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ENTERED

chamberlain, kathryn, NMENV

From: Enz, Robert D. [REnz@doeal.gov]
Sent: Friday, July 07, 2006 7:41 AM
To: chamberlain, kathryn, NMENV
Cc: Gregory, David R.; 'jmccann@lanl.gov'
Subject: FW: Final Workplan for Ash Removal
Attachments: LANL Ash Waste Final WP.pdf

Katie,

The work plan for the waste characterization sampling is attached below. Samples RE 73-05-58829, RE 73-05-58835, RE 73-05-58841, and RE 73-05-58879 were composites of 5 locations, and satisfied the frequency (one every 500 cubic yards) required by the disposal facilities per Section 2.5 of the work plan. For example, RE 73-05-58835 is a composite of locations RE 73-05-58830, RE 73-05-58831, RE 73-05-58832, RE 73-05-58833, and RE 73-05-58834. The composites are listed in Table 1 of the attached work plan.

My sampling request for the bagged ash material seems to have been overcome by the rigging/hoisting accident up here. Portage is supposed to sample the bagged material in the airport parking lot for radionuclides and TCLP Metals to satisfy TA-54 waste processing requirements. I will forward results once I have been assured that the sampling and analyses have occurred.

-----Original Message-----
From: Jeffrey Hess [mailto:jhess@itsi.com]
Sent: Thursday, July 06, 2006 3:51 PM
To: Enz, Robert D.
Cc: hyland.b.morrow@usace.army.mil; dledford@itsi.com; Ken Leonard
Subject: Final Workplan for Ash Removal

Bob,

There was a final workplan issued in April 2005 for the ash characterization. I have attached a copy of this.

Section 2.5 of this workplan discusses the use of composite samples versus discrete samples for the analysis of the ash, per guidelines from the disposal facilities:

- Metals, and radiochemistry were sampled at a frequency of 1 per 100 cubic yards

- VOCs, SVOCs, PCBs, dioxins/furans, and physical parameters were analyzed at a frequency of 1 per 500 cubic yards.

This is what accounts for the composite sample IDs, which represent the composite of 5 discrete samples (representing approximately 100 yards each) to generate the composite sample (representing approximately 500 yards).
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"The surest way to corrupt a youth is to instruct him to hold in higher regard those who think alike than those who think differently."

- -- Nietzsche

CONFIDENTIALITY NOTICE:

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Attachment 1 – Determination of Listed Waste Status of Incinerator Ash

The following describes an evaluation to determine whether incinerator ash present at solid waste management unit (SWMU) 73-002 is a listed hazardous waste. The determination of whether a waste is a listed hazardous waste is based on knowledge of the process generating that waste. The ash present at SWMU 73-002 resulted from use of an incinerator to incinerate classified documents and municipal solid waste. This process does not constitute a specific or nonspecific source of listed waste under 40 CFR 261 Subpart D (incorporated by 20.4.1.200 NMAC) and, therefore, the ash would not be listed waste on this basis. Another consideration of whether a solid waste is a listed waste is whether it is a mixture of solid waste and listed waste, in which case the entire mixture would constitute a listed waste per 40 CFR 261.3(a)(iv) (incorporated by 20.4.1.200 NMAC). This determination first involves identifying whether hazardous waste constituents associated with listed waste sources are present in the waste. If so, potential sources of these constituents are evaluated to determine whether they would be listed waste sources identified in 40 CFR 261 Subpart D (incorporated by 20.4.1.200 NMAC). None of the industrial processes identified with specific listed waste sources ("K-listed" wastes) are known to be associated with SWMU 73-002 or wastes potentially disposed of at the site. Therefore, the evaluation of potential listed waste sources is focused on non-specific listed waste sources ("F-listed" wastes).

