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B4

Joustra, Judith

From: Norman, Yolande
Sent: Monday, January 10, 2011 2:01 PM
To: Joustra, Judith; Roberts, Mark; Kauffman, Laurie
Cc: Chang, Lydia
Subject: SENSITIVE FW: NRC's RAIs
Attachments: NRCs.Requests for Additional Information for SLDA Physical Security Plan r1.12.23.2010.docx; NRC 2nd Draft Response on FSSP 2011-01-06 Comments on USACE SLDA 2nd response to comments.docx; slda trench materials.pdf; ML0809403762.SLDA License Amendment8.pdf; SLDA_Meeting Agenda_Jan.11& 12.2011.rev.doc; USACE.list.of.NCS Document Summary.doc; USACE REsponse to the NRC's_MCA RAI Responses ML 11-10-10.doc; SLDASlide.for_01.2011.interagency meeting.pptx

Hello everyone,
Attached you will find the following;

1) Meeting Agenda
2) RAIs for the PSP.
3) NRC's draft response on the FSSP dated November 10, 2010
4) USACE's response to the NRC's comments on the MC&A.
5) List of NCS Document pending submittal by USACE for the NRC Criticality Analysis

For reference purposes I have also included the following;

6) Inventory of trench material
7) A copy of the license
8) A schematic drawing of the site

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From: Norman, Yolande
Sent: Thursday, December 23, 2010 11:41 AM
To: Lenart, William J LRP
Cc: 'D'Arcy, Kimberley A HQ02'; 'Frothingham, David G LRB'; 'Hummel, Janna E LRB'; Lemoncelli, Mauri; Chang, Lydia; Purdy, Gary; Norman, Yolande
Subject: NRC's RAIs

Hello Bill,

(b)(4)

Information in this record was deleted in accordance with the Freedom of Information Act, exemptions 4
FOIA/PA-2011-0289

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(b)(4)

We welcome the opportunity for further discussion on this issue.

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Requests for Additional Information for SLDA Physical Security Plan

(b)(4)

Basis: 10 CFR 73.21, " Protection of Safeguards Information: Performance Requirements" and 10 CFR 73.22, "Protection of Safeguards Information: Specific Requirements."

(b)(4)

Basis: 10 CFR 73.67(d)(1) states, "Use the material only within a controlled access area which is illuminated sufficiently to allow detection and surveillance of unauthorized penetration or activities." Additionally, 10 CFR 73.67(d)(2) states, "Store the material only within a controlled access area such as a vault-type room or approved security cabinet or their equivalent which is illuminated sufficiently to allow detection and surveillance of un authorized penetration or activities."

(b)(4)

Basis: 10 CFR 73.67(d)(3) states, "monitor with an intrusion alarm or other device or procedures the controlled access areas to detect unauthorized penetration or activities"

(b)(4)

Basis: 10 CFR 73.67(d)(3) states, "monitor with an intrusion alarm or other device or procedures the controlled access areas to detect unauthorized penetration or activities"

(b)(4)

(b)(4)

Basis: 10 CFR 73.2 Definitions, Vault-type rooms are required to have doors that are capable of being locked, protected by an intrusion alarm which creates an alarm upon the entry of a person anywhere into the room and upon exit from the room or upon movement of an individual within the room.

(b)(4)

Basis: 10 CFR 73.67(d)(4) states, "Conduct screening prior to granting an individual unescorted access to the controlled access area where the material is used or stored, in order to obtain information on which to base a decision to permit such access."

(b)(4)

Basis: 10 CFR 73.67(d)(5) states, " Develop and maintain a controlled badging and lock system to identify and limit access to the controlled access areas to authorized individuals." 10 CFR 73.67(d)(6) states, "Limit access to the controlled access areas to authorized or escorted individuals who require such access in order to perform their duties."

(b)(4)

Basis: 10 CFR 73.67(d)(5) states, " Develop and maintain a controlled badging and lock system to identify and limit access to the controlled access areas to authorized individuals."

(b)(4)

Basis: 10 CFR 73.67(d)(8) Establish a security organization or modify the current security organization to consist of at least one watchman per shift able to assess and respond to any unauthorized penetrations or activities in the controlled access areas.

(b)(4)

Basis: 10 CFR 73.67(d)(10) states, 'Search on a random basis vehicles and packages leaving the controlled access areas."

