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Comments Regarding Water Resources (Hydrology) Issues, Draft Environmental Impact Statement (DEIS) for the Construction and Operation of an Independent Spent Fuel Storage Installation on the Reservation of the Skull Valley Band of Goshute Indians and the Related Transportation Facility in Tooele County, Utah

1) Executive Summary, Potential Environmental Impacts, p. xxxv, l. 12: The text mentions that water for construction would be supplied by new on-site wells. A map, depicting the proposed locations of those wells, is missing. The text mentions that if new on-site wells were to prove inadequate with respect to water quality or quantity, then additional wells would be drilled in other parts of the reservation. Production test wells should be drilled and pumping tests analyzed before the final EIS is issued, so that the impacts of groundwater withdrawal from the site or the reservation can be ascertained, as sustained pumping may affect groundwater levels and groundwater chemistry nearby (i.e., in non-reservation lands to the west and north). The text further states that required volumes of water for rail line construction are readily available from commercial contractors and would not disrupt other users of water in the area. The contractors should be identified and the source of water disclosed, particularly since the nearest (and economically most practical) source may be Tooele Valley, where a moratorium is in effect regarding the issuance of new water rights (in addition, Tooele and Grantsville residents are obligated to ration their water use).

2) Executive Summary, Potential Environmental Impacts, p. xxxv, l. 24: The text mentions that the proposed design includes earthen berms to protect the facility from flooding up to and including the probable maximum flood (PMF). However, all drainage features have been designed for the 100-year storm event, not for the probable maximum precipitation (PMP). This means that, during a PMF, the facility will be isolated. Although it appears that the spent fuel storage pads will not be inundated (if the PMF calculation and routing procedures are correct—see comment #6), please explain why it is deemed protective to design all site-related drainage features for the 100-year storm event. The statement that downstream flooding potential will not increase because of the presence of the facility should be backed up.

3) Executive Summary, Mitigation Measures, p. xliv, l. 1. A spill prevention, control and countermeasure plan for the facility is missing. This plan should also be incorporated into Table 2.7, p. 2-26 (Best Management Practices). See also section 5.2.1.4, Groundwater, p.5-8, l. 31, which acknowledges that a spill response commitment is absent.

4) Executive Summary, Mitigation Measures, p. xlvi, l. 32: A monitoring program to determine if wells nearest the proposed PSFS (but also groundwater levels and groundwater chemistry at the closest, hypothetical well location off the reservation!) are adversely impacted should not be initiated before construction, but before the final EIS is issued, as approval of the facility should not be contemplated before an adequate water supply (from either on-site or off-site

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sources) has been established. The monitoring program should verify that water requirements from on-site wells, as listed in Table 2.3 (p. 2-11) can be met without adversely lowering the groundwater table or altering the groundwater quality, especially since the one (1) test well drilled at the site (boring CTB-5) apparently did not yield more than 1.2 gpm (SAR, p. 2.6-29).

5) Executive Summary, Staff's Recommendation of the Preferred Alternative, p. xlvii, l. 19: The preferred alternative ought to be the no-action alternative, and not the proposed action, because (I) no impacts to environmental resources and land use would occur at and around the proposed location, (II) expansion of at-reactor SNF storage would occur at sites already disturbed by construction activities, (III) the population at a given, existing nuclear power plant would be less impacted, as less SNF will be stored there (in contrast to the combined storage of all SNF at the proposed location), and (IV) less people across the country would be at risk from transportation-related accidents or radiation, since SNF would be transported only once (to a permanent geological repository), not twice (as envisioned for the proposed action).

6) Section 1.4, Scoping Process, p. 1-12, l. 41 and p. 1-13, l. 25: The text states that evaluation of major geologic and seismic considerations that would affect the suitability of the proposed site, as well as potential impacts of surface water and groundwater resources are addressed in the safety evaluation report (SER), and that a summary of NRC's findings, based on the SER, will be made available in the Final EIS. However, the SER available to the public for review in conduction with the DEIS, is incomplete (e.g., military aircraft hazards, meteorological characteristics, seismic design and exemption request, soil classification, stability of cask storage pads and canister transfer building, are "open items"). A completed SER should be available for public review and comment, as the SER provides much background information for issues discussed in the DEIS.

