UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

March 5, 2001

LICENSEE: Carolina Power & Light Company

FACILITIES: Shearon Harris Nuclear Power Plant, Unit 1

SUBJECT: SUMMARY OF FEBRUARY 22, 2001, MEETING ON PLANS FOR USING ALTERNATE SOURCE TERM ANALYSIS AT THE HARRIS PLANT

On February 22, 2001, the NRC staff met with representatives of Carolina Power & Light Company (CP&L) in Rockville, Maryland. The purpose of the meeting was to discuss CP&L's plans for using an Alternate Source Term (AST) analysis at the Shearon Harris Nuclear Power Plant (HNP). A list of the meeting participants is included as Enclosure 1. A copy of the licensee's meeting handout is included as Enclosure 2.

CP&L requested this meeting with the staff to outline their plans and schedule for submitting an AST analysis for HNP. The AST analysis will be used to support a license amendment request to allow the containment personnel airlock (PAL) doors to be open during refueling, and will supplement the licensee's October 4, 2000, steam generator (SG) replacement amendment request, and its December 14, 2000, power uprate amendment request. The PAL door amendment request is scheduled to be submitted in late April 2001, and the supplemental submittals for SG replacement and power uprate are scheduled to be submitted in mid-June 2001.

CP&L reviewed the background that led to its decision to pursue the AST approach. During the review of CP&L's August 26, 1999, PAL door amendment request, the NRC staff raised questions about the low value assumed for unfiltered control room inleakage in the HNP accident analysis. Based on these concerns, the PAL door amendment issued on March 27, 2000, was limited to one cycle of plant operation. CP&L considered the options of (1) testing to validate the control room inleakge, (2) revising the inleakage assumptions using current source term methodology, or (3) performing an AST analysis. CP&L decided on the AST approach and said that its analysis will be consistent with NRC Regulatory Guide 1.183.

CP&L anticipates that the AST analysis will result in an assumed unfiltered inleakage of $\geq$ 400 cubic feet per minute (cfm). Based on this value, CP&L stated that they did not intend to test the unfiltered inleakage as part of the PAL door, SG replacement, or power uprate amendments. The staff confirmed that testing would not be required for these amendment reviews if the AST analysis resulted in an unfiltered inleakage value in the 400 cfm range.

The staff asked several questions related to the methodology CP&L would be using for its AST analysis. The staff also asked questions about the assumptions used in the accident analyses, including the values that CP&L would assume for the atmospheric relative concentration (χ/Q) for the various accident scenarios. The staff provided a simplified plant diagram (Enclosure 3) to assist in the discussion of the release points for various accident scenarios. The staff stated that it would prepare a request for additional information related to the accident scenarios already under review for SG replacement and power uprate and forward the questions to CP&L for a written response.

Finally, the licensee provided the staff with Enclosure 4 related to Iodine activity in response to a question that was raised by the staff during an earlier conference call related to the SG replacement submittal.

Ronald W. Hernan for

Richard J. Laufer, Project Manager, Section 2
Project Directorate II
Division of Licensing Project management
Office of Nuclear Reactor Regulation

Docket No. 50-400

Enclosures: As stated

cc w/encls: See next page

Finally, the licensee provided the staff with Enclosure 4 related to Iodine activity in response to a question that was raised by the staff during an earlier conference call related to the SG replacement submittal.

/RA by R. Hernan Acting for/

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Division of Licensing Project management
Office of Nuclear Reactor Regulation

Docket No. 50-400

Enclosures: As stated

cc w/encls: See next page

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ATTENDANCE LIST
NRC MEETING WITH CAROLINA POWER & LIGHT COMPANY
FEBRUARY 22, 2001

NAME	ORGANIZATION
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Mark Caruso	NRC
Jay Lee	NRC
Leta Brown	NRC
Steve LaVie	NRC
Donnie Ashley	NRC
Ram Subbaratnam	NRC
Eric McCartney	CP&L
Mark Ellington	CP&L
William Ziegler	CP&L
Deann Raleigh	LIS, Scientech

Enclosure 1

Alternate Source Term Analysis

Carolina Power and Light

Eric McCartney, Supervisor-Licensing HNP
Bill Ziegler, Principle Engineer Nuclear Engineering and Services
Mark Ellington, Project Analyst-Licensing

Enclosure 2

02/21/2001

Purpose

- Inform NRR staff reviewers of HNP plan for implementation of alternate source term.
- Provide and solicit information for orderly and timely review of SGR/PUR and PAL door submittals.

