Evaluation of Recent Trailer Contamination and Supersack Integrity Issues

by

EFCOG Waste Management Working Group

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Table of Contents

Attachments

E. PermaFix Corrective Action plan

F. LATA-Parallax Portsmouth Corrective Action Plan

G. Fluor-B&W Portsmouth Corrective Action Plan

H. Battelle Energy Alliance INL Corrective Action Plan

J. Los Alamos National Security Corrective Action Plan

K. George Henckel (LASO) Presentation

L. List of Soft-sided Packaging Vendors & Participants

M. Presentation by Tim Blythe at 2012 NNSS Generator Workshop

N. Letter from Al Beale, SPS

O. Presentation by Al Beale at 2012 CTMA Workshop

P. PACTEC Testing Summary

I. Statement of Issues and Executive Summary

1.1 Identification of Issues

Recent incidents involving receipt of contaminated transportation vehicles and waste packages at DOE sites have resulted in the retention of transport equipment for the purpose of decontamination to achieve the free-release levels specified in 10 CFR 835, Appendix D. This has resulted in delays for generator shipment campaigns and formal requests for corrective action. In addition, commercial transport trailers have been effectively taken out of service in order to complete decontamination activities - at both generator and disposal sites.

Recent incidents involving detection of radiological contamination on the exterior of soft-sided waste packages and trailers on which these packages were transported for disposal have raised potential concerns regarding the integrity of soft-sided packaging and its continued use for storing and/or transporting low-level and mixed wastes.

1.2 Executive Summary

During the period from FY 2009 through FY 2011, there were a total of 21 incidents involving radioactively-contaminated shipment trailers and nine (9) contaminated waste packages received at the Nevada National Security Site (NNSS) Area 5 Radioactive Waste Management Site (RWMS). During this time period, the *EnergySolutions* (ES)

Clive, UT, disposal facility had a total of 18 similar incidents involving trailer and package contamination issues.

As a result of the increased occurrence of such incidents, DOE Environmental Management Headquarters (EM/HQ) Waste Management organization (EM-30) requested that EFCOG Waste Management Working Group (WMWG) conduct a detailed review of these incidents and report back to EM-30 regarding the results of this review, including providing any recommendations formulated as a result of the evaluation of current site practices involving handling and management of radioactive material and waste shipments.

In recognition of the fact that trailer contamination incidents at the NNSS have caused some commercial equipment to be held (or required to be returned) for decontamination, resulting in significant project cost and schedule impacts, EM-30 also requested that WMWG conduct a parallel review of the current disparity between equipment free-release limits (for radiological contamination) specified by the US Department of Transportation (DOT) in 49 CFR 173-178 versus lower limits specified for DOE sites in 10 CFR 835, Appendix D.

The WMWG implemented these requests by identifying and forming two evaluation teams comprised of WMWG member company representatives:

- Trailer Contamination and Supersack Integrity Team – this team was formed under the leadership of Sydney Gordon (NNSS/NSTec) and contained representatives from Nevada (NNSS/NSTec), Idaho (CH2M*Washington Group and Battelle Energy Alliance), Los Alamos National Laboratory (LANS), Portsmouth (Fluor-B&W), EnergySolutions (Clive and Oak Ridge), Hanford (CHPRC, Cavanagh Services), New World Environmental, and sponsors from EM-33 and NNSA (NA-173). Substantial participation by and inputs from representative manufacturers of soft-sided packaging also contributed to the efforts of this Team. See Attachment A for a summary of Team members and subject matter experts.
- DOE versus DOT Surface Contamination Limits Team – this team was formed under the leadership of Jim Portsmouth and Mike Waters (Hanford) and contains representatives from NNSS (NSTec), Idaho (CH2M*Washington Group), Los Alamos National Laboratory (LANS), Portsmouth (Fluor-B&W), ES (Clive and Oak Ridge), and NNSA/NA-174, New World Environmental, DOE HSS-11, with sponsors from EM-33.

This report presents the observations and recommendations produced as a result of Trailer Contamination and Supersack Integrity Team's inquiry. During the course of this evaluation, it became apparent that the primary factor leading to retention (and subsequent requirements for decontamination prior to release) of contaminated trailers at the NNSS is the inherent difference between the DOE and DOT radiological free-release limits for surface contamination. This apparent conflict of requirements is being evaluated by the DOE versus DOT Surface Contamination Limits Team in order to arrive

at what will become a mutually-acceptable resolution that minimizes or prevents future incidents of this type. A description of the relevant issues and requirements for the DOE versus DOT Surface Contamination Limits Team is summarized in the presentation made during the EFCOG WMWG Packaging and Transportation Subgroup Meeting held following the CTMA Workshop in Reno, NV (see Attachment B).

During the course of the Trailer Contamination & Supersack Integrity Team's evaluation, a total of three formal meetings were held: the first was in conjunction with the EFCOG WMWG session during Waste Management 2012 (Phoenix, AZ, March 1, 2012); the second was in conjunction with the NNSS Generator Workshop (Las Vegas, NV, April 24, 2012); and the third was in conjunction with the Contractor Transportation Management Association (CTMA) Workshop (Reno, NV, June 15, 2012). Additional team communication was conducted by E-mail and telephone.

The primary observations made by the Trailer Contamination & Supersack Integrity Team include the following:

1. Recent trailer contamination incidents at the NNSS have resulted primarily from legacy radiological contamination (which exceeds the limits allowed by 10 CFR 835, Appendix D) on commercial trailers that were used to transport waste packages to the NNSS.
2. The NNSS Waste Acceptance Criteria specify that external contamination levels for waste packages and transport vehicles shall meet the limits specified in 10 CFR 835, Appendix D, and the NNSS is constrained from releasing any transport vehicles back into commercial use if the outgoing radiological surveys detect contamination levels above these limits.
3. No issues were observed with regard to release of radiological waste materials from packages and subsequent contamination of transport trailers being used to ship wastes to the NNSS for disposal.
4. No issues were observed at the NNSS involving the failure of soft-sided packaging used to transport radioactive wastes.
5. Legacy contamination observed during outgoing NNSS trailer surveys could not be identified uniquely with any DOE site and, in selected cases, the trailers were found to have been in use at multiple DOE sites prior to being retained for decontamination at NNSS.
6. The ES/Clive disposal facility has had two documented situations where external trailer contamination levels exceeded DOT free-release limits; however, neither shipment was from a DOE site. In such cases, ES/Clive performs all decontamination prior to the release of transport equipment.
7. Approximately one-third of the radiological contamination and container integrity issues (total of 18) at ES/Clive during the three-year period being reviewed were associated with DOE waste shipments, and approximately 30% (total of six issues) involved the integrity of Supersack packaging.

The primary conclusions developed by the Trailer Contamination and Supersack Integrity Team include the following:

1. The recent increase in trailer contamination incidents is due in large part to the application of lower DOE free-release standards to a population of transport equipment that has been used at multiple DOE sites and is subject to legacy contamination that was not detected and addressed at the time the equipment was released from those DOE sites.
2. In the event the DOE and DOT free-release limits can be brought into closer harmony, this will reduce not only the number of transport equipment holds at the NNSS but also the need for subsequent decontamination to meet a more stringent release standard – including avoidance of significant costs for retention of equipment and decontamination services.
3. Implementation of stricter and more extensive radiological surveys of transporter equipment prior to loading waste packages and prior to the release of waste shipments will identify in advance situations involving legacy contamination that may warrant future decontamination activity. This will also assist transporters in identifying equipment that may be at risk and determining the probable sources of any such contamination.
4. Soft-sided packaging has been used successfully for transporting low-level radioactive waste (LLW) over a period of 15+ years. When the proper type of packaging material is used for the waste matrix, storage and transport conditions, and the manufacturer's use instructions are followed as a result of site-specific training, soft-sided packaging has proved to be a viable and cost-effective alternative for managing LLW.
5. Improper closure or storage of filled Supersacks without adequate use of absorbents or regard for weather protection may result in water intrusion to the waste package and subsequent release of fluid onto storage or transport equipment surfaces.

Based on observations and assessments, the Trailer Contamination and Supersack Integrity Team has developed the following recommendations in order to minimize future occurrences of similar issues at DOE sites. It is recommended that EM, working in coordination with NNSA and other Program Offices, implement these practices on a Complex-wide basis.

1. Develop and implement consistent performance standards for radiological surveys on radioactive material packaging and transport equipment when either enters or exits a DOE-controlled site. It is important that waste generators perform comprehensive surveys on empty transporter equipment prior to loading waste packages. Provide guidance to improve large area survey techniques to ensure that legacy or new contamination is identified, quantified, and documented in a timely manner. This should include specification of appropriate

survey techniques, equipment and operating procedures that will offer efficient and accurate results from one site/location to another.

2. Establish and promulgate a more consistent set of contamination limits that would apply to the release of radioactive material packaging or transport equipment from a DOE-controlled location. (This Recommendation is directly related to the efforts being undertaken by the DOE versus DOT Surface Contamination Limits Team. Actual contamination measurements and determination should be accomplished using the consistent performance standards established under Recommendation Number 1 above.
3. Establish and distribute a Lessons Learned guidance document that addresses the proper selection, handling, control, and protection of soft-sided packaging used for LLW management, storage and disposal applications.
4. Establish a reliable and consistent method for ensuring contractor oversight of Complex-wide radiological survey capabilities and the proper utilization of soft-sided packaging for LLW management activities. Program oversight is a prime contractor responsibility and the goal of having clear survey performance specifications will be to ensure consistency between DOE sites as far as contractor oversight and self-assessment. DOE O. 458.1 clearly indicates that "DOE Field Element Managers responsible for oversight of clearance processes must implement oversight duties to verify that the contractor assurance program is ensuring that the applicable radiological clearance requirements have been met".

II. Team Communications

During the Trailer Contamination and Supersack Integrity Team's evaluation, a total of three formal meetings were held:

- the first was in conjunction with the EFCOG WMWG session during Waste Management 2012 (Phoenix, AZ, March 1, 2012) – this served as a kickoff meeting and initial discussion among team members of the goals and objectives for the evaluation to be conducted;
- the second was in conjunction with the NNSS Generator Workshop (Las Vegas, NV, April 24, 2012) – this included a presentation and discussion of the preliminary trailer contamination findings and a detailed description of soft-sided packaging manufacturing and usage; and
- the third was in conjunction with the Contractor Transportation Management Association Workshop (Reno, NV, June 15, 2012) – this discussion focused primarily on the summary results of the inquiry, the format and content for the Team report, and the development of recommendations for presentation to EM/HQ.

Additional team communications were conducted by E-mail and telephone. Background information and team member inputs were circulated for comment and

discussion, and a draft of this report was distributed for team review, comment, and concurrence.

III. NNSS Waste Acceptance and Free Release Requirements

Waste generators who are approved to ship to the NNSS for disposal must meet a strict set of requirements for waste acceptance (NNSS Waste Acceptance Criteria, DOE/NV—325-Rev. 9), applicable DOT requirements during actual transportation, and DOE free-release criteria (10CFR 835, Appendix D) prior to release of transporter vehicles and equipment following waste off-loading for burial. Waste shipments must be refused by NNSS if determined to be non-compliant for any reason. In addition, the NNSS WAC contains other requirements related to shipment scheduling, advance notifications, preferred route selection, criticality safety, special handling for higher-dose levels, packaging, and marking.
With regard to the free release of waste packages and transporter equipment (vehicles and trailers), the NNSS Radiological Control Manual (DOE/NV/25946--801, Revision 2) imposes the surface contamination restrictions contained in 10 CFR 835, Appendix D (see Attachment B for detailed requirements). These limits have been in place since 1998 and were communicated to waste generators in a letter from the Nevada Site Office Assistant Manager for Environmental Management, Carl Gertz, dated August 19, 1998 (see Attachment C). During the actual physical transport of radioactive wastes, commercial carriers are subject to the DOT requirements in 49 CFR 173.443/715/843 (see Attachment B for detailed requirements).

However, there is a disparity between the free release contamination limits specified in 10 CFR 835 versus those in 49 CFR 173 (see Attachment B for a comparison). The contamination limits in 10 CFR 835, Appendix D are more conservative than those in 49 CFR 173. This has led to situations at the NNSS where transporter equipment could not be released after waste unloading – even if it met 49 CFR 173 contamination limits – unless the equipment could be manifested as "rad empty" or decontaminated to a level meeting the 10 CFR 835, Appendix D limits.

IV. Description of Relevant Incidents (FY 2009 to FY 2011)

Prior to FY 2009, there were isolated and intermittent incidents at the NNSS involving radiological contamination on either waste packages or transport vehicles and, in most cases, the contamination was due to leaking/damaged packaging. In these instances, NNSS issued specific Corrective Action Requests and the waste generators took incident-specific action to correct the problems. There were only sporadic situations where NNSS was unable to release transport equipment due to external contamination, and NNSS personnel provided decontamination services.

During the period of study undertaken as part of the Trailer Contamination and Supersack Integrity Team evaluation (FY 2009 through FY 2011), the rate of such

contamination incidents increased substantially; however, the failure of waste packaging integrity was not apparent as the source of the contamination. In addition to the increased number of contaminated transport vehicles, the nature of the contamination also changed and it became more difficult to decontaminate the affected items.

As a result of the increased occurrence of such incidents, DOE Environmental Management Headquarters (EM/HQ) Waste Management (EM-30) requested that the EFCOG Waste Management Working Group (WMWG) conduct a detailed review of these incidents and report back to EM-30 regarding the results of this review, including providing any recommendations formulated as a result of the evaluation of current site practices involving handling and management of radioactive material and waste shipments. The WMWG identified and tasked the Trailer Contamination and Supersack Integrity Team (membership and affiliations are shown in Attachment A). These incidents are documented in the following section of this report – grouped in accordance with the waste site of origin.

From FY 2009 though FY 2011, there were a total of 21 incidents involving radiologically-contaminated shipment trailers and nine (9) contaminated waste packages received at the Nevada National Security Site (NNSS) Area 5 Radioactive Waste Management Site (RWMS). During this time period, the EnergySolutions (ES) Clive, UT, disposal facility had a total of 18 similar incidents involving trailer and/or package contamination issues (see Attachment D for a summary of ES/Clive incidents and their internal assessment).

4.1 Incidents Involving Shipments from PermaFix Environmental Services

In October 2008, three shipments of mixed LLW debris grouted into nine boxes were received from the PermaFix Northwest facility in Washington (adjacent to the Hanford Reservation). Although no contamination was detected on the tractors or trailers, several waste packages were found to be contaminated with weapons-grade plutonium at levels exceeding the 10 CFR 835, Appendix D limits. All waste boxes were returned to PermaFix NW for evaluation.

PermaFix subsequently determined that the presence of external contamination was due to limited access to the underside of the boxes during the final radiological surveys prior to release for shipment. Corrective action taken by PermaFix included revision of site package handling procedures to permit greater access to the underside of boxes during final survey. No further contamination issues arose during this waste campaign. See Attachment E for detail regarding the PermaFix Corrective Action Plan.

4.2 Incidents Involving Shipments from LATA-Parallax Portsmouth

In December 2010, a total of 47 shipments containing uranium metal waste from the Portsmouth facility were shipped by LATA-Parallax as part of a larger shipment campaign. Two of these trailers failed to meet the NNSS free-release survey. Generator personnel travelled to the NNSS and verified that contamination was isolated to small areas near the centerline of the trailer flooring. These two trailers were returned to Portsmouth as "rad empty" for evaluation and corrective action.

LATA-Parallax determined that the root cause involved legacy contamination on the exterior of the waste boxes (which had been packaged at Fernald and stored at Portsmouth for some time) that had somehow been transferred to the trailer flooring. No excess contamination had been measured while the boxes were in lengthy storage. Corrective actions taken at Portsmouth included the following:

- Implementation of an engineered racking system to permit enhanced visual and radiological surveys of the container bottom surfaces;
- Enhanced oversight of both pre-loading and pre-shipment vehicle surveys; and
- Comprehensive re-survey of both loaded and empty trailers staged at Portsmouth which involved enhanced large area swipe surveys on all accessible areas of the boxes.

See Attachment F for detail regarding the LATA-Parallax Corrective Action Plan.

4.3 Incidents Involving Shipments from Fluor-B&W Portsmouth

In March 2011, a group of 35 shipments (involving the same type of waste boxes as those shipped by LATA-Parallax) were received from Fluor-B&W after the end of the contract transition from LATA-Parallax. Two trailers failed to meet the NNSS free-release criteria and they were returned to Portsmouth for evaluation. It was later determined that the contamination at issue was limited to a small (two foot square) area on each trailer floor within the loading footprint of the waste boxed that had been shipped. In addition, the re-survey of other trailers staged at Portsmouth for shipment resulted in identification of one additional case of similar external contamination.

As part of its corrective action process, Fluor-B&W evaluated multiple potential root causes – including vibration loss of material from the waste boxes during transit, legacy contamination on the boxes or trailers, and legacy particle contamination that was not detectable due to the type and rigor of release surveys conducted prior to shipment. No single factor was ruled out. In addition, Fluor-B&W utilized an independent Certified Health Physicist to conduct an assessment of site radiation control processes and procedures.

Corrective actions taken by Fluor-B&W at Portsmouth included the following:

- Revision of onsite survey procedures to include a 10% independent verification;
- Implementation of a tacky roller approach to enhance large area swipes on trailer floors and outer surfaces;
- Re-wrapping of remaining waste boxes with clear stretch wrap; and
- Specification that transporters provide "new" trailers (those not having been used previously on a DOE site) for transport of the remaining shipments.

Lessons learned as a result of the corrective action process included increased emphasis on transport trailer history and trending, introduction of independent oversight for radiological survey activities, and enhanced trailer bed surveys using large area floor monitors. See Attachment G for detail regarding the Fluor-B&W Corrective Action Plan.

4.4 Incidents Involving Shipments from Idaho National Laboratory

In August 2011, a shipment consisting of one cargo container and 10 boxes was received from Battelle Energy Alliance (BEA) at the NNSS. After unloading, the trailer was surveyed and contamination was detected above DOE free-release limits in the middle area of the wooden trailer bed. However, no external contamination was found on the waste packages. NNSS was requested to perform the decontamination services, which resulted in extensive activities – including removal of wood flooring and physical scouring of accessible metal surfaces.

During the corrective action planning process, BEA identified the following potential causal factors:

- Trailer release surveys were performed as spot surveys on less than 100% of the accessible load-bearing areas,
- No incoming survey was performed on the trailer upon arrival at the site and only a limited survey was conducted prior to waste loading, and
- Review of site procedures indicated that radiological survey guidance was in general not adequate to ensure consistency.

After completion of the corrective action planning process, BEA issued enhanced survey requirements (100% coverage of accessible areas) and revised applicable site procedures for radiation control and waste generator services functions. See Attachment H for detail reading the BEA Corrective Action Plan.

4.5 Incidents Involving Shipments from Los Alamos National Laboratory

In September 2011, Los Alamos was shipping debris in Supersacks to NNSS as part of a large ARRA-funded campaign. Over 200 shipments containing more than 700 bags had been received without incident when trailers started to fail the NNSS free-release survey after being unloaded. However, no external contamination was observed on the bags that were off-loaded. A total of 13 flatbed trailers were subsequently held at NNSS for decontamination. Los Alamos personnel visited the NNSS after the second failure in order to evaluate the issue, and shipments were self-suspended in order to determine appropriate corrective action.

LANL subsequently made several shipments of Supersacks to ES/Clive and surface contamination was observed on three of the bags prior to disposal. The following details were provided with regard to those shipments:

- The bags were extensively surveyed at LANL before being loaded on the truck and were known to not have external contamination when loaded.
- One bag was placed on clean plastic on the trailer, another on clean plywood, and the third directly on the trailer which was extensively surveyed and known not to be contaminated.
- All three bags had surface contamination when they arrived at Clive. All three surfaces which were clean at the time of shipment were contaminated when they arrived at ES/Clive.

Causal analysis was conducted in accordance with LANL Procedure P322-1. The corrective action evaluation conducted by LANL identified the following causal factors:

- Packages were not stored in accordance with requirements in the NNSS WAC, Section 3.2.10 and Section 5.5 – although packages were stored in a secure location, they were stored outside without any additional protection from rain and snow;
- LANL personnel performed package closures in accordance with vendor instructions but did not consistently secure the weather protection flaps (after bags were filled) – improper closure was also noticed by NNSS Disposal Operations personnel during unloading activities;
- During periods of heavy rainfall, the plastic on which filled bags were staged inhibited water runoff and caused water to pool around the bottom of packages;
- Localized areas of standing water potentially penetrated the packages to create conditions that allowed radioactive contamination to migrate through the external bag surfaces during extended transport;
- Although contamination was detected on the outside of several packages received at ES/Clive, including discoloration along several package seams, no visual indications of package breaches were identified during inspection;

- Trailer surveys were limited by lack of physical access for survey personnel to the center portion of the trailer bed – resulting in un-surveyed areas along the centerline which could not be ruled out as having detectable contamination, and
- Procedural inconsistencies were noted with regard to radiological surveys of loaded shipments and no surveys were performed on empty trailers upon receipt at the loading area.

In response to these factors, LANL implemented the following corrective actions:

- All remaining and newly-filled waste packages (including unused bags) were relocated to secure areas with protection from adverse weather - including storage on pallets, inside covered facilities, or under tarpaulins;
- Waste Certification Official surveillance requirements were expanded to include evaluation of package storage adequacy;
- Detailed radiological surveys were implemented on packages and trailers prior to loading waste to verify that any exterior contamination is within limits allowed by NNSS;
- Enhanced 100% survey procedures were implemented for all accessible load surfaces (including trailer centerlines) prior to vehicle entry to a controlled area, package loading, and shipment release for transport; and
- LANL conducted and documented training of project operations personnel to the enhanced package storage and survey procedures.

See Attachment J for detail regarding the LANL Corrective Action Plan. Attachment K contains a copy of a presentation made at the NNSS Generator Workshop which summarizes the Lessons Learned as a result of the LANL trailer contamination incidents.

NNSS personnel performed decontamination services on the 13 trailers that failed free-release survey limits. In some cases, the decontamination activity required multiple and repeated steps in order to achieve final survey results. This resulted in additional costs and extensive delays to the ARRA-funded campaign. Los Alamos responded by deciding to provide onsite disposal for the remaining waste packages.

V. Assessment of Integrity for Soft-sided Packaging

In view of the potential for external contamination of soft-sided packages (which was evaluated by Los Alamos as a possible causal factor during development of their Corrective Action Plan), the Trailer Contamination and Supersack Integrity Team was requested to consider the inherent capabilities and limitations associated with soft-sided packaging. The Team reviewed the recent history for DOE site use of this type of packaging and also considered the potential for packaging failure as a contributing factor in the specific trailer contamination incidents described in Section

II, above. During this process, relevant material and production information was requested from several commercial vendors who specialize in providing soft-sided packaging that has been used for DOE LLW management and disposal applications – see Attachment L for a list of the firms and individuals who responded to the Trailer Contamination and Supersack Integrity Team's requests for information regarding soft-sided packaging material, applications, performance, and testing.

5.1 Background and Description for Soft-sided Packaging

For the purposes of this inquiry, "soft-sided packaging" refers to a DOT-compliant container (e.g., bag, liner, Supersack, etc.) as defined in 49CFR173.410 & 411 and includes both IP-1 and IP-2 rated containers which are manufactured from polypropylene, polyethylene or similar materials and which range from five to nine cubic yards (135 to 243 cubic feet) in capacity.

Soft-sided packaging was introduced to the radioactive waste management industry over 15 years ago. Since then, many thousands of these packages have been sold and used in the United States in both commercial nuclear and government waste management applications. Soft-sided packaging is manufactured and supplied by multiple vendors, all of which have reported consistent successful results. Based upon the Trailer Contamination and Supersack Integrity Team's review of available literature, there has not been a single documented case of soft-sided package failure during transport that has resulted in a release of radioactive material.

Soft-sided packaging is constructed from engineered plastics that repel and resist water intrusion under normal circumstances; however, these packages are not inherently water-proof. These packages have been shipped successfully in closed van trailers, flatbed trailers, and in the more demanding environment of railroad gondola cars. There storage requirements for waste boxes and metal drums apply equally to soft-sided packaging, with the addition of protection from long-term ultraviolet radiation exposure. For additional detail regarding the manufacture and past performance of soft-sided packaging, see the presentation made by Tim Blythe and Gus Chirgot at the 2012 NNSS Generator Workshop (in Attachment M), the letter received from Strategic Packaging Systems (in Attachment N), and the presentation made by Al Beale at the DOE Packaging Management Council meeting held during the June 2012 CTMA Workshop (in Attachment O).

5.2 Successful Utilization of Soft-sided Packaging

Soft-sided packaging has proved to be a cost-effective and reliable alternative to traditional wood and metal packaging in a wide variety of LLW transportation and disposal situations, as demonstrated on the following projects:

- Savannah River DUO Drum Project (SRNS) – 2,400 IP-1 4-drum overpacks (SPS) to NNSS with no issues;

- Berkeley Bevatron D&D (PermaFix, EnergySolutions) – over 1,200 9-yd IP-1 bags (SPS) to NNSS with no issues;

- Argonne Bldg 330 D&D (EnergX) – over 1,300 9-yd IP-1 bags (SPS) to NNSS with no issues;

- Los Alamos Remediation (EnergySolutions) – over 1,500 9-yd IP-1 bags (PACTEC) to Clive with no issues;

- SPRU Remediation (EnergySolutions) – over 3,000 9-yd IP-1 bags (PACTEC) to Clive with only one minor issue
  [SPRU was storing the bags for a while onsite before shipping. The bags were freezing into a block and, when they picked the bags up, the straps were not straight vertically and they were pulled out away from the top of the bag. This was put a tremendous amount of stress on the stitching around the zipper, and it was the thread that was breaking. PACTEC worked with SPRU contractors and DOE to fix this problem and wrote a protocol which specified removal of the straps from the "belt loops" around the top of the bag before lifting. This fixed the problem. Even though some bags did come open because of the broken stitching, the duffle served as an interior closure and there was no release of material];

- B&W Y-12 – 2,000 bags (PACTEC) to Oak Ridge onsite disposal cell with no issues;

- NNSS Environmental Restoration Projects – 835 lift-liners (PACTEC) and 200 burrito bags to Area 5 disposal site with no issues; and

- West Valley Demonstration Project – 3,100 IP-2 6-drum overpacks (MHF) shipped in rail gondola cars and transloaded to trucks to NNSS with no issues.

5.3 Historical Use – Best Practices

Based upon industry inputs, the following Best Practices have been identified with regard to the proper use of soft-sided packaging:

- Use packaging appropriate for the waste matrix and content;
- Consider hydrostatic pressure effects on bags containing soil-like waste with moisture content > 25%;
- Incorporate light polyethylene liner and approved absorbent media to control moisture content;
- Adjust lifting straps for load shift or deformation, as required;
- Use common sense when loading/closing/lifting/storing flexible material;
- Do not stage or store filled bags in areas of poor water drainage or pooling;

- Provide protection from precipitation for both empty and filled bags to prevent water intrusion;
- Train user personnel to manufacturer's use/care instructions; and
- Monitor dust suppression during bag fill and closure operations to minimize water intrusion.

5.4 Recent Incidents at NNSS and Clive

Evaluation of recent incidents involving receipt of LANL debris wastes in Supersacks at both NNSS and ES/Clive resulted in the following observations:

- Over 200 shipments (containing more than 700 bags) were received at NNSS with no issues;
- A total of 13 trailers failed to meet DOE free-release survey limits and were subsequently decontaminated by NNSS;
- No external contamination was found on bags off-loaded at NNSS;
- Later shipments of Supersacks to ES/Clive had both trailer and bag contamination issues;
- LANL implemented effective corrective actions (see Attachment J for specific actions and Attachment K for Lessons Learned))
- All waste packages were relocated to a secure area with adequate weather protection;
- LANL performed enhanced surveys of incoming trailers and waste packages prior to loading – including a 100% survey on all accessible load-bearing surfaces; and
- LANL provided and documented additional package-specific training given to operations personnel - including detail on revised procedures.

5.5 Integrity Factors Identified and Examined

The Trailer Contamination and Supersack Integrity Team members examined a wide range of factors that would affect the integrity for soft-sided packaging, based upon past project experience. The following factors were identified as those being relevant to successful performance of the soft-sided packaging:

- Inadequate staging/storage of filled bags at generator site can result in packaging failure;
- Potential water intrusion or pressure release effects may result in external contamination or release of waste;
- Inadequate closure of filled bags (per manufacturer instructions) may result in water intrusion;
- Use adequate absorbent media and inner liner to address moisture content factors;
- Monitor moisture content to mitigate effects due to excessive dust suppression;
- Evaluate potential for lifting stress due to bag deformation (e.g., frozen water content or load shifting); and

- Utilize standardized testing for compliance with IP-1/IP-2 specifications – see Attachment P for an example of vendor testing results.

5.6 Conclusion – Integrity of Soft-sided Packaging

Based upon the summary review conducted by all participants, the following basic observations led to the overall conclusion that soft-siding packaging is appropriate for use during LLW management and disposal – subject to the proper conditions of use:

- There has been a successful history of soft-sided packaging use for over 15 years in LLW management applications;
- Multiple vendors and customer users have reported consistent satisfactory performance during multiple applications;
- Soft-sided packaging provides viable, cost-effective alternatives to use of wooden and metal containers;
- Packaging must be appropriate for the LLW content/media being managed under controlled environmental conditions;
- Compliance with manufacturer storage, handling, filling, lifting, and related instructions is essential to ensure proper packaging performance;
- Consistent training of site operations personnel to manufacturer requirements will ensure maximum packaging performance;
- Filled waste packages must be staged and stored properly to minimize water intrusion and structural integrity; and
- Use of appropriate and adequate absorbents and liners will minimize adverse effects associated with higher moisture content.

VI. Conclusions and Recommendations

The primary conclusions developed by the Trailer Contamination and Supersack Integrity Team include the following:

1. The recent increase in trailer contamination incidents is due in large part to the application of lower DOE free-release standards to a population of transport equipment that has been used at multiple DOE sites and is subject to legacy contamination that was not detected and addressed at the time the equipment was released from those DOE sites.
2. In the event the DOE and DOT free-release limits can be brought into harmony, this will reduce not only the number of transport equipment holds at the NNSS but also the need for subsequent decontamination to meet a more stringent release standard – including avoidance of significant costs for retention of equipment and decontamination.
3. Implementation of stricter and more extensive radiological surveys of transporter equipment prior to loading waste packages and prior to the release of waste shipments will identify in advance situations involving legacy

contamination that may warrant future decontamination activity. This will also assist transporters in identifying equipment that may be at risk and determining the probable sources of any such contamination.

4. Soft-sided packaging has been used successfully for transporting LLW over a 15+-year period with no reported releases of radioactive material. When the proper type of packaging material is used for the waste matrix, storage and transport conditions, and the manufacturer's use instructions are followed as a result of site-specific training, soft-sided packaging has proved to be a viable and cost-effective alternative for managing LLW.
5. Improper closure or storage of filled Supersacks without adequate use of absorbents or regard for weather protection may result in water intrusion to the waste package and subsequent release of fluid onto storage or transport equipment surfaces.

Based on observations and assessments, the Trailer Contamination and Supersack Integrity Team has developed the following recommendations in order to minimize future occurrences of similar issues at DOE sites. It is recommended that EM, working in coordination with NNSA and other Program Offices, implement these practices on a Complex-wide basis.

1. Develop and implement consistent performance standards for radiological surveys on radioactive material packaging and transport equipment when either entering or exiting a DOE-controlled site. It is important that waste generators perform comprehensive surveys on empty transporter equipment prior to loading waste packages. Provide guidance to improve large area survey techniques to ensure that legacy or new contamination is identified, quantified, and documented in a timely manner. This should include specification of appropriate survey techniques, equipment and operating procedures that will ensure consistency of results from one site/location to another.
2. Establish a more consistent set of contamination limits that would apply to the release of radioactive material packaging or transport equipment from a DOE-controlled location. (This recommendation is directly related to the efforts being undertaken by the other WMWG Evaluation Team). Actual contamination measurements and determination should be accomplished using the consistent performance standards established under Recommendation Number 1 above.
3. Establish and distribute a Lessons Learned guidance document that addresses the proper selection, handling, control, and protection of soft-sided packaging used for LLW management, storage and disposal applications.
4. Establish a reliable and consistent method for ensuring contractor oversight of Complex-wide radiological survey capabilities and the proper utilization of soft-sided packaging for LLW management activities. Program oversight is a prime contractor responsibility and the goal of having clear survey performance specifications will be to ensure consistency between DOE sites

as far as contractor oversight and self-assessment. DOE O. 458.1 clearly indicates that "DOE Field Element Managers responsible for oversight of clearance processes must implement oversight duties to verify that the contractor assurance program is ensuring that the applicable radiological clearance requirements have been met".

Attachment A
Trailer Contamination and Supersack Integrity Team Members

- Syd Gordon, NSTec (Lead)
- Travis Myers, CWI/Idaho
- Andy Baumer, LANS/Los Alamos
- Ashok Kapoor, EM-33
- Robert Black, BEA/Idaho
- Dan Shrum, ES-Clive
- Jack Reust, ES-OR
- Don Wadsworth, New World Envr.
- Mike Waters, Cavanagh/Hanford
- Jim Portsmouth, CHPRC/Hanford
- Danny Nichols, Fluor-B&W/Portsmouth
- John McCoy, Fluor-B&W/Portsmouth
- Steve O'Connor, Sponsor/EM-33
- Randy Scott, Sponsor, NA-173
- Kathleen Burianek, Sponsor, NA-174
- Vendor SMEs: Tim Blythe (WCS), Trey Bullinger (PACTEC), Scott Dempsey (MHF), Wendall Reeves (PACTEC), Mike Lewis (CPC), Rich Defeyter (CAST), Gus Chirgott (ICE), Al Beale (SPS)

EFCOG Packaging and Transportation (P&T) Subgroup

DOE VS DOT
RELEASE LIMITS

JUNE 11, 2012

Michael S. Waters, Cavanagh Services Group
James H. Portsmouth, CH2MHill

EFCOG P&T Subgroup

Group established by EFCOG on July 2011
Charter approved November 2011

- Leverage the P&T expertise and experience of contractor community to DOE
- Seek out and promote the best management and operating practices
- Focus on complex-wide integration and experience transfer

DOE vs DOT

An initiative of the P&T Subgroup

THE ISSUE:

Consistent application of the appropriate regulation for release of commercial carrier equipment with measurable contamination or dose rates from DOE complex sites. Regulations of interest are 10 CFR 835 and 49 CFRs for transportation, primarily 49 CFR 443.

DOE vs DOT

Team Members

Jim Portsmouth, CHPRC, **Lead**; Mike Waters, Cavanagh Services- **Co-Lead**; Syd Gordon, NSTec; Ashok Kapoor, EM-33; Joel Rabovsky, HS-11; Mark Ledoux, ES (*Chair of EFCOG RAP subgroup*); Kathleen Burianek, NA-174; Dan Shrum, ES-Clive; Don Wadsworth, New World Environmental; Andy Baumer, LANL; Scott Anderson, CH2M-WG Idaho; Jack Reust, OR Naval Program-ES; Danny Nichols, Fluor/B&W Portsmouth; and John McCoy, Fluor/B&W Portsmouth

DOE vs DOT

- FOR DOE – 10 CFR 835 IS "THE LAW"
  - Appendix D to Part 835 – Surface Contamination Values
- FOR DOT – 49 CFR 173-178 IS "THE LAW"
  - 49 CFR 173.443 – Contamination Control (the shipper)
  - 49 CFR 174.715 – Cleanliness of transport vehicles after use (for rail)
  - 49 CFR 177.843 – Contamination of vehicles (the carrier)

DOE vs DOT

Non-Fixed Contamination Limits issue

DOE 10 CFR 835 is more conservative than the DOT 49 CFR and impacts offsite/onsite P&T operations significantly

No public or worker health and safety issues under DOT or DOE limits

DOE

10 CFR 835 Appendix D

SURFACE CONTAMINATION VALUES IN DPM/100 CM

Radionuclide	Removable	Total (Fixed+Removable)
• U-nat, U-235, U-238, and associated decay products	1,000	5,000
• Transuranics, Ra-226, Ra-228, Th-230, Th-228, Pa-231, Ac-227, I-125, I-129	20	500
• Th-nat, Th-232, Sr-90, Ra-223, Ra-224, U-232, I-126, I-131, I-133	200	1,000
• Beta-gamma emitters (nuclides with decay modes other than alpha emission or spontaneous fission) except Sr-90	1,000	5,000
• Tritium and STCs 6	10,000	See Footnote 6

DOT
49 CFR 173.443
Contamination Control

TABLE 9—NON-FIXED EXTERNAL RADIOACTIVE CONTAMINATION LIMITS FOR PACKAGES

Contaminant	Maximum permissible limits		
	Bq/cm^2	uCi/cm^2	dpm/cm^2
1. Beta and gamma emitters and low toxicity alpha emitters	4	10^{-4}	220
2. All other alpha emitting radionuclides	0.4	10^{-5}	22

Limits for Rail; 49 CFR 174.715
Limits for Carrier; 49 CFR 177.843

DOT and DOE Surface Radioactivity Criteria

Isotope(s)	DOT-Removable[a] dpm/100 cm^2	DOE[d,e] dpm/100 cm^2
Transuranics, Ra-226, Ra-228, Th-228, Th-230, Pa-231, Ac-227,	240	100 TTL (20-removable[f])
Ra-223, Ra-224, U-232	**240**	**1000 TTL (200-removable[f])**
Enriched Uranium[2]	**240**	**5000 TTL (1000-removable[f])**
Th-228[1], Th-230[1], I-125, I-129	2400	100 TTL (20-removable[f])
Th-232, Natural Th, Sr-90, I-126, I-131, I-133	2400	1000 TTL (200-removable[f])
U-235, U-238, Natural U, Depleted U, Beta-gamma emitters (nuclides with decay modes other than alpha emission or spontaneous fission) except Sr-90 and others noted above.	**2400**	**5000 TTL (1000 - removable[f])**
Tritium	**2400**	**10,000 TTL (all removable[f])**

a- Amount of radioactivity on a swipe (not adjusted for efficiency using the default factor of 10); **b**-Uranium containing a greater mass percentage of uranium-235 than 0.72%; **c-** when contained in ores or physical and chemical concentrates; **d-**Taken from Figure IV-1 of DOE Order 5400.5 *Protection of the Public and the Environment;* **e-**Per DOE Order 458.1 DOE may permit clearance of objects at higher levels; **f-**10CFR835 Appendix D contains the same values for removable surface radioactivity

DOE vs DOT

There are exclusions in 10 CFR 835

- 10 CFR 835.1(b)(7) – excludes radioactive material transportation not performed by DOE or DOE contractors from compliance with 10 CFR 835 regulations.

DOE vs DOT

- DOE Standard – Radiological Control
- DOE-STD-1098-2008 (October 2008)

  - Chapter 4, Part 2 – Release and Transportation of Radioactive Material

  - Article 423 – Transportation of Radioactive Material
    - Recognizes exclusion from 10 CFR 835 requirements for radioactive material transportation not performed by DOE or DOE Contractor

DOE vs DOT
An Approach

- Collection of data from Sites on Current Situation
    - Survey systems used in implementing dual contamination limits for onsite and offsite transportation
    - Decon activities and costs
    - Programmatic impacts
    - Contractual implications
- Presentation at EFCOG Radiation Protection Subgroup – 3/14/12 - Radiation Protection Project is critical to the success of this initiative!
- Presentation at NNSS Waste Generator Workshop 4/25/12
- 2 conference calls held
- Online Survey sent out 6/4/12
- Evaluation of Data

DOE vs DOT

The Proposed Path Forward:

With EFCOG team members from across the complex, formulate a recommendation and provide to the DOE-HQ for implementation of a consistent practice across the DOE complex for releasing commercial carrier equipment used for the non DOE or DOE contractor transportation of radioactive material.

We Need Your Help!

Please contact:

- Jim Portsmouth (509-373-9594), CHPRC, **Lead**, james_h_portsmouth@rl.gov
- Mike Waters (509-372-2505), Cavanagh- **Co-Lead**, michael_s_waters@rl.gov
- Ashok Kapoor (202-586-8307), EM-33, email: ashok.kapoor@hq.doe.gov

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CONTAMINATION RELEASE LIMITS FOR RADIOACTIVE WASTE TRANSPORT VEHICLES

In the recent past, we have had two occasions where radioactive waste shipments have arrived at the Nevada Test Site (NTS) and the floor of the trailer was contaminated with detectable levels of radioactive contamination. In both cases, a detailed radiological survey indicated the levels were above NTS Release Limits, but below Department of Transportation (DOT) levels for release of the vehicle. The acceptable levels for release by DOT are much greater (10 to 100 times) than the long established DOE limits for free release of equipment and personal property. The DOE limits are specified in three DOE applicable standards--10 Code of Federal Regulations (C.F.R.) Part 35 (Appendix D), DOE Radiological Control Manual, and DOE Order 5400.5.

It is not in any way the intentions of the Department of Energy/Nevada Operations Office (DOE/NV) to interfere or inhibit movement of materials in free commerce or to institute change in DOT regulations. The inconsistency in DOT and DOE radioactive contamination release limits poses a problem for waste generators which are contractors of DOE at facilities not government-owned contractor operated (GOCO). At GOCO facilities, clearly DOE standards apply. For non-GOCO facilities, DOT release limits may be acceptable for radioactive shipments not destined for DOE facilities, such as the NTS.

However, once a contaminated vehicle enters the NTS above DOE contamination limits, it is difficult to release such a vehicle without either decontaminating it to below DOE limits or creating an outgoing radioactive shipment for an empty vehicle. Our proposed solution is to request that all waste generators, including non-GOCO and Department of Defense generators, enforce the DOE established release limits for radioactive contamination for equipment and

personal property as specified in 10 C.F.R. Part 835, Appendix D. We believe it is not only in DOE's best interest, but all privately-owned commercial carriers conducting business in free commerce to always keep radioactive contamination of their vehicles at levels as-low-as reasonably achievable (ALARA). In fact, it has been our experience that when trucking companies are made aware of radioactive contamination of their vehicles, they act immediately and responsibly to decontaminate them and meet the intent of ALARA.

With this memorandum, DOE/NV is instituting a solution by imposing the DOE's lower contamination limits. DOE/NV will further evaluate this issue with the possibility of a revision to the DOE/NV NTS waste acceptance criteria.

If you have any questions, please contact Wendy A. Clayton, Waste Operations Team Lead, at (702) 295-5751.

Carl P. Gertz, Assistant Manager
for Environmental Management

WMD:JJC

cc:
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Attachment D – Summary of ES/Clive Incidents

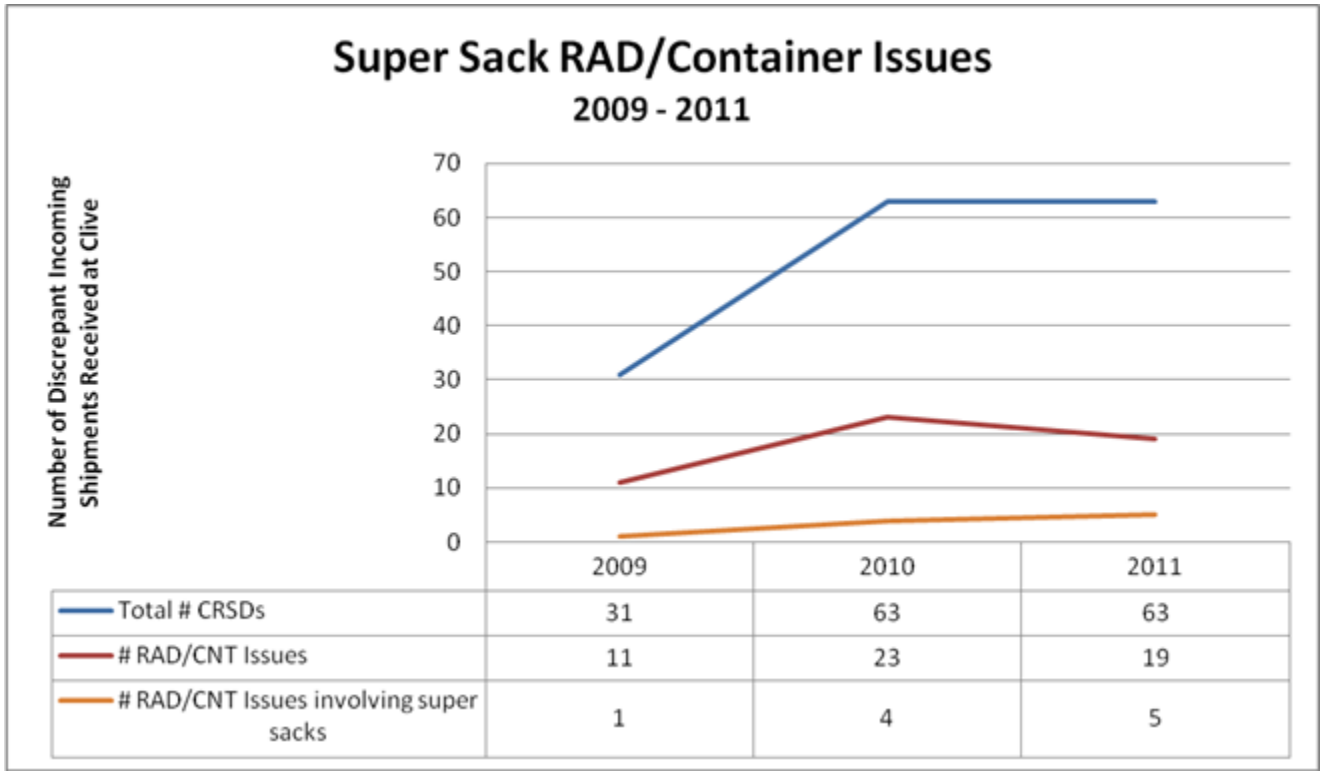
From: Gwen Young
Sent: Thursday, June 14, 2012 11:31 AM
To: Jeff Gardner; Dan Shrum
Cc: Allan Erichsen
Subject: FW: Summary of Issues

This email is response to additional data requests made via email on 5/31/12. Attached is an updated spreadsheet containing a breakdown of discrepant incoming shipments received at Clive in which involved a radiological or container issue. All data below was calculated using this spreadsheet.

1. Has ES/Clive experienced any trends with regard to incoming shipment trailer contamination (increases in frequency or severity)?
    A. In 2010 there was an increase in the number of container integrity issues.
2. Has ES/Clive received any DOE site shipments where the external contamination exceeded DOT free release limits? If so, did ES/Clive perform decontamination activities or did they direct generators to do so?
    A. There were 2 issues documented where the external contamination exceeded DOT free release limits; however this were not from any DOE site shipments.
        a. In review of the three year data, 36% of RAD/Container issues were from DOE site shipments.
        b. Removing Non-RAD/CNT issues from DOE site shipments the percentage decreases to 17%
    B. ES/Clive performs all decontamination activities.
3. Has ES/Clive experienced any trends with regard to super sack failures on incoming generator shipments? If so, what onsite actions were required to mitigate the effects of those failures upon disposal site operations?
    A. In review of the three year data, 19% of RAD/Container issues involved super sack failures.
        a. Removing Non-RAD/CNT issues involving super sacks the percentage decreases to 15%
    B. To the best of my knowledge, yearly reviews did not identify a trend for any onsite actions

Type of Issue	2009	2010	2011	3 Year Total	% of 3 Year Total	% of RAD/CNT Total
Total # CRSDs	31	63	63	**157**	-	-
# RAD/CNT Issues	11	23	19	**53**	34%	-
# of Contamination issues	1	2	6	**9**	6%	17%
# of Container Integrity issues	1	11	4	**16**	10%	30%

# of Material Release issues	3	3	4	**10**	6%	19%
#Other Non-RAD/CNT Issues	6	10	5	**21**	13%	40%
# RAD/CNT Issues involving super sacks	1	4	5	**10**	-	19%
# RAD/CNT Issues from DOE site shipments	5	10	4	**19**	-	36%



DOE Site Shipments Only					
Type of Issue	**2009**	**2010**	**2011**	**3 Year total**	**% of DOE RAD/CNT Total (53)**
# RAD/CNT Issues from DOE site shipments	5	10	4	**19**	36%
# of DOE Contamination issues	0	0	1	**1**	2%
# of DOE Container Integrity issues	0	5	0	**5**	9%

# of DOE Material Release issues	1	1	1	**3**	6%
# of DOE Other Non-RAD/CNT issues	4	4	2	**10**	19%
#DOE RAD/CNT issues involving super sacks	1	4	1	**6**	4%

Please let me know if this is what you were wanting or if I may be of any further assistance.

Gwen L. Young
Quality Assurance Coordinator
Energy***Solutions***
Direct Line: 801-649-2068
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Clive Incoming Shipments - Radiological and Container Issues
2009 - 2011

Container Type - Retreived from EWIS This information is not a normal part of the log Added for EFCOG Research	CRSD #	Date Initiated	Category	Summary of Event/Condition	Generator ID-Waste Stream-Shipping #	Bates #	Generator Name	GSAP	# of occurrences (by generator & waste stream w/ like events)	ES involvement	CAP Requested
Liner	CRSD09-002	2/9/2009	CNT	Shackles for lifting cask were not secure	1023-C-0021	C10550	Monticello (NMC)	209001562	1	NA	No
Combination - Metal boxes & Drums	CRSD09-006	3/4/2009	LIQ/ER/ RAD2	Emergency Response implemented, Leaking container	0856-05-0717	L109040	Duratek (ES)	110000021	1	ES	Yes
Intermodal	CRSD09-010	5/4/2009	CNT	Non-strong Tight and leaking shipment	8007-19-0032-0034	PR05737	DOE Paducah	604003798	1	ES-PM	Yes
Intermodal	CRSD09-011	5/11/2009	RAD4/ Safety	Shipment contained his concentrations of Uranium. Radiation Safety concern	0716-04-0094, 0095, & 0096	L109508, L109507, L109509	Honeywell	112001210	1	NA	No
Drum	CRSD09-022	9/14/2009	CNT	Weight >10% of manifested volume	6220-02-0032	PR05810	DOE Mound	701004120	1	ES-PM	No
Supersack	CRSD09-023	9/14/2009	RAD2/ER/ LIQ	Emergency Response implemented when liquid was observed leaking	0507C-17-0009	L110668	GE Healthcare	807004941	1	NA	No
Metal Box	CRSD09-024	9/14/2009	RAD2/CP/ LIQ	Contingency Plan implemented when waste like material was observed on flatbed. Additional box contained aqueous material >1%	0421-20-0039	M10984	Perma-Fix Florida	112001231	1	NA	No
Lift Liner	CRSD09-026	9/25/2009	CNT	Weight >10% of manifested volume	6220-02-0033	PR05817	DOE Mound	701004120	2	ES-PM	No
Rolloff	CRSD09-029	10/30/2009	CNT	Weight >10% of manifested volume	8027-08-0001	PR05841	DOE Los Alamos National Lab (Portage)	501003157	1	NA	No
Cask	CRSD09-030	11/3/2009	CNT	non-strong tight Cask	1017-C-1012	C01794	Entergy South Grand Gulf	204001347	1	NA	Yes

All RAD & Container CRSDs 09-11

RAD2 = Unplanned Release
RAD4 = Other

Clive Incoming Shipments - Radiological and Container Issues
2009 - 2011

Container Type - Retreived from EWIS This information is not a normal part of the log Added for EFCOG Research	CRSD #	Date Initiated	Category	Summary of Event/Condition	Generator ID-Waste Stream-Shipping #	Bates #	Generator Name	GSAP	# of occurrences (by generator & waste stream w/ like events)	ES involvement	CAP Requested
Supersack	CRSD09-031	12/18/2009	CNT	Weight >10% off manifested volume	9006-24	8 shipments see CR	DOE LANL/ES Federal Services	210001702	1	ES-PM	No
Supersack	CRSD10-002	1/8/2010	CNT	1/6/10 during incoming receipt inspection it was noted a Supersack was Breached	8038-01-134	L111939	Portage Shaw JV/DOE Environmental Management (SPRU)	804004820	1	ES-PM	No
Supersack	CRSD10-003	1/12/2010	CNT	Weight >10% off manifested volume	9006-24	5shipments see CR	DOE LANL/ES Federal Services	210001702	2	ES-PM	No
Gondola	CRSD10-006	1/22/2010	CNT	Shipment arrived with manifested gondola missing drain cap	0923-05-0034	L111940	ABB Windsor, CT	603003718	1	ES-PM	No
Supersack	CRSD10-007	1/26/2010	CNT	1/25/10 during incoming receipt inspection it was noted a Supersack was Breeched	8038-01-138	L112079	Portage Shaw JV/DOE Environmental Management (SPRU)	804004820	2	ES-PM	No
Not Specified	CRSD10-008	2/1/2010	RAD2/LIQ/ER	Non-Aqueous Liquid was identified leaking from the bottom of a waste tractor	8009-06-1001	L112107	DOE Oakridge	209001584	1	NA	No
Supersack	CRSD10-010	2/10/2010	CNT	2/10/10 during incoming receipt inspection it was noted a Supersack was Breached	8038-01-0152, 0158, 0168, 0160, 0157	L112200 L112220 L112275 L112271 L112278	Portage Shaw JV/DOE Environmental Management (SPRU)	804004820	3	ES-PM	No

All RAD & Container CRSDs 09-11

RAD2 = Unplanned Release
RAD4 = Other

Clive Incoming Shipments - Radiological and Container Issues
2009 - 2011

Container Type - Retreived from EWIS This information is not a normal part of the log Added for EFCOG Research	CRSD #	Date Initiated	Category	Summary of Event/Condition	Generator ID-Waste Stream-Shipping #	Bates #	Generator Name	GSAP	# of occurrences (by generator & waste stream w/ like events)	ES involvement	CAP Requested
End Dump	CRSD10-013	4/1/2010	CNT	4/1/10 during incoming receipt inspection it was noted the End-Dump's tarp was breached	0876-02-0116	L112651	Energysolutions for Whittaker Corp	211001864	1	ES-S	No
Drum	CRSD10-021	6/4/2010	RAD4/WPR	Shipment exceeds Class A	9011-17-0001	M11178	DOE BNL	112001215	1	NA	Yes
Drum	CRSD10-023	6/16/2010	RAD2/CNT	Hole in drum identified during incoming inspection	9314-23-0005	PM01136	DOE Westkem (DOE Bechtel Jacobs)		1	NA	No
Drum	CRSD10-028	7/30/2010	CNT	Cont # 109630-01 contains PCB labels	9306-20-0003	M11335	DOE Paducah	604003798	1	ES-PM	No
Metal Box	CRSD10-031	8/18/2010	RAD4/WPR	Shipment exceeds Class A	9079-09-0001	M11244	Flour Hanford	811005000	1	ES-PM	Yes
Liner	CRSD10-033	8/30/2010	CNT	Sling appeared compromised	1042-C-0045	C02019	RACE	112001210	1	NA	No
Drum	CRSD10-034	9/2/2010	CNT	Weight >10% off manifested volume	9006-34	see CRSD	DOE LANL/ES Federal Services	210001702	3	ES-PM	No
Intermodal	CRSD10-035	9/15/2010	RAD2/CNT/ER	Hole in bottom of intermodal	9011-08-0821	L114279	DOE BNL	112001215	1	NA	No
Combination - Metal boxes, Wood Boxes & Drums	CRSD10-036	9/20/2010	RAD2/LIQ/ER	Shipment contains unexpected liquids	0507C-25-0001	L114488	GE Healthcare	807004941	1	NA	No
Gondola	CRSD10-037	9/28/2010	RAD2/LIQ/ER	Shipment contains unexpected liquids which were observed leaking along the Clive rail line	0659-01-18186	E26582, E26570, E26569	TRONOX (West Chicago Envron. Response)	110000013	1	ES-S	No
Drum	CRSD10-043	10/21/2010	RAD2/CP	Material identified in conveyance	0588-01	M11462	CH2MHILL (Molycorp)	206001381	Tracking only	NA	No
Liner	CRSD10-049	11/19/2010	CNT	Void Shipment was compliant	1012-C-0272	C02116	Studsvik	112001211	void	NA	No

All RAD & Container CRSDs 09-11

RAD2 = Unplanned Release
RAD4 = Other

Clive Incoming Shipments - Radiological and Container Issues
2009 - 2011

Container Type - Retreived from EWIS This information is not a normal part of the log Added for EFCOG Research	CRSD #	Date Initiated	Category	Summary of Event/Condition	Generator ID-Waste Stream-Shipping #	Bates #	Generator Name	GSAP	# of occurrences (by generator & waste stream w/ like events)	ES involvement	CAP Requested
Cvan	CRSD10-051	11/22/2010	RAD4/CNT	Shipment was found to have removable alpha contamination. The contamination level that was found is over the allowable contamination limits set forth in 49 CFR 173.443.	0507C-06-0048	L115229	GE Nuclear Energy	111000044	1	ES-PM	No
85 Gal	CRSD10-053	12/9/2010	RAD4/WPR	Uranium concentrations greater than profile limit	9069-01-0006	NA	Perma-Fix (M&EC)	112001205	1	NA	Yes
Rolloff	CRSD10-056	12/10/2010	RAD2/LIQ/ ER	Shipments arrived dripping from the bottom of door seal	0939-01-0005 & 0002	L115372 & L115368	Questar	603003718	1	ES-PM	No
Liner	CRSD10-057	12/10/2010	CNT	Impeller was not marked with any uniquely identifying numbers correlating with manifest	1005-C-034	C02127	Exelon Dresden	110000029	1	ES-PM	No
Gondola	CRSD10-063	12/22/2010	RAD4/ER	Fire involving waste	0716-04	See file	Honeywell		1	NA	No
Gondola	CRSD10-064	12/22/2010	RAD2/CNT	breeched container	0953-02-0044	L115482	Breckenridge	603009718	1	ES-PM	No
Lift Liner	CRSD11-003	1/7/2011	CNT	Container integrity	9091-01	E26941	Ronald McDonald	1012006320	1	SD-O	No
Drum	CRSD11-014	2/2/2011	RAD2/LIQ	Waste leaked from containers	9061-12-0008	M11610	DOE Oak Ridge Y-12	611004060	1	SD-ES	No
Combination - Metal boxes & Drums	CRSD11-016	2/7/2011	CNT	Load shift	0870-09-0068	L115778	Toxco MMC	501003158	1	SD-O	No
Combination - Unspecified	CRSD11-020	2/23/2011	CNT	Shipments arrived without shipping confirmation. Load shift	6222, 8043, 9501 (various waste streams & shipment #s)	See CRSD	DOE Paducah LATA	10070060000	1	SD-O	No
Intermodal	CRSD11-022	2/25/2011	RAD2/ER	A leaking intermodal	0923-05-0136	L115922	Windsor	1002005542	1	SD-ES	Yes

All RAD & Container CRSDs 09-11

RAD2 = Unplanned Release
RAD4 = Other

Clive Incoming Shipments - Radiological and Container Issues
2009 - 2011

Container Type - Retreived from EWIS This information is not a normal part of the log Added for EFCOG Research	CRSD #	Date Initiated	Category	Summary of Event/Condition	Generator ID-Waste Stream-Shipping #	Bates #	Generator Name	GSAP	# of occurrences (by generator & waste stream w/ like events)	ES involvement	CAP Requested
Gondola	CRSD11-029	4/6/2011	RAD2/LIQ	Emergency Response implemented shipment observed leaking	0716-04-0149 & 0150	L116468	Honeywell	501003155	1	SD-O	Yes
Metal Box	CRSD11-031	4/29/2011	CNT	>exceeds 10% Weight	9066-05-0006	PM01357	New Port News Shipbuilding	803004700	1	SD-O	No
Gondola	CRSD11-033	4/29/2011	RAD2/LIQ	Leaking Shipment	3132-01-0008, 0010, 0011	L116646, L116641, L116642	Chicago Magnesium Casting Company	603003718	1	SD-ES	Yes
Supersack	CRSD11-037	5/10/2011	RAD2/ER	Emergency Response implemented waste detected on outside of supersack	0619-01-0005 & 0006	L116724, L116725	Chicago Magnesium Casting Company	603003718	1	SD-ES	No
Intermodal	CRSD11-043	6/23/2011	RAD4	Container exceeds RML LC27 release limits	0893-05-0313	L117025	Studvik	112001211	1	SD-ES	Yes
Supersack	CRSD11-050	7/20/2011	RAD2/CP	Contingency Plan implemented Contamination identified on shipping conveyance (trailer Bed)	3134-01-0001	L117235	General Dynamics Marion AWS	1103006520	1	tracking only	No
Drum	CRSD11-053	8/15/2011	CNT	>exceeds 10% Weight	9061-01-0067	PM01416	DOE Oak Ridge Y-12	611004060	1	SD-O	No
Drum	CRSD11-054 (Rev 1)	8/19/2011	RAD2/LDR	Contamination identified on the trailer Additional issue-LDR	0421D-01-0080 & 0421D-04-0052	M11804 M11803	Perma-Fix (DSSI)	111000801	1	SD-ES	Yes
Intermodal	CRSD11-055	8/24/2011	RAD2	Contamination identified on the trailer	0893-04-0395	L117522	Studvik	112001210	1	SD-O	Yes
Supersack	CRSD11-057	10/27/2011	RAD2	Contamination identified on the trailer	8045-07-0415	L117931	DOE LANL	1008006080	2	SD-O	Yes

All RAD & Container CRSDs 09-11

RAD2 = Unplanned Release
RAD4 = Other

Clive Incoming Shipments - Radiological and Container Issues
2009 - 2011

Container Type - Retreived from EWIS This information is not a normal part of the log Added for EFCOG Research	CRSD #	Date Initiated	Category	Summary of Event/Condition	Generator ID-Waste Stream-Shipping #	Bates #	Generator Name	GSAP	# of occurrences (by generator & waste stream w/ like events)	ES involvement	CAP Requested
Large Component	CRSD11-062	11/16/2011	CNT/LIQ	Manifested containers had holes identified in them. Additional issue with unexpected free liquids	0161-01-0022, 0023 0024	L118108 L118110	Exelon Dresden	110000029	1	SD-ES	Yes
Gondola	CRSD11-063	11/23/2011	CNT	Breeched container (plastic wrap was found open)	0659-01-18705	E27373	West Chicago Environ. Response	110000013	1	SD-O	No
Supersack	CRSD11-065	12/20/2011	CNT	Container integrity	9101-01-0001	M11896	Nuclear Fuel Services	109000006	1	SD-O	No
Liner	CRSD11-066	12/30/2011	CNT	missing shackle pins	1042-C-0048	C02455	SPF Memphis	1108006921	1	SD-O	Yes

All RAD & Container CRSDs 09-11

RAD2 = Unplanned Release
RAD4 = Other

Clive Incoming Shipments - Radiological and Container Issues
2009 - 2011

Container Type - Retreived from EWIS This information is not a normal part of the log Added for EFCOG Research	CRSD #	Date Initiated	Category	Summary of Event/Condition	Generator ID-Waste Stream-Shipping #	Bates #	Generator Name	GSAP	# of occurrences (by generator & waste stream w/ like events)	ES involvement	CAP Requested
Metal Box	CRSD09-024	9/14/2009	RAD2/CP/ LIQ	Contingency Plan implemented when waste like material was observed on flatbed. Additional box contained aqueous material >1%	0421-20-0039	M10984	Perma-Fix Florida	112001231	1	NA	No
Drum	CRSD10-043	10/21/2010	RAD2/CP	Material identified in conveyance	0588-01	M11462	CH2MHILL (Molycorp)	206001381	Tracking only	NA	No
Cvan	CRSD10-051	11/22/2010	RAD4/CNT	Shipment was found to have removable alpha contamination. The contamination level that was found is over the allowable contamination limits set forth in 49 CFR 173.443.	0507C-06-0048	L115229	GE Nuclear Energy	111000044	1	ES-PM	No
Supersack	CRSD11-037	5/10/2011	RAD2/ER	Emergency Response implemented waste detected on outside of supersack	0619-01-0005 & 0006	L116724, L116725	Chicago Magnesium Casting Company	603003718	1	SD-ES	No
Intermodal	CRSD11-043	6/23/2011	RAD4	Container exceeds RML LC27 release limits	0893-05-0313	L117025	Studvik	112001211	1	SD-ES	Yes
Supersack	CRSD11-050	7/20/2011	RAD2/CP	Contingency Plan implemented Contamination identified on shipping conveyance (trailer Bed)	3134-01-0001	L117235	General Dynamics Marion AWS	1103006520	1	tracking only	No
Drum	CRSD11-054 (Rev 1)	8/19/2011	RAD2/LDR	Contamination identified on the trailer Additional issue-LDR	0421D-01-0080 & 0421D-04-0052	M11804 M11803	Perma-Fix (DSSI)	111000801	1	SD-ES	Yes
Intermodal	CRSD11-055	8/24/2011	RAD2	Contamination identified on the trailer	0893-04-0395	L117522	Studvik	112001210	1	SD-O	Yes
Supersack	CRSD11-057	10/27/2011	RAD2	Contamination identified on the trailer	8045-07-0415	L117931	DOE LANL	1008006080	2	SD-O	Yes

Contamination CRSDs 09-11

RAD2 = Unplanned Release
RAD4 = Other

Clive Incoming Shipments - Radiological and Container Issues
2009 - 2011

Container Type - Retreived from EWIS This information is not a normal part of the log Added for EFCOG Research	CRSD #	Date Initiated	Category	Summary of Event/Condition	Generator ID-Waste Stream-Shipping #	Bates #	Generator Name	GSAP	# of occurrences (by generator & waste stream w/ like events)	ES involvement	CAP Requested
Intermodal	CRSD09-010	5/4/2009	CNT	Non-strong Tight and leaking shipment	8007-19-0032-0034	PR05737	DOE Paducah	604003798	1	ES-PM	Yes
Supersack	CRSD09-023	9/14/2009	RAD2/ER/ LIQ	Emergency Response implemented when liquid was observed leaking	0507C-17-0009	L110668	GE Healthcare	807004941	1	NA	No
Cask	CRSD09-030	11/3/2009	CNT	non-strong tight Cask	1017-C-1012	C01794	Entergy South Grand Gulf	204001347	1	NA	Yes
Supersack	CRSD10-002	1/8/2010	CNT	1/6/10 during incoming receipt inspection it was noted a Supersack was Breached	8038-01-134	L111939	Portage Shaw JV/DOE Environmental Management (SPRU)	804004820	1	ES-PM	No
Supersack	CRSD10-007	1/26/2010	CNT	1/25/10 during incoming receipt inspection it was noted a Supersack was Breeched	8038-01-138	L112079	Portage Shaw JV/DOE Environmental Management (SPRU)	804004820	2	ES-PM	No
Supersack	CRSD10-010	2/10/2010	CNT	2/10/10 during incoming receipt inspection it was noted a Supersack was Breached	8038-01-0152, 0158, 0168, 0160, 0157	L112200 L112220 L112275 L112271 L112278	Portage Shaw JV/DOE Environmental Management (SPRU)	804004820	3	ES-PM	No
End Dump	CRSD10-013	4/1/2010	CNT	4/1/10 during incoming receipt inspection it was noted the End-Dump's tarp was breached	0876-02-0116	L112651	Energysolutions for Whittaker Corp	211001864	1	ES-S	No
Drum	CRSD10-023	6/16/2010	RAD2/CNT	Hole in drum identified during incoming inspection	9314-23-0005	PM01136	DOE Westkem (DOE Bechtel Jacobs)		1	NA	No

Cont. Intergrity CRSDs 09-11

RAD2 = Unplanned Release
RAD4 = Other

Clive Incoming Shipments - Radiological and Container Issues
2009 - 2011

Container Type - Retreived from EWIS This information is not a normal part of the log Added for EFCOG Research	CRSD #	Date Initiated	Category	Summary of Event/Condition	Generator ID-Waste Stream-Shipping #	Bates #	Generator Name	GSAP	# of occurrences (by generator & waste stream w/ like events)	ES involvement	CAP Requested
Intermodal	CRSD10-035	9/15/2010	RAD2/CNT/ER	Hole in bottom of intermodal	9011-08-0821	L114279	DOE BNL	112001215	1	NA	No
Rolloff	CRSD10-056	12/10/2010	RAD2/LIQ/ER	Shipments arrived dripping from the bottom of door seal	0939-01-0005 & 0002	L115372 & L115368	Questar	603003718	1	ES-PM	No
Gondola	CRSD10-064	12/22/2010	RAD2/CNT	breeched container	0953-02-0044	L115482	Breckenridge	603009718	1	ES-PM	No
Lift Liner	CRSD11-003	1/7/2011	CNT	Container integrity	9091-01	E26941	Ronald McDonald	1012006320	1	SD-O	No
Gondola	CRSD11-029	4/6/2011	RAD2/LIQ	Emergency Response implemented shipment observed leaking	0716-04-0149 & 0150	L116468	Honeywell	501003155	1	SD-O	Yes
Gondola	CRSD11-033	4/29/2011	RAD2/LIQ	Leaking Shipment	3132-01-0008, 0010, 0011	L116646, L116641, L116642	Chicago Magnesium Casting Company	603003718	1	SD-ES	Yes
Large Component	CRSD11-062	11/16/2011	CNT/LIQ	Manifested containers had holes identified in them. Additional issue with unexpected free liquids	0161-01-0022, 0023 0024	L118108 L118110	Exelon Dresden	110000029	1	SD-ES	Yes
Gondola	CRSD11-063	11/23/2011	CNT	Breeched container (plastic wrap was found open)	0659-01-18705	E27373	West Chicago Environ. Response	110000013	1	SD-O	No
Supersack	CRSD11-065	12/20/2011	CNT	Container integrity	9101-01-0001	M11896	Nuclear Fuel Services	109000006	1	SD-O	No

Cont. Intergrity CRSDs 09-11

RAD2 = Unplanned Release
RAD4 = Other

Clive Incoming Shipments - Radiological and Container Issues
2009 - 2011

Container Type - Retreived from EWIS This information is not a normal part of the log Added for EFCOG Research	CRSD #	Date Initiated	Category	Summary of Event/Condition	Generator ID-Waste Stream-Shipping #	Bates #	Generator Name	GSAP	# of occurrences (by generator & waste stream w/ like events)	ES involvement	CAP Requested
Combination - Metal boxes & Drums	CRSD09-006	3/4/2009	LIQ/ER/ RAD2	Emergency Response implemented, Leaking container	0856-05-0717	L109040	Duratek (ES)	110000021	1	ES	Yes
Supersack	CRSD09-023	9/14/2009	RAD2/ER/ LIQ	Emergency Response implemented when liquid was observed leaking	0507C-17-0009	L110668	GE Healthcare	807004941	1	NA	No
Metal Box	CRSD09-024	9/14/2009	RAD2/CP/ LIQ	Contingency Plan implemented when waste like material was observed on flatbed. Additional box contained aqueous material >1%	0421-20-0039	M10984	Perma-Fix Florida	112001231	1	NA	No
Not Specified	CRSD10-008	2/1/2010	RAD2/LIQ/ ER	Non-Aqueous Liquid was identified leaking from the bottom of a waste tractor	8009-06-1001	L112107	DOE Oakridge	209001584	1	NA	No
Combination - Metal boxes, Wood Boxes & Drums	CRSD10-036	9/20/2010	RAD2/LIQ/ ER	Shipment contains unexpected liquids	0507C-25-0001	L114488	GE Healthcare	807004941	1	NA	No
Gondola	CRSD10-037	9/28/2010	RAD2/LIQ/ ER	Shipment contains unexpected liquids which were observed leaking along the Clive rail line	0659-01-18186	E26582, E26570, E26569	TRONOX (West Chicago Envron. Response)	110000013	1	ES-S	No
Rolloff	CRSD10-056	12/10/2010	RAD2/LIQ/ ER	Shipments arrived dripping from the bottom of door seal	0939-01-0005 & 0002	L115372 & L115368	Questar	603003718	1	ES-PM	No
Drum	CRSD11-014	2/2/2011	RAD2/LIQ	Waste leaked from containers	9061-12-0008	M11610	DOE Oak Ridge Y-12	611004060	1	SD-ES	No
Intermodal	CRSD11-022	2/25/2011	RAD2/ER	A leaking intermodal	0923-05-0136	L115922	Windsor	1002005542	1	SD-ES	Yes

Material Release CRSDs 09-11

RAD2 = Unplanned Release
RAD4 = Other

Clive Incoming Shipments - Radiological and Container Issues
2009 - 2011

Container Type - Retreived from EWIS This information is not a normal part of the log Added for EFCOG Research	CRSD #	Date Initiated	Category	Summary of Event/Condition	Generator ID-Waste Stream-Shipping #	Bates #	Generator Name	GSAP	# of occurrences (by generator & waste stream w/ like events)	ES involvement	CAP Requested
Gondola	CRSD11-029	4/6/2011	RAD2/LIQ	Emergency Response implemented shipment observed leaking	0716-04-0149 & 0150	L116468	Honeywell	501003155	1	SD-O	Yes
Gondola	CRSD11-033	4/29/2011	RAD2/LIQ	Leaking Shipment	3132-01-0008, 0010, 0011	L116646, L116641, L116642	Chicago Magnesium Casting Company	603003718	1	SD-ES	Yes
Supersack	CRSD11-037	5/10/2011	RAD2/ER	Emergency Response implemented waste detected on outside of supersack	0619-01-0005 & 0006	L116724, L116725	Chicago Magnesium Casting Company	603003718	1	SD-ES	No

Material Release CRSDs 09-11

RAD2 = Unplanned Release
RAD4 = Other

Corrective Action Request RWAP-C-09-01
NTSWAC, Rev. 7, Section 3.2.13, Contamination Levels, states, "External contamination levels for waste packages and transport vehicles shall meet the release limits specified in Title 10 CFR, Part 835, Appendix D."

