

D CD(SPO3)

Re: SP-99-074

From: "Eddie Nanney" <enanney@mail.state.tn.us>
To: TWFN_DO.twf1_po(PHL)
Date: Fri, Nov 12, 1999 4:40 PM
Subject: Responses to nickel questions

Paul, attached are our responses to some (as requested) of the original questions posed by the Commerce Committee. Also attached is our response to the 6 questions posed in SP-99-074. I'm also faxing this to you.

We worked up a response to the "4 points", but I decided that I wanted Joelle to review it first. I plan to get that to you by early Monday.

11-12-99

SP-A-4

SP-AG-26

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MRC FILE CENTER COPY

10. From the Nickel Producers Environmental Research Association, 84% of nickel is used in non-consumer products.
13. The authorization for MSC to release a given quantity of nickel was granted based on a case-by-case determination that, following processing and assessment in accordance with the license authorization, nickel meeting established release criteria which is protective of the public health and safety could be released for unrestricted use.
14. The purpose for the license Tn has issued is to allow MSC to conduct processing and decontamination activities on a given quantity of nickel, and subsequently, to authorize MSC to release nickel which, in accordance with a case-by-case determination, meets unrestricted release criteria which is protective of the public health and safety. Also, see response to question #13.
16. MSC is not introducing additional radioactivity into the nickel, it is actually reducing the radioactive content of the nickel. In view of this process and the subsequent review of the potential for exposure from this material the authorization was granted in accordance with unrestricted release criteria which is protective of the public health and safety.
17. See response to question #'s 13 and 16.
19. See response to question #13.
- 20, 23, 24. Nothing in the application or amendment addresses the consideration of exempt quantities. Also, see response to question #13.
21. Nothing in the application or amendment addresses the consideration of transfer to persons exempt from licensing. Also, see response to question #13.
22. Since this material was not evaluated for commercial distribution as a product, any labeling requirements which may be applicable to products do not apply.
- 33, 36. This amendment was issued to authorize the processing and decontamination of nickel, and to allow the subsequent unrestricted release of nickel meeting release criteria equivalent to widely recognized release criteria. No consideration was given to this as an effluent, however, we are cognizant that the NRC has advanced in its clearance rule-making the concept that solid material may be considered as an effluent. When one considers the volumes of materials being recycled it is easy to envision the analogy between streams of recycled materials and waste water effluents, especially since waste water sludge is being recycled. We do believe that a specific assessment may be necessary for each type of release proposed. A national policy that created a framework for this analysis could provide added assurances that each new action provided the protection desired.
42. Definitions from State Regulations for Protection Against Radiation:
1200-2-5-.32 Byproduct Material refers to any radioactive material (except special nuclear material) yielded in or made radioactive by exposure to the radiation incident to the process of producing or utilizing special nuclear material.
1200-2-11-.03 Disposal - Means the isolation of radioactive wastes from the biosphere inhabited by man and containing his food chains by emplacement in a land disposal facility.
1200-2-11-.03 Waste - Means those low-level radioactive wastes containing radioactive materials that are acceptable for disposal at a land disposal facility. For the purposes of this definition, low-level waste is radioactive waste not classified as high-level radioactive waste, transuranic waste, spent nuclear fuel or byproduct material as defined in section 11e.(2) of the Atomic Energy Act (uranium or thorium tailings and waste).
Effluent – not defined
Transfer – not defined

Release limits – not defined

45. The State of Tennessee is not aware of any requirement to notify the Nuclear Regulatory Commission of individual licensing actions that are taken by the State in the regulation of the activities of its licensees. Licensing actions that are consistent with the protection of public health and safety are consistent with the NRC's goals for the Agreement States.

Response to Information Request on Release of Solid Materials

- (1) U.S.N.R.C. Regulatory Guide 1.86 and Policy and Guidance PG-8-08 are used for the release of dirt, resins, asphalt, concrete, metals, and other wastes from licensed activities.
- (2) Criteria is applied through review of licensee operating procedures and subsequent authorizations by license amendment.
- (3) Monitoring methodologies are consistent with the specific system that is used for the activity and is consistent with the radiological activity, density, and release limit requested. (See response to Question 6.)
- (4) The type of instrument and sensitivity of detection is reviewed on a case-by-case basis. (See response to Question 6.)
- (5) Not applicable.