Agenda

- Background
- Overview of HNP's plan for CRH with respect to PAL door and SGR/PUR submittals
- Schedule milestones
- Scope
- Requests for NRR staff

Background

- August 26, 1999 HNP submits PAL door TS change request.
- January/February 2000 NRR staff communicates CRH concern with respect to PAL door TS change request.
- March 27, 2000, NRC issues TS change PAL door with note that option to leave PAL door open during refueling will expire after cycle 10.

Evaluation Of CRH

- Three options available: (1) test to validate 3 cfm. (2) revise inleakage assumptions using current source term methodology. (3) perform alternate source term analysis.
- HNP anticipates $\geq$ 400 cfm assumed for unfiltered inleakage using alternate source methodology.
- HNP does not plan to test CR unfiltered inleakage as part of the PAL DOOR or SGR/PUR license amendment process.

Evaluation Of CRH Continued

- HNP plans to implement guidance of NEI 99-03 (separate from the license amendment process).
- HNP alternate source term analysis will be consistent with NRC regulatory guide 1.183.

Scope of Changes

- PAL door license amendment will require only revising fuel handling accident in containment.
- SGR/PUR submittal will be revised to include new information for previously submitted accident analyses.
- No impact on EQ, no hardware modifications as a result of AST.

Schedule

- PAL door submittal targeted for 4/24/01.
- SGR/PUR supplement with replacement sections targeted for 6/11/01.
- Request NRC approval of PAL door and SGR/PUR before 9/22/01 (outage starts on 9/23/01).

Requests for the Staff

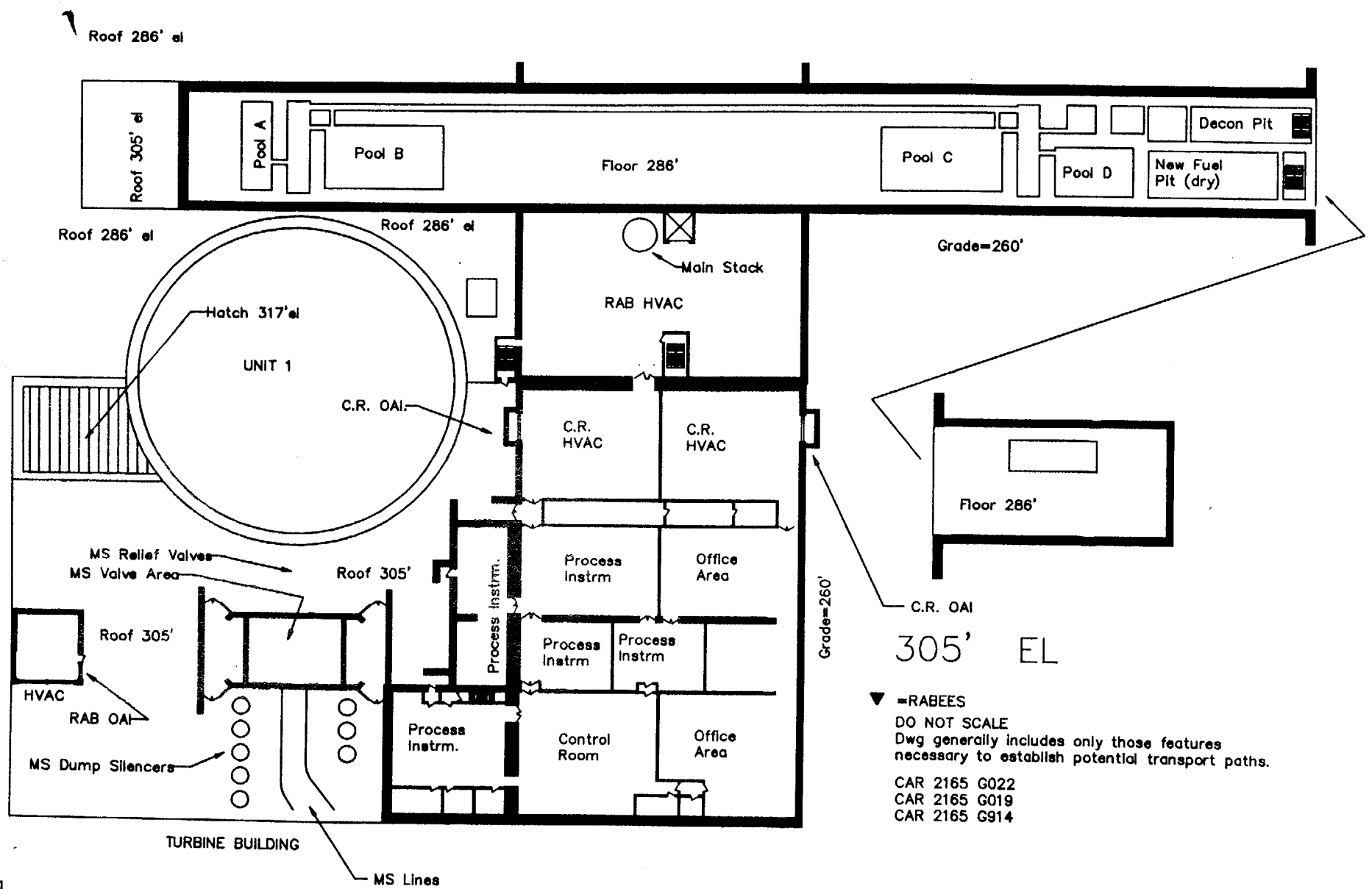
- Please confirm that inleakage testing will not be required for the PAL door and SGR/PUR license amendments if the alternate source term analysis assumes 400 cfm or greater unfiltered inleakage.
- Will additional 10 CFR 50.92 evaluations be required for the SGR/PUR submittals than originally submitted as a result of changing the methodology for source term?
- Does the staff need any additional support from licensee to ensure NRC review and approval prior to plant need date?