Contrary to the above, at approximately 0838 hrs October 23, 2008 NSTec Radiological Control Technicians were performing a radiological receipt inspection on Perma-Fix shipments PFM09013, PFM09014, and PFM09015. The survey indicated contamination was detected on various packages. The contamination levels were:

2500 dpm per 100 cm square alpha swipe, 30,000 dpm per 100 cm square, alpha direct, 10,000 dpm per 100 cm square beta direct. The contamination levels exceeded the limits as specified in Title 10 CFR, Part 835 Appendix D.

Summary of Events

Waste Processing
The Radiation Work Permit engineering control section for the processing of the waste specifies that plastic wrapping and the use of misting to limit contamination spread. The plastic wrapping is applied to the outer box prior to entering the work zone. The mixed waste debris was treated by pouring a grout in the bottom of the box. The grout floor is allowed to cure for a specified time. After curing, the box is placed into the work zone. A form is placed onto the grouted floor to insure that the waste does not contact the sides of the containers. The waste is placed into the form. A fixative is sprayed over the waste to reduce contamination during the filling process. The container is then flooded with grout to cover the waste and allowed to cure. After curing, the container is closed.

Outgoing Container Contamination Surveys
The containers were surveyed in accordance with LLOP-220, Container Surveys. A copy of the procedure LLOP-220 is included as Attachment A.

Prior to removal from the processing area the, wrapping around the container is removed. Large Area Swipes (LAS) are performed by operations and frisked by health physics technicians. For each container, the LAS are frisked for removable beta-gamma and alpha. In addition, dose rates are measured and documented. To access the bottom of the container to perform the LAS, the box is lifted with a fork lift. The LAS are used to qualitatively determine the efficacy of the decontamination. Results are recorded on the Container Checklist Survey (220-1.1). Copies of the completed surveys are included as Attachment B. Surveys for containers 000162 and 00157 could not be located. PFNW personnel maintain that the surveys were conducted; however, the documentation is not available.

In accordance with Section 4.4.1, dose rates are taken on contact and at 30 centimeters with the top, bottom, and vertical sides of the box. In addition, removable contamination surveys of the boxes are taken using a disk smear over a 100 square centimeter area. A

minimum of two smears are taken on the top, bottom, and vertical sides of the box and counted for removable beta-gamma and alpha activity. The results are documented on form LLOP 220-3.1. If contamination is found in excess of 1000 dpm/100 cm^2 beta-gamma or 20 dpm/100 cm^2 alpha, the package is decontaminated prior to the documented survey. Copies of the initial completed surveys are included as Attachment C.

A Box/Drum – Loading Prior to Shipment Checklist is completed for each container prior to loading on the conveyance. Dose rates are taken on the top, bottom, and all vertical sides. In addition, LAS of the container are taken and counted for removable beta-gamma and alpha activity. Results are recorded on form 220-4.1. These surveys are performed in various locations within the facility depending on background and forklift availability. The box is placed on a box stand and/or suspended by a forklift to complete the surveys on the bottom of the box/container. Copies of the completed surveys for the three shipments are included as Attachment D.

Table 1 contains the results of the container contamination surveys for the outgoing shipments to the Nevada Test Site (NTS).

Table 1 Summary of Container Contamination Survey Results Associated with Outgoing Packages

NTS Container Number	PFNW Container Number	Shipment Number	220-3.1 Survey Date	220-3.1 Surveys <1,000 beta/gamma; 20 alpha (dpm/100 cm^2)	220-4.1 LAS Survey Date	220-4.1 Surveys <1,000 beta/gamma; 200 alpha (dpm/100 cm2)
000156	MW08700128	PFM09013	9/18/2008	Pass	10/15/2008	1st Pass
000157	MW08700279	PFM09013	10/7/2008	Pass	10/15/2008	1st Pass
000158	MW08700289	PFM09013	9/18/2008	Pass	10/15/2008	1st Pass
000159	MW08700268	PFM09014	9/25/2008	Pass	10/15/2008	1st Pass
000160	MW08700270	PFM09014	9/25/2008	Pass	10/15/2008	1st Pass
000161	MW08700275	PFM09014	9/25/2008	Pass	10/15/2008	1st Pass
000162	MW08700277	PFM09015	9/25/2008	Pass	10/15/2008	1st Pass
000163	MW08700293	PFM09015	9/18/2008	Pass	10/15/2008	1st Pass
000164	MW08700338	PFM09015	9/25/2008	Pass	10/15/2008	1st Pass

Outgoing Vehicle Contamination Surveys

Vehicle surveys were conducted in accordance with LLOP 219, Radioactive Material Surveys. A copy of LLOP-219 is included as Attachment E. Empty vehicle surveys are recorded on Attachment 219.1-2 to LLOP 219. Prior to loading, the steps to cab, door handles, all tires and tire wells, and trailer bed are surveyed by direct frisk for beta-gamma. In addition, disc smears are performed on the locations specified above and counted for beta-gamma and alpha contamination. Table 2 contains the results of the vehicle contamination surveys associated with the outgoing shipments.

Table 2 Summary of Vehicle Contamination Survey Results Associated with Shipments

Shipment Number	Trailer Number	219-1.1 Incoming Survey Date	219-1.1 Incoming Results	219-1.1 Outgoing Survey Date	219-1.1 Outgoing Results
PFM09013	OTR-12	10/14/2008	<20	10/16/2008	<20
PFM09014	OTR-9	10/14/2008	<20	10/16/2008	<20
PFM09015	OTR-3	10/14/2008	<20	10/16/2008	<20

Copies of the contamination surveys for the conveyances are included as Attachment F.

Immediate Actions Taken Upon Notification

On 10/23/08 upon notification of the contamination issues, the initial contamination surveys were retrieved and reviewed for the three shipments. A review of the documentation did not identify any irregularities. All contamination surveys indicated that the shipments and containers conformed to 10 CFR 835 Appendix D limits. Past routine yard and truck bay surveys were reviewed to verify contamination levels in areas that the boxes were stored. No irregularities or were noted from a review of the past area surveys. In addition, surveys were performed by one of the PFNW lead Health Physic Technicians of the clean areas throughout the facility to determine if the contamination was found in posted clean areas. No contamination was found outside of posted areas.

Personnel from the PFNW Quality Assurance performed surveillance on the instruments used to perform the surveys on the containers and conveyance vehicles. All instruments used were found to be in calibration.

On 10/29/08, representatives of the Washington Department of Health (WDOH) performed an independent survey of accessible areas in and around PFNW, including a trailer loaded with waste for shipment to the Hanford site for disposal. No contamination was found outside posted areas.

On 11/03/08, PFNW initiated additional checks to be performed by QC inspectors on all outgoing shipments. The additional checks involve 5 locations on each outgoing radioactive shipment to be surveyed for direct and removable alpha. Removable beta/gamma will also be checked at these five locations and direct beta-gamma will be checked as appropriate with dose rates on the shipping containers.

Returned Container Surveys

The shipments PFM09013, PFM09014, and PFM09015 were returned to Perma-Fix Northwest, Richland, Inc. (PFNW) on 11/13/08. PFNW conducted contamination surveys (smears and direct readings) on the returned containers. Upon receipt, the containers were subjected to contamination surveys. Removable contamination surveys were conducted using a Protean model IPC9025 and/or a Ludlum model 2929. In addition to the

removable contamination surveys, direct alpha survey readings were taken on the returned containers using a Ludlum model 3 instrument.

Table 3 contains the results of the contamination surveys performed on the returned containers.

Table 3 Summary of Returned Container Contamination Survey Results

NTS Container Number	PFNW Container Number	Shipment Number	Maximum Total Alpha Contamination dpm/100 cm^2 (Direct reading)	Location of Maximum (Direct reading)	Maximum Removable alpha dpm/100 cm^2
000158	MW08700289	PFM09013	150,000	Bottom	1,849*
000163	MW08700293	PFM09015	20,000	Side1 with fixative splattering, lip area two sides	68
000159	MW08700268	PFM09014	30,000	Side1 with fixative splattering	<20
000160	MW08700270	PFM09014	20,000	Side 2	<20
000157	MW08700279	PFM09013	3,000	Runner	<20
000162	MW08700277	PFM09015	1,000	Lip on side 1	<20
000156	MW08700128	PFM09013	ND	NA	<20
000161	MW08700275	PFM09014	ND	NA	<20
000164	MW08700338	PFM09015	ND	NA	<20

* The highest value on a tech smear was counted on the 2929 provided and used in the Dade Moeller & Associates independent assessment. This same location on a PFNW survey shows highest reading to be 2000 dpm/pa on a large area wipe. Copies of the PFNW surveys on the returned boxes are included in Attachment G.

Dade Moeller & Associates (DMA), an independent firm, was contracted to observe and review the adequacy of the PFNW container surveys and perform independent contamination surveys as necessary to confirm the PFNW measurements. The DMA representatives observed PFNW surveys and conducted independent surveys on three of the nine containers returned. The DMA representatives reviewed the surveying of containers 000156, 000157, and 000158 associated with the shipment PFM09013. A copy of the independent report is included as Attachment H.

Root Cause Analysis

A root cause analysis was conducted using the Five Why process specified in QA-WTC-01, Identifying and Correcting Nonconformances. The root cause identified for the CAR was a personnel error due to inattention to detail. In addition, the requirement to remove the forklifts or reconfigure the forklifts to allow access to the underside of the box was

not specifically specified in the procedure. This resulted in the failure to discover the removable contamination.
Direct alpha readings were not procedurally required for container surveys because it was incorrectly assumed that to get a direct alpha reading on the outside of the container, loose contamination would have to be present and the loose contamination would have been discovered either by the direct smears or large area swipes due to the self shielding that can easily occur with alpha radiation. The alpha contamination would need to be directly on the surface of the container and not covered up or masked with other materials. The fixative used during processing that was on the outside of the boxes has a tacky consistency until it dries. It is believed that the alpha contamination adhered to its surface but not deep enough to shield it while it was located in the high contamination work area during treatment of the waste. Because the alpha contamination was in the fixative it also did not show the levels of loose contamination one would suspect when compared to the direct level readings.

Corrective Actions
Subject all previously treated containers destined for disposal to the NTS to the revised surveying procedural requirements (see the preventive action number 3) prior to shipment to the Nevada Test Site.

Preventive Actions

1. The General Manager will conduct training with his direct reports and front line supervisors reinforcing the need to monitor employee's work to insure that employees have adequate time and resources to perform assigned tasks. Emphasis will be placed on paying attention to extenuating circumstances that may warrant additional resources, time, or checks of the final work product.

2. Reinforcement training will be given to all employees on the need to follow all procedures and alert management when the procedure/task cannot be completed compliantly.

3. Revise LLOP-220 to include specific requirements for biased sampling of suspect areas, random location sampling for the technical surveys, direct survey of containers, and specific instruction regarding accessing all areas of the underside of the container when using forklift and racks. Personnel will be trained on the revised requirements.

4. To avoid any further contamination, PFNW will revise operating procedures or work instructions to include specific methods and criteria specifying how to adequately wrap the containers to reduce contamination. Personnel will be trained to the revised procedures/instructions.

Proposed Completion Date: 02/20/09

Attachment C

M&EC TRANSMITTAL LETTER

OBJECTIVE EVIDENCE FOR CLOSURE OF CAR RWAP-C-09-01

(2 pgs.)

M&EC
Materials & Energy Corporation
A Subsidiary of Perma-Fix Environmental Services

February 19, 2009

Mr. James J. Cebe
RWAP Task Manager
NNSA, Nevada Site Office
P.O. Box Office 98518, M/S 505
Las Vegas, NV 89138-8518

SUBJECT: OBJECTIVE EVIDENCE FOR CLOSURE OF THE CORRECTIVE ACTION REQUEST (CAR) RWAP-C-09-01

Enclosed is the objective evidence demonstrating completion of the corrective action plan for the Corrective Action Request (CAR) RWAP-C-09-01.

Please contact me at (865) 813-1324 if you have any questions.

Sincerely,

Andrew Rosenman
M&EC Waste Certification Official

Encl: CAR RWAP-C-09-01 Objective Evidence

cc: Gregg Geisinger

OBJECTIVE EVIDENCE DOCUMENTATION TO CLOSE RWAP-C-09-01

1. The General Manager will conduct training with his direct reports and front line supervisors reinforcing the need to monitor employee's work to insure that employees have adequate time and resources to perform assigned tasks. Emphasis will be placed on paying attention to extenuating circumstances that may warrant additional resources, time, or checks of the final work product.

   Documentation of the completed training by the General Manager is included as Attachment A.

2. Reinforcement training will be given to all employees on the need to follow all procedures and alert management when the procedure/task cannot be completed compliantly.

   Documentation of the completed training is included as Attachment B.

3. Revise LLOP-220 to include specific requirements for biased sampling of suspect areas, random location sampling for the technical surveys, direct survey of containers, and specific instruction regarding accessing all areas of the underside of the container when using forklift and racks. Personnel will be trained on the revised requirements.

   A copy of the revised procedure LLOP-220 and training documentation is included as Attachment C.

4. To avoid any further contamination, PFNW will revise operating procedures or work instructions to include specific methods and criteria specifying how to adequately wrap the containers to reduce contamination. Personnel will be trained to the revised procedures/instructions.

   A copy of the revised procedure MWOP-325 and training roster is included as Attachment D.

A copy of the closed M&EC Non-Conformance Report, NCR-08-42 is included as Attachment E.

Attachment C.1

LIST OF M&EC OBJECTIVE EVIDENCE RECORDS REVIEWED TO CLOSE CORRECTIVE ACTION REQUEST, RWAP-C-09-01

Attachment A – General Manager, Direct Report Training Attendance Record	(2 pgs.)
Attachment B – General Manager Value Line Training Attendance Record	(7 pgs.)
Attachment C – Revised PermaFix Northwest Procedure LLOP-220, Rev. 7	(20 pgs.)
Attachment D – Revised PermaFix Northwest Procedure MWOP-325, Rev. 3	(19 pgs.)
– PermaFix Northwest Training Attendance Records Procedures	(4 pgs.)
Attachment E – M&EC Non-Conformance Report NCR-08-042, Closed	(14 pgs.)

Note: The above M&EC records are identified as Attachments A through K as they are referenced in the respective audit observation responses. The attachments are maintained on file within RWAP (S-Drive) and are available for review upon request.

LATA/PARALLAX PORTSMOUTH, LLC

CORRECTIVE ACTION PLAN

Use this form to capture information from the analysis of issues to develop a Corrective Action Plan (CAP) or summarize closure actions. Copy and paste as many "Corrective Action" boxes as needed for this CAP. Whenever possible, generate this form electronically. Otherwise print legibly.

I/CATS Issue Number:	**Source Document Type and ID Number:** *(Use Table A)*
PT063204	S0011942-CY-20100 – Problem Report –PR-LPP-10-089

Issue Description: During the week of December 13, 2010, UMC Operations shipped 47 trailers loaded with steel banded wooden shipping containers (SBWSCs) from Lot 1 and Lot 11A1 to the Nevada National Security Site (NNSS) for waste emplacement. Contamination levels, direct and removable, detected in two trailers exceeded the allowable limits established by DOE per 10CFR835, Appendix D to free release these trailers from the NNSS site. The trailers are CAST KTX3637L and R&R 1810014. Official notification to LPP was made by Gregg Geisinger NSTec, Radioactive Waste Acceptance Program (RWAP) Manager to Glenna Gerster, LPP Waste Certification Official, on December 18, 2010, at 7:00 pm eastern.

December 17, 2010 - Incident One: After performing waste emplacement of the LPP UMC Lot 11(A)1 in the NNSS Area 5, NSTec Radiological Operations was performing release radiation surveys. Trailer (KTX3637L) provided by CAST Transport for LPP Shipment Number POL11063, was found to have the following contamination levels on the wood floor of the trailer:

- 60,000 disintegrations per minute (dpm) per 100 square centimeters (cm^2) beta/gamma direct reading, and
- 280 dpm/100 cm^2 alpha removable contamination

This is above the DOE allowable release criteria. The trailer was isolated in the Area 5 compound and posted in accordance with NSTec procedures. This is a Category 3 Noncompliance Condition in accordance with the Area 5 Low-Level Waste Shipment Administrative Procedure OP-2151.233, requiring notification to NSTec and Nevada DOE personnel. LPP was not included in the initial notification.

December 18, 2010 - Incident Two: After performing waste emplacement of the LPP UMC Lot 11(A)1 in the NNSS Area 5, NSTec Radiological Operations performed release radiation surveys. Trailer (1810014) provided by R&R Trucking for LPP Shipment Number POL11021, was found to have the following contamination levels on the wood floor of the trailer:

- 700,000 dpm/100cm^2 beta/gamma direct
- 400 dpm/100cm^2 alpha direct
- 1,800 dpm/100cm^2 alpha removable contamination, and
- 27,300 dpm/100cm^2 beta/gamma removable contamination

This is above the DOE allowable release criteria. The trailer was isolated in the Area 5 compound and posted in accordance with NSTec procedures. This is a Category 3 Noncompliance Condition in accordance with the Area 5 Low-Level Waste Shipment Administrative Procedure OP-2151.233, requiring notification to NSTec and Nevada DOE personnel. The Waste Generator, LPP, was notified.

December 20, 2010 - NSTech issued Correct Action Report (CAR) RWAP-C-11-04 to Portsmouth Gaseous Diffusion Plant (PORTS) to suspend all shipments to the Nevada National Security Site (NNSS) until CAR RWAP-C-11-04 has been addressed satisfactorily and closed by the Nevada Nuclear Security Administration Nevada Site Office (NNSA/NSO) (see attached CAR RWAP-C-11-04).

Organization:	**Issue Type:** *(Use Table B)*	**Subcontractor Code:** *(Use Table C or check ☒ for LPP)*	**SMA:** *(Use Table D)*
817-30	INC		RP-5

Significant Issue: *(Use Table E)* ☒ Yes ☐ No (9X) | **ISMS Elements:** *(Use Table F)* **Core Function:** F5 **Principle:** P6

Compensatory Measures Taken: *(If identified above as a Significant Issue)*

- LPP completed and issued First Notification FN-LPP-10-083 and Problem Report PR-LPP-10-089.
- UMC Operations "paused" loading additional trailers until directed by Facility Operations Manager to continue.
- The trailers were returned to LPP for investigation.
- LPP performed verification surveys on the returned trailers.
- LPP sampled contaminated material from the returned trailer floors and submitted for analysis to determine the origin.

Apparent Cause: *(Use Table G. List the Apparent Cause code and title)*
A7B2C01 -- Other Problem; RADIOLOGICAL/HAZARDOUS MATERIAL; Legacy contamination

Root Cause: *(If identified as a Significant Issue or when requested by management)*
A4B2C07 -- Management Problem; RESOURCE MANAGEMENT LTA; Means not provided for assuring adequate availability of appropriate materials/ tools.

Closure Summary: *(Describe corrective actions that have already been completed. Attach objective evidence of completion.)*
Attached are verification surveys and laboratory analyses performed on the returned trailers.

CORRECTIVE ACTIONS

(Copy and add extra Corrective Action blocks as needed.)

Corrective Action: *(Provide enough detail so it is clear exactly what needs to be done.)*
UMC Operations paused work to review procedures for surveying trailers in preparation for waste shipments.

Due Date:	Closure Documentation Needed:
12/20/10	The documented communication of work pause will serve as the closure documentation.

Responsible Person: *(Print name and obtain person's initials)*	Responsible Organization:	DOE Signature Needed for Changes:
Jim Eide JHE	Uranium Operations	☒ Yes ☐ No

Corrective Action: *(Provide enough detail so it is clear exactly what needs to be done.)*
UMC Operations will update work plan LPP-WP-10-0113 Rev. 1, *X-744G Lot 1 and Lot 11 A 1 Shipment of SBWSC to NTS* to add the use of an engineered rack system to allow for complete visual observation and radiological survey of the bottoms of the boxes and to add a seal to the transport vehicle closure doors if the loading of waste containers is delayed beyond the day of the vehicle radiological surveys.

Due Date:	Closure Documentation Needed:
1/24/11	The revision to Work Plan describing the use of engineered rack system will serve as the closure documentation.

Responsible Person: *(Print name and obtain person's initials)*	Responsible Organization:	DOE Signature Needed for Changes:
Jim Eide JHE	Uranium Operations	☒ Yes ☐ No

Corrective Action: *(Provide enough detail so it is clear exactly what needs to be done.)*
Train UMC Operations personnel to the updated work plan LPP-WP-10-0113 Rev. 1, *X-744G Lot 1 and Lot 11 A 1 Shipment of SBWSC to NTS.*

Due Date:	Closure Documentation Needed:
1/26/11	The attendance roster documenting all UMC Operations Personnel received training will serve as the closure documentation.

Responsible Person: *(Print name and obtain person's initials)*	Responsible Organization:	DOE Signature Needed for Changes:
Jim Eide JHE	Uranium Operations	☒ Yes ☐ No

Corrective Action: *(Provide enough detail so it is clear exactly what needs to be done.)*
Revise LPP-PO-3027, *Certification of PORTS Waste for Disposal at the Nevada National Security Site* to include additional requirements for oversight of inbound pre-shipment surveys of NNSS-bound trailers. Verification of satisfactory completion of the oversight activity by the WPC shall be the placement of a Waste Certification Verification Tag on the closed doors of the trailer that will be removed by the WPC before loading begins. The level and frequency of oversight for this activity shall be determined by the WCO.

Due Date:	Closure Documentation Needed:
2/02/11	A copy of the approved revision to procedure LPP-PO-3027 with the changes included will serve as the closure documentation.

Responsible Person: *(Print name and obtain person's initials)*	Responsible Organization:	DOE Signature Needed for Changes:
Glenna Gerster GG	Waste Certification	☒ Yes ☐ No

Corrective Action: *(Provide enough detail so it is clear exactly what needs to be done.)*
Train Waste Certification personnel to the revision of LPP-PO-3027, *Certification of PORTS Waste for Disposal at the Nevada National Security Site.*

Due Date:	Closure Documentation Needed:
2/02/11	The attendance roster documenting all LPP Waste Certification personnel received the above Training will serve as the closure documentation.

Responsible Person: *(Print name and obtain person's initials)*	Responsible Organization:	DOE Signature Needed for Changes:
Glenna Gerster GG	Waste Certification	☒ Yes ☐ No

Corrective Action: *(Provide enough detail so it is clear exactly what needs to be done.)* Revise LPP-PO-3032, *Packaging Containers for NNSS Shipment* to include instructions for the WPC to perform oversight of survey activity performed on inbound trailers used for NNSS shipments.		
Due Date: 2/02/11	**Closure Documentation Needed:** A copy of the approved revision to procedure LPP-PO-3032 with the changes included will serve as the closure documentation.	
Responsible Person: *(Print name and obtain person's initials)* Glenna Gerster GG	**Responsible Organization:** Waste Certification	**DOE Signature Needed for Changes:** ☒ Yes ☐ No

Corrective Action: *(Provide enough detail so it is clear exactly what needs to be done.)* Train Waste Certification personnel to the revision of LPP-PO-3032, *Packaging Containers for NNSS Shipment.*		
Due Date: 2/02/11	**Closure Documentation Needed:** The attendance roster documenting that all LPP Waste Certification Personnel received training will serve as the closure documentation.	
Responsible Person: *(Print name and obtain person's initials)* Glenna Gerster GG	**Responsible Organization:** Waste Certification	**DOE Signature Needed for Changes:** ☒ Yes ☐ No

Corrective Action: *(Provide enough detail so it is clear exactly what needs to be done.)* The 12 trailers currently loaded will be unloaded and the trailers shall be re-surveyed with verification surveys and the boxes shall be re-observed and smeared using the rack system to ensure no direct or removable readings are detected above release for shipment limits.		
Due Date: 1/24/11	**Closure Documentation Needed:** The documentation of inspections and surveys will serve as the closure documentation.	
Responsible Person: *(Print name and obtain person's initials)* Jim Eide JE	**Responsible Organization:** Uranium Operations	**DOE Signature Needed for Changes:** ☒ Yes ☐ No

Corrective Action: *(Provide enough detail so it is clear exactly what needs to be done.)* All empty trailers on-site shall be resurveyed with verification surveys in accordance with LPP-EH-4541 prior to NNSS waste container loading activities. RadCon management will observe this activity.		
Due Date: 2/02/11	**Closure Documentation Needed:** The documentation of Verification Surveys will serve as the closure documentation.	
Responsible Person: *(Print name and obtain person's initials)* Dan Thiel for DT 2/3/11	**Responsible Organization:** RadCon Program	**DOE Signature Needed for Changes:** ☒ Yes ☐ No

Corrective Action: *(Provide enough detail so it is clear exactly what needs to be done.)* LPP Transportation will contact CAST Transport and R&R Trucking to track the history of Trailers KTX3637L and R&R 1810014 to determine where these trailers have been and potential source of the contamination		
Due Date: 12/20/10	**Closure Documentation Needed:** The documentation from vendors regarding trailer history will serve as the closure documentation.	
Responsible Person: *(Print name and obtain person's initials)* Marilew Bartling LSM for MB 2/3/11	**Responsible Organization:** Transportation	**DOE Signature Needed for Changes:** ☒ Yes ☐ No

Corrective Action: *(Provide enough detail so it is clear exactly what needs to be done.)* LPP will perform an evaluation of the current oversight program to the existing SARP to determine if the program meets requirements.		
Due Date: 1/4/11	**Closure Documentation Needed:** The documented evaluation by WCO will serve as the closure documentation.	
Responsible Person: *(Print name and obtain person's initials)* Glenna Gerster GG	**Responsible Organization:** Waste Certification	**DOE Signature Needed for Changes:** ☒ Yes ☐ No

Corrective Action: *(Provide enough detail so it is clear exactly what needs to be done.)* LPP will revise LPP-EH- 4541, *Radiological Surveys to Support Waste Shipments to the Nevada Test Site*, to require that a large area wipe survey be performed on accessible areas of the shipping container.			
Due Date: 2/02/11	**Closure Documentation Needed:** Revised procedure LPP-EH- 4541, *Radiological Surveys to Support Waste Shipments to the Nevada Test Site* will serve as the closure documentation.		
Responsible Person: *(Print name and obtain person's initials)* Daniel Thiel for D.T. 2/3/11		**Responsible Organization:** RadCon Program	**DOE Signature Needed for Changes:** ☒ Yes ☐ No

Corrective Action: *(Provide enough detail so it is clear exactly what needs to be done.)* Train RadCon personnel on the revision of LPP-EH- 4541, *Radiological Surveys to Support Waste Shipments to the Nevada Test Site*			
Due Date: 2/02/11	**Closure Documentation Needed:** The attendance roster documenting that personnel received the training will serve as the closure documentation.		
Responsible Person: *(Print name and obtain person's initials)* Daniel Thiel for D.T. 2/3/11		**Responsible Organization:** RadCon Program	**DOE Signature Needed for Changes:** ☒ Yes ☐ No

Corrective Action: *(Provide enough detail so it is clear exactly what needs to be done.)* A Management Assessment will be performed to verify the effectiveness of the inspection rack system; including its ability to improve accessibility for radiological survey, and further to improve the visibility for structural integrity inspections of the SBWSC undercarriage.			
Due Date: 1/24/11	**Closure Documentation Needed:** Documented Management Assessment by the WCO will serve as the closure documentation.		
Responsible Person: *(Print name and obtain person's initials)* Glenna Gerster GG		**Responsible Organization:** Waste Certification	**DOE Signature Needed for Changes:** ☒ Yes ☐ No

Corrective Action: *(Provide enough detail so it is clear exactly what needs to be done.)* Perform a Root Cause Analysis			
Due Date: 1/24/11	**Closure Documentation Needed:** Completed Root Cause Analysis will serve as the closure documentation.		
Responsible Person: *(Print name and obtain person's initials)* Jim Hey JH		**Responsible Organization:** Quality Assurance	**DOE Signature Needed for Changes:** ☒ Yes ☐ No

Corrective Action: *(Provide enough detail so it is clear exactly what needs to be done.)* Establish a Senior Oversight Team to develop a plan that will define the UMC activities for review. The plan shall include the review of initial trailer survey, trailer receipt inspection, staging, container preparation, container surveys, loading operations, and shipping. Develop and issue a report defining process improvements and lessons learned for these activities as they relate to Conduct of Operations and complete actions identified.			
Due Date: 2/03/11	**Closure Documentation Needed:** The development of the above referenced plan will serve as the closure documentation.		
Responsible Person: *(Print name and obtain person's initials)* Darl Anderson DA		**Responsible Organization:** Facility Operations	**DOE Signature Needed for Changes:** ☒ Yes ☐ No

END-POINT ASSESSMENT REQUIRED: ☐ **Yes** ☒ **No**

Assessment Action(s):	**Due Date:**

APPROVALS

Concurrence with CAP or Closure:	Issue Owner Signature D.R. ANDERSON	Date 2/3/11
Concurrence with CAP or Closure:	Program Manager/Project Manager/Designee (PROG MGR) for L. BAUER (PROJ MGR)	Date 2/2/11
Concurrence with CAP or Closure:	Waste Certification Official (for NTS related Issues)	Date 2/3/11
Validation of CAP Adequacy:	QA Signature	Date 2/3/11
Verification of Issue Closure: *(If corrective actions are already completed)*	QA Signature	Date 2/3/11

DOE F 1325.8
(3/02)

United States Government **Department of Energy**

Portsmouth/Paducah Project Office

memorandum

DATE: MAY 25 2011

REPLY TO ATTN OF: PPPO: Voth PPPO-03-1214620-11

SUBJECT: **SUBMITTAL OF CORRECTIVE ACTION PLAN IN RESPONSE TO THE CORRECTIVE ACTION REQUEST, CAR-RWAP-C-11-05**

TO: James J. Cebe, National Nuclear Security Administration Nevada Site Office

Reference: Letter from J. Cebe to K. Wiehle, "National Nuclear Security Administration Nevada Site Office (NNSA/NSO), Radioactive Waste Acceptance Program (RWAP) Issuance of Corrective Action Request (CAR) (RWAP-C-11-05)," dated March 22, 2011

Enclosed are the signed, "ORIGINAL CORRECTIVE ACTION RESPONSE" (CAR) and a revision to the Corrective Action Plan (CAP) developed in response to the Radioactive Waste Acceptance Program (RWAP), CAR-RWAP-C-11-05. The revised CAP addresses the actions taken to resolve the deficiency, including a root cause analysis, a white paper which provides additional information requested at the RWAP meeting on May 2, 2011, actions to prevent recurrence, and the completion dates. Portsmouth anticipates closure of the corrective action to be completed by July 5, 2011. An evidence package will be forwarded to you upon completion of all identified actions.

If you have any questions or require additional information, please do not hesitate to call me at 740-897-4720.

Cidney Voth

Cidney Voth
General Engineer–D&D
Portsmouth/Paducah Project Office

Attachments:
1. Corrective Action Plan
2. Root Cause Analysis

cc w/attachments:
Administrative Record

cc w/o attachments:
Kristi.Wiehle@lex.doe.gov, PPPO/PORTS
Jamie.Jameson@fbports.com, FBP/PORTS
Mark.Ashby@fbports.com, FBP/PORTS
Danny.Nichols@fbports.com, FBP/PORTS
Glenna.Gerster@fbports.com, FBP/PORTS
PPPO Records/LEX

National Nuclear Security Administration
Nevada Site Office

ORIGINAL

CORRECTIVE ACTION REQUEST (CAR)

1.		2.	
Responsible Individual:	Glenna Gerster	CAR No.:	**RWAP-C-11-05**
Facility / Organization:	Portsmouth Gaseous Diffusion Plant (PORTS)	Date Issued:	03/21/2011
Site / Location:	Piketon, OH	Deficiency Code:	NNSSWAC 3.2.13

3. Facility Evaluation: ☐ Audit ☐ Surveillance ☒ N/A Report No.: Waste Receipt

4. Requirement(s): *(NTSWAC and/or Generator Program Document)*

NNSSWAC, Rev. 8-1, Section 3.2.13, Contamination Levels, states, "External contamination levels for waste packages and transport vehicles shall meet the release limits specified in Title 10 CFR Part 835, Appendix D."

5. Deficiency: * **CAP Due Date:** 05/02/2011

Contrary to the above, radioactive contamination was discovered above the release limits on the floor of trailers 813912 and KV53622L, received at the Area 5 Radioactive Waste Management Site (RWMS) on March 17, 2011. This is the second such incident related to contamination above release criteria, the first occurring on December 18, 2010, RWAP-C-11-04.

Further information on deficiency can be found on next page.

Initiator: [signature] Date: 3/21/11 RWAP Task Mgr: James J Cutler Date: 3/21/11

6. Corrective Action Plan (CAP): **(Must include corrective action, root cause analysis, action to preclude recurrence, and scheduled completion date)*

Scheduled Completion Date: 6/16/11 Responsible Manager: Glenna Gerster Date: 5/24/11

7. Corrective Action Plan Approved: *(If "No," explain)*

RWAP Reviewer: Date:

8. Corrective Action Verified: *(If "No," explain)*

Verified / Approved by: _____ Date: _____
(Team Lead, if applicable)

Approved by
RWAP Task Manager: _____ Date: _____

(Identify Block No. / Section from page one.) continuation page

On Thursday March 17, 2011, shipment POL11161 on trailer KV53622L was found with elevated contamination levels. Final survey results for Trailer KVL53622L are 20K dpm beta (direct) and 1K dpm alpha (direct) and by smear: 43 dpm alpha and 50 dpm beta.

In addition, shipment POL11163 on trailer 813912 was found to have a spot of contamination about 1.5 foot by 1.5 foot which reads 50,000 dpm beta (direct) and 2,000 dpm alpha (direct). Smears read several hundred dpm alpha removable by Electra. The contamination levels of this trailer exceeds 10 times the limits as specified by 10CFR835 Appendix D. Final survey for trailer 813912 are 50K dpm beta direct and 2K dpm alpha direct and by smear: 500 dpm alpha and 600 dpm beta.

Both trailers exceed the free release limits to authorize release of the trailers from the RWMC. Both trailers were parked and posted as Contamination Areas. Radiological Control performed surveys of the cabs of both tractors and of both drivers. No contamination was found in the cabs or on the drivers. No RWMC personnel were discovered to be contaminated. None of the waste packages were found to be contaminated or leaking during the off loading surveys performed by Radiological Controls. The contamination was limited to the patch found on each truck floor.

CORRECTIVE ACTION PLAN

Use this form to capture information from the analysis of issues to develop a Corrective Action Plan (CAP) or summarize closure actions. Copy and paste as many "Corrective Action" boxes as needed for this CAP. Whenever possible, generate this form electronically. Otherwise print legibly.

I/CATS Issue Number: PT063224 Revision 1 Date 5/24/2011	**Source Document Type and ID Number:** *(Use Table A)* S0011986/CY-2011 LPP Occurrence Reports/ EM--PPPO-LPP-PORTENVRES-2011-0001 -- Radioactive Contamination Exceeding NNSS Radioactive Waste Management Complex Release Limits Discovered Inside Trailer Following Trailer Unloading Operations.

Issue Description: On 3/17/11, LATA/Parallax Portsmouth, LLC (LPP) was notified by NNSS (Nevada National Security Site) that two trailers used to ship radioactive material from the X-744G Building to NNSS had elevated contamination levels on the floor of the trailers. The trailers were being used to transport wooden boxes that contained uranium. Prior to shipment, the trailers and wooden boxes had been thoroughly surveyed for radiological contamination. All radiological surveys on the trailer bed and boxes met the limits of the shipping profile for NNSS.

Following unloading of the LPP waste shipment boxes, NNSS conducted radiological surveys of the trailers. The survey results for two of the trailers were found to be in excess of 10 CFR835, Appendix D values. One trailer had a direct reading of 20,000 dpm/100 cm2 beta-gamma and the second trailer had a direct reading of 50,000 dpm/100 cm2 beta-gamma. These levels were isolated to a small area on the flooring. As both trailers exceeded site free release limits, NNSS held the trailers onsite. The two trailers were disconnected from their tractors, parked within the NNSS compound and were controlled as Contamination Areas. No contamination was found in the cabs of the tractors or on any personnel.

Organization:	**Issue Type:** *(Use Table B)*	**Subcontractor Code:** *(Use Table C or check ☒ for LPP)*	**SMA:** *(Use Table D)*
817-30	SC-4 (Significant Category 4 ORPS Report)		RP-5

Significant Issue: *(Use Table E)* ☒ Yes ☐ No (9X) **ISMS Elements:** *(Use Table F)* **Core Function:** F2 **Principle:** P6

Compensatory Measures Taken: *(If identified above as a Significant Issue)*

- On 3/17/11, NNSS requested LPP suspend all LPP shipments scheduled for Friday 3/18/11 as NNSS continued their investigation. LPP management self-suspended and did not release the 11 shipments scheduled for 3/18/11;
- On 3/21/11 the Nevada Site Office sent LPP Corrective Action Request (CAR) RWAP-C-11-05 notifying LPP to suspend all shipments to NNSS until the CAR has been addressed satisfactorily and closed by the Nevada Nuclear Security Administration Nevada Site Office;
- A fact-finding meeting was held on 3/21/11 followed by a meeting of LPP senior management; and
- The Event was determined to be ORPS reportable. First Notification Report was generated.

Apparent Cause: *(Use Table G. List the Apparent Cause code and title)*
A7B2C02 -- Other Problem; RADIOLOGICAL/HAZARDOUS MATERIAL PROBLEM; Source Unknown

Root Cause: *(If identified as a Significant Issue or when requested by management)*
A4B1C09 -- Management Problem; MANAGEMENT METHODS LTA; Corrective Action for previously identified problem was not adequate to prevent recurrence

Closure Summary: *(Describe corrective actions that have already been completed. Attach objective evidence of completion.)*

- UMC Operations suspended shipments scheduled for March 18, 2011 per phone call request from Nevada Test Site on 3/17/11 at 2000 hours eastern. Official shipment suspension is documented in the National Nuclear Security Administration, Corrective Action Report, RWAP-C-11-05, issued 3/21/11, Deficiency Code NNSSWAC 3.2.13, requires a Corrective Action Plan submittal.

- UMC Operations unloaded the 11 trailers containing 108 steel banded wooden shipping containers (SBWSCs) of Lot 1 and Lot 11A1 waste – NNSS Profile # 26. Trailer #s: 17837; 6810052; 7810111; 7810027; 17723; 7810063; 7810132; 7810154; 293976; 7810051; and 6810018.

- UMC Operations placed the 108 SBWSCs on hold and properly documented the placement of the 108 SBWSCs in the USEC DYMCAS inventory system in accordance with LPP-WP-10-0113 (shipment #s POL11164, POL11165, POL11129, POL11153, POL11132, POL11166, POL11167, POL11130, POL11126, POL11151, and POL11152).

- UMC Operations researched previous shipment history for Hubbard trailers #s KV53622L and 813912 and determined the UMC waste lots that were shipped in these trailers previously.

CORRECTIVE ACTIONS

(Copy and add extra Corrective Action blocks as needed.)

Corrective Action: *(Provide enough detail so it is clear exactly what needs to be done.)*
Radiological Control will use "tacky rollers" to aid in performing large area surveys of all surfaces which could contain hot particles. Surfaces include, the floors in the unloaded trailers, the exterior surfaces of the 108 SBWSCs, the loading dock, all routes traveled to and from by the forklift and any area used to set, store or inspect the SBWSCs.

Due Date:	Closure Documentation Needed:		
06/16/11	Revised Work Package LPP-WP-10-0113 to incorporate the use of tacky rollers Radiological Surveys and UE-5 forms		
Responsible Person: *(Print name and obtain person's initials)*		**Responsible Organization:**	**DOE Signature Needed for Changes:**
Dan Thiel DT		Radiological Control	☒ Yes ☐ No

Corrective Action: *(Provide enough detail so it is clear exactly what needs to be done.)*
Radiological Control will complete final surveys and free release all unloaded trailers used for Lot 11A1 and Lot 1 shipments.

Due Date:	Closure Documentation Needed:		
06/16/11	Radiological Surveys and UE-5 forms		
Responsible Person: *(Print name and obtain person's initials)*		**Responsible Organization:**	**DOE Signature Needed for Changes:**
Dan Thiel DT		Radiological Control	☒ Yes ☐ No

Corrective Action: *(Provide enough detail so it is clear exactly what needs to be done.)*
Transportation will return the two contaminated trailers (Hubbard trailers #s KV53622L and 813912) back from NNSS to UMC X-744G.

Due Date:	Closure Documentation Needed:		
4/28/11	A copy of the shipment documentation		
Responsible Person: *(Print name and obtain person's initials)*		**Responsible Organization:**	**DOE Signature Needed for Changes:**
John McCoy JMc		Transportation	☒ Yes ☐ No

Corrective Action: *(Provide enough detail so it is clear exactly what needs to be done.)*
UMC Operations will wrap each of the remaining 108 SBWSCs following a complete re-inspection and re-survey before loading for shipment.

Due Date:	Closure Documentation Needed:		
6/16/11	Revised Work Package LPP-WP-10-0113 to incorporate the wrapping of SBWSCs		
Responsible Person: *(Print name and obtain person's initials)*		**Responsible Organization:**	**DOE Signature Needed for Changes:**
James Eide JHE		UMC Operations	☒ Yes ☐ No

Corrective Action: *(Provide enough detail so it is clear exactly what needs to be done.)*
Train UMC Operations personnel to revised Work Package LPP-WP-10-0113 for the wrapping of 108 SBWSCs.

Due Date:	Closure Documentation Needed:		
6/16/11	Completed training roster		
Responsible Person: *(Print name and obtain person's initials)*		**Responsible Organization:**	**DOE Signature Needed for Changes:**
James Eide JHE		UMC Operations	☒ Yes ☐ No

Corrective Action: *(Provide enough detail so it is clear exactly what needs to be done.)*
Waste Certification will determine if a profile deviation or NCSE revision is necessary to include addition of the wrapping on the SBWSCs.

Due Date:	Closure Documentation Needed:		
6/16/11	Memo to file		
Responsible Person: *(Print name and obtain person's initials)*		**Responsible Organization:**	**DOE Signature Needed for Changes:**
Glenna Gerster GG		Waste Certification	☒ Yes ☐ No

Corrective Action: *(Provide enough detail so it is clear exactly what needs to be done.)*
Transportation will prepare leasing for up to fifteen new closed van trailers to use as conveyances for the remaining eleven Lot 11A1 and Lot 1 shipments to NNSS.

Due Date:	Closure Documentation Needed:		
6/16/11	Purchase Requisition and RADCON baseline surveys for the trailers		
Responsible Person: *(Print name and obtain person's initials)*		**Responsible Organization:**	**DOE Signature Needed for Changes:**
John McCoy JMc		Transportation	☒ Yes ☐ No

Corrective Action: *(Provide enough detail so it is clear exactly what needs to be done.)* Generate a white paper which lays out the timeline and provides further detail for the actions defined in the corrective action plan for CAR #RWAP-C-11-04. In addition the white paper will further detail the actions taken to address CAR #RWAP-C-11-05.		
Due Date: 6/16/11	**Closure Documentation Needed:** A signed copy of the white paper	
Responsible Person: *(Print name and obtain person's initials)* Danny Nichols CDN	**Responsible Organization:** Waste Management	**DOE Signature Needed for Changes:** ☒ Yes ☐ No

Corrective Action: *(Provide enough detail so it is clear exactly what needs to be done.)* Contract the services of a Certified Health Physicist to conduct an Independent Assessment of the RADCON contamination control process for shipping from the Portsmouth site. FBP will evaluate all recommendations on a case by case basis and implement each as applicable.		
Due Date: 6/16/11	**Closure Documentation Needed:** A signed copy of the Independent Assessment	
Responsible Person: *(Print name and obtain person's initials)* Dan Thiel DT	**Responsible Organization:** Radiological Control	**DOE Signature Needed for Changes:** ☒ Yes ☐ No

Corrective Action: *(Provide enough detail so it is clear exactly what needs to be done.)* Waste Certification shall perform a Management Assessment of the ICATS database to determine the history of contamination events as they relate to truck shipments from PORTS.		
Due Date: 6/16/11	**Closure Documentation Needed:** A signed copy of the Management Assessment	
Responsible Person: *(Print name and obtain person's initials)* Glenna Gerster GG	**Responsible Organization:** Waste Certification	**DOE Signature Needed for Changes:** ☒ Yes ☐ No

Corrective Action: *(Provide enough detail so it is clear exactly what needs to be done.)* Waste Certification shall generate a lessons learned presentation of contaminated trailer events.		
Due Date: 6/16/11	**Closure Documentation Needed:** A copy of the lessons learned presentation	
Responsible Person: *(Print name and obtain person's initials)* Glenna Gerster GG	**Responsible Organization:** Waste Certification	**DOE Signature Needed for Changes:** ☒ Yes ☐ No

END-POINT ASSESSMENT REQUIRED: ☐ **Yes** ☒ **No**

Assessment Action(s):	**Due Date:**

APPROVALS

Concurrence with CAP or Closure:	Issue Owner Signature	Date 5/24/11
Concurrence with CAP or Closure:	Program Manager/Project Manager/Designee	Date 5/24/2011
Concurrence with CAP or Closure:	Waste Certification Official (for NNSS related Issues)	Date 5/24/11
Validation of CAP Adequacy:	QA Signature	Date 5/24/2011
Verification of Issue Closure: *(If corrective actions are already completed)*	QA Signature	Date

Causal Analysis and Root Cause Determination

On 3/17/11, LATA/Parallax (LPP) was notified by NNSS (Nevada National Security Site) that two trailers used to ship radioactive material from the Portsmouth Plant (PORTS) X-744G Building to NNSS had elevated contamination levels on the floor of the trailers (Trailers 813912 and KV53622L). The trailers contained Lot 11A1 material packaged in Model 4214 Steel Banded Wood Shipping Containers. Prior to shipment, these trailers had received a 100% radiological survey of the trailer bed for total and removable contamination. This was followed by an independent confirmatory radiological survey of the trailer. All surfaces of the containers to be shipped were surveyed for removable contamination. All LPP radiological surveys on the trailer bed and containers indicated they met the limits of the shipping profile for NNSS.

Following unloading of the LPP waste shipment from these trailers, the NNSS final radiological survey results for trailer KVL53622L were found to be in excess of 10 CFR835, Appendix D values. Specifically a direct reading value of 20,000 dpm/100 cm2 beta-gamma was measured on the trailer floor. After unloading trailer 813912, radioactive contamination in excess of 10 CFR 835, Appendix D was also discovered on the trailer floor. A direct reading value of 50,000 dpm/100 cm2 beta-gamma was measured. As both trailers exceeded site free release limits, NNSS held the trailers onsite. The two trailers were disconnected from their tractors, parked within the NNSS compound and were controlled as Contamination Areas. No contamination was found on the boxes, in the cabs of the tractors or on any personnel. The contamination was located within the footprint of the boxes.

Before and after the transition of the prime contract from LPP to Fluor B&W Portsmouth (FBP), key personnel from the UMC Operations, Radiological Controls, Quality Assurance, Waste Certification, and Transportation, were involved with the investigation's path forward to identify the potential causes and remedies.

As was the case with the December 2010 event, the investigation noted above assumed that the causal factors associated with this event originated at the PORTS.

The investigation/discussion concluded the possible causal factors contributing to the event of 3/17/11 were:

1. Loss of material from the shipping container caused by vibration during transport.

2. Legacy contamination imbedded in the trailer's wood floor that became detectable as a result of vibration during transport.

3. Legacy particle contamination which could not be identified using detection methods currently in place

A Root Cause Analysis for this event was conducted using the TapRoot ® system. The associated Department of Energy Causal Analysis Code was determined to be A4B1C09

Management Problem; MANAGEMENT METHODS LTA; Corrective action for previously identified problem was not adequate to prevent recurrence.

This root cause will be remedied by addressing the causal factors listed above through the implementation of Corrective Action Plan (CAP) PTO63224. FBP believes that the completion of CAP PTO63224 will satisfactorily correct the deficiency identified in CAR RWAP-C-11-05 and prevent its recurrence.

Supporting Information, Research, and Findings

For Contaminated Trailers

Originating on Shipments from the

Portsmouth Gaseous Diffusion Plant (GDP)

December 2010 to March 2011

White Paper

5/24/2011

Contaminated Trailer White Paper
5/24/2011

This white paper documents the actions taken by the Portsmouth Gaseous Diffusion Plant (PORTS) Waste Management organization to identify the possible causes for contamination of closed van trailers used to ship Lot 1 and Lot 11A1 radioactive waste packages to the Nevada National Security Site (NNSS) during the final weeks of 2010. The contamination levels exceeded 10 CFR 835, Appendix D limits.

This package of attachments comprises the additional information requested by the Radioactive Waste Acceptance Program (RWAP) in our meeting of May 2, 2011.

Photos and a history of the package types and internal packaging configurations for the waste uranium metal transported to the NNSS can be found in Attachment 1 to this document. Attachment 1 consists of a Power Point presentation presented at the May NNSS Generators Conference as part of the PORTS lessons learned effort. The presentation documents the timeline, contamination levels and fact finding events as they were conducted by PORTS Waste Management for the contamination events. Also included in this presentation are lessons learned and weaknesses identified in the PORTS Waste Certification Program.

Corrective Actions taken in response to Corrective Action Request (CAR) RWAP-C-11-04 which was issued by the NNSS in December 2010 are documented in Attachment 2. Corrective Action Plan (CAP) #PT63204 includes a revision to survey procedure LPP-EH-4541, *Radiological Surveys to Support Waste Shipments to the Nevada Test Site,* which was revised to include the addition of an independent verification survey on at least 10% of the truck bed. Other actions include increased survey activity of the packages, additional oversight of survey activity, package inspection activity and training. The CAP was issued to the NNSS for review and approval on February 2, 2011; the RWAP approval to resume PORTS shipments to the NNSS was issued on February 9, 2011.

Following development of the CAP, an Independent Assessment was conducted by Department of Energy (DOE) Portsmouth/Paducah Project Office (PPPO) Facility Representative from the Lexington office, Don Dihel. The results of the assessment are included as Attachment 3; Don verified all corrective actions closed and provided additional valuable recommendations moving forward.

Following the approval of the CAP and resumption of waste shipments to the NNSS on Feb. 9, 2011; thirty-four shipments consisting of Lot 1, Lot 11A1, and other project waste were delivered to the NNSS in the month of February without further trailer contamination issues.

At the beginning of March, forty-three Lot 1 and Lot 11A1 shipments remained to be shipped. During preparation for loading, on March 4, 2011 trailer #7810085 was found to be contaminated above the 10 CFR 835 limit by the LPP Radiological Control Technician (RCT). Trailer #7810085 had been released and returned to the PORTS after successfully delivering one of the February shipments to the NNSS. As evidenced by this discovery, the improvements to the LPP Radiological Control survey program appear to have been effective at locating contamination in the trailers.

On March 3 and 8, 2011 eighteen of the remaining forty-three shipments were also delivered to the NNSS without issue. On March 17, 2011 another seventeen shipments were delivered to the NNSS. Of these seventeen, a disappointing two trailers were found to be contaminated above 10 CFR 835, Appendix D limits by the NNSS RCT. As a result, all shipments planned for disposal at the NNSS were effectively placed on hold along with the final eleven Lot 1 and Lot 11A1 shipments scheduled for release on March 18, 2011. Subsequently, a second CAR, RWAP-C-11-05 was issues by RWAP on March 22, 2011.

Attachment 4 documents fact finding efforts for the two contaminated trailers identified at the NNSS on March 17, 2011. Attachment 4 includes a timeline and short history on the two contaminations identified in December of 2010 and elaborates on the facts surrounding the additional two contaminations found on March 17, 2011.

CAP #PT063224 was developed from information learned during fact finding efforts and the approved copy was provided to RWAP on May 2, 2011 at the DOE site office during a one-on-one meeting with the newly instated prime contractor for the Portsmouth site Fluor-B&W Portsmouth (FBP). The signed CAR and CAP #PT063224 are included here as Attachment 5.

To address concerns raised at the FBP /RWAP meeting held on May 2, 2011, FBP management revised, added, and amended several actions resulting in a further developed CAP indentified as #PT063224 Rev. 1. The changes are as follows:

- FBP has amended plans to bag the SBWSCs in IP-1 bags as proposed to instead wrap the complete boxes with a clear stretch wrap to improve visibility of package integrity. Coordination with the NNSS Area 5 management assures labeling and marking requirements are adequately satisfied.

- FBP contracted the help of a Certified Health Physicist, to conduct an Independent Assessment of the RADCON contamination control process for shipping from the Portsmouth site. FBP has added an action to the CAP for this assessment and once the report is issued, FBP will evaluate all recommendations on a case-by-case basis and implement as appropriate. See attached report provided as Attachment 6.

- FBP has performed a historical review of site contamination issues as they relate to truck shipments from the Portsmouth site. A copy of this historical review is provided as Attachment 7. This review along with the independent RADCON assessment, the due diligence review performed by FBP for contract turnover and the results of the original "hot particle" survey program will be used to further determine if a programmatic breakdown in the RADCON program has contributed to the contaminated trailer incidents. The initial evidence gathered through the fact finding on the trailers, the due diligence review and the initial "hot particle" results do not indicate a programmatic failure.

- After further discussions and review of the 49 CFR versus 10 CFR regulations, FBP in no longer considering the use of "Radioactive Material Use Only" trailers to deliver the remaining Lot 11A1 and Lot 1 waste SBWSCs.

Attachment 1

Contaminated Trailers

Power Point Presentation

Spring WCO Conference 2011

Unsolved Mysteries

Presented By:

Glenna Gerster WCO Portsmouth

Spring WCO Conference 2011

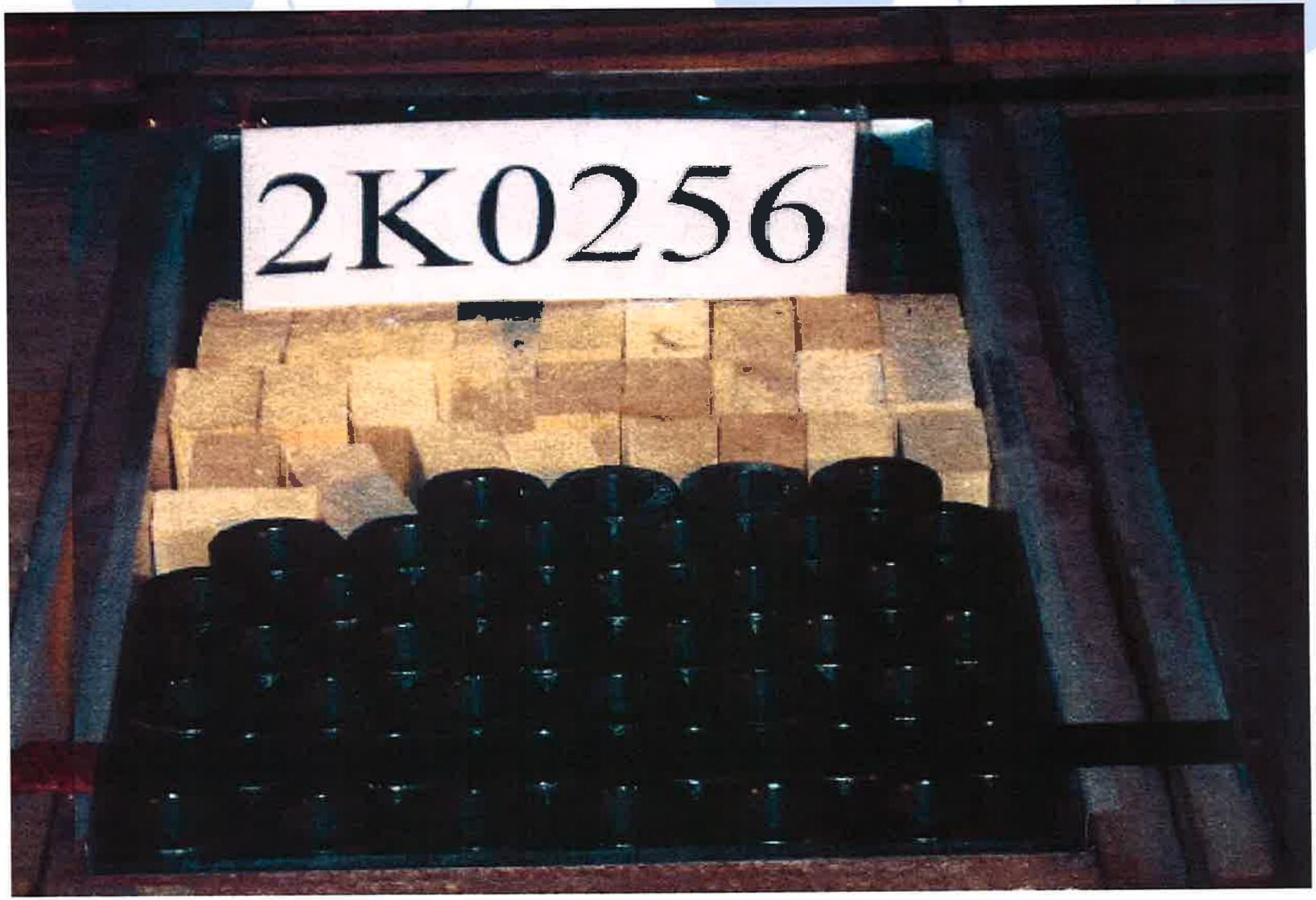
Contaminated Trailers

- LATA Parallax Portsmouth
- December 2010

Project History

Lot 11A1 = 421 Steel Banded Wooden Shipping Containers (SBWSC) containing metal derbies, ingots, billets shipped from Fernald and stored in the Uranium Management Center (UMC)

Lot 11A1 Inside SBWSC



Lot 11A1 Inside SBWSC

Lot 11A1 loaded trailer

History

Lot 1 & 11C = 517 SBWSCs containing ingots, derbies and miscellaneous metal shipped from Fernald to Hanford then to the UMC at Portsmouth for storage.