(6)

American Ecology Recycle Center
109 Flint Road
Oak Ridge, TN 37830-7033
Amendment 128

R-01037

Condition 31

This authorization allows AERC to apply U.S. Nuclear Regulatory Guide 1.86 criteria to "a bag of material." They model the container and the material and assume a value for the surface area of the container. Total allowable activity in the container is computed using the total allowable activity on the surface area and the material's mass to obtain an equivalent derived pico curie per gram value. Appropriate settings are made for the waste monitor system instituting an action level for hotspot activity and an action level for "general activity." These action levels may vary as processing conditions may change.

American Ecology Recycle Center
Amendment 135

R-01037-B04
Condition 47

Allows characterization and release of bulk materials to a permitted (non-radiological) disposal site. Records of all disposals shall be submitted to the Division quarterly, and these reports shall contain a summary of the material released and the concentrations of all isotopes. Bulk material are described as soil, resin, rubble, bags of trash, etc.). Radiological assessment of this proposal utilized RESRAD 5.61 computer code in accordance with PG-8-08. This assessment was verified using IMPACTS-BRC 2.1 computer codes. TEDE to the MEI for a period of 5 years was determined to be < 1 mrem/yr.

Detection system to monitor material for release was the Canberra Series WM-1200 Gamma Series Q₂ Low Level Waste Assay System. The conveyor monitors consisted of six plastic scintillation detectors wrapped with aluminum foil to be "light tight." The system was principally sensitive to gamma radiation. Detectors were located above, below, and to the sides of the conveyor belt. Alarm set points are based on the summed counts from all detectors.

ATG Catalytics, LLC
1556 Bear Creek Road
Kingston, TN 37763

License R-13020-K00

Amendment 8, Condition 32
Amendment 13, Condition 36
Amendment 16, Condition 36
Amendment 19, Condition 38
Amendment 22, Condition 42

Authorizations have been held by this licensee to dispose of solidified (in a clay matrix) scrubber blowdown liquids to permitted (non-radiological) disposal sites. The disposal authorizations are as follows:

Quantity	¹⁴ C Limits (pCi/g)	³ H Limits (pCi/g)
7000 gal ^A		
Considered Proprietary ^B	200	510
200,000 gal ^B	125	510
60,000 gal ^B	125	510
82680 ft ³ /yr ^C (for 5 yrs)	600	500

^ARESRAD Modeling Summary of Scenarios and Parameters for Solidified H₂S Scrubber Blowdown

^BRESRAD Modeling Outputs Disposal of Solidified H₂S Scrubber Blowdown

^CRequest For Alternate Disposal Method For Solidified Scrubber Solids (Using same RESRAD Modeling)

Frank W. Hake Associates
1790 Dock Street
Memphis, TN 38113
Amendments 125 & 126

R-79171-I01

Conditions 37 and 41

Allowed to receive DAW, ion exchange resins, mirror insulation, soils, and soil like material from customers and survey these materials and those items below set release limits will be sent for burial at a permitted (non-radiological) disposal site.

Allows survey, decontamination, and disposal of radioactive material originating from Lazarov Brothers facility in Memphis, TN.

Both conditions utilize the SafeCheck Volumetric Bulk Survey Analysis System.

Isotopes Given a Concentration Limit of 2 pCi/g

Antimony 124	Gold 195	Selenium 75
Bismuth 207	Iodine 125	Silver 188m
Cadmium 109	Iridium 192	Strontium 85
Calcium 45	Iron 59	Strontium 89
Cerium 139	Plutonium 238	Sulfur 35
Cerium 141	Plutonium 239	Tantalum 182
Cerium 144	Plutonium 240	Tellurium 125m
Cesium 135	Plutonium 241	Thallium 204
Cobalt 57	Plutonium 242	Tin 113
Curium 243	Polonium 210	Uranium 233
Curium 244	Potassium 40	Uranium 234
Europium 152	Promethium 147	Uranium 236
Europium 154	Radium 228	Uranium 238
Europium 155	Ruthenium 106	Uranium depleted
Gadolinium 153	Samarium 151	Uranium natural
Germanium 68	Scandium 46	Zirconium 95