(b)(4)

Basis:10 CFR 73.67(a) states, "*General performance objectives.* (1) Each licensee who possesses, uses or transports special nuclear material of moderate or low strategic significance shall establish and maintain a physical protection system that will achieve the following objectives:

(b)(4)

(b)(4)

Basis:10 CFR 73.67(f) states, "Fixed site requirements for special nuclear material of low strategic significance. Each licensee who possesses, stores, or uses special nuclear material of low strategic significance at a fixed site or contiguous sites, except those who are licensed to operate a nuclear power reactor pursuant to part 50, shall:
(1) Store or use the material only within a controlled access area,
(2) Monitor with an intrusion alarm or other device or procedures the controlled access areas to detect unauthorized penetrations or activities,
(3) Assure that a watchman or offsite response force will respond to all unauthorized penetrations or activities"

(b)(4)

Basis: 10 CFR 73.67(f) states, "Fixed site requirements for special nuclear material of low strategic significance. Each licensee who possesses, stores, or uses special nuclear material of

low strategic significance at a fixed site or contiguous sites, except those who are licensed to operate a nuclear power reactor pursuant to part 50, shall:

(1) Store or use the material only within a controlled access area."

(b)(4)

Basis: 10 CFR 73.67(f) states, "Fixed site requirements for special nuclear material of low strategic significance. Each licensee who possesses, stores, or uses special nuclear material of low strategic significance at a fixed site or contiguous sites, except those who are licensed to operate a nuclear power reactor pursuant to part 50, shall: (1) Store or use the material only within a controlled access area."

(b)(4)

Basis: 10 CFR 73.67(e)(i) states, "Provide advance notification to the receiver of any planned shipments specifying the mode of transport, estimated time of arrival, location of the nuclear material transfer point, name of carrier and transport identification."
Basis: 10 CFR 73.67(g)(i) states, "Provide advance notification to the receiver of any planned shipments specifying the mode of transport, estimated time of arrival, location of the nuclear material transfer point, name of carrier and transport identification."

(b)(4)

Basis: 10 CFR 73.67 (e)(1)(ii) states, " Receive confirmation from the receiver prior to the commencement of the planned shipment that the receiver will be ready to accept the shipment at the planned time and location and acknowledges the specified mode of transport."

Basis: 10 CFR 73.67(g)(1)(ii) states, "Receive confirmation from the receiver prior to commencement of the planned shipment that the receiver will be ready to accept the shipment at the planned time and location and acknowledges the specified mode of transport."

(b)(4)

Basis: 10 CFR 73.67(e)(3)(i) states, " Arrange for telephone or radio communications between the transport and the licensee or its designee: (A) To periodically confirm the status of the shipment (B) for notification of any delays in the scheduled shipment, and (C) to request appropriate local law enforcement agency response in the event of an emergency."

(b)(4)

Basis: 10 CFR 73.67(e)(3)(ii) states, " Minimize the time that the material is in transit by reducing the number and duration of nuclear material transfers and by routing the material in the most safe and direct manner."

(b)(4)

Basis: 10 CFR 73.67(e)(3)(iii) states, "Conduct screening of all licensee employees involved in the transportation of the material in order to obtain information on which to base a decision to permit them control over the material."

(b)(4)

Basis: 10 CFR 73.67(e)(4)(i) states, " Make all shipments of the material either (A) in dedicated transports with no intermediate stops to load or unload other cargo and with no carrier or vehicle transfers or temporary storage in-transit, or (B) under arrangements whereby the custody of the shipment and all custody transfers are acknowledged by signature, and
(ii) Maintain the material under lock or under the control of an individual who has acknowledged acceptance of custody of the material by signature."

(b)(4)

COMMENTS ON THE U.S. ARMY CORPS OF ENGINEERS' (USACE) RESPONSE TO COMMENTS FOR THE SHALLOW LAND DISPOSAL AREA FINAL STATUS SURVEY PLAN

(NRC's draft response dated January 10, 2011)

At the request of the U.S. Nuclear Regulatory Commission (NRC), the Oak Ridge Institute for Science and Education (ORISE) performed a technical review of the USACEs' response to NRC comments titled:

Proposed SLDA FSSP Revisions from the October 21, 2010 Meeting between the NRC, ORISE, USACE, and ANL;

and the USACE's revised Final Status Survey Plan titled:

Shallow Land Disposal Area (SLDA) Site Final Status Survey Plan Parks Township, Armstrong County, Pennsylvania. November, 2010.

In general, responses to comments were adequate, with two noted exceptions. These exceptions are discussed below.

