manual Procedure BPW-4 C.3, will be required to wear full face respirators providing protection factor of 50.~~
3. When testing or surveying is performed on an active lift area, the testing personnel must make eye contact with and receive a hand signal from all excavation vehicle operators working the active area.
4. ~~To prevent w~~Wind dispersal of waste material will be addressed in accordance with ~~R~~reference 7, ~~a polymer solution will be sprayed bi-weekly on all exposed contaminated cell areas, and on any 11e.(2) Disposal Cells which have been disturbed in the previous two weeks but are not currently active.~~

_____ a _____ Each spring after the waste is no longer frozen, but in no case later than March 1, the year's initial application of polymer shall be made.

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- ~~b. The year's final application of polymer will be made before November 1 of any calendar year. Application of polymer is not required when the waste remains frozen.~~

5. During periods of high winds (winds in excess of 40 miles per hour), movement and placement of bulk waste material must be shut down.

D. GENERAL INSTRUCTIONS:

1. This procedure applies to the disposal and placement of all waste material in the 11e.(2) embankment at the Envirocare South Clive Disposal Facility.

2. Each lift of waste material shall be given a discrete designation (zone name and lift number) for testing and surveying purposes.

3. Each lift of waste material shall be approved as "placed" upon satisfactory completion of compaction, moisture, and thickness testing requirements.

- a. Each lift shall be compacted to 90 percent of a standard Proctor performed for each generator or fill material.
- b. A lift shall have a moisture content from zero to 3 percent over optimum based on ASTM standard D598.
- c. Waste material is placed in lifts with an uncompacted thickness not exceeding 12 inches.

4. All soil density and moisture tests shall be performed with a licensed nuclear moisture/density gauge or by the sand cone method.

5. To insure proper calibration, a sand cone density test shall be performed jointly with five percent of all nuclear density tests for waste material. Also, an oven-drying test shall be performed jointly with five percent of all nuclear moisture tests.

6. All waste placement in the 11e.(2) embankment will be documented in the Waste Placement Record (EC-0250) by a Quality Control Engineering Technician (or designated alternate) or Quality Assurance personnel.

7. Wastes from shipments identified as Radiation Areas, as defined in Reference 5, BPW-4 C.3, that are placed in the disposal cell must be covered with low activity waste or six inches of clean fill after final compaction if that portion of the lift will be inactive for more than 10 working days. High Activity Waste, as defined in OP Manual Procedure BPW-4 C.3, placed in the disposal cell must be covered with low activity waste or four inches or more of clean fill after final compaction in order to

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reduce gamma exposures to workers on subsequent lifts, unless the subsequent lifts are also high activity waste (reference 1):

8. Wastes placed within 10 feet of the top or sides of the disposal cell must not exceed an average of 500 pCi/g of ^{226}Ra or ^{230}Th and must not exceed 1,000 pCei/g for those isotopes in any shipment in order to prevent radon emissions at the surface of the radon barrier from exceeding 20 pCei/m²/s. ~~High Activity Wastes, as defined in OP Manual Procedure BPW-4 C.3, will not be placed~~ closer than 10 feet from the top or sides of a disposal cell to prevent high radon emissions.

9. No shipment with average concentrations exceeding 500 pCei/g of ^{226}Ra or ^{230}Th will be placed within 2 feet of the top or sides of the cell. An approved model for radon emanation will be run after completion of the upper lifts and before placement of the radon barrier to confirm that any layering of wastes with average concentrations of more than 500 pCei/g per lift will meet the design criterion for radon release at the surface of the completed cell.

10. Any movement of waste material after it has been placed must be documented by the Quality Control (QC) Officer or QC Engineering Technician on the QC Daily Construction Report and Lift Approval Form must be assigned a new zone specification and lift number. The change of location coordinates will be recorded in the Waste Placement Record.

11. A minimum of four classification tests will be conducted each year waste is placed. At least two classification tests shall be performed for each large generator (a generator disposing of 50,000 cubic yards or more). If there is a change of material for a large generator, a new classification will be performed.

12. All debris placed within a lift must be uniformly distributed throughout the lift. It should be distributed so that adequate space is provided for fill between the debris to enable compaction according to the guidelines given in D.3 above.

13. A lift shall not contain more than ten percent by volume of non-compactable debris (unless in the form of stone, concrete or solid metal). Non-compactable debris is defined as any waste material that:

- a. Has a gradation that will not pass through a four inch grizzly; and,
- b. Has a density less than 70 pounds per cubic foot dry weight.

14. Non-compactable debris in the form of stone, concrete or solid metal may be placed up to 25 percent by volume of a lift if the debris is placed to minimize any void space in the lift.

15. A lift may not consist of more than a total of 25 percent by volume of any type of non-compactable debris (reference 4).

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16. Debris shall not be placed in the outermost two feet of the disposal embankment. --Debris-free material is defined as: a) material which contains less than one percent debris volume, and b) debris where the maximum volume of any individual piece is less than or equal to 0.1 cubic foot.
17. Waste material shall ~~only~~ be placed in winter only when the required moisture and compaction requirements, as listed in D.3 above, can be met. --For waste placement purposes, winter is defined as November 1 to March 1. --To assure compliance ~~of~~ with this requirement:
- a. On November 1, decrease density and moisture lot size to 750 cubic yards.
 - b. On December 1, and continuing to March 1, decrease density and moisture lot size to 500 cubic yards.
18. No frozen material shall be placed within 24 inches of the clay liner. --Frozen material is defined as material which cannot meet the compaction requirements (as listed in D.3) because of frozen water mixed within the material.
19. After October 1 of any given year, placement of waste in any defined zone shall be stopped when two consecutive compaction tests fail due to frozen material. --The first "unapproved" lift shall be defined as "winter blanket."
- a. Winter blanket can be temporarily managed in piles up to ten feet on the embankment.
 - b. Winter blanket cannot be placed on slopes steeper than 5H:1V.
 - c. If waste stored as winter blanket is classified as high activity waste, as defined in Reference 5, OP-Manual BPW-4 C.3, it must be covered with low activity waste or six inches of clean fill material to reduce gamma exposure and radon emissions.
 - d. All winter blanket shall be placed to final specifications within 90 days after spring start-up, and in no case later than June 1.
20. Prior to placing another generator's waste on top of waste from another generator whose laboratory tests have not yet been received, the top of the lift will be surveyed at a minimum rate of one survey point for every 800 square feet of lift.
21. When new lifts are placed next to old lifts, at least 3 feet; (measured horizontally;) shall be removed from the outer edge of the old lift. --In addition to the density testing of the lift, an average of one density test per three lifts shall be performed at the old/new lift interfaces.

