

**REQUEST FOR ADDITIONAL INFORMATION SUPPORTING
THE ENVIRONMENTAL ASSESSMENT FOR THE RENEWAL OF
U.S. NUCLEAR REGULATORY COMMISSION
LICENSE NO. SNM-124
FOR NUCLEAR FUEL SERVICES, ERWIN, TENNESSEE**

In support of its license renewal application, Nuclear Fuel Services (NFS) provided an Environmental Report (ER), as required under NRC's regulations at Title 10 of the *Code of Federal Regulations* (10 CFR) 70.21(f). The NRC staff has reviewed the NFS application and ER, using the guidance in NUREG-1748, "Environmental Review Guidance for Licensing Actions Associated with NMSS Programs." Additional information is needed to support the NRC's environmental review.

RAI 1

Expand description on the magnitude of trucking activities associated with current and proposed activities.

The licensee's environmental report provides only a brief discussion on transportation activities associated with licensed activities at the NFS Plant. Additional information is needed to adequately evaluate the potential environmental impacts related to transportation. The information needed includes the following:

- (1) Estimate the number of trucks that cross the NFS site boundary annually (i.e., number of shipments) stratified by the type of material that is shipped including (i) nonradioactive hazardous materials, (ii) radioactive hazardous materials, and (iii) nonradioactive nonhazardous. Values can be based on past activities or projections for future activities or a combination of both provided the estimates are considered representative of expected activities during the proposed license renewal period. If this information has been previously reported or documented, then provide the citation for the reference. If this information is excessively burdensome to obtain, practical alternatives should be discussed further with NRC.
- (2) State whether decommissioning waste shipments are expected to represent the majority of the cumulative highway miles traveled for NFS shipping activities over the life of the facility, and identify the location of the site(s) where the material is expected to be disposed. This information is needed for staff to verify the estimate of calculated traffic fatalities that was included in a previous environmental assessment (NRC, 1999) for the prior NFS license renewal. If decommissioning shipments do not represent the majority of shipping miles that are expected, then NFS should provide an estimate of the cumulative highway miles traveled for all trucking activities for the life of the facility.
- (3) Provide an estimate of the number of waste shipments that are expected from decommissioning activities (a) planned to occur during the proposed renewal period of 40 years; (b) planned to occur during the initial 10 years of the proposed renewal period of 40 years; and (c) that would occur should the license renewal application be denied and the facility decommissioned.

Enclosure

RAI 2

Clarify whether rail is used as a transportation mode associated with current and proposed activities.

The licensee's environmental report mentions the Carolina, Clinchfield, and Ohio rail line adjacent to the site but includes no information on whether NFS uses rail for shipment of any materials or supplies. Clarify whether NFS uses the rail line to support licensed activities at the NFS Erwin plant and, if so, whether this mode is used for any hazardous material or radioactive material shipments. This information is needed to adequately evaluate the potential environmental impacts related to transportation.

RAI 3

Clarify whether other environmental or risk assessments associated with NFS activities are available and whether NFS is relying for its transportation analysis on other documented environmental or risk assessments.

In its environmental report, NFS references a prior U.S. Department of Energy (DOE) Final Environmental Impact Statement (EIS) (DOE, 1996) that evaluated the potential environmental impacts of the national program to dispose of surplus high-enriched uranium. NFS downblending activities support this program. In 2007, DOE analyzed whether the EIS needed to be supplemented and concluded that no supplement was needed (DOE, 2007). However, the supplement analysis contains information on planned changes to the program.

Discuss whether the transportation analysis in the ER is consistent with the 2007, supplement analysis issued by DOE. Clarify whether, for its transportation analysis, NFS is relying on any other documented environmental or risk analyses (e.g., from other agencies such as DOE or the U.S. Navy) that apply to other parts of NFS operations. This information is needed to adequately evaluate the potential environmental impacts related to transportation.

RAI 4

Provide a discussion on the current status of cyanide, copper, and zinc levels in Banner Spring Branch and a discussion of the monitoring program for these constituents.

According to information in NRC's 1999 environmental assessment for the renewal of SNM-2010, NFS noted that non-radiological constituents were detected in surface water samples at concentration levels above the Tennessee Water Quality Criteria or the Environmental Protection Agency (EPA) drinking water maximum contaminant levels. In particular, total cyanide, nitrate/nitrite, copper, and zinc concentrations were detected at elevated concentrations in downstream locations on Banner Spring Branch (NRC, 1999, p. 3-26). In order to assess the potential environmental impacts associated with these non-radiological constituents, additional information is needed.