Lot 1 Inside SBWSC

Lot 1 Inside SBWSC

Lot 1 loaded trailer

Timeline

- Open Lines of Communication – Aug. 2009
- ARRA – Nov. 2009
- Profile/NCSR/NCSE – Sept. 2010
- Approvals – Dec. 15, 2010
- Delivery first 47 Shipments – Dec. 16 – 19
  - 12/16 – 6 Shipments = no issues
  - 12/17 – 10 Shipments =
    one trailer 4''x6" spot
    60,000 dpm/100 cm^2 (direct)
  - 12/18 – 15 Shipments =
    one trailer 4"x 6" spot
    700,000 dpm/100 cm^2 (direct)
  - 12/19 – 16 Shipments = no new issues

Fact Finding

Dec. 21 trip to NNSS

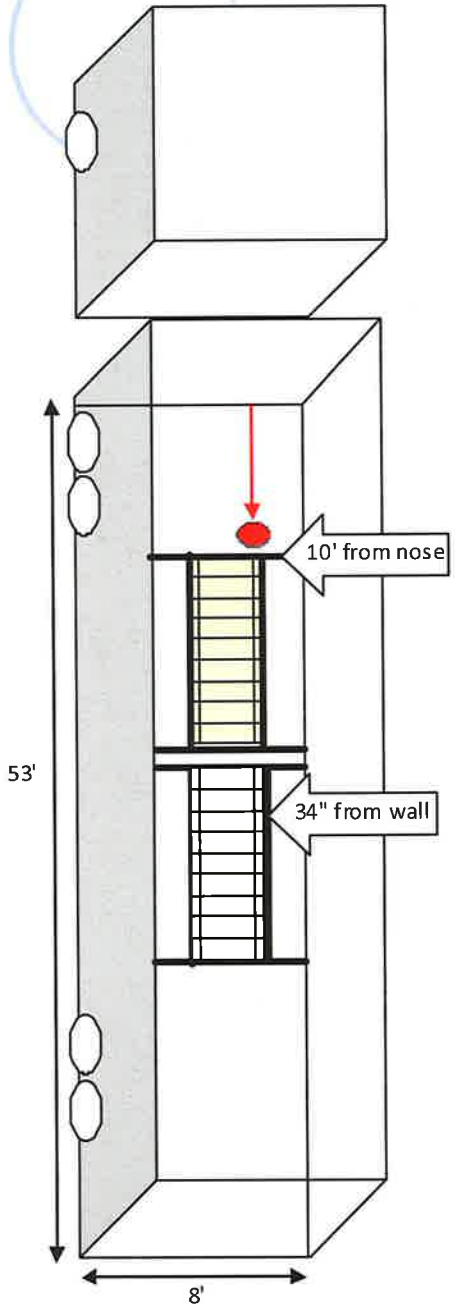
NNSS RCT re-survey hot spots in trailers using LPP supplied equipment and LPP RCT observing

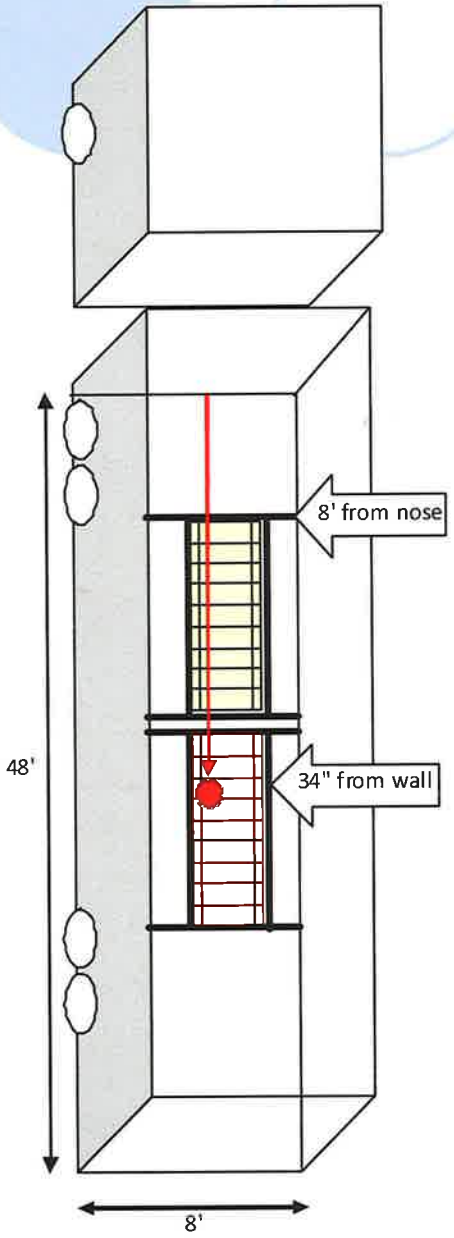
Fact Finding at PORTS

- Unloading and re-survey of 12 trailers loaded and staged for shipment
- Re-survey lay down & loading dock areas
- Re-survey operators and equipment
- Sample contaminated spots in both trailers once they were returned to the PORTS

Sampling

Fact Finding





Sampling Results

- Early indications were that the Contamination was Depleted Uranium
- Sampling confirmed that the contamination was Enriched Uranium
  - 1.38% and 1.4%
  - 883 and 117 pCi/gm Tc-99

Possible Scenarios

- Legacy contamination in trailers
- Leaking packages
- Loose contamination on the packages and/or cross contamination from the UMC building

Root Cause Analysis

- Incoming trailer survey error
- Oxidized material vibrating from the SBWSC during transport
- Legacy contamination on exterior of SBWSC or loading equipment not detected before or during loading

Corrective Actions

- All loaded and staged trailers were unloaded and all empty trailers on site were re-surveyed
- A Rack system was utilized to allow a complete visual inspection and survey of the bottoms of each package including the packages from the loaded trailers
- Large area wipes were used to survey all external surfaces of each package
- Usage histories for each contaminated trailer was obtained from the carriers
- Waste Certification personnel evaluated SBWSC oversight activities to requirements in the Safety Analysis Report for Packaging (SARP)
- A Management Assessment of increased inspection activities was performed by Waste Certification personnel
- Waste Certification increased oversight of inbound trailer survey activities and placed a verification tag on the rear doors to be removed at loading

WC Inspection From Forklift

Surface Inspection

Inspection Rack

Survey Skid Runners

100% Bottom Smear

100% Bottom Inspection

Bottom View

Shipments Resume

- Feb.9, 2011- LPP received approval to resume shipments to the NNSS
- February – Delivered 34 shipments with no issues
- March – 43 shipments remain to ship before March 28, 2011 (transition)

LPP Identified Contamination

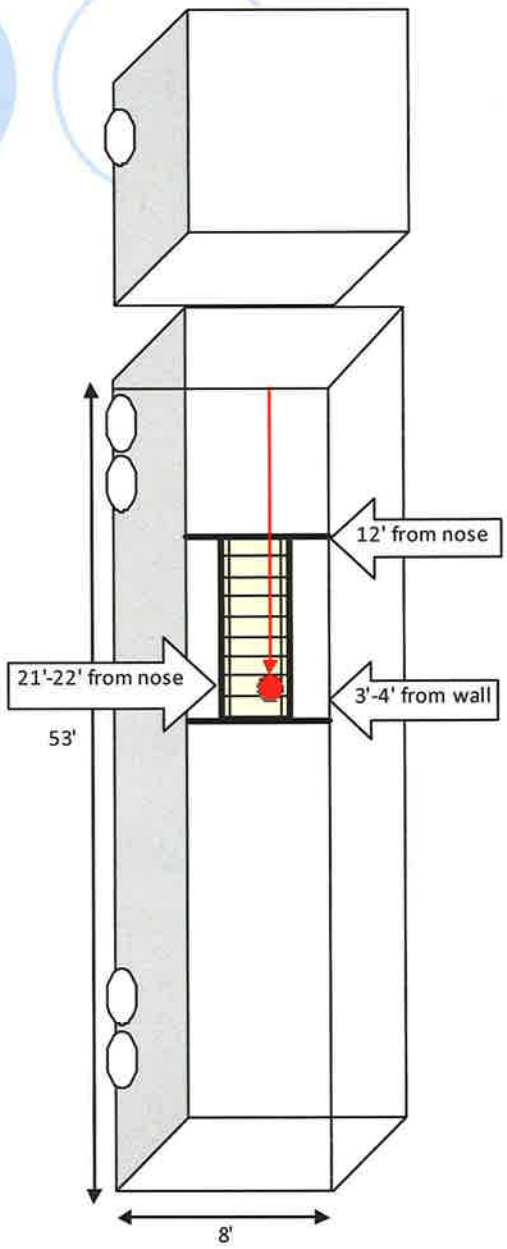
- 3/4/11- LPP Incoming survey following NNSS delivery of shipment POL11101
  - Lot 1 G-4255 (5) Located eight feet from the nose of the trailer near the center
  - **30,458 dpm/100 cm^2** (direct)
  - **20,565 dpm/100 cm^2** (removable)

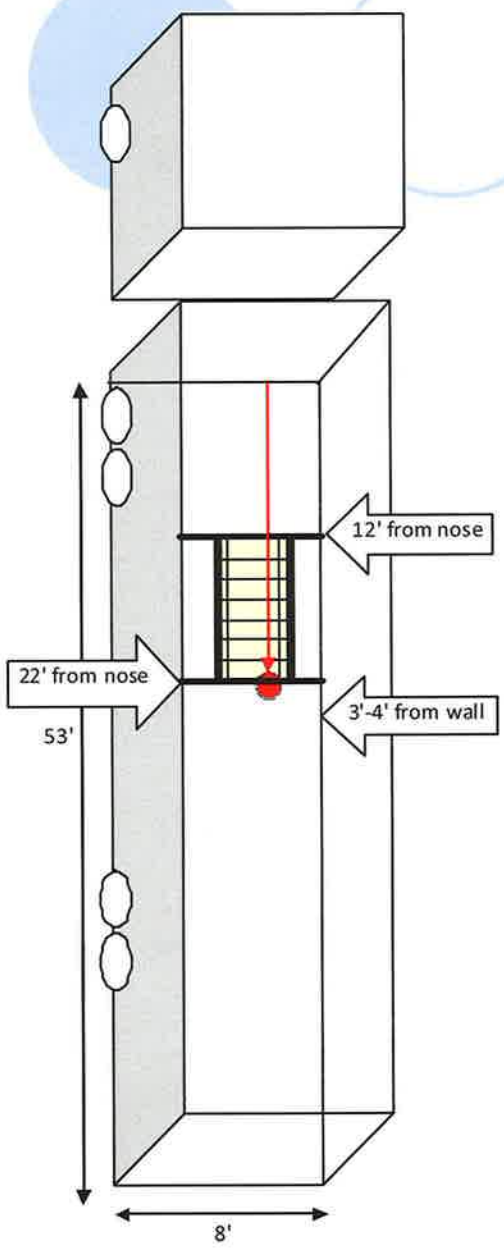
Additional NNSS Contaminations

- 3/17/11- Found during NNSS release survey
  - Lot 11A1 (9) G-4214
  - **50,000 dpm/100 cm^2** (direct)

- 3/17/11- Found during NNSS release survey
  - Lot 11A1 (7) G-4214
  - **20,000 dpm/100 cm^2** (direct)

One previous shipment delivered to NNSS
Lot 1 (5) G-4255


12' from nose
21'-22' from nose
3'-4' from wall
53'
8'


12' from nose
22' from nose
3'-4' from wall
53'
8'

LPP Identified Contamination

- 3/22/11 – Found during LPP release survey following NNSS delivery
  - **7,656 dpm/100 cm^2** (direct)
- Three previous shipments delivered to NNSS
  - POL11071 Lot 1 G-4355 (5)
  - POL11110 Lot 1 G-4255 (5)
  - POL11137 Lot 1 G-4255 (5)

Root Cause Analysis

- Loss of oxidized material vibrating from the SBWSC during transportation
- Legacy contamination imbedded in the trailer's wood floor that became detectable as a result of vibration during transport
- Contamination legacy particles which could not be identified using detection methods currently in place

Additional Corrective Actions

- "Tacky roller" trailer floors before loading SBWSCs
- Tacky roller outer surfaces and bag each SBWSC before loading into trailer
- Obtain new van trailers to transport remaining 108 SBWSCs totaling 11 shipments

Lessons Learned

- Trend trailer usage; know which trailers are routinely used and which have never been used at the site before or move to a dedicated fleet of trailers
- Conduct trailer survey oversight at the appropriate level based on trailer usage.
- Do not certify packages until 100% of the surfaces are accessible.

Review

List of Contaminated NNSS Trailers

1. **KTX3637L - December 17, 2010- found during NNSS release survey:**
   Shipped 12/13/2010
   CAST Transport **POL11063** - Lot 11A1 (18 = G-4214)
   NNSS found contamination levels on the floor (wood) of the trailer:
   - 60,000 disintegrations per minute (dpm) per 100 square centimeters (cm^2) beta/gamma direct reading, and
   - 280 dpm/100 cm^2 alpha removable contamination

   RAD Tech/Supervisor – T. Buchana/A. Peterson
   PR-LPP- 10 - 089

2. **1810014 - December 18, 2010- found during NNSS release survey:**
   Shipped – 12/14/2010
   R&R Trucking **POL11021** - Lot 11A1 (18 = G-4214)
   NNSS found contamination levels on the floor (wood) of the trailer:
   - 700,000 dpm/100cm^2 beta/gamma direct
   - 400 dpm/100cm^2 beta/gamma direct
   - 1,800 dpm/100cm^2 alpha removable contamination
   - 27,300 dpm/100cm^2 beta removable contamination

   RAD Tech/Supervisor – M. Hensley/A. Bennicker
   PR-LPP- 10 - 089

3. **7810085 - March 4, 2011 – found on PORTS incoming survey**
   Last Shipped – 02/18/2011
   R&R Trucking – **POL11101** – Lot 1 (5 = G-4255)
   PORTS RCT found smearable contamination on floor of trailer.
   - 17,091 dpm/100cm^2 removable contamination.
   - 20,565 dpm/100cm^2 removable contamination with second instrument

   RAD Techs 1&2/Supervisor – Steger/Hensley/Bennicker
   PR-LPP- 11 - 008

Identified at the NNSS during free release survey

4. **KV53622L – March 17, 2011 – found during NNSS release survey:**
   Shipped – March 14, 2011
   Hubbard Trucking – **POL11161** - Lot 11A1 (9 = G-4214)
   NNSS found by direct reading and smears contamination of floor of trailer
   - 20,000 dpm/100cm² beta-gamma and 1K dpm alpha direct
   - 43 dpm alpha and 50 dpm beta smears

   RAD Tech/Supervisor – G. Koehler/Bennicker
   PR-LPP-11-020

   Previous shipment - POL11136 – Lot 1 (5 = G-4255)
   Shipped – 02/28/2011
   RAD Tech/Supervisor – Johnson/Bennicker

5. **813912 – March 17, 2011 – found during NNSS release survey:**
   Shipped - March 14, 2011
   Hubbard Trucking - **POL11163** – Lot 11A1 (7 = G-4214)
   NNSS found contamination in the floor of trailer during release survey
   - 50,000 dpm beta gamma (direct) and 2,000 dpm alpha direct

   RAD Tech/Supervisor – Martin Hensley

Identified at the NNSS during free release survey

6. **U81203 –March 22, 2011 – found at PORTS incoming survey**
   Last Shipped – 2/28/2011
   Hubbard Trucking - **POL11071** – Lot 1 (5 = G-4255)
   PORTS RCT found contamination on the metal plate, small area at the rear of the trailer.
   - 7,656 dpm /100cm2 beta/gamma by direct.

Previous shipment from PORTS in Trailer

3) POL11137 – Lot 1 (5 = G-4255)
Date of previous shipment – 02/28/2011
RAD Tech/Supervisor – Miller/Bennicker
PR-LPP-11-021

2) POL11110 – Lot 1 (5 = G-4255)
Date of previous shipment – 02/15/2011
RAD Tech/Supervisor – Kirk/Birch

1) POL11071 - Lot 1 (5 = G-4255)
Date of previous shipment – 12/13/2010
RAD Tech/Supervisor – Kirk/Birch

Attachment 2

Corrective Action Request (CAR)

RWAP-C-11-04

12/17/2010

&

Correction Action Plan (CAP)

PT063204

2/3/2011

Department of Energy
National Nuclear Security Administration
Nevada Site Office
P.O. Box 98518
Las Vegas, NV 89193-8518

FEB 9 2011

Kristi L. Wiehle, U.S. DOE Portsmouth/Paducah Project Office, Portsmouth Site, Piketon, OH

RADIOACTIVE WASTE ACCEPTANCE PROGRAM (RWAP) CLOSURE OF CORRECTIVE ACTION REQUEST (CAR) RWAP-C-11-04

National Nuclear Security Administration Nevada Site Office (NNSA/NSO) RWAP personnel have completed all activities associated with CAR RWAP-C-11-04 that was issued on December 20, 2010, to Ms. Glenna Gerster, Waste Certification Official for the Portsmouth Gaseous Diffusion Plant. The CAR was issued as a result of radioactive contamination being discovered on two transport trailers after off-loading that were above the release limits specified in Title 10 CFR Part 835, Appendix D. Implementation of the Portsmouth Corrective Action Plan to resolve the RWAP-C11-04 was verified and found to be acceptable. No further action on this issue is required by Portsmouth. A copy of the closed CAR is attached for your records.

Based on the requirements of the Nevada Test Site Waste Acceptance Criteria, Revision 8-01 and the Portsmouth Waste Certification Program, shipment of currently approved radioactive waste profiles to the Nevada Nuclear Security Site (formerly the Nevada Test Site) may resume.

If you have any questions or require additional information, please contact me at (702) 295-0957 or Gregg Geisinger at (702) 295-5196.

James J. Cebe
RWAP Task Manager
for the Waste Management Project

WMP:7233.JJC

Enclosure:
As stated

cc w/encl:
J. J. MacDougall, NDEP, Las Vegas, NV
T. H. Murphy, NDEP, Las Vegas, NV
G. L. Gerster, LATA/Parallax Portsmouth, Piketon, OH
R. G. Geisinger, NSTec, Las Vegas, NV
NSTec Correspondence Control, MS NLV008
J. J. Cebe, WMP, NNSA/NSO, Las Vegas, NV
K. K. Snyder, PSG, NNSA/NSO, Las Vegas, NV
S. A. Hejazi, SC, NNSA/NSO, Las Vegas, NV
D. J. Morgan, OPA, NNSA/NSO, Las Vegas, NV
NNSA/NSO Read File

National Nuclear Security Administration
Nevada Site Office

CORRECTIVE ACTION REQUEST (CAR)

ORIGINAL

1.		2.	
Responsible Individual:	Glenna L. Gerster, Waste Certification Official	CAR No.:	RWAP-C-11-04
Facility / Organization:	Portsmouth Gaseous Diffusion Plant (PORTS)	Date Issued:	12-20-2010
Site / Location:	Piketon, OH	Deficiency Code:	NNSSWAC 3.2.13

3. Facility Evaluation: ☐ Audit ☐ Surveillance ☒ N/A Report No.: Receipt of waste at Area 5 RWMS

4. Requirement(s): *(NNSSWAC and/or Generator Program Document)*

NNSSWAC, Rev. 8, Section 3.2.13, Contamination Levels, states, "External contamination levels for waste packages and transport vehicles shall meet the release limits specified in Title 10 CFR Part 835, Appendix D."

5. Deficiency: * CAP Due Date: 01-24-2011

Contrary to the above, radioactive contamination was discovered above the release limits on the floor of R&R Transport Trailer 1810014, PORTS Shipment Number POL11021, received at the Area 5 Radioactive Waste Management Site (RWMS) on December 18, 2010. Waste packages had acceptable levels of contamination, and they were off-loaded and disposed.

Further information on deficiency can be found on next page.

Initiator: Dawn Linkenheil Date: 12/20/2010 RWAP Task Mgr. [signature] Date: 12/20/2010

6. Corrective Action Plan (CAP): **(Must include corrective action, root cause analysis, action to preclude recurrence, and scheduled completion date)*

Scheduled Completion Date: 2/3/11 Responsible Manager: Glenna Gerster Date: 2/3/11

7. Corrective Action Plan Approved: *(If "No," explain)*

Approved RWAP Reviewer: for Geisinger/Linkenheil Date: 02.08.2011

8. Corrective Action Verified: *(If "No," explain)*

The objective evidence submitted by the generator was reviewed by RWAP members and found to be acceptable. The supplied documentation will ensure corrective actions were implemented and will prevent recurrence.

Verified / Approved by: *(Team Lead, if applicable)* Alexander L. Dellaverson Date: 02.08.2011

Approved by RWAP Task Manager: James J. Cebe Date: 02.08.2011

RWAP07-01 (10/2010)

(Identify Block No. / Section from page one.) continuation page

5. Deficiency (continued):

Radiological operations exit surveys (NSTec Survey 10-RW-5-1147) on R&R Transport Trailer 1810014, Shipment Number POL11021 (One of 15 shipments from PORTS on 12/18/2010) was found to have the following contamination levels on the floor (wood) of the trailer:

700,000 disintegrations per minute per 100 cm^2 beta direct
400 disintegrations per minute per 100 cm^2 alpha direct
1,800 disintegrations per minute per 100 cm^2 alpha removable
27,300 disintegrations per minute per 100 cm^2 beta removable

These levels indicate contamination above the allowable release criteria. The trailer has been isolated in the Area 5 RWMS, posted in accordance with radiological operations requirements, and the tractor and driver were allowed to exit after completion of compliant surveys. A Radiological Awareness Report (RAR) was issued for this noncompliance. In addition, this is a Category 3 Noncompliance Condition in accordance with the Area 5 Low-Level Waste Shipment Administrative Procedure OP-2151.233. The Waste Generator (LATA/Parallax Portsmouth) was also notified of incident.

This is the second incident in two days with a contaminated trailer from PORTS and involving waste stream PORT-LPP000026, High Gram Low Enriched Uranium Metal. Shipment Number POL11063 received on 12/17/2010 also had contamination (NSTec Survey 10-RW-5-1145). In both cases, the contamination was isolated to a small area in the center of the trailers on the flooring. Personnel, waste packages, and equipment were monitored with no additional contamination.

National Security Technologies LLC
Vision • Service • Partnership

December 20, 2010

Glenna L. Gerster, Waste Certification Official
LATA/Parallax Portsmouth
3930 US Route 23 South
Piketon, OH 45661

Subject: **CORRECTIVE ACTION REQUEST (CAR) RWAP-C-11-04**

Because of the adverse conditions identified in CAR RWAP-C-11-04; Portsmouth Gaseous Diffusion Plant (PORTS) shall suspend all shipments to the Nevada National Security Site (NNSS) until the CAR has been addressed satisfactorily and closed by the National Nuclear Security Administration Nevada Site Office (NNSA/NSO). Enclosed is the CAR identified for the PORTS waste shipments POL11063 and POL11021 received at the Nevada National Security Site on December 17 and 18, 2010, respectively.

A Corrective Action Plan (CAP) is required to address the CAR. The CAP must address actions taken to resolve the deficiency, including a root cause analysis, actions to prevent recurrence, and the completion date. Please ensure the signed "ORIGINAL CAR" and CAP are returned to National Nuclear Security Administration Nevada Site Office (NNSA/NSO), Waste Management Project, by January 24, 2011. All corrective actions must be implemented by March 24, 2011.

Radioactive Waste Acceptance Program (RWAP) personnel are available to review the draft CAP to ensure your proposed action(s) will satisfy the Nevada National Security Site Waste Acceptance Criteria. This allows for both RWAP and PORTS personnel to agree with the proposed actions before the CAR with the CAP are returned to the NNSA/NSO Task Manager. If you have any questions on the CAR, please do not hesitate to call me at 702-295-1157.

Deron Linkenheil
Radioactive Waste Acceptance Program

DGL:nmw

Enclosure: 1) Correction Action Requests, RWAP-C-11-04 with instructions

cc: RWAP CAR Files, w/enc. NLV 022

Gerster, Glenna

From: Geisinger, Robert [GEISINRG@nv.doe.gov]
Sent: Monday, January 24, 2011 12:46 PM
To: Gerster, Glenna; Uetrecht, Greg (PPPO/ETS); Anderson, Darl
Subject: Portsmouth CAP

Glenna,

I wanted to formally notify you that an extension for submittal of your CAP for CAR RWAP-C-11-04 has been granted. Please ensure the signed "ORIGINAL CAR" and CAP are returned to NNSA/NSO, Waste Management Project, by February 14, 2011. All corrective actions must be implemented by March 24, 2011. I would also like to recommend that the CAP be held in the PPPO Office until after our discussions with Mr. Cebe are held tomorrow on the conference call. I did not have the opportunity to discuss his concerns, therefore I am not sure if they may affect the CAP which could result in a revision.

R. Gregory Geisinger
National Security Technologies, LLC
Contractor to the U. S. Department of Energy
Radioactive Waste Acceptance Program Manager
Office Phone: 702-295-5196
Office Fax: 702-295-3112
Cell Phone 702-506-7644

National Nuclear Security Administration
Nevada Site Office

ORIGINAL

CORRECTIVE ACTION REQUEST (CAR)

1. Responsible Individual:	Glenna L. Gerster, Waste Certification Official	2. CAR No.:	**RWAP-C-11-04**
Facility / Organization:	Portsmouth Gaseous Diffusion Plant (PORTS)	Date Issued:	12-20-2010
Site / Location:	Piketon, OH	Deficiency Code:	NNSSWAC 3.2.13

3. Facility Evaluation: ☐ Audit ☐ Surveillance ☒ N/A Report No.: Receipt of waste at Area 5 RWMS

4. Requirement(s): *(NNSSWAC and/or Generator Program Document)*

NNSSWAC, Rev. 8, Section 3.2.13, Contamination Levels, states, "External contamination levels for waste packages and transport vehicles shall meet the release limits specified in Title 10 CFR Part 835, Appendix D."

5. Deficiency: * **CAP Due Date: 01-24-2011**

Contrary to the above, radioactive contamination was discovered above the release limits on the floor of R&R Transport Trailer 1810014, PORTS Shipment Number POL11021, received at the Area 5 Radioactive Waste Management Site (RWMS) on December 18, 2010. Waste packages had acceptable levels of contamination, and they were off-loaded and disposed.

Further information on deficiency can be found on next page.

Initiator: Devon Timberlake Date: 12/20/2010 RWAP Task Mgr. [signature] Date: 12/20/2010

6. Corrective Action Plan (CAP): **(Must include corrective action, root cause analysis, action to preclude recurrence, and scheduled completion date)*

Scheduled Completion Date: 2/3/11 Responsible Manager: Glenna Gerster Date: 2/3/11

7. Corrective Action Plan Approved: *(If "No," explain)*

RWAP Reviewer: Date:

8. Corrective Action Verified: *(If "No," explain)*

Verified / Approved by: _____ Date: _____
(Team Lead, if applicable)

Approved by
RWAP Task Manager: _____ Date: _____

RWAP07-01 (10/2010)

(Identify Block No. / Section from page one.) continuation page

5. Deficiency (continued):

Radiological operations exit surveys (NSTec Survey 10-RW-5-1147) on R&R Transport Trailer 1810014, Shipment Number POL11021 (One of 15 shipments from PORTS on 12/18/2010) was found to have the following contamination levels on the floor (wood) of the trailer:

700,000 disintegrations per minute per 100 cm^2 beta direct
400 disintegrations per minute per 100 cm^2 alpha direct
1,800 disintegrations per minute per 100 cm^2 alpha removable
27,300 disintegrations per minute per 100 cm^2 beta removable

These levels indicate contamination above the allowable release criteria. The trailer has been isolated in the Area 5 RWMS, posted in accordance with radiological operations requirements, and the tractor and driver were allowed to exit after completion of compliant surveys. A Radiological Awareness Report (RAR) was issued for this noncompliance. In addition, this is a Category 3 Noncompliance Condition in accordance with the Area 5 Low-Level Waste Shipment Administrative Procedure OP-2151.233. The Waste Generator (LATA/Parallax Portsmouth) was also notified of incident.

This is the second incident in two days with a contaminated trailer from PORTS and involving waste stream PORT-LPP000026, High Gram Low Enriched Uranium Metal. Shipment Number POL11063 received on 12/17/2010 also had contamination (NSTec Survey 10-RW-5-1145). In both cases, the contamination was isolated to a small area in the center of the trailers on the flooring. Personnel, waste packages, and equipment were monitored with no additional contamination.

LATA/PARALLAX PORTSMOUTH, LLC

CORRECTIVE ACTION PLAN

Use this form to capture information from the analysis of issues to develop a Corrective Action Plan (CAP) or summarize closure actions. Copy and paste as many "Corrective Action" boxes as needed for this CAP. Whenever possible, generate this form electronically. Otherwise print legibly.

I/CATS Issue Number:	**Source Document Type and ID Number:** *(Use Table A)*
PT063204	S0011942-CY-20100 – Problem Report –PR-LPP-10-089

Issue Description: During the week of December 13, 2010, UMC Operations shipped 47 trailers loaded with steel banded wooden shipping containers (SBWSCs) from Lot 1 and Lot 11A1 to the Nevada National Security Site (NNSS) for waste emplacement. Contamination levels, direct and removable, detected in two trailers exceeded the allowable limits established by DOE per 10CFR835, Appendix D to free release these trailers from the NNSS site. The trailers are CAST KTX3637L and R&R 1810014. Official notification to LPP was made by Gregg Geisinger NSTec, Radioactive Waste Acceptance Program (RWAP) Manager to Glenna Gerster, LPP Waste Certification Official, on December 18, 2010, at 7:00 pm eastern.

December 17, 2010 - Incident One: After performing waste emplacement of the LPP UMC Lot 11(A)1 in the NNSS Area 5, NSTec Radiological Operations was performing release radiation surveys. Trailer (KTX3637L) provided by CAST Transport for LPP Shipment Number POL11063, was found to have the following contamination levels on the wood floor of the trailer:

- 60,000 disintegrations per minute (dpm) per 100 square centimeters (cm^2) beta/gamma direct reading, and
- 280 dpm/100 cm^2 alpha removable contamination

This is above the DOE allowable release criteria. The trailer was isolated in the Area 5 compound and posted in accordance with NSTec procedures. This is a Category 3 Noncompliance Condition in accordance with the Area 5 Low-Level Waste Shipment Administrative Procedure OP-2151.233, requiring notification to NSTec and Nevada DOE personnel. LPP was not included in the initial notification.

December 18, 2010 - Incident Two: After performing waste emplacement of the LPP UMC Lot 11(A)1 in the NNSS Area 5, NSTec Radiological Operations performed release radiation surveys. Trailer (1810014) provided by R&R Trucking for LPP Shipment Number POL11021, was found to have the following contamination levels on the wood floor of the trailer:

- 700,000 dpm/100cm^2 beta/gamma direct
- 400 dpm/100cm^2 alpha direct
- 1,800 dpm/100cm^2 alpha removable contamination, and
- 27,300 dpm/100cm^2 beta/gamma removable contamination

This is above the DOE allowable release criteria. The trailer was isolated in the Area 5 compound and posted in accordance with NSTec procedures. This is a Category 3 Noncompliance Condition in accordance with the Area 5 Low-Level Waste Shipment Administrative Procedure OP-2151.233, requiring notification to NSTec and Nevada DOE personnel. The Waste Generator, LPP, was notified.

December 20, 2010 - NSTech issued Correct Action Report (CAR) RWAP-C-11-04 to Portsmouth Gaseous Diffusion Plant (PORTS) to suspend all shipments to the Nevada National Security Site (NNSS) until CAR RWAP-C-11-04 has been addressed satisfactorily and closed by the Nevada Nuclear Security Administration Nevada Site Office (NNSA/NSO) (see attached CAR RWAP-C-11-04).

Organization:	**Issue Type:** *(Use Table B)*	**Subcontractor Code:** *(Use Table C or check ☒ for LPP)*	**SMA:** *(Use Table D)*
817-30	INC		RP-5

Significant Issue: *(Use Table E)* ☒ Yes ☐ No (9X) **ISMS Elements:** *(Use Table F)* **Core Function:** F5 **Principle:** P6

Compensatory Measures Taken: *(If identified above as a Significant Issue)*

- LPP completed and issued First Notification FN-LPP-10-083 and Problem Report PR-LPP-10-089.
- UMC Operations "paused" loading additional trailers until directed by Facility Operations Manager to continue.
- The trailers were returned to LPP for investigation.
- LPP performed verification surveys on the returned trailers.
- LPP sampled contaminated material from the returned trailer floors and submitted for analysis to determine the origin.

Apparent Cause: *(Use Table G. List the Apparent Cause code and title)*
A7B2C01 -- Other Problem; RADIOLOGICAL/HAZARDOUS MATERIAL; Legacy contamination

Root Cause: *(If identified as a Significant Issue or when requested by management)*
A4B2C07 -- Management Problem; RESOURCE MANAGEMENT LTA; Means not provided for assuring adequate availability of appropriate materials/ tools.

Closure Summary: *(Describe corrective actions that have already been completed. Attach objective evidence of completion.)*
Attached are verification surveys and laboratory analyses performed on the returned trailers.

CORRECTIVE ACTIONS

(Copy and add extra Corrective Action blocks as needed.)

Corrective Action: *(Provide enough detail so it is clear exactly what needs to be done.)*
UMC Operations paused work to review procedures for surveying trailers in preparation for waste shipments.

Due Date:	Closure Documentation Needed:		
12/20/10	The documented communication of work pause will serve as the closure documentation.		
Responsible Person: *(Print name and obtain person's initials)* Jim Eide JHE		**Responsible Organization:** Uranium Operations	**DOE Signature Needed for Changes:** ☒ Yes ☐ No

Corrective Action: *(Provide enough detail so it is clear exactly what needs to be done.)*
UMC Operations will update work plan LPP-WP-10-0113 Rev. 1, *X-744G Lot 1 and Lot 11 A 1 Shipment of SBWSC to NTS* to add the use of an engineered rack system to allow for complete visual observation and radiological survey of the bottoms of the boxes and to add a seal to the transport vehicle closure doors if the loading of waste containers is delayed beyond the day of the vehicle radiological surveys.

Due Date:	Closure Documentation Needed:		
1/24/11	The revision to Work Plan describing the use of engineered rack system will serve as the closure documentation.		
Responsible Person: *(Print name and obtain person's initials)* Jim Eide JHE		**Responsible Organization:** Uranium Operations	**DOE Signature Needed for Changes:** ☒ Yes ☐ No

Corrective Action: *(Provide enough detail so it is clear exactly what needs to be done.)*
Train UMC Operations personnel to the updated work plan LPP-WP-10-0113 Rev. 1, *X-744G Lot 1 and Lot 11 A 1 Shipment of SBWSC to NTS.*

Due Date:	Closure Documentation Needed:		
1/26/11	The attendance roster documenting all UMC Operations Personnel received training will serve as the closure documentation.		
Responsible Person: *(Print name and obtain person's initials)* Jim Eide JHE		**Responsible Organization:** Uranium Operations	**DOE Signature Needed for Changes:** ☒ Yes ☐ No

Corrective Action: *(Provide enough detail so it is clear exactly what needs to be done.)*
Revise LPP-PO-3027, *Certification of PORTS Waste for Disposal at the Nevada National Security Site* to include additional requirements for oversight of inbound pre-shipment surveys of NNSS-bound trailers. Verification of satisfactory completion of the oversight activity by the WPC shall be the placement of a Waste Certification Verification Tag on the closed doors of the trailer that will be removed by the WPC before loading begins. The level and frequency of oversight for this activity shall be determined by the WCO.

Due Date:	Closure Documentation Needed:		
2/02/11	A copy of the approved revision to procedure LPP-PO-3027 with the changes included will serve as the closure documentation.		
Responsible Person: *(Print name and obtain person's initials)* Glenna Gerster GG		**Responsible Organization:** Waste Certification	**DOE Signature Needed for Changes:** ☒ Yes ☐ No

Corrective Action: *(Provide enough detail so it is clear exactly what needs to be done.)*
Train Waste Certification personnel to the revision of LPP-PO-3027, *Certification of PORTS Waste for Disposal at the Nevada National Security Site.*

Due Date:	Closure Documentation Needed:		
2/02/11	The attendance roster documenting all LPP Waste Certification personnel received the above Training will serve as the closure documentation.		
Responsible Person: *(Print name and obtain person's initials)* Glenna Gerster GG		**Responsible Organization:** Waste Certification	**DOE Signature Needed for Changes:** ☒ Yes ☐ No

Corrective Action: *(Provide enough detail so it is clear exactly what needs to be done.)* Revise LPP-PO-3032, *Packaging Containers for NNSS Shipment* to include instructions for the WPC to perform oversight of survey activity performed on inbound trailers used for NNSS shipments.		
Due Date: 2/02/11	**Closure Documentation Needed:** A copy of the approved revision to procedure LPP-PO-3032 with the changes included will serve as the closure documentation.	
Responsible Person: *(Print name and obtain person's initials)* Glenna Gerster GG	**Responsible Organization:** Waste Certification	**DOE Signature Needed for Changes:** ☒ Yes ☐ No

Corrective Action: *(Provide enough detail so it is clear exactly what needs to be done.)* Train Waste Certification personnel to the revision of LPP-PO-3032, *Packaging Containers for NNSS Shipment.*		
Due Date: 2/02/11	**Closure Documentation Needed:** The attendance roster documenting that all LPP Waste Certification Personnel received training will serve as the closure documentation.	
Responsible Person: *(Print name and obtain person's initials)* Glenna Gerster GG	**Responsible Organization:** Waste Certification	**DOE Signature Needed for Changes:** ☒ Yes ☐ No

Corrective Action: *(Provide enough detail so it is clear exactly what needs to be done.)* The 12 trailers currently loaded will be unloaded and the trailers shall be re-surveyed with verification surveys and the boxes shall be re-observed and smeared using the rack system to ensure no direct or removable readings are detected above release for shipment limits.		
Due Date: 1/24/11	**Closure Documentation Needed:** The documentation of inspections and surveys will serve as the closure documentation.	
Responsible Person: *(Print name and obtain person's initials)* Jim Eide JE	**Responsible Organization:** Uranium Operations	**DOE Signature Needed for Changes:** ☒ Yes ☐ No

Corrective Action: *(Provide enough detail so it is clear exactly what needs to be done.)* All empty trailers on-site shall be resurveyed with verification surveys in accordance with LPP-EH-4541 prior to NNSS waste container loading activities. RadCon management will observe this activity.		
Due Date: 2/02/11	**Closure Documentation Needed:** The documentation of Verification Surveys will serve as the closure documentation.	
Responsible Person: *(Print name and obtain person's initials)* Dan Thiel for DT 2/3/11	**Responsible Organization:** RadCon Program	**DOE Signature Needed for Changes:** ☒ Yes ☐ No

Corrective Action: *(Provide enough detail so it is clear exactly what needs to be done.)* LPP Transportation will contact CAST Transport and R&R Trucking to track the history of Trailers KTX3637L and R&R 1810014 to determine where these trailers have been and potential source of the contamination		
Due Date: 12/20/10	**Closure Documentation Needed:** The documentation from vendors regarding trailer history will serve as the closure documentation.	
Responsible Person: *(Print name and obtain person's initials)* Marilew Bartling LSM for MB 2/3/11	**Responsible Organization:** Transportation	**DOE Signature Needed for Changes:** ☒ Yes ☐ No

Corrective Action: *(Provide enough detail so it is clear exactly what needs to be done.)* LPP will perform an evaluation of the current oversight program to the existing SARP to determine if the program meets requirements.		
Due Date: 1/4/11	**Closure Documentation Needed:** The documented evaluation by WCO will serve as the closure documentation.	
Responsible Person: *(Print name and obtain person's initials)* Glenna Gerster GG	**Responsible Organization:** Waste Certification	**DOE Signature Needed for Changes:** ☒ Yes ☐ No

Corrective Action: *(Provide enough detail so it is clear exactly what needs to be done.)* LPP will revise LPP-EH- 4541, *Radiological Surveys to Support Waste Shipments to the Nevada Test Site*, to require that a large area wipe survey be performed on accessible areas of the shipping container.		
Due Date: 2/02/11	**Closure Documentation Needed:** Revised procedure LPP-EH- 4541, *Radiological Surveys to Support Waste Shipments to the Nevada Test Site* will serve as the closure documentation.	
Responsible Person: *(Print name and obtain person's initials)* Daniel Thiel for D.T. 2/3/11	**Responsible Organization:** RadCon Program	**DOE Signature Needed for Changes:** ☒ Yes ☐ No

Corrective Action: *(Provide enough detail so it is clear exactly what needs to be done.)* Train RadCon personnel on the revision of LPP-EH- 4541, *Radiological Surveys to Support Waste Shipments to the Nevada Test Site*		
Due Date: 2/02/11	**Closure Documentation Needed:** The attendance roster documenting that personnel received the training will serve as the closure documentation.	
Responsible Person: *(Print name and obtain person's initials)* Daniel Thiel for D.T. 2/3/11	**Responsible Organization:** RadCon Program	**DOE Signature Needed for Changes:** ☒ Yes ☐ No

Corrective Action: *(Provide enough detail so it is clear exactly what needs to be done.)* A Management Assessment will be performed to verify the effectiveness of the inspection rack system; including its ability to improve accessibility for radiological survey, and further to improve the visibility for structural integrity inspections of the SBWSC undercarriage.		
Due Date: 1/24/11	**Closure Documentation Needed:** Documented Management Assessment by the WCO will serve as the closure documentation.	
Responsible Person: *(Print name and obtain person's initials)* Glenna Gerster GG	**Responsible Organization:** Waste Certification	**DOE Signature Needed for Changes:** ☒ Yes ☐ No

Corrective Action: *(Provide enough detail so it is clear exactly what needs to be done.)* Perform a Root Cause Analysis		
Due Date: 1/24/11	**Closure Documentation Needed:** Completed Root Cause Analysis will serve as the closure documentation.	
Responsible Person: *(Print name and obtain person's initials)* Jim Hey	**Responsible Organization:** Quality Assurance	**DOE Signature Needed for Changes:** ☒ Yes ☐ No

Corrective Action: *(Provide enough detail so it is clear exactly what needs to be done.)* Establish a Senior Oversight Team to develop a plan that will define the UMC activities for review. The plan shall include the review of initial trailer survey, trailer receipt inspection, staging, container preparation, container surveys, loading operations, and shipping. Develop and issue a report defining process improvements and lessons learned for these activities as they relate to Conduct of Operations and complete actions identified.		
Due Date: 2/03/11	**Closure Documentation Needed:** The development of the above referenced plan will serve as the closure documentation.	
Responsible Person: *(Print name and obtain person's initials)* Darl Anderson	**Responsible Organization:** Facility Operations	**DOE Signature Needed for Changes:** ☒ Yes ☐ No

END-POINT ASSESSMENT REQUIRED: ☐ **Yes** ☒ **No**

Assessment Action(s):	**Due Date:**

APPROVALS

Concurrence with CAP or Closure:	Issue Owner Signature D.R. ANDERSON	Date 2/3/11
Concurrence with CAP or Closure:	Program Manager/Project Manager/Designee (PROG MGR) for L. BAUER (Portsmouth)	Date 2/2/11
Concurrence with CAP or Closure:	Waste Certification Official (for NTS related issues)	Date 2/3/11
Validation of CAP Adequacy:	QA Signature	Date 2/3/11
Verification of Issue Closure: *(If corrective actions are already completed)*	QA Signature James T Hay	Date 2/3/11

Attachment 3

Independent Assessment of

Corrective Action Plan (CAP) for

RWAP-C-11-04

Conducted by

Department of Energy (DOE)
Portsmouth/Paducah Project Office
(PPPO)
Facility Representative

Don Dihel

2/3/2011

LPP CAP Review

Corrective Actions:

1. UMC Operations work paused to review procedures for surveying trailers in preparation for waste shipments. Problem Report PR-LPP-10-089 meets the requirement, however, the form in the submittal package was not signed as generated, nor signed as complete. LPP corrected this observation with a signed, completed version of the form. When checking the field implementation, the stop work was not entered into the work history log, but is noted on the shift turnover form. It is suggested that the field superintendent record the initiation and lifting of stop works/work pauses into the history log when they occur. This corrective action has been verified closed.
2. UMC Operations will update work plan LPP-WP-10-0113 Rev. 1, *X-744G Lot 1 and Lot 11 A 1 Shipment of SBWSC to NTS* to add the use of an engineered rack system to allow for complete visual observation and radiological survey of the bottoms of the boxes and to add a seal to the transport vehicle closure doors if the loading of waste containers is delayed beyond the day of the vehicle radiological surveys. Work Package LPP-WP-10-0113 Rev 2 meets the requirements. The document however is stamped as "LPP Business Proprietary," which is not a DOE approved marking. Also the cover sheet has a correction that is lined out, but not initialed and dated. During review of the implementation of the document, worker training is reviewed daily for D&D workers, but not support personnel (WPC, RCT, etc.). The review of worker training is documented by the project supervisor, although the entry does not state it is only for D&D workers. Two D&D workers were identified as having NCS training overdue since 5/28/10 and there was no indication of any worker restrictions being implemented. When identified to project management, these workers were assigned to next NCS class, which was conducted on February 3, 2011. This corrective action has been verified closed.
3. Train UMC Operations personnel to the updated work plan LPP-WP-10-0113 Rev. 1, *X-744G Lot 1 and Lot 11 A 1 Shipment of SBWSC to NTS.* LPP-WP-10-0113 Rev 2 training roster meets the requirements. However, the document contains blank lines that need to be lined out. Although this document shows training for current assigned personnel, it does not address the training for future workers. This is training would be through required reading, but required reading is not checked to ensure workers are aware of the new document and implementing the requirements. Although implementation is weak in some areas, this corrective action has been verified closed.
4. Revise LPP-PO-3027, *Certification of PORTS Waste for Disposal at the Nevada National Security Site* to include additional requirements for oversight of inbound pre-shipment surveys of NNSS-bound trailers. Verification of satisfactory completion of the oversight activity by the WPC shall be the placement of a Waste Certification Verification Tag on the closed doors of the trailer that will be removed by the WPC before loading begins. The level and frequency of oversight for this activity shall be determined by the Waste Certification Officer. Procedure LPP-PO-3027 meets the requirements. However, the assignment of oversight of radiological surveys is assigned to the Waste Package Certifier, who does not have a full understanding of radiological procedures and techniques. It is recommended these individuals receive training so they can effectively implement oversight or individuals

with radiological training perform the oversight. But LPP has met the corrective action requirement, and this corrective action has been verified closed.

5. Train Waste Certification personnel to the revision of LPP-PO-3027, *Certification of PORTS Waste for Disposal at the Nevada National Security Site.* LPP-PO-3027 training roster meets the requirements. However, the document contains blank lines that need to be lined out. Although this document shows training for current assigned personnel, it does not address the training for future workers. This is training would be through required reading, but required reading is not checked to ensure workers are aware of the new document and implementing the requirements. Although implementation is weak in some areas, this corrective action has been verified closed.
6. Revise LPP-PO-3032, *Packaging Containers for NNSS Shipment* to include instructions for the WPC to perform oversight of survey activity performed on inbound trailers used for NNSS shipments. Procedure LPP-PO-3032 meets the requirements. However, the description of this revision states there were no intent changes made to the procedure, which does not agree with the corrective action. Intent changes were made for project oversight by the WPC (see comment 4 on training of WPC to perform oversight). Although implementation is weak in some areas, this corrective action has been verified closed.
7. Train Waste Certification personnel to the revision of LPP-PO-3032, *Packaging Containers for NNSS Shipment.* LPP-PO-3032 training roster meets the requirements. Although this document shows training for current assigned personnel, it does not address the training for future workers. This is training would be through required reading, but required reading is not checked to ensure workers are aware of the new document and implementing the requirements. Although implementation is weak in some areas, this corrective action has been verified closed.
8. The 12 trailers currently loaded will be unloaded and the trailers shall be re-surveyed with verification surveys and the boxes shall be re-observed and smeared using the rack system to ensure no direct or removable readings are detected above release for shipment limits. A two page report authored by Task Lead and Corrective Action #9 meets the requirements. This corrective action has been verified closed.
9. All empty trailers on-site shall be resurveyed with verification surveys in accordance with LPP-EH-4541 prior to NNSS waste container loading activities. RadCon management will observe this activity. Twelve surveys of trailers and the wooden shipping containers meet the corrective action requirements. This corrective action has been verified closed.
10. LPP Transportation will contact CAST Transport and R&R Trucking to track the history of Trailers KTX3637L and R&R 1810014 to determine where these trailers have been and potential source of the contamination A report on history of trailers usage meets the requirements. This corrective action has been verified closed.
11. LPP will perform an evaluation of the current oversight program to the existing SARP to determine if the program meets requirements. An e-mail from LPP WCO meets the requirements. This corrective action has been verified closed.
12. LPP will revise LPP-EH- 4541, *Radiological Surveys to Support Waste Shipments to the Nevada Test Site*, to require that a large area wipe survey be performed on accessible areas of the shipping container. Procedure LPP-EH-4541 meets the requirements. However, the procedure does not state the acceptance criteria for the

Large Area Wipe, even though the field personnel are appropriately applying a limit. It is recommended that the next revision of the procedure include a statement that 10 CFR 835 limits are lower than DOT and the option to use these limits is approved in 49 CFR 173.443(a)(2). This corrective action is verified closed.

13. Train RadCon personnel on the revision of LPP-EH- 4541, *Radiological Surveys to Support Waste Shipments to the Nevada Test Site.* LPP-EH-4541 training roster meets the requirements. However, the document contains blank lines that need to be lined out. Also, some training forms indicate there was a Pass/Fail portion of the training, but another training sheet has this boxed marked NA. Although these documents show training for current assigned personnel, it does not address the training for future workers. RadCon does implement a program to ensure Radiological Control personnel are training on the latest procedures, when assigned to the project. However, required reading is not checked to ensure workers are aware of the new document and implementing the requirements. Although implementation is weak in some areas, this corrective action has been verified closed.
14. A Management Assessment will be performed to verify the effectiveness of the inspection rack system; including its ability to improve accessibility for radiological survey, and further to improve the visibility for structural integrity inspections of the SBWSC undercarriage. LPP Management Assessment Report LPP-MA-11-040 meets the requirements. This corrective action has been verified closed.
15. Perform a Root Cause Analysis. Root Cause Analysis Determination Report meets the requirements. This corrective action has been verified closed.
16. Establish a Senior Oversight Team to develop a plan that will define the UMC activities for review. The plan shall include the review of initial trailer survey, trailer receipt inspection, staging, container preparation, container surveys, loading operations, and shipping. Develop and issue a report defining process improvements and lessons learned for these activities as they relate to Conduct of Operations and complete actions identified. Approval of a Standard Order by LPP Project Manager meets the requirements. However, the plan has not been fully implemented yet. Also, the plan calls for the Project Manager to designate "qualified personnel" as Senior Supervisor. Although personnel have been assigned Senior Supervisor, no qualification criteria has been established nor a verification that the assigned personnel meet the qualification requirements. The Standard Order was revised to correct to remove the word "qualified" and to include a minimum frequency for performing oversight activities. Although implementation is weak in some areas, this corrective action has been verified closed.

Field observations were conducted to review documents, verify closure of the corrective actions, evaluate implementation of the corrective actions, observe proper inspections, observe proper surveys, observe proper labeling and marking of packages, and observe proper loading of trailers.

Review performed by Don Dihel, DOE, and Dan Mosley, support contractor to DOE, for the period of January 27, 2011 to February 3, 2011.

Donald Dihel, CHARM

Attachment 4

Fact Finding Report for

Contaminated Trailers – Second Event

March 17, 2011

by
Steve Schmucker

FACT SHEET

Title: UMC Operations Fact Finding for Contaminated Hubbard Trailers 813912 and KV53622L

Scope: UMC Operations Fact Finding to document Remedial Actions necessary to Close Out I/CATS Issue PT063224 and to restart waste shipments to the Nevada Test Site

Background: On 3/17/11, LATA/Parallax (LPP) was notified by the Nevada National Security Site (NNSS) that two trailers used to ship radioactive material from the X-744G Building to NNSS had elevated contamination levels on the floor of the trailers provided by Hubbard Trucking (Trailers 813912 and KV53622L). Both trailers contained Lot 11A1 low enriched metal, 1.25% Uranium from Fernald, packaged in Model G-4214 Steel Banded Wood Shipping Containers (SBWSCs) [USA/5467/AF-85 (DOE)].

Hubbard Trailers 813912 and KV53622L had received a 100% radiological survey of the trailer bed for total and removable contamination and an independent confirmatory radiological survey of the trailer. All surfaces of the containers to be shipped were surveyed for removable contamination in accordance with Work Package 10-0113, *Lot 1 and 11A1 Preparations and Shipments*, including the use of a metal rack system that provides complete access to the external surfaces of the SBWSCs. The radiological surveys on the trailer bed and containers met the limits of LPP-EH-4541, Rev. 3, *Radiological Surveys to Support Waste Shipments to the Nevada National Security Site* , Attachment C 10 CFR Part 835, APPENDIX D, *Surface Contamination Values (10 CFR Part 835, Appendix D)*.

Following unloading of the waste containers from Hubbard Trailers 813912 and KV53622L, NNSS attempted to perform release radiological surveys. The survey results for trailer KVL53622L were found to be in excess of 10 CFR835, Appendix D values. Specifically a direct reading value of 20,000 dpm/100 cm^2 beta-gamma was measured on the trailer floor (Appendix D limit of 5,000 dpm/100 cm^2 beta-gamma). After unloading trailer 813912, radioactive contamination in excess of 10 CFR 835, Appendix D was also discovered on the trailer floor. A direct reading value of 50,000 dpm/100 cm^2 beta-gamma was measured (Appendix D limit of 5,000 dpm/100 cm^2 beta-gamma).

Hubbard Trailers 813912 and KV53622L trailers exceeded site free release limits, NNSS held the trailers onsite. The two trailers were disconnected from their tractors, parked within the NNSS compound and were controlled as Contamination Areas.

History: The following is a discussion on December 2010 I/CATS PT063204 – Contaminated trailers at NNSS:

During the week of December 13, 2010, UMC Operations shipped 47 trailers loaded with SBWSCs containing Lot 1 and Lot 11A1 materials to NNSS. Radiological contamination, direct and removable, was detected in two trailers and exceeded the allowable release limits for NNSS site. The trailers were CAST Transport KTX3637L and R&R Trucking 1810014. Official notification to LPP was made to Portsmouth Waste Certification Official, on December 18, 2010.

Incident One: On December 17, 2010, after performing waste emplacement of the UMC waste Lot 11(A)1 in the NTS Area 5, NSTec Radiological Operations performed release radiological surveys. CAST trailer KTX3637L, UMC Shipment Number POL11063, was found to have the following contamination levels on the floor (wood) of the trailer:

- 60,000 dpm/100 cm^2 beta/gamma direct reading, and
- 280 dpm/100 cm^2 alpha removable contamination

This was above the allowable release criteria for NNSS per 10CFR835, Appendix D. This was a Category 3 Noncompliance Condition in accordance with the NNSS Area 5 Low-Level Waste Shipment Administrative Procedure OP-2151.233, requiring notification to NSTec and Nevada DOE personnel. Trailer KTX3637L was returned to UMC and was sampled and decontaminated under work package LPP-WP-11-0011. The analytical data is reflected in Appendix A (Attached). The trailer was radiologically free released and returned to CAST Transport.

The following basic description information on the SBWSCs was gathered from a UMC Lot inventories report compiled by Hazelwood in 2007.

Shipment #	SBWSC	WCT #	Container #	Basic Description
POL11063	G4214	10-005282	W193005	Derbies, Code 1 and Code 3
	G4214	10-005283	W192757	Derbies, Code 1 and Code 3
	G4214	10-005284	W192697	Derbies, Code 1 and Code 3
	G4214	10-005285	W192700	Derbies, Code 1 and Code 3
	G4214	10-005286	W192342	Derbies, Code 1 and Code 3
	G4214	10-005287	W192369	Derbies, Code 1 and Code 3
	G4214	10-005288	W192299	Derbies, Code 1 and Code 3
	G4214	10-005289	W192766	Derbies, Code 1 and Code 3
	G4214	10-005290	W192728	Derbies, Code 1 and Code 3
	G4214	10-005291	W192689	Derbies, Code 1 and Code 3
	G4214	10-005292	W192343	Derbies, Code 1 and Code 3
	G4214	10-005293	W192354	Derbies, Code 1 and Code 3
	G4214	10-005294	W192994	Derbies, Code 1 and Code 3
	G4214	10-005295	W192691	Derbies, Code 1 and Code 3
	G4214	10-005296	W192365	Derbies, Code 1 and Code 3
	G4214	10-005297	W192352	Derbies, Code 1 and Code 3
	G4214	10-005298	W192706	Derbies, Code 1 and Code 3
	G4214	10-005299	W192335	Derbies, Code 1 and Code 3

* Code 1 is a finished derby for remelt. Code 3 is a treated derby for remelt

Incident Two: On December 18, 2010, after performing waste emplacement of the UMC waste Lot 11(A)1 in the NTS Area 5, NSTec Radiological Operations performed release radiation surveys. R&R Trucking trailer 1810014, UMC Shipment Number POL11021, was found to have the following contamination levels on the floor (wood) of the trailer:

- 700,000 dpm/100cm^2 beta/gamma direct
- 400 dpm/100cm^2 alpha direct
- 1,800 dpm/100cm^2 alpha removable contamination, and
- 27,300 dpm/100cm^2 beta/gamma removable contamination

This was above the allowable release criteria for NNSS. This was a Category 3 Noncompliance Condition in accordance with the Area 5 Low-Level Waste Shipment Administrative Procedure OP-2151.233, requiring notification to NSTec and Nevada DOE personnel. The Waste Generator (LATA/Parallax/Portsmouth) was notified. Trailer 1810014 was returned to UMC and was sampled and decontaminated under work package LPP-WP-11-0011. The analytical data is reflected in Appendix B (Attached). The trailer was radiologically free released and returned to R&R Trucking.

The following basic description information on the SBWSCs was gathered from a UMC Lot inventories report compiled by Hazelwood in 2007.

Shipment #	SBWSC	WCT #	Container #	Basic Description *
POL11021	G4214	10-005073	W192734	Derbies, Code 1 and Code 3
	G4214	10-005075	W193000	Derbies, Code 1 and Code 3
	G4214	10-005076	W192295	Derbies, Code 1 and Code 3
	G4214	10-005077	W193003	Derbies, Code 1 and Code 3
	G4214	10-005109	W193045	Derbies, Code 1 and Code 3
	G4214	10-005108	W193015	Derbies, Code 1 and Code 3
	G4214	10-005107	W193057	Derbies, Code 1 and Code 3
	G4214	10-005106	W193032	Derbies, Code 1 and Code 3
	G4214	10-005105	W193058	Derbies, Code 1 and Code 3
	G4214	10-005104	W193052	Derbies, Code 1 and Code 3
	G4214	10-005103	W192722	Derbies, Code 1 and Code 3
	G4214	10-005102	W192739	Derbies, Code 1 and Code 3
	G4214	10-005101	W192708	Derbies, Code 1 and Code 3
	G4214	10-005100	W193007	Derbies, Code 1 and Code 3
	G4214	10-005099	W193022	Derbies, Code 1 and Code 3
	G4214	10-005098	W193014	Derbies, Code 1 and Code 3
	G4214	10-005097	W192995	Derbies, Code 1 and Code 3
	G4214	10-005096	W193041	Derbies, Code 1 and Code 3

* Code 1 is a finished derby for remelt. Code 3 is a treated derby for remelt

I/CATS PT063204: On December 20, 2010: NSTech issued Correct Action Report (CAR) RWAP-C-11-04 to Portsmouth Gaseous Diffusion Plant (PORTS) to suspend all shipments to the Nevada National Security Site (NNSS) until CAR RWAP-C-11-04 has been addressed satisfactorily and closed by the Nevada Nuclear Security Administration Nevada Site Office (NNSA/NSO). PORTS closed out RWAP-C-11-04 with NNSS and resumed waste shipments to NNSS on February 15, 2011.

Remedial Actions for PT063204: The following remedial actions were completed to close out PT063204 and resume UMC Operations shipments to NNSS.

- UMC Operations suspended Lot 1 and 11A1 shipments to NNSS on December 20, 2010
- Work Package WP-10-0113, Lot 1 and 11A1 Preparations and Shipments, was revised to add the use of an engineered rack system to allow better access to the externals surfaces of the SBWSCs for container integrity inspections and radiological surveys
- LPP-PO-3027, *Certification of PORTS Waste for Disposal at the NNSS*, was revised to include additional requirements for oversight of inbound pre-shipment surveys of NNSS bound trailers
- Addition of oversight by Waste Package Certifiers during radiological pre-shipment surveys of the incoming trailers, including the placement of a Waste Certification Verification Tag on the closure doors of the trailers
- UMC Operations unloaded 12 trailers schedule for shipment
- UMC Operations re-surveyed, with WPC oversight, all trailers in staging areas scheduled for UMC waste shipments
- UMC Operations re-inspected and re-surveyed 469 SBWSCs utilizing the engineered rack system and additional oversight by Senior Management Team
- UMC Operations received back from NNSS, Trailers KTX3637L and 813912, performed decontamination, and radiologically free released these trailers back to the vendors (CAST Transport and R&R Trucking)

Problem Report: On 3/4/11at approximately 16:42, a Radiological Control Technician (RCT) contacted his Lead with a concern of potential smearable contamination of R&R Trailer 7810085. A contamination survey smear was removed to an area for counting where background could be minimized and radiological controls could be implemented. The initial survey results were 17,091 dpm/100cm^2 removable contamination beta/gamma. Subsequent survey with another instrument used to count the smear showed 20,565 dpm/100cm^2 removable contamination (recount of smear performed 30 minutes from initial count to allow for decay of any possible radon). Verbal notifications were made to UMC Superintendents upon discovery and phone notifications to Radiological Controls Management. Additional notifications included ESH&Q Manager and the Project Lead. Survey documentation is on survey DOE-1800. Location of contamination was approximately 8 ft from nose of trailer in center area. Trailer 7810085 is an enclosed trailer. The smear was sent to Southwest Research labs for isotopic analysis. The data is summarized in Appendix C.

Occurrence Report

Occurrence Report Number: EM-PPPO-LPP-PORTENVRES-2011-0001, *Radioactive Contamination Discovered on Trailer Floor*, was issued in conjunction with Corrective Action Plan PT063224.

Reporting Criteria:

> 10(2) - An event, condition, or series of events that does not meet any of the other reporting criteria, but is determined by the Facility Manager or line management to be of safety significance or of concern to other facilities or activities in the DOE complex. One of the four significance categories should be assigned to the occurrence, based on an evaluation of the potential risks and the corrective actions taken. (1 of 4 criteria - This is a SC 4 occurrence)

Fact Finding: PT063224 (April 2011)

Hubbard Trailer 813912: Hubbard Trailer 813912 was used for UMC Shipment # POL11163, Lot 11A1 Load Sheet 26, seven (7) G-4214 SBWSCs. POL11163 was shipped from Portsmouth on March 14, 2011 and was received and unloaded and NNSS on March 17, 2011. Hubbard Trailer 813912 was previously used for POL11157, HASA waste shipment to NNSS February 21, 2011, unloaded and released on February 24, 2011.