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22. When waste material is to be placed and the work area is covered with snow, the snow must be removed prior to placement.

E. OPERATING INSTRUCTIONS:

1. A QC Engineering Technician directs the contractor to have waste transported to an appropriate embankment location (with the concurrence of the Site Manager) upon obtaining approval for placement from the Site Manager or Shipping and Receiving Manager (SRM)-ARCS.

2. When receiving material to be placed directly in the cell, a QC Engineering Technician (or qualified designated alternate) shall visually inspect the shipment, calculate the percentage of debris, and record on the Lift Approval Form ~~Daily Construction Report~~ the amount of fill required to meet the volume ratios specified in D.103 through D.125 above. If the debris volume cannot be determined visually, or if the calculated debris volume is close to the specified limits, the RSR will be consulted for the manifested volume.

3. The contractor is directed to uniformly distribute the waste in the designated cell area to a thickness not exceeding 12 inches, uncompacted, ~~uncompacted~~.

4. A ~~qualified~~ QC Engineering Technician (or designated alternate) (or ~~designated alternate~~) performs a thickness test as follows:

- a. Calculate the approximate area of the lift; document it on the Lift Approval Form; and sketch the lift area on the Lift Approval Form.
- b. Divide the lift into lots (during construction season 1 lot = a minimum ~~maximum~~ of 10,000 square feet).
- c. Generate two random numbers from 0 to 1 for each lot using a calculator that has a random numbers function, random numbers table or another approved method. Multiply one random number by the approximate north-south dimension of the lot, and the other random number by the approximate east-west dimension of the lot as measured in feet. These are the coordinates for the test to be performed. Record these locations on the Lift Approval Form.
- d. Dig a hole and measure the loose lift thickness with a ruler, tape measure, or other measuring device with a minimum of tenths of foot accuracy markings. Measure this thickness from the bottom of the hole to the bottom of a straight edge laid across the top of the hole or survey the lift. ~~The lift may also be surveyed to measure the thickness.~~

IS THIS?
ALTERNATE

BPW-5 11e.(2) WASTE DISPOSAL

- e. Approve the lot for thickness if the resulting measurement is less than 12 inches. Document this approval on the Lift Approval Form.
 - f. If the thickness is greater than 12 inches, repeat step 4.d above at four points (north, east, south, and west) approximately ten feet from the original measurement.
 - 1) Average the five measurements together.
 - 2) Approve the lift for thickness if the resulting average is less than 12 inches. Rework the lot if the average is greater than 12 inches. Repeat steps E.4.c through e. noted above.
5. A QC Engineering Technician releases the lift area to the contractor to work (compact) the waste material to achieve the required moisture and compaction limits listed in D.3 above. Upon ~~judgment~~judgement of satisfactory working of the material, a QC Technician (or designated alternate) with certified completion of eight hours of Nuclear Moisture/Density Gauge training shall:
- a. Identify the number of lots in the lift using the area and thickness calculated in E.4 above (1 lot = 1,000 cubic yards).
 - b. Generate random numbers for the in-place moisture/density test coordinates following the same process as for the thickness measurement described in E.4.c above.
 - c. Carefully prepare the testing site for the nuclear gauge test to assure a high probability of accuracy.
 - d. Measure the moisture and density of the material using the nuclear moisture/density gauge.
 - e. Approve the lift if the compaction and the moisture content meet the requirements given in D.3 above, and document approval on the Lift Approval Form.
 - f. If the lift does not meet compaction or moisture requirements, direct the contractor to re-work the material and repeat step E.5 in its entirety.
6. Density tests will also be performed at the old/new lift interfaces at an average of one density test per three lifts, as follows:

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- a. Generate a random number for each lift which has an old/new lift interface. --If the random number generated is 0.65 or greater, a moisture/density test is required on the lift interface.
 - b. Generate a random number for each lift interface to determine the location of the test to be performed. --Multiply the random number by the approximate length of the interface. --This is the coordinate location for the test.
 - c. Approve lots which meet compaction requirements as described in D.3 above.
 - d. Re-work and re-test lots not meeting the compaction requirements as described in E-5D.3 above.
7. For waste material placed in the 11e.(2) embankment as winter blanket, the QC Officer (or designated alternate) shall:
- a. Document the elevation of the last approved lift (before winter blanket material was applied) on the Lift Approval Form~~Daily Construction Report~~.
 - b. Identify the generator of the waste on the Lift Approval Form~~Daily Construction Report~~.
 - c. Survey each zone where blanket is placed and document the approximate thickness of the blanket.
 - d. Calculate bi-monthly the total volume of waste classified as winter blanket or as storage ~~and also waste on the LARW storage pads to assure limitations given in Reference 1D-16-e above are not exceeded.~~
 - e. During Spring Start-Up:
 - 1) -- ~~d~~ Divide all exposed winter blanket into lots-5,000 square foot lots in area lots;
 - 2) -- ~~e~~ Conduct moisture/density and thickness tests on the bottom 12 inch lift, following steps E.4 and E.5 above (except for the noted lot size);
 - 3) -- ~~e~~ Continue performing steps E.4 and E.5 above for each successive lift:

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-*-----if a lift fails a density test, perform three additional density tests on the lift, following step E.5 above and approve the lift if all three tests have satisfactory results;

*-----if a lift continues to exhibit unsatisfactory test results, it is considered a failing lift and all material placed above the failing lift must be removed. Re-compact the material of the failing lift and conduct moisture/density tests on the lift following step E.5 above. Re-work the material above the failing lift and repeat steps E.3 through 5 until all winter blanket material is placed (Reference 4).

