

**REQUEST FOR ADDITIONAL INFORMATION NUCLEAR FUEL SERVICES, INC.  
FINAL STATUS SURVEY REPORT ON SUBSURFACE SOIL CHARACTERIZATION,  
SURVEY UNITS 4, 6, 7, 12, 16, 17, AND 18 OF THE NORTH SITE**

**1. Final Status Survey Results for Surface**

**Soils Request:**

Provide results of the *surface* final status survey for Survey Units (SUs) 4, 6, 7, 12, 16, 17 and 18 or the basis for determining why surface soil surveys are not needed.

**Basis:**

In some areas of the North Site, soils have been or will be excavated and clean backfill may be applied over the excavated areas. In such cases, soils at the surface at the time of final status survey (FSS) may be considered or treated as subsurface soils, because after backfill the soils will be subsurface and therefore the subsurface criteria would be applicable. Thus, at the time of FSS, some areas may only have soils that will be considered "subsurface." In the following, the terms surface and subsurface generally refer to the eventual location of the soil, after any backfilling that has been committed to by Nuclear Fuel Services, Inc. (NFS).

As discussed in the NFS Decommissioning Plan (DP) (Revision 3, dated May 2, 2006), Section 5.1, a *surface* final FSS will be performed for the North Site. As discussed in the (DP), Appendix B, Section 1, the FSS for *subsurface* soils only applies to impacted subsurface soils deeper than 15 centimeters. The U.S. Nuclear Regulatory Commission (NRC) staff understands this to mean that when surface soils (0-15 cm in depth) and subsurface soils (depth greater than 15 cm) are both present at the time of FSS, both the surface and subsurface FSSs are to be performed. Survey Units 4, 6, 7, 12, 16, 17 and 18 contain surface soils, so it appears to NRC staff that a surface FSS should have been performed. However, the final status survey report (FSSR) for SUs 4, 6, 7, 12, 16, 17 and 18 does not provide results of the surface FSS for these SUs.

The surface FSS would include gamma scans of the surface soils as well as soil samples or in situ gamma spectroscopy measurements, as described in Chapter 5 of the DP. The NRC staff understanding is that these measurements are important to addressing potential exposures to material as they are being left on the site. The NRC staff understanding is that the subsurface FSS are important to addressing potential exposures that might occur if subsurface soils are disturbed (in particular, if subsurface soils are excavated and brought to the surface). Thus, the two FSSs (for surface soils and for subsurface soils) address two different aspects of the overall demonstration that the area is suitable for unrestricted use.

This information is required to verify compliance with the NFS North Site DP.

## 2. Number of Survey Unit Coreholes

### **Request:**

Provide results of the determination and basis of the appropriate number of coreholes (corehole density) for SUs 6, 17, and 18.

### **Basis:**

In review of the NFS FSSR of Subsurface Soil Characterization and FSS Project Revision 0, dated April 2016, NRC Staff noted that the highest 90<sup>th</sup> percentile and maximum concentrations observed exceeded the corresponding permissible surface soil Derived Concentration Guideline Level in SU 6. This is indicated by the 90<sup>th</sup> percentile and maximum concentration values intersecting the volume factor curves, which indicates the need to adjust corehole density to account for the possibility of localized anomalies in the subsurface soil. For SU 6, this resulted in a corehole density of 1.0 m<sup>2</sup> or 3,101 coreholes for the 3,101 m<sup>2</sup> survey area.

Based on Section 4.3 of the Characterization Plan (MACTEC 2007), a corehole sampling density of 50 m<sup>2</sup> was selected resulting in 60 corehole samples for the 3,101 m<sup>2</sup> survey area. The NFS FSSR states that Section 5.3.3.2 of MARSSIM (NRC 2000) defines a typical reference system spacing for open land areas as 10 meters (100 m<sup>2</sup>). The reference system spacing was reduced by two to 50 m<sup>2</sup> (or 1 corehole every 7 m) by NFS due to surface scanning not being applicable to subsurface soil characterization and known hot spots. This approach was described by NFS as “conservative” for determining corehole sampling density. NFS utilized the Visual Sample Plan code hotspot function to locate the 60 planned corehole locations.

It is not clear that the basis for selecting 60 coreholes vs. the calculated corehole density of 3,101 coreholes is justified as a “conservative approach” in determining the acceptability of a SU for unrestricted release.

This information is required to verify compliance with the NFS North Site DP and demonstration that a SU is suitable for unrestricted use.