General Comment

1. *Response 4, Bullet 3* and *Response 4 Bullets 4 – 6*: It is the reviewer's opinion that the responses noted for the optimistic scan MDCs and Class 2 and 3 survey unit composite sample evaluations are very general, and non-committal in nature. That is to say, although the USACE has recognized and understands the NRC concerns identified in the original comments, the response does not provide specific actions that will be taken or specific modifications to the FSSP. Rather, the USACE has committed to further evaluation of these concerns once the plan has been implemented and data are gathered. It is the reviewer's opinion that this item remains open and be subject to in-process evaluations once the FSSP commences to determine how the USACE follows-up on the stated investigative commitments.

   Furthermore, the FSSP most notably the Item #2, page 19 excerpt shown below, is technically incorrect and does not reflect the comment responses. It is not appropriate to use $DCGL_{EMC}$ in the SOR calculations for Class 2 and 3 areas and in particularly background reference area values as stated.

> The mean subsurface background activity concentrations will be used to calculate $DCGL_{emc}$ SOR values from samples collected in the excavation areas (including the overburden and bench/side slope soils). For the surficial composite soil samples collected from the unexcavated Class 2 and Class 3 units, mean surface background values will be used to calculate the SORs. The SOR $DCGL_{emc}$ values must be less than or equal to one for every soil sample. Each soil sample will be required to comply with the 100-m^2 $DCGL_{emc}$ standard.

Specific Comment

1. *Response 1*: The ORISE review has determined that Response 1 is not appropriate. During the October 21, 2010 conference call, it was explained that the investigation level for a composite sample was to be based on the number of increments forming the composite sample and the $DCGL_{EMC}$ for the area represented by the composite. The point is also stressed in NUREG-1505. In the case of the SLDA, the number of increments is 5 and the area represented by each composite sample is 100 m^2. The USACE's response to comments and FSSP revisions did not satisfy this commitment. Rather, the response was that the action level would be 1/5 of the $DCGL_{EMC}$ for a 20 m^2 area and that if this action level were met, then the $DCGL_{EMC}$ for a 100 m^2 area would also be met.

   The text of the response states the following:

   > *The table also provides derived investigation levels for Class 1 100 m^2 5-increment systematic composites sample that guarantees that each of the increments could not have exceeded its corresponding $DCGL_{EMC}$ (in other words, if activity concentrations were zero in four of the increments while the fifth carried all of the activity). It is important to note that the resulting investigation levels exceed the 100 m^2 $DCGL_{EMC}$ requirement. Consequently, a systematic composite result below its 100 m^2 $DCGL_{EMC}$ requirement also guarantees that none of the contributing increments will exceed their 20 m^2 $DCGL_{EMC}$ requirement.*

   and the Table footnote states:

   > [2] *ROC investigations levels are 1/5 of the 20-m^2 $DCGL_{emc}$ activity concentrations.*

   The reviewer evaluated this approach, using 1/5 of the 20 m^2 $DCGL_{EMC}$, for two of the radionuclides of concern (ROCs)—Am-241 and Th-232 were the selected ROCs. The result of this evaluation is that the proposed derived investigation levels will not consistently provide a guarantee that the 100 m^2 $DCGL_{EMC}$ will also be met for all radionuclides. Again, the recommendation during the conference call, guidance in NUREG 1505, and other sources clearly state the investigation level should be based on $(DCGL_{EMC,\ 100\ m^2})/5$.

   The evaluations for both Am-241 and Th-232 were selected based on DCGL levels and the predominance of these ROCs as reported in the FSSP. For the case of Am-241, the USACE approach held. That is, running the various worst case scenarios provided the 20 m^2 $DCGL_{EMC}$ concentration levels not exceeded than all other possible scenarios would also be identified for the 100 m^2 exceedances. However, for Th-232, the approach did not hold. The reviewer interpolated area factors for both ROCs to enable a closer inspection of the approach. For Am-241, calculated composite sample activity concentrations for 20, 40, 60, and 80 m^2 hot spots at the respective $DCGL_{EMC}$ were calculated and compared with the 100 m^2 $DCGL_{EMC}$. In each case, the concentration would be greater than the 420 pCi/g 100 m^2 $DCGL_{EMC}$. The table below shows the results.

