Nuclear Fuel Services, Inc.
P.O Box 337, MS 123
Erwin, TN 37650

(423) 743-9141

E-Mail :http://www.atnfs.com

AIRBORNE EXPRESS

21G-03-0104
GOV-01-55-04
ACF-03-0135

April 14, 2003

Director
Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555

References: 1) Docket No. 70-143; SNM License 124
2) Letter from B.M. Moore to NRC, License Amendment Request to Support the Uranyl Nitrate Building at the BLEU Complex, dated February 28, 2002 (21G-02-0051)

Subject: License Amendment Request Regarding 10 CFR 20.2003 Requirements

Dear Sir:

Nuclear Fuel Services, Inc. (NFS) hereby requests an amendment to the referenced license to clarify requirements regarding sampling and analysis of liquids discharged into the sanitary sewerage. Title 10, Code of Federal Regulations (CFR), Part 20.2003, *Disposal by Release into Sanitary Sewerage,* allows such discharges, provided, in part, that the quantity of licensed materials discharged does not exceed the concentrations listed in Table 3 of Appendix B of 10 CFR 20. If licensed materials are being discharged, sampling and analysis are required to verify compliance with the limits. However, if licensed materials are not being discharged into the sanitary sewerage, sampling and analysis should not be required. An example of the latter condition will be present at the Uranyl Nitrate Building (UNB) (Reference 2), where disposal of process water containing licensed materials into the sanitary sewerage will not occur. Therefore, to clarify the sampling and analysis requirements for discharges into the sanitary sewerage, NFS requests approval of page changes to Chapters 5, 10 and 13 of the referenced license.

The unit related to the action level and typical minimum detectable concentration listed in Table 5.1 *Summary Table of Environmental Radiological Monitoring Program* was revised to properly address the threshold for initiating an investigation and the associated instrumentation sensitivity, respectively.

NMSS01

The NFS Safety and Safeguards Review Council has reviewed and approved the attached page changes. For your convenience, vertical lines in the right-hand margin of affected license pages denote changes.

If you or your staff have any questions, require additional information, or wish to discuss this, please contact me, or Mr. Rik Droke, Licensing and Compliance Director at (423) 743-1741. Please reference our unique document identification number (21G-03-0104) in any correspondence concerning this letter.

Sincerely,

NUCLEAR FUEL SERVICES, INC.

B. Marie Moore
Vice President
Safety and Regulatory

Attachments

JSK/lsn

cc:
Regional Administrator
U.S. Nuclear Regulatory Commission
Region II
Atlanta Federal Center
61 Forsyth Street, SW
Suite 23T85
Atlanta, GA 30303

Mr. William Gloersen
Project Inspector
U.S. Nuclear Regulatory Commission
Region II
Atlanta Federal Center
61 Forsyth Street, SW
Suite 23T85
Atlanta, GA 30303

Mr. Daniel Rich
Senior Resident Inspector
U.S. Nuclear Regulatory Commission

ATTACHMENT

Page Changes to SNM-124

Part I

Page Index
Pages 1 through 6

Chapter 5

Pages 2 and 8

Part II

Page Index
Pages 1 through 7

Chapter 10

Section H, Pages 1-4

Chapter 13

Section A, Pages 1-9

SPECIAL NUCLEAR MATERIAL LICENSE

SNM-124 (04/14/03) |

PAGE INDEX (Submitted)

Part	Section	Page(s)	Revision	Date
I	Introduction	i	1	08/15/89
		ii	1	08/15/89
I	Table of Contents	iii	6	08/07/98
		iv	8	04/28/00
		v	7	01/24/03
		vi	5	10/23/98
		vii	5	10/23/98
		vii-a	2	10/11/02
I	List of Figures	viii	9	10/11/02
I	List of Tables	ix	2	05/09/97
I	Chapter 1	1	6	04/28/00
		2	7	04/28/00
		3	9	12/10/99
		4	6	11/24/98
		5	6	11/15/01
		6	13	04/03/02
		7	2	10/15/90
		8	2	05/15/91
		9	1	08/15/89
		10	1	05/15/91
		11	1	05/18/95
		12	2	01/11/01
I	Appendix A	1	1	11/06/98
		2	1	11/06/98
		3	1	11/06/98
		4	1	11/06/98
I	Appendix B (NRC)	1	0	10/06/95
		2	0	10/06/95
		3	0	10/06/95
		4	0	10/06/95
I	Appendix C	1	0	09/25/98
		2	0	09/25/98
		3	0	09/25/98
		4	0	09/25/98
I	Appendix D	1	1	10/11/02
		2	1	10/11/02
		3	1	10/11/02

SPECIAL NUCLEAR MATERIAL LICENSE

SNM-124 (04/14/03) |

PAGE INDEX (Submitted)

Part	Section	Page(s)	Revision	Date
I	Chapter 2	1	4	09/15/98
		2	4	09/15/98
		3	3	05/15/91
		4	1	08/15/89
		5	1	08/15/89
		6	2	03/13/98
		7	3	03/13/98
		8	2	03/13/98
		9	2	03/13/98
		10	2	10/15/90
		11	1	08/15/89
		12	3	09/15/98
		13	3	03/13/98
		14	2	03/13/98
		15	4	03/13/98
		16	8	07/30/99
		17	5	12/20/00
		18	4	12/20/00
		19	5	10/19/98
		20	5	10/19/98
		21	4	06/18/93
		22	5	07/30/93
		23	3	08/07/92
		24	2	10/15/90
		25	2	10/15/90
		26	2	10/15/90
		27	3	11/16/98
		28	3	01/11/01
		29	0	01/24/03
I	Chapter 3	1	2	05/15/91
		2	4	05/18/95
		3	5	03/13/98
		4	3	05/18/95
		5	6	03/13/98
		6	1	08/15/89
		7	5	03/13/98
		8	3	05/18/95
		9	3	05/18/95
		10	2	05/15/91
		11	4	05/20/92
		12	3	05/18/95
		13	6	01/23/03

SPECIAL NUCLEAR MATERIAL LICENSE

SNM-124 (04/14/03)

PAGE INDEX (Submitted)

Part	Section	Page(s)	Revision	Date
I	Chapter 3	14	4	03/13/98
		15	6	12/10/99
		16	2	05/18/95
		17	3	05/15/91
		18	2	05/15/91
		19	4	12/10/99
		20	7	01/23/03
		21	10	01/23/03
		22	5	04/28/00
		23	5	04/28/00
		24	7	04/28/00
		25	6	03/13/98
I	Chapter 4	1	4	10/23/98
		2	4	10/23/98
		3	3	10/23/98
		4	5	10/23/98
		5	2	10/23/98
		6	4	10/23/98
		7	4	10/23/98
		8	2	10/23/98
		9	2	10/23/98
		10	4	10/23/98
		11	4	10/23/98
		12	4	10/23/98
		13	2	10/23/98
		14	2	10/23/98
		15	3	10/23/98
		16	2	10/23/98
		17	2	10/23/98
		18	4	10/23/98
		19	3	10/23/98
		20	3	10/23/98
		21	3	10/23/98
		22	5	10/23/98
		23	3	10/23/98
		24	2	10/23/98
		25	2	10/23/98
		26	2	10/23/98
		27	3	10/23/98