Therefore, please provide details on the current monitoring program for cyanide, copper, and zinc in the Banner Spring Branch. Highlight any changes in the monitoring program that have occurred since 1999, the basis for the changes, and any regulatory review of the changes.

Provide the annual-average concentrations for these constituents over the most recent 5-year period for which these concentrations were determined.

RAI 5

Provide confirmation that the agency issuing the discharge permit has agreed with NFS's investigation concluding that elevated nitrate and magnesium concentrations are naturally occurring in surface and groundwater at the site.

NFS presented annually sampled stormwater data for 2007 and 2008 in Tables 27 and 28 of the ER. The licensee reported that nitrate and magnesium concentration levels in storm water runoff exceeded the National Pollutant Discharge Elimination System cutoff concentration limits. Based on its investigation, NFS concluded that elevated nitrate and magnesium concentrations in storm water were consistent with naturally-occurring elevated nitrate and magnesium concentration levels in surface and groundwater. However, NFS did not indicate the results of the permitting agency's determination regarding the source of the elevated concentrations.

Provide the results of the permitting agency's review regarding the source of the elevated nitrate and magnesium concentrations, as measured in storm water discharge samples from the NFS site.

RAI 6

Provide a discussion of the basis for terminating certain water quality measurements in local surface water bodies in 2003.

In Section 6.2.2 of the ER, NFS states that in 2003, it stopped monitoring for ammonia, nitrates, fluoride, mercury, and acidity/alkalinity in the Nolichucky River, Martin Creek, and Banner Spring Branch due to NFS's assessment that available data did not demonstrate a statistical trend or change due to plant operations. However, NFS did not indicate the results of the permitting agency's review of the end of this monitoring.

Provide a discussion of the basis for terminating the monitoring for ammonia, nitrates, fluoride, mercury and acidity/alkalinity in the Nolichucky River, Martin Creek, and Banner Spring Branch, and include any regulatory approval of these changes in the surface water monitoring program.

RAI 7

Provide additional information on the status of remediation efforts for identified radiological and non-radiological groundwater contaminant plumes.

Historically, NFS reported plumes of uranium; tetrachloroethylene; trichloroethylene; 1,2-dichloroethylene; and vinylchloride at the NFS site and their potential offsite excursions toward the Nolichucky River (NRC, 1999, p. 5-2). Further, in its ER, NFS states that certain constituents (tetrachloroethylene; trichloroethylene; 1,2-dichloroethylene; vinylchloride; tributyl phosphate; and uranium) are at concentrations above drinking water maximum concentration levels in the deep alluvium/shallow groundwater systems at the site (NFS, 2009a, Section 4.4). To address this situation, NFS has conducted decommissioning and remedial work and

provided the results to the Tennessee Department of Environment and Conservation, Division of Hazardous Waste Management, and EPA (NFS, 2009a, pp. 4.13 and 6-5). NFS also states that the Erwin Utilities “Railroad Well” does not appear to intersect the contaminant plume at the NFS site based on its numerical groundwater simulations (NFS, 2009a, p. 4-3).

Provide the following:

- (1) Information on the remedial techniques being used by NFS to address identified groundwater contaminant plumes;
- (2) Copies of the two most recent updates to the Facility Action Plan, with documentation of the regulatory authority’s approval of these action plans; and
- (3) Figures that clearly display contours and labels for current contaminant concentrations in the deep alluvium/shallow groundwater systems.

RAI 8

Clarify the discussion of downgradient water users and provide a justification for the 1.6- and 4.8-km [1- and 3-mi] radii used in the groundwater well search surveys.

In Section 3.4.2.2 of its ER, NFS references a 1996, report in stating that there are no known household, public, or industrial users of groundwater downgradient of the site. NFS also states that a water well survey was performed for the NFS site vicinity using data from the Tennessee Department of Environment and Conservation – Division of Water Supply. Clarify whether the results of the undated water well survey were consistent with the findings in the 1996 report.

Additionally, NFS presents some of the results of the water well survey in Tables 8 and 9 of the ER. The data in Table 8 and 9 cover public water systems within a 1.6 km [1 mi] and a 4.8-km [3-mi] radius of the NFS facility. NFS did not discuss its rationale for using these radii for its survey. This search distance is important in determining potential impacts of operational and decommissioning activities at the NFS site on nearby wells and public water systems.