8. As a part of Spring Start-Up, test the last approved lift of each specified zone in the 11e.(2) embankment that was not protected by six inches of clay compacted to a field permeability of 1×10^{-6} , 12 inches of loose clay, or two feet of winter blanket during the winter season. For zones where a lift fails the compaction requirements:

- a. Divide all the exposed waste in that zone into lots of 10,000 square foot lots in size lots;
- b. Dig down 12 inches into the lift and conduct in-place moisture/density tests at a rate of one test per lot, following step E.5 above.
 - 1)-----if a lot fails a test, perform three additional density tests on the lot following step E.5 above;
 - 2)-----if a lot continues to exhibit unsatisfactory test results, continue to test each successively lower 12 inch lift until a lift with satisfactory test results is found; then Remove and re-work all the material which was placed above the passing lift following steps E.3 through E.5 of this procedure.

F. QUALITY CONTROL:

1. QC Process Control Checks:
 - a. All QC documentation must be reviewed and approved by the Quality Assurance Officer (or designated alternate) prior to final lift placement approval.
 - b. A daily inspection of all embankment cell areas should be performed to look for plastic and other items which may easily become airborne; Any such material found should be returned to the appropriate cell area.

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- c. The QA Officer ~~(or designate alternate)~~ Department shall observe a minimum of five percent of the tests performed by the QC personnel to ensure that the test and observations are being performed and recorded correctly.
2. Sample Control: -A soil sample is obtained from the site of the nuclear moisture/density tests performed for verification of the testing results. This verification is performed by the oven-dry method.
3. Data Control:
 - a. All density, moisture, and proctor records shall be maintained in the QC Engineering Files at the South Clive Site with a copy maintained at Corporate Headquarters in accordance with Reference 4.
 - b. The Quality Assurance Daily Report shall be maintained in the QA Files at both the South Clive Site and at Corporate Headquarters.
 - c. The "Zone Summary Drawing" must be up-dated semi-annually to reflect the changes in the landfill area.
4. Audit Requirements:
 - ~~b~~ a. ~~Semi-annually~~ Quarterly; The Envirocare Waste Placement Record shall be audited by the QA Officer ~~(or designate alternate)~~ Department to assure all waste received and disposed of has disposal date, zone specification, and lift number.
 - ~~eb~~ Quarterly; The Polymer Record (EC-1850) shall be reviewed by the Radiation Safety Officer (or designated alternate) to assure bi-weekly application.

BPW-5 11e.(2) WASTE DISPOSAL

A. PURPOSE: This procedure provides guidelines for proper placement of radioactive waste material into the appropriate 11e.(2) disposal embankment.

B. REFERENCE OR AUTHORITY:

1. 11e.(2) Radioactive Material License SMC-1559, dated 11/19/93;
2. Application for 11e.(2) Radioactive Material License SMC-1559, dated 12/23/91, as amended;
3. Groundwater Quality Discharge Permit #UGW450005, dated 03/20/92;
4. Construction QA/QC Manual.

C. PRECAUTIONS AND LIMITATIONS:

1. Always wear gloves when handling waste material to prevent possible skin contamination.
2. All workers, other than truck drivers in closed trucks, involved in unloading or disposal of high activity waste, as defined in OP Manual Procedure BPW-4 C.3, will be required to wear full-face respirators providing protection factor of 50.
3. When testing or surveying is performed on an active lift area, the testing personnel must make eye contact with and receive a hand signal from all excavation vehicle operators working the active area.
4. To prevent wind dispersal of waste material, a polymer solution will be sprayed bi-weekly on all exposed contaminated cell areas, and on any 11e.(2) Disposal Cells which have been disturbed in the previous two weeks but are not currently active.
 - a. Each spring after the waste is no longer frozen, but in no case later than March 1, the year's initial application of polymer shall be made.
 - b. The year's final application of polymer will be made before November 1 of any calendar year. Application of polymer is not required when the waste remains frozen.
5. During periods of high winds (winds in excess of 40 miles per hour), movement and placement of waste material must be shut down.

D. GENERAL INSTRUCTIONS:

1. This procedure applies to the disposal and placement of all waste material in the 11e.(2) embankment at the Envirocare South Clive Disposal Facility.

BPW-5 11.e(2) WASTE DISPOSAL

2. Each lift of waste material shall be given a discrete designation (zone name and lift number) for testing and surveying purposes.
3. Each lift of waste material shall be approved as "placed" upon satisfactory completion of compaction, moisture, and thickness testing requirements.
 - a. Each lift shall be compacted to 90 percent of a standard Proctor performed for each generator or fill material.
 - b. A lift shall have a moisture content from zero to 3 percent over optimum.
 - c. Waste material is placed in lifts with an uncompacted thickness not exceeding 12 inches.
4. All soil density and moisture test shall be performed with a licensed nuclear moisture/density gauge or by the sand cone method.
5. To insure proper calibration, a sand cone density test shall be performed jointly with five percent of all nuclear density for waste material. Also, an oven-drying test shall be performed jointly with five percent of all nuclear moisture tests.
6. All waste placement in the 11e.(2) embankment will be documented in the Waste Placement Record (EC-0250) by a Quality Control Engineering Technician (or designated alternate).
7. High Activity Waste, as defined in OP Manual Procedure BPW-4 C.3, placed in the disposal cell must be covered with low activity waste or six inches or more of clean fill after final compaction in order to reduce gamma exposures to workers on subsequent lifts, unless the subsequent lifts are also high activity waste (reference 1).
8. High Activity Wastes, as defined in OP Manual Procedure BPW-4 C.3, will not be placed closer than 10 feet from the top or sides of a disposal cell to prevent high radon emissions.
9. Any movement of waste material after it has been placed must be documented by the Quality Control (QC) Officer in the QC Daily Construction Report and must be assigned a new zone specification and lift number. The change of location coordinates will be recorded in the Waste Placement Record.
10. A minimum of four classification tests will be conducted each year waste is placed. At least two classification tests shall be performed for each large generator (a generator disposing of 50,000 cubic yards or more). If there is a change of material for a large generator, a new classification will be performed.