The following basic description information on the SBWSCs was gathered from a UMC Lot inventories report compiled by Hazelwood in 2007.

Shipment #	SBWSC	WCT #	Container #	Basic Description
POL11163	G4214	11-001280	W202015	Pickled Primary Ingots containing First Generation Top Crops
	G4214	11-001281	W202003	Pickled Primary Ingots containing First Generation Top Crops
	G4214	11-001282	W202030	Pickled Primary Ingots Containing No Top Crop
	G4214	11-001283	W202011	Sawed Sections, Requiring Pickling, From Primary Ingots Containing First Generation Top Crops
	G4214	11-001284	W202027	Sawed Sections, Requiring Pickling, From Primary Ingots Containing First Generation Top Crops
	G4214	11-001285	W202024	Pickled Primary Ingots containing First Generation Top Crops
	G4214	11-001286	W202023	Pickled Primary Ingots containing First Generation Top Crops

Table: Radiological Surveys for POL11163

RAD Survey	RAD Survey Date	Purpose of Survey
DOE-1650	3/1/11	10% Verification Survey to Support Incoming Baseline Survey DOE-1647 (813912)
DOE-1647	3/1/11	Incoming Baseline Survey for NNSS Shipment (813912)
DOE-1264	2/18/11	10% Reverification Survey for Incoming Enclosed Trailer for NNSS Shipment (813912)
DOE-1254	2/17/11	Incoming Survey Box Trailer 813912
DOE-619	1/27/11	SBWSCs Shipment to NNSS (Lot 11A1/29 resurvey)
DOE-10399	12/14/10	SBWSCs (Derbies) Shipment to NTS – Lot 11A1-Shipment 29

Hubbard Trailer KV53622L: Hubbard Trailer KV53622L was used for UMC Shipment # POL11161, Lot 11A1 Load Sheet 29, nine (9) G-4214 SBWSCs. POL11161was shipped from Portsmouth on March 14, 2011 and was received and unloaded and NNSS on March 17, 2011. Hubbard Trailer KV53622L was previously used for POL11154, UMC metal drum waste shipment to NNSS February 21, 2011, unloaded and released on February 24, 2011.

The following basic description information on the SBWSCs was gathered from a UMC Lot inventories report compiled by Hazelwood in 2007.

Shipment #	WCT #	Container #	Basic Description
POL11161	11-001287	W201950	Chemical Reject Solid Metal for Pickling Prior to Remelt
	11-001288	W202053	Chemical Reject Solid Metal for Pickling Prior to Remelt
	11-001289	W202008	Pickled Primary Ingots containing First Generation Top Crops
	11-001290	W201954	Pickled Primary Ingots containing First Generation Top Crops
	11-001291	W201949	Pickled Primary Ingots containing First Generation Top Crops
	11-001292	W202019	Pickled Primary Ingots containing First Generation Top Crops
	11-001293	W202016	Pickled Primary Ingots containing First Generation Top Crops
	11-001294	W201945	Chemical Reject Solid Metal for Pickling Prior to Remelt
	11-001295	W202031	Pickled Primary Ingots containing First Generation Top Crops

Table: Radiological Surveys for POL11161

RAD Survey	RAD Survey Date	Purpose of Survey
DOE-1911	3/8/11	10% Verification Survey to Support Incoming Baseline Survey DOE-1925 (KV53622L)
DOE-1925	3/8/11	Incoming Enclosed Trailer From NNSS Shipment (KV53622L)
DOE-1529	2/25/11	10% Verification Survey for Incoming Enclosed Truck for NNSS Shipment (KV53622L)
DOE-1530	2/25/11	Incoming Baseline Survey for NNSS Shipment (KV53622L)
DOE-618	1/27/11	SBWSCs Shipment to NNSS (Lot 11A1/26 resurvey)
DOE-10398	12/14/10	SBWSCs (Derbies) Shipment to NTS – Lot 11A1-Shipment 26

Remedial Actions for PT063224: The following remedial actions were drafted to close out PT063224 and resume UMC Operations shipments to NNSS.

- UMC Operations suspended shipments on March 17, 2011
- UMC Operations unloaded the 11 trailers containing the remaining SBWSCs
  - Lot 1 – 10 SBWSCs
  - Lot 11A1 – 98 SBWSCs
- UMC Operations re-surveyed the 11 trailers and installed tamper indicating devices on the closure doors
- Radiation Control will us "tacky rollers" to survey the trailer floors, rack system general area, and the 108 remaining SBWSCs for uranium shavings

Appendix A

Cast Trailer KTX3637L data

Sample ID	Analyte	Result	Result Units	Lab Qualifier	Inst. ID
KTX3637L-R1A	Americium-241	1.02E-01	pCi/g		Alpha-Sp
KTX3637L-R1A	Neptunium-237	1.76E-01	pCi/g		Alpha-Sp
KTX3637L-R1A	Plutonium-238	9.44E-02	pCi/g		Alpha-Sp
KTX3637L-R1A	Plutonium-239/240	1.15E+00	pCi/g		Alpha-Sp
KTX3637L-R1A	Protactinium-234m	6.12E+02	pCi/g		Gamma
KTX3637L-R1A	Thorium-228	1.53E-01	pCi/g		Alpha-Sp
KTX3637L-R1A	Thorium-230	7.13E-01	pCi/g		Alpha-Sp
KTX3637L-R1A	Thorium-231	2.69E+01	pCi/g		Gamma
KTX3637L-R1A	Thorium-234	2.34E+02	pCi/g		Gamma
KTX3637L-R1A	Uranium-234	8.18E+02	pCi/g	J	Gamma
KTX3637L-R1A	Uranium-235	3.07E+01	pCi/g		Gamma
KTX3637L-R1A	Uranium-238	1.48E+02	pCi/g	U	Gamma
KTX3637L-R1B	Total Uranium	3.10E+02	mg/Kg	D	ICP-MS
KTX3637L-R1B	Uranium-233	0.07	mass %	U	ICP-MS
KTX3637L-R1B	Uranium-234	0.01	mass %		ICP-MS
KTX3637L-R1B	Uranium-235	1.40	mass %		ICP-MS
KTX3637L-R1B	Uranium-236	0.05	mass %		ICP-MS
KTX3637L-R1B	Uranium-238	98.55	mass %		ICP-MS
KTX3637L-R1B	Technicium-99	1.17E+02	pCi/g		LSC

KTX3637L-R1A sample split analysis was performed by on-site USEC laboratory
KTX3637L-R1B sample split analysis was performed by MCL in Oak Ridge, TN

All isotopes that were reported at less than minimum detectible activity (MDA), with the exception of U-233 mass % and U-238 gamma spec, have been omitted from the table above for clarity

J=Estimated Value
U=Undetected
D=Diluted. Concentration Calculation include dilution factor

Appendix B

R & R Trailer 1810014 data

Sample ID	Analyte	Result	Result Units	Lab Qualifier	Inst. ID
1810014-R1A	Lead-212	3.67E+00	pCi/g		Gamma
1810014-R1A	Neptunium-237	1.43E-01	pCi/g		Alpha-Sp
1810014-R1A	Plutonium-239/240	3.88E-01	pCi/g		Alpha-Sp
1810014-R1A	Protactinium-234m	3.42E+03	pCi/g		Gamma
1810014-R1A	Thorium-228	6.70E-01	pCi/g		Alpha-Sp
1810014-R1A	Thorium-230	8.03E+00	pCi/g		Alpha-Sp
1810014-R1A	Thorium-231	2.25E+02	pCi/g		Gamma
1810014-R1A	Thorium-232	8.04E-02	pCi/g		Alpha-Sp
1810014-R1A	Thorium-234	1.87E+03	pCi/g		Gamma
1810014-R1A	Uranium-234	4.67E+03	pCi/g	J	Gamma
1810014-R1A	Uranium-235	2.16E+02	pCi/g		Gamma
1810014-R1A	Uranium-238	2.80E+03	pCi/g		Gamma
1810014-R1B	Total Uranium	2.20E+03	mg/Kg	D	ICP-MS
1810014-R1B	Uranium-233	0.05	mass %	U	ICP-MS
1810014-R1B	Uranium-234	0.01	mass %		ICP-MS
1810014-R1B	Uranium-235	1.38	mass %		ICP-MS
1810014-R1B	Uranium-236	0.04	mass %		ICP-MS
1810014-R1B	Uranium-238	98.57	mass %		ICP-MS
1810014-R1B	Technicium-99	8.83E+02	pCi/g		LSC

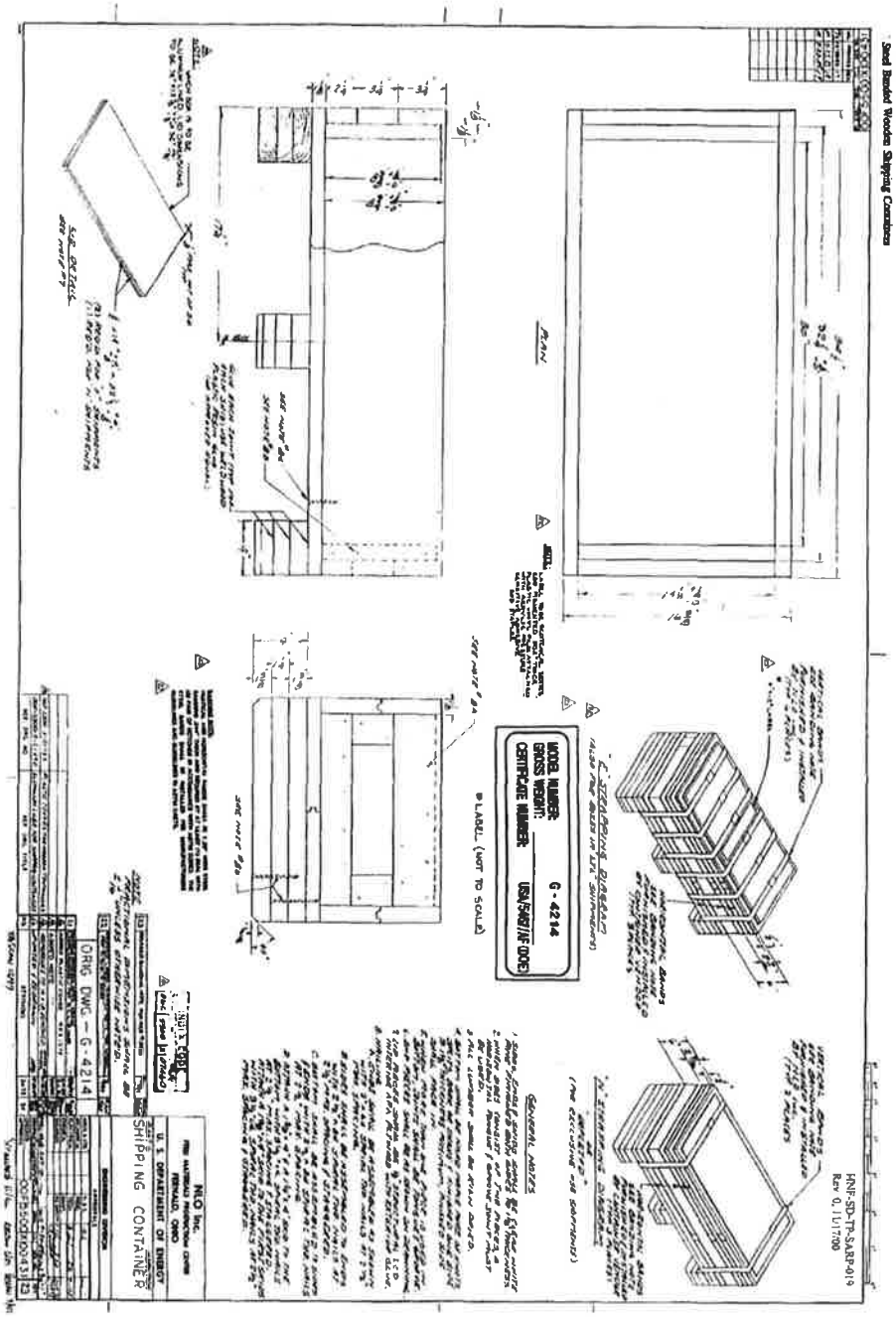
1810014-R1A sample split analysis was performed by on-site USEC laboratory
1810014-R1B R1A sample split analysis was performed by MCL in Oak Ridge, TN

All isotopes that were reported at less than minimum detectible activity (MDA), with the exception of U-233 mass %, have been omitted from the table above for clarity

J=Estimated Value
U=Undetected
D=Diluted. Concentration Calculation include dilution factor

Appendix C
R&R Trailer 7810085 Data

Sample ID	Analyte	Result	Result Units
7810085	Total Uranium	5.06E-01	ug / sample
7810085	Uranium-238	1.68E-01	pCi / sample
7810085	Uranium-235	0.0139	pCi / sample
7810085	Uranium-235	1.27	weight %



G4214 SBWSC Print excerpted from SARP

Exhibit
Packaging Derbies in G4214 box at Fernald

Exhibit
Packaging Derbies in G4214 Box at Fernald

Exhibit
Packaging Ingots in G4255 box at Fernald

Exhibit
Packaging Ingots in G4255 box at Fernald

Exhibit
Packaging Derbies in G4292 Box at Fernald

Exhibit
Packaging Derbies in G4292 Box at Fernald

From: Geisinger, Robert [mailto:GEISINRG@nv.doe.gov]
Sent: Thursday, March 17, 2011 8:06 PM
To: Gerster, Glenna; Uetrecht, Greg (PPPO/ETS); Anderson, Darl
Cc: Carilli, Jhon (NEV); Wrapp, John; Wiehle, Kristi PPPO; Cebe, Jim (NEV); Disanza, Frank (NEV); Browdy, Teri; Poling, E Jeanne; Gordon, Sydney; Tanaka, Katherine; Dellaverson, Alexander L; Dixon, Marcus; Harmon, Derrell; Linkenheil, Deron; Moran, Brian
Subject: FW: Contamination Levels in Trailer During Portsmouth Unloading

Glenna,

I have extremely disappointing news. The details are provided below. Both trailers were identified above release limits. There is still some investigation going on here that will be completed Monday, but it is very unlikely to be radon. If things remain as is, we will need to issue a CAR and suspend all shipments. Until the investigation on our side is completed, please suspend all shipments scheduled for Friday.

R. Gregory Geisinger
National Security Technologies, LLC
Contractor to the U. S. Department of Energy
Radioactive Waste Acceptance Program Manager
Office Phone: 702-295-5196
Office Fax: 702-295-3112
Cell Phone 702-506-7644

From: Freter, Jerry
Sent: Thursday, March 17, 2011 4:53 PM
To: Mumma, James (NEV); Thomas, Rhonda; Wagner, Ricky; Piburn, Ronald; Stueckrath, Robert; McCullough, Michael; Occdutymanager (NEV); Gile, Andrea; Geisinger, Robert; Snyder, Duane; Prestridge, Jason; Kesler, Jim; Gregory, Louis; Bounds, Bradley; Wrapp, John; Dionizio, Augusto
Subject: RE: Contamination Levels in Trailer During Portsmouth Unloading

At 1540, we discovered that we have a second trailer (shipment POL11163 on trailer 813912) in this Portsmouth waste stream which has been found to have a spot of contamination about 1.5 foot by 1.5 foot which reads 50,000 dpm beta (direct) and 2,000 dpm alpha (direct). Smears read several hundred dpm alpha removable by Electra and will be run down to Mercury for analysis in the alpha and gamma spectroscopy equipment. The contamination levels of this trailer exceed 10 times the limits as specified by 10CFR835 Appendix B. According to Andy Gile, this is ORPS reportable but needs to be ORPS reported by Portsmouth since they were the ones who released the contaminated trucks. They should be looking at Group 6A and reporting according to their program.

After the first trailer (shipment POL11161 on trailer KV53622L) was found with elevated levels, we stopped work to follow a new RWP and conducted a pre-job brief. There were seven trailers which were left to be done. The first contaminated trailer (POL11161 on trailer KV53622L) had only been half unloaded and set aside to return to once we completed the other trailers. When we unloaded the last trailer (with shipment POL11163 on trailer 813912), we discovered a spot of contamination and finished offloading it according to the new RWP then off-loaded the first contaminated trailer. The two contaminated trailers have been disconnected from their tractors, parked within the compound, and controlled as Contamination Areas. We intend to develop a plan to handle these trailers on Monday morning.

Final survey results for Trailer KVL53622L are 20K dpm beta (direct) and 1K dpm alpha (direct) and by smear: 43 dpm alpha and 50 dpm beta

Final survey for trailer 813912 is 50K dpm beta direct and 2K dpm alpha direct and by smear: 500 dpm alpha and 600 dpm beta.

Both trailers exceed the free release limits to authorize release of the trailers from the RWMC. We have parked both trailers and posted them as Contamination Areas. Radiological Control performed surveys of the cabs of both tractors and of both drivers. No contamination was found in the cabs or on the drivers. No personnel were discovered to be contaminated.

From: Thomas, Rhonda
Sent: Thursday, March 17, 2011 2:08 PM
To: Mumma, James (NEV)
Cc: Piburn, Ronald; Wagner, Ricky; Stueckrath, Robert; McCullough, Michael
Subject: Contamination Levels in Trailer During Portsmouth Unloading

Hi James,
Thursday, 3/17/11, while off-loading a Portsmouth trailer in Cell 16, the HP Techs found elevated removable alpha and beta contamination in the trailer floor underneath one of the waste packages. Work was paused and personnel, waste packages and equipment were surveyed. No additional contamination was found. The levels found were 762 Alpha dpm removable and 932 dpm removable Beta. The trailer was sealed and posted as a Contamination Area as a precautionary measure. The surveys were run on the gamma spectrometer and determined to be non-Transuranic. Per Surface Contamination Values (10 CFR Part 835, Appendix D), this falls below the occurrence reporting criteria and also is below the release limits for the trucks. Additionally, the RWP was not exceeded. As a precautionary measure, a pre-job brief was performed under a different RWP for off-loading contaminated trucks. The remaining trucks will be off-loaded utilizing gloves and booties in case additional contamination is found. The suspect Portsmouth trailer will be off-loaded last and additional surveys performed. A follow-up email will be sent if additional contamination is found that exceeds the RWP or release limits or occurrence reporting criteria. Please feel free to call or email me with any questions.

Rhonda W Thomas
Nuclear Facility Manager
Radioactive Waste Management Complex Area 5
Nuclear Operations Directorate

Contractor to the United States Department of Energy
Mail Stop NTS 403
(702) 295-9862 NTS
(702) 465-6987 Blackberry
(702) 295-5576 Fax

NSTec
Form
FRM-0108B

RADIOLOGICAL SURVEY REPORT - DATA

05/24/10
Rev. 0

SURVEY # 11-RW-5-289

Location:			Purpose:		Comments:			Date/Time:
Area 5, RWMC			Shipment/Off- Loading Survey		S/A= See Attached. (see atteached printout for swipe results) Page 41A causes 65 total pages.			3/17/11 0720
Instrument:	Serial #:	Cal Due:	Eff in %: Alpha / Beta	BKG in dpm: Alpha / Beta	MDA in dpm: Alpha / Beta	RWP# 11-0005-01		
Tennelec	70478	11/17/11	S/A	S/A	S/A	Work Package # SOP-2151.203		
Tennelec	77570-1	6/23/11	S/A	S/A	S/A	RCT Name: Fred Caufield	Signature:	
Tennelec	39221	1/27/12	S/A	S/A	S/A	RCT Name: F.Hennessey	Signature:	
NE Electra	5296	10/4/11	15.3/25.9	17.0/1355	80/500	RCT Name: Mike Payne	Signature: C. Mike Payne	
NE Electra	5047	8/10/11	14.6/24.1	4.1/1348	80/500	RCT Name: P.Salvato	Signature: Paul Salvato	

Survey Point	Description/Comments	Removable dpm/100cm²		Fixed + Removable dpm/100cm²		Gamma mrem/hr	Neutron mrem/hr	Total mrem/hr
		Alpha	Beta	Alpha	Beta			
S/A	SHIPMENT POL11142 (5 BOXES)	S/A	S/A	S/A	S/A	S/A	N/A	N/A
S/A	SHIPMENT POL11161 (9 BOXES)	S/A	S/A	S/A	S/A	S/A	N/A	N/A
S/A	SHIPMENT POL11162 (8 BOXES)	S/A	S/A	S/A	S/A	S/A	N/A	N/A
S/A	SHIPMENT POL11163 (7 BOXES)	S/A	S/A	S/A	S/A	S/A	N/A	N/A
S/A	SHIPMENT POL11148 (5 BOXES)	S/A	S/A	S/A	S/A	S/A	N/A	N/A
S/A	SHIPMENT POL11145 (5 BOXES)	S/A	S/A	S/A	S/A	S/A	N/A	N/A
S/A	SHIPMENT POL11140 (5 BOXES)	S/A	S/A	S/A	S/A	S/A	N/A	N/A
S/A	SHIPMENT POL11147 (5 BOXES)	S/A	S/A	S/A	S/A	S/A	N/A	N/A
S/A	SHIPMENT POL11146 (5 BOXES)	S/A	S/A	S/A	S/A	S/A	N/A	N/A
S/A	SHIPMENT POL11150 (5 BOXES)	S/A	S/A	S/A	S/A	S/A	N/A	N/A
S/A	SHIPMENT POL11144 (5 BOXES)	S/A	S/A	S/A	S/A	S/A	N/A	N/A

Reviewed By (Print):	Signature:	Date:
Bradley Bounds		3/21/11

RADIOLOGICAL SURVEY REPORT - DATA

SURVEY # 11-RW-5-289

Location:	Purpose:	Comments:	Date/Time:
Area 5	Instrument Continuation Sheet	see p. 1	see p. 1

Instrument:	Serial #:	Cal Due:	Eff in %: Alpha / Beta	BKG in dpm: Alpha / Beta	MDA in dpm: Alpha / Beta	RWP# see p. 1	
Model 3	225602	4/5/11	N/A	N/A	N/A	Work Package # see p. 1	
Model 3	242806	2/2/12	N/A	N/A	N/A	RCT Name: S.Luke	Signature:
RO20	125	8/9/11	N/A	N/A	N/A	RCT Name: B.Foskett	Signature:
RO20	4130	5/19/11	N/A	N/A	N/A	RCT Name: S.Pennock	Signature:
N/A	N/A	N/A	N/A	N/A	N/A	RCT Name: N/A	Signature:

Survey Point	Description/Comments	Removable dpm/100cm²		Fixed + Removable dpm/100cm²		Gamma mrem/hr	Neutron mrem/hr	Total mrem/hr
		Alpha	Beta	Alpha	Beta			
S/A	POL11138 (5BOXES)	S/A	S/A	S/A	S/A	S/A	N/A	N/A
S/A	DRL11163 (2 SACKS)	S/A	S/A	S/A	S/A	S/A	N/A	N/A
S/A	DRL11164 (2 SACKS)	S/A	S/A	S/A	S/A	S/A	N/A	N/A
S/A	POL11149 (5 BOXES)	S/A	S/A	S/A	S/A	S/A	N/A	N/A
S/A	DRL11166 (2 SACKS)	S/A	S/A	S/A	S/A	S/A	N/A	N/A
S/A	DRL11168 (2 SACKS)	S/A	S/A	S/A	S/A	S/A	N/A	N/A
S/A	DRL11170 (2 SACKS)	S/A	S/A	S/A	S/A	S/A	N/A	N/A
S/A	DRL11169 (2 SACKS)	S/A	S/A	S/A	S/A	S/A	N/A	N/A
S/A	POL11143 (5 BOXES)	S/A	S/A	S/A	S/A	S/A	N/A	N/A
S/A	DRL11167 (2 SACKS)	S/A	S/A	S/A	S/A	S/A	N/A	N/A
S/A	DRL11158 (2 SACKS)	S/A	S/A	S/A	S/A	S/A	N/A	N/A

Reviewed By (Print):	Signature:	Date:
N/A	N/A	N/A

SURVEY # 11-RW-5-289

Survey Point	Description/Comments	Removable dpm/100cm²		Fixed + Removable dpm/100cm²		Gamma mrem/hr	Neutron mrem/hr	Total mrem/hr
		Alpha	Beta	Alpha	Beta			
S/A	DRL11160 (2 SACKS)	S/A	S/A	S/A	S/A	S/A	N/A	N/A
S/A	SRL11059 (6 BAGS)	S/A	S/A	S/A	S/A	S/A	N/A	N/A
S/A	FORKLIFT 74077	S/A	S/A	<MDA	<MDA	N/A	N/A	N/A
S/A	FORKLIFT 74077,74078	S/A	S/A	<MDA	<MDA	N/A	N/A	N/A
S/A	CELL #16 RAMP	S/A	S/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

NSTec
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FRM-0108C

RADIOLOGICAL SURVEY REPORT - FULL MAP

05/24/10
Rev. 01
Page 6 of 6

Survey # 11-RW-5-289

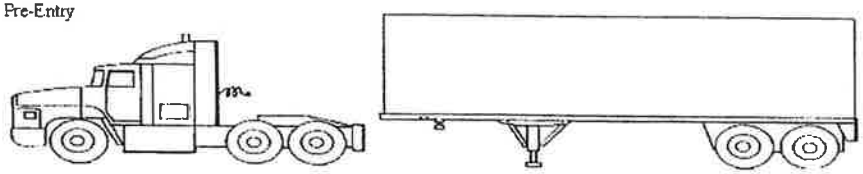
Description/Map/Drawing/Picture/Comments

Enclosed Truck

Shipment # POL 11161 Truck Company Hubbard Tractor # 32 Trailer # KV576221 # of Packages 9 boxes

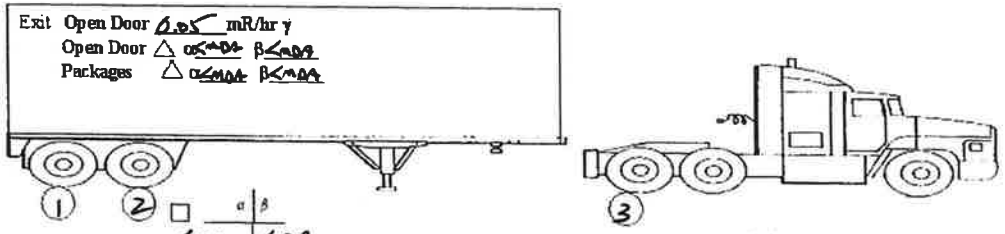
Package # 001292 (2)
Package # 001294 (3)

Pre-Entry



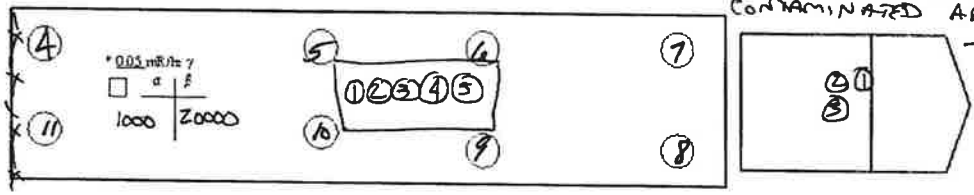
Dose * 0.3 mR/hr γ @ contact
Dose * 0.1 mR/hr γ @ 30cm
Dose * 0.08 mR/hr γ @ 1 m
Dose * V mR/hr γ @ Cab

Exit Open Door 0.05 mR/hr γ
Open Door △ α<MDA β<MDA
Packages △ α<MDA β<MDA



Max Offload On Packages
*3.5 mR/hr γ

TRAILER DOOR POSTED CONTAMINATED AREA



TRAILER LEFT IN COMPOUND. TRACTOR RELEASED

LEGEND
O = Swipe * __/__ = Contact / 30cm γ = gamma β = beta n = neutron x-x-x-x = Boundary Δ LAW □=direct frisk

Device: A5 WM ID: 70478

Batch ID: Swipes - 201103171625

Count Date: 3/17/2011 4:25:45PM

Background (dpm)		Efficiency (%)		MDA (DPM)		Sample Count Time:
Alpha Rate:	0.00	**Alpha:**	26.46	**Alpha:**	10.23	1.00 **Minutes**
Beta Rate:	2.50	**Beta:**	40.08	**Beta:**	15.36	

Results Report: Page 1 of 1

Swipes

Batch Key: 10794

Device: A5 WM ID: 70478

Survey # 11-Rw-5-289 3/17/11

Sample ID	Alpha (dpm)	Beta (dpm)	Comments
20110317162545-A1	0	-2.50	EXIT SURVEY TK 32 TL KV53622L (1-11)
20110317162716-A2	0	2.50	TIRES (1-3)
20110317162826-A3	0	-2.50	
20110317162946-A4	3.78	7.49	TRAILER BED (4-11)
20110317163056-A5	3.78	4.99	
20110317163206-A6	3.78	2.50	
20110317163316-A7	0	0.00	
20110317163436-A8	0	-2.50	
20110317163546-A9	3.78	2.50	
20110317163656-A10	0	-2.50	
20110317163816-A11	0	4.99	
20110317163926-A12	3.78	2.50	PRE ENTRY SHIPMENT POL11161 (12-13) PKG 001292 (12)
20110317164036-A13	3.78	9.98	PKG 001294 (13)

Device: Tennelec 39221

Batch ID: Swipes - 201103171614

Count Date: 3/17/2011 4:14:22PM

Background (dpm)		Efficiency (%)		MDA (DPM)		Sample Count Time:
Alpha Rate:	0.00	Alpha:	25.56	Alpha:	10.59	1.00 Minutes
Beta Rate:	1.98	Beta:	40.36	Beta:	14.35	

Results Report: Page 1 of 1

Swipes

Batch Key: 7735

Device: Tennelec 39221

Survey # 11-Rw-S-289

Sample ID	Alpha (dpm)	Beta (dpm)	Comments
20110317161422-A1	0	-1.98	EXIT SURVEY INSIDE CAB TK 32 (1-3) DASH (1)
20110317161553-A2	0	-1.98	FLOOR (2)
20110317161703-A3	0	2.97	PEDALS (3)

Device: Tennelec 39221

Batch ID: Swipes - 201103171626

Count Date: 3/17/2011 4:26:09PM

Background (dpm)		Efficiency (%)		MDA (DPM)		Sample Count Time:
Alpha Rate:	0.00	Alpha:	25.56	Alpha:	10.59	1.00 Minutes
Beta Rate:	1.98	Beta:	40.36	Beta:	14.35	

Results Report: Page 1 of 1

Swipes

Batch Key: 7736

Device: Tennelec 39221

Survey # 11-Rad-5-289

Sample ID	Alpha (dpm)	Beta (dpm)	Comments
20110317162609-A1	7.82	20.32	TRUCK # 32 Trailer Bed
20110317162740-A2	0	7.93	
20110317162850-A3	7.82	2.97	
20110317163010-A4	43.03	45.10	
20110317163120-A5	43.03	47.58	

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RADIOLOGICAL SURVEY REPORT - FULL MAP

05/24/10
Rev. 01
Page 12 of 14

Survey # 11-RW-5-289

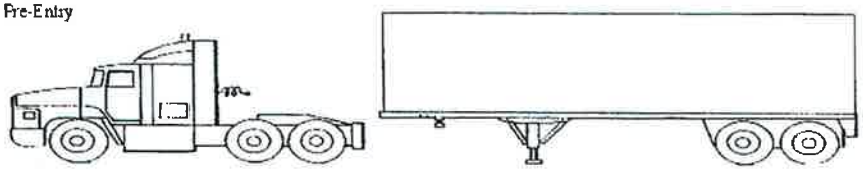
Description/Map/Drawing/Picture/Comments

Enclosed Truck

POL
Shipment # 1163 Truck Company HUBBARD Tractor # 33 Trailer # 813112 # of Packages 7 BOXES

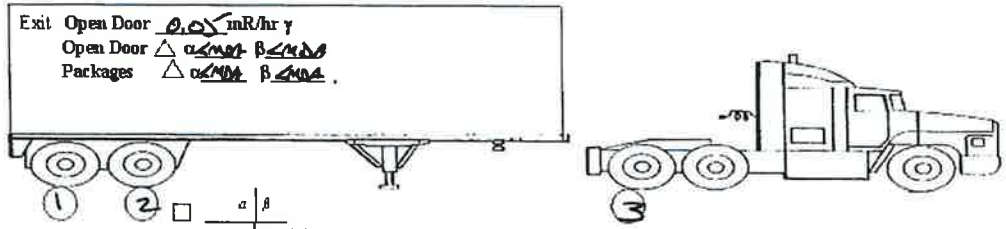
Package # 001282 (12)
Package # 001280 (13)

Pre-Entry



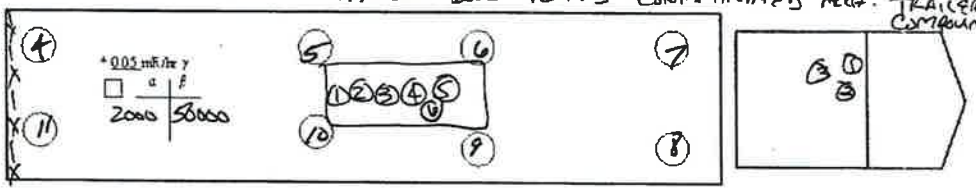
Dose * 0.4 mR/hr γ @ contact
Dose * 0.2 mR/hr γ @ 30cm
Dose * 0.1 mR/hr γ @ 1 m
Dose * 0.05 mR/hr γ @ Cab

Exit Open Door 0.05 mR/hr γ
Open Door △ α <MDA β <MDA
Packages △ α <MDA β <MDA.



Max Offload On Packages
* 3 mR/hr γ

□ α/β <MDA/<MDA TRAILER DOOR ASSED CONTAMINATED AREA. TRAILER LEFT IN COMPOUND. TRACTOR RELEASED



LEGEND
O = Swipe * ___/___ = Contact / 30cm γ = gamma β = beta n = neutron x-x-x-x = Boundary Δ LAW □=direct frisk

Device: A5 WM ID: 70478

Batch ID: Swipes - 201103171550

Count Date: 3/17/2011 3:50:53PM

Background (dpm)		Efficiency (%)		MDA (DPM)		Sample Count Time:
Alpha Rate:	0.00	Alpha:	26.46	Alpha:	10.23	1.00 Minutes
Beta Rate:	2.50	Beta:	40.08	Beta:	15.36	

Results Report: Page 1 of 1

Swipes

Batch Key: 10792 **Device:** A5 WM ID: 70478

Survey # 11-2W-5-289

Sample ID	Alpha (dpm)	Beta (dpm)	Comments
20110317155053-A1	0	2.50	EXIT SURVEY TK 33 TL 813912 (1-11)
20110317155354-A2	0	7.49	TIRES (1-3)
20110317155504-A3	0	0.00	
20110317155624-A4	0	0.00	TRAILER BED (4-11)
20110317155734-A5	0	0.00	
20110317155844-A6	0	0.00	
20110317160004-A7	0	7.49	
20110317160114-A8	7.56	4.99	
20110317160224-A9	11.34	4.99	
20110317160334-A10	3.78	2.50	
20110317160454-A11	0	12.48	
20110317160604-A12	0	2.50	PRE ENTRY SHIPMENT POL11163 (12-13) PKG 001282 (12)
20110317160714-A13	0	0.00	PKG 001280 (13)

Device: Tennelec 39221

Batch ID: Swipes - 201103171550

Count Date: 3/17/2011 3:50:19PM

Background (dpm)		Efficiency (%)		MDA (DPM)		Sample Count Time:
Alpha Rate:	0.00	**Alpha:**	25.56	**Alpha:**	10.59	1.00 **Minutes**
Beta Rate:	1.98	**Beta:**	40.36	**Beta:**	14.35	

Results Report: Page 1 of 1

Swipes

Batch Key: 7733 **Device:** Tennelec 39221 **Survey #** 11-Rw-5-289

Sample ID	Alpha (dpm)	Beta (dpm)	Comments
20110317155019-A1	168.21	285.45	Truck # 33 Bed Contamination Area
20110317155150-A2	133.00	173.95	
20110317155300-A3	277.74	372.18	
20110317155420-A4	485.07	558.02	
20110317155530-A5	414.68	508.46	
20110317155640-A6	469.43	434.13	

Device: A5 WM ID: 70478

Batch ID: Swipes - 201103171613

Count Date: 3/17/2011 4:13:23PM

Background (dpm)		Efficiency (%)		MDA (DPM)		Sample Count Time:
Alpha Rate:	0.00	**Alpha:**	26.46	**Alpha:**	10.23	1.00 **Minutes**
Beta Rate:	2.50	**Beta:**	40.08	**Beta:**	15.36	

Results Report: Page 1 of 1

Swipes

Batch Key: 10793 **Device:** A5 WM ID: 70478 **Survey #** 11-2w-5-289

Sample ID	Alpha (dpm)	Beta (dpm)	Comments
20110317161323-A1	0	2.50	EXIT SURVEY INSIDE CAB TK 33 (1-3) DASH (1)
20110317161454-A2	0	-2.50	FLOOR (2)
20110317161604-A3	0	2.50	PEDALS (3)

From: McCullough, Michael
Sent: Tuesday, March 22, 2011 10:44 AM
To: Gerster, Glenna ; Gregory, Louis
Cc: Geisinger, Robert; Linkenheil, Deron; Wagner, Ricky; Wrapp, John; Thomas, Rhonda
Subject: FW: Trailer Questions

Here are the answers to your questions. I have also attached a copy of the Alpha spec info for both trailers. Area 5 RWMC is ready to support the transport of the trailers back to Portsmouth whenever all the logistics have been resolved. If you have any other questions or need more info please don't hesitate to contact me.

Michael McCullough
EM Operations Manager
National Security Technology LLC
Contractor to the U.S. Department of Energy
Phone (702)295-5876
Blackberry (702)324-2554

Mike & Lou,

In an effort to understand any differences between these two new contamination incidences and the ones in December, can you provide PORTS Management and Rad Con group with the answers to the following questions?

1. Can you pinpoint for us where the contamination was found; was it under the footprint of the boxes in both cases; nose, rear? In the path of the forklift tires?
   Answer: The contamination was located under the footprint of the boxes. The location was not in the path of the fork truck tires. More towards the front of the trailer.

2. At what interval do you survey the fork tines and wheels of the fork truck during offloading activities?
   Answer: We have been taking Large Area Wipes (gross massalin) on the fork truck tines and tires randomly after the boxes are placed in their disposal locations; we then take swipes on the fork truck tines after off-loading is completed. We have been surveying randomly the feet of personnel entering the trailer as they were off loading the boxes. If we detect contamination during off-loading or on the exit survey, then the tires are surveyed again.

3. For the boxes and also the floor do you perform gross massalin and/or 100 cm swipes? If you do both, what is the order?
   Answer: We perform a Large Area Wipe on the floor (accessible areas) and the boxes (accessible area) of the trailer once the trailer doors are open and before the off loading process begins. We then survey (Large Area Wipe) the bottom of the boxes as they are removed from the trailers. Swipes are performed in accordance with answer to # 7. LAW's performed first.

4. Concerning survey methods, have you started doing anything differently after the first contamination incidents in December but before these new contamination incidents?
   Answer: We perform our survey according to a set survey plan for off loading shipments. The RCT's have been instructed to be more attentive because of the issues we have encountered with this profile.

5. Based on the comment from Rhonda Thomas attached to the first e-mail "...the HP Techs found elevated removable alpha and beta contamination in the trailer floor underneath one of the waste packages." Was this a procedure change from last time, we understood that you didn't survey the trailer until after you unloaded all packages? Is this the same spot where the fixed contamination was later discovered?
   Answer: The RCT are performing their job in accordance to the survey plan in place and the training of their profession. Because of the issues encountered we are performing Large Area Wipes under the boxes as they are being removed. Contamination was detected on one of the trailers as the boxes were being removed, and during the exit survey on the other trailer. Not a procedure change, again, we have tasked the RCT's with being more attentive due to previous problems. RCT's frequently perform additional surveys during the off-loading, especially on enclosed conveyances, as containers are removed, the trailer bed becomes accessible, thus can be surveyed. Yes, the removable and fixed contamination was in the same location, ~4 square foot area on each trailer.

6. In the spots identified with fixed contamination was there any noticeable discoloration, cracks or crevasses in the flooring?
   Answer: There were no visible spots or stains on the trailers, nothing unusual reported.

7. At what rate (% of boxes) were you swiping the boxes as they were being offloaded and did you identify the box located over the spot? Did you further swipe the undercarriage of that box?
   Answer: Our survey plan requires us to perform swipes on 10% of the waste packages per shipment (minimum of 2- packages). The bottom of the box above the contamination was surveyed on the first trailer only, since it was detected during the off-loading process, with no detectable contamination.
   The second trailer contamination was detected after off-loading complete, standard surveys were performed on all boxes off-loaded as described above.

Thanks a lot; we really appreciate your help,

Glenna Gerster
LATA/Parallax Portsmouth LLC
Waste Certification Official
740 897-2858
740 897-2900 fax
740 222-0646 cell

AlphaVision v5.3 *Alpha-Spectroscopy Analysis Report*

ORTEC
Oak Ridge, TN 37830
2:36:43PM 3/21/2011

Analyst: ORTEC

Sample

Sample: d1 Type: Sample
Spectrum #1 Analysis #1
:
Sample Collection Date:
Comment: sample 1 from trailer 32

Sample Volume : 1.00 Sample Units: mL
First Stage Dilution: N/A
Aliquot: N/A Aliquot Fraction: N/A
Dilution 2: N/A
Lab Preparation:

Batch

Batch Name: 2011.03.21 014
:
Description:

Client Name: Undefined
Client Contact:

Tracer

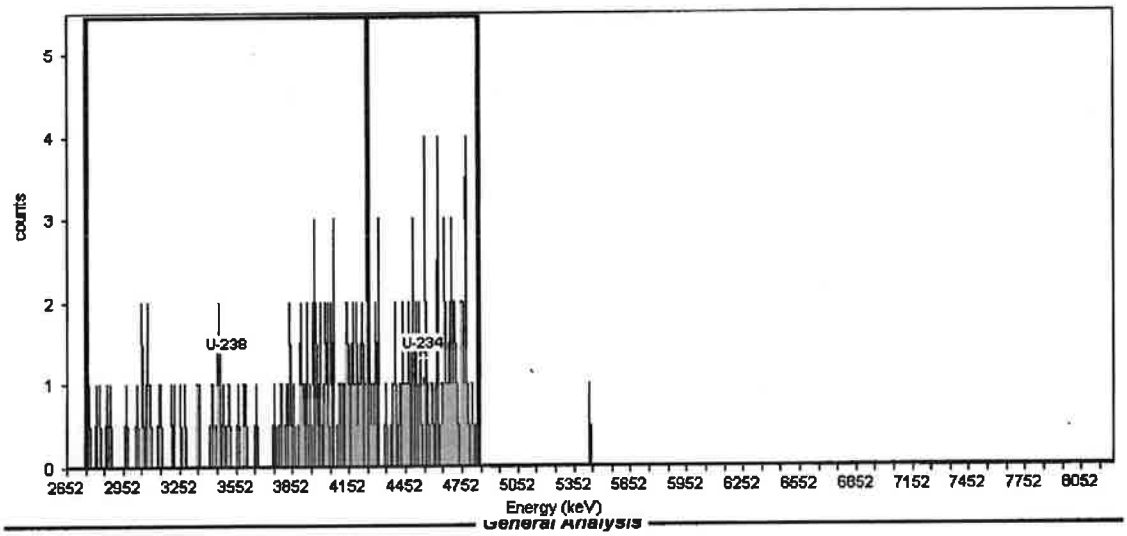
Tracer Name: Undefined
Tracer Activity:
Tracer Ref. Date:

Tracer Nuclide: External Recovery
Tracer Recovery: 100.00%

Acquisition

Detector: detector 1 SN: 45-090G1
Acquisition Start Date: 3/21/2011 1:51:45PM
Live Time: 44.48 min.
Real Time: 44.48 min.
Background Date: 3/14/2011 4:51:31PM
Bkgd Info: Sample: d1; Det: detector 1; Spectrum #1; Mar-14-2011 16:51

Energy Calibration: D1 43mm 2011-2-28
Efficiency Calibration:D1 43mm 2011-2-28
Calibration Date: 3/1/2011 7:29:16AM
Energy Cal: Gain = 5.4519 keV / Ch
Offset = 2,646.70 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 22.84% +/- 0.44% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = depleted or
Decay Correction:None
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: plutonium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity DPM	2.00Sigma TPU DPM	Critical Level DPM	MDA DPM
U-238	3500.000	2750.000	4250.000	.489	100.0	114.00	1.1739	113	1.111E+001	2.124E+000	1.808E-001	6.280E-001
U-234	4546.000	4251.000	4840.000	251.583	100.0	99.00	0.5560	98	9.691E+000	1.973E+000	1.244E-001	5.152E-001

3/21/2011

3/21/11

AlphaVision v5.3 *Alpha-Spectroscopy Analysis Report*

ORTEC
Oak Ridge, TN 37830
2:36:54PM 3/21/2011

Analyst: ORTEC

Sample

Sample: d2 Type: Sample
Spectrum #1 Analysis #1
:
Sample Collection Date:
Comment: sample 2 from trailer 32

Sample Volume : 1.00 Sample Units: mL
First Stage Dilution: N/A
Aliquot: N/A Aliquot Fraction: N/A
Dilution 2: N/A
Lab Preparation:

Batch

Batch Name: 2011.03.21 015
:
Description:

Client Name: Undefined
Client Contact:

Tracer

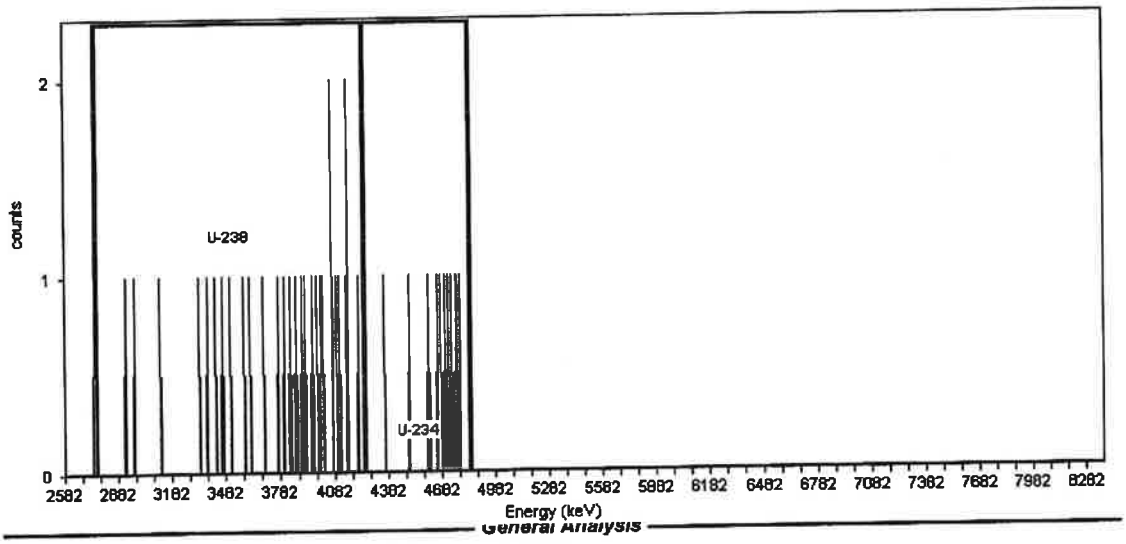
Tracer Name: Undefined
Tracer Activity:
Tracer Ref. Date:

Tracer Nuclide: External Recovery
Tracer Recovery: 100.00%

Acquisition

Detector: Detector 2 SN: 45-090F3
Acquisition Start Date: 3/21/2011 1:52:24PM
Live Time: 43.91 min.
Real Time: 43.91 min.
Background Date: 3/14/2011 4:51:31PM
Bkgd Info: Sample: d2; Det: Detector 2; Spectrum #1; Mar-14-2011 16:51

Energy Calibration: D2 43mm s2 2011-2-9
Efficiency Calibration:D2 43mm s2 2011-2-9
Calibration Date: 2/10/2011 9:55:50AM
Energy Cal: Gain = 5.6716 keV / Ch
Offset = 2,577.19 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 23.13% +/- 0.44% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = depleted or
Decay Correction: None
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: plutonium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity DPM	2.00Sigma TPU DPM	Critical Level DPM	MDA DPM
U-238	3500.000	2750.000	4250.000	.242	100.0	28.05	0.7928	27	2.684E+000	1.059E+000	1.485E-001	5.634E-001
U-234	4546.000	4251.000	4840.000	124.913	100.0	11.00	0.1830	11	1.065E+000	6.587E-001	7.135E-002	4.091E-001

3/21/2011

3/21/11

AlphaVision v5.3 *Alpha-Spectroscopy Analysis Report*

ORTEC
Oak Ridge, TN 37830
1:44:10PM 3/21/2011

Analyst: ORTEC

Sample

Sample: d1 Type: Sample
Spectrum #1 Analysis #1
:
Sample Collection Date:
Comment: sample 3 from trailer 32

Sample Volume : 1.00 Sample Units: mL
First Stage Dilution: N/A
Aliquot: N/A Aliquot Fraction: N/A
Dilution 2: N/A
Lab Preparation:

Batch

Batch Name: 2011.03.21 012
:
Description:

Client Name: Undefined
Client Contact:

Tracer

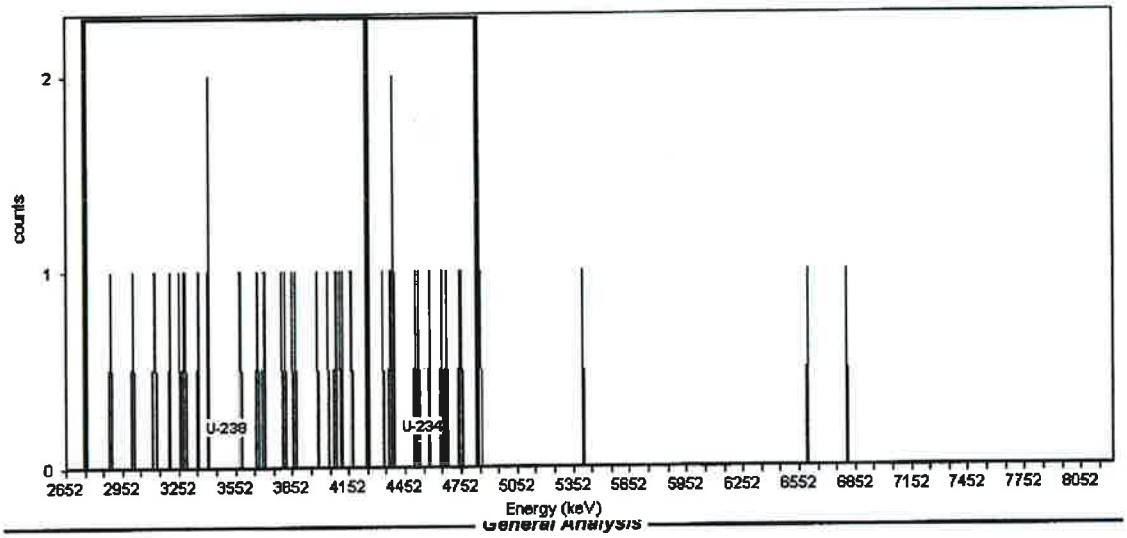
Tracer Name: Undefined
Tracer Activity:
Tracer Ref. Date:

Tracer Nuclide: External Recovery
Tracer Recovery: 100.00%

Acquisition

Detector: detector 1 SN: 45-090G1
Acquisition Start Date: 3/21/2011 12:57:38PM
Live Time: 46.17 min.
Real Time: 46.17 min.
Background Date: 3/14/2011 4:51:31PM
Bkgd Info: Sample: d1; Det: detector 1; Spectrum #1; Mar-14-2011 16:51

Energy Calibration: D1 43mm 2011-2-28
Efficiency Calibration:D1 43mm 2011-2-28
Calibration Date: 3/1/2011 7:29:16AM
Energy Cal: Gain = 5.4519 keV / Ch
Offset = 2,646.70 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 22.84% +/- 0.44% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = depleted or
Decay Correction:None
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: plutonium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity DPM	2.00Sigma TPU DPM	Critical Level DPM	MDA DPM
U-238	3500.000	2750.000	4250.000	31.947	100.0	29.00	1.2183	28	2.635E+000	1.044E+000	1.777E-001	6.120E-001
U-234	4546.000	4251.000	4840.000	30.445	100.0	12.00	0.5771	11	1.083E+000	6.731E-001	1.223E-001	5.012E-001

3/21/2011

3/21/11

AlphaVision v5.3 *Alpha-Spectroscopy Analysis Report*

ORTEC
Oak Ridge, TN 37830
1:44:45PM 3/21/2011

Analyst: ORTEC

Sample

Sample: d2 Type: Sample
Spectrum #1 Analysis #1
:
Sample Collection Date:
Comment: sample 4 from trailer 32

Sample Volume : 1.00 Sample Units: mL
First Stage Dilution: N/A
Aliquot: N/A Aliquot Fraction: N/A
Dilution 2: N/A
Lab Preparation:

Batch

Batch Name: 2011.03.21 013
:
Description:

Client Name: Undefined
Client Contact:

Tracer

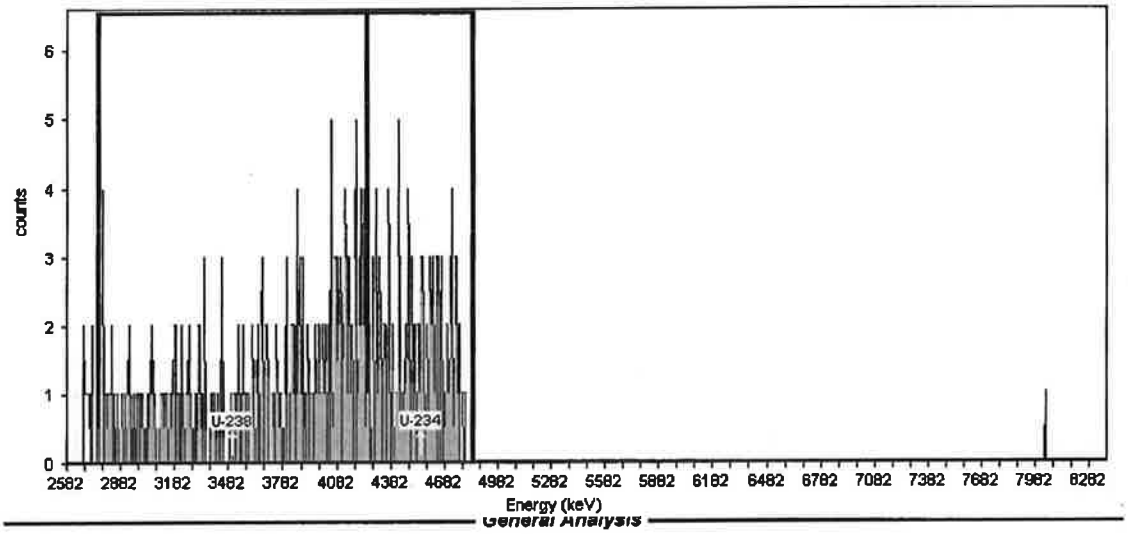
Tracer Name: Undefined
Tracer Activity:
Tracer Ref. Date:

Tracer Nuclide: External Recovery
Tracer Recovery: 100.00%

Acquisition

Detector: Detector 2 SN: 45-090F3
Acquisition Start Date: 3/21/2011 12:58:14PM
Live Time: 45.65 min.
Real Time: 45.65 min.
Background Date: 3/14/2011 4:51:31PM
Bkgd Info: Sample: d2; Det: Detector 2; Spectrum #1; Mar-14-2011 16:51

Energy Calibration: D2 43mm s2 2011-2-9
Efficiency Calibration:D2 43mm s2 2011-2-9
Calibration Date: 2/10/2011 9:55:50AM
Energy Cal: Gain = 5.6716 keV / Ch
Offset = 2,577.19 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 23.13% +/- 0.44% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = depleted or
Decay Correction:None
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: plutonium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity DPM	2.00Sigma TPU DPM	Critical Level DPM	MDA DPM
U-238	3500.000	2750.000	4250.000	23.906	100.0	253.48	0.8242	253	2.393E+001	3.055E+000	1.458E-001	5.479E-001
U-234	4546.000	4251.000	4840.000	250.845	100.0	137.00	0.1902	137	1.296E+001	2.232E+000	7.006E-002	3.964E-001

3/21/2011

3/21/11

AlphaVision v5.3 *Alpha-Spectroscopy Analysis Report*

ORTEC
Oak Ridge, TN 37830
12:48:40PM 3/21/2011

Analyst: ORTEC

Sample

Sample: d1 Type: Sample
Spectrum #1 Analysis #1
:
Sample Collection Date:
Comment: sample 4 from trailer 32 (in envelope 4, no sample #)

Sample Volume : 1.00 Sample Units: mL
First Stage Dilution: N/A
Aliquot: N/A Aliquot Fraction: N/A
Dilution 2: N/A
Lab Preparation:

Batch

Batch Name: 2011.03.21 010
:
Description:

Client Name: Undefined
Client Contact:

Tracer

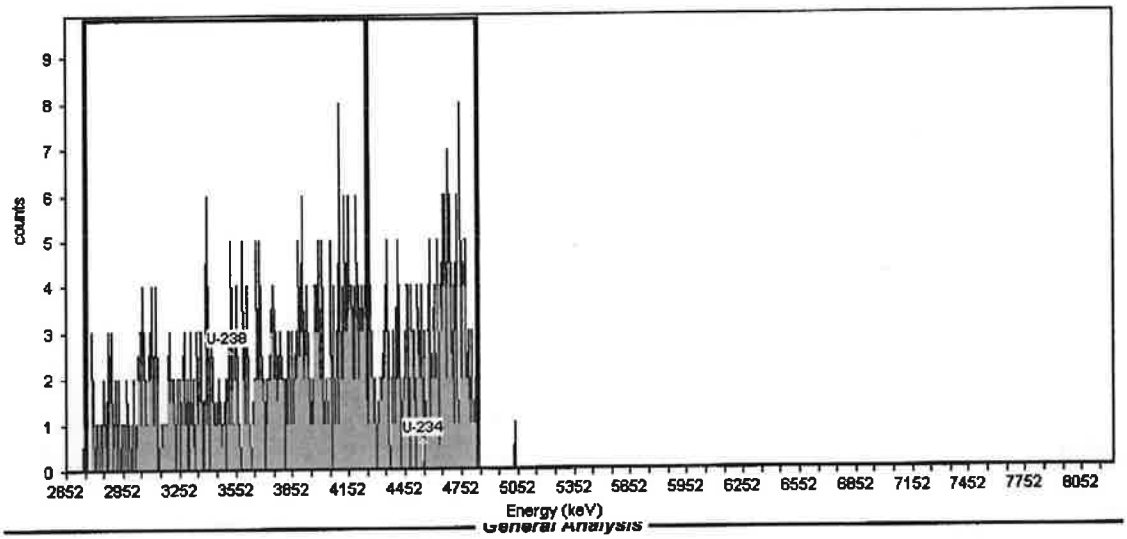
Tracer Name: Undefined
Tracer Activity:
Tracer Ref. Date:

Tracer Nuclide: External Recovery
Tracer Recovery: 100.00%

Acquisition

Detector: detector 1 SN: 45-090G1
Acquisition Start Date: 3/21/2011 12:03:31PM
Live Time: 44.92 min.
Real Time: 44.92 min.
Background Date: 3/14/2011 4:51:31PM
Bkgd Info: Sample: d1; Det: detector 1; Spectrum #1; Mar-14-2011 16:51

Energy Calibration: D1 43mm 2011-2-28
Efficiency Calibration:D1 43mm 2011-2-28
Calibration Date: 3/1/2011 7:29:16AM
Energy Cal: Gain = 5.4519 keV / Ch
Offset = 2,646.70 keV
Quadratic = 0.0000 keV / Ch²
Efficiency: 22.84% +/- 0.44% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = depleted or
Decay Correction:None
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: plutonium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity DPM	2.00Sigma TPU DPM	Critical Level DPM	MDA DPM
U-238	3500.000	2750.000	4250.000	142.711	100.0	497.08	1.1853	496	4.835E+001	4.451E+000	1.800E-001	6.237E-001
U-234	4546.000	4251.000	4840.000	462.147	100.0	255.56	0.5615	255	2.486E+001	3.157E+000	1.239E-001	5.115E-001

3/21/2011

3/21/04

AlphaVision v5.3 *Alpha-Spectroscopy Analysis Report*

ORTEC
Oak Ridge, TN 37830
12:49:06PM 3/21/2011

Analyst: ORTEC

Sample

Sample: d2 Type: Sample
Spectrum #1 Analysis #1
:
Sample Collection Date:
Comment: sample 5 from trailer 32

Sample Volume : 1.00 Sample Units: mL
First Stage Dilution: N/A
Aliquot: N/A Aliquot Fraction: N/A
Dilution 2: N/A
Lab Preparation:

Batch

Batch Name: 2011.03.21 011
:
Description:

Client Name: Undefined
Client Contact:

Tracer

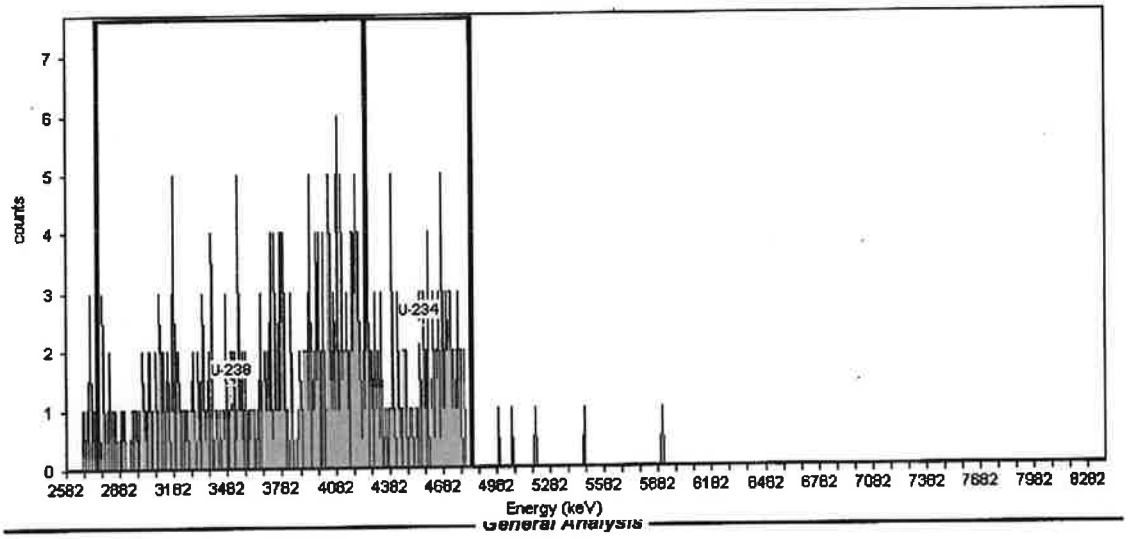
Tracer Name: Undefined
Tracer Activity:
Tracer Ref. Date:

Tracer Nuclide: External Recovery
Tracer Recovery: 100.00%

Acquisition

Detector: Detector 2 SN: 45-090F3
Acquisition Start Date: 3/21/2011 12:04:14PM
Live Time: 44.30 min.
Real Time: 44.30 min.
Background Date: 3/14/2011 4:51:31PM
Bkgd Info: Sample: d2; Det: Detector 2; Spectrum #1; Mar-14-2011 16:51

Energy Calibration: D2 43mm s2 2011-2-9
Efficiency Calibration:D2 43mm s2 2011-2-9
Calibration Date: 2/10/2011 9:55:50AM
Energy Cal: Gain = 5.6716 keV / Ch
Offset = 2,577.19 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 23.13% +/- 0.44% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = depleted or
Decay Correction:None
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: plutonium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity DPM	2.00Sigma TPU DPM	Critical Level DPM	MDA DPM
U-238	3500.000	2750.000	4250.000	524.135	100.0	318.00	0.7999	317	3.095E+001	3.535E+000	1.479E-001	5.598E-001
U-234	4546.000	4251.000	4840.000	508.323	100.0	132.12	0.1846	132	1.287E+001	2.258E+000	7.105E-002	4.061E-001

3/21/2011

3/21/11

AlphaVision v5.3 *Alpha-Spectroscopy Analysis Report*

ORTEC
Oak Ridge, TN 37830
9:26:32AM 3/21/2011

Analyst: ORTEC

Sample

Sample: d1 Type: Sample
Spectrum #1 Analysis #1
:
Sample Collection Date:
Comment: area5 truck sample1 Truck 31

Sample Volume : 1.00 Sample Units: mL
First Stage Dilution: N/A
Aliquot: N/A Aliquot Fraction: N/A
Dilution 2: N/A
Lab Preparation:

Batch

Batch Name: 2011.03.21 003
:
Description: Area 5 truck sample 1

Client Name: Undefined
Client Contact:

