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MEMORANDUM FOR: George H. Bidinger, Section Leader
Uranium Fuel Section
Fuel Cycle Safety Branch
Division of Industrial and
Medical Nuclear Safety, NMSS

FROM: Sean Soong
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SUBJECT: MEETING WITH UNC, INC. (UNC) TO DISCUSS DECOMMISSIONING PLAN

On February 7, 1991, at NRC One White Flint North, a meeting was held between the following representatives of UNC and NRC to discuss UNC's response to the staff's comments on the decommissioning plan:

<u>NRC</u>	<u>UNC</u>
Charles Haughney, IMSB	Robert Gregg
George Bidinger, IMSB	Tom Gutman
Elaine Keegan, IMSB	Donald Birks
Sean Soong, IMSB	
Jerry Roth, RI	
Mark Thaggard, LLWM	
Charles Gaskins, SGRT	
Raymond Jackson, SGBD	

At the meeting, UNC provided its proposed response to the staff's comments (see enclosure). As a result of the meeting, UNC has agreed to submit a revised decommissioning plan to incorporate UNC's response, as modified during the meeting, and consolidate two previous submittals.

Original Signed By:
Sean Soong
Uranium Fuel Section
Fuel Cycle Safety Branch
Division of Industrial and
Medical Nuclear Safety, NMSS

Enclosure: UNC Naval Products Decommissioning
Reply to NRC Comments dtd 1/17/91

Distribution w/o encl

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UNC
NAVAL PRODUCTS
DECOMMISSIONING

REPLY TO NRC COMMENTS DATED 1-17-91

Response to NRC Comments to Decon Plan
1-17-91

1. NRC Comment: Sect. 2.1.1, "EPA Guideline of 10 mRem/yr" should be changed to "NRC's Below Regulatory Concern dose guideline of 10 mRem/yr and other applicable guidelines."

UNC response and comments: UNC agrees

2.1.1 Decommissioning Objective, Activities, and Tasks

Decommissioning activities will 1) remove all accountable quantities of nuclear material from the site; 2) reduce contamination of building structures, fixtures, and releasable equipment to levels below those prescribed by Condition 11 of SNM-368; 3) verify that site soil and building contamination levels are below the basis of NUREG/CR-5512, assuring that calculated exposures will remain below the NRC's dose guidelines of 10 mr/year, and other applicable guidelines" and 4) transfer all by-product and accelerator produced sources to licensed facilities. Performance and completion of these activities will:

(No further changes on pgs. 2, 3, and 3)

2. NRC Comment* In Section 2.1.2, The specific work permit (SWP) for decommissioning activities should contain not only radiation protection requirements but also criticality, chemical, and fire safety requirements, as appropriate. The SWP shall be approved by the Nuclear and Industrial Safety Department.

UNC response and comments: UNC agrees.

2.1.2 Description:

This section provides a description of the basic methods which will be utilized for performing the major cleanup activities. With the possible exception of the potential need for concrete removal from portions of the Rad Waste basement, the steps listed in 2.1.1 above have all been performed at some time during the life of the plant, have been proceduralized, and do not present any potential hazards not previously dealt with. Decommissioning and Decontamination operations will be performed in accordance with procedures as specified by Section 2.5, and with Special Work Permits, as specified by Section 4.6.3, Part I, SNM-368. All procedures and Special Work permits will incorporate requirements relating to nuclear, chemical, fire, and industrial safety as appropriate, and will be approved by NIS.

3. NRC Comment In Section 2.1.2, reference to Task Instructions 2-1, 4-9, 5-2, 5-14, and 5-15; Manufacturing Procedure MDP-X-048; and Shop Procedure SP-105 should be deleted.

UNC response and comments: UNC agrees

The major decontamination projects are listed together with a reference to similar work which has been performed during the life of the facility. These activities have all been performed in accordance with procedures as specified in this section.

Glove box, hood, and equipment cleanup

These cleanups are performed to contract standards in accordance with procedure which satisfy the requirements of Section 2.5 of SNM-368. When the plant was operating, some decontaminated items were released for rework by outside vendors.