Clarify the basis for the statement that there are no known household, public, or industrial groundwater users downgradient of the NFS site. Provide the NFS rationale for using the 1.6 km (1 mi) and 4.8 km (3 mi) radii for its search for public water systems near the NFS site.

RAI 9

Provide additional information concerning the hydrologic characterization of the NFS site.

In the ER, NFS discusses aspects of the groundwater systems beneath the NFS site. However, NFS does not provide a detailed discussion of the subsurface hydrology. Provide copies of or references to previous hydrologic characterizations of the NFS site and any associated modeling conducted in support of these characterizations.

RAI 10

Provide additional information about the onsite wetlands.

In its ER, NFS reported two onsite wetlands on the north side of the NFS site (NFS, 2009a, p. 3-2), but the exact location and hydrologic properties of these wetlands are not provided in the environmental report (NFS, 2009a). Because (i) the north site includes ponds and burial areas that have been under remediation; and (ii) the groundwater table in the alluvium aquifer is close to the ground surface at the NFS site, which would increase the likelihood of hydraulic connection between the alluvium aquifer and wetlands, provide the following additional information regarding the wetlands:

- (1) a detailed description and discussion, to include their exact locations on a site map, whether they are classified as U.S. water, their current status (whether they are wet or dry), and their potential hydraulic connections with the alluvium aquifer below; and
- (2) the status of the permitting process with the U.S. Army Corps of Engineers.

RAI 11

Provide terrestrial and aquatic resource information.

The ER summarizes vegetation and aquatic species near NFS (Section 3.5); however it does not provide information for these resource areas on the NFS site. The 1999 EA for the renewal of NFS' current license provided terrestrial information found on site. Provide any changes that have occurred during the last ten years with respect to vegetation. No past analysis was provided for aquatic species found on site. Provide a list of aquatic species found on site at NFS.

RAI 12

Provide non-radiological air permit and emission information.

The ER indicates that facility nonradiological emissions are regulated by permit. Table 22, Section 4.12 of the ER identifies allowable limits for certain pollutants. It is unclear whether permit restrictions are limited to the allowable annual emission levels expressed in Table 22. Hydrogen and ammonia were not included, but these were identified as regulated compounds in the 2002, environmental assessment. Descriptions of the permits are needed to assess any potential impacts related to air resources.

- (1) Identify all air permits that pertain to the NFS site
- (2) Describe the limits and conditions (i.e., emissions levels or process throughputs) for each permit for both National Ambient Air Quality Standards (NAAQS) and National Emissions Standards for Hazardous Air Pollutants
- (3) Describe any changes in operations or facilities that resulted in permit modifications (i.e. not including Hydrogen and Ammonia).

RAI 13

Expand discussion of the ER Table 22 data and related information.

The information in Table 22, Section 4.12 of the ER provides a single set of emission estimates and asserts this demonstrates compliance. A broader discussion is needed to encompass the range of NFS emissions, allow for identification of trends, and present a compliance history over time. Please provide the following:

- (1) Annual emissions for the years since the last license renewal (1999)
- (2) Identification of any large variations or trends in these emissions levels
- (3) Identification of any permit violations since the last renewal and for any such violations, a discussion of the causes and corrective actions including the findings of the appropriate regulatory agency regarding compliance

RAI 14

Clarify whether any Greenhouse Gas (GHG) regulations apply to NFS and provide estimated GHG emissions.

The ER has no discussion of greenhouse gas emissions. EPA published a final rule (October 2009) requiring mandatory reporting of GHG emissions. Clarify any applicability to NFS under this recent rule issued by EPA, or any other regulations regarding greenhouse gases. If this rule or other regulations apply to NFS, provide estimates of projections for GHG emissions and the basis for the emission levels.

RAI 15

Provide updated information and clarify NAAQS classification.

The ER states that as of January 1995, the areas within the Eastern Tennessee-Southwestern Virginia Interstate Air Quality Control Region were classified as in attainment for NAAQS as specified in 40 CFR 81.343 (Section 3.6). The most recent information is necessary to accurately assess impacts with respect to air quality. Provide more up to date information specifically for nitrogen dioxide, ozone (1-hour and 8-hour standards), and particulate matter PM_{2.5} for the region as stated in ER. Clarify whether the region is still classified as in attainment, and should the attainment status for the region have changed, clarify whether there is any modification to the air quality impact assessment.