BPW-5 11.e(2) WASTE DISPOSAL

11. All debris placed within a lift must be uniformly distributed throughout the lift. It should be distributed so that adequate space is provided for fill between the debris to enable compaction according to the guidelines given in D.3 above.
12. A lift shall not contain more than ten percent by volume of non-compactable debris (unless in the form of stone, concrete or solid metal). Non-compactable debris is defined as any waste material that:
 - a. Has a gradation that will not pass through a four inch grizzly; and,
 - b. Has a density less than 70 pounds per cubic foot dry weight.
13. Non-compactable debris in the form of stone, concrete or solid metal may be placed up to 25 percent by volume of a lift if the debris is placed to minimize any void space in the lift.
14. A lift may not consist of more than a total of 25 percent by volume of any type non-compactable debris (reference 4).
15. Debris shall not be placed in the outermost two feet of the disposal embankment. Debris-free material is defined as: a) material which contains less than one percent debris volume, and b) debris where the maximum volume of any individual piece is less than or equal to 0.1 cubic foot.
16. Waste material shall only be placed in winter when the required moisture and compaction requirements, as listed in D.3 above, can be met. For waste placement purposes, winter is defined as November 1 to March 1. To assure compliance of this requirement:
 - a. On November 1, decrease density and moisture lot size to 750 cubic yards.
 - b. On December 1, and continuing to March 1, decrease density and moisture lot size to 500 cubic yards.
17. No frozen material shall be placed within 24 inches of the clay liner. Frozen material is defined as material which cannot meet the compaction requirements (as listed in D.3) because of frozen water mixed within the material.
18. After October 1 of any given year, placement of waste in any defined zone shall be stopped when two consecutive compaction tests fail due to frozen material. The first "unapproved" lift shall be defined as "winter blanket."
 - a. Winter blanket can be temporarily managed in piles up to ten feet on the embankment.
 - b. Winter blanket cannot be placed on slopes steeper than 5H:1V.

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- c. If waste stored as winter blanket is classified as high activity waste, as defined in OP Manual BPW-4 C.3, it must be covered with low activity waste or six inches of clean fill material to reduce gamma exposure and radon emissions.
 - d. All winter blanket shall be placed to final specifications within 90 days after spring start-up, and in no case later than June 1.
19. Prior to placing another generator's waste on top of waste from another generator whose laboratory tests have not yet been received, the top of the lift will be surveyed at a minimum rate of one survey point for every 800 square feet of lift.
20. When new lifts are placed next to old lifts, at least 3 feet, measured horizontally, shall be removed from the outer edge of the old lift. In addition to the density testing of the lift, an average of one density test per three lifts shall be performed at the old/new-lift interfaces.
21. When waste material is to be placed and the work area is covered with snow, the snow must be removed prior to placement.

E. OPERATING INSTRUCTIONS:

1. A QC Engineering Technician directs the contractor to have waste transported to an appropriate embankment location (with the concurrence of the Site Manager) upon obtaining approval for placement from the Site Manager or ARCS.
2. When receiving material to be placed directly in the cell, a QC Engineering Technician (or designated alternate) shall visually inspect the shipment, calculate the percentage of debris, and record on the Daily Construction Report the amount of fill required to meet the volume ratios specified in D.10 through D.12 above. If the debris volume cannot be determined visually, or if the calculated debris volume is close to the specified limits, the RSR will be consulted for the manifested volume.
3. The contractor is directed to uniformly distribute the waste in the designated cell area to a thickness not exceeding 12 inches, uncompacted.
4. A QC Engineering Technician (or designated alternate) performs a thickness test as follows:
 - a. Calculate the approximate area of the lift, document it on the Lift Approval Form, and sketch the lift area on the Lift Approval Form.
 - b. Divide the lift into lots (during construction season 1 lot = a maximum of 10,000 square feet).

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- c. Generate two random numbers for each lot using a calculator that has a random numbers function. Multiply one random number by the approximate north-south dimension of the lot, and the other random number by the approximate east-west dimension of the lot as measured in feet. These are the coordinates for the test to be performed. Record this location on the Lift Approval Form.
- d. Dig a hole and measure the loose lift thickness with a ruler, tape measure, or other measuring device with a minimum of tenths of foot accuracy markings. Measure this thickness from the bottom of the hole to the bottom of a straight edge laid across the top of the hole.
- e. Approve the lot for thickness if the resulting measurement is less than 12 inches. Document this approval on the Lift Approval Form.
- f. If the thickness is greater than 12 inches, repeat step 4.d above at four points (north, east, south, and west) approximately ten feet from the original measurement.
 - 1) average the five measurements together,
 - 2) approve the lift for thickness if the resulting average is less than 12 inches. Rework the lot if the average is greater than 12 inches. Repeat steps E.4.c through e. noted above.

5. A QC Engineering Technician releases the lift area to the contractor to work (compact) the waste material to achieve the required moisture and compaction limits listed in D.3 above. Upon judgement of satisfactory working of the material, a QC Technician (or designated alternate) with certified completion of eight hours of Nuclear Moisture/Density Gage training shall:

- a. Identify the number of lots in the lift using the area and thickness calculated in E.4 above (1 lot = 1,000 cubic yards);
- b. Generate random numbers for the in-place moisture/density test coordinates following the same process as for the thickness measurement described in E.4.c above;
- c. Carefully prepare the testing site for the nuclear gage test to assure a high probability of accuracy;
- d. Measure the moisture and density of the material using the nuclear moisture/density gage;

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- e. Approve the lift if the compaction and the moisture content meet the requirements given in D.3 above, and document approval on the Lift Approval Form;
 - f. If the lift does not meet compaction or moisture requirements, direct the contractor to re-work the material and repeat step E.5 in its entirety.
6. Density tests will also be performed at the old/new lift interfaces at an average of one density test per three lifts, as follows:
- a. Generate a random number for each lift which has an old/new lift interface. If the random number generated is 0.65 or greater, a moisture/density test is required on the lift interface.
 - b. Generate a random number for each lift interface to determine the location of the test to be performed. Multiply the random number by the approximate length of the interface. This is the coordinate location for the test.
 - c. Approve lots which meet compaction requirements as described in D.3 above.
 - d. Re-work and re-test lots not meeting the compaction requirements as described in E.5 above.
7. For waste material placed in the 11e.(2) embankment as winter blanket, the QC Officer (or designated alternate) shall:
- a. Document the elevation of the last approved lift (before winter blanket material was applied) on the Daily Construction Report.
 - b. Identify the generator of the waste in the Daily Construction Report.
 - c. Survey each zone where blanket is placed and document the approximate thickness of the blanket.
 - d. Calculate bi-monthly the total volume of waste classified as winter blanket and also waste on the LARW storage pads to assure limitations given in D.16.c above are not exceeded.
 - e. During Spring Start-Up:
 - 1) divide all exposed winter blanket into 5,000 square foot lots;