Floor and area cleanup

These cleanups have been performed following spills, which although infrequent, have occurred in the Unit I, Unit II, Sectioning, Lab, and Rad. Waste areas.

Sectioning room cleanout, including machine disassembly and ventilation duct removal

The sectioning equipment has been cleaned on an ongoing basis in accordance with procedures which satisfy the requirements of Section 2.5 of SNM-368. Sectioning ventilation ducts have been cleaned in accordance with Special Work Permits several times through the life of the facility.

3. Cont'd

The RT tanks have been cleaned several times. This entailed removal of all raschig rings from the tanks. Poison rings have also been cleaned from time to time. All work is performed in accordance with procedures as specified in this section.

Rotoclone and Colag cleanout

The hydrostatic precipitator units use for fume scrubbing have been cleaned several times during the life of the facility, and one unit has been replaced. All work is performed in accordance with procedures as specified in this section.

Standpipe cleanout

The standpipes have been cleaned numerous times in accordance with approved procedures, and will be dismantled in accordance with procedures as specified in this section

Septic field

Soil exceeding 30 pCi/gm. gross alpha will be evaluated to determine its contribution to the 10 mR/year limit. This is further discussed in Attachment A.

4. NRC Comment In Section 2.1.3, the decon activities and task should be performed in accordance with written procedures which incorporate the requirements for nuclear, chemical, and fire safety. Please revise accordingly.

UNC response and comment

UNC agrees

Decon activities and tasks will be performed in accordance with procedures as specified in Section 2.5, or Special work permits as specified in Section 4.6.3 of SNM-368. These will incorporate the requirements for nuclear, chemical, and fire safety, as appropriate.

5. NRC Comment⁷ Section 2.2 should identify by title, function, and minimum qualifications the positions responsible for decommissioning.

UNC response and comment

UNC agrees

The organization structure is shown in Figure 2.2. Functional responsibilities are as specified in Sections 2.1, 2.2 and 2.3 of SNM-368. Qualifications for NIS personnel, having safety responsibilities under this license are specified in Section 2.2. Consistent with all licensed operations, NIS performs safety evaluations for all tasks involving radioactive and hazardous materials, and assures that all tools and materials leaving the site meet release limits.

6. NRC Comment In Section 2.3, all workers, including contractors, who perform decontamination activities should complete training prior to initiating decontamination operations. The training should include nuclear, chemical, and fire safety. Please revise accordingly.

UNC response and comment

UNC agrees

Section 2.8 of SNM-368 specifies training requirements. These apply to all persons involved in the decommissioning efforts, including contractor personnel. Training shall cover nuclear, chemical, industrial safety, and fire safety as appropriate. In addition the HF SWP program will provide job specific training prior to the work being performed as needed. Training will cover the need for assuring that tools, trucks, etc. are verified for release before leaving the site.

7. NRC Comment* Section 3.1 should include information related to past operations which resulted in contamination that could have an effect on decontamination safety (e.g., fire in ventilation system). Please revise accordingly.

UNC response and comment

UNC agrees

Significant residual contamination related to past operations will be included in discussion of contamination which could have an effect on decontamination safety.

8. NRC comment* This section should confirm whether the licensed operations ever involved thorium. If it did, the radiological survey plan should be expanded to include the detection of thorium. If thorium contamination is found in the building or land, decontamination limits should be established in consultation with the NRC staff.

UNC response and comment Section 3.1 will be expanded to add:

Although the licensed authorized the processing of thorium source material, UNC did not possess licensed quantities of this material.

9. NRC Comment^e Why is waste generation projected into 1992 when the target completion date is given as November 1991? Please explain.

UNC response and comment

Although all waste is expected to be packaged by the end of 1991, shipments to burial will extend into 1992.

10. NRC Comment

In Section 4.0, the final survey should contain the following elements.

All affected areas i.e., where unclad radioactive materials have been used or the potential for contamination exists, should be surveyed for radioactivity according to the following survey unit.

- (1) 1 m x 1 m grid size should be used for lower surfaces, i.e., floor, walls up to a height of 2 m, and surfaces easily accessible to a surveyor standing on the floor.

