NRO Comments

Based on ADAMS #ML0729706730

General comment

The specific measures proposed through this draft document are very comprehensive and will be valuable as a guide for minimizing contamination. However, we found that a couple of measures need to be clarified or revised. For instance, the proposed measure to maintain a groundwater level below foundation (C.2.t) could not be implemented at sites with high groundwater levels. Also, the proposed measures on the conceptual site model and backfill scheme need to be revised so that these measures can be implemented during the early planning stage. We propose, after section C.2, a separate section that includes specific measures for planning and implementation of contaminant monitoring specifically.

Section B. Discussion

- (Page 4, last paragraph, “License application should…”): Since this document is intended to provide guidance from the initial facility layout and design stages to the decommission stage as mentioned in the introduction, we recommend modifying the subtitle and the paragraph as follows:

  “Site Configuration to Prevent or Confine Contamination: License applications should consider the site configuration to aid in preventing the migration of radionuclides to the offsite environment via potential pathways. They should identify, as early as practical in the licensing process, the potential pathways and travel times of radionuclide contaminants through surface and subsurface media. …. Plans for responding to detection of leaks and spills should reflect facility design and site configuration.”

Section C. Regulatory Position

- (Page 6, Item C.1.p): Without providing a list of suitable materials and installation specification (e.g., stainless steel, types of aggregates in concrete, acceptable sealing coats), the staff will not be able to judge that this regulatory position has been met by an applicant. We recommend adding detailed guidance or references to help implement the proposed measure.

- (Page 6, Item C.1.r): The proposed measure to protect contamination from pipes and joints should call for a fabrication and maintenance specification or relevant reference guide to ensure adherence to this regulatory position.

Section C. Regulatory Position

- (Page 7, Item C.1.s): The first sentence needs to be corrected by removing “and” after replacement.

  (Page 7, Item C.1.z): It is not clear what constitute an acceptable design criterion to achieve the minimization of sample fluid leaking to the ground or to the underlying pad surface.

Section C. Regulatory Position

- (Page 8, 1st para.) Conceptual site model (CSM) should be built during the early planning stage in order to predict the fate of contamination in the future. Thus, we recommend revising the 1st paragraph as: ***"… A conceptual site model (CSM) based on site characterization and facility design and construction can be a significant tool in (1) understanding the site, (2) planning and implementation of a contamination monitoring program, and (3) planning and implementing mitigative actions. Therefore, … following construction. The CSM should be developed as early as practical in the licensing process to simulate the hydrogeology conditions before and after the construction of the facilities. In addition … the potential release scenario and possible locations of contaminant release should be defined. …..."***

Section C. Regulatory Position

- (Page 8, C.2.a): We recommend revising this item to address the issues related to theCSM as follows: “License applicants should evaluate the system design with respect to the hydrogeology of a site during the ESP/COL stages as well as the detailed design stage to : … on the hydrogeological characteristics of the site. The CSM should be built accurately considering both the horizontal and vertical variability of the on-site hydrogeological characteristics and the layout of structures, foundations and footings, and backfills. A plan for building and updating the CSM should be one component of the proposed facility planning and operation procedures. Specifically, following facility construction, any impacts of site construction activities, such as excavation, dewatering, and backfilling, on final site hydrogeological….”

Section C. Regulatory Position

- (Page 8, C.2.b): The first part of this item repeats the “Item 1.a" in page 5. This duplicative item should be removed and combined with "Item 1.a." We propose to change the paragraph as follows: ***“The applicant should propose, during the planning stage, specific environmental monitoring (e.g., sampling and testing of ground water in close proximity to potential sources) to periodically verify integrity of the system. The monitoring program should be implemented from the beginning of plant operation to decommissioning.”***

- (Page 8, C.2.c): To avoid repetition, this should be combined with Item (f) on page 5.

- (Page 9, C.2.e): All monitoring requirements should be combined into one place.

Section C. Regulatory Position

- (Page 9, C.2.f): All items that instruct on avoidance of buried piping, drains etc. should be combined.
- (Page 9, C.2.i): This item should be combined with Item C.2.f.
- (Page 9, C.2.l): Remove this item because it does not deal with radioactive
- contaminants. Or, it may not be necessary if Item C.2.j is implemented properly. Taking into account the construction and maintenance cost and its efficiency, a pond with a liner
- may not be an economically feasible option. The current statement implies that any and all retention ponds (mostly used for storm water collection) should have a liner.
- (Page 9, C.2.o): The type of seals referred to in the first sentence is unclear.

Section C. Regulatory Position

- (Page 9, C.2.p): We recommend revising this item as follows: ***"The design of excavation and backfill and the selection of backfill materials for SSCs containing radioactive materials should: (1) prevent or minimize leaking contaminants from the facilities to natural permeable layers or fractured rock, …."***

- (Page 10, C.2.q): We do not have such a requirement for safety related SSCs. If this item is included, it should say that backfill soil should be checked for radioactivity levels to preclude radioactivity levels above the background level or maximum allowable concentration levels.
- (Page 10, C.2.r): This statement is unclear. If the intent is to monitor the radioactive levels in the removed material, it may need to be treated as radwaste.

Section C. Regulatory Position

- (Page 10, C.2.s): How is this to be accomplished? Are we talking about surface level or in-ground leakage? We do not need this as long as the prevention, monitoring, inspection and mitigation measures are effective.
- (Page 10, C.2.t): Remove this item because it can not be implemented. This item, though desirable, cannot be implemented for sites that are located on a flat area with a high groundwater level. In general, the maximum groundwater level below 1-foot or 2-feet from a plant grade is an acceptable criterion for evaluating the safety of on-site flooding.
- (Page 10, C.2.u): The guide should say that the extraction plan should be approved to prevent adverse effects, such as foundation settlements, etc.

Section C. Regulatory Position

- (Page 12, C.3.e): It is not clear which SSCs are applicable to this measure.