Tracer

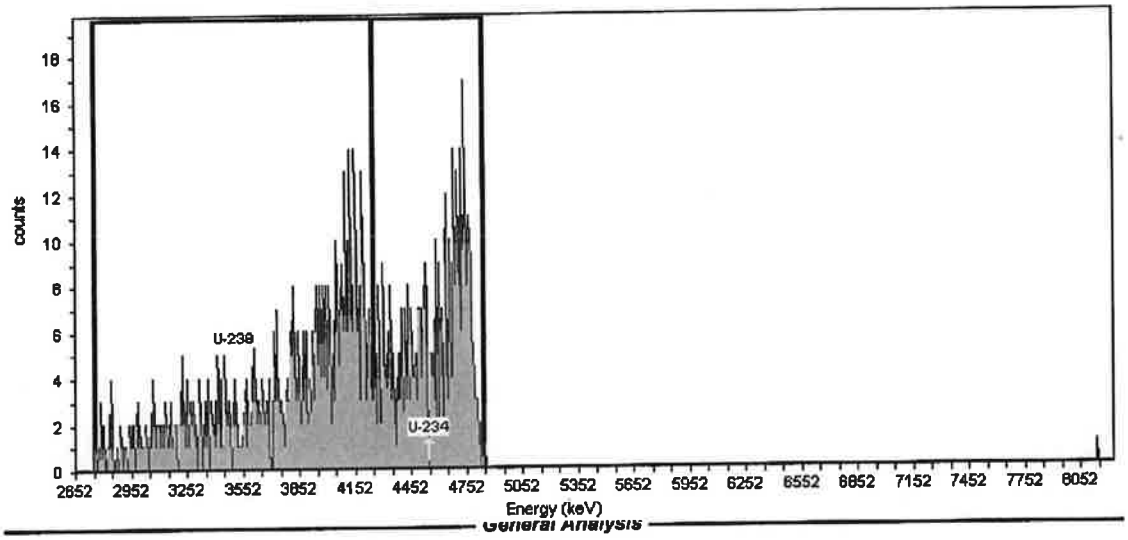
Tracer Name: Undefined
Tracer Activity:
Tracer Ref. Date:

Tracer Nuclide: External Recovery
Tracer Recovery: 100.00%

Acquisition

Detector: detector 1 SN: 45-090G1
Acquisition Start Date: 3/21/2011 8:52:05AM
Live Time: 32.17 min.
Real Time: 32.17 min.
Background Date: 3/14/2011 4:51:31PM
Bkgd Info: Sample: d1; Det: detector 1; Spectrum #1; Mar-14-2011 16:51

Energy Calibration: D1 43mm 2011-2-28
Efficiency Calibration:D1 43mm 2011-2-28
Calibration Date: 3/1/2011 7:29:16AM
Energy Cal: Gain = 5.4519 keV / Ch
Offset = 2,646.70 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 22.84% +/- 0.44% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = depleted or
Decay Correction:None
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: plutonium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity DPM	2.00Sigma TPU DPM	Critical Level DPM	MDA DPM
U-238	3500.000	2750.000	4250.000	325.130	100.0	825.97	0.8488	825	1.123E+002	8.122E+000	2.109E-001	7.901E-001
U-234	4546.000	4251.000	4840.000	281.323	100.0	591.26	0.4021	591	8.044E+001	6.802E+000	1.451E-001	6.587E-001

3/21/11
3/21/11

AlphaVision v5.3 *Alpha-Spectroscopy Analysis Report*

ORTEC
Oak Ridge, TN 37830
10:15:54AM 3/21/2011

Analyst: ORTEC

Sample

Sample: d1 Type: Sample
Spectrum #1 Analysis #1
:
Sample Collection Date:
Comment: swipe 2 from trailer 33

Sample Volume : 1.00 Sample Units: mL
First Stage Dilution: N/A
Aliquot: N/A Aliquot Fraction: N/A
Dilution 2: N/A
Lab Preparation:

Batch

Batch Name: 2011.03.21 005
:
Description:

Client Name: Undefined
Client Contact:

Tracer

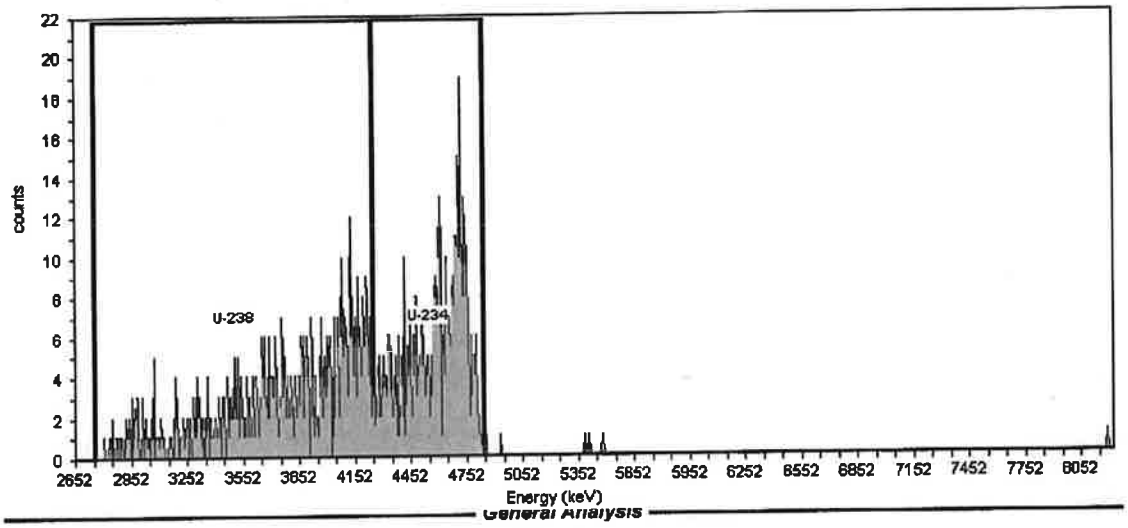
Tracer Name: Undefined
Tracer Activity:
Tracer Ref. Date:

Tracer Nuclide: External Recovery
Tracer Recovery: 100.00%

Acquisition

Detector: detector 1 SN: 45-090G1
Acquisition Start Date: 3/21/2011 9:34:30AM
Live Time: 38.70 min.
Real Time: 38.70 min.
Background Date: 3/14/2011 4:51:31PM
Bkgd Info: Sample: d1; Det: detector 1; Spectrum #1; Mar-14-2011 16:51

Energy Calibration: D1 43mm 2011-2-28
Efficiency Calibration:D1 43mm 2011-2-28
Calibration Date: 3/1/2011 7:29:16AM
Energy Cal: Gain = 5.4519 keV / Ch
Offset = 2,646.70 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 22.84% +/- 0.44% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = depleted or
Decay Correction:None
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: plutonium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity DPM	2.00Sigma TPU DPM	Critical Level DPM	MDA DPM
U-238	3500.000	2750.000	4250.000	23.406	100.0	680.00	1.0213	679	7.883E+001	6.088E+000	1.931E-001	6.924E-001
U-234	4546.000	4251.000	4840.000	186.537	100.0	592.00	0.4838	592	6.693E+001	5.657E+000	1.329E-001	5.720E-001

3/21/2011

3/21/11

AlphaVision v5.3 *Alpha-Spectroscopy Analysis Report*

ORTEC
Oak Ridge, TN 37830
10:15:39AM 3/21/2011

Analyst: ORTEC

Sample

Sample: d2 Type: Sample
Spectrum #1 Analysis #1
:
Sample Collection Date:
Comment: sample 3 from trailer 33

Sample Volume : 1.00 Sample Units: mL
First Stage Dilution: N/A
Aliquot: N/A Aliquot Fraction: N/A
Dilution 2: N/A
Lab Preparation:

Batch

Batch Name: 2011.03.21 006
:
Description:

Client Name: Undefined
Client Contact:

Tracer

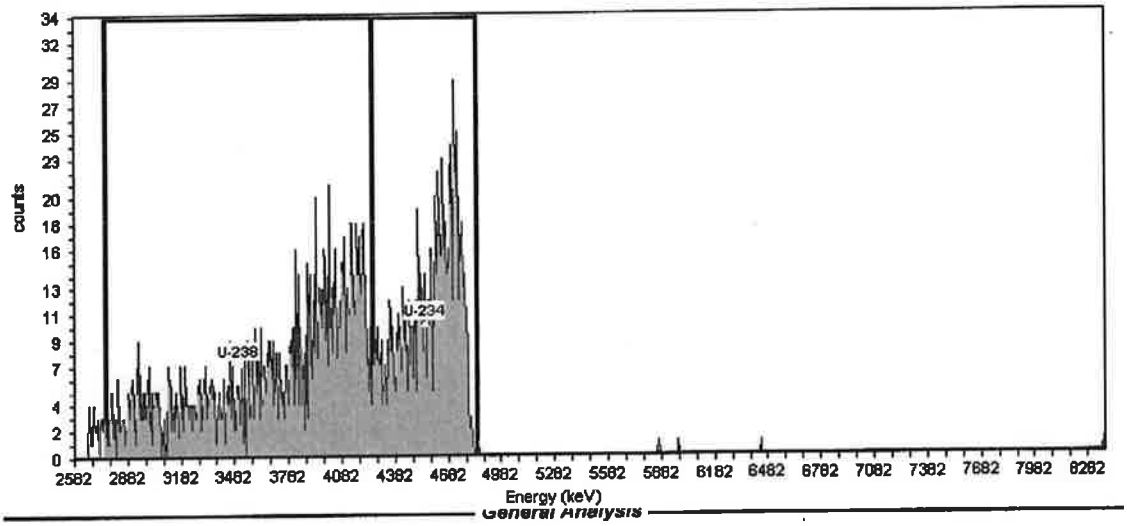
Tracer Name: Undefined
Tracer Activity:
Tracer Ref. Date:

Tracer Nuclide: External Recovery
Tracer Recovery: 100.00%

Acquisition

Detector: Detector 2 SN: 45-090F3
Acquisition Start Date: 3/21/2011 9:36:09AM
Live Time: 37.38 min.
Real Time: 37.38 min.
Background Date: 3/14/2011 4:51:31PM
Bkgd Info: Sample: d2; Det: Detector 2; Spectrum #1; Mar-14-2011 16:51

Energy Calibration: D2 43mm s2 2011-2-9
Efficiency Calibration:D2 43mm s2 2011-2-9
Calibration Date: 2/10/2011 9:55:50AM
Energy Cal: Gain = 5.6716 keV / Ch
Offset = 2,577.19 keV
Quadratic = 0.0000 keV / Ch²
Efficiency: 23.13% +/- 0.44% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = depleted or
Decay Correction:None
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: plutonium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity DPM	2.00Sigma TPU DPM	Critical Level DPM	MDA DPM
U-238	3500.000	2750.000	4250.000	311.030	100.0	1,648.78	0.6749	1,648	1.906E+002	1.008E+001	1.603E-001	6.335E-001
U-234	4546.000	4251.000	4840.000	278.880	100.0	1,116.88	0.1557	1,117	1.291E+002	8.120E+000	7.700E-002	4.670E-001

3/21/2011

3/21/11

AlphaVision v5.3 *Alpha-Spectroscopy Analysis Report*

ORTEC
Oak Ridge, TN 37830
11:05:18AM 3/21/2011

Analyst: ORTEC

Sample

Sample: d1 Type: Sample
Spectrum #1 Analysis #1
:
Sample Collection Date:
Comment: sample 4 from trailer 33

Sample Volume : 1.00 Sample Units: mL
First Stage Dilution: N/A
Aliquot: N/A Aliquot Fraction: N/A
Dilution 2: N/A
Lab Preparation:

Batch

Batch Name: 2011.03.21 007
:
Description:

Client Name: Undefined
Client Contact:

Tracer

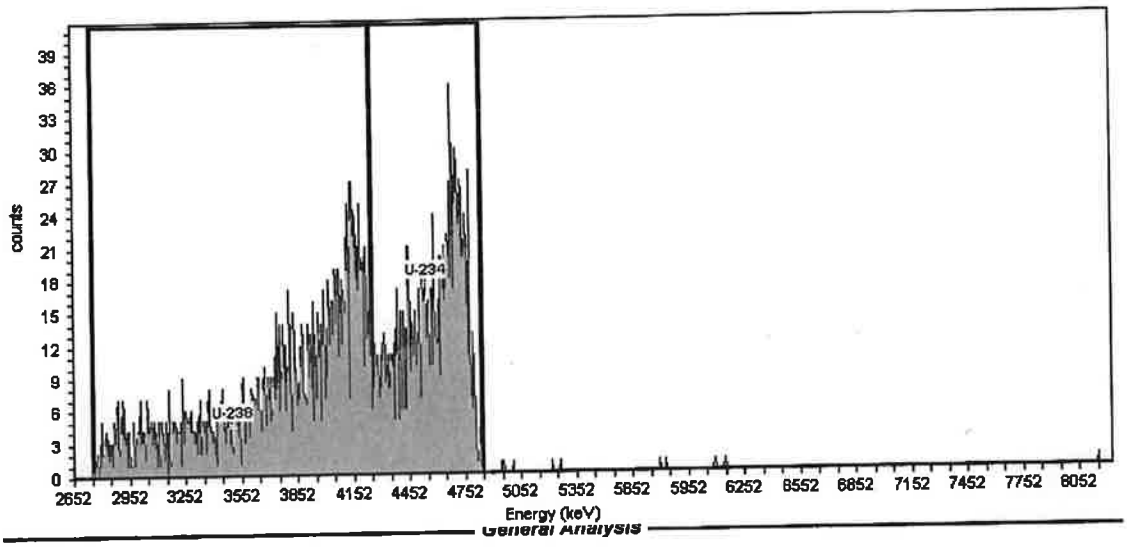
Tracer Name: Undefined
Tracer Activity:
Tracer Ref. Date:

Tracer Nuclide: External Recovery
Tracer Recovery: 100.00%

Acquisition

Detector: detector 1 SN: 45-090G1
Acquisition Start Date: 3/21/2011 10:27:51AM
Live Time: 34.38 min.
Real Time: 34.38 min.
Background Date: 3/14/2011 4:51:31PM
Bkgd Info: Sample: d1; Det: detector 1; Spectrum #1; Mar-14-2011 16:51

Energy Calibration: D1 43mm 2011-2-28
Efficiency Calibration:D1 43mm 2011-2-28
Calibration Date: 3/1/2011 7:29:16AM
Energy Cal: Gain = 5.4519 keV / Ch
Offset = 2,646.70 keV
Quadratic = 0.0000 keV / Ch²
Efficiency: 22.84% +/- 0.44% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = depleted or
Decay Correction:None
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: plutonium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity DPM	2.00Sigma TPU DPM	Critical Level DPM	MDA DPM
U-238	3500.000	2750.000	4250.000	209.277	100.0	2,009.16	0.9073	2,008	2.558E+002	1.244E+001	2.043E-001	7.532E-001
U-234	4546.000	4251.000	4840.000	347.440	100.0	1,502.53	0.4298	1,502	1.913E+002	1.054E+001	1.406E-001	6.258E-001

3/21/2011

AlphaVision v5.3 *Alpha-Spectroscopy Analysis Report*

ORTEC
Oak Ridge, TN 37830
11:05:49AM 3/21/2011

Analyst: ORTEC

Sample

Sample: d2 Type: Sample
Spectrum #1 Analysis #1
:
Sample Collection Date:
Comment: sample 5 from trailer 33

Sample Volume : 1.00 Sample Units: mL
First Stage Dilution: N/A
Aliquot: N/A Aliquot Fraction: N/A
Dilution 2: N/A
Lab Preparation:

Batch

Batch Name: 2011.03.21 008
:
Description:

Client Name: Undefined
Client Contact:

Tracer

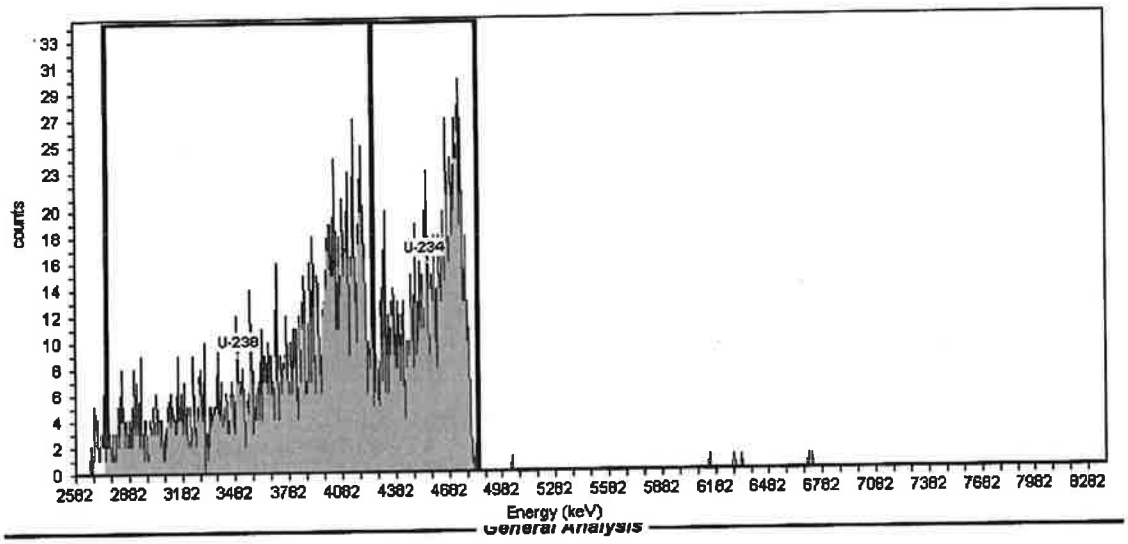
Tracer Name: Undefined
Tracer Activity:
Tracer Ref. Date:

Tracer Nuclide: External Recovery
Tracer Recovery: 100.00%

Acquisition

Detector: Detector 2 SN: 45-090F3
Acquisition Start Date: 3/21/2011 10:29:22AM
Live Time: 33.07 min.
Real Time: 33.08 min.
Background Date: 3/14/2011 4:51:31PM
Bkgd Info: Sample: d2; Det: Detector 2; Spectrum #1; Mar-14-2011 16:51

Energy Calibration: D2 43mm s2 2011-2-9
Efficiency Calibration:D2 43mm s2 2011-2-9
Calibration Date: 2/10/2011 9:55:50AM
Energy Cal: Gain = 5.6716 keV / Ch
Offset = 2,577.19 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 23.13% +/- 0.44% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = depleted or
Decay Correction:None
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: plutonium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity DPM	2.00Sigma TPU DPM	Critical Level DPM	MDA DPM
U-238	3500.000	2750.000	4250.000	416.435	100.0	1,955.22	0.5972	1,955	2.555E+002	1.256E+001	1.699E-001	6.935E-001
U-234	4546.000	4251.000	4840.000	461.586	100.0	1,286.63	0.1378	1,286	1.681E+002	9.918E+000	8.162E-002	5.169E-001

3/21/2011

AlphaVision v5.3 *Alpha-Spectroscopy Analysis Report*

ORTEC
Oak Ridge, TN 37830
11:54:52AM 3/21/2011

Analyst: ORTEC

Sample

Sample: d1 Type: Sample
Spectrum #1 Analysis #1
:
Sample Collection Date:
Comment: sample 6 from trailer 33

Sample Volume : 1.00 Sample Units: mL
First Stage Dilution: N/A
Aliquot: N/A Aliquot Fraction: N/A
Dilution 2: N/A
Lab Preparation:

Batch

Batch Name: 2011.03.21 009
:
Description:

Client Name: Undefined
Client Contact:

Tracer

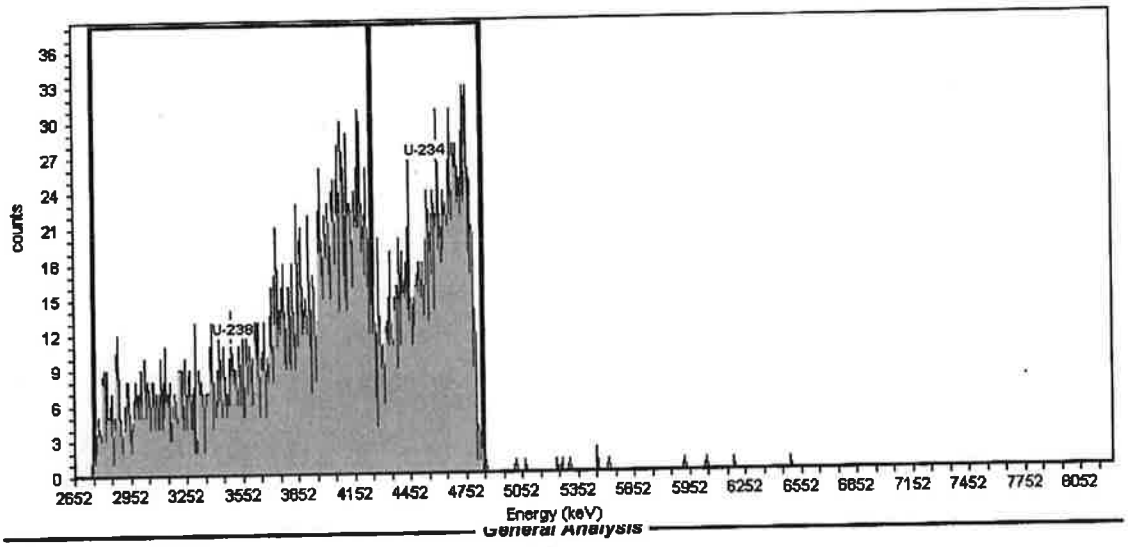
Tracer Name: Undefined
Tracer Activity:
Tracer Ref. Date:

Tracer Nuclide: External Recovery
Tracer Recovery: 100.00%

Acquisition

Detector: detector 1 SN: 45-090G1
Acquisition Start Date: 3/21/2011 11:12:17AM
Live Time: 42.51 min.
Real Time: 42.52 min.
Background Date: 3/14/2011 4:51:31PM
Bkgd Info: Sample: d1; Det: detector 1; Spectrum #1; Mar-14-2011 16:51

Energy Calibration: D1 43mm 2011-2-28
Efficiency Calibration:D1 43mm 2011-2-28
Calibration Date: 3/1/2011 7:29:16AM
Energy Cal: Gain = 5.4519 keV / Ch
Offset = 2,646.70 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 22.84% +/- 0.44% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = depleted or
Decay Correction:None
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: plutonium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity DPM	2.00Sigma TPU DPM	Critical Level DPM	MDA DPM
U-238	3500.000	2750.000	4250.000	202.495	100.0	2,894.27	1.1219	2,893	2.980E+002	1.248E+001	1.847E-001	6.481E-001
U-234	4546.000	4251.000	4840.000	461.980	100.0	1,817.05	0.5314	1,817	1.871E+002	9.493E+000	1.271E-001	5.330E-001

3/21/2011

AlphaVision v5.3 *Alpha-Spectroscopy Analysis Report*

ORTEC
Oak Ridge, TN 37830
9:26:49AM 3/21/2011

Analyst: ORTEC

Sample

Sample: d2 Type: Sample
Spectrum #1 Analysis #1
:
Sample Collection Date:
Comment: area5 sample10 truck 32

Sample Volume : 1.00 Sample Units: mL
First Stage Dilution: N/A
Aliquot: N/A Aliquot Fraction: N/A
Dilution 2: N/A
Lab Preparation:

Batch

Batch Name: 2011.03.21 004
:
Description: Area5 Truck sample 10

Client Name: Undefined
Client Contact:

Tracer

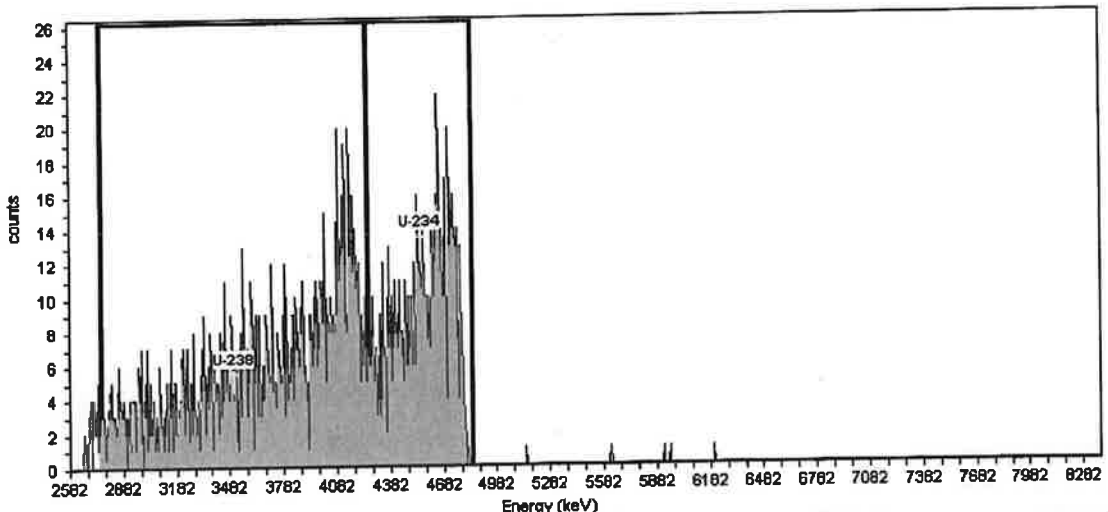
Tracer Name: Undefined
Tracer Activity:
Tracer Ref. Date:

Tracer Nuclide: External Recovery
Tracer Recovery: 100.00%

Acquisition

Detector: Detector 2 SN: 45-090F3
Acquisition Start Date: 3/21/2011 8:53:09AM
Live Time: 32.87 min.
Real Time: 32.87 min.
Background Date: 3/14/2011 4:51:31PM
Bkgd Info: Sample: d2; Det: Detector 2; Spectrum #1; Mar-14-2011 16:51

Energy Calibration: D2 43mm s2 2011-2-9
Efficiency Calibration:D2 43mm s2 2011-2-9
Calibration Date: 2/10/2011 9:55:50AM
Energy Cal: Gain = 5.6716 keV / Ch
Offset = 2,577.19 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 23.13% +/- 0.44% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = depleted or
Decay Correction:None
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: plutonium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity DPM	2.00Sigma TPU DPM	Critical Level DPM	MDA DPM
U-238	3500.000	2750.000	4250.000	251.378	100.0	1,514.36	0.5935	1,514	1.991E+002	1.093E+001	1.704E-001	6.966E-001
U-234	4546.000	4251.000	4840.000	410.097	100.0	922.00	0.1370	922	1.212E+002	8.319E+000	8.186E-002	5.196E-001

3/21/2011

3/21/11

Attachment 5

Corrective Action Plan (CAP)

PT063224

Trailer Contaminations - Second Event

March 17, 2011

DOE F 1325.8
(3/02)

United States Government **Department of Energy**
Portsmouth/Paducah Project Office

memorandum

DATE: APR 2 9 2011

REPLY TO ATTN OF: PPPO: Voth PPPO-03-1197590-11

SUBJECT: **SUBMITTAL OF CORRECTIVE ACTION PLAN IN RESPONSE TO THE CORRECTIVE ACTION REQUEST (CAR), CAR-RWAP-C-11-05**

TO: James J. Cebe, National Nuclear Security Administration Nevada Site Office

Reference: Letter from James J. Cebe to Kristi L. Wiehle, *National Nuclear Security Administration Nevada Site Office (NNSA/NSO), Radioactive Waste Acceptance Program (RWAP) Issuance of Corrective Action Request (CAR) (RWAP-C-11-05,* dated March 22, 2011

Enclosed is the signed, "ORIGINAL" Corrective Action Plan (CAP) developed in response to the Radioactive Waste Acceptance Program (RWAP), CAR-RWAP-C-11-05. The CAP addresses the actions taken to resolve the deficiency, including a root cause analysis, actions to prevent recurrence, and the completion dates. Portsmouth anticipates closure of the corrective action to be completed by July 5, 2011. An evidence package will be forwarded to you upon completion of all identified actions. Please note that future correspondence related to the Nevada National Security Site and the Department of Energy, Portsmouth/Paducah Project Office should be addressed to me.

If you have any questions or require additional information, please do not hesitate to call me at 740-897-4720.

Cidney Voth

Cidney Voth
General Engineer–D&D
Portsmouth/Paducah Project Office

Attachments:
1. Corrective Action Plan
2. Root Cause Analysis

cc w/attachments:
Administrative Record

cc w/o attachments:
Kristi.Wiehle@lex.doe.gov, PPPO/PORTS
Jamie.Jameson@fbports.com, FBP/PORTS
Mark.Ashby@fbports.com, FBP/PORTS
Danny.Nichols@fbports.com, FBP/PORTS
Glenna.Gerster@fbports.com, FBP/PORTS
PPPO Records

Fluor-B&W Portsmouth LLC
P. O. Box 548
Piketon, Ohio 45661

740-897-2095 Telephone

FBP-11-0168
April 28, 2011

To: Mr. Cidney Voth
Portsmouth/Paducah Project Office
U.S. Department of Energy
P.O. Box 700
Piketon, OH 45661

Dear Mr. Voth:

SUBJECT: Contract No: DE-AC30-10CC40017 – Transmittal of Corrective Action Plans for Corrective Action Request RWAP-C-11-05 to Department of Energy

Reference: Letter dated March 22, 2011 from James J. Cebe, Radioactive Waste Acceptance Program (RWAP) Task Manager to Kristi L. Wiehle, DOE Portsmouth/Paducah Project Office, NATIONAL NUCLEAR SECURITY ADMINISTRATION NEVADA SITE OFFICE (NNSA/NSO), RADIOACTIVE WASTE ACCETANCE PROGRAM (RWAP) ISSUANCE OF CORRECTIVE ACTION REQUEST (CAR) RWAP-C-11-05

Enclosed please find the signed "ORIGINAL CAR" and corrective action plan (CAP) for resolution of CAR RWAP-C-11-05 which addresses actions taken by the Fluor B&W management team to resolve the deficiency identified, including a root cause analysis, and actions to prevent recurrence.

This CAP should be provided to Mr. James Cebe, NNSA/NSO RWAP Task Manager, Waste Management Project as soon as practical, but no later than May 2, 2011.

If you have any questions, please contact Glenna Gerster at (740) 897-2858.

Regards,

Jamie Jameson
Program Manager

Attachments: As Stated

cc w/att: vince.adams@lex.doe.gov
joel.bradburne@lex.doe.gov
Kristi.wiehle@lex.doe.gov
Danny.Nichols@fbports.com
mark.ashby@fbports.com
Glenna.gerster@fbports.com
Trisha.jones@fbports.com
File-FBP RMDC-**RECORD COPY**

Fluor-B&W | Portsmouth

CORRECTIVE ACTION PLAN

Use this form to capture information from the analysis of issues to develop a Corrective Action Plan (CAP) or summarize closure actions. Copy and paste as many "Corrective Action" boxes as needed for this CAP. Whenever possible, generate this form electronically. Otherwise print legibly.

I/CATS Issue Number:	Source Document Type and ID Number: *(Use Table A)*
PT063224	S0011986/CY-2011 LPP Occurrence Reports/ EM--PPPO-LPP-PORTENVRES-2011-0001 -- Radioactive Contamination Exceeding NNSS Radioactive Waste Management Complex Release Limits Discovered Inside Trailer Following Trailer Unloading Operations.

Issue Description: On 3/17/11, LATA/Parallax Portsmouth, LLC (LPP) was notified by NNSS (Nevada National Security Site) that two trailers used to ship radioactive material from the X-744G Building to NNSS had elevated contamination levels on the floor of the trailers. The trailers were being used to transport wooden boxes that contained uranium. Prior to shipment, the trailers and wooden boxes had been thoroughly surveyed for radiological contamination. All radiological surveys on the trailer bed and boxes met the limits of the shipping profile for NNSS.

Following unloading of the LPP waste shipment boxes, NNSS conducted radiological surveys of the trailers. The survey results for two of the trailers were found to be in excess of 10 CFR835, Appendix D values. One trailer had a direct reading of 20,000 dpm/100 cm2 beta-gamma and the second trailer had a direct reading of 50,000 dpm/100 cm2 beta-gamma. These levels were isolated to a small area on the flooring. As both trailers exceeded site free release limits, NNSS held the trailers onsite. The two trailers were disconnected from their tractors, parked within the NNSS compound and were controlled as Contamination Areas. No contamination was found in the cabs of the tractors or on any personnel.

Organization:	Issue Type: *(Use Table B)*	Subcontractor Code: *(Use Table C or check ☒ for LPP)*	SMA: *(Use Table D)*
817-30	SC-4 (Significant Category 4 ORPS Report)		RP-5

Significant Issue: *(Use Table E)* ☒ Yes ☐ No (9X) **ISMS Elements:** *(Use Table F)* **Core Function:** F2 **Principle:** P6

Compensatory Measures Taken: *(If identified above as a Significant Issue)*

- On 3/17/11, NNSS requested LPP suspend all LPP shipments scheduled for Friday 3/18/11 as NNSS continued their investigation. LPP management self-suspended and did not release the 11 shipments scheduled for 3/18/11;
- On 3/21/11 the Nevada Site Office sent LPP Corrective Action Request (CAR) RWAP-C-11-05 notifying LPP to suspend all shipments to NNSS until the CAR has been addressed satisfactorily and closed by the Nevada Nuclear Security Administration Nevada Site Office;
- A fact-finding meeting was held on 3/21/11 followed by a meeting of LPP senior management; and
- The Event was determined to be ORPS reportable. First Notification Report was generated.

Apparent Cause: *(Use Table G. List the Apparent Cause code and title)*
A7B2C02 -- Other Problem; RADIOLOGICAL/HAZARDOUS MATERIAL PROBLEM; Source Unknown

Root Cause: *(If identified as a Significant Issue or when requested by management)*
A4B1C09 -- Management Problem; MANAGEMENT METHODS LTA; Corrective Action for previously identified problem was not adequate to prevent recurrence

Closure Summary: *(Describe corrective actions that have already been completed. Attach objective evidence of completion.)*

- UMC Operations suspended shipments scheduled for March 18, 2011 per phone call request from Nevada Test Site on 3/17/11 at 2000 hours eastern. Official shipment suspension is documented in the National Nuclear Security Administration, Corrective Action Report, RWAP-C-11-05, issued 3/21/11, Deficiency Code NNSSWAC 3.2.13, requires a Corrective Action Plan submittal.

- UMC Operations unloaded the 11 trailers containing 108 steel banded wooden shipping containers (SBWSCs) of Lot 1 and Lot 11A1 waste – NNSS Profile # 26. Trailer #s: 17837; 6810052; 7810111; 7810027; 17723; 7810063; 7810132; 7810154; 293976; 7810051; and 6810018.

- UMC Operations placed the 108 SBWSCs on hold and properly documented the placement of the 108 SBWSCs in the USEC DYMCAS inventory system in accordance with LPP-WP-10-0113 (shipment #s POL11164, POL11165, POL11129, POL11153, POL11132, POL11166, POL11167, POL11130, POL11126, POL11151, and POL11152).

- UMC Operations researched previous shipment history for Hubbard trailers #s KV53622L and 813912 and determined the UMC waste lots that were shipped in these trailers previously.

CORRECTIVE ACTIONS

(Copy and add extra Corrective Action blocks as needed.)

Corrective Action: *(Provide enough detail so it is clear exactly what needs to be done.)*
Radiological Control will use "tacky rollers" to aid in performing large area surveys of all surfaces which could contain hot particles. Surfaces include, the floors in the unloaded trailers, the exterior surfaces of the 108 SBWSCs, the loading dock, all routes traveled to and from by the forklift and any area used to set, store or inspect the SBWSCs.

Due Date:	Closure Documentation Needed:		
06/16/11	Revised Work Package LPP-WP-10-0113 to incorporate the use of tacky rollers Radiological Surveys and UE-5 forms		
Responsible Person: *(Print name and obtain person's initials)* Dan Thiel DT		**Responsible Organization:** Radiological Control	**DOE Signature Needed for Changes:** ☒ Yes ☐ No

Corrective Action: *(Provide enough detail so it is clear exactly what needs to be done.)*
Radiological Control will complete final surveys and free release all unloaded trailers used for Lot 11A1 and Lot 1 shipments.

Due Date:	Closure Documentation Needed:		
06/16/11	Radiological Surveys and UE-5 forms		
Responsible Person: *(Print name and obtain person's initials)* Dan Thiel DT		**Responsible Organization:** Radiological Control	**DOE Signature Needed for Changes:** ☒ Yes ☐ No

Corrective Action: *(Provide enough detail so it is clear exactly what needs to be done.)*
Transportation will return the two contaminated trailers (Hubbard trailers #s KV53622L and 813912) back from NNSS to UMC X-744G.

Due Date:	Closure Documentation Needed:		
4/28/11	A copy of the shipment documentation		
Responsible Person: *(Print name and obtain person's initials)* John McCoy JMc		**Responsible Organization:** Transportation	**DOE Signature Needed for Changes:** ☒ Yes ☐ No

Corrective Action: *(Provide enough detail so it is clear exactly what needs to be done.)*
UMC Operations will bag each of the remaining 108 SBWSCs following a complete re-inspection and re-survey but before applying marking/labeling and loading for shipment.

Due Date:	Closure Documentation Needed:		
6/16/11	Revised Work Package LPP-WP-10-0113 to incorporate the bagging of SBWSCs		
Responsible Person: *(Print name and obtain person's initials)* James Eide JE		**Responsible Organization:** UMC Operations	**DOE Signature Needed for Changes:** ☒ Yes ☐ No

Corrective Action: *(Provide enough detail so it is clear exactly what needs to be done.)*
Train UMC Operations personnel to revised Work Package LPP-WP-10-0113 for the bagging of 108 SBWSCs.

Due Date:	Closure Documentation Needed:		
6/16/11	Completed training roster		
Responsible Person: *(Print name and obtain person's initials)* James Eide JE		**Responsible Organization:** UMC Operations	**DOE Signature Needed for Changes:** ☒ Yes ☐ No

Corrective Action: *(Provide enough detail so it is clear exactly what needs to be done.)*
Waste Certification will determine if a profile deviation or NCSE revision is necessary to include addition of the bags on the SBWSCs.

Due Date:	Closure Documentation Needed:		
6/16/11	Memo to file.		
Responsible Person: *(Print name and obtain person's initials)* Glenna Gerster GG		**Responsible Organization:** Waste Certification	**DOE Signature Needed for Changes:** ☒ Yes ☐ No

Corrective Action: *(Provide enough detail so it is clear exactly what needs to be done.)*
Transportation will prepare leasing for up to fifteen new closed van trailers to use as conveyances for the remaining eleven Lot 11A1 and Lot 1 shipments to NNSS.

Due Date:	Closure Documentation Needed:		
6/16/11	Purchase Requisition and RADCON baseline surveys for the trailers.		
Responsible Person: *(Print name and obtain person's initials)* John McCoy JMc		**Responsible Organization:** Transportation	**DOE Signature Needed for Changes:** ☒ Yes ☐ No

END-POINT ASSESSMENT REQUIRED: ☐ **Yes** ☒ **No**

Assessment Action(s):	**Due Date:**

APPROVALS

Concurrence with CAP or Closure:	Issue Owner Signature	Date 4/28/11
Concurrence with CAP or Closure:	Program Manager/Project Manager/Designee	Date 4/28/11
Concurrence with CAP or Closure:	Waste Certification Official (for NNSS related issues)	Date 4/28/2011
Validation of CAP Adequacy:	QA Signature	Date 4/28/2011
Verification of Issue Closure: *(If corrective actions are already completed)*	QA Signature	Date

Causal Analysis and Root Cause Determination

On 3/17/11, LATA/Parallax (LPP) was notified by NNSS (Nevada National Security Site) that two trailers used to ship radioactive material from the Portsmouth Plant (PORTS) X-744G Building to NNSS had elevated contamination levels on the floor of the trailers (Trailers 813912 and KV53622L). The trailers contained Lot 11A1 material packaged in Model 4214 Steel Banded Wood Shipping Containers. Prior to shipment, these trailers had received a 100% radiological survey of the trailer bed for total and removable contamination. This was followed by an independent confirmatory radiological survey of the trailer. All surfaces of the containers to be shipped were surveyed for removable contamination. All LPP radiological surveys on the trailer bed and containers indicated they met the limits of the shipping profile for NNSS.

Following unloading of the LPP waste shipment from these trailers, the NNSS final radiological survey results for trailer KVL53622L were found to be in excess of 10 CFR835, Appendix D values. Specifically a direct reading value of 20,000 dpm/100 cm2 beta-gamma was measured on the trailer floor. After unloading trailer 813912, radioactive contamination in excess of 10 CFR 835, Appendix D was also discovered on the trailer floor. A direct reading value of 50,000 dpm/100 cm2 beta-gamma was measured. As both trailers exceeded site free release limits, NNSS held the trailers onsite. The two trailers were disconnected from their tractors, parked within the NNSS compound and were controlled as Contamination Areas. No contamination was found on the boxes, in the cabs of the tractors or on any personnel. The contamination was located within the footprint of the boxes.

Before and after the transition of the prime contract from LPP to Fluor B&W Portsmouth (FBP), key personnel from the UMC Operations, Radiological Controls, Quality Assurance, Waste Certification, and Transportation, were involved with the investigation's path forward to identify the potential causes and remedies.

As was the case with the December 2010 event, the investigation noted above assumed that the causal factors associated with this event originated at the PORTS.

The investigation/discussion concluded the possible causal factors contributing to the event of 3/17/11 were:

1. Loss of material from the shipping container caused by vibration during transport.

2. Legacy contamination imbedded in the trailer's wood floor that became detectable as a result of vibration during transport.

3. Legacy particle contamination which could not be identified using detection methods currently in place

A Root Cause Analysis for this event was conducted using the TapRoot ® system. The associated Department of Energy Causal Analysis Code was determined to be A4B1C09

Management Problem; MANAGEMENT METHODS LTA; Corrective action for previously identified problem was not adequate to prevent recurrence.

This root cause will be remedied by addressing the causal factors listed above through the implementation of Corrective Action Plan (CAP) PTO63224. FBP believes that the completion of CAP PTO63224 will satisfactorily correct the deficiency identified in CAR RWAP-C-11-05 and prevent its recurrence.

Department of Energy
National Nuclear Security Administration
Nevada Site Office
P.O. Box 98518
Las Vegas, NV 89193-8518

MAR 22 2011

Kristi L. Wiehle, U.S. DOE Portsmouth/Paducah Project Office, Portsmouth Site, Piketon, OH

NATIONAL NUCLEAR SECURITY ADMINISTRATION/NEVADA SITE OFFICE (NNSA/NSO) RADIOACTIVE WASTE ACCEPTANCE PROGRAM (RWAP) ISSUANCE OF CORRECTIVE ACTION REQUEST (CAR) RWAP-C-11-05

Enclosed is a copy of the CAR RWAP-C-11-05 identified for PORTS waste shipments POL11161 and POL11163 received at the NNSS on March 17, 2011. Contamination above release limits as specified in Title 10 CFR Part 835 Appendix D was identified while off-loading each trailer. Because of the adverse conditions identified in CAR RWAP-C-11-05, Portsmouth Gaseous Diffusion Plant (PORTS) shall suspend all shipments to the Nevada National Security Site (NNSS) until the CAR has been addressed satisfactorily and closed by the NNSA/NSO.

The original CAR (stamped in red) has been sent to Glenna Gerster, PORTS Waste Certification Official, for resolution. A Corrective Action Plan (CAP) is required to address the CAR. The CAP must address actions taken to resolve the deficiency, including a root cause analysis, actions to prevent recurrence, and the completion date. Please ensure the signed "ORIGINAL CAR" and CAP are returned to NNSA/NSO, Waste Management Project, by May 2, 2011. All corrective actions must be implemented by July 5, 2011.

RWAP personnel are available to review the draft CAP to ensure your proposed action(s) will satisfy the Nevada National Security Site Waste Acceptance Criteria. This allows RWAP personnel to agree with the proposed actions before the CAR with the CAP are returned to the NNSA/NSO Task Manager. If you have any questions or require additional information, please do not hesitate to call me at 702-295-0957 or Gregg Geisinger at 702-295-5196.

James J. Cebe
RWAP Task Manager
for the Waste Management Project

WMP: 7359.JJC

Enclosure:
As stated

Glenna,

Attached is the Original CAR RWAP-C-11-05 (stamped in red) identified for PORTS waste shipments POL11161 and POL11163 received at the NNSS on March 17, 2011. Because of the adverse conditions identified in CAR RWAP-C-11-05; Portsmouth Gaseous Diffusion Plant (PORTS) shall suspend all shipments to the Nevada National Security Site (NNSS) until the CAR has been addressed satisfactorily and closed by the NNSA/NSO.

A Corrective Action Plan (CAP) is required to address the CAR. The CAP must address actions taken to resolve the deficiency, including a root cause analysis, actions to prevent recurrence, and the completion date. Please ensure the signed "ORIGINAL CAR" and CAP are returned to NNSA/NSO, Waste Management Project, by May 2, 2011. All corrective actions must be implemented by July 5, 2011.

Radioactive Waste Acceptance Program (RWAP) personnel are available to review the draft CAP to ensure your proposed action(s) will satisfy the Nevada National Security Site Waste Acceptance Criteria. This allows for RWAP personnel to agree with the proposed actions before the CAR with the CAP are returned to the NNSA/NSO Task Manager. If you have any questions or require additional information, please do not hesitate to call me.

R. Gregory Geisinger
National Security Technologies, LLC
Contractor to the U. S. Department of Energy
Radioactive Waste Acceptance Program Manager
Office Phone: 702-295-5196
Office Fax: 702-295-3112
Cell Phone 702-506-7644

National Nuclear Security Administration
Nevada Site Office

ORIGINAL

CORRECTIVE ACTION REQUEST (CAR)

1.		2.	
Responsible Individual:	Glenna Gerster	CAR No.:	RWAP-C-11-05
Facility / Organization:	Portsmouth Gaseous Diffusion Plant (PORTS)	Date Issued:	03/21/2011
Site / Location:	Piketon, OH	Deficiency Code:	NNSSWAC 3.2.13

3. Facility Evaluation: ☐ Audit ☐ Surveillance ☒ N/A Report No.: Waste Receipt

4. Requirement(s): *(NTSWAC and/or Generator Program Document)*

NNSSWAC, Rev. 8-1, Section 3.2.13, Contamination Levels, states, "External contamination levels for waste packages and transport vehicles shall meet the release limits specified in Title 10 CFR Part 835, Appendix D."

5. Deficiency: * **CAP Due Date:** 05/02/2011

Contrary to the above, radioactive contamination was discovered above the release limits on the floor of trailers 813912 and KV53622L, received at the Area 5 Radioactive Waste Management Site (RWMS) on March 17, 2011. This is the second such incident related to contamination above release criteria, the first occurring on December 18, 2010, RWAP-C-11-04.

Further information on deficiency can be found on next page.

Initiator: [signature] Date: 3/21/11 RWAP Task Mgr: James J Cutlo Date: 3/21/11

6. Corrective Action Plan (CAP): **(Must include corrective action, root cause analysis, action to preclude recurrence, and scheduled completion date)*

Scheduled Completion Date: 7/5/11 Responsible Manager: Glenna Gerster Date: 4/28/11

7. Corrective Action Plan Approved: *(If "No," explain)*

RWAP Reviewer: Date:

8. Corrective Action Verified: *(If "No," explain)*

Verified / Approved by: _____ Date: _____
(Team Lead, if applicable)

Approved by
RWAP Task Manager: _____ Date: _____

RWAP07-01 (06/10)

(Identify Block No. / Section from page one.) continuation page

On Thursday March 17, 2011, shipment POL11161 on trailer KV53622L was found with elevated contamination levels. Final survey results for Trailer KVL53622L are 20K dpm beta (direct) and 1K dpm alpha (direct) and by smear: 43 dpm alpha and 50 dpm beta.

In addition, shipment POL11163 on trailer 813912 was found to have a spot of contamination about 1.5 foot by 1.5 foot which reads 50,000 dpm beta (direct) and 2,000 dpm alpha (direct). Smears read several hundred dpm alpha removable by Electra. The contamination levels of this trailer exceeds 10 times the limits as specified by 10CFR835 Appendix D. Final survey for trailer 813912 are 50K dpm beta direct and 2K dpm alpha direct and by smear: 500 dpm alpha and 600 dpm beta.

Both trailers exceed the free release limits to authorize release of the trailers from the RWMC. Both trailers were parked and posted as Contamination Areas. Radiological Control performed surveys of the cabs of both tractors and of both drivers. No contamination was found in the cabs or on the drivers. No RWMC personnel were discovered to be contaminated. None of the waste packages were found to be contaminated or leaking during the off loading surveys performed by Radiological Controls. The contamination was limited to the patch found on each truck floor.

Attachment 6

Independent Assessment

RADCON

Contamination Control

Jay Maisler

Fluor-B&W Portsmouth
Independent Evaluation of Corrective Actions – Contaminated Trailer Events
May 9 – 12, 2011

Introduction

An independent evaluation was performed of corrective actions taken by Fluor-B&W Portsmouth (FBP) following six separate events involving radioactive contamination discovered in closed van trailers used to transport radioactive material from the Uranium Management Center (UMC) X-744G Building to the Nevada Nuclear Security Site (NNSS).

The evaluation was performed by Jay Maisler, CHP, from Enercon Services, Inc.

Individuals Contacted

Radiation Protection Manager

SAM/BOP Radiation Protection Manager

D&D Radiation Protection Manager

Radiation Protection Supervisor

Radiological Engineers

Radiological Control Technicians

Radiation Protection Training Staff

Waste Certification Official

UMC Management and Staff

Documents Reviewed

FBP Organization Charts

RP-PRO-00001 (formerly LPP-EH-4515), Rev.1, Radiation Surveys

RP-PRO-00002 (formerly LPP-EH-4516), Rev. 4, Radioactive Contamination Control and Monitoring

RP-PRO-00022 (formerly LPP-EH-4517), Rev. 3 (draft), Posting and Labeling

RP-PRO-00023 (formerly LPP-EH-4518), Rev. 1, Radiation Protection Program Records

RP-PRO-00033 (formerly LPP-EH-4541), Rev. 3, Radiological Surveys to Support Waste Shipments to the Nevada National Security Site

RP-PRO-00036 (formerly LPP-EH-4527), Rev. 3, Radiological Surveys for the Reciept, Transport, and Movement of Radioactive Materials

Fact Sheet, UMC Operations Fact Finding for Contaminated Hubbard Trailers 813912 and KV53622L

Occurrence Report Number EM-PPPO-LPP-PORTENVRES-2011-0001, Radioactive Contamination Discovered on Trailer Floor

NNSA Corrective Action Request, RWAP-C-11-04, 12/20/2010

Corrective Action Plan, PT063204 and Causal Analysis and Root Cause Determination

Corrective Action Plan, PT063224 and Causal Analysis and Root Cause Determination (draft versions)

LPP CAP Review (for PT063204)

Problem Report, PR-LPP-10-089

Problem Report, PR-LPP-11-008

Problem Report, PR-LPP-11-020

Problem Report, PR-LPP-11-021

Work Package FBP-WP-11-0029, Rev. 0

RCT Training Records

Radiological Survey Documentation

Field Observations

Toured X-744G facility and Lot 11A1/Lot 1 box storage area

Decontamination efforts on Trailer 813912

Equipment release surveys at Trailer KV53622L

Work Package FBP-WP-11-0029, Rev. 0, pre-job briefing, dry run, post-job debrief

Background

During the week of December 13, 2010, UMC Operations shipped 47 closed van trailers loaded with steel-banded wood shipping containers (SBWSCs) containing Fernald Lot 1 and Lot 11A1 materials to the NNSS. Direct and removable radiological contamination was detected in two trailers and exceeded limits allowed by NNSS. On March 17, 2011, NNSS notified LATA/Parallax Portsmouth (predecessor to FBP) that two trailers containing material shipped by UMC had elevated contamination levels on the floor of the trailers. These trailers had been used to ship SBWSCs from Lot 11A1. Additionally, two trailers that had been used to ship Lot 11A1 SBWSCs to NNSS. NNSS surveys did not reveal elevated contamination levels. Upon their return to UMC, the trailers were found contaminated following a receipt survey by (LPP) radiological control technicians. A root cause evaluation of these contamination events was performed by FBP Quality Assurance and corrective actions identified to prevent recurrence.

Results

The Causal Analysis and Root Cause Determination developed for the December contamination events identified the following three root causes for these events:

1. LPP incoming trailer radiological survey error,
2. Loss of containment from the shipping container during transport to NNSS, or
3. Legacy contamination on the exterior of the box that was not detected prior to loading.

Following the discovery of four more contaminated trailers (two by NNSS and two at Portsmouth), a second Causal Analysis and Root Cause Determination was performed. The following root causes were identified (and encompass the December events):

1. Loss of material from the shipping container caused by vibration during transport.

2. Legacy contamination imbedded in the trailers' wood floor that became detectable as a result of vibration during transport.
3. Legacy particle contamination which could not be identified using detection methods currently in place.

LPP and FBP Quality Assurance, Waste Certification, Transportation, Operations, and Radiation Protection staffs have evaluated the information from these contaminated events extensively and a definitive cause has not been identified. The corrective actions from the December events (see PT063204) were not specifically evaluated as they had been acceptable to NNSS and independently verified by LPP and DOE as being complete. However, the corrective actions identified in the most recent Corrective Action Plan (PT063224) were reviewed and are discussed below:

1. Radiological Control will use "tacky rollers" to aid in performing large area surveys which could contain hot particles. Surfaces include, the floors in the unloaded trailers, the exterior surfaces of the 108 SBWSCs, loading dock, all routes travelled by the forklift and any area used to set, store or inspect the SBWSCs.
2. Radiological Control will complete final surveys and free release all unloaded trailers for Lot 11A1 and Lot 1 shipments.
3. Transportation will return the two contaminated trailers (Hubbard trailers #KV53622L) and 813912) back from NNSS to UMC X-744G.
4. UMC Operations will bag each of the remaining 108 SBWSCs following a complete re-inspection and re-survey but before applying marking/labeling and loading for shipment.
5. Train UMC Operations personnel to revised Work Package LPP-WP-10-0113 to incorporate the bagging of SBWSCs.
6. Waste Certification will determine if a profile deviation or NCSE revision is necessary to include addition of the bags on the SBWSCs.
7. Transportation will prepare leasing for up to fifteen new closed van trailers to use as conveyances for the remaining eleven Lot 11A1 and Lot 1 shipments to NNSS.

Field Observations

Field observations of trailer decontamination efforts and radiological surveys were conducted. Activities observed included decontamination of one discrete spot on the floor of each of the two trailers, RCT coverage supporting these efforts, and release surveys for one trailer. Tacky rollers were used on the floor of one trailer to collect potential contamination; none was detected. A scanning survey of the floor of one trailer was observed. The technique involved the use of a PVC detector holder, which relieved RCTs of the need to perform the survey on their hands and knees. However, the holder was a little awkward to use – the RCT initially performing the survey requested another RCT relieve him to continue the survey who, in turn, was relieved by the original RCT to complete the survey. Recommendations for floor monitoring are discussed later in this report. Standard smears were also taken and no removable contamination was detected. Direct measurements were taken at each smear location. An independent confirmatory survey (scanning, direct, and smears) was performed verifying the adequacy of the complete floor survey.

The dry run for preparing SBWSCs for shipment was observed. Activities included the pre-job briefing, radiological surveys, stretch wrapping of SBWSCs (from Lot 11A1), and the post-job

debriefing. Radiological surveys and waste certification inspections of two SBWSCs (one Lot 1 SBWSC and one Lot 11A1 SBWSC) confirmed work package criteria were satisfied. Stretch wrapping can effectively address potential issues with contamination from the SBWSC. The dry run provided an opportunity for UMC personnel to test their technique for wrapping the SBWSCs and identified the need to improve techniques to ensure complete wrapping of the SBWSCs.

Document Reviews

Procedures: Several procedures were reviewed during the independent evaluation. Opportunities to improve and clarify procedures were noted. The following general observations discuss some specific examples of areas for improvement.

RP-PRO-00036: Documentation converting LPP-EH-4527 under the FBP Blue Sheet Procedure, Forms FBP-PTM-GEN01-001-A01 and A03 both indicate that Revision 2 of LPP-EH-4527 was converted. The version attached shows Rev. 3 dated 10/14/10. Other observations on this procedure include the following:

- Step A.2.a, first bullet: "10 CFR 835.4059(c)(1)" should be corrected to "10 CFR 835.405(c)(1)."
- Step C.2.a: The procedure may not provide sufficient guidance for contamination surveys on Exclusive Use (LSA/SCO) to sufficiently to characterize the vehicle.
- Step D.2 is confusing. The step includes multiple actions that are not clearly distinguished.

RP-PRO-00033: Some steps in this procedure are not clear or are incomplete. The following examples are provided:

- Step B.4 provides RCTs direction on what to do if removable contamination levels exceed 20 dpm/100 cm^2. Step a then instructs the RCT to ensure the container is properly posted "if removable contamination levels exceed 1,000 dpm/100 cm^2," but does not specify alpha or beta. This instruction appears to conflict with the scope of the procedure that specifically calls out the removable and fixed limits for transuranics. More procedural guidance could improve clarity of the procedure.
- No guidance is provided in how to interpret results from large area wipes.
- Guidance contained in Attachment B appears to be inconsistent. For example, large area wipes are only required for wooden boxes, but no other item. The number of smears required for wooden boxes is 4 which is both inconsistent with the 6 required for steel boxes and does not ensure all 6 sides of the wooden box are smeared.

Survey Documentation: Surveys for trailer releases, daily forklifts, down-posting trailers, and trailer receipts were reviewed. Appropriate information, signatures, and approvals were provided. The need to improve consistency in survey documentation was evidenced by the following:

- The trailer diagram used to identify smear and direct measurement locations is inconsistent. Some maps included a top view of the trailer (e.g., rectangle) showing smear/measurement locations, but the orientation was not indicated (e.g., which was the front end of the trailer, where the doors were located). Other receipt surveys included an outside lateral view of the trailer with survey locations shown on the outside surface but noting that the locations were actually inside the trailer (therefore, the

smear/measurement location could be difficult to replicate). In some cases, an isometric end view of the trailer was provided with smear/measurement locations identified (difficulty to identify specific locations). Others included a survey map that consisted of a side/end view of the trailer with no locations noted for the 20 smears taken.

- The number of smears taken on the trailer floors varied from a minimum of 4 to a maximum of 20. Procedure RP-PRO-00038 provides no guidance on how many smears or direct measurements are required for vehicle surveys. Procedural guidance should be established.

Analysis

Based on document reviews and interviews, the root causes identified in the two Causal Analyses adequately capture the potential causes to the trailer contamination events. The root causes from these reports were considered during this independent evaluation in order to determine the effectiveness of corrective actions to prevent recurrence of trailer contaminations shipped from the X-744G Building. Based on this evaluation, the root causes can be combined into three areas: radiological survey techniques and equipment (including the human element), potential issues with contamination from the Lot 11A1 boxes, and legacy contamination from prior radioactive material shipment in trailers. Discussions with a number of FBP personnel resulted in arguments supporting and dispelling each of these areas, as discussed below.

Radiological Survey Techniques and Equipment: By their very nature, the adequacy and accuracy of radiological surveys are heavily dependent on human performance. Of the six trailers with elevated contamination levels, four were identified by NNSS following removal of the shipping containers. The contamination in each trailer was limited to a single, discrete area. The remaining two contaminated trailers were identified by LPP/FBP upon return from NNSS where they had been free-released (e.g., no contamination detected during the NNSS survey). These trailers also had single discreet areas of contamination.

RCTs are required to have specific education, experience, and training in order to be qualified to perform radiological surveys. In addition, LPP/FBP procedures require RCTs to complete job performance measures (JPM); an objective tool used to demonstrate competency in specific skills required for performing surveys. Corrective actions have been implemented to provide additional training to RCTs on the requirements of RP-PRO-0003 to ensure an adequate understanding of the requirements for performing surveys to support waste shipments to NNSS. The floors of incoming trailers are required to be completely (100%) surveyed by an RCT upon arrival at the site. A confirmatory (10%) survey is independently performed. The results of these surveys are reviewed by a Radiation Protection Supervisor.

Radiological surveys are performed using instrumentation appropriate for detecting uranium contamination (Ludlum 2360 with a 43-93 detector). RCTs use an improvised extension device to hold the detector when performing the trailer floor surveys. Observations of surveys performed using this configuration appeared adequate, however, the design was awkward to use over extended periods of time associated with surveying the floor of a trailer. A properly designed instrument should be considered for performing floor surveys. Commercially available floor monitors are available to efficiently measure large floor areas. For more discrete measurements, an ergonomically designed holder with wheels to maintain the proper distance from the floor could be fabricated for the Ludlum 43-93 probe and model 2360 survey instrument. Use of a floor monitor or ergonomic probe holder to survey trailer floors would improve consistency in individual RCT survey and improve RCT efficiency.

Inconsistencies in documentation of survey results were noted and previously discussed in this report. Clear procedural direction on the number of smears and management expectations for survey maps should be provided to RCT supervisors and RCTs.

Potential Issues with the Lot 11A1 Boxes Contamination: The steel banded wooden shipping containers (SBWSCs) containing uranium derbies, ingots, and billets were shipped from Fernald to the UMC several years ago. The SBWSCs were loaded in the 1990's at Fernald. Interviews indicated that these containers have been handled and moved multiple times over many years. At times, these containers were stored in posted contamination areas at Fernald. Contamination surveys on the SBWSCs detected no removable contamination on the surfaces of any container. Complete surveys of the bottoms of the containers were not implemented until after the two contaminated trailer events in December 2010. Given the age and storage history associated with these boxes and the number of times these boxes have been moved, additional precautions should be implemented to prevent release of any radioactive material from inside the container or on its surface. Suggestions discussed with various individuals included stretch wrapping SBWSCs or applying a fixative coating to the bottoms and sides of these containers. FBP has committed to stretch wrap SBWSCs, which is acceptable to NNSS for disposal.

Legacy Contamination from Prior Radioactive Material Shipment in Trailers: Discussions with several individuals raised the potential for contamination that has been embedded in the trailer floors being released as a result of vibration during transit to NNSS. The history of prior use of the contaminated trailers is not known; most of these trailers are 15 to 20 years old. Information discussed indicated that as a result of loading trailers well below the maximum capacity for the trailers leads to increased vibrations that dislodge embedded contamination. For a variety of reasons, this scenario is not considered credible. For example, the contamination isolated to one discrete area on each of the contaminated trailers. Trailers vibrate more when fully empty, which is how the initially arrive at the site and are returned from NNSS. The isotopic analysis indicates the contamination to be slightly enriched uranium. There is no indication of other DOE sites experiencing similar problems. Five of the six trailers were used to ship Lot 11A1 SBWSCs; the other to ship Lot 1 SBWSCs. However, FBP has appropriately determined that future shipments will use new trailers, which will remove any potential for the legacy contamination theory.

Review of Corrective Actions for PT63224:

1. If the contamination resulted from "hot particles" or is otherwise presence, the use of "tacky rollers" will effectively collect the contamination. RCT surveys of the tacky roller sheet were observed during a trailer survey. These surveys were appropriately performed and documented.
2. One trailer (813912) was not completely decontaminated during this independent evaluation. Trailer KV53622L was decontaminated and surveyed for free release. Survey records for the other free-released trailers were reviewed and documented that no contamination above release criteria specified in RP-PRO-0036 were satisfied.
3. Decontamination efforts for trailers KV53622L and 813912 were observed. Release surveys for trailer KV53622L were properly performed and documented.
4. Work Package LPP-WP-10-0113 has been replaced with FBP-WP-11-0029. A pre-job briefing was conducted to thoroughly discuss work package requirements. In lieu of bagging, as indicated in the draft corrective action plan, FBP has decided to stretch wrap

the 108 remaining SBWSCs prior to shipment. This process is addressed in Work Package FBP-WP-11-0029 Rev. 0.

5. A briefing on Work Package FBP-WP-11-0029 was observed. The information presented discussed the stretch wrapping process and appropriate controls for handling SBWSCs. Following
6. Discussions with the Waste Certification Official and other project personnel indicate that stretch wrapping is not considered a waste profile deviation and a Criticality Safety Engineer signed Work Package LPP-WP-10-0113 indicating that an NCSE revision is not required.
7. Discussions with the Waste Certification Official indicated FBP's intention to obtain new closed van trailers to ship the 11 remaining SBWSC shipments.

Conclusions

FBP has completed a thorough causal analysis and root cause determination for the contaminated trailer events. Essentially, three root causes have been identified: radiological survey techniques and equipment, potential issues with contamination from the Lot 11A1 boxes, and legacy contamination from trailers. No single root cause can easily be ruled out. Further investigation and evaluation to definitively determine the source of the contamination could be expensive and further delay final disposal of the SBWSCs. FBP has identified a number of corrective actions addressing the root causes. Based on field observations and interviews, RCTs assigned to X-744G are qualified and competent to perform the surveys required for shipment of radioactive waste. As recommended below, additional emphasis on providing RCTs with better tools to perform their job will help ensure the accuracy of their surveys. FBP has committed to stretch wrap SBWSCs which will address any concerns with the contamination from the containers. FBP has committed to use only new trailers for the 11 remaining SBWSC shipments which addresses concerns regarding legacy contamination.