Request for the Staff Continued

- Confirm that the current NRC review of conventional source term for SGR/PUR submittal inputs and assumptions will be a valuable preview of the AST submittal, since inputs and plant configuration are intended to be the same.

Summary

- HNP is planning to perform AST analysis for PAL door and SGR/PUR license amendments.
- HNP is targeting 4/24/01 for PAL door submittal and 6/11/01 for SGR/PUR supplement submittal.
- All three submittals plant need date is prior to 9/22/01.



WASTE PROCESSING BUILDING

Enclosure 3

The primary coolant I-131 activity prior to the accident is 0.35 μCi/g dose equivalent (D.E.) I-131.

The initial mass in the RCS is 1.729E8 g.

The activity levels of the Iodine nuclides (based on 1% fuel defects) are listed in the table below and converted to 1.0 μCi/g D.E. I-131 by multiplying the activity for each isotope by its associated dose conversion factors and dividing by the I-131 dose conversion factor. The total activity corresponding to 1.0% fuel defects is 3.002 μCi/g D.E. I-131 and is calculated by adding together all of the converted to dose equivalent I-131 activities. The activity corresponding to a total of 1.0 μCi/g D.E. I-131 is found by dividing the 1% fuel defect activity for each nuclide by 3.002. The activity corresponding to a total of 0.35 μCi/g D.E. I-131 is found by multiplying the 1.0 μCi/g D.E. I-131 fuel defect activity for each nuclide by 0.35.

The RCS activity is calculated by taking the mass in the RCS, 1.729E8 g, and multiplying by the nuclide activity based on dose equivalent I-131 and then dividing by E6 (unit conversion).
For example, 1.729E8 g * 0.200 μCi/g = 3.458E7 μCi / E6 μCi/Ci = 34.6 Ci.

Nuclide	Activity – 1% Fuel Defect (μCi/g)	ICRP-30 Dose Conversion Factors (rem thyroid/Ci inhaled)	Activity – D.E. I-131 (μCi/g)	Activity Corresponding to a total of 1.0 μCi/g D.E. I -131	Activity Corresponding to a total of 0.35 μCi/g D.E. I –131	RCS Activity Corresponding to 0.35μCi/g (Ci)
I-131	1.71	1.07E6	1.71	0.570	0.200	34.6
I-132	2.47	6.29E3	0.01452	0.823	0.288	49.8
I-133	7.23	1.81E5	1.223	2.408	0.843	145.8
I-134	0.567	1.07E3	5.67E-4	0.189	0.066	11.4
I-135	1.84	3.14E4	0.054	0.613	0.215	37.2
Total			3.002			278.8

The RCS activity (A) is related to the appearance rate by:

A = Iodine Appearance Rate (P) / Removal rate (λ)

where $\lambda = \lambda_{purification} + \lambda_{decay}$

with $\lambda_{purification} = [(1 - 1/DF)(F) + L] / V$

where DF = Maximum Decontamination Factor provided for iodine

DF = infinite, thus 1/DF = 0
F = Maximum purification mass flow rate (letdown flow)
Max purification flow is 120 gpm and this is conservatively increased by 10% to 132 gpm (cold conditions are assumed so density = 62.4 lb/ft^3)
F = (132 gpm)(0.13368 ft^3/gal)(62.4 lb/ft^3) = 1101.1 lb/min = 66,066 lb/hr