Am-241 Investigation Levels				
Area (m^2)	Area Factor	$DCGL_{EMC}$ (pCi/g)	Calculated Composite Activity (pCi/g)	Composite concentration $\geq$ $DCGL_{EMC}$ [1]
20	184.7	5,172	5,172 × 0.2 = 1,034	≥ 420
40	63	1,764	1,764 × 0.4 = 705.6	≥ 420
60	33.1	926.8	926.8 × 0.6 = 556.1	≥ 420
80	21.9	613	613 × 0.8 = 490.4	≥ 420
100	15	420	420 × 1 = 420	≥ 420

[1] Based on # of elevated increments at the respective $DCGL_{EMC}$

However, for Th-232, this did hold. For example a 40 m^2 Th-232 area factor would be 5.6. The interpolated area factor is 1.4; corresponding to a 40 m^2 $DCGL_{EMC}$ of 7.87. This level represented within a composite (2 increments containing 7.87 pCi/g and the remaining 3 increments with no added Th-232) would be reported as 3.1 pCi/g. A value less than the 100 m^2 $DCGL_{EMC}$ of 5.3 pCi/g. If this were the case, the USACE would conclude the area was acceptable when in reality it may not be. The reviewer is providing this one example only and has not looked at the remaining hot spot area scenarios and other ROCs.

The above evaluation combined with the original concern with overly optimistic scan MDCs discussed in the general comment suggests that the USACE follow standard composite sample result evaluation guidance.

TABLE 2-1
DESCRIPTION OF MATERIALS PLACED IN SLDA TRENCHES

Trench #	Dates of Activity	Description from the Site Characterization Report	Reported[1] Radiological Content	Description from ARCO Memo to Department of Justice (DOJ) (March 2000)[2]
Trench # 1	1961	61 drums and 5 bags of process waste 23 drums and 17 bags of trash 4 drums of beryllium waste miscellaneous debris	141.7 g U-235 Total Uranium = 4,526 g	Approximately 125,000 cubic feet (ft^3) of waste including process wastes, beryllium wastes, and scrap protective clothing (e.g. "dry active waste" DAW)
Trench # 2	1962	15,668 grams (g) of metal oxide powder 142.8 kilograms (kg) vapor blast [i.e. sand] 25 drums containing 1,075 kg of organic liquid Leached solids, including 399 pounds (lbs.) ash and 160 lbs. miscellaneous residue Leached residue In 1965 Trench #2 also received liquids during the exhumation of Trenches 4 & 5	4.41 g Uranium 156 g Uranium 152 g Uranium 616 g Uranium; 564 g U-235 289 g Uranium 564 g U-235 Total Uranium = 1,217.41 g	Approximately 110,000 cubic feet (ft^3) of waste including scrap metallic oxide powders, contaminated sand, process ash and residues, contaminated organic liquids, and DAW.
Trench # 3	1965 (best estimate)	ARCO/B&W believed this trench never received solid or liquid waste. Trench 3 is however thought to have functioned as a "catch basin" that received run-off from Trenches 2 and 4 when they were exhumed in 1965.		Excavated as a settling pond during 1965 exhumation. Approximately 5,000 ft^3 of contaminated soil exists in this area.
Trenches # 4 and #5	1963 - 1965 burial in 1963 no burial reported in 1964 exhumed in 1965	270 kg of scrap "solutions" (UO_2-BeO) 175 "birdcages" (shipping containers) used for UO2-BeO wastes 52 truck-loads of assorted process wastes, debris, and contaminated equipment The roof from the Apollo facility (burned in pit in early 1963) metal drums, stanchions, shipping container liners, strapping material, combustibles, etc.	37 g Uranium	Approximately 85,000 ft3 of waste (55,000 and 30,000 respectively). Materials from both trenches included uranium-beryllium scrap solutions, empty "birdcages" , assorted process wastes, debris, contaminated equipment, roof of Apollo facility, and DAW (Dry Active Waste).
Trench # 6	1965 - 1967 1965 1966 1967	 150 drums each containing 5 g Th02 593 2-quart (qt) bottles of leached solids 75 2-qt bottles calcined filters 14 55-gallon drums containing 1,811 g U-235 200 to 300 drums and air filters from "Blue Building" at Apollo 40 55-gal drums containing scrap recovery wastes, including leached ashes and solids leached poly buckets and vials, scap metal, glass, and debris 22 drums process waste from CP-1 1 drum of 8-OH filter cake	 750 g Th02 estimated, not previously reported 1,811 g U-235 3,162 g U-235; Total Uranium = 3,660.6 g 1,720 g U-235; Total Uranium = 787,800 g 570 g U-235; Total Uranium = 258,700 g Total U-235 = 5,911.9 g Total Uranium = 1,051,618 g	Approximately 110,000 cubic feet (ft^3) of scrap thorium oxide, scrap recovery waste such as ash and residues, filter cakes, DAW and zircalloy wastes.
Trench # 7	1968 - 1970 1968	 large vacuum chamber one drum of zirc[onium]-beryllium 208,456.5 (units not specified) of raffinate, condensate, and filtrate from the high-enriched scrap recovery line 33 filters 97 55-gal drums of scrap recovery wastes and misc. wastes, including leached solids, vials, poly buckets, filter frames, residues and misc. scrap. Disposal boxes containing filter papers and 8-OH filter cake	913.5 g U 235 Total Uranium = 982.8 g 148.5 g U-235 Total Uranium = 152 g 2,301.5 g U-235 Total Uranium = 2,553 g 230 g U-235 Total Uranium = 130,000 g Total U-235 = 3690 g Total Uranium = 133690 g	Approximately 100,000 cubic feet (ft^3) of zirc-beryllium waste, scrap recovery wastes, filter paper, filter frames, 8-hydroxyquinoline filter cake, DAW, spent organic solutions, and a large vacuum chamber.