With regard to surface hydrology (SER, section 2.1.4), the PMF analysis is not referenced in the text, so it cannot be verified. The PMF analysis should be made available, so that it can be assessed whether or not groundwater contaminant transport analysis will have to be included in the SER (it is presently left out). However, from the information available in the SAR and ER, the following questions arise: Why was the PMF generated for basin "A" based on a general, low-intensity cyclonical storm? Were "worst case" trajectories for storm movements in both basins modeled in order to maximize the combined "time of concentration" at the facility location? What are the watershed eccentricities for both basins, respectively? Since snowmelt from the Stansbury Mountains may constitute an important contribution to the PMF, have optimum snow cover, and maximum melting rates been considered? Was the PMF, as calculated at the facility, based on combined routing of basin "A" and "B" PMFs by HEC-RAS, or on the larger PMF for basin "B" (102,000 cfs) only?

With regard to subsurface hydrology (SER, section 2.1.5), it is unclear why no local data were obtained to estimate hydraulic gradient, conductivity, storativity, and average linear groundwater velocity at the site. All cited data (SER, p. 2-25) appears to have been gleaned from regional studies (which are also not directly referenced in the text). If it is believed that data from one (1) groundwater monitoring well at the site does not render any trustworthy data, why has only one well been constructed? Without sufficient, site-specific groundwater data collection and analysis, groundwater characteristics have not been adequately described. The statement "Anecdotal information from the Skull Valley Band indicates annual groundwater fluctuations in their community well over 33m/yr (section 3.2.3, Water Use, p. 3-14, l. 4) provides another argument for better groundwater characterization. All figures pertaining to sections 2.4 and 2.5 of the SAR are missing.

7) Section 2.1.1.2, Facility Description, p. 2-9, l. 24, l.46, and Section 4.2.1.1, Surface Water, p. 4-5, l. 26: The text states that an earthen diversion berm would be built to protect the site from PMF events. From a review of drainage characteristics for catchment basin "B" (surface depressions generally trending NW to WNW), it appears that the western flood protection berm should be extended to the north, and that a "funnel and gate" system should be provided at the northern end of the berm for any diverted water to enter the northern detention basin. The text states that water entering the detention basin would be allowed to either evaporate or to percolate into the ground. Has any unsaturated zone modeling been conducted (based on site-specific data) to assess soil infiltration rates and the soil's water-retention characteristics? In section 4.2.2.4, p. 4-12, l. 34, it is stated that soil characteristics have a relatively low infiltration capacity, but this statement is not backed up by a quantitative analysis. An infiltration model would need to show that pooling of surface water would not adversely impact operation of the facility. What is the rationale for designing the detention basin (and associated drainage features) for the 100-year storm event? Please keep in mind that from a probabilistic point of view, the 100-year storm event is likely to be equaled or exceeded 2.33 times, or once in ca. 43 years. Why is a single design storm considered adequate for economic analysis regarding flood mitigation, and storm drainage at this facility (especially in light of the statement (p.2-23, l. 8) that PFS intends to store SNF at the proposed facility for up to 40 years)?

8) Section 3.2, Water Resources, p. 3-6, l. 40: The text mentions that in the late Pleistocene, Lake Bonneville inundated Skull Valley. However, the text fails to mention that the northern end of Skull Valley was inundated around A.D. 1700 (prehistoric high, elevation 4217 feet a.m.s.l.). It is not inconceivable for this event to happen again within the near future (within the proposed project's lifetime), thereby potentially flooding sections of the main Union Pacific railroad (west of Timpie). This scenario ought to be discussed in more detail, and mitigating measures ought to be considered.

9) Section 3.2.1.2, Flooding, p. 3-11, l. 3: The text states that flooding is an "extremely rare" event in the Skull Valley area; however, in the early 1980s, debris flows moved down from the piedmont of the Stansbury Mountains and crossed Skull Valley road near Iosepa (Sack, D., Quaternary Geologic Map of Skull Valley, Tooele County, Utah, 1993, p. 12). How do precipitation events encountered in the early 1980s fit as percentages into the theoretically derived PMP?

