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Internal Letter

Rockwell Intern

000024611

Date April 28, 1987

No DL-GLPIV-24

TO (Name Organization Internal Address)

A. C. Ficklin
Waste Operations
Building 707

FROM (Name Organization Internal Address, Phone)

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SUBJECT COMMENTS ON POND CRETE DEREGULATION PETITION

You have presented an excellent case for deregulation of Pondcrete. I have included several specific comments on the attached copy of your petition. I offer the following general comments for your consideration:

(1) Statements regarding toxicity/carcinogenicity and environmental effects will need to be substantiated with references from the general scientific literature. I have some documents which may be helpful in this regard. This is especially important for items i, iii, iv, v, vi and ix.

(2) Arguments advanced in item vii need to be strengthened. Also, here you include a statement on possible adverse consequences associated with current storage practices. You may want to re-think including this statement. Our argument is that the material and its contained constituents do not pose a threat to the environment because of the form that it's in, i.e. solidified concrete blocks. Don't link its safety to specific handling practices.

Call me if you have any questions.

G. L. Potter
HS&E Operations Management

Enc. (1)

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POND CRETE April 24, 1987

Solar evaporation pond 207A is in the process of being closed under a Compliance Agreement signed by the US DOE, US EPA and the Colorado Department of Health (CDH) on July 31, 1986.

Pond crete is cemented pond 207A sludge packaged in 15-cubic-foot tri-wall boxes lined with plastic. The pond crete blocks weigh about 1500 pounds each and are 50% sludge. There are approximately 4500 pond crete boxes (68,000 cubic feet) in storage at the Rocky Flats Plant. There will be an estimated 16,000 boxes produced by March 1988 when the pond sludge has been completely removed. The asphalt liner and contaminated soil will be removed in the final phase of pond closure.

Currently, pond crete is being stored until it is designated as a non-RCRA-regulated, low level, contaminated waste.

The US EPA (Region VIII) and the CDH regulators are asked to review the following rationale showing this waste does not represent a threat to human health or the environment. If approval to deregulate pond crete is received, Rocky Flats requests assistance in approaching the US EPA (Region IX) and the State of Nevada in also accepting this waste as deregulated under RCRA.

Subpart B - Criteria for Identifying the Characteristics of Hazardous Waste and for Listing Hazardous Waste.

261.11 Criteria for Listing Hazardous Waste

(a) The Administrator [or Department in 6 CCR 261.11(a)] shall list a solid waste as a hazardous waste only upon determining that the solid waste meets one of the following criteria:

. . . (3) It contains any of the toxic constituents listed in Appendix VIII unless, after the Administrator [or Director in 6 CCR 261.11(a)(3)] concludes that the waste is not capable of posing a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported or disposed of, or otherwise managed:

The pond crete (cemented pond sludge) has been analyzed for 123 listed constituents from the Hazardous Substances List (HSL). The results are given in Attachment 1. The pond sludge has been analyzed for 116 listed constituents from the HSL and the results are given in Attachment 2. An additional 32 analyses will be performed on pond sludge. These results are listed in Attachment 3.

These constituents are on the EPA priority pollutant list. This is why the pond crete and the pond sludge were analyzed for these constituents and not all materials listed in Appendix VIII or the HSL. The entire HSL was reviewed. Rocky

Flats is analyzing pond sludge for those substances which are not priority pollutants, but which may be present in Rocky Flats waste (see Attachment 3).

Both the pond crete and the pond sludge passed the EP toxic leach test.

(i) The nature of the toxicity presented by the constituent.

The following constituents are of low toxicity:

Status	
Acetone	Listed waste because of its ignitability
PCB	
Fluoranthene	Tested negative for cancer in animals by the International Agency for Research of Cancer
1,1,1-Trichloroethane	

could probably have paragraph for each individual substance stating specific concentrations and ..., at these centrations and ..., it poses significant ...

The following are suspected carcinogens:

Methylene chloride
1,1,2,2 - Tetrachloroethane
Tetrachloroethene

The following is a carcinogen:

Carbon tetrachloride

The following is toxic, but at higher levels:

Cyanide

However, these constituents are in part-per-billion amounts in a 1500-pound cement block.

(ii) The concentration of the constituent in the waste.

The concentrations of the listed constituents in the pond crete are given in Attachment 1.

(iii) The potential of the constituent or any toxic degradation product of the constituent to migrate from the waste into the environment under the types of improper management considered in paragraph (a)(3)(vii) of this section.

The waste, if deregulated, will be disposed by shallow land burial (at least 10 feet below the surface) in unlined trenches at the Nevada Test Site (NTS), Mercury, Nevada. This site is arid (less than 5 inches annual rainfall and the soil moisture content is 3-9%). The ground water is located 800-900 feet below grade. Hydrology studies conducted at the site show that migration of any solvents will take approximately 20,000 years to

Should any migration occur it would take 20,000 yrs

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reach ground water. This conservative estimate is based on a 1% recharge rate and a soil content of 7% clinoptilolite, which is a naturally occurring ion exchange resin. A USGS report issued in 1986 estimated that there isn't enough water in the soil to leach and move solvents (1) The ground water is not a source of drinking water. Organic solvent migration is monitored by unsaturated zone monitoring.