SPECIAL NUCLEAR MATERIAL LICENSE

SNM-124 (04/14/03) |

PAGE INDEX (Submitted)

Part	Section	Page(s)	Revision	Date
I	Chapter 4	28	3	10/23/98
		29	5	05/21/99
		30	4	05/21/99
		31	3	10/23/98
		32	5	10/23/98
		33	4	10/23/98
		34	3	10/23/98
		35	4	10/23/98
		36	4	10/23/98
		37	6	04/23/99
		38	6	04/23/99
		39	3	10/23/98
		40	5	04/23/99
		41	2	10/23/98
		42	2	10/23/98
		43	2	10/23/98
		44	5	04/23/99
		45	2	10/23/98
		46	4	10/23/98
		47	4	10/23/98
		48	3	10/23/98
		49	2	10/23/98
		50	2	10/23/98
		51	2	10/23/98
		52	2	10/23/98
		53	4	10/23/98
		54	2	10/23/98
		55	2	10/23/98
		56	2	10/23/98
		57	2	10/23/98
		58	2	10/23/98
		59	2	10/23/98
		60	4	10/23/98

SPECIAL NUCLEAR MATERIAL LICENSE

SNM-124 (04/14/03) |

PAGE INDEX (Submitted)

Part	Section	Page(s)	Revision	Date
I	Chapter 5	1	3	08/09/00
		2	6	04/14/03 |
		3	3	08/28/98
		4	3	08/28/98
		5	2	08/28/98
		6	3	10/11/02
		7	4	10/11/02
		8	8	04/14/03 |
		9	5	10/11/02
		10	6	08/18/00
		11	3	08/28/98
		12	2	08/28/98
		13	2	08/28/98
		14	3	08/28/98
		15	3	08/28/98
		16	2	08/28/98
		17	3	08/28/98
		18	7	10/11/02
		19	5	08/28/98
		20	2	08/28/98
		21	2	08/28/98
		22	2	08/28/98
		23	0	08/28/98
I	Chapter 6	1	2	08/14/98
		2	3	11/13/98
		3	7	05/21/99
		4	7	09/04/98
		5	2	08/14/98
		6	3	10/11/02
		7	1	08/14/01
		8	1	10/11/02
		9	2	08/14/98
		10	1	11/29/94

SPECIAL NUCLEAR MATERIAL LICENSE

SNM-124 (04/14/03) |

PAGE INDEX (Submitted)

Part	Section	Page(s)	Revision	Date
I	Chapter 7	1	8	11/16/98
		2	5	10/08/93
		3	4	10/08/93
		4	2	11/16/98
		5	2	11/16/98
		6	2	11/16/98
I	Chapter 7 Appendix A	deleted		
I	Chapter 7 Appendix B	deleted		
I	Chapter 8	1	2	08/28/98

Table 5.1 Summary Table of Environmental Radiological Monitoring Program

Sampling Point	Sample Type/ Collection Frequency	Parameters Analyzed	Action Level (µCi/ml, unless otherwise stated)	Typical MDC (µCi/ml, unless otherwise stated)
Airborne Effluents[1]				
Operating Radiological Stacks[2]				
Main Processing Stack	Continuous/Daily[3]	Gross Alpha	Cumulative > 16.5 mCi/12-months Monthly Average > 2 0E-11	8.0E-14
		Gross Beta	Cumulative > 3800 mCi/12-months Monthly Average > 4 7E-9	1.0E-13
Combined Releases from Other Uranium Stacks	Continuous/Daily[3]	Gross Alpha	Cumulative > 1.8 mCi/12-months Monthly Average > 2.0E-12	8.0E-14
		Gross Beta	Cumulative > 270 mCi/12-months Monthly Average > 2 9E-10	1.0E-13
Combined Releases from Plutonium Stacks (Bldg 234)	Continuous/Weekly	Gross Alpha	Cumulative > 0.1 mCi/12-months Monthly Average > 7.0E-13	8.0E-15
		Gross Beta	Cumulative > 0 3 mCi/12-months Monthly Average > 1.9E-12	1 0E-14
Ambient Air	Continuous/Weekly	Gross Alpha	Quarterly Average > 5 0E-15	3 0E-15
		Gross Beta	Quarterly Average > 9.0E-11	1.0E-14
	Composite/Quarterly	Isotopic U	Total U > 5.0E-15	4.0E-16
	Composite/Annually	Isotopic Th	Total Th > 4 0E-16	1.0E-16
		Isotopic Pu	Total Pu > 2 0E-15	1.0E-16
Liquid Effluents				
Surface Water				
Banner Spring Branch Upstream	Grab/Quarterly	Gross Alpha	Sample > 3.0E-8	1 0E-08
		Gross Beta	Sample > 3.0E-6	2.0E-08
Martin Creek Upstream	Grab/Quarterly	Gross Alpha	Sample > 3 0E-8	1.0E-08
		Gross Beta	Sample > 3 0E-6	2 0E-08
Nolichuckey River Upstream	Grab/Quarterly	Gross Alpha	Sample > 3 0E-8	1.0E-08
		Gross Beta	Sample > 3 0E-6	2 0E-08
Banner Spring Branch Downstream	Continuous/Daily[3]	Gross Alpha	Sample > 3.0E-7	1.5E-08
		Gross Beta	Sample > 6.0E-6	3 0E-08
	Composite/Monthly	Isotopic U	Sample SOF > 1.0 (see note 4)	1.00E-09
Martin Creek Downstream	Grab/Weekly	Gross Alpha	Sample > 3 0E-7	1 5E-08
		Gross Beta	Sample > 6 0E-6	3.0E-08
Nolichuckey River Downstream	Grab/Quarterly	Gross Alpha	Sample > 3 0E-7	1 5E-08
		Gross Beta	Sample > 6.0E-6	3.0E-08
Process Waste Water				
Waste Water Treatment Facility	Grab/each batch	Gross Alpha	Batch > 3E-7	1.5E-07
		Gross Beta	Batch > 6E-5	6.0E-07
	Composite/Monthly	Isotopic U	Semiannual Average SOF > 1.0 (see notes 4 and 7)	1.00E-09
Sanitary Sewer (See Note 8)	Continuous/Daily[3]	Gross Alpha	Sample > 3.0E-7	1.5E-08
		Gross Beta	Sample > 6.0E-6	3.0E-08
	Composite/Monthly	Isotopic U	Sample SOF > 0 5 (see note 4)	1.0E-09
Ground-Water Treatment Facility (Discharges to Sewer)	Composite/Monthly (filtered insoluble material)	Gross Alpha	> insoluble radioactivity in background water	3.0E-08
		Gross Beta	Same as above	5 0E-08
Other Environmental Media				
Sludge (Erwin POTW)	Grab/Quarterly	Isotopic U	Sample >30 pCi/g Total U	1 pCi/g
Soil	Grab/Quarterly	Gross Alpha See note 5	Sample > 25 pCi/g	5 pCi/g
Silt/Sediment	Grab/Quarterly	Gross Alpha See note 5	Sample >25 pCi/g	5 pCi/g
Vegetation	Grab/Quarterly	Gross Alpha See note 5	Sample >25 pCi/g	5 pCi/g
Groundwater	Grab/Quarterly	Gross Alpha Gross Beta See note 5	Sample > 15 pCi/liter Sample > 50 pCi/liter	10 pCi/L 15 pCi/L