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- 2) conduct moisture/density and thickness tests on the bottom 12 inch lift, following steps E.4 and E.5 above (except for the noted lot size);
- 3) continue performing steps E.4 and E.5 above for each successive lift:
 - if a lift fails a density test, perform three additional density tests on the lift, following step E.5 above and approve the lift if all three tests have satisfactory results;
 - if a lift continues to exhibit unsatisfactory test results, it is considered a failing lift and all material placed above the failing lift must be removed. Re-compact the material of the failing lift and conduct moisture/density tests on the lift following step E.5 above. Re-work the material above the failing lift and repeat steps E.3 through 5 until all winter blanket material is placed (reference 4).
8. As a part of Spring Start-Up, test the last approved lift of each specified zone in the 11e.(2) embankment that was not protected by six inches of clay compacted to a field permeability of 1×10^{-6} , 12 inches of loose clay, or two feet of winter blanket during the winter season. For zones where a lift fails the compaction requirements:
 - a. Divide all the exposed waste in that zone into 10,000 square foot lots;
 - b. Dig down 12 inches into the lift and conduct in-place moisture/density tests at a rate of one test per lot, following step E.5 above.
 - 1) if a lot fails a test, perform three additional density tests on the lot following step E.5 above;
 - 2) if a lot continues to exhibit unsatisfactory test results, continue to test each successively lower 12 inch lift until a lift with satisfactory test results is found, then remove and re-work all the material which was placed above the passing lift following steps E.3 through E.5 of this procedure.

F. QUALITY CONTROL:

1. All QC documentation must be reviewed and approved by the Quality Assurance Officer (or designated alternate) prior to final lift placement approval.
2. A daily inspection of all embankment cell areas should be performed to look for plastic and other items which may easily become airborne, such material found should be returned to the appropriate cell area.

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3. Sample Control: A soil sample is obtained from the site of the nuclear moisture/density tests performed for verification of the testing results. This verification is performed by the oven-dry method.
4. Data Control:
 - a. All density, moisture, and proctor records shall be maintained in the QC Engineering Files at the Clive Site with a copy maintained at Corporate Headquarters in accordance with reference 4.
 - b. The Quality Assurance Daily Report shall be maintained in the QA Files at the Clive Site and at Corporate Headquarters.
 - c. The "Zone Summary Drawing" must be up-dated semi-annually to reflect the changes in the landfill area.
5. Audit Requirements:
 - a. The QA Officer (or designated alternate) shall observe a minimum of five percent of the tests performed by the QC personnel to ensure that the test and observations are being performed and recorded correctly.
 - b. Quarterly, the Envirocare Waste Placement Record shall be audited by the QA Officer (or designated alternate) to assure all waste received and disposed of has disposal date, zone specification, and lift number.
 - c. Quarterly, the Polymer Record (EC-1850) shall be reviewed by the Radiation Safety Officer (or designated alternate) to assure bi-weekly application.

ENVIROCARE OF UTAH, INC. OPERATING PROCEDURES MANUAL

PROCEDURE: BPW-6 11e.(2) Waste Interim Storage

REVISION NUMBER: 4

AFFECTED PAGES: _____

PURPOSE: Incorporate changes from the CAP and annual review

SUBMITTED BY: Curts Kirk

Curts R. Kirk
Signature

Date 12-9-96

FORWARDED:

[Signature] ACTING
Site Manager

Date 12-16-96

[Signature]
Site Radiation Safety Officer

Date 1-10-97

Quality Assurance Officer

Date _____

CONCURRENCE:

N/A OK

Date 12/9/96

REVIEW:

Corporate Radiation Safety Officer

Date _____

APPROVAL:

Project Manager/Operations Director

Date _____

BPW-6 11e.(2) WASTE INTERIM STORAGE

A. PURPOSE: This procedure~~To~~ provides guidelines for the storage, inspection and handling of bulk and containerized waste that is not placed directly into the 11e.(2) disposal embankment upon acceptance.

B. REFERENCES OR AUTHORITY:

1. 11e.(2) Radioactive Material License SMC-1559, ~~dated 11/19/93,~~ as amended;
2. Application for 11e.(2) Radioactive Material License SMC-1559, ~~dated 12/23/91,~~ as amended;
3. Ground Water Quality Discharge Permit #UGW450005 ~~dated 9/10/93,~~ as amended;
4. Envirocare of Utah, Inc. Construction QA/QC Manual, as revised;
5. Waste Management Plan, as revised;
6. Envirocare of Utah, Inc. Operating Procedures Manual, as revised.

C. PRECAUTIONS AND LIMITATIONS:

1. Within 48 hours of waste-being unloaded at the Truck Unloading Facility, waste must be moved to the 11e.(2) Disposal Cell. Waste which does not meet waste acceptance criteria may remain in the Truck Unloading Facility until the problem is resolved.
2. Bulk waste at the Rail Car Roll'over Facility must be taken to the 11e.(2) Disposal Cell as soon as possible or within 24 hours after the most recent rail car or shipment has been unloaded.
3. Any container discovered to be leaking must be either: contained in an overpack drum;; placed into approved bulk storage;; or properly disposed of in the embankment.
4. A polymer solution will be sprayed on all bulk waste material stored in the 11e.(2) Disposal Cell Area in accordance with reference 5.
5. Whenever average wind velocities exceed 40 miles per hour, or upon notice from the Site Manager, Field or Corporate Radiation Safety Officer, all loading, hauling, and dumping of bulk wastes will cease.

D. GENERAL INSTRUCTIONS:

1. This procedure applies to all 11e.(2) waste accepted by Envirocare but not immediately disposed of in the 11e.(2) disposal cell.
2. After a shipment is accepted, it will be managed as either bulk waste or waste in containers.
 - a. For all Bulk Waste Material placed in storage:

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- 1) The following types of bulk shipments may be received:

~~_____ Gondola Rail Cars;~~
~~_____ Dump Truck Loads;~~
~~_____ Intermodals;~~
~~_____ End Dumps.~~

- 2) All bulk shipments should have the proper labeling and marking as required by the U.S. Department of Transportation (DOT).

- 23) Bulk waste may be unloaded directly into the 11e.(2) Disposal Cell or at the Rail Car Rollover Facility.