UNC response and Comment:

UNC will generally use a 1 m x 1 m grid size for surveying lower surfaces in areas where unclad radioactive materials have been used. However, some areas, by virtue of limited use (e.g. Unit 3 Vault), or maintenance of high levels of control (e.g. met lab reading area) do have a low probability of surface contamination. UNC will survey these areas using a 2 m x 2 m grid size.

10. NRC Comment, (Continued)

- (2) 2 m x 2 m should be used for overhead surfaces, i.e., ceiling, walls more than 2 m above the floor, and surfaces not described in (1).

UNC response and comment

In accordance with the NRC guidance in NUREG/CR-2082 "Monitoring for Compliance With Decontamination Termination Survey Criteria", UNC will survey overhead surfaces with at least 30 measurements each spread over the vertical and horizontal surfaces. While UNC will not "grid" these surfaces, the location of each measurement will be marked for future reference.

- (3) In solution handling areas subsurface soil samples should be obtained if the indoor survey result shows floor contamination.

UNC response and comment: UNC agrees

Subsurface soil from solution handling areas shall be sampled if surveys show activity associated with cracks or joints in floors.

- (4) All underground buried pipes which have potential radioactive contamination should be surveyed, and if contaminated, should be cleaned or removed.

UNC response and comment

Except as specifically approved, all underground pipes which have potential radioactive contamination will be surveyed, and if contaminated, will be cleaned or removed.

For all unaffected areas, random (statistical) surveys with a larger grid size may be used. Based on plant operations, provide justification as to what areas are unaffected.

UNC response and comment

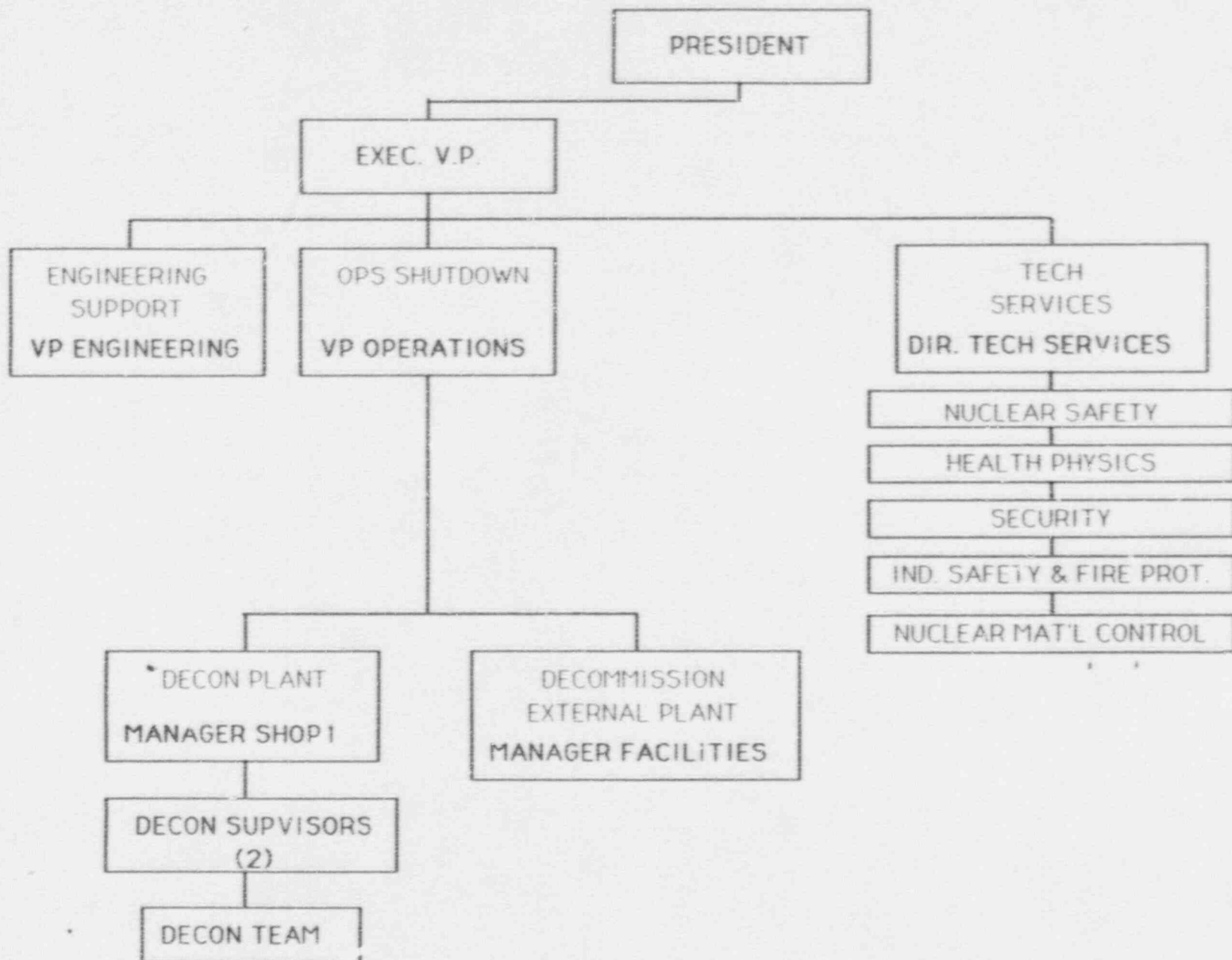
UNC will perform random surveys of all unaffected areas (areas outside of the contamination control area). UNC will also perform non-random surveys in selected areas which by virtue of their use (e.g. the pack welding room) could potentially have received some exposure to unclad radioactive materials. While UNC will not "grid" these areas, the location of each measurement will be marked or identified on a map for future reference.