10) Section 3.2.2, Groundwater Hydrology and Quality, p. 3-12, l.18: The location of the on-site test well, as well as any construction logs and pumping test data should be made available for review. Why is the cited hydraulic conductivity (5.0 x 10E-5 cm/s) not derived in section 2.1.5.2 (Aquifer Characteristics) of the SER, or in section 2.5.5 (Groundwater Hydrology) of the ER? Do any vertical gradients exist at the site? Bedrock outcroppings, ca. 1.5 miles S of the site at Hickman Knolls (SAR, p. 2.6-3), may indicate that the groundwater flow regime at the proposed facility is complex (i.e., the assumption of the entire aquifer system as a porous medium may be violated), and diversion around the bedrock outcrop may occur. The groundwater flow regimes at and around the site need to be fully characterized before the final EIS is issued. This includes, at a minimum, a sufficient number of wells, with a sufficient number of observations over time to account for seasonal variations of hydraulic heads. A numerical groundwater flow model should be developed and calibrated. Section 4.2.4, Mitigation Measures, p. 4-13, l. 26 is inadequate, because it does not provide for a quantitative analysis of aquifer characteristics.

11) Figure 3.4, Locations of Water Wells, p. 3-13: According to the Utah Division of Water Rights, Castle Rock Land and Livestock, Inc. has water rights to a well in Section 33, Township 4S, Range 8W, which is apparently not listed. Also, the USA Bureau of Land Management has water rights to a surface impoundment in Section 35, Township 4S, Range 9W. The figure should be updated.

12) Section 4.2.1.3, Groundwater, p. 4-7, l. 20: The text states that potential impacts from proposed use of groundwater would be small. However, no reference is given for the analysis (provided by PFS), that drawdown is not expected to extend beyond 2.1 km from the pumped well. It appears that direct aquifer recharge is likely non-existent at the site, so withdrawal of groundwater would cause a water level decline, as water will be removed from storage (and recharge is likely to be slow). Is extrapolating from the 25-feet screen test well to a full-scale production well reasonable? The applicant should drill a full-scale production well (to the correct depth) before issuance of the final EIS. Only then can it be stated with some level of confidence if owners of existing wells, as listed in Figure 3.4, would be impacted (see comments #1, #10). See also section 9.4.1, Summary of Proposed Impacts, p. 9-4, l. 12, where it is stated that until test wells are drilled and their production capacity is checked, certainty of the impact [to the groundwater resource] is unknown. It is curious that, regardless of the above, the statement "The planned groundwater withdrawals for the proposed PSFS would

not adversely impact other groundwater users in Skull Valley during construction and operation or after decommissioning of the site" is made in section 6.3.2, Water Resources, p. 6-33, l. 20.

13) Section 4.2.2.4, Groundwater, p. 4-12, l. 23: The text states that PFS would sample and analyze water from the basin when water is present to determine if contaminants are present; however, in section 6.3 of the ER (Proposed Operational Monitoring Programs), this effort is not mentioned. This section should be updated, and contaminants of concern listed, along with analytical methods to be used.

14) Section 5.2.1.4, Groundwater, p. 5-8, l. 28: The text states that a large fuel spill would be required to adversely impact groundwater quality (at the Timpie or Skunk Ridge sites), because the groundwater table is at 125 feet below the ground surface. It appears that this is the groundwater elevation at the proposed site, not the rail line locations. This section should be corrected, and the required size of the fuel spill to impact groundwater re-evaluated.

15) Section 5.2.2.2, Potential Impacts of Flooding, p.5-9, l. 39: The text states that flows in excess of the 100-year flood could result in overtopping of the railroad embankment at one or more locations. However, a cask-specific accident analysis (design event IV) appears to be missing for a scenario involving a train derailment with canister leakage as a result of sheet flooding along the rail spur between the facility and Skunk ridge. For such an accident, can risks of radiological effects on the surrounding environment be quantified? The summary given in section 5.7.2.4, Incident-Free and Accident Dose Risks From SNF Shipments to the Proposed PFSF, doesn't appear to answer this question, because it is not cask-specific and based on general assumptions, which apply to the entire rail corridor from the Maine Yankee Plant to the facility.

16) Section 6.1.2, Water Resources, p. 6-4, l. 41: The text states that localized channel alterations, caused by the presence of the flood control berm, would constitute potential impacts to surface water hydrology. Changes in channel morphology and sediment distribution might also occur downstream of the facility and the retention basin, on public lands. A description of these impacts and any associated inspection and mitigation activities appears to be missing.

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