L = Leakage from the primary coolant system
= 42 gpm at cold conditions – assume 62.4 lb/ft^3
= (42 gpm)(0.13368 ft^3/gal)(62.4 lb/ft^3) = 350.3 lb/min
= 21,018 lb/hr

V = RCS water mass = 1.729E8 g

Thus, $\lambda_{purification}$ = (66,066 + 21,018) lb/hr * 453.6 g/lb / 1.729E8 g = 0.2285 hr^{-1}

The values for λ_{decay} are combined with the purification term to create a total removal term for each isotope:

$\lambda_{I-131} = 0.2285 + 0.00359 = 0.2321\ hr^{-1}$
$\lambda_{I-132} = 0.2285 + 0.303 = 0.5315\ hr^{-1}$
$\lambda_{I-133} = 0.2285 + 0.0333 = 0.2618\ hr^{-1}$
$\lambda_{I-134} = 0.2285 + 0.791 = 1.0195\ hr^{-1}$
$\lambda_{I-135} = 0.2285 + 0.105 = 0.3335\ hr^{-1}$

The RCS inventory is (from table above)
A_{I-131} = 34.6 Ci
A_{I-132} = 49.8 Ci
A_{I-133} = 145.8 Ci
A_{I-134} = 11.4 Ci
A_{I-135} = 37.2 Ci

Normal appearance rate is calculated by $P = A\lambda$
P_{I-131} = (34.6 Ci)*(0.2321 hr^{-1}) / (60 min/hr) = 0.134 Ci/min
P_{I-132} = (49.8 Ci)*(0.5315 hr^{-1}) / (60 min/hr) = 0.441 Ci/min
P_{I-133} = (145.8 Ci)*(0.2618 hr^{-1}) / (60 min/hr) = 0.636 Ci/min
P_{I-134} = (11.4 Ci)*(1.0195 hr^{-1}) / (60 min/hr) = 0.194 Ci/min
P_{I-135} = (37.2 Ci)*(0.3335 hr^{-1}) / (60 min/hr) = 0.207 Ci/min

The appearance rates are assumed to increase by a factor of 500 for the SGTR. The iodine spike appearance rates are thus:
P_{I-131} = 67.0 Ci/min
P_{I-132} = 220.5 Ci/min
P_{I-133} = 318.0 Ci/min
P_{I-134} = 97.0 Ci/min
P_{I-135} = 103.5 Ci/min

cc:

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3/2/01
→ Phil

ENVIROCARE OF UTAH, INC.

THE SAFE ALTERNATIVE

February 22, 2001

Susan: 03/07/01
Please Annotate.
Thanks.
Mike Lepore

VIA FACSIMILE and U.S. MAIL

Michael F. Weber, Director
Division of Fuel Cycle Safety
and Safeguards, NMSS
United States Nuclear Regulatory Commission
Washington, D.C. 20555

Re: Disposal of FUSRAP Waste at Envirocare

Dear Mr. Weber:

As discussed in a telephone conference call on February 14, 2001 among representatives of the Nuclear Regulatory Commission (NRC) staff, the U.S. Army Corps of Engineers (Corps) and Envirocare of Utah, Inc. (Envirocare), Envirocare is preparing to receive and dispose of Formerly Utilized Sites Remedial Action Program (FUSRAP) materials from Corps sites in Maywood and Wayne, New Jersey based, in part, on your letter of January 26, 2001. At the same time, we would like to confirm our understanding of the NRC's positions on several issues as set forth below.

First, the NRC has rejected the position taken by the Corps that all of the material from the Maywood site is 11e.(2) byproduct material within the meaning of the Uranium Mill Tailings Radiation Control Act of 1978 (UMTRCA). Instead, your letter states that UMTRCA only gives the NRC jurisdiction over mill tailings that were covered by an NRC license on the effective date of UMTRCA or thereafter. According to the NRC, the only material at the Maywood site that was covered by an NRC license after enactment of UMTRCA is material located in three pits; therefore, such material is the only 11e.(2) byproduct material at that site. Envirocare continues to believe that all pre-UMTRCA tailings are 11e.(2) material, but we certainly agree that the material from the three pits on the Maywood site is 11e.(2) byproduct material and that disposal of that material in Envirocare's 11e.(2) disposal cell is already authorized by Envirocare's 11e.(2) license.