Section 4 should address surveys of potentially contaminated drainage pathways, storm drains, and settling ponds.

UNC response and Comment UNC agrees

Sufficient surveys will be made to assure that drainage pathways, storm drains, and settling ponds are free of contamination in excess of release limits.

FIGURE 2.2
UNC NAVAL PRODUCTS
DECOMMISSIONING & DECONTAMINATION ORGANIZATION CHART



UNC RESPONSE TO NRC COMMENTS
REGARDING LEACH FIELD SURVEY PLAN

NRC COMMENT

- UNC reported two background samples by letter dated July 25, 1986, not October 29, 1985, as stated in the Background Sampling Section. Please revise accordingly.

UNC REPLY

- The 7-25-86 letter revised some of the data submitted in the 10-29-85 letter. Both documents should therefore be referenced.

THE PLAN WILL BE REVISED TO READ

Background Sampling:

"...(Report to W.T. Crow from W.F. Kirk dated 10-29-85 and revised by report dated 7-25-86)."

UNC RESPONSE TO NRC COMMENTS
REGARDING LEACH FIELD SURVEY PLAN

NRC COMMENT

- All background samples should be measured for total alpha activity and uranium isotopes U-234, U-235, and U-238. Please revise accordingly.

UNC REPLY

- ° Due to the low gross alpha results on background samples, coupled with a set limit of 30 pCi/gm uranium on all field samples, this analysis is not considered necessary.

THE PLAN WILL BE REVISED TO READ

No Change to plan.

UNC RESPONSE TO NRC COMMENTS
REGARDING LEACH FIELD SURVEY PLAN

NRC COMMENT

- Justify background samples taken from locations near the septic field. It appears that samples were taken at locations which might contain surface and/or subsurface contamination.

UNC REPLY

- The confusion may lie with the term "background". The four sample locations referred to in the report as BG-1 through BG-4 were collected in order to determine conditions in close proximity to the field. This tactic was used to reveal whether possible contamination had spread past the boundaries of the field. Since a limit of 30 pCi/gm uranium is being used in all areas of the septic field regardless of the "background" levels, the possible presence of contamination outside the field will have no impact on the analysis.

During the Decommissioning effort, several true background samples will be obtained inside and outside the fence line. At that time, it is UNC's goal to show that the leach field can be treated as any other portion of the site.