- 34) Before any 11e.(2) bulk waste material is unloaded at the Rail Car Rollover Facility, the facility must be cleaned of all LARW waste material using loaders, brooms, shovels or other appropriate means until the residue of LARW material has been removed from the surface of the facility, as determined by a qualified ~~Radiation Technician~~ Health Physics Specialist.

- 45) Bulk waste unloaded at the Rail Car Rollover Facility may only be managed one generator at a time.

- 56) Bulk waste may be stored in the 11e.(2) disposal cells as Winter Storage during winter months (between November 1 and March 1) in accordance with reference 4.

- 67) Bulk shipments may not be unloaded at the LARW Truck Unloading Facility.

b. For all Containerized Waste placed in storage:

- 1) The following types of strong, tight, DOT-approved containers may be received or used to containerize bulk waste:

- 96 cubic foot B-25 boxes;
- 48 cubic foot B-12 boxes;
- 50- and 55-gallon drums;
- Various sizes of polyethylene bags;
- Seavans;
- Other containers approved by the U.S. DOT.

- 2) All containers must arrive at the site in good condition and must have the proper labeling and marking as required by the U.S. DOT.

BPW-6 11e.(2) WASTE INTERIM STORAGE

- 3) Containers may be unloaded in the 11e.(2) Disposal Cell, at the LARW Bulk Transfer or Container Storage Pads for transfer, or onto the LARW Truck Unloading Facility.
- 4) Before any containerized waste material is unloaded ~~or stored~~ at any of the facilities listed in D.2.b.3 above, the facility surface will be cleaned of all LARW waste material (bulk or containerized) using loaders, brooms, shovels or other appropriate means until the residue of LARW material has been removed ~~from the surface of the facility~~, as determined by a qualified Health Physics Specialist Radiation Technician.
- 5) Containers will be ~~movetransfered~~ on the LARW Container Storage Pad by means of forklift, dump trucks, flatbed trailers, or other such vehicles. Rock trucks or other heavy equipment that will damage the surface of the Storage Pad will not be allowed on the LARW Container Storage Pad.
- 6) Waste containers will be transported only when it has been assured that the lid or cover is secured and the container in a closed condition.
- 7) Containers will be transported as close to the ground as practical to minimize falling distance in case of an accident. Whenever a container is moved, transportation shall be done in a manner to prevent rupture of the container or release of waste material inside.

3. All waste material stored within the Restricted Area for more than 24 hours shall be identified by identification signs. ID signs must indicate the generator of the waste, the waste stream and the date the waste was stored. If the waste is containerized, the information for identification may be written directly on the container.

4. ~~Monthly inspection shall include visual observation of the integrity of the containers and packages in storage.~~ Storage of 11e.(2) waste at the facility shall be explicitly limited to unexcavated areas within the confines of the 11e.(2) disposal cell. Said disposal shall be over areas of native grade and consist of clays which have been scarified and compacted in compliance with the 11e.(2) Construction Quality Assurance/Quality Control Plan.

5. Written record of all storage area inspections shall be maintained on site for a minimum of three years.

6. Any wastes from shipments identified as Radiation Areas as defined in reference 6, BPW-3 Precaution C.3, which are to be placed in storage for longer than 10 days must be covered with an additional six inches of lower activity waste or clean fill material as soon as practical to reduce radiation exposures, re-suspension of particulate materials, and thoron emissions.

BPW-6 11e.(2) WASTE INTERIM STORAGE**E. OPERATING INSTRUCTIONS:**

1. Once an incoming shipment has been accepted, sampled and determined to be unloaded into one of the storage facilities, a ~~Radiation Technician~~ Health Physics Specialist (or designated alternate), or the Contractor's foreman (or designated alternate) shall document on the Form EC-18 the storage area where the shipment is stored.
2. After the shipment is unloaded in the appropriate area, it shall be marked with an identification sign as described in D.3 above.
3. ~~Monthly, e~~Each shipment in storage (or group of shipments if they are bulk material) will then be inspected monthly until it is placed in the appropriate 11e.(2) Disposal Cell. The inspection will be documented on form EC-1200 and kept on file at the Site.

F. QUALITY CONTROL:

1. QC Process Control-Checks: The South Clive Site Health Physics Department conducts daily inspections of the LARW Container Storage Pad, the Rail Car Rollover Unloading Facility, and the Truck Unloading Facility to ensure the reference 5 requirements are met.
2. Data Control: An inspection of all storage facilities will be performed and documented ~~of all storage facilities~~ each month.
3. Sampling Control: None.
4. Audit Requirements: Semi-annually, the Quality Assurance Officer ~~Department~~ will coordinate a comprehensive review of the filed shipment records and the monthly waste storage areas inspections to ensure a complete record exists.

BPW-6 11e.(2) WASTE INTERIM STORAGE

A. PURPOSE: To provide guidelines for the storage, inspection and handling of bulk and containerized waste that is not placed directly into the 11e.(2) disposal embankment upon acceptance.

B. REFERENCES OR AUTHORITY:

1. 11e.(2) Radioactive Material License SMC-1559, dated 11/19/93;
2. Application for 11e.(2) Radioactive Material License SMC-1559, dated 12/23/91, as amended;
3. Ground Water Quality Discharge Permit #UGW450005 dated 9/10/93;
4. Construction QA/QC Manual;
5. Waste Management Plan.

C. PRECAUTIONS AND LIMITATIONS:

1. Waste material stored as bulk waste must be stored in the 11e.(2) Disposal Cells area. Waste stored as containerized waste should be in storage on the LARW Container Storage Pad for a minimum tenure, but in no case will storage exceed 180 days. A greater storage period than this limit requires prior written approval from the Executive Secretary of the Division of Radiation Control (DRC).
2. Within 48 hours of waste being unloaded at the Truck Unloading Facility, waste must be moved to the 11e.(2) Disposal Cell or the LARW Container Storage Area. Waste which does not meet waste acceptance criteria may remain in the Truck Unloading Facility until the problem is resolved.
3. Bulk waste at the Rail Car Rollover Facility must be taken to the 11e.(2) Disposal Cell as soon as possible or within 24 hours after the most recent rail car or shipment has been unloaded.
4. Any container discovered to be leaking must be either contained in an overpack drum, placed into approved bulk storage, or properly disposed of in the embankment.
5. Any fluid found in the leak detection observation manhole of the LARW Bulk Storage Pad must be reported to both the Utah Division of Radiation Control and Division of Water Quality within 24 hours of detection. Additionally, a written report must be submitted to the DRC within 5 working days.
6. On a bi-weekly basis, a polymer solution will be sprayed on all bulk waste material stored in the 11e.(2) Disposal Cell Area. The application of polymer will begin each calendar year when the waste is no longer frozen, but in no case later than March 1. The year's final application will be made before November 1 of any calendar year. Each application of polymer will be documented on the forms EC-1825 and EC-1850.