TABLE 2-1
DESCRIPTION OF MATERIALS PLACED IN SLDA TRENCHES

Trench #	Dates of Activity	Description from the Site Characterization Report	Reported[1] Radiological Content	Description from ARCO Memo to Department of Justice (DOJ) (March 2000)[2]
Trench # 7 (cont.)	1969	contaminated waste drums and filters, 14 truckloads of contaminated waste and filters		
		45 drums of leached samples, filters, debris, vials, buckets, and misc. scrap	586 g U-235 Total Uranium = 608 g	
		154 liters of stripped organic solution	2.37 g U-235 Total Uranium = 2.43 g	
		697 drums (C, D, E, and F series)	14,238 g U-235 Total Uranium = 15,310 g	
			Total U-235 = 14830 g Total Uranium: "not ascertained"	
	1970	14 boxes, 11 2-qt bottles, 66 buckets containing 231.933 kg scrap, and 2 filters - "shaken out"		
		25 drums of leached residues, miscellaneous scrap	1,058 g U-235 Total Uranium = 2,404 g	
		70 liters stripped organic solution		
		198,385 (no units specified) aqueous waste and contaminated oil	91 g U-235 Total Uranium = 2,833 g	
		210 boxes, 27 drums containing "relatively large quantity of U-235"	Total U-235 = 1150 g Total Uranium = 5240 g	
Trench # 8	1970	Discarded filtrate from ADU recovery, raffinates from scrap recovery and leached dissolver residues	543 g U-235 Total Uranium = 18,512 g	Approximately 30,000 cubic feet (ft^3) of scrap recovery wastes, contaminated soil, leached residues, scrap and DAW.
		22 drums of contaminated soil from sewer project at Apollo		
		25 drums of leached residues and scrap	322.1 g U-235 Total Uranium = 2,747.6 g	
			Total U-235 = 865.1 g Total Uranium = 21260 g	
Trench # 9	1968-1970	Contaminated soil from Trench #2		Approximately 55,000 cubic feet (ft^3) of contaminated soil, leached residues, scrap and DAW.
		17 pieces of equipment	not listed	
		several pieces of plywood from "Plutonium Facility drum field"		
Trench # 10	1960-1971			Approximately 370,000 cubic feet (ft3) of material including, electrodes, DAW, filter cakes, barn debris, lightly contaminated equipment, and a truck. Much of the equipment placed in the trench was "uncontaminated (a barn, construction/demolition waste)
		Electrodes, kimwipes and other lab waste, pipes, valves, tygon tubing, fuel tubing, feed sacks, and filter cake	308.2 g U-235 Total Uranium = 3,815 g Thorium: 0.03 g	
	1960			
		Slaughter house demolition waste, a barn foundation and quantities		
	1968	of soil from excavation work		
		uncontaminated scrap (primarily old equipment) from an		
	1971	equipment storage and laydown area near Trench 10.		
		contaminated truck likely used for waste transport reportedly also placed in the trench		

[1]Descriptions of the waste and dates of activity were obtained from SLDA Site Characterization Report, Section 4.5, May 19, 1995

[2]Memo to the Department of Justice was issued by ARCO March 2000