Notes:

1. To minimize interference of radon progeny, air samples may be counted after a holding period (e g , 7 days) or decay-corrected prior to comparing to action levels and reporting final results
2. Radiological stacks and vents are considered to be those with a potential for releasing airborne activity at concentrations greater than or equal to 10% of the values in 10 CFR 20, Appendix B, Table 2, Column 1.
3. Daily means normal operating days, Monday-Friday, excluding holidays and weekends On holidays and weekends samplers will continue to accumulate a sample, however, the sample will not be collected until the next normal operating day
4. SOF = Sum of Fractions for the mixture of radionuclides. The SOF is determined by computing the sum of the ratios of various nuclides divided by their applicable effluent concentration value in Appendix B, Table 2, Column 2 to 10CFR Part 20.
5. If an action level is exceeded for this media, isotopic analysis will be performed on the sample (or a sample from the same location if the initial sample volume is insufficient)
6. The bases of all action levels and minimum detectable concentrations are documented and available for review.
7. If the SOF (WWTF) exceeds 1.0, results of a dose assessment to maximum exposed offsite receptor will be reported as indicated in paragraph 2 of Section 5 1 2 3.
8. Sampling is only required for disposal of process water containing licensed materials into the sanitary sewerage in accordance with 10 CFR 20.2003

Liquid effluents that do not go through the Waste Water Treatment Facility shall meet the unrestricted area requirements of 10 CFR 20. See Table 5.1 for collection frequencies, analyses required, action levels, and minimum detectable concentrations.

5.1.2.1 **Source-Point Sampling of Liquid Effluents**

All process wastes liquids, except noncontact cooling water, are collected and treated, if necessary, prior to discharge.
During the operation of the Waste Water Treatment Facility, each batch is analyzed for gross alpha and gross beta radioactivity prior to discharge. A monthly composite sample is analyzed for isotopes of uranium. The monthly composite will be analyzed for other radionuclides if materials in addition to uranium are suspected to be present in process waste water at levels exceeding 10% of the concentration values in Appendix B, Table 2, Column 2, 10 CFR Part 20. The chemical parameters prescribed in the State of Tennessee NPDES permit are also analyzed at least on the frequency specified in the permit. Samples of the treated waste water are collected from the final neutralization or storage tank prior to discharge.

When operating, a monthly composite sample of the Groundwater Treatment Facility is collected and analyzed for insoluble alpha and beta radioactivity. A method published by the American Public Health Association [e.g., Method 7110, "Gross Alpha and Beta Radioactivity (Total, Suspended, and Dissolved)" in Standard Methods for the Examination of Water and Wastewater, 18th Edition] will serve as underlying guidance for the analysis.

Sanitary wastes are collected in two main pipes, (one for the BLEU Complex and one for the remainder of the main NFS plant site) for discharge to the Erwin-POTW. If process water containing radioactive materials is disposed of by release into the sanitary sewer in accordance with requirements cited in 10 CFR 20.2003, samples representative of the total discharge will be collected and analyzed for gross alpha and gross beta activity as outlined in Table 5.1. In addition, a monthly composite sample is collected and analyzed for isotopic uranium. The monthly composite will be analyzed for other radionuclides if materials in addition to uranium are suspected to be present in sanitary effluents at levels exceeding 10% of the concentration values in Appendix B, Table 2, Column 2, 10 CFR Part 20. In addition, sludge samples will be collected at the Erwin POTW. These samples will be collected at least quarterly (provided a blowdown sample is available) and analyzed for isotopic uranium.

With the exception of the BLEU Complex, the plant storm water drainage system runs into Banner Spring Branch. Subsequently, the flow enters Martin Creek, North Indian Creek, and then the Nolichucky River. The storm water drainage system at the BLEU Complex discharges into culverts which parallel the northwest plant boundary and empty into Martin Creek, and subsequently into North Indian Creek and then the Nolichucky River. Samples are taken at Banner Spring Branch (excluding runoff from the BLEU Complex), Martin Creek and the Nolichucky River, as outlined in Table 5.1. The downstream Banner Spring Branch daily samples are composited monthly and analyzed for uranium isotopics. The monthly composite will be analyzed for additional elemental

SPECIAL NUCLEAR MATERIAL LICENSE
SNM-124
PAGE INDEX(SUBMITTED)

PART	SEGMENT		PAGE(S)	REVISION	DATE
II	Table of Contents		i-viii	5	01/24/03
II	List of Figures		ix-xii	3	06/28/02
II	List of Tables		xiii-xv	4	01/24/03
II	Chapter 9,	Section A	1-6	3	06/28/02
		Appendix A	1-3	1	12/31/92
II	Chapter 10,	Section A	1-6	3	10/11/02
		Section B	1-4	3	06/28/02
		Section C	1-3	3	10/11/02
		Section D	1-16	2	10/11/02
		Section E	1-15	2	06/28/02
		Section F	1-16	2	06/28/02
		Section G	1-2	1	10/11/02
		Section H	1-4	4	04/14/03
		Section I	1-8	4	10/11/02
II	Chapter 11,	Section A	1-12	2	06/28/02
		Appendix A	--	--	--
		Section B	1-10	2	06/28/01
		Section C	1-9	0	01/24/03
II	Chapter 12,	Section A	1-10	2	06/28/02
		Section B	1-5	3	06/28/02
		Section C	1-6	2	06/28/02
		Section D	1-11	4	01/23/03
		Appendix A	1-10	10	06/28/02
		Appendix B	1-3	0	07/06/00
		Section E	1-7	2	06/28/02
II	Chapter 13,	Section A	1-9	5	04/14/03

SPECIAL NUCLEAR MATERIAL LICENSE
SNM-124
PAGE INDEX (SUBMITTED)

PART	SEGMENT		PAGE(S)	REVISION	DATE
II	Chapter 14,	Section A	1-8	1	06/28/01
		Section B	1-11	1	06/28/01
		Section C	1-8	1	06/28/01
II	Chapter 15,	Section 15.3A	1-17	0	06/23/00
		Section 15.3B	1-11	0	06/23/00
		Section 15.3C	1-8	0	06/23/00
		Section 15.3D	1-11	0	06/23/00
		Section 15.3E	1-11	0	06/23/00
		Section 15.3F	1-7	0	06/23/00
		Appendix A	1-8	0	07/23/98
II	Chapter 15,	Section 15.4A	1-15	0	06/23/00
		Section 15.4B	1-7	0	06/23/00
II	Chapter 15,	Section 15.5	1-1	0	06/23/00
II	Chapter 15,	Section 15.6	1-17	3	06/28/02
II	Chapter 15,	Section 15.7	1-25	2	06/28/02
II	Chapter 15,	Section 15.8	1-8	2	06/28/02
II	Chapter 15,	Section 15.9	1-5	1	06/28/01
II	Chapter 15,	Section 15.11	1-7	0	06/23/00
II	Chapter 15,	Section 15.12	1-9	0	02/28/02
II	Chapter 15,	Section 15.13	1-4	0	10/11/02
II	Chapter 16,	Section A	1-1	0	06/23/00