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7. Whenever average wind velocities exceed 40 miles per hour, or upon notice from the Site Manager, Field or Corporate Radiation Safety Officer, all loading, hauling, and dumping of bulk wastes will cease.

D. GENERAL INSTRUCTIONS:

1. This procedure applies to all 11e.(2) waste accepted by Envirocare but not immediately disposed of in the 11e.(2) disposal cell.

2. After a shipment is accepted, it will be managed as either bulk waste or waste in containers.

a. For all Bulk Waste Material placed in storage:

1) The following types of bulk shipments may be received:

- Gondola Rail Cars,
- Dump Truck Loads,
- Intermodals,
- End Dumps.

2) All bulk shipments should have the proper labeling and marking as required by the U.S. Department of Transportation (DOT).

3) Bulk waste may be unloaded directly into the 11e.(2) Disposal Cell, on the Bulk Storage Pad for transfer to the 11e.(2) Disposal Cell, or at the Rail Car Rollover Facility.

4) Before any 11e.(2) bulk waste material is unloaded onto either the LARW Bulk Storage Pad or the Rail Car Rollover Facility, the facility must be clean of all LARW waste material using loaders, brooms, shovels or other appropriate means until the residue of LARW material has been removed from the surface of the facility, as determined by a qualified Radiation Technician.

5) Bulk waste unloaded at the Rail Car Rollover Facility may only be managed one generator at a time.

6) Bulk waste may be stored in the 11e.(2) disposal cells as Winter Storage during winter months (between November 1 and March 1) in accordance with reference 4.

BPW-6 11e.(2) WASTE INTERIM STORAGE

- 7) Bulk shipments may not be unloaded at the LARW Truck Unloading Facility.
- b. For all Containerized Waste placed in storage:
 - 1) The following types of strong, tight, DOT-approved containers may be received or used to containerize bulk waste:
 - 96 cubic foot B-25 boxes;
 - 48 cubic foot B-12 boxes;
 - 50- and 55-gallon drums;
 - Various sizes of polyethylene bags;
 - Seavans;
 - Other containers approved by the U.S. DOT.
 - 2) All containers must arrive at the site in good condition and must have the proper labeling and marking as required by the U.S. DOT.
 - 3) Containers may be unloaded in the 11e.(2) Disposal Cell, onto LARW Bulk Storage Pad, onto the LARW Container Storage Pad, or onto the LARW Truck Unloading Facility. However, temporary storage is only permitted at the Container Storage Pad.
 - 4) Before any containerized waste material is unloaded or stored at any of the facilities listed in D.2.b.3 above, the facility will be cleaned of all LARW waste material (bulk or containerized) using loaders, brooms, shovels or other appropriate means until the residue of LARW material has been removed from the surface of the facility, as determined by a qualified Radiation Technician.
 - 5) Waste in bags or cardboard boxes may only be stored at the LARW Bulk Storage Pad. They may not be unloaded and managed at the LARW Truck Unloading Facility.
 - 6) All drums will be stored so that they are up off the ground on pallets. Boxes stored in the LARW Container Storage Area will be equipped with bottom runners to prevent contact with the ground surface.
 - 7) Waste containers on the Container Storage Pad must be separated by aisles to allow for inspection. Aisle spacing will consist of at least the following distances:
 - 2 feet between container rows (spacing is between the pallets for drums on pallets);

BPW-6 11e.(2) WASTE INTERIM STORAGE

- 2 feet between generators;
 - 10 feet between containers and bulk waste;
 - 2 feet from the perimeter of the storage pad.
- 8) Containers holding waste may only be stacked to a maximum height of 10 feet (two B-25 boxes or three B-12 boxes) above the pad surface.
- 9) A row of containers shall be a maximum of two pallets or two boxes wide, provided that the pallets and box skids are placed perpendicular to the aisles to allow inspection of the area beneath the containers.
- 10) Containers will be moved on the LARW Container Storage Pad by means of forklift, dump trucks, flatbed trailers, or other such vehicles. Rock trucks or other heavy equipment that will damage the surface of the Storage Pad will not be allowed on the LARW Container Storage Pad.
- 11) Waste containers will be transported only when it has been assured that the lid or cover is secured and the container in a closed condition.
- 12) Containers will be transported as close to the ground as practical to minimize falling distance in case of an accident. Whenever a container is moved, transportation shall be done in a manner to prevent rupture of the container or release of waste material inside.
3. All waste material stored within the Restricted Area for more than 24 hours shall be identified by identification signs. ID signs must indicate the generator of the waste, the waste stream and the date the waste was stored. If the waste is containerized, the information for identification may be written directly on the container.
4. Monthly inspection shall include visual observation of the integrity of the containers and packages in storage.
5. Written record of all storage area inspections shall be maintained on site for a minimum of three years.

E. OPERATING INSTRUCTIONS:

1. Once an incoming shipment has been accepted, sampled and determined to be unloaded into one of the storage facilities, a Radiation Technician (or designated alternate), or the Contractor's foreman (or designated alternate) shall document on the Form EC-18 the storage area where the shipment is stored.

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2. After the shipment is unloaded in the appropriate area, it shall be marked with an identification sign as described in D.3 above.
3. Monthly, each shipment in storage (or group of shipments if they are bulk material) will then be inspected until it is placed in the appropriate 11e.(2) Disposal Cell. The inspection will be documented on form EC-1200 and kept on file at the Site. The inspection of the LARW Container Storage Pad shall consist of the following:
 - a. Inspect each container for evidence of leaks, corrosion, or deterioration;
 - b. Inspect each container for evidence of excessive rusting;
 - c. Inspect container lids to ensure that they are sealed;
 - d. Visually inspect each container to ensure it has structural integrity (no holes, gaps, or damage from forklifts or other actions);
 - e. Check for adequate aisle spacing as specified in D.2.b.6 above;
 - f. Inspect each container for proper identification as specified in D.3 above;
 - g. Ensure that each generator waste stream is separated and adequately spaced from the other waste streams (as specified in D.2.b.6 above);
 - h. Ensure that only 11e.(2) waste containers are stored on the LARW Container Storage Pad;
 - i. Inform the Site Manager and the Radiation Safety Officer of any inspection items which are not in compliance. updated measures taken to resolve any problems.