Hazardous constituents identified through previous analysis of the ash are metals, semivolatile organic compounds (SVOCs), and volatile organic compounds (VOCs). The SVOCs historically detected in the ash samples are presented in Tables 3 and 4 of the approved work plan for SWMU 73-002 and consist of polynuclear aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), pesticides, dioxins and furans, phthalate esters, chlorinated aromatics and phenols, ethers, and benzoic acid. These hazardous constituents were compared to the hazardous constituents that form the basis for listing wastes from non-specific sources that are presented in Appendix VII of 40 CFR 261 (incorporated by 20.4.1.200 NMAC). The classes of hazardous constituents present in the ash that are also constituents that form the basis for listing hazardous wastes are metals, PAHs, dioxins/furans, and chlorinated VOCs. These constituents and their associated listed waste sources are presented in Table 1.

Table 1. Hazardous Constituents Detected in Ash and Associated Listed Waste Sources.

Hazardous Constituents	Listed Waste Sources
Metals	Wastewater treatment sludges from electroplating and metal conversion processes (F006, F019); wastes from wood preserving processes (F034, F035).
PAHs	Process wastes associated with production of organic chemicals and wood preservatives (F024, F025, F034); wastes associated with petroleum refining (F037, F038).
Dioxins/Furans, Chlorinated Phenols	Wastes associated with production or manufacturing use of chlorinated phenols and chlorinated benzenes (F020, F021, F022, F023, F026); discarded formulations containing chlorinated phenols (F027); residues from incineration or thermal treatment of soil contaminated with F020, F021, F022, F023, F026, or F027 wastes (F028).
Chlorinated VOCS	Spent solvents, including degreasing solvents (F001, F002); process wastes from production of organic chemicals (F024, F025).
Aromatic VOCs	Spent solvents, including degreasing solvents (F005).

The listed waste sources identified in Table 1 are not known to be associated with disposal of waste at SWMU 73-002. The only known sources of the wastes present at SWMU 73-002 are incineration of classified documents and municipal refuse and disposal of household trash. These sources are not identified as sources of listed wastes and are also consistent with the presence of the hazardous constituents found in the ash. That is, incineration is known to produce dioxins, furans, and PAHs and these constituents are expected to be present in ash. VOCs should not be associated with incineration since any VOCs present in wastes sent to the incinerator would be volatilized during incineration and would not be present in the ash. Household wastes are expected to contain metals and VOCs, but are excluded from the definition of hazardous waste and would not constitute a listed waste source. On the basis of this evaluation, the ash is not designated as a listed hazardous waste.

Attachment 2 – Radiological Status of Debris Waste

The incinerator ash present at solid waste management unit (SWMU) 73-002 has been determined to be low-level radioactive waste (LLRW). Pursuant to the approved corrective action work plan for SWMU 73-002, debris that is in direct contact with ash will also be managed as LLRW. SWMU 73-002 also contains debris that is not currently in contact with the incinerator ash, but which may have historically been in contact with the ash. The following describes an evaluation to determine whether such debris is LLRW or nonradioactive waste. Evaluation of the radiological status of the debris waste is based on the Department of Energy's (DOE's) performance objective for the certification of non-radioactive hazardous waste. This performance objective was established to evaluate whether hazardous waste generated within a radioactive materials management area (RMMA) was also radioactive and, therefore, a mixed waste. This situation is analogous to the generation of debris waste during remediation of the ash pile. The DOE performance objective establishes two conditions for determining that waste generated within a RMMA is not radioactive. These conditions are: (1) there is no measurable increase in radioactivity above background in volume or bulk and (2) surface contamination meets the requirements of DOE Order 5400.5, II.5.c.(1). These same conditions were used to evaluate the debris waste stream to determine whether it would be LLRW if it had been in contact with ash.

The first condition involves adding radioactivity to the waste matrix itself. In general, this condition would be applicable to wastes such as liquids or bulk solids (e.g., soil). In the case of the debris, contact with the ash would not be expected to add radioactivity to the waste matrix itself (e.g., the metal comprising a can or automobile part). Rather, contact of debris with the ash would only have the potential for causing surface contamination of the waste. Therefore, debris would meet the first condition for release even if it had been in contact with ash.

The second condition addresses surface contamination of the waste. DOE Order 5400.5 establishes surface contamination limits for release of materials from DOE control. Table 1 presents the surface contamination guidelines from DOE Order 5400.5.