Recommendations

1. Provide floor monitoring instrumentation for surveying large areas, such as trailer floors.
2. Improve consistency in trailer surveys.
3. Fabricate an appropriately designed holder, with wheels, to ensure consistent surveying of discrete floor areas, for the Ludlum 2360/43-93 instrument.
4. Implement plans to stretch wrap Lot SBWSCs and finalize the technique to ensure complete wrapping of the SBWSCs.
5. Implement plans to use only new trailers to ship SBWSCs to NNSS.
6. Revise procedures as discussed previously in this report.

Attachment 7

Management Assessment

History of

Trailer Contaminations

Glenna Gerster

FBP MANAGEMENT ASSESSMENT REPORT

Assessment Number:	Assessors:	Date Performed:
FBP-MA-10-002	Glenna Gerster	May 19, 2011

Assessment Title:

Documented History of Contaminated Trailers at the PORTS

Location (place where assessment was performed):	**Assessed Organization(s):**
X100 Office	ICATS and Problem Report Databases

Scope of Assessment:

To determine if there have been other documented trailer contaminations with trailers used for shipments from the PORTS in support of Corrective Action Plan #PT063224

Basis (provide full reference to documents where requirements, specifications, other criteria forming basis characteristics of assessment were Identified):

- ICATS database
- Problem Report database
- BJC Event Fact Sheet database

Lines of Inquiry (specify checklist, guidance cards, basis document excerpts, other basis characteristics tracking tools used and attach):

Same as Basis

Personnel Contacted (list who was interviewed and consulted during the assessment and their title and organization):

- Jackie Book – ICATS Database Administrator (QA)
- Dana Jenkins -- Problem Report/BJC Event Fact Sheet Databases (QA)
- Dan Thiel – Radiological Control
- Adrian Jones – Radiological Control

Results Summary:

This assessment consisted of completing a search of the ICATS, Problem Report and BJC Databases for a history of previous incidence concerning documented contamination events of trailers used to transport waste shipments from the PORTS.

The results of the search of these three databases are provided and the documented evidence is included as attachments to this document.

The first search was of the ICATS database spanning the years from 2000 to the present and that search resulted in one hit.

On 9/11/2007 the NTS notified the PORTS that they had received a conveyance (flatbed) with fixed contamination reading 3,700 dpm/100cm^2 Alpha and 12,900 dpm/100cm^2 Bata on the right rear of the trailer. I spoke with Dan Thiel and AJ Jones about this event and AJ did remember it. AJ did not know why the contamination value for this event was not averaged over 1M^2. A copy of the Problem Report and CAP are attached. AJ did tell me that prior to this event RCTs did not conduct 100% surveys of the incoming trailers.

The next event, I remember because I got the call from the NTS on 3/12/2010. It was just a courtesy call to let me know about contamination spots found in two different trailers. No CAR was issued because the contaminated spots found on two different trailers (8.5 K and 9.1K) averaged over 1M^2 both were below 5000 dpm which is the limit. I requested a copy of the surveys at that time and those copies are attached to this report.

The second search was of the Problem Report database going back to 2005 and there were three Problem Reports written for contaminated trailers found to be contaminated above the 10 CFR limits during incoming surveys. All three were flatbeds and were picked up by the carrier (Mettler) without being used. The dates of two of these findings, interestingly enough, were just days after the contamination found on 9/11/2007 (9/26/07 and 9/28/07).

The final search was of the BJCs Event Fact Sheet database from 2004 and back through 2003 where we found two contaminations documented from transloading activities to the NTS; one at the transload point and one when the IMs were returned to the site by rail from the transload point.

All reports from these contamination events are attached for further information.

WCO (if assessment evaluates activities/processes associated with Nevada Test Site Waste Certification Program, otherwise N/A): Dianna Forster	**Date of Review:** 5/24/11
Manager:	**Date of Review:** 5/24/11

Problem Report

&

ICATS Report

for

2007 Event

LATA Parallax
LATA/PARALLAX PORTSMOUTH, LLC

PROBLEM REPORT

Doug Scott	705804	4771	REPORT NUMBER
Prepared By (Print)	Employee/Badge No.	Extension	PR-LPP- 07 - 056

Discovery Date: 9/11/2007 Discovery Time: 1730 Building No.: X-1000 Facility Mgr.: Joe Halcomb

Dwg/Spec/Procedure/Work Pkg No./Rev.: Passed on to Supervision to confirm receipt? ☐ No ☐ Yes – Supt/Mgr:

DESCRIPTION OR NATURE OF PROBLEM: (Describe the details of this incident; i.e., who [titles only], what, why, when, and where.)

At approximately 1730 hours the LPP Waste Characterization Officer was notified by the Nevada Test Site that they had received a conveyance #4802 from the Portsmouth Facility that had fixed contamination. The fixed contamination readings were 3,700 dpm/100cm2 Alpha and 12,900 dpm/100 cm2 Beta on the right rear of the trailer. No contamination was found on the exterior of the container that was shipped on the trailer.

This trailer was part of a low level radioactive waste shipment that was properly placarded, controlled and transported per DOE and DOT regulations.

A review of the records indicates that no contamination was detected on the incoming (sampling) radiological survey of the tractor and trailer.

Industrial Safety Concern ☐ NCS Concern ☐ Suspect/Counterfeit Item Concern ☐ Radiological Exposure/Contamination Concern ☒

IMMEDIATE ACTIONS TAKEN: (Identify qty. and location of any QA HOLD tags or other means used to identify the nonconforming items.)

The trailer was parked and posted in a controlled area.

RECOMMENDED CORRECTIVE ACTIONS TO PREVENT RECURRENCE:

Fax PR to ext. 2500. Then call 2569, 4771, 3442, Pager 289-0344, or 740-370-5333 to confirm receipt. PM Initials: _____

ENGINEER/ SUBJECT MATTER EXPERT COMPLETE BELOW

TYPE OF SSC:	Regulatory Impact:
☐ CAT 2-Related[1]	☐ DSA/TSR
☐ CAT 2-Related[2]	☐ PHS
☐ NTS-Related	☐ NCS/Anom. Cond. Level ____
☐ Other Type	☐ Environmental Compliance
☒ Not an SSC	☒ None

INITIAL ASSESSMENT

	Y	N	N/A
1. Is Facility/Component Operable?	☐	☐	☒
2. Is System Operable?	☐	☐	☒
3. Is Incident ORPS Reportable?	☐	☒	☐

Categorization Date: 9/12/2007 Time: 1030

ORPS CATEGORIZATION/EVALUATION/COMMENTS/CORRECTIVE ACTIONS:

- This incident does not meet any ORPS reporting criteria.
- This has been reviewed against criteria 6 B (1)2 and found not to exceed any of the applicable limits.

Eng/SME Signature: _____

ESH&Q COMPLETE BELOW

Action:
- ☐ Enter in I/CATS to develop a Corrective Action Plan
- ☐ Enter in I/CATS that corrective actions are already completed
- ☐ No Corrective Actions needed. Entry in I/CATS not required.

QA Manager: _____ Date: _____

Linked in I/CATS via:
- ☐ Occurrence Report (No.: _____)
- ☐ Anomalous Condition (No.: _____ Level : ___)
- ☐ Other: _____
- ☐ N/A

Issue Owner: I/CATS Issue Number:

Issue Entered in I/CATS: _____ Date: _____
Issues Management Coordinator

PAAA Screening: ☐ NTS Reportable ☐ Non-NTS Reportable ☐ N/A PAAA Coord.: Date:

CAT 2-Related[1] = Safety Class, Safety Significant, or Design Feature Structure, System or Component
CAT 2-Related[2] = Other than a Safety Class, Safety Significant, or Design Feature Structure, System or Component

Issue Report - Full Text

5/19/2011

Issue ID/Reference	Responsible Person	Responsible Organization	Status	Date Due	Date Closed
PT062605 Problem Report PR-LPP-07-056	Thiel, Dan	817-30 - PORTS Remediation	CL	3/31/2008	2/28/2008

Assisted By:

Subject Matter Expert:

Issue Type: IN - Incident

Root Cause: 9X - Root Cause Analysis Not Required

Subject Matter Area: RP-5 - Material Contamination

Significant ?: No

Direct Cause: N/A - Does Not Apply

ISMS Code 1: F3 - Develop & Implement Hazard Controls

Subcontractor: N/A - Does Not Apply

ISMS Code 2: P2 - Clear Roles and Responsibilities

Issue Description

DESCRIPTION OR NATURE OF PROBLEM: At approximately 1730 hours the LPP Waste Characterization Officer was notified by the Nevada Test Site that they had received a conveyance #4802 from the Portsmouth Facility that had fixed contamination. The fixed contamination readings were 3,700 dpm/100cm2 Alpha and 12,900 dpm/100 cm2 Beta on the right rear of the trailer. No contamination was found on the exterior of the container that was shipped on the trailer.

This trailer was part of a low level radioactive waste shipment that was properly placarded, controlled and transported per DOE and DOT regulations.

A review of the records indicates that no contamination was detected on the incoming (sampling) radiological survey of the tractor and trailer.

Issue Summary

IMMEDIATE ACTIONS TAKEN: The trailer was parked and posted in a controlled area.

Closure Summary

2/28/2008 -- All corrective actions have been completed; therefore, this effectively closes this Issue.

Action Information:

Sequence	Action ID	Responsible Person	Responsible Organization	Status	Date Due	Date Closed
Action Subject:		Institute 100% direct scan surveys of trailers				
01	20644	Thiel, Dan	817-30 - PORTS Remediation	CL	9/24/2007	9/26/2007

Action Description:

Status Codes: OP-Open; DP-Duplicate; TD-To Be Determined Date; CAN-Client Action Needed; CAD-Client Action Needed Duplicate; RE-Reopened; SP - Similar Plan; CA-Cancelled; CL - Closed; CDP-Closed Duplicate; EC-Externally Closed

Issue Report - Full Text

5/19/2011

Institute 100% direct scan surveys of trailers upon entry to the PORTS site of all trucks to be used for shipments to NTS for fixed contamination greater than 500 dpm alpha and 5000 dpm beta-gamma per 100 square centimeters.

Action Closure Summary:

A copy of an email instituting the requirement of this is attachment as closure evidence; therefore,this effectively closes this issue.

Action Subject: Conduct a review of LPP-EH-4541

02	20645	Thiel, Dan	817-30 - PORTS Remediation	CL	10/10/2007	10/9/2007

Action Description:

Conduct a review of LPP-EH-4541 to assure full compliance the radiological requirements of the NTS WAC.

Action Closure Summary:

10/9/2007 — The Radiological Control Manager conducted a review of the procedure (attached); therefore, this effectively closes this issue.

Action Subject: Conduct a review of the 2005 Radioactive Waste Program Audit Finding

03	20646	Thiel, Dan	817-30 - PORTS Remediation	CL	2/28/2008	2/28/2008

Action Description:

Conduct a review of the 2005 Radioactive Waste Program Audit Finding and re-evaluate the need to invoke transuranic limits on NTS shipment surveys.

Action Closure Summary:

2/28/2008 – A review was conducted. A copy is attached; therefore, this effectively closes this action.

1/14/2008 – Extending due date to 2/28/2008. Additional time is needed to allow for response from NTS.

Action Subject: Review NTS WAC survey requirements

04	20647	Thiel, Dan	817-30 - PORTS Remediation	CL	10/31/2007	10/30/2007

Action Description:

Review NTS WAC survey requirements and this problem report (PR-LPP-07-056) with all Radiation Control Technicians as continuing education.

Status Codes: OP-Open; DP-Duplicate; TD-To Be Determined Date; CAN-Client Action Needed; CAD-Client Action Needed Duplicate; RE-Reopened; SP - Similar Plan; CA-Cancelled; CL - Closed; CDP-Closed Duplicate; EC-Externally Closed

Issue Report - Full Text

5/19/2011

Action Closure Summary:

10/30/2007 – A review was conducted. Attached is a copy of the training module and attendance sheet; therefore, this effectively closes this action.

Action Subject: Evaluate alternative radioactive survey monitoring

05	20648	Thiel, Dan	817-30 - PORTS Remediation	CL	12/14/2007	12/13/2007

Action Description:

Evaluate alternative radioactive survey monitoring equipment for increased efficiency in conducting the trailer surveys.

Action Closure Summary:

12/13/2007 -- radioactive survey monitoring equipment has been evaluated and it has been determined that LPP is currently using the correct instrumentation for this task. A copy of the evaulation letter is on file; therefore, this effectively closes this action.

Status Codes: OP-Open; DP-Duplicate; TD-To Be Determined Date; CAN-Client Action Needed; CAD-Client Action Needed Duplicate; RE-Reopened; SP - Similar Plan; CA-Cancelled; CL - Closed; CDP-Closed Duplicate; EC-Externally Closed

NTS Survey Report

for

2010 Event

NSTec

RADIOLOGICAL SURVEY REPORT – DATA

SURVEY # _10-RW-5-194

Location: Area 5 RWMC	Purpose: Waste Shipments	Comments: See attached printout for swipe locations and totals. See maps for additional comments.	Date/Time: 03/12/10 10:45

Instrument:	Serial #:	Cal Due:	Eff in %: Alpha / Beta	BKG in dpm: Alpha / Beta	MDA in dpm: Alpha / Beta	RWP # 10-0005-01/ 10-0005-03	
TENNELEC	7827055	09/14/10	26.76/40.66	0.75/2.46	15.88/15.14	Work Package # SOP-2151.203	
TENNELEC	39221	01/28/11	26.01/39.82	0.0/3.52	10.41/17.05	RCT Name: P. SALVATO	Signature:
ELECTRA	4845	08/24/10	15.5/25.5	6.5/1408	80/500	RCT Name: F. HENNESSEY	Signature:
ELECTRA ELECTRA	2329 1399	04/30/10 02/22/11	13.4/21.4 14.6/24.9	29.9/1481 0.0/1614	80/500 80/500	RCT Name: S. PENNOCK	Signature:
MODEL-3 RO20	190328 4132	02/16/11 05/26/10	NA	NA	NA	RCT Name: NA	Signature NA:

Survey Point	Description/Comments	Removable dpm/100cm²		Fixed + Removable dpm/100cm²		Gamma mrem/hr	Neutron mrem/hr	Total mrem/hr
		Alpha	Beta	Alpha	Beta			
See Attached	Shipment POL10066,R&R,Tk/Trl 5995/3830104RR (3 PKGS.)	See Attached	See Attached	See Attached	See Attached	See Attached	NA	NA
See Attached	Shipment POL10067, R&R, TK/TRL 6034/3830095 (3 PKGS.)	See Attached	See Attached	See Attached	See Attached	See Attached	NA	NA
See Attached	Shipment POL10068, R&R, TK/TRL 6184/3830043RR (3 PKGS.)	See Attached	See Attached	See Attached	See Attached	See Attached	NA	NA
See Attached	Shipment POL10069, R&R, TK/TRL 6183/3830010 (3 PKGS.)	See Attached	See Attached	See Attached	See Attached	See Attached	NA	NA
See Attached	Shipment POL10070, R&R, TK/TRL 4291/3830140(3PKGS.)	See Attached	See Attached	See Attached	See Attached	See Attached	NA	NA
See Attached	FORK LIFT # 74155	See Attached	See Attached	< MDA	< MDA	NA	NA	NA
NA	NA	NA	NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA	NA	NA	NA

Reviewed By (Print):Bradley Bounds	Signature:	Date: 03/12/2010 3/12/10

NSTec

SUPPLEMENTAL MAP SHEET

Survey # 10-RW-5-194 Page # 4 of 15

Description/Map/Drawing/Picture/Comments 1 SEALAND

PACKAGE# 001156

Shipment # P040067 Truck Company R+R Tractor # 6034 Trailer # 3330095 # of Packages 3

Package # 001157

Package # 001158

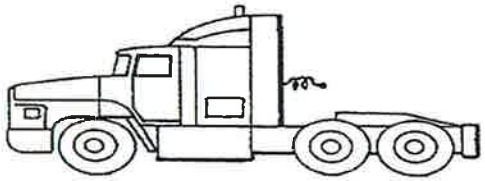
Dose * 1.0 mR/hr γ @ contact

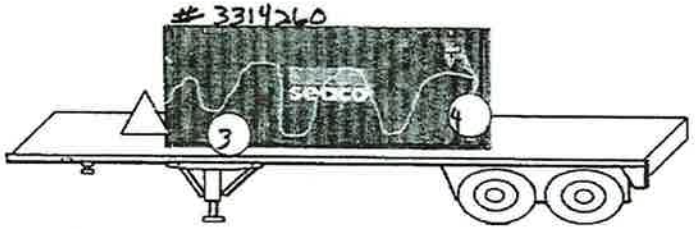
Dose * 0.7 mR/hr γ @ 30cm

Dose * 0.5 mR/hr γ @ 1 m

Dose * 0.05 mR/hr γ @ Cab

Pre-Entry



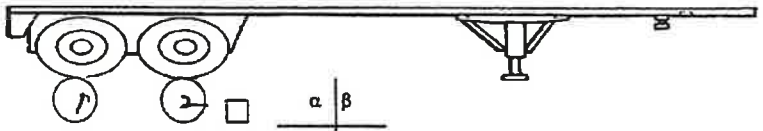


Δ | α | β

∠MDA | ∠MDA

COMMENT: THE ABOVE LISTED PACKAGES ARRIVED INSIDE OF THE ABOVE LISTED SEALAND, AND WILL BE DISPOSED OF AS AN UNOPENED, COMPLETE UNIT, THEREFORE PRE-ENTRY SURVEYS WERE PERFORMED ON THE EXTERIOR OF THE SEALAND.

Exit



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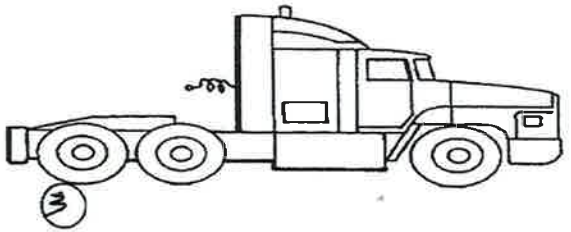
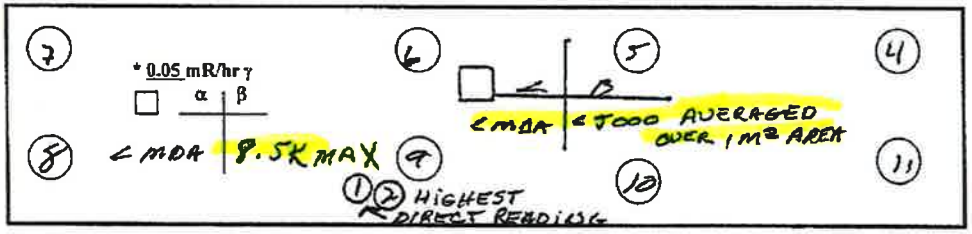
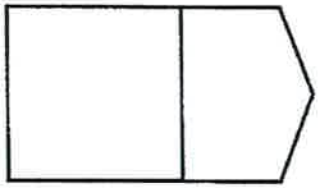


Max Offload On Packages

* 1.0 mR/hr γ





LEGEND

O = Swipe * __/__ = Contact / 30cm γ = gamma β = beta n = neutron x-x-x-x = Boundary Δ = LAW ☐: Direct dpm/100cm²

NSTec

SUPPLEMENTAL MAP SHEET Survey # 10-RW-5-194 Page # 11 of 15

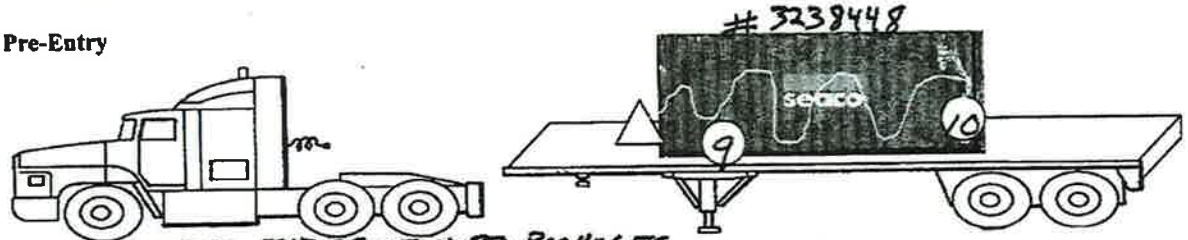
Description/Map/Drawing/Picture/Comments 1 SEALAND

PACKAGE # 001150

Shipment # P0110070 Truck Company R+R Tractor # 4291 Trailer # 3830140 # of Packages 5

Package # 001151
Package # 001152
Dose * 1.0 mR/hr γ @ contact
Dose * 0.7 mR/hr γ @ 30cm
Dose * 0.5 mR/hr γ @ 1 m
Dose * 0.05 mR/hr γ @ Cab

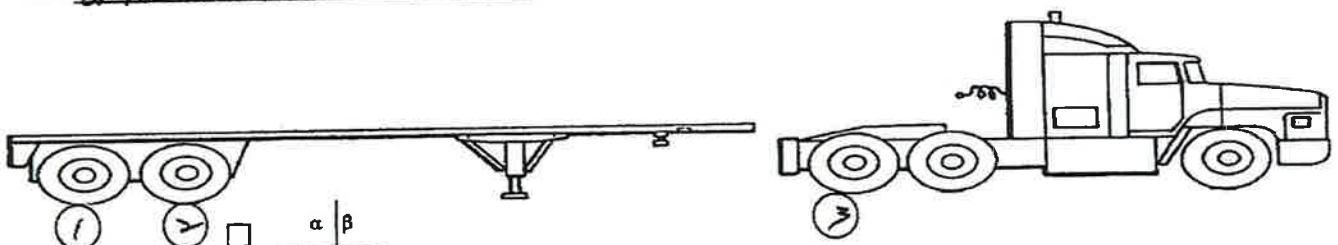
Pre-Entry



COMMENT: THE ABOVE LISTED PACKAGES ARRIVED INSIDE OF THE ABOVE LISTED SEALAND, AND WILL BE DISPOSED OF AS AN UNOPENED, COMPLETE UNIT. THEREFORE PRE-ENTRY SURVEYS WERE PERFORMED ON THE EXTERIOR OF THE SEALAND.

Exit

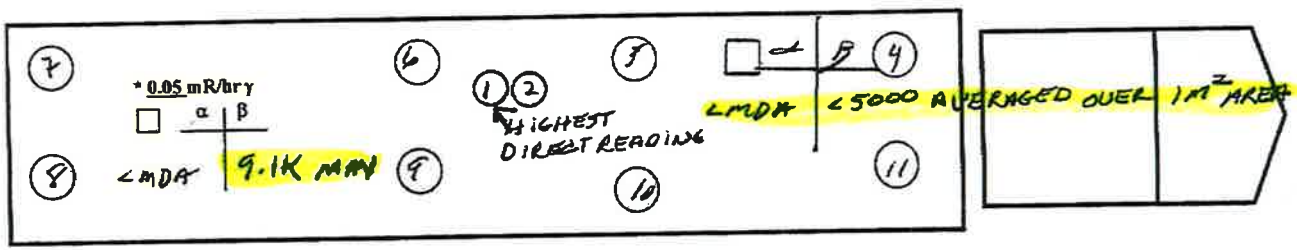
Δ | α | β
LMDA | LMDA



α | β
LMDA | LMDA

Max Offload On Packages

* 1.0 mR/hrγ



LEGEND
O = Swipe * __/__ = Contact / 30cm γ = gamma β = beta n = neutron x-x-x-x = Boundary Δ = LAW □: Direct dpm/100cm²

FRM- 01080 (08-06)

Problem Reports

from

Incoming Surveys

LPP - 2005 -2011

LATA/PARALLAX PORTSMOUTH, LLC

PROBLEM REPORT

Urbach, J. Chris (Prepared By (Print))	702501 (Employee/Badge No.)	3021 (Extension)	REPORT NUMBER: PR-LPP- 07 - 060

Discovery Date: 9/26/07 Discovery Time: 1500 hrs. Building No.: 747H Facility Mgr.: Bob Tieman

Dwg/Spec/Procedure/Work Pkg No./Rev.: Passed on to Supervision to confirm receipt? ☐ No ☐ Yes – Supt/Mgr:

DESCRIPTION OR NATURE OF PROBLEM: (Describe the details of this incident; i.e., who [titles only], what, why, when, and where.)

While performing a receipt survey on an empty flat-bed trailer (number 4827) to be used for a low level radwaste shipment to the Nevada Test Site, the Radiological Control Technician found total (fixed) contamination levels in excess of 10 CFR 835, Appendix D Values. The levels were below the Department of Transportation limits specified in 49 CFR Part 173. The highest fixed level was 5,225 dpm/100 cm^2 beta/gamma (the Appendix D total contamination value for Uranium is 5,000 dpm/100 cm^2). No removable contamination was discovered. The affected area was approximately 10 inches by 10 inches and was located at the approximate middle of the truck-bed, on the right-hand passenger side. No alpha contamination detected.

Industrial Safety Concern ☐ NCS Concern ☐ Suspect/Counterfeit Item Concern ☐ Radiological Exposure/Contamination Concern ☒

IMMEDIATE ACTIONS TAKEN: (Identify qty. and location of any QA HOLD tags or other means used to identify the nonconforming items.)

Trailer was temporarily posted as Controlled Area, FCA (Fixed Contamination Area). The affected spot was marked with a yellow grease marker. Shipping notified the trucking company (A.J. Mettler) at 1530 hours of the issue. They will be returning to retrieve their conveyance.

RECOMMENDED CORRECTIVE ACTIONS TO PREVENT RECURRENCE:

Emphasize to the trucking companies that they need to do a better job in surveying their trailers prior to sending them to PORTS.

Fax PR to ext. 2500. Then call 2569, 4771, 3442, Pager 289-0344, or 740-370-5333 to confirm receipt. PM Initials: _____

ENGINEER/ SUBJECT MATTER EXPERT COMPLETE BELOW

TYPE OF SSC:

☐ CAT 2-Related[1]
☐ CAT 2-Related[2]
☐ NTS-Related
☐ Other Type
☒ Not an SSC

Regulatory Impact:

☐ DSA/TSR
☐ PHS
☐ NCS/Anom. Cond. Level ____
☐ Environmental Compliance
☒ None

INITIAL ASSESSMENT

	Y	N	N/A
1. Is Facility/Component Operable?	☒	☐	☐
2. Is System Operable?	☒	☐	☐
3. Is Incident ORPS Reportable?	☐	☒	☐

Categorization Date: : 9-26-2007 Time: 1710

ORPS CATEGORIZATION/EVALUATION/COMMENTS/CORRECTIVE ACTIONS:

- The limits for contamination per ORPS reporting criteria is 10 times the 10CFR 835 limits or 50,000 dpm/100 cm2 total contamination. This does not meet ORPS criteria 6B(3)3 or any other ORPS reporting criteria.
- This problem report is not ORPS reportable.

Eng/SME Signature: _____

ESH&Q COMPLETE BELOW

Action:

☐ Enter in I/CATS to develop a Corrective Action Plan
☐ Enter in I/CATS that corrective actions are already completed
☒ No Corrective Actions needed. Entry in I/CATS not required.

QA Manager: _____ Date: _____

Linked in I/CATS via:

☐ Occurrence Report (No.: _____)
☐ Anomalous Condition (No.: _____ Level : ____)
☐ Other: _____
☐ N/A

Issue Owner:

I/CATS Issue Number:

Issue Entered in I/CATS: _____ Date: _____
Issues Management Coordinator

PAAA Screening: ☐ NTS Reportable ☐ Non-NTS Reportable ☐ N/A

PAAA Coord.: Date:

CAT 2-Related[1] = Safety Class, Safety Significant, or Design Feature Structure, System or Component
CAT 2-Related[2] = Other than a Safety Class, Safety Significant, or Design Feature Structure, System or Component

LATA/PARALLAX PORTSMOUTH, LLC

PROBLEM REPORT

Urbach, J. Chris Prepared By (Print)	702501 Employee/Badge No.	3021 Extension	**REPORT NUMBER** **PR-LPP- 07 - 063**

Discovery Date: 9/28/07 Discovery Time: 1030 hrs. Building No.: 747H Facility Mgr.: Bob Tieman

Dwg/Spec/Procedure/Work Pkg No./Rev.: Passed on to Supervision to confirm receipt? ☐ No ☐ Yes – Supt/Mgr:

DESCRIPTION OR NATURE OF PROBLEM: (Describe the details of this incident; i.e., who [titles only], what, why, when, and where.)

While performing a receipt survey on an empty flat-bed trailer (number 238318) to be used for a low level radwaste shipment to the Nevada Test Site, the Radiological Control Technician found total (fixed) contamination levels in excess of 10 CFR 835, Appendix D Values. The levels were below the Department of Transportation limits specified in 49 CFR Part 173. No removable contamination was discovered. The highest readings were found at the approximate middle of the truck-bed, on the right-hand/ passenger side. The fixed Beta/ Gamma Contamination level was 10,463 dpm/ 100cm^2. The fixed contamination covered an approximate area of 10 x 36 inches, (360in^2.)

The fixed contamination area was marked with orange grease marker.

Industrial Safety Concern ☐ NCS Concern ☐ Suspect/Counterfeit Item Concern ☐ Radiological Exposure/Contamination Concern ☒

IMMEDIATE ACTIONS TAKEN: (Identify qty. and location of any QA HOLD tags or other means used to identify the nonconforming items.)

Trailer posted as Controlled Area, FCA (Fixed Contamination Area) until removed from plant site.
Shipping notified at 1040hrs, and they contacted the truck company. (TSMC)

RECOMMENDED CORRECTIVE ACTIONS TO PREVENT RECURRENCE:

Fax PR to ext. 2500. Then call 2569, 4771, 3442, Pager 289-0344, or 740-370-5333 to confirm receipt. PM Initials: _____

ENGINEER/ SUBJECT MATTER EXPERT COMPLETE BELOW

TYPE OF SSC:

- ☐ CAT 2-Related[1]
- ☐ CAT 2-Related[2]
- ☐ NTS-Related
- ☐ Other Type
- ☒ Not an SSC

Regulatory Impact:

- ☐ DSA/TSR
- ☐ PHS
- ☐ NCS/Anom. Cond. Level ____
- ☐ Environmental Compliance
- ☒ None

INITIAL ASSESSMENT

	Y	N	N/A
1. Is Facility/Component Operable?	☒	☐	☐
2. Is System Operable?	☒	☐	☐
3. Is Incident ORPS Reportable?	☐	☒	☐

Categorization Date: : 10/1/2007 Time: 1630

ORPS CATEGORIZATION/EVALUATION/COMMENTS/CORRECTIVE ACTIONS:

- The limits for contamination per ORPS reporting criteria is 10 times the 10CFR 835 limits or 50,000 dpm/100 cm2 total contamination. This does not meet ORPS criteria 6B(3)3 or any other ORPS reporting criteria.
- This problem report is not ORPS reportable.

Eng/SME Signature: _____

ESH&Q COMPLETE BELOW

Action:

- ☐ Enter in I/CATS to develop a Corrective Action Plan
- ☐ Enter in I/CATS that corrective actions are already completed
- ☐ No Corrective Actions needed. Entry in I/CATS not required.

QA Manager: _____ Date: _____

Linked in I/CATS via:

- ☐ Occurrence Report (No.: _____)
- ☐ Anomalous Condition (No.: _____ Level : ___)
- ☐ Other: _____
- ☐ N/A

Issue Owner:

I/CATS Issue Number:

Issue Entered in I/CATS: _____ Date: _____
Issues Management Coordinator

PAAA Screening: ☐ NTS Reportable ☐ Non-NTS Reportable ☐ N/A

PAAA Coord.: Date:

CAT 2-Related[1] = Safety Class, Safety Significant, or Design Feature Structure, System or Component
CAT 2-Related[2] = Other than a Safety Class, Safety Significant, or Design Feature Structure, System or Component

LATA Parallax
LATA/PARALLAX PORTSMOUTH, LLC

PROBLEM REPORT

Paul S. Bowen (Prepared By (Print))	60571 (Employee/Badge No.)	6348 (Extension)	REPORT NUMBER: PR-LPP- 08 - 020

Discovery Date: 4/7/08 Discovery Time: 08:30 Building No.: X-206B Facility Mgr.: Joe Halcomb

Dwg/Spec/Procedure/Work Pkg No./Rev.: LPP-EH-4541

Passed on to Supervision to confirm receipt? ☐ No ☐ Yes – Supt/Mgr:

DESCRIPTION OR NATURE OF PROBLEM: (Describe the details of this incident; i.e., who [titles only], what, why, when, and where.)

A Radiological Control Technician discovered fixed contamination while performing an incoming radiological survey on Metler tractor trailer #4825.Two spots on the rear of the trailer were identified with total beta-gamma contamination levels of 8019dpm/100cm2 and 15,730dpm/100cm^2. These values are above the 10 CFR 835 Appendix D limit of 5000dpm/100cm^2 for total contamination. Loose contamination above the 10 CFR 835 Appendix D limit was not detected. The trailer was to be used for loading intermodal containers from the X-744Y Converter Shell Project for shipment to the Nevada Test Site.

The surveys were performed in accordance with procedure LPP-EH-4541 *Radiological Surveys to Support Waste Shipments to the Nevada Test Site.*

The contamination detected on the trailer did not exceed DOT limits found in 49 CFR 173.443. This regulation only addresses loose contamination and has no limits for fixed radioactive contamination.

Industrial Safety Concern ☐ NCS Concern ☐ Suspect/Counterfeit Item Concern ☐ Radiological Exposure/Contamination Concern ☒

IMMEDIATE ACTIONS TAKEN: (Identify qty. and location of any QA HOLD tags or other means used to identify the nonconforming items.)

Representatives from Metler were notified and the trailer was not accepted for use by LPP.

☐ determine the extent of the condition.

RECOMMENDED CORRECTIVE ACTIONS TO PREVENT RECURRENCE:

Fax PR to ext. 2500. Then call 2569, 4771, 3442, Pager 289-8440, or 740-370-5333 to confirm receipt. PM Initials: _____

ENGINEER/ SUBJECT MATTER EXPERT COMPLETE BELOW

TYPE OF SSC:

☐ CAT 2-Related
☐ NTS-Related
☐ Other Type
☒ Not an SSC

Regulatory Impact:

☐ DSA/TSR
☐ PHS
☐ NCS/Anom. Cond. Level ____
☐ Environmental Compliance
☒ N/A

INITIAL ASSESSMENT

	Y	N	N/A
1. Is Facility/Component Operable?	☐	☐	☒
2. Is System Operable?	☐	☐	☒
3. Is Incident ORPS Reportable?	☐	☒	☐

Categorization Date: 4/7/2008 Time: 1500

ORPS CATEGORIZATION/EVALUATION/COMMENTS/CORRECTIVE ACTIONS:

- This incident does not meet any ORPS reporting criteria. This was fixed contamination on a trailer that was detected before it was accepted for use on this site. This contamination level is not above the DOT limit or the ORPS reporting level of 50,000 DPM per 100^2 cm.

Eng/SME Signature: _____ Date: _____

ESH&Q COMPLETE BELOW

Action:

☐ Enter in I/CATS to develop a Corrective Action Plan
☐ Enter in I/CATS that corrective actions are already completed
☐ No Corrective Actions needed. Entry in I/CATS not required.

QA Manager: _____ Date: _____

Linked In I/CATS via:

☐ Occurrence Report (No.: _____)
☐ Anomalous Condition (No.: _____ Level : ___)
☐ Other: _____
☐ N/A

Issue Owner:

I/CATS Issue Number:

Issue Entered in I/CATS: _____ Date: _____
Issues Management Coordinator

PAAA Screening: ☐ NTS Reportable ☐ Non-NTS Reportable ☐ N/A

PAAA Coord.: Date:

Event Fact Sheets

from

BJC – 2003 - 2005

Bechtel Jacobs Company LLC

PORTSMOUTH EVENT FACT SHEET

This Fact Sheet should be completed whenever an event of ES&H, operational, or quality significance occurs. See Instructions for completing a "Portsmouth Event Fact Sheet" for guidance on completing this form.

BJC Point of Contact: Lewis Goidell Phone Number: 3844

Date of Event: 9/15/03 Time of Event: 1500 hours EST

Fact Sheet Number: WD-03-09-16-107 Location: Cisco, Utah

(ORG-YR-MO-DY-#-REV.#)

I. Background:

- 6,500 to 8,000 DPM/100cm2 beta contamination levels were found on four (4) pinion trucks during receipt inspection of the trucks in Cisco, Utah.
- The trucks were to be used for transporting BJC-PORTS intermodal containers (filled with low level radioactive waste scrap metal from the X-747H Scrap Yard) to the Nevada Test Site (NTS). The intermodals were to be emptied at NTS and returned to Cisco, Utah on the trucks. From Cisco they would be returned to BJC at Portsmouth Gaseous Diffusion Plant, Piketon Ohio (PORTS) by rail.
- The contamination was found during receipt inspection of the trucks and the trucks were not accepted. The contamination was associated with greasy surfaces on fifth wheel pinions, fifth wheel pads and jack stands.

II. Incident and Response Chronology (Timeline):

- Time: 1700 Event: 6,500 to 8,000 DPM/100cm2 beta/gamma contamination levels were found on four (4) pinion trucks during receipt inspection of the trucks in Cisco, Utah.

III. ES&H Impact
Time: Event:

IV. Categorization
Time: Event:

V. Notfications
Time: 1130 Notified: P/QA

VI. Compliance Issues/Violations
Time: 1300 Event: 9/16/03 - Issue is being screened against occurrence reporting group 6, Transportation of DOE Hazardous Material and 10, Management Concern. Contamination is less than 10,000 DPM/100CM2 reporting criteria.

VII. Recovery Actions
Time: 9/16/03 Event: Decontaminate trucks

VIII. Additional Information

- Landstar Ranger Inc, a subcontractor to MHF Logistical Solutions INC, provided the trucks.
- Decontamination of the vehicles is in progress.
- This Fact Sheet was filed because the receipt inspection radiological survey result were unanticipated.
- Report as of 1325 hours on 9/16/03 from Greg Carter, PGDP SEC Site Manager, the trucks had been successfully decontaminated and were being loaded with intermodal containers.

Completed By: Chris Watkins / Print Name / Signature Title: QA Engineer Date: 9/16/03

Deliver Fact Sheet, with available information, to associated PM/FM, STR, PQA, ES&H, and MOP (or Designees) within 2 hours after event. The BJC Point of Contact on the Fact Sheet will generally be the applicable PM/FM. If an event is potentially reportable as an occurrence, Jackie Adkins, Dan Longpre, or Bonnie Spencer must be notified immediately, or in their absence the PSS. Occurrence reports must be categorized within 2 hours of event identification.

Bechtel Jacobs Company LLC

PORTSMOUTH EVENT FACT SHEET

This Fact Sheet should be completed whenever an event of ES&H, operational, or quality significance occurs. See Instructions for completing a "Portsmouth Event Fact Sheet" for guidance on completing this form.

BJC Point of Contact:	Mike Kidd	Phone Number:	2159
Date of Event:	12-09-03	Time of Event:	1015 hours
Fact Sheet Number:	IFR-03-12-09-155, R1	Location:	X-747H Scrap Yard

(ORG-YR-MO-DY-#-REV.#)

I. Background:

- Removable contamination was found on the flatbed truck posted as a Radioactive Material Area.
- The truck was used to haul scrap material from X-747G to X-747H Scrap Metal Yard.
- Meter readings indicate 33,000 DPM beta/gamma fixed and 1,800 DPM beta/gamma removable contamination.
- The truck is being leased from DKM for use by BJC at the X-747H and X-747G Scrap Yards
- Surveys were being conducted to prepare the truck for return to DKM

New Information - Revision 1

- Information from additional surveys indicates that the source of the initial meter readings was from radioactive material in the bed of the truck and not from removable contamination. The truck was correctly posted as a Radioactive Material Area.

II. Incident and Response Chronology (Timeline):

- Time: 1015 Event: Radiological Control Technician found contamination
- Time: 1015 Event: SEC Lead informed. Project Superintendent calls PSS
- Time: 1045 Event: Contamination area establish around the truck

III. ES&H Impact

- None

IV. Notifications for Fact Sheet

- Time: 1016 Notified: SEC Lead informed.
- Time: 1036 Notified: Project Superintendent and PSS informed
- Time: 1037 Pager message sent
- Time: 1050 Notified PQA/QE

V. Occurrence Report Categorization (BJC and PSS Concurrence)

VI. Compliance Issues/Violations

- None

VII. Recovery Actions

- None
- Remove radioactive material from truck bed
- Complete survey of truck and release truck to DKM

VIII. Additional Information

- Truck is posted for Radioactive Material Area.

Completed By: Chris Watkins/ Title: QA Engineer Date: 12/9/03

Print Name / Signature

By signing this fact sheet you attest that you have delivered the Fact Sheet, with available information, to associated PM/FM, STR, PQA, ES&H, FS, NSL, PSS, and MOP (or Designees) within 1 hour after event for on-shift incidents, and by 1000 the next business day for off-shift incidents. The BJC Point of Contact on the Fact Sheet will generally be the applicable PM/FM. Occurrence reports must be categorized within 2 hours of event discovery.

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Bechtel Jacobs Company LLC

PORTSMOUTH EVENT FACT SHEET

This Fact Sheet should be completed whenever an event of ES&H, operational, or quality significance occurs. See Instructions for completing a "Portsmouth Event Fact Sheet" for guidance on completing this form.

BJC Point of Contact:	Lewis Goldell	Phone Number:	3844
Date of Event:	03-08-04	Time of Event:	1000
Fact Sheet Number:	IFR-04-03-08-029, * Rev.2	Location:	X-747H Scrap Yard

(ORG-YR-MO-DY-#-REV.#)

I. Background:

- *Deposits of dirt containing detectable levels or radioactivity were found on 6 intermodal boxes and 1 railcar returning from NTS Nevada. The radioactive material appears to be coming from dirt buildup on the intermodals and railcar. The dirt build up is up to an inch thick and is a brown-red brick color. *It was not expected that these containers would be returned with a dirt buildup.
- *Direct meter readings performed by PORTS RCT indicate 400-600 DPM beta/gamma total contamination on dirt accumulations on the railcar and intermodal containers. These levels, although detected at PORTS, are within the DOE release limit of 5000 DPM beta/gamma total contamination and the DOT transportation limit of 22,000 DPM beta/gamma total contamination.
- Dirt build up appears to be concentrated on external areas of the intermodals that were protected from the weather.
- * Transportation labeling on the 4 of the 6 intermodals removed from the railcar may not fully meet the 49 CFR 173.428 requirements to remove, obliterate or cover previously applied labels. Some of the labels on the 6 intermodal containers have been removed, partially obliterated or covered. However, a Package Certification Label, three Waste Information Labels, two Bill of Ladings and four Barcode Labels were still legible and in good condition on 4 of the intermodal containers.

II. Incident and Response Chronology (Timeline):

- Time: about 1000 Event: RCT identifies detectable contamination on railcar and intermodal containers from NTS
- Time: afternoon Event: collected excess dirt from railcar.

III. ES&H Impact

- None

IV. Notifications for Fact Sheet

- Time: 1000 Notified: SEC Lead Informed.
- Time: 1015 Notified: Project Superintendent/*Field Engineer Informed
- Time: 1400 Notified: WCO Informed
- Time: 1530 Notified: PQA/QE Informed

Time: 1710 Notification: PSS Informed

V. Occurrence Report Categorization (BJC and PSS Concurrence)

Not reportable: Contamination levels are less then reporting limits

VI. Compliance Issues/Violations
- None

VII. Recovery Actions
- Removed accumulations amounts of dirt from railcar
- Complete survey of railcar and intermodal containers
- Determine source and cause of contamination
- Resolve labeling issues with MHF/Wastren and NTS

VIII. Additional Information
- Railcar GCCX200023
- Intermodal numbers: MHFU 1980, MHFU 2199, MHFU 1779, MHFU 2154, MHFU 2115 and MHFU 1966.

Completed By: Chris Watkins/ Title: QA Engineer Date: 03/10/04

Print Name / Signature

By signing this fact sheet you attest that you have delivered the Fact Sheet, with available information, to associated PM/FM, STR, PQA, ES&H, FS, NSL, PSS, and MOP (or Designees) within 1 hour after event for on-shift incidents, and by 1000 the next business day for off-shift incidents. The BJC Point of Contact on the Fact Sheet will generally be the applicable PM/FM. Occurrence reports must be categorized within 2 hours of event discovery.

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Document ID: PLN-3962
Revision ID: 1
Effective Date: 11/07/2011

Corrective Action Plan

ICAMS: IO-013580

Fixed Radioactive Contamination Found on INL Waste Shipping Trailer at Nevada National Security Site

The INL is a U.S. Department of Energy National Laboratory
operated by Battelle Energy Alliance.

Corrective Action Plan

for the

Fixed Radioactive Contamination Found on INL Waste Shipping Trailer at Nevada National Security Site

PLN-3962
Revision 1

Incident Date: August 16, 2011

Approved by:

V. Lynn Wadsworth — 11-2-2011
V. Lynn Wadsworth
INL Cause Analyst
Date

Rob Black — 11/3/2011
Rob Black
INL Subcontract Technical Representative
Waste Management Program
Date

11/3/2011
Randall Bargelt
INL Director
Waste Management Program
Date

REVISION LOG

Rev.	Date	Affected Pages	Revision Description
0	09/15/11	All	New issue. See eCR 596766.
1	11/07/11	15	Corrected objective evidence requirement for Action 2. See eCR 598854.

EXECUTIVE SUMMARY

On August 16, 2011, an Idaho National Laboratory (INL) radioactive waste shipment was unloaded at the Nevada National Security Site (NNSS). Fixed radioactive contamination was detected in the middle of the wooden trailer bed by NNSS radiological control personnel during the exit survey. The contamination levels exceeded the NNSS waste acceptance criteria requirements for releasing a shipment from the site. NNSS notified Battelle Energy Alliance (BEA) that the trailer was impounded until the contamination could be removed. Following notification by NNSS, BEA notified the Department of Energy Idaho Operations Office (DOE-ID) of the incident and launched an investigation.

On August 17, 2011, the DOE Nevada Site Office Radioactive Waste Acceptance Program task manager transmitted a corrective action request regarding the incident. The corrective action request requested a corrective action plan be submitted to the Radioactive Waste Acceptance Program office no later than September 22, 2011, identifying actions to resolve the deficient condition, root causes of the incident, and planned corrective actions to preclude recurrence of the deficiency. On August 19, 2011, DOE-ID formally transmitted the corrective action request to BEA and requested the corrective action plan be submitted to DOE-ID no later than September 15, 2011.

On August 18, 2011, BEA held a critique as part of the investigation and issued a long-term, timely order providing detailed survey requirements for all subsequent INL radioactive shipments. The investigation identified the following three factors considered causal to this event:

1. NNSS waste acceptance criteria survey requirements were not clearly communicated to health physics personnel.
2. The pre-load survey conducted was a spot check and did not include all areas of the trailer deck.
3. INL radiological control procedures lack detailed survey guidance to meet different radioactive material shipment requirements.

The causal analysis identified the following four corrective actions that are required to avoid recurrence of this incident:

1. The INL radiological control manager will issue a long-term, timely order, with interim guidelines, for surveys for radioactive shipments.
2. The INL Radiological Control organization will review MCP-139, “Radiological Surveys,” to determine survey requirements for shipments, incorporate these survey requirements into the long-term order (until MCP-139 can be revised), and initiate a procedure change to MCP-139 to incorporate the changes.
3. Radiological control will incorporate any necessary requirements into the long-term order (until MCP-139 can be revised) and initiate a procedure change to MCP-139 to incorporate any changes
4. The INL Packaging and Transportation organization and the INL Waste Generator Services organization will revise applicable procedures, as necessary, to incorporate any necessary changes.

All corrective actions will be implemented on or before November 22, 2011. The long-term, timely order will remain in effect until the corrective actions are implemented. The corrective actions will be entered and tracked in the INL Corrective Actions Management System. Completion of the actions will be formally documented in the INL Corrective Actions Management System.

On August 22, 2011, NNSS agreed to remove the contaminated sections of the trailer's wooden deck to resolve the deficient condition. The contaminated wood will be dispositioned at the NNSS radioactive waste disposal facility.

CONTENTS

ACRONYMS

CC	cause code
CF	causal factor
DOT	Department of Transportation
EO	equipment operator
HP	health physics (technician)
INL	Idaho National Laboratory
MFC	Materials and Fuels Complex
NNSS	Nevada National Security Site
ORSA	Outside Radiological Storage Area
P&T	packaging and transportation
RFS	request for services
SRAAD	shipment request for radioactive material
WCO	waste certification official
WDS	waste disposition specialist
WGS	Waste Generator Services
WTS	waste technical specialist

1. SCOPE OF INVESTIGATION

This scope of this investigation is to identify the causal factors and corrective actions in response to fixed contamination discovered by the Nevada National Security Site (NNSS) radiological control personnel on a Tri-State waste shipping trailer that was shipped from the Materials and Fuels Complex (MFC) at the Idaho National Laboratory (INL).

2. EVENT DESCRIPTION

On July 27, 2011, a Waste Generator Services (WGS) waste disposition specialist (WDS) electronically submitted a shipment request-radioactive (SRRAD) to the Packaging and Transportation (P&T) organization. The SRRAD was submitted in accordance with LWP-2501, "Requesting Hazardous and/or Radioactive Materials Shipments or Receipts." The SRRAD requested transport of eleven radioactive waste containers from MFC to NNSS on August 15, 2011. The SRRAD was approved by the P&T organization on August 1, 2011.

On August 3, 2011, a WGS waste technical specialist (WTS) electronically submitted a request for services (RFS) to the MFC work control administration center. The RFS requested craft and radiological control support to be assigned to a low-level radioactive waste shipment from MFC to NNSS. The RFS requested that the shipment be scheduled for August 15, 2011. The RFS was approved by MFC facility management on August 3, 2011, and the MFC planning lead on August 5, 2011.

On August 8, 2011, a Tri-State Motor Transit driver delivered a commercial flatbed trailer to MFC for the shipment. The driver unhooked the trailer near MFC-783, Rigging Test Facility, and the driver exited MFC. The trailer was delivered a week early to allow flexibility for loading the trailer if resources could be scheduled earlier than August 15, 2011. An incoming radiological survey was not conducted. The tender agreement, under which Tri-State provides transport services, requires Tri-State to provide transport vehicles that meet all applicable 49 CFR, "Transportation," requirements.

On August 10, 2011, the WTS contacted the MFC radiological control supervisor to discuss the possibility of loading the trailer earlier than August 15, 2011. After making additional inquiries, the WTS discovered that equipment operator (EO) resources could not be scheduled to load the trailer earlier than August 15, 2011.

On August 11, 2011, the approved treatment, storage, and disposal facility plan of the week was issued for August 11 through August 17, 2011. The waste shipment was included as activity number MM162638. The WTS notified the MFC radiological control supervisor that the shipment was scheduled for August 15, 2011. The supervisor responded that a health physics (HP) technician was assigned to the shipment.

On August 15, 2011, the following activities occurred:

- At 7:30 a.m., the WTS contacted the radiological control supervisor to identify the HP assigned to the shipment. The WTS contacted the HP and requested a pre-load survey of the trailer. The HP stated he had to perform the weekly instrument calibrations and he would not be available to conduct the survey before 9:00 a.m. The HP stated that the calibration to be performed included the instruments needed to survey the shipment.
- Following the call to the HP, the WTS contacted the EO supervisor to identify the EOs assigned to the shipment.
- At 8:00 a.m., the WTS discussed the loading operation with the EOs and logged onto the radiological work permit at the same time as the EOs.

- At 8:30 a.m., the Tri-State driver arrived onsite with a truck, hooked up the trailer, and moved the truck and trailer to an area adjacent to MFC-797, Outside Radiological Storage Area (ORSA). The WTS conducted other shipment preparation duties while waiting for the HP to arrive at ORSA for the pre-load survey.
- At 9:00 a.m., the WTS, P&T shipper, EOs, and HP met at the trailer location near ORSA. The HP conducted the pre-load survey of the truck and trailer. The survey was conducted in accordance with MCP-139, "Radiological Surveys." Direct reading surveys conducted were spot checks performed on the trailer by standing on the ground and reaching in as far as able (approximately 2.5 ft). No contamination was found on the smears or scans. The middle of the trailer was not surveyed for fixed contamination.
- Following the survey of the truck and trailer, a 20-ft cargo container of low-level radioactive waste was removed from ORSA and surveyed by the HP. The survey was performed in accordance with MCP-139, LRD-15001, "Radiological Controls Manual," and direction from P&T. The HP survey included taking a variety of direct readings, smears, and large area wipes. All radiological readings were checked against the shipping paperwork, which included the SRRAD and previous radiological survey results. The cargo container was loaded onto the front of the trailer.
- The truck and trailer were moved to MFC-794, Contaminated Equipment Storage Building. The ten boxes targeted for shipment were identified by the WTS. The HP surveyed each box before it was moved and staged outside MFC-794 near the trailer. The surveys included direct readings, smears, and large area wipes. All radiological readings were checked against the SRRAD and previous radiological survey results. The staged boxes were loaded onto the rear section of the trailer. The boxes were placed in the middle of the trailer behind the cargo container. Four to six feet of the trailer bed was left empty. The boxes were secured and covered with a tarp.
- At 11:06 a.m., the HP originated the radiological survey map (number M-20110815-15) in the INL Visual Survey Data System.
- At 12:21 p.m., the HP completed and printed the radiological survey map (number M-20110815-15). The status box on the survey map stated "Ready for Review."
- The waste certification official (WCO), WDS, WTS, and P&T shipper reviewed the survey map and completed the shipping paperwork. The WCO completed Form 435.89, "NNSS Shipment Checklist." The WCO, WTS, and WDS completed appropriate sections of Form 435.93, "NNSS Waste Certification Official Shipment Checklist." The P&T shipper completed Form 460.10, "Shipment Checklist for Radioactive Material Transportation," in accordance with MCP-9810, "Shipment and Receipt of Hazardous Materials."
- At 1:30 p.m., the P&T shipper released the driver and shipment. The shipment departed MFC for NNSS.

On August 16, 2011, the following activities occurred:

- The waste shipment arrived at NNSS.
- NNSS personnel unloaded the waste containers from the trailer.
- NNSS radiological control surveyed the waste containers during the unloading process. No contamination was detected on any of the containers.
- NNSS radiological control surveyed the truck as part of the facility exit process. No contamination was detected on the inside or outside of the truck.

- NNSS radiological control surveyed the trailer as part of the facility exit process and discovered fixed radioactive contamination in the middle of the trailer bed. The maximum levels of contamination were 21,000 dpm/100 cm^2 alpha and 71,000 dpm/100 cm^2 beta/gamma. The fixed contamination levels exceeded the 10 CFR 835, Appendix D, limits for releasing the trailer from the site per the NNSS waste acceptance criteria.
- NNSS radiological control personnel re-surveyed the INL waste containers for radioactive contamination. No contamination was detected on the INL waste containers.
- NNSS radiological control personnel surveyed the NNSS material handling equipment that was used for unloading the INL waste containers. No contamination was detected on the material handling equipment.
- NNSS radiological control personnel verbally notified the Tri-State driver that the trailer was being impounded due to contamination. The Tri-State driver verbally notified MFC P&T that the trailer was being impounded.
- MFC P&T verbally notified MFC WGS and MFC radiological control personnel that the trailer was impounded.
- NNSS personnel requested a copy of the MFC preload survey map. MFC WGS personnel provided an electronic version of the preload survey map via e-mail.
- MFC WGS personnel requested a copy of the NNSS release survey map. NNSS personnel faxed the preload survey map to the WDS.
- WGS personnel discussed contamination readings with NNSS radiological control. WGS personnel asked if the contamination could be attributed to radon. NNSS personnel agreed to re-survey the trailer the following morning to rule out the possibility of radon contamination.
- The MFC radiological control supervisor approved the MFC preload survey map after notification from NNSS that the trailer was contaminated.

On August 17, 2011, the following activities occurred:

- The NNSS Radioactive Waste Acceptance Program manager informs the INL WGS WCO that the contamination is not radon and that a corrective action request would be issued by NNSS.
- The NNSS auditor e-mailed information on the corrective action request to the INL WGS WCO.

On August 18, 2011, a fact finding critique was held with INL radiological control, P&T, WGS, MFC operations, and DOE-ID representatives. Immediate action taken following the critique included the INL radiological control program issuing a long-term, timely order, providing survey guidance for radiological shipments.

Additional corrective actions identified during the critique included:

- INL radiological control would revise MCP-139 to determine survey requirements for shipments.
- INL radiological control, P&T, and WGS would meet to discuss the different types of shipments that are normally conducted at INL and the associated requirements. The group would develop a checklist or revise procedures, as necessary, to incorporate requirements for the different types of shipments to ensure compliance.

3. FACTS

- 07/27/11 A WGS WDS submitted an SRRAD form to request that P&T provide a truck and trailer for a radioactive waste shipment to NNSS.
- 08/03/11 A WGS WTS submitted an RFS requesting MFC craft and HP support be scheduled to support the shipment.
- 08/08/11 A Tri-State commercial trailer was delivered to MFC. An incoming radiological survey was not conducted on the trailer because surveys are not required to be performed on this type of trailer. Tri-State is required to provide trailers that are compliant with DOT regulations.
- 08/10/11 The WTS contacted the radiological control supervisor and discussed the possibility of loading the trailer on August 11, 2011. Resources were not available to load on August 11, 2011.
- 08/11/11 The treatment, storage, and disposal facility plan of the week was issued for August 11 through August 17, 2011. The shipment was on the plan of the week for August 15, 2011.
- 08/15/11-0730 The WTS contacted the radiological control supervisor to find the HP that was assigned to the shipment. The WTS contacted the assigned HP and requested the pre-load survey of the trailer. The HP was unavailable until 0900. After contacting the HP, the WTS contacted the EO supervisor and discussed EO support for loading the trailer.
- 08/15/11-0800 The WTS met with the EOs to discuss loading the trailer. The WTS and EOs logged onto the radioactive work permit assigned to the job.
- 08/15/11-0830 The Tri-State truck driver arrived at MFC, connected the trailer, and moved the trailer to ORSA.
- 08/15/11-0900 The HP performed the pre-load survey of the truck and trailer. The survey conducted was a spot check and did not include all areas of the trailer deck. MCP-139 or LRD-15001 does not provide detailed survey guidance to meet different radioactive material shipment requirements.
- 08/15/11 A 20-ft cargo container was surveyed and loaded onto the front of the trailer. The HP survey did not detect radiation or contamination levels above release limits for the cargo container.
- 08/15/11 The trailer was moved to MFC-794 and ten waste boxes were surveyed and loaded onto the trailer. The HP survey did not detect radiation or contamination levels above release limits for the 10 boxes.

- 08/15/11-1221 The HP completed the radiation and contamination survey map #M-20110815-15 for the waste containers, truck, and trailer. The HP printed a survey map for WGS and P&T review. The status box of the survey map included the text "Ready for Review," the name of the HP, and the date. The status box did not clearly indicate the approval status (e.g., approved or pending approval) or identify the title of the intended reviewer. INL radiological control procedures do not require INL radiological control approval of a survey map prior to shipment. P&T Form 460.10, Section D, was completed for the shipment, with the check box marked "Yes" for an approved survey map prior to shipping. The radiological control supervisor approved the survey map on August 16, 2011.

- 08/15/11 The WCO completed Form 435.89. The WCO, WTS, and WDS completed Form 435.93.

- 08/15/11 The P&T shipper completed Form 460.10.

- 08/16/11 NNSS radiological control personnel discovered fixed radioactive contamination in the middle of the trailer bed. The maximum contamination levels were 21,000 dpm/100 cm^2 alpha and 71,000 dpm/100 cm^2 beta/gamma. The levels exceeded the 10 CFR 835, Appendix D, limits as required by the NNSS waste acceptance criteria. The levels are within DOT limits.

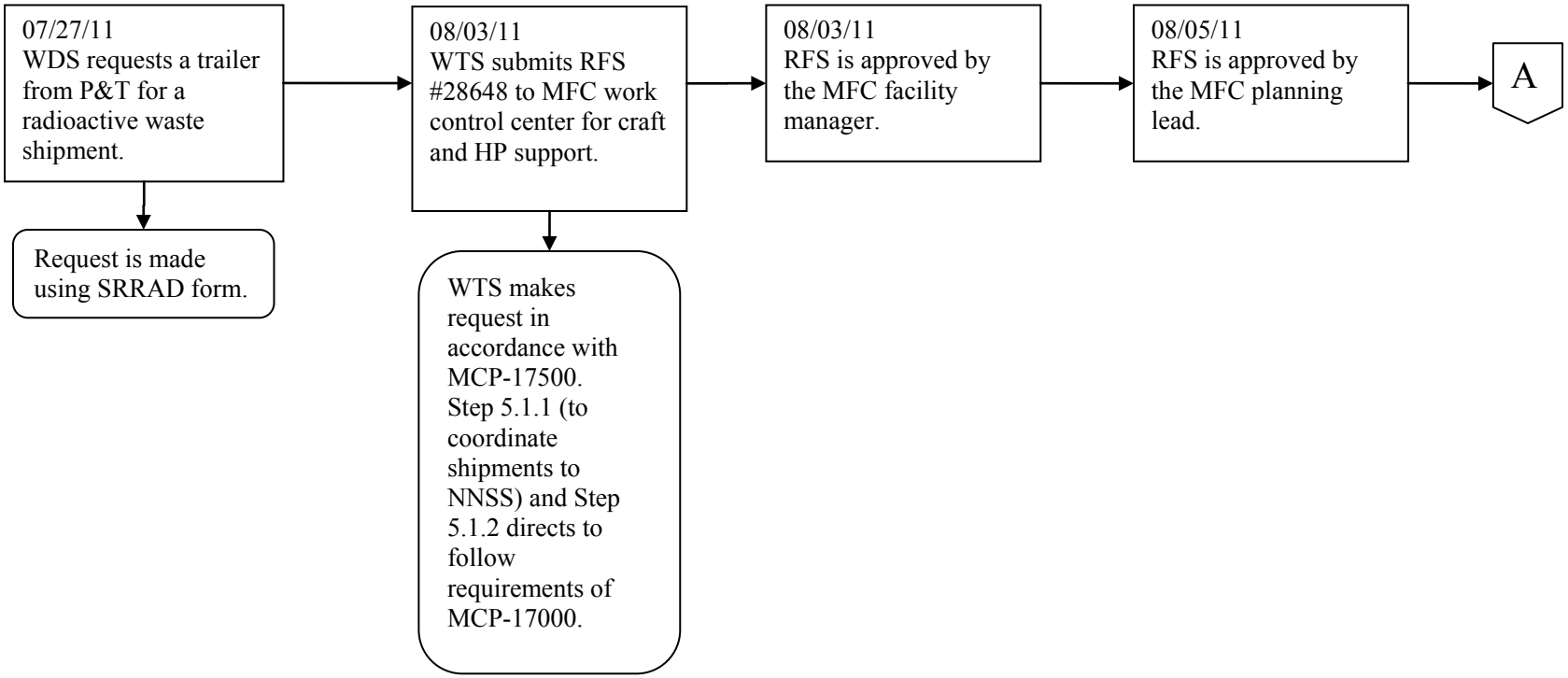
4. ANALYSIS

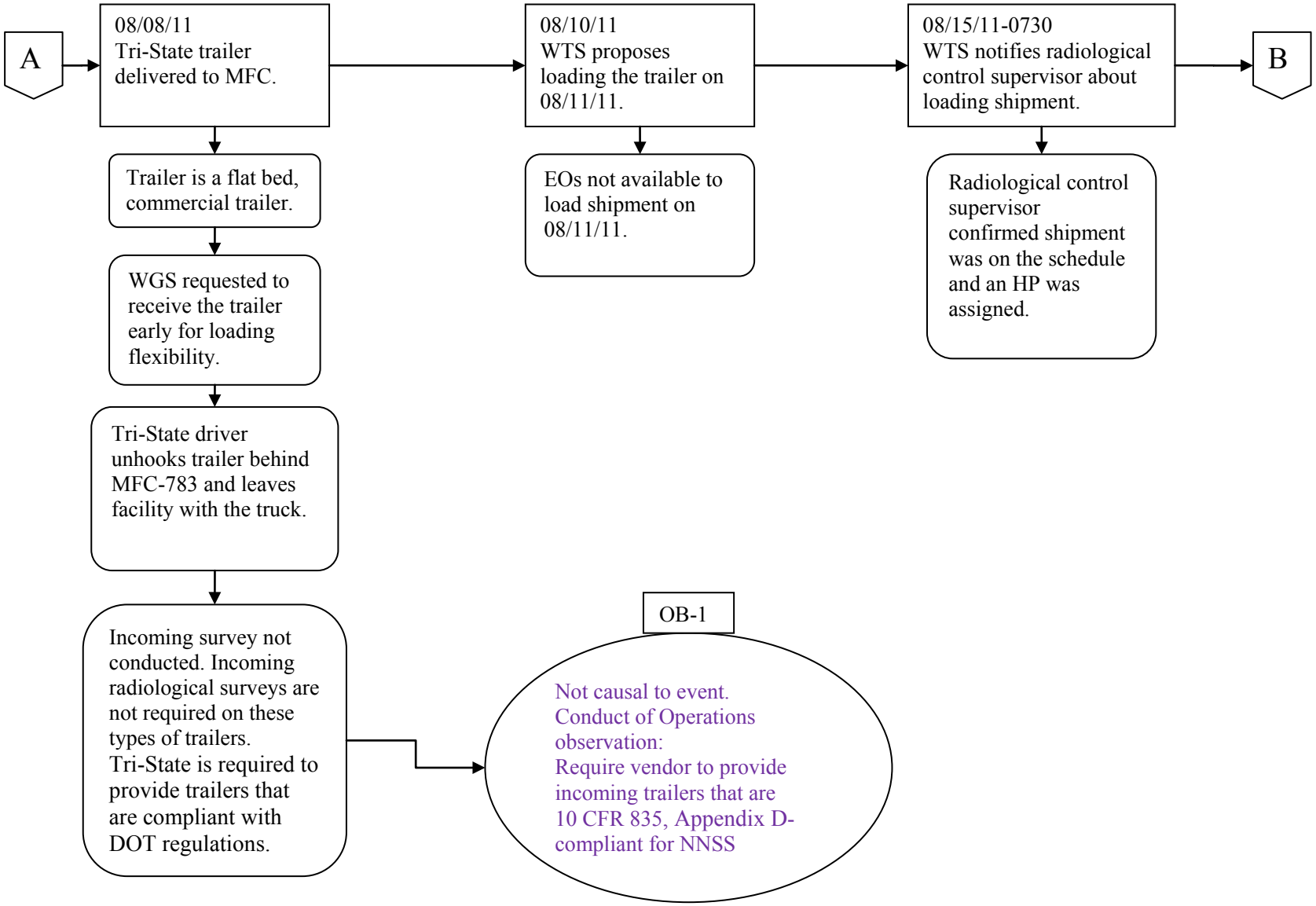
An event and casual factors chart was used to identify causes to this event. The analysis was performed by an INL cause analyst in accordance with LWP-13845, "Cause Analysis, Action Planning, and Investigation Report Process," and included document reviews and interviews with personnel that were directly involved.