RAI 16

Provide information on local noise codes and ordinances.

In the environmental report, NFS states that neither the State of Tennessee nor Unicoi County have established specific environmental noise standards applicable to NFS (p. 3-12). However, NFS has not indicated whether the Town of Erwin has noise standards that may be applicable to the NFS site. Therefore, please provide one of the following:

- (1) Erwin municipality codes and ordinances regarding permissible noise levels and time of day at which they apply

or

- (2) A statement from Town of Erwin officials stating that no codes or ordinances apply to activities at the NFS site.

RAI 17

Provide estimates of sound levels at site boundary and clarify if a zoning ordinance applies to NFS.

The environmental report indicates that noise emissions come from a variety of sources from plant operation (Section 3.7). Some of these include alarm systems, operating equipment, and traffic. However the ER does not indicate current noise levels. Provide estimated noise levels during operations at the site boundary. Clarify whether NFS is within a zoning ordinance, if so, provide a discussion of how these noise levels at NFS compare to those of similar industrial sites within the surrounding areas. This information is needed to fully evaluate the potential noise impacts.

RAI 18

Expand description and clarify socioeconomic resources, specifically for the Region of Influence (ROI).

NFS discusses socioeconomics in Section 3.10 of the environmental report. The following information is needed to completely and accurately describe the ROI in the socioeconomic impact analysis:

- (1) The ER identifies four Tennessee counties for the ROI (Section 3.10). Unicoi County sits next to the North Carolina border. Provide a discussion of why only Tennessee counties are within the ROI.
- (2) The ER provided population data for the year 2000, (Table 14, Section 3.10). Population projections were not provided. Provide projections for population, as well as any expected trends with respect to population in the ROI for the proposed license renewal period.
- (3) The ER provided no information on educational data to support a socioeconomic analysis. Provide current education trends for the ROI. This should include the main schools present in ROI and the schools capacity for students.
- (4) The ER provides no information on health and social services for the ROI. Provide a brief description of health and social services in the ROI. This description should include but is not limited to law enforcement officials, and emergency services present in the ROI.

- (5) Table 14, Section 3.10 of the ER, lists the number of people in the ROI for 2000, but the source listed is: U.S. Census 2005. Additionally, in Table 14, no year is given for the percent employed by NFS. Clarify if the data given for the percent employed by NFS is for the same year as the population column in Table 14. Clarify as to which year the data was collected (2000 or 2005).

RAI 19

Provide projections for NFS employment.

Historical data was provided for the number of NFS employees from 2004 to 2008, in the ER (Table 19, Section 4.10), but no projected employment levels were provided. Provide the NFS projected employment levels for (a) the proposed license renewal period (40-years), and (b) over the next 10 years of proposed operations.

RAI 20

Provide information on occupational injury and fatality rates, and summarize health effects studies (radiation and chemical hazards combined).

NFS did not provide, in its ER, occupational health data for workers at the NFS site. As part of its environmental review, NRC considers occupational worker injury rates and fatality rates at licensed facilities. Therefore, NFS should provide the following and note whether the information is for a particular location or for the entire NFS site:

- (1) The total recordable incident rate and lost time incident rate over the past 5 calendar years (cy).
- (2) Occupational fatality rates or fatalities over the course of the NFS site's operating history.
- (3) A summary of any health effects studies specific to the NFS operations for the past 5 cy.

- (4) A discussion of industrial hygiene surveillance activities for the past 5 years, including information on workplace environmental monitoring, engineering controls, personal protective equipment, and respiratory protection (as required) to assure that exposures to combined radiation and chemical hazards are maintained well below applicable regulatory limits.

RAI 21

Provide results of the direct radiation dose monitoring program for the previous 5 years.

In Section 4.12.2.2 of its ER, NFS did not provide the results from its offsite direct radiation monitoring program. These data are needed to adequately evaluate the radiological impacts on public health and safety. Therefore, NFS should provide the results of direct radiation monitoring at the site boundary and other offsite locations for the most recent 5-year period.

RAI 22

Provide additional information on monitoring for non-radiological constituents.

In Table 22 of its ER, NFS provides estimated emissions of hazardous air pollutants and compares these to limits apparently in effect for NFS air permits. NFS should provide the basis for estimating the emission levels (e.g., based on operational experience) and provide copies of the most recent air permits for the NFS site.