F. QUALITY CONTROL:

1. Data Control:

An inspection will be performed and documented of all storage facilities each month.

2. Audit Requirements:

- a. The Clive Site Health Physics Department conducts daily inspections of the LARW Container Storage Pad, the Rail Car Rollover Unloading

BPW-6 11e.(2) WASTE INTERIM STORAGE

Facility, and the Truck Unloading Facility to ensure the reference 5 requirements are met.

- b. Semi-annually, the QA Officer will coordinate a comprehensive review of the filed shipment records and the monthly waste storage areas inspections to ensure a complete record exists.

10 NCA 11/19/96
EMP-8 RADON/THORON DAUGHTER WORKING LEVEL
MEASUREMENTS

MANUAL/PROCEDURE: RN/TN DAUGHTER WORKING LEVEL
MEASUREMENTS

REVISION NUMBER: 0

AFFECTED PAGES:

1 TO 4

NCA
11/15/96

PURPOSE:

NEW PROCEDURE

SUBMITTED BY:

Vernon E. Andrews

Signature

Vernon E. Andrews

Date

11/15/96

FORWARDED:

Site Manager

[Signature]

Date

11/20/96

Site Radiation Safety Officer

[Signature]

Date

11-20-96

Quality Assurance Officer

[Signature]

Date

11/20/96

CONCURRENCE:

Compliance Engineer

N/A *EAH*

Date

11/20/96

REVIEW:

Corporate Radiation Safety Officer

Vernon E. Andrews

Date

11/15/96

APPROVAL:

Project Manager/Operations Director

[Signature]

Date

11/15/96

EMP-10 RADON/THORON DAUGHTER WORKING LEVEL MEASUREMENTS**A. PURPOSE:**

This procedure describes the process of sample collection and data analysis to determine the radon (Rn-222) and thoron (Rn-220) daughter working levels in the workplace and to serve as the basis for estimating the degree of equilibrium between the radon isotopes and their respective daughters.

B. REFERENCES OR AUTHORITY:

1. 11e.(2) Radioactive Material License SMC-1559, dated 11/19/93
2. Application for 11e.(2) Radioactive Material License SMC-1559, dated 12/31/91, as amended, Section 7.
3. Ogden, T.L.; *Radon and Thoron Working Levels from Ordinary Industrial-Hygiene Dust Samples*; Ann. Occup. Hyg.; Vol. 20, Pergamon Press, 1977

C. PRECAUTIONS AND LIMITATIONS:

1. Assure that an alpha counter, properly calibrated and checked for constancy with a current background, will be available when needed.
2. Calibrate lapel sampler according to PMP-3.

D. GENERAL INSTRUCTIONS:

1. This procedure applies to the collection of samples and analysis of count data to measure radon and thoron daughter working levels in the restricted area.
2. Samples are collected on membrane filters using lapel samplers which may be placed on an individual working on the disposal cell or at the downwind edge of the disposal cell.
3. Refer to Table 1 for required sample times. If sampler is to be placed on a worker, make sure that the person will be working in that area for the necessary sample collection time.
4. The minimum time required for sample collection and counting using this method is 6 hours. Sample collection must be started in time to allow completion of counting. If sample collection times longer than 2.5 hours are to be used, the extra time must be considered in the total time required.

E. OPERATING INSTRUCTIONS

1. Select sampling location, either stationary downwind location at downwind edge of disposal cell or breathing zone sample on worker in the cell.

EMP-10 RADON/THORON DAUGHTER WORKING LEVEL MEASUREMENTS

2. Follow Operating Procedure PMP-3 to calibrate the sampler and collect the sample.
3. Collect sample continuously for sampling period selected. The sample will be invalid if collection is stopped during the prescribed sampling period.
4. The first sample count should start at 20 minutes after the end of the sampling to achieve the maximum sensitivity. If it cannot be started at that time, the sample can be started at five minute intervals after the initial 20-minute wait time.
5. The sample is counted for two successive counts. The first count is of 85 minutes duration. The second count starts immediately after the first count and is of 105 minutes duration. Thus, the total count period is 190 minutes or 3 hours, 10 minutes.
6. The radon daughter working level W_R is calculated as:

$$W_R = 4.736 \times 10^{-9} a(bA_1 - A_2)/V$$

The thoron daughter working level W_T is calculated as:

$$W_T = 4.736 \times 10^{-9} c(dA_2 - A_1)/V$$

Where: a , b , c , and d are given in Table 1 for sampling time of T and wait time t_0

V = Sampling Rate, 1/s

A_1 and A_2 = Total disintegrations in each counting period

7. For ease in counting the working levels, a spreadsheet - **work-lvl.xls** - has been developed. It is only necessary to enter collection data, count data and variables a , b , c , and d from Table 1.
8. Compare the measured working levels to the appropriate DACs. The DAC for radon is 0.33 WL. The DAC for thoron is 1.0 WL. Notify the Site RSO immediately if the sum-of-fractions of the for the two working levels exceeds 0.1.
9. When it is desired to calculate the state of equilibrium (F) between radon and it's daughter products the following is used:

$$F = \frac{WL \times 100}{Rn \text{ Conc (pCi/l)}}$$

EMP-10 RADON/THORON DAUGHTER WORKING LEVEL MEASUREMENTS**F. QUALITY CONTROL**

1. Samplers are calibrated daily before and after sample collection.
2. Alpha counting instrument is calibrated for detection efficiency every six months and is checked for constancy each day before use.
3. An independent check of field data collection sheets, laboratory count data and computer inputs is made and recorded monthly.

G. DATA CONTROL

1. Field log books and laboratory count logs are completed and filed by year.
2. The computer spreadsheet is printed at the end of each quarter and a copy is filed for reference.