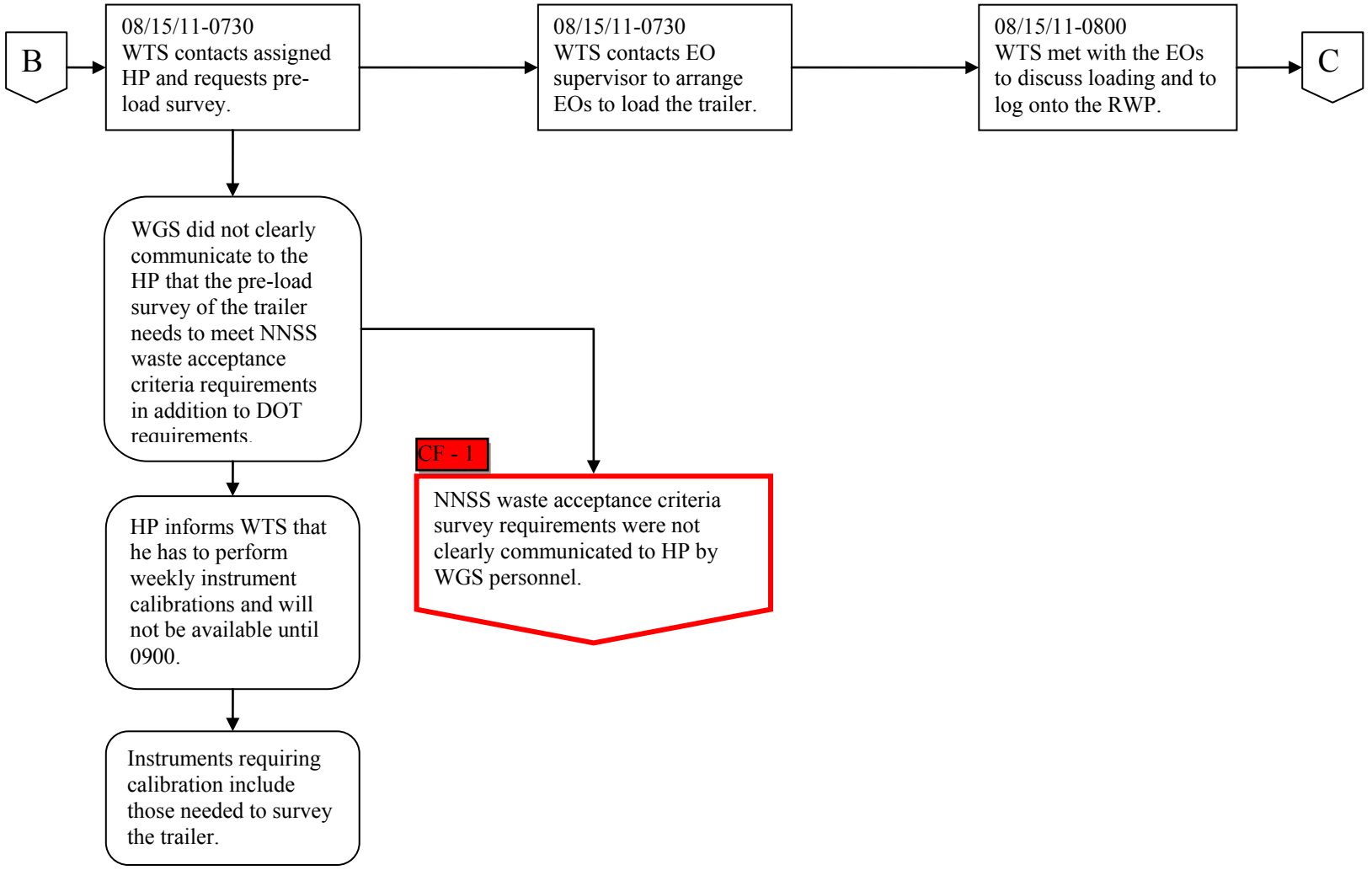
The analysis requires the use of one of the approved investigation analytical techniques identified in LWP-13485. The technique selected by the cause analyst is the event and causal factor chart. This technique is used for analyzing multifaceted problems such as a system or plant events. The technique provides a visual display of the analysis process and identifies probable contributors to the incident. The technique also helps to identify where deviations occurred from acceptable methods. Development of the chart assists the cause analyst in identifying the causal factors (CFs) associated with the incident. The CFs are denoted in the red-lined pentagons on the chart in Section 4.1. The CFs will be analyzed in Section 4.2.

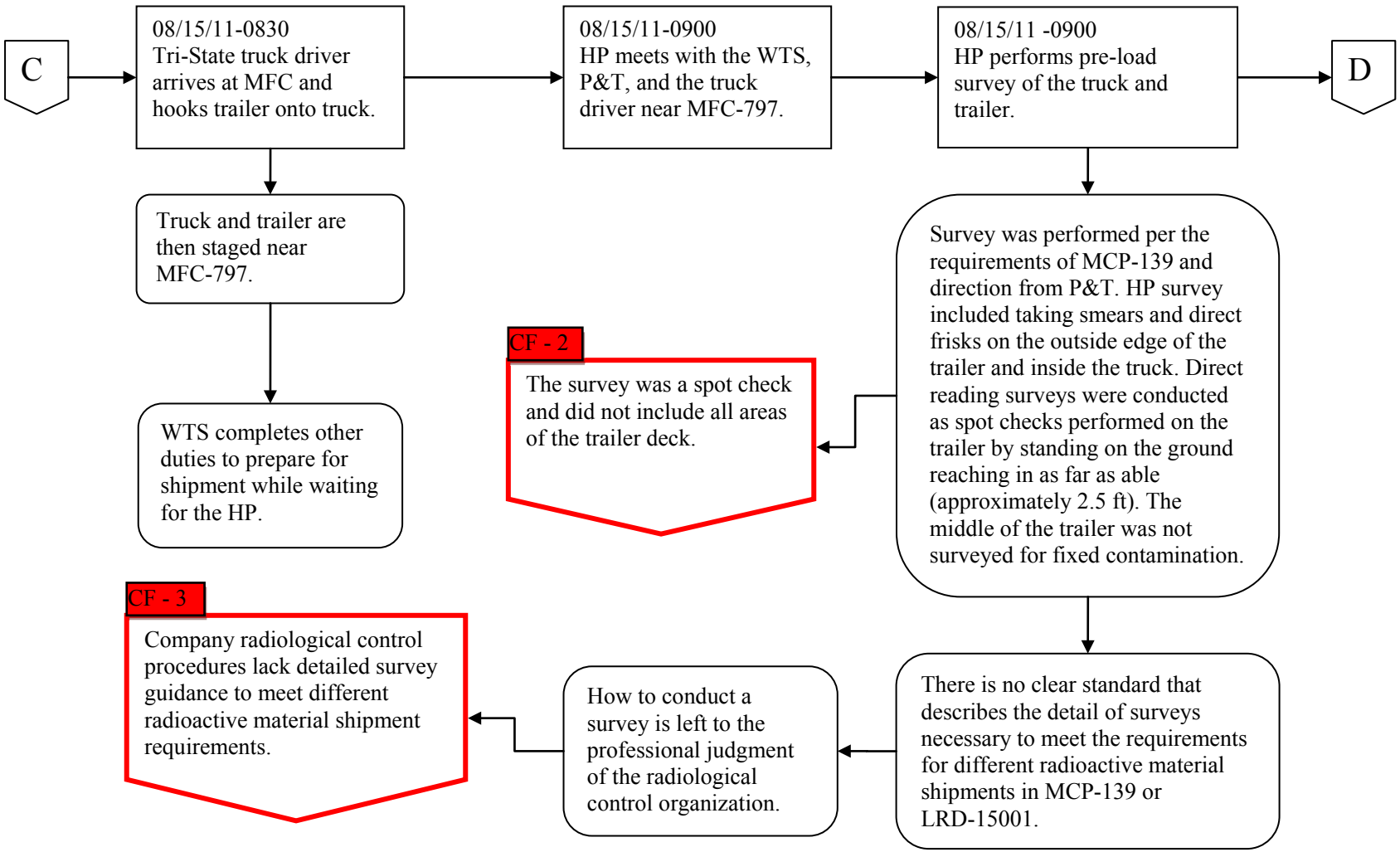
During analysis of the incident, the cause analyst identified three observations that could improve the processes used during the preparation, loading, and surveying of outgoing shipments. None of the observations met the definition of a causal factor. The observations are denoted in the purple ovals on the chart in Section 4.1.

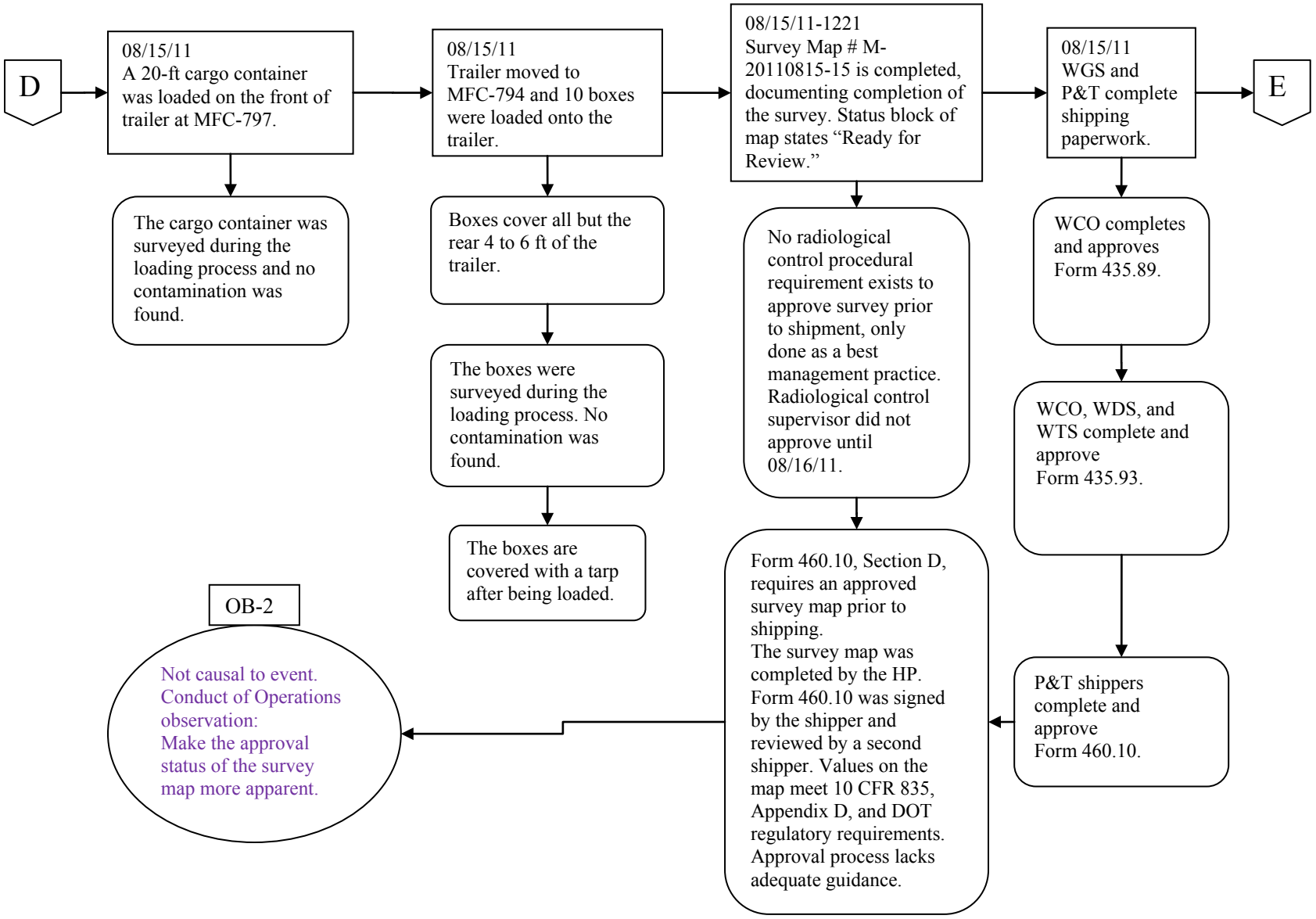
4.1 Event and Causal Factors Chart

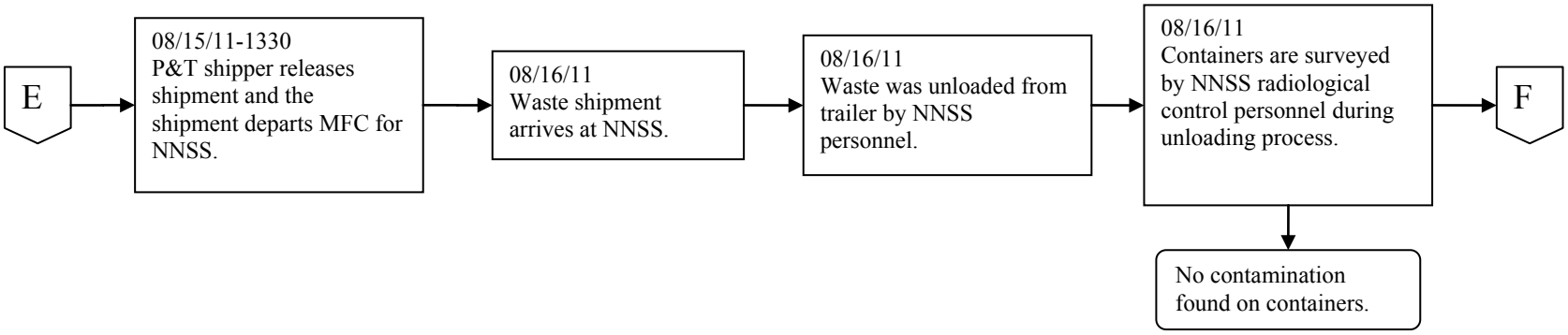


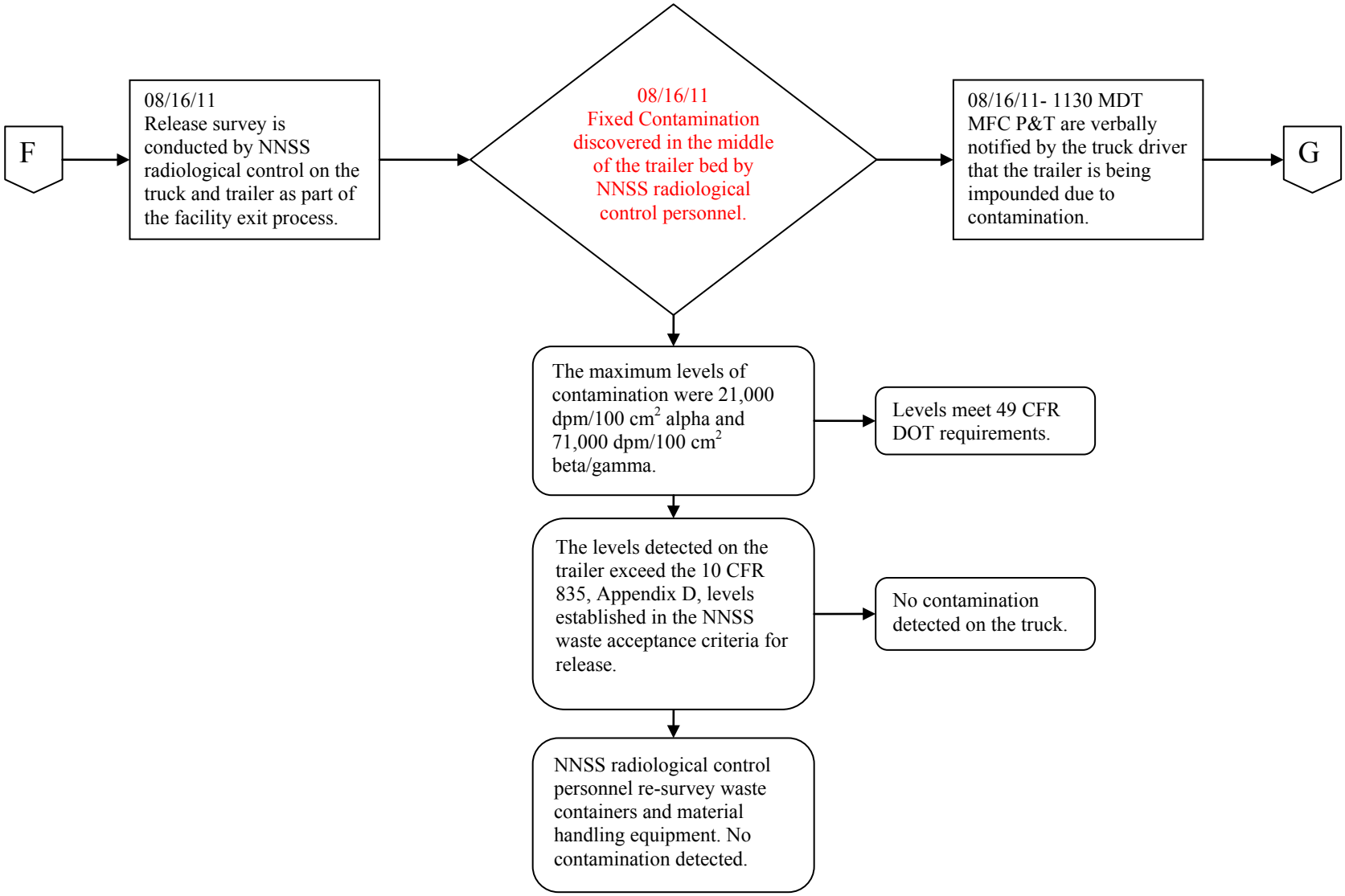

A
08/08/11
Tri-State trailer delivered to MFC.
08/10/11
WTS proposes loading the trailer on 08/11/11.
08/15/11-0730
WTS notifies radiological control supervisor about loading shipment.
B
Trailer is a flat bed, commercial trailer.
EOs not available to load shipment on 08/11/11.
Radiological control supervisor confirmed shipment was on the schedule and an HP was assigned.
WGS requested to receive the trailer early for loading flexibility.
Tri-State driver unhooks trailer behind MFC-783 and leaves facility with the truck.
Incoming survey not conducted. Incoming radiological surveys are not required on these types of trailers.
Tri-State is required to provide trailers that are compliant with DOT regulations.
OB-1
Not causal to event.
Conduct of Operations observation:
Require vendor to provide incoming trailers that are 10 CFR 835, Appendix D-compliant for NNSS

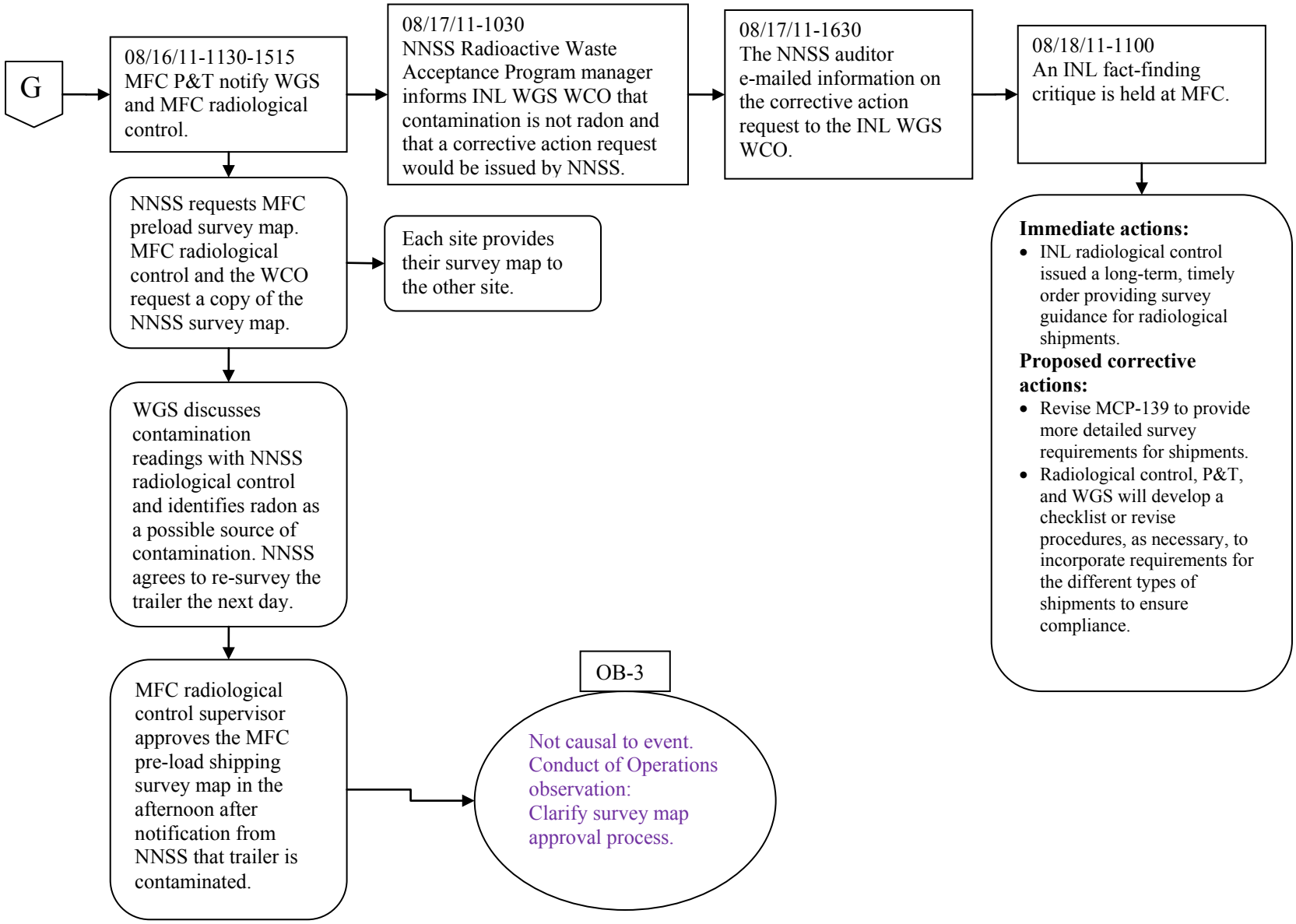

B
08/15/11-0730
WTS contacts assigned HP and requests pre-load survey.
08/15/11-0730
WTS contacts EO supervisor to arrange EOs to load the trailer.
08/15/11-0800
WTS met with the EOs to discuss loading and to log onto the RWP.
C
WGS did not clearly communicate to the HP that the pre-load survey of the trailer needs to meet NNSS waste acceptance criteria requirements in addition to DOT requirements.
CF - 1
NNSS waste acceptance criteria survey requirements were not clearly communicated to HP by WGS personnel.
HP informs WTS that he has to perform weekly instrument calibrations and will not be available until 0900.
Instruments requiring calibration include those needed to survey the trailer.


C
08/15/11-0830
Tri-State truck driver arrives at MFC and hooks trailer onto truck.
08/15/11-0900
HP meets with the WTS, P&T, and the truck driver near MFC-797.
08/15/11 -0900
HP performs pre-load survey of the truck and trailer.
D
Truck and trailer are then staged near MFC-797.
WTS completes other duties to prepare for shipment while waiting for the HP.
CF - 2
The survey was a spot check and did not include all areas of the trailer deck.
Survey was performed per the requirements of MCP-139 and direction from P&T. HP survey included taking smears and direct frisks on the outside edge of the trailer and inside the truck. Direct reading surveys were conducted as spot checks performed on the trailer by standing on the ground reaching in as far as able (approximately 2.5 ft). The middle of the trailer was not surveyed for fixed contamination.
CF - 3
Company radiological control procedures lack detailed survey guidance to meet different radioactive material shipment requirements.
How to conduct a survey is left to the professional judgment of the radiological control organization.
There is no clear standard that describes the detail of surveys necessary to meet the requirements for different radioactive material shipments in MCP-139 or LRD-15001.


D
08/15/11
A 20-ft cargo container was loaded on the front of trailer at MFC-797.
The cargo container was surveyed during the loading process and no contamination was found.
08/15/11
Trailer moved to MFC-794 and 10 boxes were loaded onto the trailer.
Boxes cover all but the rear 4 to 6 ft of the trailer.
The boxes were surveyed during the loading process. No contamination was found.
The boxes are covered with a tarp after being loaded.
08/15/11-1221
Survey Map # M-20110815-15 is completed, documenting completion of the survey. Status block of map states "Ready for Review."
No radiological control procedural requirement exists to approve survey prior to shipment, only done as a best management practice. Radiological control supervisor did not approve until 08/16/11.
Form 460.10, Section D, requires an approved survey map prior to shipping.
The survey map was completed by the HP. Form 460.10 was signed by the shipper and reviewed by a second shipper. Values on the map meet 10 CFR 835, Appendix D, and DOT regulatory requirements. Approval process lacks adequate guidance.
OB-2
Not causal to event.
Conduct of Operations observation:
Make the approval status of the survey map more apparent.
08/15/11
WGS and P&T complete shipping paperwork.
WCO completes and approves Form 435.89.
WCO, WDS, and WTS complete and approve Form 435.93.
P&T shippers complete and approve Form 460.10.
E


E
08/15/11-1330
P&T shipper releases shipment and the shipment departs MFC for NNSS.
08/16/11
Waste shipment arrives at NNSS.
08/16/11
Waste was unloaded from trailer by NNSS personnel.
08/16/11
Containers are surveyed by NNSS radiological control personnel during unloading process.
F
No contamination found on containers.


F
08/16/11
Release survey is conducted by NNSS radiological control on the truck and trailer as part of the facility exit process.
08/16/11
Fixed Contamination discovered in the middle of the trailer bed by NNSS radiological control personnel.
08/16/11- 1130 MDT
MFC P&T are verbally notified by the truck driver that the trailer is being impounded due to contamination.
G
The maximum levels of contamination were 21,000 dpm/100 cm2 alpha and 71,000 dpm/100 cm2 beta/gamma.
Levels meet 49 CFR DOT requirements.
The levels detected on the trailer exceed the 10 CFR 835, Appendix D, levels established in the NNSS waste acceptance criteria for release.
No contamination detected on the truck.
NNSS radiological control personnel re-survey waste containers and material handling equipment. No contamination detected.


G
08/16/11-1130-1515
MFC P&T notify WGS and MFC radiological control.
08/17/11-1030
NNSS Radioactive Waste Acceptance Program manager informs INL WGS WCO that contamination is not radon and that a corrective action request would be issued by NNSS.
08/17/11-1630
The NNSS auditor e-mailed information on the corrective action request to the INL WGS WCO.
08/18/11-1100
An INL fact-finding critique is held at MFC.
NNSS requests MFC preload survey map. MFC radiological control and the WCO request a copy of the NNSS survey map.
Each site provides their survey map to the other site.
Immediate actions:
• INL radiological control issued a long-term, timely order providing survey guidance for radiological shipments.
Proposed corrective actions:
• Revise MCP-139 to provide more detailed survey requirements for shipments.
• Radiological control, P&T, and WGS will develop a checklist or revise procedures, as necessary, to incorporate requirements for the different types of shipments to ensure compliance.
WGS discusses contamination readings with NNSS radiological control and identifies radon as a possible source of contamination. NNSS agrees to re-survey the trailer the next day.
MFC radiological control supervisor approves the MFC pre-load shipping survey map in the afternoon after notification from NNSS that trailer is contaminated.
OB-3
Not causal to event.
Conduct of Operations observation:
Clarify survey map approval process.

4.2 Causal Factors and Cause Codes

The event and casual factors chart in Section 4.1 identifies three CFs for the incident. The cause analyst used the causal analysis tree in Table A-1 of LWP-13845 as a tool for analyzing the CFs, identifying the root causes, and assigning cause codes (CCs) associated with the incident. The CCs also assisted in development of the corrective actions to ensure the incident will not reoccur. One or more CCs from the causal analysis tree have been assigned to each of the CFs as follows:

CF-1: NNSS waste acceptance criteria survey requirements were not clearly communicated to HP by WGS personnel.

CC-A5B4C01 – Communications between work groups less than adequate.

Discussion: The WGS procedure MCP-17500, Steps 5.1.17 and 5.1.18, were established to ensure that surveys are performed on transportation equipment and that contamination levels do not exceed 10 CFR 835, Appendix D, limits. Discussions with WGS personnel concluded that the requirements/expectations of the NNSS waste acceptance criteria were not clearly communicated to radiological control personnel performing the surveys.

CF-2: The survey was a spot check and did not include all areas of the trailer deck.

CC-A3B2C05 – Situation incorrectly identified or represented, resulting in the wrong rule used.

CC-A3B3C06 – Individual underestimated problem, using past as basis.

CC-A5B4C01 – Communications between work groups less than adequate.

Discussion: The HP stated in a personnel statement and the fact finding critique that the pre-load survey of the trailer was a spot check. The survey on the trailer was performed from the ground while reaching in approximately 2.5 ft from the edge of the trailer. Direct scans were completed around the edge of the trailer, but not in the middle of the trailer. The resulting survey map indicated that the trailer met 10 CFR 835, Appendix D, requirements. Based on his professional judgment, past experience, and the fact that MCP-139 or LRD-15001 does not provide specific details concerning the survey of these types of shipments, he believed that the survey was adequate. In addition, the NNSS waste acceptance criteria requirements were not clearly communicated to him by WGS personnel.

CF-3: INL radiological control procedures lack detailed survey guidance to meet different radioactive material shipment requirements.

CC-A4B1C01 – Management policy guidance/expectations not well-defined, understood, or enforced.

Discussion: MCP-139 or LRD-15001 does not describe (in enough detail) how surveys should be conducted for these types of shipments. The following is an example: MCP-139, Section 4.7.2, "Outgoing Material Shipments," Step 4.7.2.11 states, "perform additional contamination surveys as required by the shipping agent, on packages and/or transportation vehicle."

4.3 Corrective Actions

1. Radiological control manager will issue a long-term, timely order with interim guidelines for surveys for radioactive shipments.

   Objective evidence: Documentation demonstrating timely order was implemented by responsible organizations.

Causal factor(s) addressed: CF-2 and CF-3

Due date: September 30, 2011

2. Radiological control will review MCP-139 to determine survey requirements for shipments. Incorporate these survey requirements into the long-term order (until MCP-139 can be revised) and initiate a procedure change to MCP-139 to incorporate the changes.

   Objective evidence: Documentation demonstrating MCP-139 revision has been initiated in the INL Electronic Document Management System.

   Causal factor(s) addressed: CF-2 and CF-3

   Due date: October 31, 2011

3. Radiological control, P&T, and WGS will meet to discuss all the different shipment types normally encountered and the associated requirements and develop a checklist or revise associated procedures, as necessary, to incorporate requirements for all of the different shipments to ensure compliance (including those requirements that exist in waste acceptance criteria documents or other similar documentation) as follows:

   - Radiological control will incorporate any necessary requirements into the long-term order (until MCP-139 can be revised) and initiate a procedure change to MCP-139 to incorporate any changes.

     Objective Evidence: Documentation demonstrating MCP-139 was formally revised in the INL Electronic Document Management System.

     Causal factor(s) addressed: CF-2 and CF-3

     Due Date: November 15, 2011

   - P&T and WGS will revise applicable procedures, as necessary, to incorporate any necessary changes.

     Objective evidence: Documentation demonstrating procedures were formally revised in the INL Electronic Document Management System OR formal documentation approved by the BEA waste management director stating why applicable procedures were not revised.

     Causal factor(s) addressed: CF-1

     Due date: November 15, 2011.

4.4 Observations and Actions for Consideration

OB-1. Require vendor to provide incoming trailers that are 10 CFR 835, Appendix D-compliant for NNSS shipments.

Requiring the vendor to provide incoming trailers that are 10 CFR 835, Appendix D-compliant for NNSS shipments would provide defense-in-depth to avoid re-occurrence of the incident. The impact of this recommendation would be minimal. WGS would be required to request a shipment trailer 1 or 2 days earlier.

OB-2. Make the approval status of the survey map more apparent.

The statement “Ready for Review” on the status line of the survey map is ambiguous. Replacing the statement with “Not Approved – Ready for Review by HP Supervisor,” or similar language, would provide clarity and not infer that the survey map was ready for the P&T shipper and WCO to review.

OB-3. Clarify survey map approval process.

No radiological control procedural requirement exists to approve a survey prior to shipment. The volume of survey maps generated each day is very large and, in most cases, is appropriate to be approved at the discretion and convenience of the radiological control supervisor. Clear guidance on approving survey maps should be provided to radiological control personnel.

4.5 Personnel Interviewed

Name	Title	Company
Bryan King	MFC HP	BEA
Trenna Le Page	MFC radiological control supervisor	BEA
Jon Jacobson	MFC WTS	EnergySolutions
Rodney Allen	MFC WDS	EnergySolutions
Deb Rowley	MFC P&T shipper	AREVA
Troy Taylor	P&T shipper	AREVA
Tim Brown	Alternate WCO	EnergySolutions
Don Darrington	P&T program manager	BEA
Allen Cain	WGS manager	EnergySolutions
Rebecca Guertal	WCO	EnergySolutions
Jessica Waters	MFC radiological control supervisor	BEA
Rob Black	Waste Management Program, Subcontract Technical Representative	BEA

5. CONCLUSION

An INL radioactive waste shipment was unloaded at NNSS and fixed radioactive contamination was detected in the middle of the wooden trailer bed during the exit survey. The contamination levels exceeded the requirements for releasing a shipment from the site.

BEA launched an investigation of the incident and issued a long-term, timely order, providing detailed survey requirements for all subsequent INL radioactive shipments. The investigation identified three factors considered causal to this event and four corrective actions that are required to avoid recurrence of this incident.

The corrective actions will be implemented on or before November 22, 2011. The long-term, timely order will remain in effect until the corrective actions are implemented and the contaminated sections of the trailer wooden deck will be removed to resolve the deficient condition.

6. REFERENCES

10 CFR 835, “Occupational Radiation Protection”

49 CFR, “Transportation”

Form 435.89, “NNSS Shipment Checklist”

Form 435.93, “NNSS Waste Certification Official Shipment Checklist”

Form 460.10, “Shipment Checklist for Radioactive Material Transportation”

LRD-15001, “Radiological Control Manual”

LWP-2501, “Requesting Hazardous and/or Radioactive Materials Shipments or Receipts”

LWP-13845, “Cause Analysis, Action Planning, and Investigation Report Process”

MCP-139, “Radiological Surveys”

MCP-9810, “Shipment and Receipt of Hazardous Materials”

MCP-17000, “Waste Generator Services Waste Management”

MCP-17500, “Waste Generator Services Certification of Waste Shipments to the Nevada National Security Site”

DEPARTMENT OF ENERGY
National Nuclear Security Administration
Los Alamos Site Office
Los Alamos, New Mexico 87544

FEB 29 2012

Mr. Scott A. Wade
Assistant Manager
Environmental Management
Department of Energy
National Nuclear Security Administration
Nevada Site Office
P.O. Box 98518
Las Vegas, NV 89193-8518

Dear Mr. Wade:

Subject: Corrective Action Plan (CAP) for Radioactive Waste Acceptance Program (RWAP)-C-11-09 Radioactive Contamination Found on Los Alamos National Laboratory Waste Shipments at Nevada National Security Site

The Los Alamos Site Office (LASO) is submitting the enclosed corrective action plan (CAP), which incorporates revisions based on the comment resolution meeting held at the Nevada Site Office on February 15, 2012, for approval.

Los Alamos National Security, LLC, as discussed during our meeting on February 15 and 16, 2012, has already initiated implementing the corrective actions identified in the CAP prior to approval to improve waste management and transportation practices at the Los Alamos National Laboratory. LASO expects to have objective evidence documentation available for the Nevada Site Office and the Radioactive Waste Acceptance Program (RWAP) review by the end of March 2012, if not sooner. The Waste Certification Official will coordinate with RWAP on submittal of the objective evidence for review prior to the site visit.

The Los Alamos Site Office looks forward to closing out this CAP as soon as possible, and resuming use of the disposal options offered by the Nevada National Security Site.

If you have any question, please contact George Henckel at (505) 606-0960 or electronically at George.Henckel@nnsa.doe.gov.

Peter Maggiore for George J. Rael
George J. Rael
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Corrective Action Plan

RWAP-C-11-09

Radioactive Contamination Found on LANL Waste Shipments at Nevada National Security Site

LA-UR-11-06372

Los Alamos
NATIONAL LABORATORY
EST. 1943

Radioactive Contamination Found on LANL Waste Shipments at Nevada National Security Site

LA-UR-11-06372

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Table of Contents

Acronyms

ADEP	Associate Directorate Environmental Protection
ADESH	Associate Directorate Environmental Safety and Health
AWCO	Alternate Waste Certification Official
CAO-PF	Contractor Assurance Office-Performance Feedback
CAP	Corrective Action Plan
CAR	Corrective Action Request
CFR	Code of Federal Regulations
DOE	Department of Energy
DOT	Department of Transportation
LANL	Los Alamos National Laboratory
LTA	Less Than Adequate
MDA	Material Disposal Area
NNSS	Nevada National Security Site
PCL	Package Certification Label
RCT	Radiological Controls Technician
RP-1	Radiation Protection Group
RWAP	Radioactive Waste Acceptance Program
TA	Technical Area
VSP	Visual Sample Plan
WAC	Waste Acceptance Criteria
WCO	Waste Certification Official
WDR	Waste Disposal Request
WCP	Waste Certification Program
WP	Waste Profile
WPC	Waste Package Certifier
WCSA	Waste Package Staging Area

1.0 EXECUTIVE SUMMARY

On September 22, 2011, two shipments of low-level radioactive waste were transported from Los Alamos National Laboratory's (LANL) Technical Area 54 (TA-54). Shipment number LAL11408 (trailer number OTR14) and shipment number LAL11405 (trailer number OTR35) were delivered to the Nevada National Security Site (NNSS). The shipments were staged at the NNSS drop yard and the first shipment was transferred to the Area 5 disposal facility and unloaded on September 27, 2011. The second shipment was transferred to the Area 5 disposal facility and unloaded on September 29, 2011. After the waste had been off-loaded from each shipment, NNSS radiological controls personnel conducted an exit survey and detected fixed and removable radioactive contamination on the shipment trailers that exceeded the NNSS waste acceptance criteria (WAC) requirements as stated in section 3.2.13. NNSS personnel notified the LANL WCO that the affected trailer beds would be held until the contamination could be removed. On September 29, 2011, LANL voluntarily suspended further shipments to the NNSS. Further investigation identified a total of thirteen (13) trailers at NNSS and (3) trailers at LANL that had radiological contamination present in levels that exceeded the NNSS WAC section 3.2.13 requirement.

On October 4, 2011 the DOE Nevada Site Office Radioactive Waste Acceptance Program (RWAP) task manager transmitted a suspension of shipments notice to LANL and issued corrective action request (CAR) RWAP-C-11-09. In response, LANL prepared this corrective action plan (CAP). This CAP identifies causal factors and the root cause of the incident, corrective actions to preclude recurrence, and actions to strengthen the LANL NNSS certification and shipping program.

Subsequently, the LANL Waste Certification Official (WCO) and a professional investigator from the LANL Contractor Assurance Office-Performance Feedback (CAP-PF) lead a root cause analysis investigation. LANL staff from the Associate Directorate of Environmental Programs (ADEP) and the Associate Directorate of Environment, Safety, and Health (ADESH) participated on the investigation team. The investigation determined that one factor was considered causal to this event:

> Packages were not stored in accordance with the NNSS WAC Section 3.2.10 that states packages shall be stored in a secure area to prevent deterioration and that storage should include protection from adverse weather, particularly rain and/or snow and were not stored in accordance with NNSS WAC Section 5.5 that states that waste packages shall be controlled through the life cycle of the component (e.g. receipt, handling, storage, packaging, and shipping) to prevent damage, loss, or deterioration.
>
> Although LANL waste management personnel stored the packages in a secure location, they were stored outside without providing additional protection from rain and snow. The storage method was based on information provided by the vendor who claimed that the packages could withstand exposure to the elements. LANL personnel did performed package closures in accordance with vendor's closure instruction however LANL personnel did not consistently follow the vendor's information to secure the weather protection flap. Subsequent events have revealed that these waste packages require additional protection from the elements. Specifically, during heavy rain the plastic in storage areas inhibited water runoff and caused water to pool around the bottom of packages. Localized areas of standing water potentially

penetrated the packages creating conditions that allowed radioactive contamination to migrate through the external surfaces of the packages during extended transport of the packages to the NNSS site. This migration of contamination through the external surface of the packages directly lead to the transport vehicles exceeding the contamination levels defined in the NNSS waste acceptance criteria (WAC) requirements as stated in section 3.2.13.

The investigation also determined that one factor was relevant to this event:

Radiological survey techniques on the flatbed trailers were evaluated and LANL Radiological Controls Technicians (RCTs) were interviewed. Radiological survey techniques on the flatbed trailers and procedural inconsistencies were noted. TA-54 performed receipt surveys only on vehicles with incoming shipments of radioactive material; therefore, receipt surveys of incoming empty flatbeds from NNSS were not performed at TA-54. Additionally, direct scans of flatbeds at TA-21 were performed from the sides of the trailer at arm's length. This would result in an unsurveyed area down the middle of the trailer of approximately 3.0 feet in width.

The LANL radiological protection program implementation of the Visual Sample Plan (VSP) at the stated confidence level did not support the radiological release of shipments to meet the NNSS WAC requirements stated in section 3.2.13.

The corrective actions required to avoid recurrence of this incident are discussed in Section 5.0, "Corrective Action Plan."

2.0 SCOPE OF INVESTIGATION

The scope of this investigation was to identify the root cause and contributing causal factors of the fixed and removable contamination discovered by NNSS radiological control personnel on waste shipment trailers shipped from LANL. This investigation also evaluated LANL's radiological survey program for trailers and waste packages designated for shipment to NNSS.

To determine what the potential root cause and contributing causal factors were, the investigation team evaluated the following areas:

1. Package procurement and receipt inspection;
2. The onsite storage program for waste packages;
3. Physical integrity of the loaded waste packages;
4. Storage and staging of packages prior to loading with waste;
5. Potential exceedance of the package's rated capacity;
6. The number of times packages were handled and lifted;
7. Package integrity evaluations;
8. Waste material compatibility (including moisture content);
9. Isotopic solubility in soils matrix;
10. Changes in manufacturing process, materials, and suppliers of materials for the construction of packages; and
11. Adequacy of radiological surveys performed on waste shipments , loaded waste packages, and waste storage areas package including statistical evaluations of the existing LANL radiological

survey methodology, understanding and communication of Department of transportation (DOT) contamination limits listed in DOE Order 460.2A, 10 CFR 835, and 49 CFR 177.843, surveys of CAST and LANL trailers onsite, surveys of waste loading areas, waste storage areas, and package handling equipment to evaluate all potential sources of contamination.

Results of the evaluation are discussed in Section 4.0 "Causal Analysis and Observations."

3.0 FACTS AND EVENT DESCRIPTION

NNSS officials from RWAP conducted an assessment of the LANL NNSS WCO program (RWAP-S-11-21) on August 23 and 24, 2011 and provided Observation T1 that states that as required by the NNSS WAC, the LANL organizational structure must be designed to ensure the independence of the WCO.

On August 26, 2011, Waste Disposal Request (WDR) Nos. 3030076, 3030077, and 3030078 were submitted electronically for the disposal of three packages (LANL Item ID No. 10179530, 10179531, and 10179532) to NNSS. Shipping manifest 90528 was then completed and signed for the transport of these three packages with CAST Transport named as the carrier. The NNSS Shipment number assigned to this shipment was LAL11408 and was scheduled to take place on September 22, 2011.

Also on August 26, 2011, Waste Disposal Request (WDR) Nos. 3030065, 3030067, and 3030068 were submitted electronically for the disposal of three packages (LANL Item ID Nos. 10179553, 10179522, and 10179523) to NNSS. Shipping manifest No. 90517 was then completed and signed for the transport of these three packages with CAST Transport named as the carrier. The NNSS Shipment number assigned to this shipment was LAL11405 and was also scheduled to take place on September 22, 2011.

All six packages identified above were generated during the excavation of Material Disposal Area B (MDA-B) at TA-21 inside Enclosures 5 and 12. Following the filling and closure of each sack, a radiological survey was performed and the packages were released to the TA-21 Waste Package Staging Areas (WCSA) for storage.

On August 30, 2011, the six packages identified above were loaded from the ground at TA-21 onto a flatbed trailer and transported to TA-54 for storage. All six of the sacks were off-loaded directly onto pallets at Pad 281.

On September 19, 2011, CAST empty commercial flatbed trailers OTR14 and OTR35 and seven others arrived at TA-21 to receive an incoming security inspection to obtain access to TA-54 Area-G, where the packages were stored. No incoming radiological survey was performed when the empty trailers entered Area-G. All trailers were staged for loading at Pit 37 and Pad 281.

On September 20 and 21, 2011, nine trailers were loaded in the following manner: The LANL NNSS WPC arrived at TA-54 to begin loading packages scheduled to leave to NNSS on September 22. The WPC contacted the Radiation Protection Group (RP-1) to ensure that the 10-point surveys had been performed; RP-1 confirmed that the surveys had been conducted and gave the go-ahead to begin loading operations.

Each empty trailer was connected to a truck and taken either to Pit 37 or to Pad 281 to load the correct packages according to the shipment configuration for that load. RP-1 personnel collected swipe samples from each package prior to lifting it off the ground. When each package was lifted, RP-1 personnel used a long-handled tool to collect additional swipe samples from the bottom area of the package and from the pallet and the ground beneath the pallet. Each package was then loaded onto a trailer. The WPC and Alternate Waste Certification Official (AWCO) applied labels to the packages after loading.

On September 21, 2011, at approximately 1500 hours, all loading, marking and labeling tasks were complete.

On September 22, 2011 the following activities occurred*:

1. At 0630, CAST trucks arrived at TA-21 to receive a security inspection to go to TA-54 to drop off empties and hook up to loaded trailers.
2. At 0700, CAST arrived at TA-54 and entered Area-G to drop off empties at the spoils pile to await incoming survey at a later point and went to PIT 37 and Pad 281 to hook up to loaded trailers.
3. At 0730, WPC and AWCO performed a final walk-down and AWCO signed the Package Certification Label (PCL) for all the shipments scheduled for that day. The WPC completed the shipment checklist, and trucking personnel began covering the loads.
4. At 0930, once the shipment loads were secure, the shipments moved to TA-54 Operations Center Area-G where a final release survey was conducted by RP-1.
5. At 1230, after receiving RP-1 survey results and signatures from RP-1, shipments were released.

All trailers subsequently identified by NNSS as contaminated were surveyed, handled, and loaded with packages of waste destined for NNSS using the same procedure detailed above. The identification of these shipments and associated shipping dates are listed in Figure 3.1.

On September 22, 2011, the two shipments of low-level radioactive waste departed from Los Alamos National Laboratory's (LANL) Technical Area 54 and were unloaded at the Nevada National Security Site (NNSS). Shipment LAL11405 on trailer OTR35 and shipment LAL11408 on trailer OTR14 arrived at the CAST Transport drop yard at NNSS on September 23, 2011. Shipment LAL11408 shuttled into the NNSS Area 5 disposal site by CAST Transport personnel on September 27, 2011 and shipment LAL11405 shuttled into the NNSS Area 5 disposal site by CAST Transport personnel on September 29, 2011

After the six packages had been off-loaded, NNSS radiological controls personnel conducted an exit survey and detected fixed and removable radioactive contamination on the trailer beds that exceeded the NNSS waste acceptance criteria requirements as stated in 10 CFR 835 Appendix D for external contamination. Subsequently, the packages from the two shipments were surveyed and no contamination was identified. NNSS personnel notified the LANL WCO that the contaminated trailer beds would be impounded until the contamination could be removed. Subsequently (11) additional trailers were determined to have radiological contamination present in levels that exceeded the NNSS waste acceptance criteria requirements. The identification of these shipments and associated shipping

* Times are estimated.

dates are given in Figure 3.1. Three additional trailers delivered to the LANL site from NNSS between September 28, 2011 and September 30, 2011 were determined to have radiological contamination present in levels that exceeded 10 CFR 835 Appendix D for external contamination. The identification of these trailers are given in Figure 3.2.

On September 29, 2011, LANL voluntarily suspended further shipments. On October 4, 2011 the DOE Nevada Site Office Radioactive Waste Acceptance Program (RWAP) task manager transmitted a suspension of shipments notice to LANL and issued corrective action request (CAR) RWAP-C-11-09. On October 11, 2011 the WCO organization was transferred from ADEP to ADESH.

Subsequently the LANL Waste Certification Official (WCO) and a professional investigator from the LANL Contractor Assurance Office-Performance Feedback (CAP-PF) lead a root cause analysis investigation. LANL staff from the Associate Directorate of Environmental Programs (ADEP) and the Associate Directorate of Environment, Safety, and Health (ADESH) participated in the critique/root cause analysis.

LANL initiated the corrective action plan (CAP) process. The CAP identifies causal factors and the root cause of the incident, corrective actions to preclude recurrence, and actions to strengthen the LANL NNSS certification and shipping program.

Shipment number	sealed date	ship dates	LANL ID Number	shipment origination (TA)	Trailer
LAL11408	8/25/2011	9/22/2011	10179531	TA-54/Pad 281	OTR14
	8/25/2011	9/22/2011	10179530	TA-54/Pad 281	
	8/25/2011	9/22/2011	10179532	TA-54/Pad 281	
LAL11405	8/25/2011	9/22/2011	10179523	TA-54/Pad 281	OTR35
	8/25/2011	9/22/2011	10179522	TA-54/Pad 281	
	8/25/2011	9/22/2011	10179553	TA-54/Pad 281	
LAL12205	8/23/2011	9/29/2011	10155537	TA-54/Pit 37	OTR38A
	8/23/2011	9/29/2011	10155540	TA-54/Pit 37	
LAL11363	8/9/2011	9/26/2011	10155514	TA-54/Pit 38	OTR42
	8/9/2011	9/26/2011	10155516	TA-54/Pit 38	
	8/9/2011	9/26/2011	10155515	TA-54/Pit 38	
LAL11406	8/25/2011	9/22/2011	10179524	TA-54/Pad 281	193
	8/25/2011	9/22/2011	10179525	TA-54/Pad 281	
	8/25/2011	9/22/2011	10179526	TA-54/Pad 281	
LAL12201	8/5/2011	9/29/2011	10155502	TA-54/Pit 37	927158
	8/5/2011	9/29/2011	10155503	TA-54/Pit 37	
	8/5/2011	9/29/2011	10155504	TA-54/Pit 37	
LAL11370	8/19/2011	9/26/2011	10179507	TA-54/Pit 37	OR8
	8/19/2011	9/26/2011	10179508	TA-54/Pit 37	
	8/19/2011	9/26/2011	10179509	TA-54/Pit 37	
LAL12209	8/26/2011	9/29/2011	10179554	TA-21	OTR10
	8/26/2011	9/29/2011	10179555	TA-21	
	8/26/2011	9/29/2011	10179556	TA-21	
LAL12207	8/25/2011	9/29/2011	10155546	TA-54/Pad 281	OTR44
	8/25/2011	9/29/2011	10155548	TA-54/Pad 281	
LAL11420	8/31/2011	9/22/2011	10179548	TA-21	925728
	8/31/2011	9/22/2011	10179549	TA-21	
	8/31/2011	9/22/2011	10179550	TA-21	
LAL12210	8/26/2011	9/29/2011	10179557	TA-21	925782
	8/26/2011	9/29/2011	10179558	TA-21	
	8/26/2011	9/29/2011	10179559	TA-21	
LAL11387	8/23/2011	9/26/2011	10155541	TA-54/Pit 38	925793
	8/19/2011	9/26/2011	10179510	TA-54/Pit 38	
	8/19/2011	9/26/2011	10179511	TA-54/Pit 38	
LAL12208	8/23/2011	9/29/2011	10155538	TA-54/Pit 37	OS2777
	8/23/2011	9/29/2011	10155539	TA-54/Pit 37	
	8/23/2011	9/29/2011	10155542	TA-54/Pit 37	

Figure 3.1 NNSS Contaminated Trailer Inventory and Chronology

Trailer Number	Shipment Origination (TA)	Date Trailer arrived at LANL	Date Surveyed
TL-286	TA-21	9/29/2011	9/30/2011
TL-OTR-25	TA-54	9/29/2011	9/30/2011
TL- OTR-45	TA-54	9/29/2011	9/30/2011

Figure 3.2 LANL Contaminated Trailer Inventory

4.0 CAUSAL ANALYSIS AND OBSERVATIONS

Causal analysis was conducted in accordance with LANL procedure P322-1, *Causal Analysis and Corrective Action Development*. The apparent cause analysis was performed based on the evaluator's judgment and experience.

The investigation analysis determined that there was one root cause to this event with three causal codes. The root cause is as follows:

> Packages were not stored in accordance with the NNSS WAC Section 3.2.10 that states packages shall be stored in a secure area to prevent deterioration and that storage should include protection from adverse weather, particularly rain and/or snow and were not stored in accordance with NNSS WAC Section 5.5 that states that waste packages shall be controlled through the life cycle of the component (e.g. receipt, handling, storage, packaging, and shipping) to prevent damage, loss, or deterioration.
>
> Although LANL waste management personnel stored the packages in a secure location, they were stored outside without providing additional protection from rain and snow. This storage method was based on information provided by the vendor who claimed that the packages could withstand exposure to the elements. LANL personnel did performed package closures in accordance with vendor's closure instruction however LANL personnel did not consistently follow the vendor's information to secure the weather protection flap. Subsequent events have revealed that these waste packages require additional protection from the elements. Specifically, during heavy rain the plastic in storage areas inhibited water runoff and caused water to pool around the bottom of packages. Localized areas of standing water potentially penetrated the packages creating conditions that allowed radioactive contamination to migrate through the external surfaces of the packages during extended transport of the packages to the NNSS site. This migration of contamination through the external surface of the packages directly lead to the transport vehicles exceeding the contamination levels defined in the NNSS waste acceptance criteria (WAC) requirements as stated in section 3.2.13.

The following DOE Causal Codes were assigned to this root cause:

A5B3C01 – Lack of written communication (e.g. procedures)
A2B4C02 - Material storage Less Than Adequate (LTA)
A2B4C04 – Material shipping LTA

Specifically for A5B3C01, lack of written communication (e.g. procedures) and A2B4C04, material

shipping LTA, radiological survey techniques on the flatbed trailers were evaluated and LANL RCTs were interviewed. Based on this, the investigation team has determined that areas of the flat-bed trailers used for transporting the packages, specifically the centerline of the bed, could not be reached and surveyed from ground level. This centerline area could not be ruled out as an area having detectable contamination.

In addition, a representative from the vendor provided briefings on preparation, filling, closure and storage of packages. LANL employees were qualified per the vendor written closure instructions and LANL procedures. The vendor representative stated that there were no vendor written storage procedures for the packages. The DOE cause code that best describe this root cause is A5B3C01 – Lack of written communication.

For A2B4C02, material storage LTA Packages were not stored in accordance with; 1) the NNSS WAC Section 3.2.10 that states packages shall be stored in a secure area to prevent deterioration and that storage should include protection from adverse weather, particularly rain and/or snow. 2) Section 5.5 that states waste packages shall be controlled through the life cycle of the component (e.g. receipt, handling, storage, packaging, and shipping) to prevent damage, loss, or deterioration.

The storage method was based on information provided by the vendor who claimed that the packages could withstand exposure to the elements. LANL personnel did performed package closures in accordance with vendor's closure instruction however LANL personnel did not consistently follow the vendor's information to secure the weather protection flap. Events have revealed that these waste packages require additional protection from the elements. Specifically during heavy rain the plastic in some storage areas inhibited water runoff and caused water to pool around the bottom of packages. Localized areas of standing water potentially penetrated the packages creating conditions that allowed radioactive contamination to migrate to the external surfaces of the packages during transport of the packages to the NNSS site.

This migration of contamination through the external surface of the packages directly lead to the transport vehicles exceeding the contamination levels defined in the NNSS waste acceptance criteria (WAC) requirements as stated in section 3.2.13.

ROOT CAUSE

Equipment:

4.1 Root Cause Analysis

To determine what the potential root cause and contributing causal factors were, the investigation team evaluated the following areas:

1. Package procurement and receipt inspection;
2. The onsite storage program for waste packages;
3. Physical integrity of the loaded waste packages;
4. Storage and staging of packages prior to loading with waste;
5. Potential exceedance of the package's rated capacity;

6. The number of times packages were handled and lifted;
7. Package integrity evaluations;
8. Waste material compatibility (including moisture content);
9. Isotopic solubility in soils matrix;
10. Changes in manufacturing process, materials, and suppliers of materials for the construction of packages; and
11. Adequacy of radiological surveys performed on waste shipments, loaded waste packages, and waste storage areas including statistical evaluations of the existing LANL radiological survey methodology, , surveys of CAST and LANL trailers onsite, surveys of waste loading areas, waste storage areas, and package handling equipment to evaluate all potential sources of contamination.

Based on the information gathered during the investigation, the following was concluded:

1. Package procurement and receipt inspections were performed properly in accordance with LANL purchasing and receipt inspection procedures.

   The storage method for the packages was not sufficiently weather protective and therefore not in accordance with the NNSS WAC Section 3.2.10 that states packages shall be stored in a secure area to prevent deterioration and that storage should include protection from adverse weather, particularly rain and/or snow and were not stored in accordance with NNSS WAC Section 5.5 that states that waste packages shall be controlled through the life cycle of the component (e.g. receipt, handling, storage, packaging, and shipping) to prevent damage, loss, or deterioration.

   The LANL WCO and AWCO were trained and familiar with the NNSS WAC section 3.2.10 and 5.5 and believed those requirements were met based on the vendor information that the packages could be stored outside. Following vendor guidelines, LANL waste management personnel stored packages outside and without additional protection due to the vendor claim, that the packages could withstand exposure to the elements. LANL personnel did performed package closures in accordance with vendor's closure instruction however LANL personnel did not consistently follow the vendor's information to secure the weather protection flap. Subsequent events have revealed that these waste packages require additional protection from the elements. Specifically some packages were routinely stored outdoors on plastic covered lay-down areas and were subjected to moisture events. Localized areas of standing water on ungraded laydown areas and plastic sheeting potentially penetrated the packages creating conditions that allowed radioactive contamination to migrate to the external surfaces of the packages during transport of the packages to the NNSS site. Further discussions with the vendor also identified the following:

   - The vendor stated during the investigation that the packages are not designed to sit in water.

- A representative from the vendor provided briefings on preparation, filling, and closure of packages. LANL employees followed the vendor written closure instructions and LANL procedures for the closure of the packages.

- The vendor representative stated that there are no the vendor written storage procedures for the packages. However, the vendor representative did state that the packages were designed to be stored outdoors.

2. No apparent physical breaches of the packages were identified during visual inspections – either at the time of shipment or receipt. Additionally, no contamination was detected on the packages at the time of shipment or on shipments between TA-21 and TA-54. However, radioactive contamination was detected on some trailer beds after off loading of packages at NNSS.

3. Operations personnel verified that prior to use, the new, unused packages were stored and staged in a manner consistent with the vendor recommendations and that the pre-use quality assurance inspections had been completed.

4. Operations records verify that there has been no overloading of the package's rated capacity. The maximum package weight was 17,400 lbs. (well within the 24,000 lbs. loading capacity of the package). The maximum volume of waste place inside the package was seven cubic yards, (well within the maximum loading capacity of nine cubic yards).

5. Operations personnel verified that the loaded packages were handled as recommended by the vendor but the investigation showed that the subsequent storage practices may not have sufficiently protected the packages from weather events.

6. While contamination was detected on the outside of several packages, no visual indications of breaches to the package were identified when inspected in accordance with 49 CFR 173.24.b.1 (e.g. frayed stitching, burst seems) but discoloration was identified at the seams where contamination was also identified indicating that the packages had released materials at the seams.

7. Programmatic procedures and operations conducted by TA-21 waste management personnel, Waste Characterization Engineers, and LANL Waste Package Certifiers (WPC) under the LANL NNSS Waste Certification Official program demonstrate that no waste materials were added to the packages that were incompatible with package construction materials.

8. The waste in the packages met the limitations set forth for the IP-2 package as designated in 49 CFR.

9. The vendor has verified that no changes in manufacturing process, no changes of the manufacturing materials used, and no changes in the vendors providing materials used in the construction of the packages were made during the production for the packages in question.

10. Radiological survey techniques on the flatbed trailers were evaluated and LANL RCTs were interviewed. Radiological survey techniques on the flatbed trailers and procedural inconsistencies were noted. TA-54 performed receipt surveys only on vehicles with incoming shipments of radioactive material; therefore, receipt surveys of incoming empty flatbeds from NNSS were not performed at TA-54. Additionally, direct scans of flatbeds at TA-21 were performed from the sides of the trailer at arm's length. This would result in an unsurveyed area down the middle of the trailer of approximately 3.0 feet in width. The LANL radiological protection program implementation of the Visual Sample Plan (VSP) at the stated confidence level did not support the radiological release of shipments to meet the NNSS WAC requirements stated in section 3.2.13.

Work Control:

It was determined during the investigation that workers at both LANL sites involved with the loading, storage, surveying, and shipment of packages all performed work in accordance with their facility procedures; however, it was noted during the investigation that there are variances from TA-21 to TA-54 regarding survey completions.

During the course of the investigation LANL's radiological survey program was extensively evaluated and all potential sources of the trailer contamination were investigated. This section of the CAP will address item 11 of Section 2.0.

The investigation team evaluated the following:

- Receipt and pre-load surveys of the NNSS shipments at LANL;
- Survey statistics derived from DOE's Visual Sample Plan software;
- Detection of contamination using standard LANL survey techniques on trailers received from the NNSS;
- History of shipments between TA-21 and TA-54;
- Adequacy of radiological surveys performed on waste shipments to other disposal facilities;
- Adequacy of radiological surveys performed on loaded waste packages;
- Surveys of CAST and LANL trailers onsite; and
- Surveys of waste loading areas, waste storage areas, and package handling equipment to evaluate all potential sources of contamination.