RAI 23

Provide quantities of wastes generated that require offsite disposal.

In the ER, NFS describes the types of wastes that it generates (Section 3.12) but does not provide estimates of the volumes of waste that would require offsite disposal at another permitted facility. This information is needed to assess the potential impacts for proposed activities. Provide the following:

- (1) Annual waste generation volume totals for radioactive, non-radioactive hazardous, mixed wastes and non-radioactive non-hazardous wastes for the past ten years.
- (2) Estimated waste generation volumes for all waste categories identified above for (a) the proposed 40-year license renewal period and (b) the first 10 years of the proposed 40-year license renewal period.

RAI 24

Clarify and expand on the containment measures for storage of liquid wastes.

In the ER (Section 2.1.2.2), NFS states that "...the majority of the secondary containment structures are designed to hold the contents of the largest structure, or they are administratively limited." Clarification is needed for the staff to completely and accurately describe any potential impacts from liquid waste storage. Provide the following:

- (1) Clarify whether all liquid waste storage tanks have secondary containment structures or administrative controls
- (2) Provide a list of tanks that do not have containment controls and the basis for why such containment is not needed
- (3) Provide the nature of the "administrative controls" that serve to provide containment assurance

RAI 25

Provide a description of practices used for temporary onsite storage of solid wastes.

In the ER (Section 2.1.2.2), NFS generally states that wastes are temporarily stored onsite and that measures are taken to ensure containment of some liquid waste storage. However, it does not describe containment measures taken for storage of radioactive and hazardous solid wastes. Provide a general description of the measures taken to ensure containment of these solid wastes temporarily stored onsite prior to disposal.

RAI 26

Identify any substantive maintenance activities necessary to support current and future operations and describe the associated impacts.

In the ER, NFS does not identify the activities (i.e., replacement or major maintenance of facilities or equipment) that NFS would need to perform over the 40-year license renewal period in order to continue operations. Please identify any such activities and describe their associated impacts.

RAI 27

Provide the results of other federal or state agency assessments of environmental conditions for the NFS site.

To aid NRC's environmental review, NFS should provide copies of or references to recent (i.e., within the past 10 years) environmental evaluations or determinations made by other federal (i.e., non-NRC) and state agencies with respect to the NFS facility operations and site.

RAI 28

Provide copies of all current permits that NFS has with federal or state agencies.

In its ER discussion of the various effluents from the NFS facility and site, NFS references and discusses permits that it has currently with other federal (i.e., non-NRC) and state agencies. To aid in the NRC's environmental review, NFS should provide copies of all current effluent monitoring permits (i.e., concerning air, surface and ground water, sewer) that it has with non-NRC federal agencies and with relevant state agencies. Additionally, NFS should identify the changes to those permits since 1999, and identify any anticipated future modifications to the permits over the next 10 years.

REFERENCES:

DOE, DOE/EIS-0240-SA1, "Supplement Analysis: Disposition of Surplus Highly Enriched Uranium," October 2007.

———, DOE/EIS-0240, "Disposition of Surplus High Enriched Uranium Final Environmental Impact Statement," Vol. 1. June 1996.

EPA. "National Ambient Air Quality Standards (NAAQS)." 2009a.
<<http://epa.gov/air/criteria.html>> (25 November 2009).

——— "Mandatory Reporting of Greenhouse Gases." 74 FR 56260. *Federal Register*. Vol. 74, No. 209. pp. 56260–56519. Washington, DC: EPA. October 30, 2009b.

NFS. "Environmental Report for Renewal of Special Nuclear Material License No. SNM-124." License No. SNM-124. Docket No. 70-143. Erwin, Tennessee: NFS. May 2009a.

———. "License Application—NRC SNM License No. 124 (June 30)." Docket No. 70-143. Erwin, Tennessee: NFS. 2009b.

NRC. NUREG-1748, "Environmental Review Guidance for Licensing Actions Associated With NMSS Programs—Final Report." Washington, DC: NRC. August 2003.

———. "Environmental Assessment for Proposed License Amendments to Special Nuclear Material License No. SNM-124 Regarding Downblending and Oxide Conversion of Surplus High-Enriched Uranium." Docket 70-143. Erwin, Tennessee: NFS. June 2002.

———. "Environmental Assessment for Renewal of Special Nuclear Material License No. SNM-124." Docket 70-143. Washington, DC: NRC. January 1999.