Specific Concentrations in pCi/g

Antimony 125	4
Carbon 14	1
Cobalt 58	5
Cobalt 60	5
Cesium 134	4
Cesium 137	5
Iron 55	500
Hydrogen 3	15
Iodine 129	1
Manganese 54	4
Niobium 94	4
Nickel 59	4
Nickel 63	500
Strontium 90	2
Technetium 99	2
Zinc 65	3

GTS Duratek (formerly SEG)
P.O. Box 2530
1560 Bear Creek Road
Oak Ridge, TN 37830
Amendment 57

R-73006-A02

Condition 31

Green is Clean Free Release Program

Utilizes Q₂ Low Level Waste Assay System that incorporates a collimated counting array custom design for the system's three intrinsic germanium detectors. MDA is set at a point much lower than 5 pCi/g. The Quality Control Sample measuring ≤ 5 pCi/g (not including NORM) will be considered conformity and the waste will be released at a permitted (non-radiological) disposal site. During presorting, waste exhibiting ≤ 30 μ R/hr above background will be accepted for the Green is Clean Program.

Base nuclides are Cobalt 60 and Cesium 137. Allows the release of both high density and low density wastes.

High density wastes have bulk densities ≥ 0.65 g/cc. This waste normally consists of soil, sands, glass, wood, clay, ash, slag, asphalt, concrete, and building rubble.

Low density wastes with bulk densities ≤ 0.65 g/cc. This includes normal trash such as paper, plastic, cloth, and rubber.

GTS Duratek (formerly SEG)**R-73008-H94
Condition 43.B.**

Scientific Ecology Group, Inc. (SEG) is to perform remediation activities and radiological surveys for all buildings, structures, and environs at a Jackson, TN facility. As a result of these cleanup activities, the following unconditional release limits were established by the Division:

Bag House Electric Arc Furnace (EAF) Dust - Cs-137 background limit of 2.0 pCi/g

Soil and Surface Media (mixture of fill materials consisting of soil, gravel, and slag) - 5.0 pCi/g

Gray Water Cs-137 Release Limit (Effluent liquids) - 1.0 pCi/g

Gray liquids are the effluent liquids resulting from the showers personnel receive after leaving the controlled area. These liquids are held in a holding tank and analyzed for Cs-137. If the water exceeds the above mentioned limit, it is not released.)

Splash Condenser Dross Residue (SCDR) Materials - 5.0 pCi/g

This material is a byproduct of the zinc ingot process. If this material meets the above mentioned limits, it can be further processed to retrieve salvageable materials, or it can be disposed of in a commercial landfill.

High Temperature Metal Recovery (HTMR) Slag - 5.0 pCi/g

The slag from the HTMR process could be further salvaged for metallic materials, or this material could be sold commercially.

Zinc Ingots - 2.0 pCi/g

**Manufacturing Sciences
804 Kerr Hollow Road
Oak Ridge, TN 37830**

**S-01046-L00 (Amendment 56 Condition 30)
R-01078-L00 (Amendment 18)**

This allows the licensee to conduct unrestricted release of U.S. DOE volumetrically contaminated nickel metal. The nickel metal is decontaminated in accordance with U.S.N.R.C. Regulatory Guide 1.86 with an additional volumetric contamination criteria for Tc 99 of an average of 81 pCi/g in a single shipment of nickel not to exceed 20 tons and with no single ingot in the shipment to exceed 162 pCi/g. The release criteria for Uranium will be an average of 8.1 pCi/g in a single shipment of nickel not to exceed 20 tons and with no single ingot in the shipment to exceed 16.2 pCi/g. The computer codes MicroShield, VARSKIN MOD 2, and RESRAD 5.80 were utilized along with the services of the researchers at Auxier and Associates.

Other licensees use U.S.N.R.C. Regulatory Guide 1.86 for the release of surface contaminated equipment