SPECIAL NUCLEAR MATERIAL LICENSE
SNM-124
PAGE INDEX (SUBMITTED)

PART	SEGMENT	PAGE(S)	REVISION	DATE
		CLASSIFIED PORTION		
II	Table of Contents	Ci-Civ	10	06/29/01
II	List of Figures	Cv-Cviii	9	06/23/00
II	List of Tables	Cix	9	06/23/00
II	Chapter 15, Section 15.1 (Classified Only)	C1	2	12/15/91
		C2	1	08/15/89
		C3	1	08/15/89
		C4	1	08/15/89
		C5	1	08/15/89
		C6	1	08/15/89
		C7	1	08/15/89
		C8	1	08/15/89
		C9	1	08/15/89
		C10	2	06/09/93
		C11	2	06/09/93
		C12	2	06/09/93
		C13	2	06/09/93
		C14	2	06/09/93
		C15	2	06/09/93
		C16	2	06/09/93
		C17	2	06/09/93
		C18	2	06/09/93
		C19	2	06/09/93
		C20	2	06/09/93
		C21	2	06/09/93
		C22	2	06/09/93
		C23	1	08/15/89
		C24	1	08/15/89
		C25	1	08/15/89
		C26	2	06/09/93

SPECIAL NUCLEAR MATERIAL LICENSE
SNM-124
PAGE INDEX (SUBMITTED)

PART	SEGMENT	PAGE(S)	REVISION	DATE
II	Chapter 15	C27	1	08/15/89
	Section 15.1	C28	2	05/15/91
	(Classified Only)	C29	2	05/15/91
		C30	2	05/15/91
		C31	1	08/15/89
		C32	1	08/15/89
		C33	1	08/15/89
		C34	1	08/15/89
		C35	1	08/15/89
		C36	1	08/15/89
		C37	1	08/15/89
		C38	1	08/15/89
		C39	1	08/15/89
		C40	1	08/15/89
		C41	1	08/15/89
		C42	2	06/09/93
		C43	1	08/15/89
		C44	1	08/15/89
		C45	1	08/15/89
		C46	2	05/15/91
		C47	3	12/15/91
		C48	1	08/15/89
		C49	2	05/15/91
		C50	2	06/09/93
		C51	1	08/15/89
		C52	2	05/15/91
		C53	1	08/15/89
		C54	1	08/15/89
		C55	1	08/15/89
		C56	1	08/15/89
		C57	1	08/15/89
		C58	1	08/15/89
		C59	1	08/15/89
		C60	1	08/15/89

SPECIAL NUCLEAR MATERIAL LICENSE
SNM-124
PAGE INDEX (SUBMITTED)

PART	SEGMENT	PAGE(S)	REVISION	DATE
II	Chapter 15	C61	1	08/15/89
	Section 15.1	C62	1	08/15/89
	(Classified Only)	C63	1	08/15/89
		C64	1	08/15/89
		C65	1	08/15/89
		C66	1	08/15/89
		C67	2	06/09/93
		C68	1	08/15/89
		C69	1	08/15/89
		C70	1	08/15/89
		C71	2	05/15/91
		C72	1	08/15/89
		C73	1	08/15/89
		C74	1	08/15/89
		C75	1	08/15/89
		C76	1	08/15/89
		C77	1	08/15/89
		C78	2	05/15/91
		C79	1	08/15/89
		C80	1	08/15/89
		C81	1	08/15/89
		C82	1	08/15/89
		C83	1	08/15/89
		C84	1	08/15/89
		C85	1	08/15/89
		C86	2	12/15/91
		C87	2	12/15/91
		C88	1	08/15/89
		C89	1	08/15/89
		C90	1	08/15/89
		C91	1	08/15/89
		C92	1	08/15/89
		C93	1	08/15/89
		C94	1	08/15/89

SPECIAL NUCLEAR MATERIAL LICENSE
SNM-124
PAGE INDEX (SUBMITTED)

PART	SEGMENT	PAGE(S)	REVISION	DATE
II	Chapter 15	C95	1	08/15/89
	Section 15.1	C96	1	08/15/89
	(Classified Only)	C97	2	12/15/91
		C98	3	06/09/93
		C99	3	06/09/93
		C100	2	12/15/91
		C101	2	12/15/91
		C102	2	05/15/91
		C103	3	12/15/91
		C104	2	12/15/91
		C105	2	06/09/93
		C106	1	08/15/89
		C107	1	08/15/89
		C108	1	08/15/89
		C109	2	06/09/93
		C110	1	08/15/89
		C111	1	08/15/89
		C112	1	08/15/89
		C113	2	05/15/91
		C114	1	08/15/89
		C115	2	05/15/91
		C116	1	08/15/89
		C117	3	12/15/91
		C118	1	08/15/89
		C119	1	08/15/89
		C120	1	08/15/89
		C121	1	08/15/89
		C122	1	08/15/89

SPECIAL NUCLEAR MATERIAL LICENSE
SNM-124
PAGE INDEX (SUBMITTED)

PART	SEGMENT	PAGE(S)	REVISION	DATE
II	Chapter 15 Section 15.2 (Classified Only)	15.2-1 through 15.2-53	0	08/09/94
	Chapter 15 Section 15.10 (Classified Only)	15.10.1-1 through 15.10.1-3	2	06/23/00
		15.10.2-1 through 15.10.2-12	2	06/29/01
		15.10.3-1 through 15.10.3-6	1	06/23/00
		15.10.4-1 through 15.10.4-6	3	06/29/01
		15.10.4.1-1 through 15.10.4.1-6	3	06/29/01
		15.10.4.2-1 through 15.10.4.2-7	3	06/29/01
		15.10.4.3-1 through 15.10.4.3-6	4	06/27/02
		15.10.4.4-1 through 15.10.4.4-13	4	06/29/01
		15.10.4.5-1 through 15.10.4.5-5	4	06/29/01
		15.10.4.6-1 through 15.10.4.6-8	3	06/29/01
		15.10.4.7-1 through 15.10.4.7-6	3	06/29/01
		15.10.4.8-1 through 15.10.4.8-10	4	06/27/02
		15.10.4.9-1 through 15.10.4.9-6	3	06/29/01
		15.10.5-1 through 15.10.5-29	3	06/29/01
		15.10.6.1-1 through 15.10.6.1-6	2	06/29/01
		15.10.6.2-1 through 15.10.6.2-5	2	06/29/01
		15.10.6.3-1 through 15.10.6.3-6	2	06/29/01
		15.10.6.4-1 through 15.10.6.4-5	2	06/29/01
		15.10.6.5-1 through 15.10.6.5-6	2	06/29/01
		15.10.6.6-1 through 15.10.6.6-11	3	06/29/01
		15.10.6.7-1 through 15.10.6.7-7	2	06/29/01
		15.10.6.8-1 through 15.10.6.8-5	2	06/29/01
		15.10.6.9-1 through 15.10.6.9-5	2	06/29/01
		15.10.6.10-1 through 15.10.6.10-9	2	06/29/01

CHAPTER 10

H. WASTE

10.4 RADIOACTIVE WASTE HANDLING

10.4.1 Liquid Wastes

Liquid wastes are discharged from the Plant through two routes: process wastes and sanitary wastes.