The ash was sampled in 2005 and analyzed for radionuclides. The average activities measured in 2005 were used to calculate the amount of surface contamination that would result from a 1 mm-thick layer of ash on the surface of a piece of debris. These results are presented in Table 2.

The results in Table 2 indicate that a slight coating of ash on debris is not likely to cause the debris to exceed surface contamination guidelines in DOE Order 5400.5. Debris that does not have observable ash contamination should also meet the surface contamination guidelines. This conclusion is consistent with the results of a radiological survey that was performed on 25 samples of debris from SWMU 73-002 in December 2005. This survey included both a direct survey of alpha and beta/gamma radioactivity and smear sampling for removable alpha and beta/gamma radioactivity. The direct survey results showed detectable alpha radioactivity in only 2 of the 25 samples (77 and 88 dpm/100 cm^2) and no detectable beta/gamma radioactivity in any of the 25 samples. The smear samples showed no detectable alpha radioactivity in any of the 25 samples and detectable beta/gamma radioactivity in only 1 of the 25 samples (8.1 dpm/100 cm^2).

Debris that may have been in contact with ash is, therefore, given an initial designation of nonradioactive waste. This designation will be verified in the field by visual inspection for obvious ash contamination. In addition, radiation control technicians will perform field surveys (direct surveys and/or wipes) on representative samples of the debris as it is placed in containers to verify that surface contamination guidelines are met.

Table 1. Surface Contamination Guidelines From DOE Order 5400.5.

Radionuclides[2]	Allowable Total Residual Surface Contamination (dpm/100 cm^2)[1]		
	Average[3,4]	Maximum[4,5]	Removable[4,6]
Transuranics, I-125, I-129, Ra-226, Ac-227, Ra-228, Th-228, Th-230, Pa-231	Reserved	Reserved	Reserved
Th-Natural, Sr-90, I-126, I-131, I-133, Ra-233, Ra-224, U-232, Th-232	1,000	3,000	200
U-Natural, U-235, U-238, and associated decay product, alpha emitters	5,000	15,000	1,000
Beta-gamma emitters (radionuclides with decay modes other than alpha emission or spontaneous fission) except Sr-90 and others noted above.[7]	5,000	15,000	1,000

[1]As used in this table, dpm (disintegrations per minute) means the rate of emission by radioactive material as determined by correcting the counts per minute measured by an appropriate detector for background, efficiency, and geometric factors associated with the instrumentation.

[2]Where surface contamination by both alpha- and beta-gamma-emitting radionuclides exists, the limits established for the alpha- and beta-gamma-emitting radionuclides should apply independently.

[3]Measurements of average contamination should not be averaged over an area of more than 1m^2. For objects of less surface area, the average should be derived for each such object.

[4]The average and maximum dose rates associated with surface contamination resulting from beta-gamma emitters should not exceed 0.2 mrad/h and 1.0 mrad/h, respectively, at 1 cm.

[5]The maximum contamination level applies to an area of not more than 100cm^2.

[6]The amount of removable material per 100 cm^2 of surface area should be determined by wiping an area of that size with dry filter or soft absorbent paper, applying moderate pressure, and measuring the amount of radioactive material on the wiping with an appropriate instrument of know efficiency. When removable contamination on objects of surface area less than 100 cm^2 is determined, the activity per unit area should be based on the actual area and the entire surface should be wiped. It is not necessary to use wiping techniques to measure removable contamination if direct scan surveys indicate that the residual surface contamination levels are within the limits for removable contamination.

[7]This category of radionuclides includes fission products, including the Sr-90 which is present in them. It does not apply to Sr-90 which has been separated from the other fission products or mixtures where the Sr-90 has been enriched.

Table 2. Surface Contamination Associated With 1-mm Layer of Ash on Debris.

Radionuclide	Average Activity in Ash, pCi/g	Surface Contamination From 1-mm Layer of Ash, dpm/100 cm^2
Cs-137	0.013	0.5
Ra-224	1.70	60
Ra-226	5.14	183
Th-234	3.83	136
U-234	7.91	281
U-235	0.40	14
U-238	6.25	222