THE PLAN WILL BE REVISED TO READ

page A5 - Analysis and Instrumentation

"The acceptable alpha radiation release level for soil at UNC will be 30 pCi/gm per the NRC Branch Technical Position.

UNC RESPONSE TO NRC COMMENTS
REGARDING LEACH FIELD SURVEY PLAN

NRC COMMENT

- Surface beta-gamma measurements (last paragraph) are of questionable value because the contaminant was high enriched uranium, which has minimal beta radiation. This commitment may be deleted.

UNC REPLY

- ° UNC concurs with the statement.

THE PLAN WILL BE REVISED TO READ

page A2 - Surface Radioactivity Level Sampling

"Surface beta-gamma readings will be taken at every grid point and at the approximate center of each grid" **shall be deleted.**

UNC RESPONSE TO NRC COMMENTS
REGARDING LEACH FIELD SURVEY PLAN

NRC COMMENT

- Each soil and ground water sample should be analyzed for total alpha activity. These samples should be analyzed for U-238, U-235, and U-234 isotopes if the total alpha activity (including background) in the soil and water samples exceed 30 pCi/gm and 15 pCi/l, respectively.

UNC REPLY

- ° UNC concurs with the statement.

THE PLAN WILL BE REVISED TO READ

page A5 - Analysis and Instrumentation

"Isotopic uranium analyses shall be performed whenever the total alpha activity of the soil or water samples exceed 30 pCi/gm or 15 pCi/l respectively".

UNC RESPONSE TO NRC COMMENTS
REGARDING LEACH FIELD SURVEY PLAN

NRC COMMENT

- All pipes in fields 1 and 2 should be surveyed. Please revise accordingly.

UNC REPLY

- UNC presently plans to remove all piping from Field 1 and 2 unless an alternative action is mutually agreed upon by UNC and the NRC.

THE PLAN WILL BE REVISED TO READ

No change to plan.

UNC RESPONSE TO NRC COMMENTS
REGARDING LEACH FIELD SURVEY PLAN

NRC COMMENT

- The septic tank should be confirmed as clean at the same time the leach field status is determined. If the tank is contaminated, the leach field could receive further contaminants after the survey is completed. The plan should address positive actions (e.g., disconnection) to prevent future use of the septic field until decommissioning is completed.

UNC REPLY

- ° The septic tank and associated piping is not a part of the current project and will be performed at a later time. This tank is presently required as an overflow protection if UNC is ever cut off from the Montville Sewer System. In order to assure that no contamination can escape to the leach field, the outflow pipe to the field was capped during the early stages of the project.

THE PLAN WILL BE REVISED TO READ

page A4 - Related Equipment

"The outflow pipe from the septic tank has been capped to prevent possible spread of contamination."

UNC RESPONSE TO NRC COMMENTS
REGARDING LEACH FIELD SURVEY PLAN

NRC COMMENT

- The instrumentation and procedures to be used for obtaining contamination measurements inside the piping and wells should be described. How will the equipment, including uR meters, be calibrated? Please describe.

UNC REPLY

- ° Measurement instruments used for this project is as described in Part I of SNM-368, Section 4.5. Calibration shall be performed per existing procedures.

THE PLAN WILL BE REVISED TO READ

page A5 - Analysis and Instrumentation

"Instrumentation used shall be as specified in the SNM License 368, Part I Section 4.5. Calibration techniques shall follow existing procedures."

UNC RESPONSE TO NRC COMMENTS
REGARDING LEACH FIELD SURVEY PLAN
(Section 2)

NRC COMMENT

- Background Sampling
- 1. Groundwater analysis should be made on samples collected up-gradient hydrologically from the suspected contamination area. Gross alpha concentrations of groundwater samples already collected from "background" boreholes 3 and 4 would appear to indicate that these boreholes are being affected by the source area, because their gross alpha concentrations may be inadequate resulting in false negative Type II error) conclusions. We suggest that UNC establish and analyze additional background groundwater sampling locations that are clearly hydrologically up-gradient from the source of contamination.