10.4.1.1 Process Wastes

Most process waste water is collected in tanks in or near the various process buildings. Prior to pumping these wastes to the Waste Water Treatment Facility (WWTF), they are analyzed and must show levels below internal action guide limits. Waste water generated in the following processes is currently treated in the WWTF:

- Fuel Manufacturing
- Highly Enriched Uranium Fuel Recovery
- Laboratories
- Decontamination
- Fuel Development
- Decommissioning activities
- Laundry
- Mixed Waste Treatment
- BLEU Preparation

The WWTF is operated in accordance with a State of Tennessee issued NPDES permit. Waste water is treated in the WWTF on a batch basis with discharge directly to the Nolichucky River. The average discharge is approximately 15,000 gallons. The specific process description is included in Chapter 15.

In this facility, waste water is treated for removal of fluorides by precipitation. The precipitate is de-watered, and the solids are packaged for land burial. The solutions may undergo ammonia removal by use of a stripping tower or by break-point chlorination prior to neutralization for discharge. The treated water is discharged directly to the Nolichucky River. A sample from each batch is collected and analyzed prior to discharge to assure compliance with 10 CFR Part 20 and applicable State of Tennessee regulations.

10.4.1.2 **Sanitary Wastes**

Plant sanitary wastes are discharged through piping which goes to the City of Erwin publicly owned treatment works. The inputs for the sanitary sewer system include all bathrooms and showers (as outlined in Figure 10.16). Water from the Groundwater Treatment Facility is also discharged in accordance with all applicable regulatory requirements. Effluent sampling is addressed in Chapter 5, Section 5.1.2.1 and Chapter 13, Section 13.3.2.

10.4.2 **Solid Wastes**

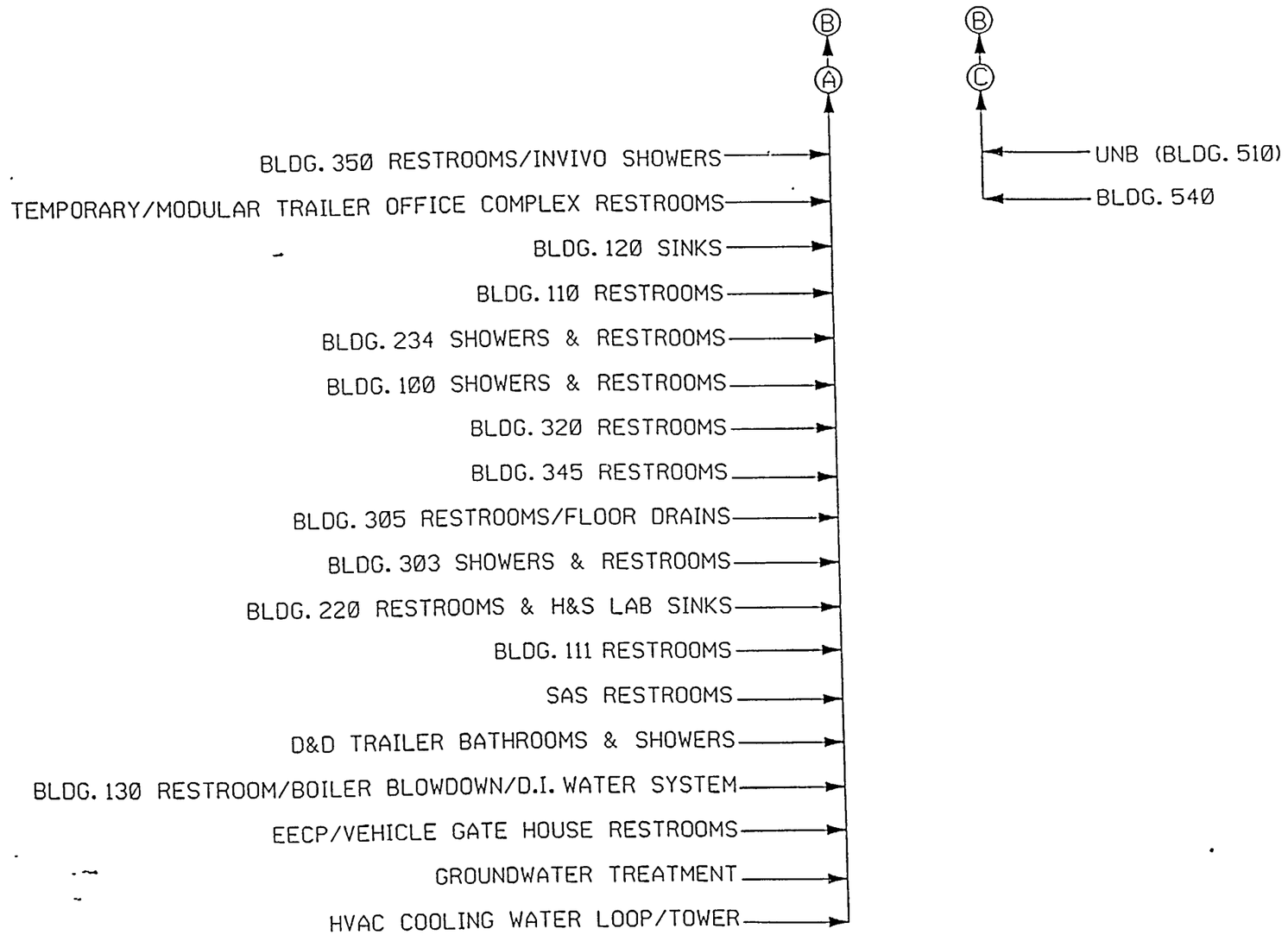
Solid waste materials generated as a result of operations at the NFS Erwin Facilities are of four types: radiologically contaminated waste, non-contaminated solid waste, hazardous waste and mixed waste (hazardous and radioactive).

10.4.2.1 **Radiologically Contaminated Waste**

Radiologically contaminated wastes may be additionally processed by sorting, segregation, blending, mixing, volume reduction, and/or shipment to a licensed disposal facility.

10.4.2.2 **Non-contaminated Solid Waste**

Non-contaminated combustible materials, such as office and lunchroom trash, and non-contaminated, non-combustible waste, including normal industrial materials, metals and construction rubble, are disposed of at a local permitted landfill.


