Environmental Requests for Additional Information

Proposed Action (PA)

RAI PA-1

Provide additional information on the railroad side track to be built as part of the proposed CISF. This information should include:

- Clarification of the location (i.e., footprint) of the railroad side track. The location of the proposed railroad side track is not consistently depicted in figures in the Environmental Report (ER). For example, compare ER Figure 2.2-6 with ER Figure 4.5-1. Specifically, clarify whether the railroad side track would cross Stateline Road into New Mexico as depicted in ER Figure 4.5-1.
- The status of any Federal, State, or local permits or approvals that would be needed to construct and operate the railroad side track, as applicable both in Texas and New Mexico (as depicted in ER Figure 4.5-1, the railroad side track appears to be partly located in both states).
- A description of the materials, methods, and equipment that would be used to construct, operate, and maintain the railroad side track, including timing of the construction. If the side track would be decommissioned along with the CISF, include similar information for decommissioning.
- Local natural resources (e.g., groundwater, geologic materials) and manpower needed to construct and operate the railroad side track; and whether or not construction and operation workers for the railroad side track are already included in the resource impacts analysis in the ER (transportation, socioeconomics, etc.).
- The amount of land that would be disturbed by construction and operation of the railroad side track.
- The volume of soil that would be excavated during construction and potentially stockpiled during operation of the railroad side track and available information on the disposition of the stockpiled soil.
- An assessment of the environmental impacts that construction, operation, and decommissioning of the railroad side track would have on all resource areas (e.g., land use, transportation, geology and soils, water resources, air quality, ecological resources, historic and cultural resources, noise, visual and scenic, socioeconomics, public and occupational health, and waste management).
- Mitigation measures that would be implemented to reduce the environmental impacts associated with construction, operation, and decommissioning of the railroad side track on all resource areas.
- Any environmental measures, management plans, and/or monitoring that would be required during construction, operation, and decommissioning of the railroad side track to comply with any Federal, State, and local rules and regulations.

ER Section 2.2.2.5 states that an approximately 2,134 m [7,000 ft] railroad side track would be built adjacent to the existing railroad access loop for spent nuclear fuel (SNF) deliveries

to the proposed CISF. The ER provides limited information on the construction, operation, and decommissioning activities associated with the railroad side track. Specifically, additional information on the railroad side track is needed to support the NRC staff's description of the proposed action and evaluation of environmental impacts in the Environmental Impact Statement (EIS).

This additional information is needed in accordance with 10 CFR 51.45(b) and (b)(1), which requires that the ER include a description of the proposed action and discuss the impacts of the proposed action.

Response to RAI PA-1:

Information on the railroad side track to be built as part of the proposed CISF is provided below:

- The railroad side track will be limited to Texas and will not cross stateline road into New Mexico. ER Figure 2.2-6 and the identical Figures 3.2-4 and 4.5-1 have been updated to be consistent with the side track layout. Additional figures have been updated to be consistent with the change. The affected figures are: ER Figures 2.2-6, 3.1-3, 3.2-4, 3.3-1, 3.6-1, 4.2-1 (deleted), 4.5-1, 4.12-1, 4.12-7, 4.12-8, 4.12-9, 4.12-10, 4.12-11, and 4.12-12 as well as SAR Figures 1-1, 1-2, 1-3, 2-1, 2-4, 2-15, 9-1, 9-2, and 9-6.
- As shown in the updated figures, the CISF railroad side track will be located entirely in Texas. No portion of the side track will cross State Line Road into New Mexico. The Track will be constructed to comply with 49 CFR Part 213, "Track Safety Standards," and will be maintained and inspected in accordance with Federal Railroad Administration (FRA) Class 1 Standards. There are no additional Federal, State, or local permits or approvals that would be needed to construct and operate the side track beyond than those associated with general construction of the CISF and as detailed in ISP response to RAI RRP-1. ER Section 2.2.2.5 has been updated to provide this information.
- The new railroad side track will be constructed using industry standard rail construction techniques. The profile of the track is relatively level (basically follows the existing grade) therefore excavation and embankment work are expected to be minimal and to only ensure correct grade and alignment of the rail. Construction of the railroad side track involves the following basic steps.

    1. Clearing the ground along the pathway of the track. A pathway with a width of approximately 40 feet will be necessary to build the rail. Pathway preparation work would potentially be performed using bulldozers.

    2. Subgrade soil is placed and compacted to provide suitable foundation for rail construction. Work would potentially be performed using bulldozers, haul trucks, motor graders, and compaction equipment.

    3. Sub-ballast (structural fill) is placed to provide further support of the rail. Thickness of sub-ballast will be determined when final design and construction of the railroad is performed but is typically around 12 inches thick. Work would potentially be performed using bulldozers, haul trucks, motor graders, and compaction equipment.

4. Ballast (graded rock/gravel) is placed and wood rail ties are placed. Thickness of the ballast will be determined with final design and construction of the railroad is performed, but is typically around 12 inches thick. Work would potentially be formed using haul trucks, ballast regulators, and ballast tamping machines.

5. Finally, steel rail is attached to the rail ties. Work would potentially be performed by fork-lift and crew labor.

Maintenance of the track consists of monthly inspections and re-gauging of track and replacement of damaged bolts, clips, and other standard components, which is typically completed by crew-labor.