To determine if contaminated trailers were accepted and re-used at LANL for waste shipments, pre-load survey documentation for all trailers and packages were reviewed. Trailers found to be contaminated at NNSS received receipt surveys and pre-load surveys at TA-21 prior to being shipped to NNSS. No contamination was detected. Additionally, the packages on the trailers found to be contaminated at NNSS received pre-load surveys prior to being shipped to NNSS; no contamination was detected. Two separate 9-point surveys were performed on each flatbed load surface prior to shipment to NNSS. Furthermore, because each trailer was generally used more than one time, there is a history of receipt

and pre-load surveys showing no detectable contamination. Having multiple surveys of each trailer reduces the probability that a given "hot spot" was missed. At TA-54, pre-load surveys of the trailer and packages indicated no detectable contamination. However, interviews with LANL RCTs and comprehensive reviews of the existing procedures indicated three areas of concern within the radiological survey program:

- Radiological survey techniques on the flatbed trailers and procedural inconsistencies were noted. TA-54 performed receipt surveys only on vehicles with incoming shipments of radioactive material; therefore, receipt surveys of incoming empty flatbeds from NNSS were not performed at TA-54.

- Direct scans of flatbeds at TA-21 were performed from the sides of the trailer at arm's length. This would result in an unsurveyed area down the middle of the trailer of approximately 3.0 feet in width.

- The LANL radiological protection program implementation of the Visual Sample Plan (VSP) at the stated confidence level did not support the radiological release of shipments to meet the NNSS WAC requirements stated in section 3.2.13.

5.0 CORRECTIVE ACTION PLAN

The findings from the root cause analysis discussed in section 4.0 directly relate to the NNSS WAC sections as follows:

- NNSS WAC Section 3.2.13 Contamination Levels; A5B3C01 – Lack of written communication (e.g. procedures)
- NNSS WAC Section 3.2.10 Package Protection; A2B4C02 - Material storage LTA
- NNSS WAC Section 3.2.13 Contamination Levels; A2B4C04 – Material shipping LTA

The following corrective actions will be implemented to preclude a recurrence of the events described in this CAP:

1. All waste packages (of any type) generated for disposition at NNSS will be stored in a manner that protects the package in accordance the NNSS WAC Section 3.2.10, Section 5.5, and the LANL WAC Section 17.2.9. An interim guidance will be issued pending LANL WAC review and revision to properly inspect, package/load, close, and ship various types of waste packages commonly used at LANL. The interim guidance will include implementing the following; 1) Packages shall be stored in a secure area to prevent deterioration and that storage should include protection from adverse weather, particularly rain and/or snow. 2) waste packages shall be controlled through the life cycle of the component (e.g. receipt, handling, storage, packaging, and shipping) to prevent damage, loss, or deterioration. This may include storing the waste packages on pallets, inside covered facilities, under tarpaulins, or other methods or combinations of methods deemed practical by the LANL WCO. WCO surveillance requirements will include an evaluation of package storage adequacy. This requirement will ensure compliance with NNSSWAC Section 3.2.10. Objective evidence: Copy of interim storage guidance. Copy of LANL NNSS WCO waste package storage surveillance and assessment. Copy of

LANL NNSS WCO brief and attendance sheet demonstrating WCO communication of storage requirements for newly loaded packages. **Due Date**: Within (30) Days of NNSS CAP approval.

2. All packages will have a detailed radiological surveys performed prior to loading to verify no radiological contamination greater than allowable limits as specified in the NNSS WAC Section 3.2.13 is on the external surface of the package. Objective evidence: Copy of each package radiological survey. **Due Date**: Prior to shipping to NNSS.
3. All transport vehicles destined for NNSS will have detailed direct radiological surveys performed on 100% of load surfaces (including centerline) prior to entry into a LANL controlled area and loading and prior to release to NNSS to verify no radiological contamination greater than allowable limits as specified in the NNSS WAC Section 3.2.13 is on the surface of the trailer. Objective evidence: Copy of first (3) trailer radiological surveys and copy of revised, approved, and implemented radiological survey procedure. **Due Date:** Prior to shipping to NNSS.
4. The Health Physics Operations Group Management will revise current LANL survey procedures to address deficiencies noted in this CAP investigation regarding protocols for incoming and outgoing NNSS shipments. Revisions will address standardization of survey procedures, revision of the current VSP to ensure a confidence level of radiological surveys for shipment incoming, outgoing, and pre-loading surveys to meet 10 CFR 835, Appendix D and NNSS WAC Section 3.2.13 requirements, and survey techniques that ensure that areas of the trailer (such as the trailer centerline) that cannot be reached from the ground are encompassed in the radiological survey. This requirement will ensure compliance with NNSS WAC Section 3.2.13. Objective evidence: Documentation demonstrating procedures were formally revised to incorporate changes. **Due Date**: Within (30) Days of NNSS CAP approval.
5. Health Physics Operations, Waste Transportation, and the LANL NNSS team will hold a formal documented training on the revised NNSS radiological survey shipment requirements. Objective evidence: Attendance sheet and meeting agenda. **Due Date**: Within (30) Days of NNSS CAP approval.
6. LANL WCO organization will be realigned to provide independence from the project execution organization. On October 11, 2011, the WCO organization was transferred from ADEP to ADESH. Objective evidence: Signed organization chart. **Due Date**: Within (30) Days of NNSS CAP approval.
7. WCO, AWCO, waste management personnel, and Waste Transportation will hold a formal documented training on the revised NNSS and LANL waste management requirements and procedures. Objective evidence: Attendance sheet and meeting agenda. **Due Date**: Within (30) Days of NNSS CAP approval.
8. In accordance with NNSS WAC section 6.4, LANL will consign all shipments to NNSS under exclusive use controls. An interim guidance will be issued pending procedural development. Objective evidence: Copy of approved and issued interim guidance. **Due Date**: Within (30) Days of NNSS CAP approval.
9. LANL will issue a lessons learned regarding the events. Objective evidence: Documentation demonstrating that DOE Lessons Learned has been created. **Due Date**: To be presented at the WCO Spring Workshop

5.1 Completion Date

Corrective actions will be completed no later than thirty (30) days from the date of NNSS approval of this Corrective Action Plan.

5.2 Responsible Line Management

The LANL NNSS WCO will be responsible for oversight and verification that the corrective actions have been completed.

The LANL ENV-WGS Group Leader will be responsible to work with LANL waste management operations to ensure that the corrective actions have been implemented in accordance with this CAP.

George Henckel
Department of Energy Los Alamos Site Office

Steve Singledecker
LANL ENV-WGS Group Leader

LA-UR-11-06372

Contaminated Trailers Shipped to NNSS

Lessons Learned

April 23-27, 2012

Chronology Summary of Events

- **September 22, 2011, two LLW shipments were transported to the Nevada National Security Site (NNSS) for disposal.**
- **September 27, 2012 LANL notified about radiological contamination on one trailer.**
- **September 28, 2012 Original CAR issued.**
- **September 29, 2012**
  - LANL notified about radiological contamination on second trailer.
  - LANL self suspended shipments
- **A total of thirteen (13) trailers at NNSS and (3) trailers at LANL were contaminated.**
- **October 4, 2011 NSO issued corrective action request (CAR) RWAP-C-11-09 with suspension of shipments.**

Scope of Root Cause Analysis/Investigation

- **General Package Pre-Use Information**
  - Procurement & receipt inspections
  - Storage/staging prior to loading
  - Pre-use package integrity evaluation
  - Potential changes to manufacturing process, materials, and suppliers
  - Compatibility with waste material
    - physical/chemical,
    - Moisture
    - isotopic solubility
- **Package Use/Storage**
  - On site storage program for loaded waste containers
  - Physical integrity of loaded containers
  - Containers rated weight capacity vs. actual load
  - Number of times containers were handled loaded

Scope of Root Cause Analysis/Investigation

- Radiological Surveys
  - Adequacy of vehicle & container survey
  - Statistical evaluations of the existing LANL radiological survey methodology
  - History of on site shipments (TA-21 to TA-54)
  - on site surveys of CAST and LANL trailers
  - Detection of contamination using LANL method on trailers returned from NNSS
  - Adequacy of surveys on shipments to other facilities
  - surveys of waste loading areas
  - waste storage areas surveys
  - package handling equipment

Root Cause Analysis

- **Root Cause :**
  - Containers were not stored in accordance with the NNSS WAC Section 3.2.10
  - Specifically, during rain the plastic in storage areas inhibited water runoff and caused water to pool around the bottom of containers. Localized areas of standing water potentially degraded the containers creating conditions that allowed radioactive contamination to migrate through the external surfaces of the containers during extended transport.
  - This migration of contamination through the external surface of the containers directly lead to the contamination of transport vehicles
  - Storage method was based on vendor information that the containers could withstand exposure to the elements.
  - These waste containers required additional protection from the elements.

ROOT CAUSE (cont.)

- **Contributing Factor :**
  - Radiological survey methodology was less than adequate as the centerline of the transport could not be surveyed.
  - Radiological survey approach at 2 locations at LANL were not consistent.

Corrective Actions Summary

- **September 2011 - LANS initiated moving the WCO and the NNSS approved program into the LANS ADESH&Q Environmental Division organization in response to NNSS RWAP observation.**
- **Waste packages generated for disposition at NNSS will be stored in compliance NNSS WAC Section 3.2.10 and the LANL WAC Section 17.2.9 to protect containers from degradation from the environment (e.g., weather, UV)**
- **Containers will have a detailed radiological surveys performed prior to loading.**
- **Transport vehicles destined for NNSS will have detailed direct radiological surveys performed on 100% of load surfaces.**
- **LANL will issue a lessons learned regarding the events. Objective evidence: Documentation demonstrating that DOE Lessons Learned has been created.**

Corrective Actions

- **LANL Health Physics Operations Group Management will revise current survey procedures to address deficiencies noted in this CAP investigation.**
- **LANL WCO will coordinate formal documented training/briefing(s) on the revised NNSS radiological survey shipment requirements.**
- **LANL WCO Program procedures will undergo a complete review by the new organization to improve the overall program compliance with NNSS WAC.**

Lessons Learned

- **Radioactive waste packages must be stored in accordance with the NNSS WAC Section 3.2.10 that states packages shall be stored in a secure area to prevent deterioration and that storage should include protection from adverse weather, particularly rain and/or snow.**
- **All transport vehicles destined for NNSS will have detailed direct radiological surveys performed on 100% of load surfaces (including centerline) prior to entry into a LANL controlled area and loading and prior to release to NNSS to verify no radiological contamination greater than allowable limits as specified in the NNSS WAC Section 3.2.13 is on the surface of the trailer.**
- **LANL WCO organization will be realigned to provide independence from the project execution organization.**

Lessons Learned

- **The Health Physics Operations Group Management will revise current LANL survey procedures to address deficiencies noted in this CAP investigation regarding protocols for incoming and outgoing NNSS shipments. Revisions will address standardization of survey procedures, revision of the current VSP to ensure a confidence level of radiological surveys for shipment incoming, outgoing, and pre-loading surveys to meet 10 CFR 835, Appendix D and NNSS WAC Section 3.2.13 requirements, and survey techniques that ensure that areas of the trailer (such as the trailer centerline) that cannot be reached from the ground are encompassed in the radiological survey.**

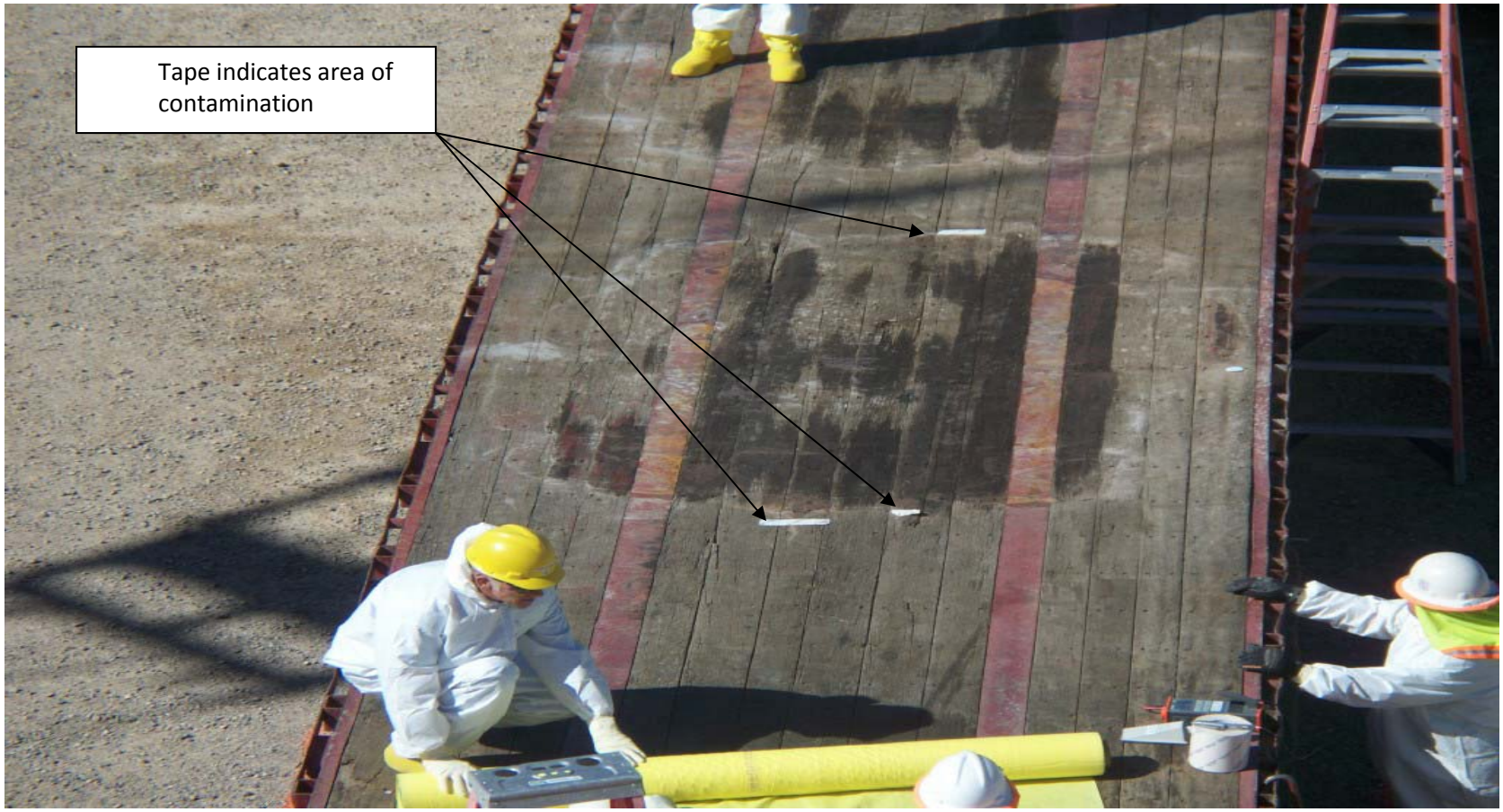
QUESTIONS?

Background Slides

NNSS Contaminated Trailers

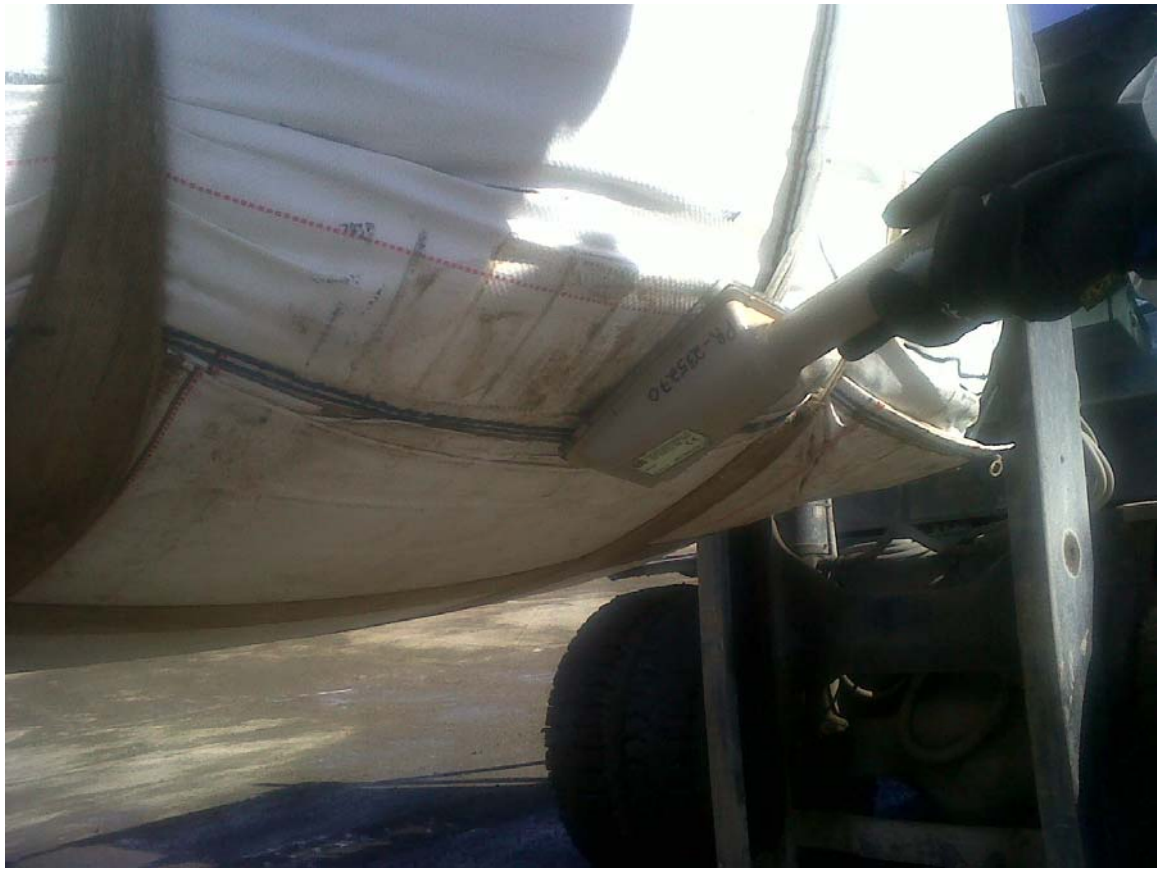
NNSS Contaminated Trailers

NNSS Contaminated Trailers



Radiological Personnel Surveying Shipment at Clive Facility

Soft-sided container where contamination was detected



Soft-sided container where contamination was detected

Attachment L

Soft-sided Packaging Vendors/Participants

Al Beale, Strategic Packaging Systems

Tim Blythe, Waste Control Specialists

Trey Bullinger, PacTec

Gus Chirgott, I.C.E. Service Group

Rich Defeyter, CAST Transportation

Scott Dempsey, MHF Services

Mike Lewis, Container Products Corporation

Wendall Reeves, PacTec

Performance of “Soft-Sided” Packaging

Presented by:

Tim Blythe - Waste Control Specialists LLC

Gus Chirgott – I.C.E. Service Group

Overview - Performance of "Soft-Sided" Packaging

Soft-sided packaging was introduced to radioactive waste management industry over 15 years ago. Since this time, hundreds of thousands of these packages have been sold and used in the United States in commercial nuclear and government applications. Soft-sided packaging is manufactured and supplied by several different vendors reporting consistent successful results. To the best of my knowledge there has never been a single documented case of a package failure during transport that has resulted in a release of radioactive material.

Definition of "soft-sided" packaging for the purposes of this presentation means a DOT compliant container (e.g. Bag) as defined in 49CFR173.410 & 411 (IP-1/IP-2) which are manufactured from polypropylene, polyethylene or similar materials ranging from 5 to 9 cubic yards in capacity.

"Key" Definitions

- ***Water Resistant*** *- designed to resist but not entirely prevent the penetration of water*
- ***Water Proof*** *- impervious to or unaffected by water*
- ***Stewardship*** *- responsible use and protection of the environment through conservation and sustainable practices*
- ***Taxpayer*** *- a person who pays a tax or is subject to taxation*
- ***Black Eye*** *- A dishonored reputation; a bad name*

Why are we here -

- *Gus and I have personally used and/or were responsible for many projects that have used thousands of bags over the past 15 years.*
- *To assist the bag manufacturers with helping to remove the "black eye" scenario that seems to exist at many DOE sites because of one highly visible project. (e.g. LANL MDA-B)*
- *To share accurate "real-life" success stories from two major bag manufacturers (e.g. SPS & PacTec) and provide lessons learned.*

Our goal -

- *Prove that bags provide a viable cost effective alternative to metal containers when used in "suitable" applications and in accordance with the manufacturers instructions.*
- *Reminder that we as waste management professionals need to be good stewards of taxpayer dollars and not discount the use of bags on future projects.*

When using "soft-sided" packaging, the most important things to remember:

- ***Bags are constructed from materials that repel water and resist water intrusion under normal circumstances. They are "water-resistant" they are not "water-proof".***
- ***Use common sense when loading, closing, lifting and storing filled bags. They are constructed from engineered plastics, not cold rolled steel.***
- ***Follow the manufacturers instructions. Many lessons have been learned through in-house testing and "real-life" field operations.***
- ***Never store loaded bags in poor drainage areas or in areas that are susceptible to water "pooling".***

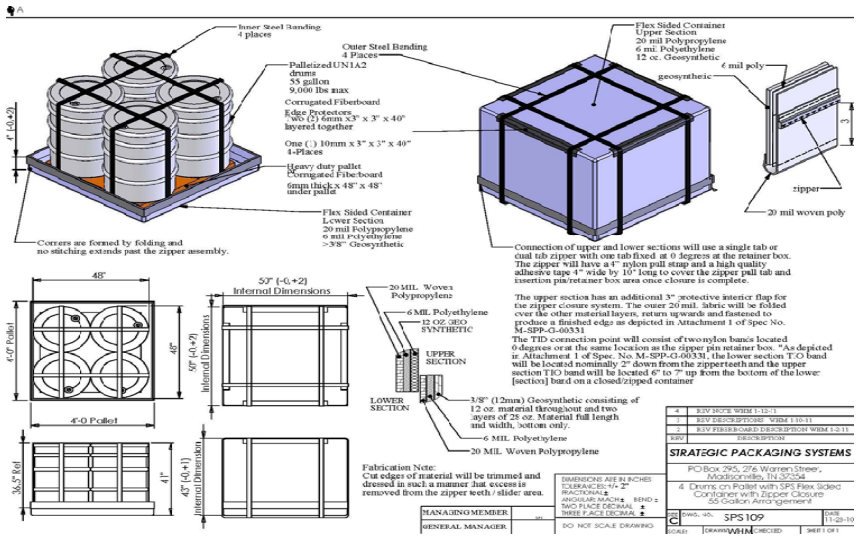
- ***Protect bags from long-term UV exposure.***
- ***Use a quality "WAC Approved" absorbent media in all bags.***
- ***Monitor the amount of water used for dust suppression and the source of the water. Storm water run-off is often used in this application and may have varying amounts of radioactivity.***
- ***Excessive dust suppression or improperly closed packages are the leading contributors to leaking bags. Be sure to use all the bag features and don't take short cuts. Follow the manufacturers instructions!***
- ***When work is being performed by more than one work crew, ensure that both crews receive the same level of training.***

Strategic Packaging Systems, LLC

"MEMBER"

Projects - Strategic Packaging Systems

- ## Savannah River Nuclear Solutions – DUO Drum Project
  - **Manufactured 2,400 (4-pack) drum bags (IP-1)**
  - **Shipped to NNSS via Truck – No Reported Bag Issues**
  - **Cost Savings to Taxpayer = Est. $1.5 mil.**



Strategic Packaging Systems, LLC

"MEMBER"

Projects - Strategic Packaging Systems

- *Berkeley Bevatron Project – 9YD Nautilus™ Bags*
  - *Supplied over 1,200 Bags (IP-1)*
  - *Shipped to NNSS via Truck – No Reported Bag Issues*
  - *Cost Savings to Taxpayer = Est. $1.4 mil.*

Strategic Packaging Systems, LLC

"MEMBER"

Projects - Strategic Packaging Systems

- *Argonne Building 330 D&D – 9YD Nautilus™ Bags*
  - *Provided over 1,300 bags (IP-1)*
  - *Shipped to NNSS via Truck – No Reported Bag Issues*
  - *Cost Savings to Taxpayer = Est. $1.4 mil.*

PACTEC

We manufacture packaging.
We engineer solutions.

Projects - PacTec

- ***Los Alamos National Lab/EnergySolutions– 9YD LiftPac™ Bags***
  - ***Provided over 1,500 bags (IP-1)***
  - ***Shipped to Clive, UT via Truck – No Reported Bag Issues***
  - ***Waste Description – Soil-like, concrete rubble***
  - ***Cost Savings to Taxpayer = Est. $1.7 mil.***

PACTEC

We manufacture packaging.
We engineer solutions.

Projects - PacTec

- ***SPRU Project/EnergySolutions– 9YD LiftPac™ Bags***
  - ***Provided over 3,000 bags (IP-1)***
  - ***Shipped to Clive, UT via Truck/Rail – No Reported Bag Issues***
  - ***Waste Description – Soil-like material***
  - ***Cost Savings to Taxpayer = Est. $3.1 mil.***

PACTEC

We manufacture packaging.
We engineer solutions.

Projects - PacTec

- ***B&W Y-12 Site – Custom 9YD LiftPac™ Bags***
  - ***Provided over 2,000 bags (IP-1)***
  - ***Shipped to EMWMF via Truck – No Reported Bag Issues***
  - ***Waste Description – Beryllium contaminated components***
  - ***Cost Savings to Taxpayer = Est. $2 mil.***
  - ***Also designed a patent pending remote release lifting frame to provide better worker safety for the project***

Lessons Learned:

- ***Common sense – always use common sense. If it looks like metal, feels like metal and smells like metal, don't use a bag. Use a metal container.***
- ***When moisture content of a soil-like material approaches 25%, the bag will press water through the weave of the bag due to the hydrostatic pressure.***
- ***Solution: Add a light weight polyethylene inner liner in addition to extra polymer absorbent. Be sure the material meets the disposal site WAC.***

Lessons Learned:

A project using the LiftPac bags took place during the winter months in extreme weather conditions with snow and temperatures below freezing. During loading the soil was placed into the bags and became frozen while in the staging area prior to shipment. The bags froze into unusual shapes which deformed the top portions of the bag. When the time came to load the bags for transport, the unusual shape of the bags caused unequal stress on the lifting straps. The lift straps are fed through guide loops, similar to belt loops which caused the bag to tear due to slight shifting of the bag through multiple lifts.

Solution:

After evaluating the situation the problem was solved by removing the straps from the guide loops on the LiftPac bag, which allowed the lifting straps to be repositioned removing the stress on the guide loops and providing an even lift on the straps.

For more information:

- Tim Blythe @ Waste Control Specialists LLC
724-312-1757 or tblythe@valhi.net
- Gus Chirgott @ I.C.E. Service Group
724-266-7580 or gchirgott@iceservicegroup.com
- Al Beale @ Strategic Packaging Systems, LLC
423-545-9505 or allbeale@aol.com
- Trey Bullinger @ PacTec, Inc. 800-272-2832 Ext. 217
or treybullinger@pactecinc.com

Strategic Packaging Systems, LLC

MADE IN THE USA FOUNDATION "MEMBER"

March 19, 2012

Syndney Gordon
Waste Generator Coordinator
Environmental Management
National Security Technologies
2621 Losee Road
North Las Vegas, NV 89030

SUBJECT: Discussion of Flexible Packaging Performance

Dear Syd,

The following discussion of flexible packaging performance is provided to follow up on our discussions at the Waste Management Symposium in Phoenix. I've made the discussion general, and not specific to Strategic Packaging Systems' (SPS) products, but some of the claims made about packaging performance I cannot make for others, and make them for SPS alone.

As you know, flexible packagings have been in use for the packaging and transport of radioactive materials for many years, and the products are supplied by several different vendors. Hundreds of thousands of these packagings have been sold and used in the United States in commercial nuclear and government applications. These packagings have been shipped successfully in closed van trailers, flatbed trailers, and even in the much more demanding environment of railroad gondola cars. To the best of my knowledge, there has never been a single documented case of packaging failure during transport that has resulted in the release of radioactive materials. None.

Packaging designs include IP-1 and IP-2 certified packages, and SPS products are subjected to the physical tests (not merely design analysis) to demonstrate performance to those standards. And, the use of packaging in capacities ranging from one ton to twelve tons have proven the performance of flexible packaging performance in the more than 15 years since I first introduced them for radioactive materials shipment.

Flexible packages are constructed of materials which repel water and resist water intrusion under normal circumstances. Many users of SPS and other brand flexible packages have stored materials outdoors for weeks or months in various extremes of weather with no reported degradation of the packaging of release of contents. There are no storage requirements unique to flexible packagings that do not apply equally to metal drums or boxes, with the exception of protecting the packages from long term UV exposure as described in the packaging material specifications. It is not good

practice to store any radioactive materials package in standing water (rigid or flexible). If stored in standing water, drums and B-25 containers can rust or suffer freeze ruptures; intermodals may also suffer in-leakage through their lower door gaskets.

SPS does not recommend storing radioactive materials packages in standing water, nor do we believe storage in standing water is a standard practice that needs to be addressed in package design or handling instructions. However, SPS maintains that storage in standing water does not adversely affect the materials of construction of our packaging, or the ability of the packaging to retain its contents.

SPS *strongly disputes* any assertion that storage in standing water presents some unexplained mechanism for migration of contents through the package walls, or for the migration of significant quantities of water into the package. We have not been presented with credible evidence that this has occurred with flexible packaging of any design from any manufacturer. Material migration through the package has not been demonstrated to occur. SPS believes the most likely cause of external contamination from packaging that has been stored in standing water would be cross contamination from external sources carried by the water itself. Specifically, SPS notes the following:

- Storage in standing water, particularly water that may itself be contaminated, presents a risk of externally contaminating packages. Similarly, water used for dust suppression during package loading may result in contaminated material deposition on the package.
- Contamination from pooled water would most likely occur on the bottom of the package, or edges that present a barrier to water flow around the package and provide a deposition site for contamination contained in the water. The deposition site may even discolor from the accumulation of material, but the discoloration alone does not demonstrate leakage.
- Fixed alpha contamination on the bottom of a flexible package may be difficult to detect, especially when surveys or samples must be obtained on the surface of a suspended load using long-handled tools. Fixed contamination in dried mud or calcium carbonate could be loosened by vibrations normal to transportation.
- Standard flexible packages are not designed to contain free liquids. Improper closure, including failure to properly close the weather flap on a flexible package, can provide paths for in-leakage of rainwater. Users who do not completely secure the weather protection flap on a flexible packaging cannot claim they are following the written closure instructions. Closure of the weather protection flap is an integral step in the closure of the package.
- Free liquids loaded into a flexible package, or allowed to leak into the package because of improper closure, would most likely leak from the package through the lower sewn seams, owing to the hydraulic pressure presented by several tons of wet soil and liquid. In-leakage from standing water is far less likely to occur

because it is not driven by significant hydraulic pressures, and would have to overcome counter-pressure from the package contents. Such in-leakage has never been demonstrated to occur.

- An externally contaminated package represents a finite source term, and the transfer of external contamination from the package to another surface would tend to reduce the contamination on the package. This explains how a trailer could become more contaminated than a package placed upon it during the rigors of transportation. Conversely, a leaking package represents a virtually unlimited source term, and would be expected to always be more contaminated than any surface it cross-contaminates.

- When work is being performed in more than one area, or by more than one work crew, the end-user must assure that each work crew receives the same level of training and exercises the same level of diligence in proper package use and closure.

Flexible packagings have a proven track record of successful use for the safe and cost-effective packaging, transport, and disposal of radioactive materials. Admittedly, the proper use of flexible packagings is not as intuitive to some end-users as conventional rigid packaging. However, the improper use and handling of flexible packagings by a few should not drive the government or industry to impose any restrictions on the qualification and use of flexible packagings for radioactive materials.

I hope you find this information helpful, please feel free to contact me at 423-545-9505.

Sincerely,

Al Beale
Managing Member
Strategic Packaging Systems

Al Beale
Strategic Packaging Systems, LLC

Madisonville, TN, USA

HUBZone
Historically Underutilized Business Zone

MADE IN THE USA FOUNDATION

Varieties of Soft Sided Super-sacks

Large Custom Transporter

Varieties of Soft Sided Super-sacks

Large Custom Transporter

Varieties of Soft Sided Super-sacks

Sea-Land Bag

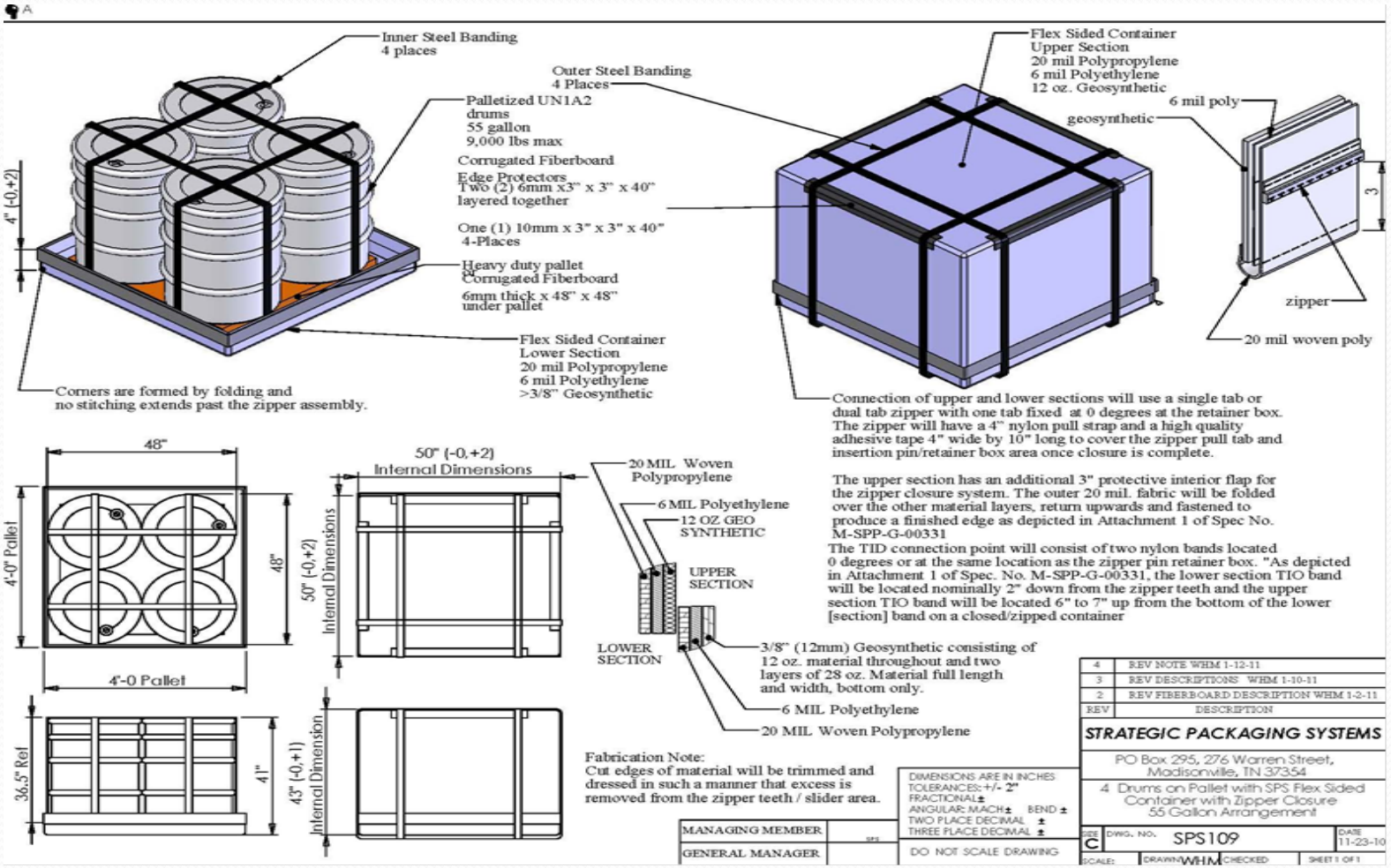
Varieties of Soft Sided Super-sacks

20 Cubic Yard Truck Bag

Varieties of Soft Sided Super-sacks

9 Cubic Yard Bag

Varieties of Soft Sided Super-sacks



Savannah River Drum Bag

Varieties of Soft Sided Super-sacks

1 Cubic Yard Bad

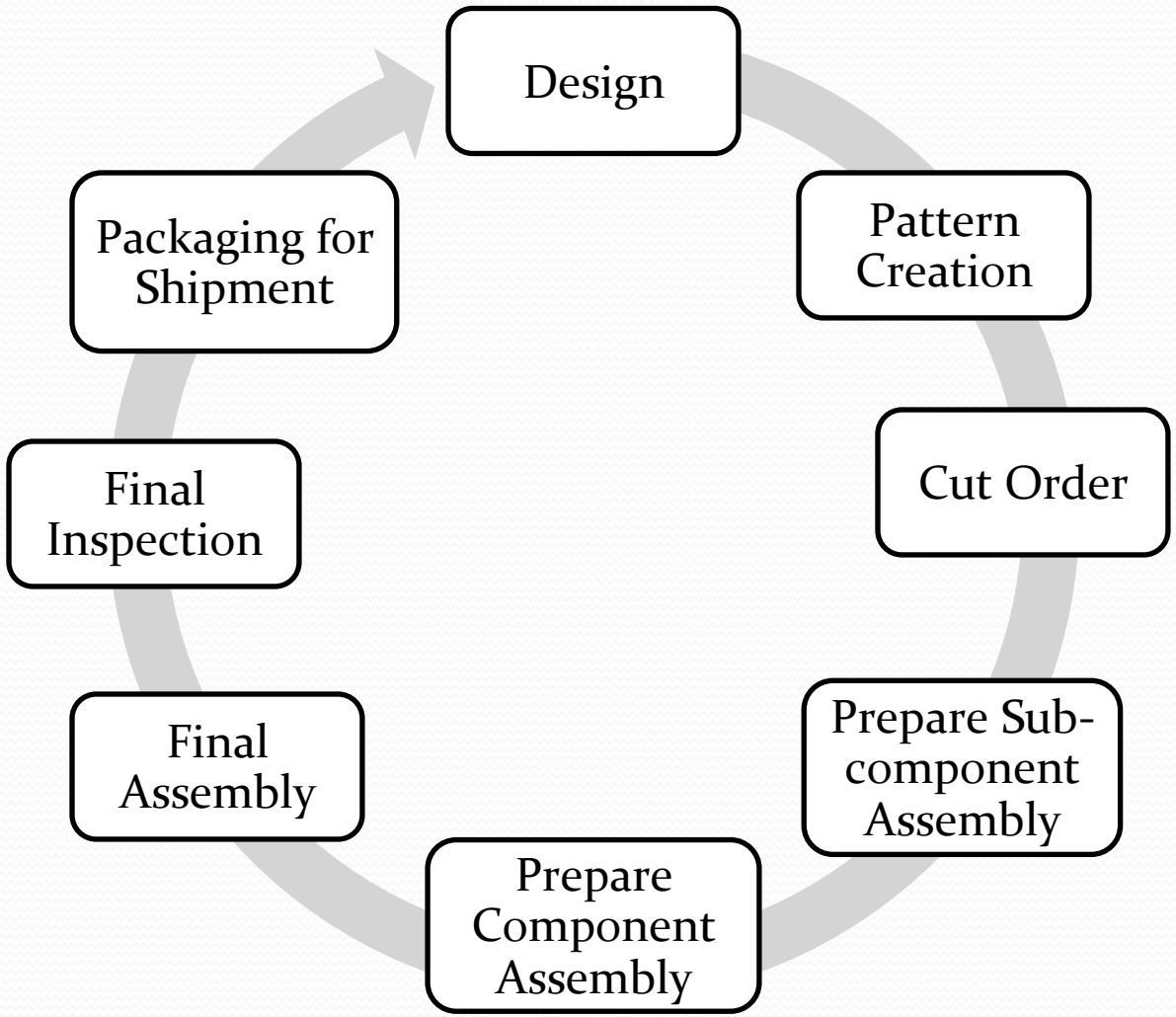
Varieties of Soft Sided Super-sacks

Popcorn Bag

Varieties of Soft Sided Super-sacks

9 Yard/24,000# Liftable Bulk Material Container

How Soft Sided Super-sacks are Manufactured



Design

Criteria for Design

- Physical profile of material
- How will it be filled?
- How will it be loaded into the transporter?
- How will it be shipped?
- Will it need certification for IP1 or IP2?
  - Designed as prescribed in 49 CFR 173.410 A & B/173.411

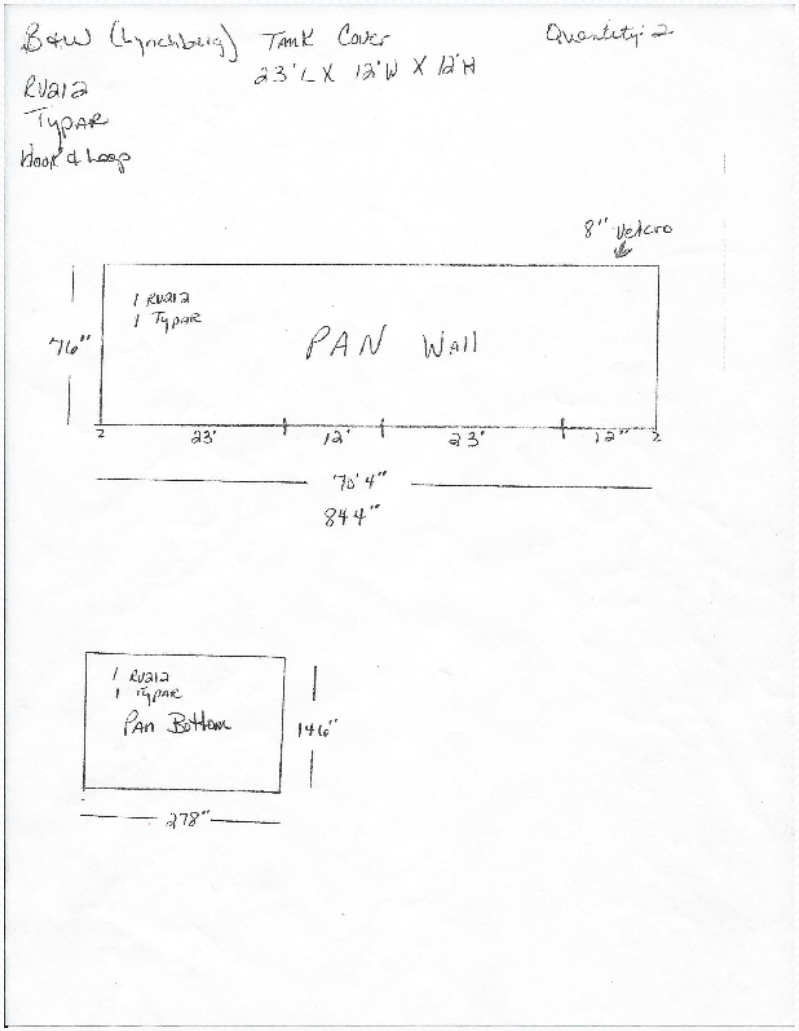
Design, continued

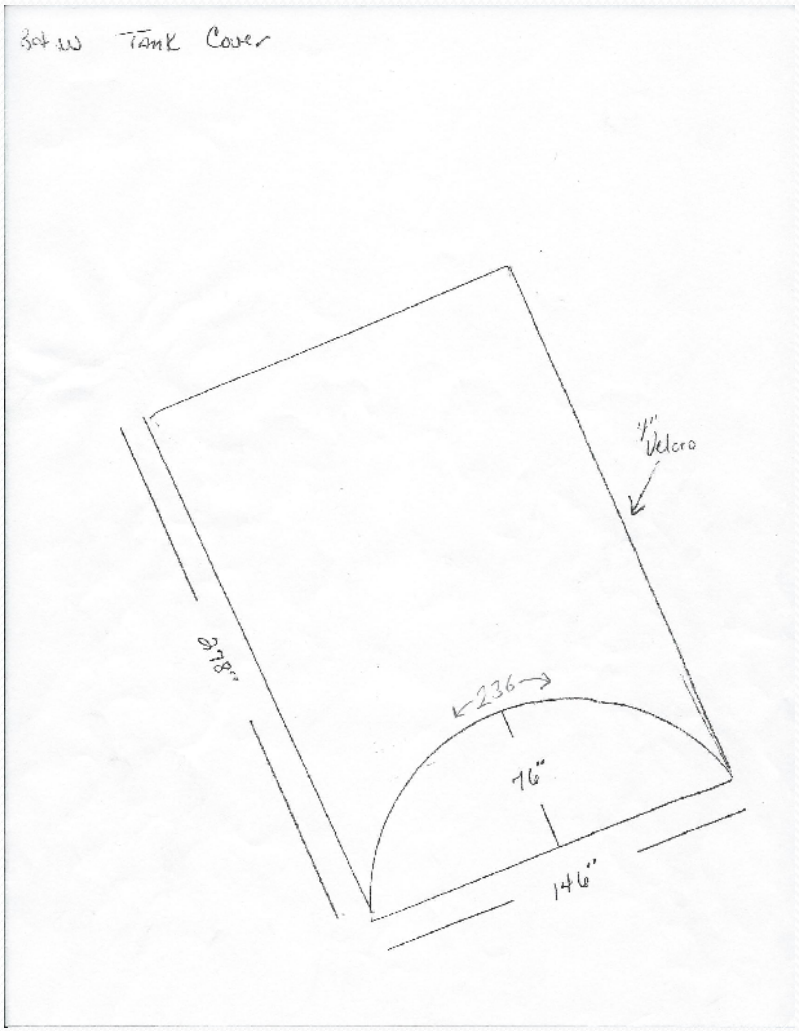
Selection of materials based on criteria

- Exterior fabric
  - Weight
  - Strength
  - Finish
- Liner
  - Puncture
  - Permeability
- Lift Straps
  - Tensile Strength
- Thread
  - Compatible with fabrics

Pattern Creation

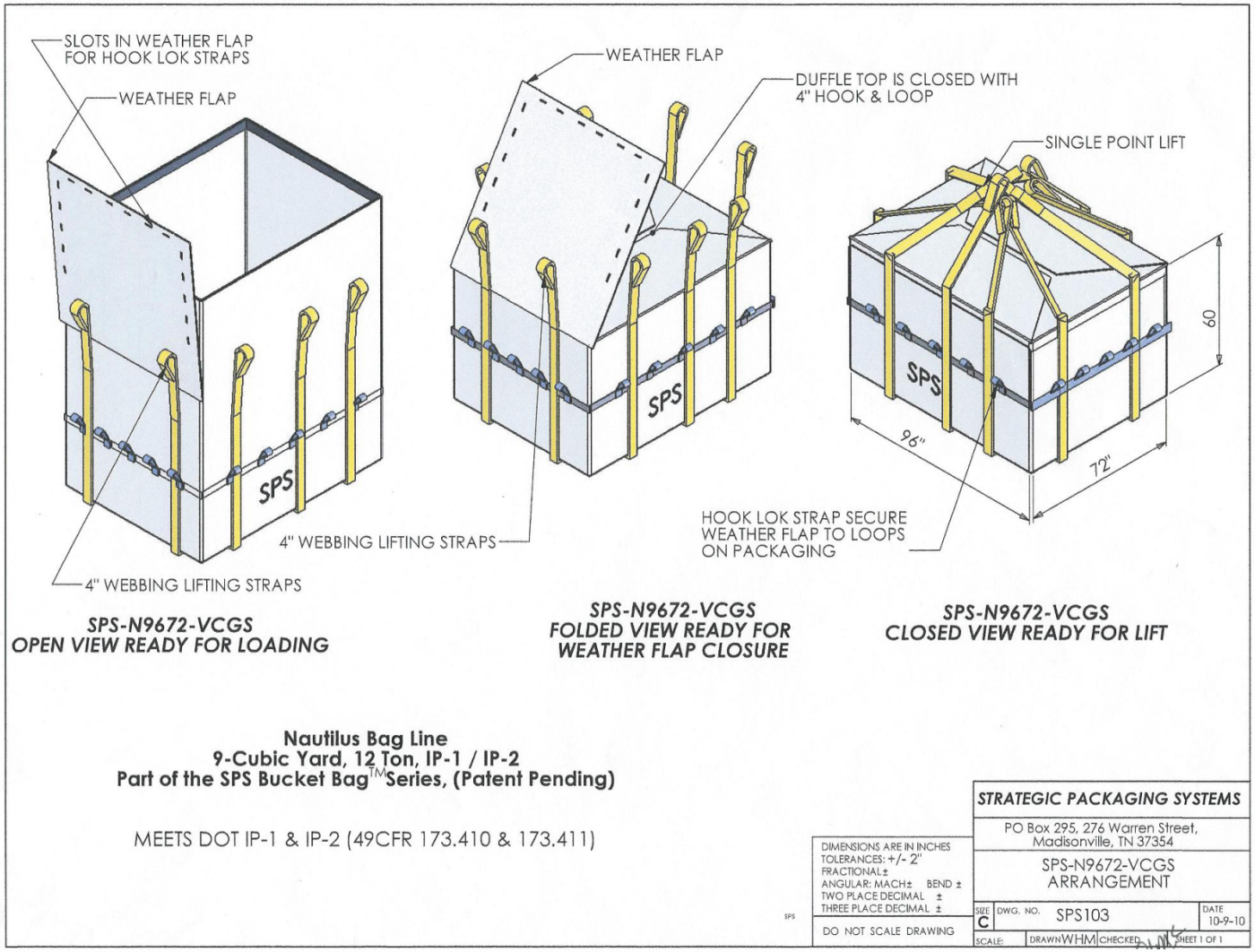
In House Sketch





Pattern Creation, continued

Final Sketch



Cut Order

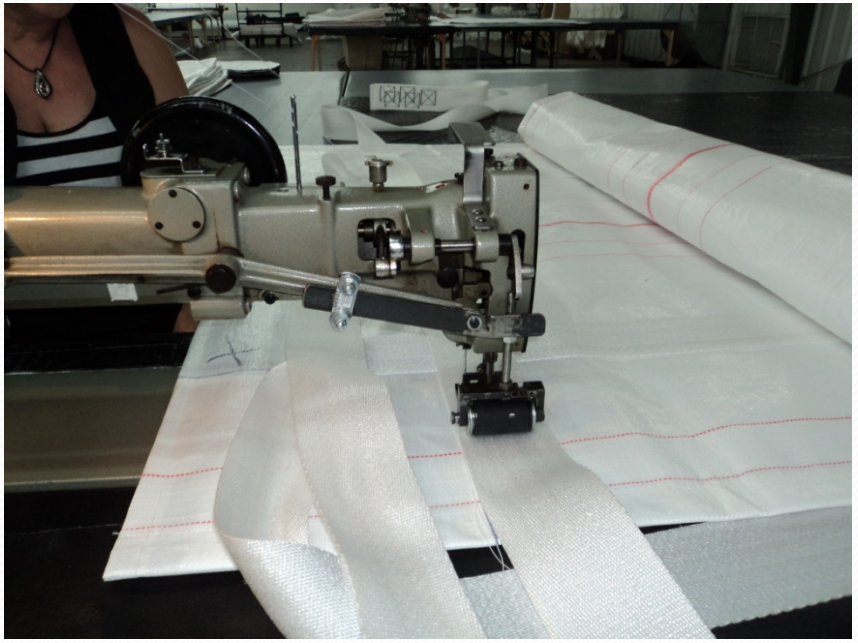
Work Order#	SPS-Custom-RW	Item Number#	SPS-2312-VC		Date Issued
Fabric	RV212/ Typar	Drawing/Sketch	Custom sketch		1-26-2012
Customer	RTW-Lynchburg	Procedure			Date Completed
Quantity: 2					
Date	**Operation**	**Item Number**	**Inspection Results**	**Quantity Complete**	
1-27-2012	Cut pcs	1-2	OK		
2-15-2012	stay stitch	1-2	OK		
	Attach Velcro	1-2	OK		
	Attach End Panel	1-2	OK		
	Dimensions	1-2	OK		
Fabric Roll #	B10616044				
Fabric Roll #					
Fabric Roll #					

Preparing Sub-component Assemblies

- Loops on lifting straps
- Cross tie strap assemblies
- Hook locks for weather strap
- Hook and loop sizing, for closure

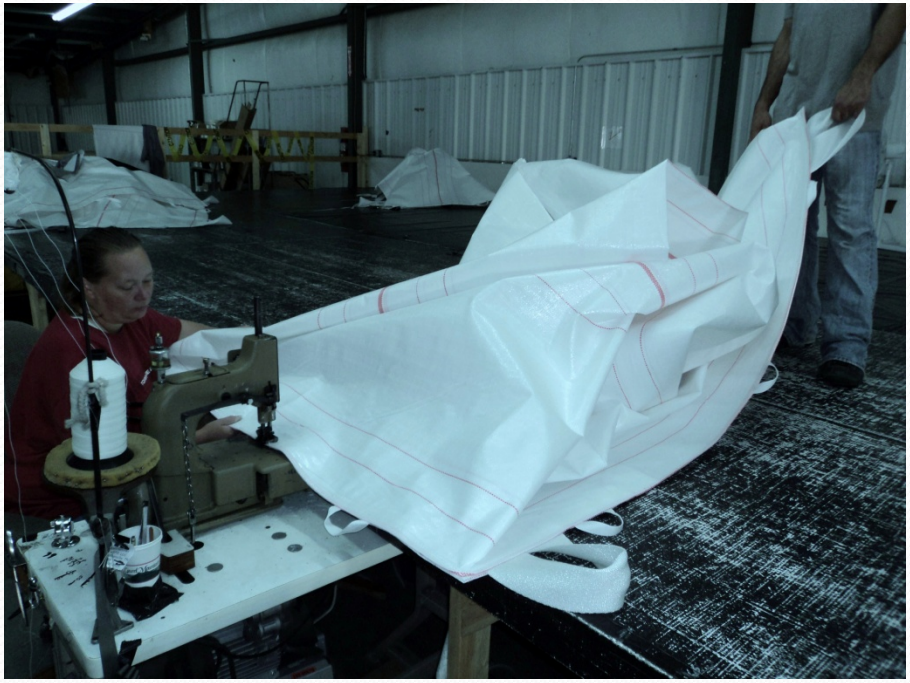
Preparing Component Assemblies

- Hem & attach lifting straps to floor
- Hem & attach liner to walls, if needed
- Hem & attach weather flap and/or duffle top
- Attach closure
  - Duffle top
  - Hook & loop
  - Cross ties



Final Assembly

- Join floor to wall section
- Join duffle top to wall top with closure
- Add weather flap



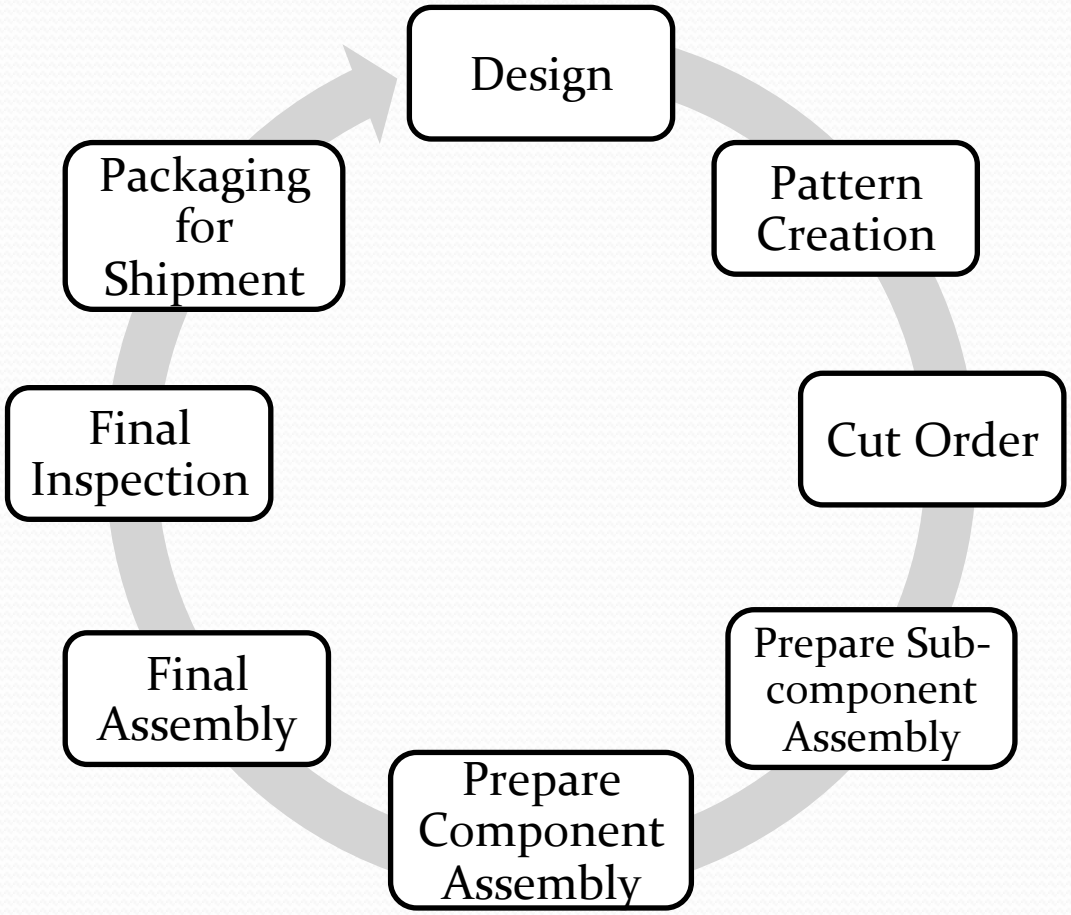
Final Inspection

- Bag is attached to inspection lifting frame
- Specific inspection procedures are followed per bag design
- Final inspecting is performed by QA manager
- Sign off on inspection checklist

Packaging for Shipment

- Bag is folded per procedure,
- Placed on a fabric covered pallet,
- Banded, covered, & banded again
- Any special instructions or certifications are applied to the package

How Soft Sided Super-sacks are Manufactured



Questions & Answers

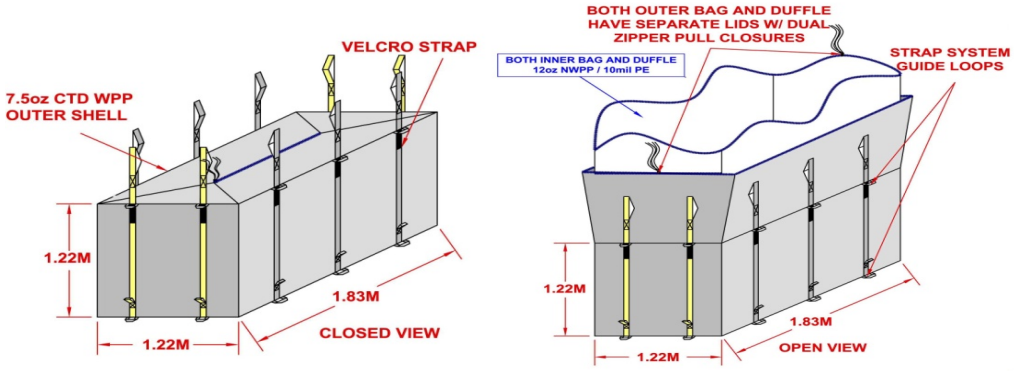
Attachment P – PacTec Testing Summary

LIFTPAC FLEXIBLE PACKAGE DESIGN AND FEATURES:

Flexible waste packages, are engineered products, fabricated under strict quality controls, and are tested and certified to IAEA Standards IP-1 or IP-2 including "leak tightness", as required by the intended application and user requirements. Drop tests, stacking tests, simulated transport conditions, meteorological changes, and the like are all tests that flexible packages have been subjected.

LiftPac bag stack test with 54,515 kg of weight

LiftPac bag lift test



The materials used to fabricate flexible packages are robust, and include woven and non-woven polypropylene, polyethylene, nylon, and other special materials. The flexible waste package is a large rectangular bag, with special closures, including zippers and a unique lifting system. In that each bag is individually fabricated, there are several options available regarding size, volume, closures, lifting devices, internal stiffeners, and so on. Smaller, scaled down bags can be used where space is limited, for example.

Bag seams are strongly constructed and are carefully manufactured, and may require other methods to ensure strong, tight joints, depending upon applications. Custom liners can be added to the bag for wet

applications. Each bag receives quality control inspections throughout the manufacturing process and independent lab tests, as required. Note from the Figures that the lifting straps are held in place in such a way that they are readily accessible to the operators responsible for loading, closing and moving the bag. Flexible packaging is manufactured in special purpose facilities, with ISO quality manufacturing certifications.

TESTING:

Flexible packaging has been tested and certified to IP-1 and IP-2 standards per 49 CFR 173.411 and can also meet IAEA Safety Standards TS-R-1 Section VI Requirements for Industrial Packaging.

PacTec carried out additional testing of the flexible package to confirm the “leak tightness” of the bag during routine conditions of transport and meteorological conditions. The test method chosen was a vibration table test with associated pressure flow test with a tracer dust to detect release of any fine particulate dust during the test.

Testing incorporated a large vibration table, using military standard test procedures for cargo transportation “MIL-STD-810F”. The flexible package, loaded with sand/soil, gravel and construction debris as well as a Fluorescein tracer dust was placed on the vibration table. To ensure that the test specimen represented the original design, the flexible package containment barrier was not penetrated and a unique method of increasing the air volume was developed. Establishment of the test parameters for Vibration Profile, Air Pressure/Volume are discussed below..

Table 1 The frequency of occurrence of a range of acceleration values – 20’ ISO freight container

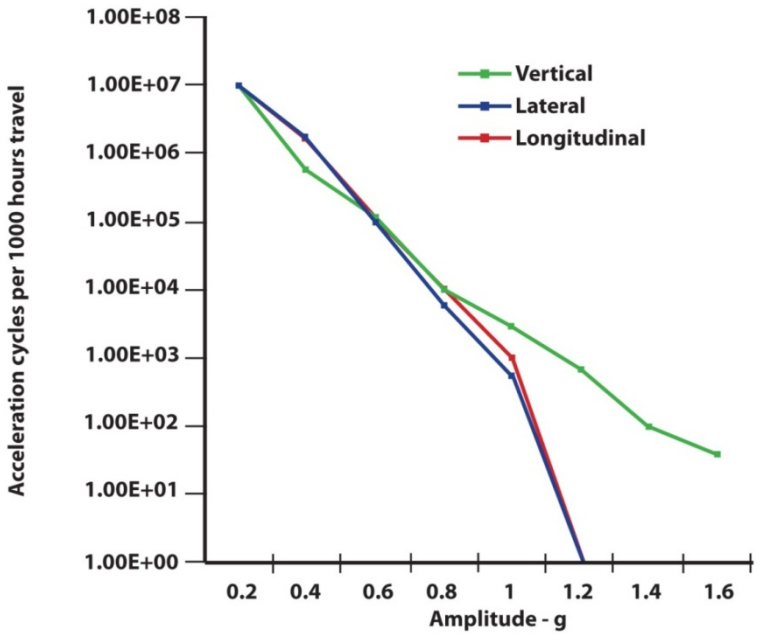


Figure 1 - Acceleration data 20' ISO freight container

Load case	Longitudinal amplitude -g	Lateral amplitude -g	Vertical amplitude -g	Total number of cycles per 1000 hours
1	0.4	0.2	0.4	11.15×10^6
2	0.8	0.4	0.8	1.93×10^6
3	1.2	0.6	1.2	99.5×10^3
4	1.6	0.8	1.6	5.36×10^3
5	2.0	1.0	2.0	491

Combined Effect
The following combined effects were considered for temperature change, pressure, and altitude.

Increase in air volume due to 122^{o}F rise in temperature	=	18%
Increase in air volume due to 55mbar fall in pressure	=	5%
Increase in air volume due to 1,300 ft change in altitude	=	5%
Total increase in air volume in the LiftPac bag	**=**	**28%**

Interpretation of test parameters

To increase in the air volume by 28%, a unique method of increasing the air volume was developed. Although a typical flexible package would most likely not travel more than 5-10 hours, the test specimen was tested to failure, simulating over 180 hours of drive (transport) time*. At set intervals during the test, inspections were carried out on the test specimen at 30 minute intervals using a fine mist water spray and a UV light, no dispersal of the contents were detected during the test parameters.

**1 hr. of test time is equivalent to over 180 hrs. of travel time: X=[(5Hz x 60 sec/min) / 99,5000 cyc] x 1000 hr. = 180.9 hrs.*

Flexible package used in testing

SAFETY:

Flexible waste packages have been proven to be safe when used for the applications they have been designed, tested, and certified for. More than 25,000 flexible LLW packages have been safely used in the USA over the last 15 years. The bags are DOT certified and also IP-1 or IP-2 certified as a Class 7 package.

CONCLUSION:

The LiftPac bag has been subjected to extreme re-assurance testing, to demonstrate that no loss or dispersal of contents can occur during routine conditions of transport and meteorological changes, which complies with the IAEA Standards for IP-1 and IP-2 including leak tightness.