N.F.S. INPUTS TO THE SANITARY WASTE STREAM
B
A
B
C
UNB (BLDG. 510)
BLDG. 540
BLDG. 350 RESTROOMS/INVIVO SHOWERS
TEMPORARY/MODULAR TRAILER OFFICE COMPLEX RESTROOMS
BLDG. 120 SINKS
BLDG. 110 RESTROOMS
BLDG. 234 SHOWERS & RESTROOMS
BLDG. 100 SHOWERS & RESTROOMS
BLDG. 320 RESTROOMS
BLDG. 345 RESTROOMS
BLDG. 305 RESTROOMS/FLOOR DRAINS
BLDG. 303 SHOWERS & RESTROOMS
BLDG. 220 RESTROOMS & H&S LAB SINKS
BLDG. 111 RESTROOMS
SAS RESTROOMS
D&D TRAILER BATHROOMS & SHOWERS
BLDG. 130 RESTROOM/BOILER BLOWDOWN/D.I. WATER SYSTEM
EECP/VEHICLE GATE HOUSE RESTROOMS
GROUNDWATER TREATMENT
HVAC COOLING WATER LOOP/TOWER
LEGEND:
Ⓐ MANHOLE FOR SAMPLING OUTSIDE SECURITY BOUNDARY
Ⓑ TO CITY OF ERWIN-PUBLICLY OWNED TREATMENT WORKS
Ⓒ SAMPLING LOCATION FOR BLEU COMPLEX
THIS DRAWING RELEASED FOR:
SIGNATURE/DATE
CONSTRUCTION
INFORMATION ONLY
BID
PURCHASE/FAB
VR#
PR#
BY | DATE | REVISION | LET
ORIGINAL ISSUE
THIS DRAWING AND ALL INFORMATION CONTAINED HEREON IS THE PROPERTY OF NUCLEAR FUEL SERVICES, INC. AND SHALL NOT BE USED OR DISCLOSED FOR ANY PURPOSES OTHER THAN THAT FOR WHICH IT HAS BEEN FURNISHED WITHOUT THE EXPRESS WRITTEN CONSENT OF NFS
TOLERANCE UNLESS SPECIFIED
FRACTIONAL ± 1/64"
ANGULAR ± 1/2°
DECIMAL XX ± .01 XXX ± .001
REVIEWED BY
PROPOSED COMPLETION DATE:
DRAFTER WG HENSLEY
PROPOSED APPROVALS
REQ.
NUCLEAR FUEL SERVICES, INC.
ERWIN, TENNESSEE
NFS INPUT TO SANITARY SEWER SYSTEM SHOWING PROPOSED BLEU FACILITY
DRAFTER
AS-BUILT APPROVALS
REQ.
OWNER
SCALE NONE
DATE 2-26-02
DRAWING NO. 000-F0080-B1

10.4.2.3 **Hazardous Waste**

Hazardous waste that is generated at the site may be treated on-site or stored in a designated 90-day storage area prior to treatment and/or disposal at a permitted facility.

10.4.2.4 **Mixed Waste**

Mixed waste is waste that is both hazardous (as defined by EPA) and radioactive. Mixed waste may be treated to remove the hazardous characteristics or stored in an on-site permitted storage facility. Mixed waste may be shipped for treatment and/or disposal to a permitted and licensed facility as such facilities become available.

10.4.2.5 **General**

Approved procedures are used to identify, control, store, and dispose of all waste material.

CHAPTER 13

ENVIRONMENTAL PROTECTION

A. ENVIRONMENTAL PROTECTION

13.1 SUMMARY OF ENVIRONMENTAL DATA AND IMPACTS

Complete radiological and non-radiological environmental summaries for the NFS Erwin facility are included in the NFS Environmental Report, dated December 1996 (submitted to the NRC May 2, 1997). A summary of the NRC's Environmental Assessment and its Finding of No Significant Impact (FONSI) to the 1999 renewal of SNM-124 is included in a 1999 notice in the Federal Register (Vol. 64, No. 23, pp. 5681 - 5683).

A Supplemental Environmental Report provides a summary of radiological and non-radiological impacts attributable to the Blended Low-Enriched Uranium (BLEU) Project. This Supplemental Environmental Report specified the environmental impacts associated with constructing and operating the Uranyl Nitrate Building, BLEU Prep. Facility (BPF), Oxide Conversion Building, and Effluent Processing Building. The NRC noticed an EA/FONSI in the Federal Register (Vol. 67, No. 131, P. 45555-45559) concerning the license amendment needed to construct and operate the Uranyl Nitrate Building on July 9, 2002. Additionally, this EA/FONSI served to address the impacts associated with increasing the possession limit from 7,000 kilograms to 14,000 kilograms of ^{235}U and those attributable to the entire BLEU Project.

13.2 OFF-SITE DOSES

Since 1981, NFS has routinely calculated doses to members of the general public due to air effluents by operating stacks. These calculations utilize data from the air effluent monitoring program, along with site-specific meteorological data and physical characteristics of stacks. A summary of the results of these calculations for the maximally exposed individual for the period 1992 through the fourth quarter of 2001 are given in Table 13.1.

13.3 EFFLUENT CONTROL AND ENVIRONMENTAL MONITORING

Effluent monitoring and environmental monitoring are implemented through compliance with a number of Safety Department procedures. These procedures outline: sampling technique, sample processing and analysis methodologies, quality assurance, and other necessary information for maintaining a viable program.

Current sampling locations are identified in Table 13.2 and Table 13.3. These tables may also include sampling locations that are not required by license SNM-124 and applicable regulations. The minimum environmental protection sampling locations are identified in Chapter 5 of Part I. Action levels associated with effluent monitoring and environmental monitoring are provided in Table 5.1 of Chapter 5, Part I of this license.

13.3.1 Air Sampling

Airborne effluents from process ventilation stacks and vents are sampled continuously for radioactivity, during the processing of radioactive materials. Samples, representative of the total discharge, are routinely collected at frequencies specified in Safety Department procedures. All airborne effluent samples are analyzed for gross alpha and gross beta radioactivity.

Ambient air is continuously monitored at onsite and offsite locations. All environmental ambient air samples are analyzed for gross alpha and gross beta radioactivity, and are composited and analyzed for specific radionuclides.

13.3.2 Liquid Sampling

The Wastewater Treatment Facility (WWTF) treats and discharges process wastewater on a batch basis. Prior to discharge, each batch is sampled and analyzed for gross alpha and gross beta radioactivity as well as selected chemical parameters. The WWTF batches are discharged when they meet regulatory compliance parameters. The batch samples collected from the WWTF are composited and analyzed for specific radionuclides.

The Groundwater Treatment Facility (GWTF) discharges liquid effluents to the Sanitary Sewer. When operating, a grab sample is obtained from the GWTF. The grab sample(s) are composited and analyzed for insoluble radioactivity. The Sanitary Sewer discharges to the City of Erwin - Publicly Owned Treatment Works (POTW), and is sampled continuously using a proportional sampler. Sanitary Sewer samples are composited and analyzed for specific radionuclides. Sanitary Sewer discharges from the Uranyl Nitrate Building (UNB) are not required to be monitored since there are no process discharges, only plant restroom discharges, to the sanitary sewer.

Storm water is discharged to Banner Spring Branch. Banner Spring Branch is sampled continuously at a downstream location with a proportional sampler. Routine grab samples are collected from an upstream location. These samples are composited and analyzed for specific radionuclides.

NFS routinely collects grab samples from locations that are upstream and downstream of the NFS facility along Martin Creek and the Nolichucky River. Individual grab samples are analyzed for specific radionuclides, and the grab samples from the downstream locations are composited prior to analyzing them for specific radionuclides. Non-routine locations such as the Valved Surface Drainage Holding Area are periodically sampled in addition to the routine samples.

The site groundwater monitoring wells are shown in Figure 13.1. These site wells include those located inside of the protected area and those located in the former burial grounds, outside of the protected area to the north and the west. A number of wells are sampled both monthly and quarterly and analyzed for both chemical and radiological parameters. The routine radiological parameters are gross alpha and gross beta activity. If the action points of 15 pCi/liter alpha or 50 pCi/liter beta activity are exceeded, isotopic analysis will be performed.