Second, except as noted below, the NRC's view is that Envirocare's existing 11e.(2) license does not authorize Envirocare to dispose of any tailings from the Wayne and Maywood sites other than the material from the three licensed Maywood pits. This NRC view is based on a) the fact that Envirocare's 11e.(2) license authorizes disposal only of 11e.(2) material; b) NRC's legal conclusion that pre-UMTRCA tailings are not 11e.(2) material; and c) NRC's

belief that, except for the material from the Maywood pits, Wayne and Maywood materials were not covered by an NRC license on or after the effective date of UMTRCA.

Third, the NRC states that the pre-UMTRCA material at Wayne and Maywood is radiologically, physically and chemically similar to and compatible with materials already being disposed of in Envirocare's 11e.(2) cell and that disposal of such material in an 11e.(2) cell will provide adequate protection of the public health, safety, and the environment.

Fourth, the NRC is relying on its enforcement discretion to allow Envirocare to dispose of pre-UMTRCA tailings (non-11e.(2) material) in its 11e.(2) disposal cell for a period of 120 days, i.e., until May 28, 2001. If Envirocare desires to dispose of such pre-UMTRCA material after May 28, 2001, it must submit a request to the NRC by that date seeking a license amendment to dispose of that material as non-11e.(2) material in accordance with the NRC's interim guidance set forth in Regulatory Issue Summary (RIS) 2000-23, "Recent Changes to Uranium Recovery Policy" (November 30, 2000). The exercise of enforcement discretion would continue while the NRC reviews any such application.

Fifth, if Envirocare does not dispose of additional quantities of pre-UMTRCA tailings (non-11e.(2) material) after May 28, 2001, the NRC will not require Envirocare to take any action pursuant to its interim guidance or seek a license amendment as to non-11e.(2) material that will have been disposed in its 11e.(2) disposal cell prior to that date. Regardless, the NRC will regulate all material disposed in Envirocare's 11e.(2) cell as 11e.(2) material since that material will have been covered by an 11e.(2) license after the passage of UMTRCA.

Finally, in the telephone conference call referenced above, Envirocare asked about licensing requirements applicable to pre-UMTRCA mill tailings that contain 0.05 percent by weight or greater of uranium or thorium located at the Maywood site. NRC representatives were not prepared to take a position on the issue of the agency's authority over such material, and requested this written inquiry. Since our telephone conference, Envirocare has reviewed this matter further, and we have concluded that such material is subject to the NRC's requirements applicable to source material. Our conclusion is based on the NRC regulations applicable to source material and is supported by various prior statements of the Commission.

In a prepared statement to the Subcommittee on Raw Materials of the Joint Committee on Atomic Energy in a hearing on the use of uranium mill tailings on October 28, 1971 on

behalf of the Atomic Energy Commission (AEC) Commissioner Clarence E. Larson stated that "AEC regulatory control [over transfer of tailings from uranium mills subject to AEC jurisdiction] would depend on the uranium and thorium content of the tailings. Ores, compounds or alloys containing less than 0.05 percent by weight -- 1 pound per ton -- of uranium, thorium or any combination thereof were . . . exempt from AEC licensing requirements." This and numerous other statements by Commission representatives, including its then General Counsel, indicate that only mill tailings that contain less than 0.05 percent of uranium and thorium are exempt from Commission regulation. It was recognized that the radium content of mill tailings was of concern, but the Commission did not have jurisdiction to regulate radium.

The adoption of UMTRCA did not alter the responsibility of the NRC to regulate source material in accordance with the requirements of the AEA. UMTRCA was adopted to extend NRC regulatory authority to mill tailings that were otherwise not being regulated, because they did not meet the definition of source material. NRC and Agreement State regulations concerning source material continue in effect to the same extent as they were before enactment of UMTRCA.

Envirocare would greatly appreciate the NRC's prompt response to this letter, especially if there are any disagreements with our understandings described above. Thank you.

Very truly yours,

Jonathan P. Carter

cc: Philip Ting, NRC, NMSS, via facsimile
Harold LeFevre, NRC, FCSS, via facsimile
James Lieberman, Esq., NRC, OGC, via facsimile
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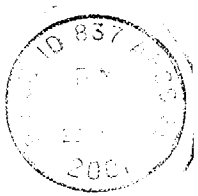

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THE SAFE ALTERNATIVE