The non-solvent hazardous constituents (PCB, fluoranthene, heavy metals and cyanides) are known not to migrate from their point of original disposition.

(iv) The persistence of the constituent or any toxic degradation product of the constituent.

The cyanide will persist in a non-reactive, oxidized form. At the 5 ppm concentrations in the pond crete, cyanide is well below the EPA guideline of 250 ppm which could represent a threat to human health or the environment if improperly managed.

The PCB constituent at 1.5 - 6.4 ppm in the pond sludge is well below the 50 ppm level of regulatory concern established by the Toxic Substances Control Act (TSCA). The PCB's will persist in the pond crete.

The heavy metals and the fluoranthene will persist in the pond crete at very low levels (passes the EP toxic test) or, as in the case of fluoranthene, at undetectable levels.

The highly chlorinated solvents will persist and may eventually leach out of the waste into the environment. These levels are so low, however, as not to represent a threat to the environment at the remote, arid disposal site. (See response to Section iii.)

The original sludge contains solvents at concentrations within the limits allowed by the land ban exemption [40 CFR, Subpart C, 268.30 (c)(1)] in TCLP extract. Two samples of sludge will be taken for TCLP extraction. As soon as a laboratory is contracted by Rockwell, a schedule for analysis results will be given to the EPA and CDH.

(v) The potential for the constituent or any toxic degradation product of the constituent to degrade into non-harmful constituents and the rate of degradation.

The cyanide present in the pond crete is in an oxidized, non-reactive form, as shown by the results of the test for total cyanide (2-8 ppm CN).

(1) (W.D. Nichols, 1986, Geohydrology of the Unsaturated Zone at the Burial Site for Low Level Radioactive Waste Near Beatty, Nye County, Nevada, USGS, Open File Report 85-198.)

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The test for reactive cyanide where the pond crete is subjected to acid at a pH of _____ is the only way cyanide can be detected in the waste. Under these conditions, the chemical bonds are broken to release the cyanide as hydrogen cyanide. The pH of the soil at NTS is 8.2, which will not produce HCN.

Acetone and other non-chlorinated solvents, and aromatic compounds will degrade rapidly in the oxidizing soil at NTS. The degradation of the other constituents will be extremely slow. The greater the chloride substitution, the slower will be the degradation. Their presence in low concentrations and the disposal of this waste at NTS, preclude their being a threat to human health or the environment.

(vi) The degree to which the constituent or any degradation product of the constituent bioaccumulates in ecosystems.

These constituents do not bioaccumulate:

Heavy metals, except mercury and lead
Fluoranthene
Acetone
Cyanide

precluded from bioaccumulation because buried 10 feet below surface where managed such that it will not be problem.

The chlorinated solvents, PCB and the mercury and lead will bioaccumulate, but will be present in the ecosystem from this waste at such low levels as not to represent a hazard. This assessment is based on the fact that this waste passes the EP toxic test for metals; is below regulatory concern for PCB, and the solvents are in low enough levels to qualify for the land ban exemption.

(vii) The plausible types of improper management to which the waste could be subjected.

If the US DOE were to abandon the NTS:

1. There could be casual intruders at the disposal site. These intruders would not suffer any hazardous chemical exposure from this buried waste.

this whole response needs to be strengthened.

2. There could be people who would build homes and drink water from wells drilled at the site. However, the land is not arable (no agrarian potential) because the ground water is 800-900 feet below the surface. Thus, no settlement would be anticipated.

Weak Argument

If the waste were to remain indefinitely in storage at Rocky Flats Plant and the tri-wall containers allowed to degrade, the waste leachate resulting from natural moisture could carry nitrate salts and these minor constituents into surface water. Four to five percent nitrate leached from the pond crete when subjected to leach tests. (See the attached Draft Salt and Pond Crete Leaching Study, December 1986.)

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(viii) The quantities of the waste generated at individual generation sites or on a regional or national basis.

The pond crete is generated as a result of a clean-up and closure of a surface impoundment unique to Rocky Flats Plant. Therefore, this is the only generation site on either a regional or national basis. An estimated 240,000 cubic feet of pond crete will be produced.

(ix) The nature and severity of the human health and the environmental damage that has occurred as a result of the improper management of wastes containing the constituent

The waste has been properly managed. See the response to Section (vii) for the risks to human health and the environment from improper management. Access to the NTS is controlled to preclude entrance of any casual intruders.

(x) Action taken by other governmental agencies or regulatory programs based on the health or environmental hazard posed by the waste or waste constituent.

The US DOE has submitted a Part B permit application for use of the NTS for mixed waste disposal. The site has been evaluated by the DOE and judged to be suitable for the disposal of mixed waste in unlined trenches, based on the hydrology, geology, the climate, remoteness and controlled access to the area. DOE has applied for an exemption from ground water monitoring by using unsaturated zone monitoring to trace volatile organic compounds. This exemption is being applied for under 40 CFR 264.90 (b) (4).

This is the disposal system that is being proposed here for pond crete.