Two leak detection wells are located to the north and west of the two underground 6000-gallon tanks. These wells, shown in Figure 13.2, will be sampled on a quarterly basis when the tanks are in use.

13.3.3 Soil, Sediment and Vegetation

Soil, sediment, and vegetation grab samples are routinely collected from the locations listed in Table 13.2. Soil sampling is typically restricted to the surface layer, which is indicative of the recent deposition of airborne radioacivity at a given location. Sediment sampling emphasizes shallow sediments, which is indicative of recent deposition from liquid effluents. Vegetation sampling relies primarily on annual plant growth, which is indicative of the radioactivity taken up through the roots and deposited on plant surfaces. In addition, sludge samples are routinely collected from the City of Erwin POTW and analyzed for uranium isotopes.

13.3.4 Environmental Dosimeters

Dosimeters are placed on and off site in order to routinely assess ambient radiation levels at the selected locations. The data from these dosimeters are used to demonstrate compliance with the 10 CFR Part 20, Subpart D requirement.

TABLE 13.1

RESULTS OF QUARTERLY DOSE ASSESSMENTS FOR THE MAXIMALLY EXPOSED OFF-SITE INDIVIDUAL

Period	Maximum TEDE (mrem)	Maximum CDE (mrem)	Maximally Exposed Organ	Location of Maximum Exposure	
				Sector	Distance (m)
1st Qtr. 1992		0.18	Child-Lung	S	405
2nd Qtr. 1992		0.09	Child-Lung	S	405
3rd Qtr. 1992		0.27	Child-Lung	S	405
4th Qtr. 1992		0.08	Child-Lung	S	405
1st Qtr. 1993		0.21	Child-Lung	S	405
2nd Qtr. 1993		0.29	Child-Lung	S	405
3rd Qtr. 1993		0.21	Child-Lung	S	405
4th Qtr. 1993		0.11	Child-Lung	S	405
1st Qtr. 1994		0.01	Child-Lung	SSW	210
2nd Qtr. 1994		0.02	Child-Lung	SSW	210
3rd Qtr. 1994		0.02	Child-Lung	SSW	210
4th Qtr. 1994		0.02	Child-Lung	ESE	300
1st Qtr. 1995		0.05	Child-Lung	ESE	300
2nd Qtr. 1995		0.02	Child-Lung	ESE	300
3rd Qtr. 1995		0.02	Child-Lung	ESE	300
4th Qtr. 1995		0.02	Child-Lung	ESE	300
1st Qtr. 1996		0.05	Child-Lung	SE	215
2nd Qtr. 1996		0.03	Child-Lung	ESE	300
3rd Qtr. 1996		0.04	Child-Lung	SE	215
4th Qtr. 1996		0.05	Child-Lung	SE	215
1st Qtr. 1997		0.07	Child-Lung	SE	215
2nd Qtr. 1997		0.03	Child-Lung	SE	215
3rd Qtr. 1997		0.05	Child-Lung	NNE	210
4th Qtr. 1997		0.04	Child-Lung	NNE	210
1st Qtr. 1998	0.004	0.03	Lung	NNE	250
2nd Qtr. 1998	0.073	0.43	Lung	NNE	650
3rd Qtr. 1998	0.013	0.10	Bone Surfaces	NNE	200
4th Qtr. 1998	0.011	0.07	Lung	NNE	550
1st Qtr. 1999	0.009	0.06	Bone Surfaces	NNE	500
2nd Qtr. 1999	0.012	0.13	Bone Surfaces	NNE	300
3rd Qtr. 1999	0.013	0.14	Bone Surfaces	NNE	300
4th Qtr. 1999	0.020	0.07	Bone Surfaces	NE	100
1st Qtr. 2000	0.014	0.09	Bone Surfaces	SSE	900
2nd Qtr. 2000	0.013	0.13	Bone Surfaces	NNE	300
3rd Qtr. 2000	0.006	0.06	Bone Surfaces	NNE	300
4th Qtr. 2000	0.005	0.04	Bone Surfaces	NNE	300
1st Qtr. 2001	0.005	0.05	Bone Surfaces	NNE	300
2nd Qtr. 2001	0.010	0.06	Lung	NNE	250
3rd Qtr. 2001	0.007	0.05	Lung	NNE	300
4th Qtr. 2001	0.009	0.06	Lung	NNE	250

NOTES.
TEDE is the total effective dose equivalent from air emissions for period (NFS began reporting TEDE the 1st Qtr 1998)
CDE is the committed dose equivalent to the maximally exposed organ from air emissions during period
All dose predictions represent 50-year dose commitments for internal exposure pathways
As of the 1st quarter of 1998 assessment techniques changed and doses are now computed using the CAP88-PC computer code

Table 13.2
ENVIRONMENTAL MONITORING
SAMPLING LOCATIONS

SURFACE WATER	GROUND WATER	AMBIENT AIR	VEGETATION	SOIL/SEDIMENT
Martin Creek Upstream Sampling Point		NW Perimeter Air Sampling Sta #170	Asheville Highway Sampling Point	Asheville Highway Sampling Point (soil)
Martin Creek Downstream Sampling Point	Well LD-1A[2] West of two underground 6,000-gallon tanks	W Perimeter Air Sampling Sta #171	Banner Hill Rd Sampling Point	Banner Hill Rd Sampling Point (soil)
Banner Spring Branch Downstream[1] Sampling Point		S Perimeter Air Sampling Sta #172	Little Mountain Sampling Point	Little Mountain Sampling Point (soil)
Banner Spring Branch, Upstream Sampling Point	Well LD-2A[2] North of two underground 6,000-gallon tanks		Burial Ground Sampling point	Highland Ave/First St Sampling Point (soil)
	Well 52 Background Well		Highland Ave/First St Sampling Point	Burial Ground at Sampling Point (soil)
Nolichucky River Upstream Sampling Point	Wells 98A, 99A, 100A 100B, 101A 102A, 103A	E Perimeter Air #1 Sampling Sta #174		Nolichucky River Upstream Sampling Point (sediment)
Nolichucky River Downstream Sampling Point	104A, 105A, 106A, Quarterly Downgradient Wells	E Perimeter Air #2 Sampling Sta #218		Nolichucky River Downstream Sampling Point (sediment)
				Martin Creek at Upstream Sampling Point (sediment)
	Other[3]	Near Ponds 1 & 2 Air Sampling Sta #555		Martin Creek at Downstream Sampling Point (sediment)
		W Perimeter Air Sampling Sta #668		Banner Spring at Upstream Sampling Point (soil)
Surface Drainage Ditch West Sampling Point		Banner Hill Rd Air Sampling Sta #323		Banner Spring at Downstream Sampling Point (sediment)
		Prk. Lot/Ent Air Sampling Sta #372		
		B. Hill/Stalling Air Sampling Sta #381		