UNC REPLY

- ° Prior sampling collected from sunken sampling wells provide data on true ground-water background levels. However, additional sampling shall be done up-gradient of the field. Since the action levels in and around the field are presently not based on the BG-3 and BG-4 readings, the sampling to date is appropriate.

THE PLAN WILL BE REVISED TO READ

page A2 - Background Sampling - New paragraph

"in addition to the ground-water sampling discussed above, water samples shall be obtained from existing wells (including some up-gradient from the field) located at various locations around the site."

UNC RESPONSE TO NRC COMMENTS
REGARDING LEACH FIELD SURVEY PLAN
(Section 2)

NRC COMMENT

- Background Sampling
- 2. The sampling plan states that soil samples will be collected every three feet from the background boreholes; however, the data collected from "background" boreholes 1-4 are in two-foot increments. Two-foot increments also agree with what is stated for samples collected in the field. Accordingly, the plan should be changed to reflect that samples from background boreholes will be collected at two-foot increments.

UNC REPLY

- ° A soil sample was taken with a 2' long split spoon every three feet as stated in the plan.

THE PLAN WILL BE REVISED TO READ

No change in plan.

UNC RESPONSE TO NRC COMMENTS
REGARDING LEACH FIELD SURVEY PLAN
(Section 2)

NRC COMMENT

- Background Sampling
- 3. UNC should clarify the location of the two "background" soil samples that were collected in 1985, to clearly show that these samples were taken up gradient from the source of contamination. No information is provided on the location of these samples. UNC also needs to provide information on whether or not groundwater samples were collected from these locations, and if these soil sampling locations can be used as background sampling locations.

UNC REPLY

- ° These locations will be shown in Exhibit 1. Ground-water samples were not obtained at these locations.

THE PLAN WILL BE REVISED TO READ

page Exhibit 1 - BG 85-4 and BG 85-5 shall be shown.

UNC RESPONSE TO NRC COMMENTS
REGARDING LEACH FIELD SURVEY PLAN
(Section 2)

NRC COMMENT

- Field Sampling
- 1. The sampling plan indicates that soil samples will be collected at all locations in which the surface reading is above background. "Above background" is defined as those measurements that exceed the mean background level at the 95% confidence level. It appears that what this should say is background will be considered exceeded when the maximum statistical background reading is exceeded; with the maximum statistical background reading being the upper limits of the 95% confidence interval.

UNC REPLY

- ° UNC concurs with this statement.

THE PLAN WILL BE REVISED TO READ:

page A3 - Soil Sampling, Meter Readings Above Background

"All locations (if any) which demonstrate an above background reading during the surface sampling discussed above, shall be subject to soil sampling. "Above background" will consist of readings which exceed the maximum statistical background reading which is the upper limits of the 95% confidence interval."..

UNC RESPONSE TO NRC COMMENTS
REGARDING LEACH FIELD SURVEY PLAN
(Section 2)

NRC COMMENT

1. Field Sampling
2. The sampling plan also states that any locations which are above background due to proximity to fuel handling buildings will not require soil sampling. The term "proximity" is somewhat vague, and should be clearly defined beforehand.

UNC REPLY

1. This statement was included because some radiation readings were affected by radioactive materials being stored in nearby buildings (or trailers). Proximity is thus defined as a radioactive material storage area being close enough to the field that the meter reading is recognizably increasing as one nears the building from several different angles (thus confirming this to be the source of the elevated counts).

THE PLAN WILL BE REVISED TO READ

page A3 - Soil Sampling - Meter Readings Above Background

"...Any locations which are above background due to proximity to fuel handling buildings will not require soil sampling. Proximity is defined as a radioactive material storage area being close enough to the meter location to cause a recognizable increase in the radiation level. This increase must be present as one approaches the storage area from several different angles thus confirming this to be the source of the elevated counts."

UNC RESPONSE TO NRC COMMENTS
REGARDING LEACH FIELD SURVEY PLAN
(Section 2)

NRC COMMENT

- Both Background and Field Sampling
- 1. The plan indicates that selected soil samples will be analyzed (in addition to gross alpha) for total uranium, specific isotopes, and radium 226. The criteria for determining how samples will be selected for these additional analyses should be clearly defined beforehand. These additional analyses should not be limited to the soil, but should be extended to include some groundwater samples. It is important that adequate analyses be made on both background and field samples so that some comparisons can be made.