Table 13.2 (Cont.)
ENVIRONMENTAL MONITORING SAMPLING LOCATIONS

SURFACE WATER	GROUND WATER	AMBIENT AIR	VEGETATION	SOIL/SEDIMENT
		Stalling Ln SE Air Sampling Sta #382		
		Highland/1st St Air Sampling Sta #383		
		Spar Mill Rd Air Sampling Sta #384		
		Security Fence SE Air Sampling Sta #385		
		Asheville Hwy Air Sampling Sta #324		
		North NFS Mound Air Sampling Sta #553		
		Images West Sampling Sta #581		
		NFS Training Center Sampling Sta #582		
		Little Mountain Air Sampling Sta #322		
		E of North NFS Burial Ground Sampling Station #677		
		NE of North NFS Burial Ground Sampling Station #678		
		N of North NFS Burial Ground Sampling Station #679		
		SW Burial Trench Area Sampling Station #685		

NOTES:

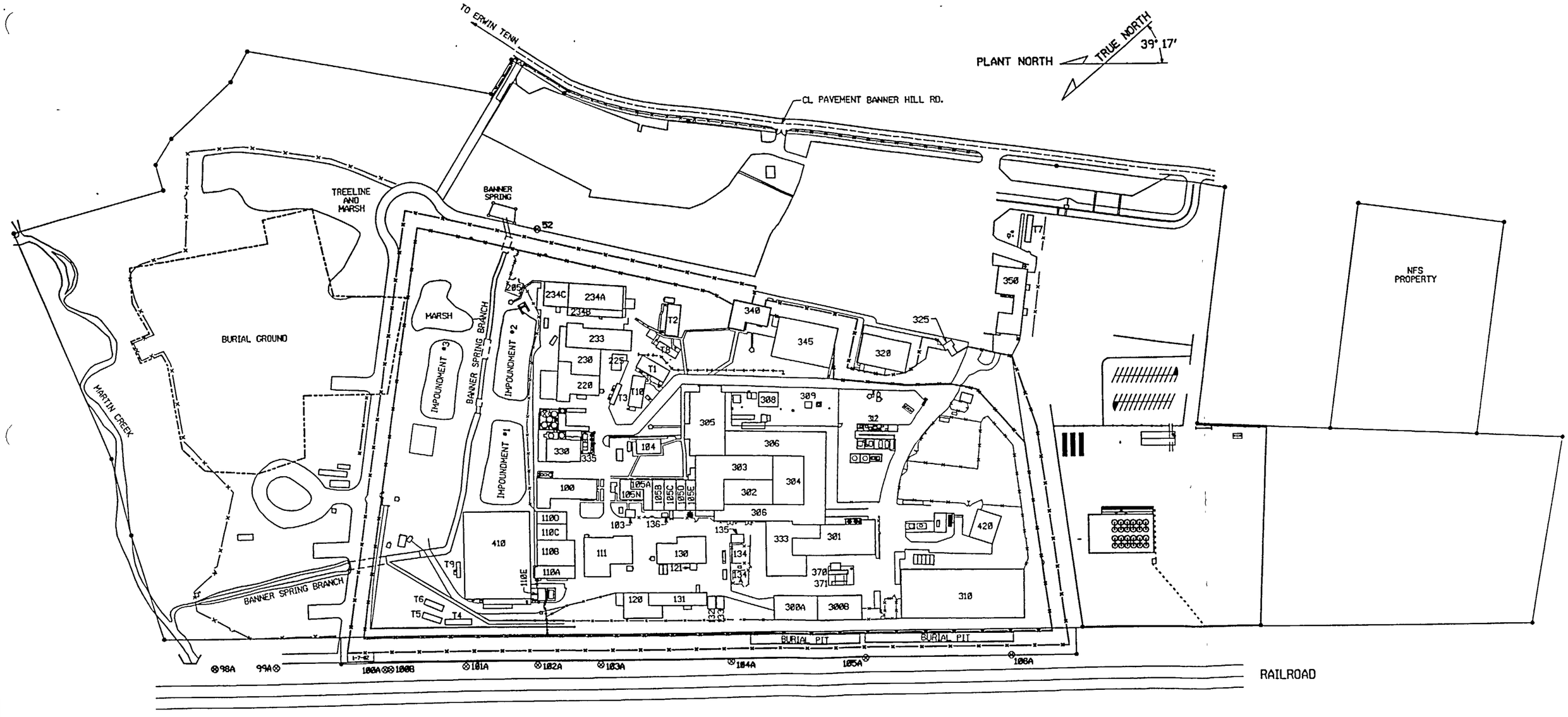
(1) Samples are collected using a continuous, proportional sampler. In the event that this sampler becomes inoperable due to power failure, mechanical breakage, etc., a daily grab sample will be collected.
(2) Wells LD1A and LD2A are routinely collected when the underground storage tanks are in use.
(3) In accordance with established procedures, a number of well samples are collected on a routine basis. At a minimum, these are analyzed for gross alpha and beta radioactivity (see Figure 13.1).

Table 13.3
EFFLUENT SAMPLING LOCATIONS[1]

Gaseous Effluents (Stacks/Vents)	Liquid Effluents (Streams)
Stack 416, Main Stack	Wastewater Treatment Facility (WWTF)
Stack 185, Building 131	Groundwater Treatment Facility (GWTF)
Stack 234, Building 234	NFS Sanitary Sewer
Stack 27, Building 234	BLEU Complex Sanitary Sewer
Stack 28, Building 234	EPOTW Sludge
Stack 332, Building 120	
Stack 376, Building 301	
Stack 421, Building 100	
Stack 547, Building 100	
Stack 573, Building 306-W	
Stack 600, Building 110	
Stack 615, Building 306-W	
Stack 646, Building 110	
Stack 649, Building 330	
Stack 667, Building 410	
Stack 703, Building 333	
Stack 704, Building 333	
Stack 501, Building 510	

Note:
1 - Normally, samples are only collected from these locations when discharges occur (i.e. stack/vent operates or facility discharges liquid effluents).

FIGURE 13.1
SITE GROUNDWATER MONITORING WELL LOCATIONS



LEGEND

⊗ MONITORING WELL LOCATION

⊗ PROPOSED MONITORING WELL LOCATION

BY	DATE	REVISION	LET
		ORIGINAL ISSUE	—

THIS DRAWING AND ALL INFORMATION CONTAINED HEREON IS THE PROPERTY OF NUCLEAR FUEL SERVICES, INC. AND SHALL NOT BE USED OR DISCLOSED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT HAS BEEN FURNISHED WITHOUT THE EXPRESS WRITTEN CONSENT OF NFS.

TOLERANCE UNLESS SPECIFIED
FRACTIONAL ± 1/64"
ANGULAR ± 1/2°
DECIMAL .XX ± .01 .XXX ± .005

NFS

REVIEWED BY RPStevens
PROPOSED COMPLETION DATE: 12/02
DRAFTER M.D. KEEVER
PROPOSED APPROVALS
REQ. [signature]

NUCLEAR FUEL SERVICES, INC.
ERWIN, TENNESSEE

SNM-124 GROUNDWATER MONITORING PROGRAM MONITORING WELL LOCATIONS

DRAFTER
AS-BUILT APPROVALS
REQ.
OWNER

SCALE 1" = 200' | DATE 02-19-02

005-C0132-B1

DRAWING NO.

CONFIGURATION CONTROL YES _____ NO _____

THIS DRAWING RELEASED FOR
SIGNATURE/DATE
☐ CONSTRUCTION
☐ INFORMATION ONLY
☐ BID
☐ PURCHASE/FAB

FIGURE 13.2
6000 GALLON TANK MONITORING WELLS