UNC REPLY

- ° Soil and water samples will be analyzed per page 5 of this report. Ra-226 sampling shall be performed if the isotopic uranium values do not add up to the gross alpha value. In addition, at least ten locations shall be chosen (based on gross alpha results) from various locations throughout the field for Ra-226 testing. This criteria applies to both field and background sample locations.

THE PLAN WILL BE REVISED TO READ

page A5 - Analysis And Instrumentation

Several samples will also be checked for additional isotopes. At least ten samples will be selected from various locations to be tested for Ra-226 (based on several factors including gross alpha values). In addition, Ra-226 shall be tested in any sample which has cumulative isotopic uranium values less than the gross alpha figure."

UNC RESPONSE TO NRC COMMENTS
REGARDING LEACH FIELD SURVEY PLAN
(Section 2)

NRC COMMENT

- Both Background and Field Sampling
- 2 No mention is made, within the plan, for analyzing more than one groundwater sample from each well; however, more than one sample should be collected and analyzed to ensure the reliability of the results. Preferably a minimum of four samples should be collected at different time intervals. The time interval should be sufficient, based upon the groundwater velocity, to allow independent samples to be collected. If samples are not collected at different times, replicate samples should be analyzed.

UNC REPLY

- c Since the wells in the plan are drywells which were for leaching the waste stream into the ground and are located approximately ten feet above the ground-water, additional sampling would require several borings. Instead, three sampling wells were sunk in and around the septic field to provide locations for continuous sampling. These wells shall be sampled at least four times taking ground-water velocity into account. The initial data and locations were transmitted in the letter to C. Haughney from D. Birks dated 1-14-91.

THE PLAN WILL BE REVISED TO READ

page A4 - Sunk Well Water Sampling (New Paragraph)

"Three sampling wells shall be sunk as shown in Exhibit 1. These wells shall be sampled a total of four times at different time intervals based on ground-water velocity data. The wells shall be pumped and circulated at least ten minutes prior to sampling."

UNC RESPONSE TO NRC COMMENTS
REGARDING LEACH FIELD SURVEY PLAN
(Section 2)

NRC COMMENT

- Both Background and Field Sampling
- 3. Some type of procedure needs to be developed for determining whether or not the groundwater is contaminated; no procedure is stated. A simple comparison of field groundwater concentrations with the statistical maximum background concentration may not be appropriate, if an adequate number of background samples has not been collected. The EPA has proposed a number of procedures which may be appropriate (EPA, 1989). Again, this procedure should be developed beforehand.

UNC REPLY

- A procedure shall be written and shall use "Statistical Analysis of Ground-water Monitoring Data at RCRA (Resource Conservation and Recovery Act) Facilities" written by the EPA as a guide. Until that procedure is approved, a 15 pCi/l gross alpha upper limit will be used as a trigger for further evaluation.

THE PLAN WILL BE REVISED TO READ

page A5 - Analysis and Instrumentation

" Ground-water contamination levels shall be analyzed per a procedure based on the EPA guide "Statistical Analysis of Ground-water Monitoring Data at RCRA (Resource Conservation and Recovery Act) Facilities" unless otherwise mutually agreed upon by UNC and the NRC."

UNC RESPONSE TO NRC COMMENTS
REGARDING LEACH FIELD SURVEY PLAN
(Section 2)

NRC COMMENT

- Both Background and Field Sampling
- 4. No information is provided on how groundwater samples will be collected. Specific sampling procedures should be developed and described, bearing in mind such factors as: the presence of stagnant water in the well, the hydrogeology, and the chemicals being monitored.

UNC REPLY

- Procedures shall be written where current procedures do not apply.

THE PLAN WILL BE REVISED TO READ

page A4 - Sunk Well Water Sampling (See page 15 of this report)
"Test wells shall be sampled per existing procedures."