Rail sidetrack construction will be performed as part of the initial CISF construction (Phase 1).

The decommissioning plan for the CISF includes characterization surveys that will be performed to verify that the storage pads, Cask Handing Building, and surrounding facilities are free from contamination. ISP does not anticipate contamination in or around these surrounding facilities. The Decommissioning Plan for the CISF includes a site survey and in the unlikely event of contamination, decontamination for surrounding facilities. The railroad side track is considered to be a “surrounding facility.” The railroad sidetrack will be surveyed to verify it is not contaminated and then left in place.

- Local natural resources and manpower needed to construct and operate the railroad side track are included in the evaluation in Chapter 4 of the ER. ER Section 4.1 has been updated to indicate that the railroad side track is part of this evaluation and to be consistent with ISP Response to RAI LU-3.
- The amount of land that would be disturbed by construction and operation of the railroad side track is addressed in the ISP response to RAI LU-3. ER Sections 4.5.4, 4.5.5, 4.5.6, 4.5.7, 4.5.8, and 4.5.12 have been updated to be consistent with ISP Response to RAI LU-3.
- Total length of the new rail being constructed (inside and outside of the Owner Controlled Area (OCA)) is approximately 1.25 miles (6,600 feet). Rail will be placed at or near grade with minimal excavation needed to meet railroad grade requirements. Excavation activities will consist of removal of the top layer of soil containing vegetation and other deleterious material before placing the structural fill for the railroad tracks. Estimates for total soil excavation performed during construction of the railroad are 10,000 cubic yards. As noted in ISP Response to RAI LU-3, approximately a quarter of a mile of rail track extends outside of the OCA area, meaning that approximately 80% of the excavation required for the rail track will be completed as part of the site preparation performed for the CISF, and the remaining 2,000 cubic yards of excavation will be outside of the OCA boundary. Soil will be stockpiled at the existing Waste Control Specialists facility soil stockpiles to the northeast of the proposed CISF location. ER Sections 2.2.2.3, 2.2.2.5, 2.3.4, 3.2.3, and 4.2.5 have been updated to reflect the revised total length and layout of new rail being constructed.

- The section of railroad sidetrack originally shown in New Mexico will no longer be constructed as part of the CISF. An assessment of the environmental impacts that construction, operation, and decommissioning of the railroad side track would have on all resource areas associated with the remaining railroad sidetrack is addressed in the ISP Response to RAI ECO-1.
- Mitigation measures that would be implemented to reduce the environmental impacts associated with construction, operation, and decommissioning of the railroad side track on resources in the area are implemented through required plans and permits by the Texas Commission on Environmental Quality (TCEQ). These include a Construction General Permit (CGP TXR150000), Stormwater Pollution Prevention Plan (SWPPP), and Spill Prevention, Control, and Countermeasures Plan (SPCC). In addition to these plans and permits, the Best Management Practices (BMPs) discussed in the ISP Response to RAI GS-1 will be implemented. In addition, ER Section 1.3.2.3 indicates that construction and operations activities at the CISF are not expected to have measurable impacts on local air quality. However, for a project of this size, a BMP Emissions Control Plan will be developed to manage and minimize fugitive dust emissions throughout the construction phases of the project.
- Environmental measures, management plans, and/or monitoring that would be required during construction, operation, and decommissioning of the railroad side track to comply with any Federal, State, and local rules and regulations are included in ISP Response to RAI RRP-1 and ER Section 1.3.

Impact:

ER Sections 2.2.2.5, 2.3.4, 3.2.3, 4.1, 4.2.5, 4.5.4, 4.5.5, 4.5.6, 4.5.7, 4.5.8, and 4.5.12, ER Figures 2.2-6, 3.1-3, 3.2-4, 3.3-1, 3.6-1, 4.5-1, 4.12-1, 4.12-7, 4.12-8, 4.12-9, 4.12-10, 4.12-11, and 4.12-12, and SAR Section 4.5.2 and SAR Figures 1-1, 1-2, 1-3, 2-1, 2-4, 2-15, 9-1, 9-2, and 9-6 have been revised, as described in the response.

ER Figure 4.2-1 has been deleted as described in the response.

RAI PA-2

Provide additional information on the new concrete batch plant to be constructed as part of the proposed CISF. This information should include:

- The size (acreage) of the batch plant and a figure showing its outline and location with respect to the proposed CISF and current site facilities.
- The design of the concrete batch plant (description of major components) and associated infrastructure (e.g., access roads, pipelines, utilities, and areas for parking, waste management, chemical storage, and maintenance).
- Any state and local permits or approvals that would be needed to construct and operate the batch plant.
- A description of construction, operation, and decommissioning activities for the concrete batch plant and an anticipated schedule for construction, operation, and decommissioning.
- The amount and source of water needed to operate the batch plant.
- Manpower needed to construct and operate the batch plant and whether or not construction and operation workers for the batch plant are already included in the resource impacts analysis in the ER (transportation, socioeconomics, etc.).
- The amount of land that would be disturbed during construction and operation of the batch plant and associated infrastructure.
- The volume of soil that would be excavated during construction and potentially stockpiled during operation of the batch plant, and available information on the disposition of the stockpiled soil.
- An assessment of the environmental impacts that construction, operation, and decommissioning of the batch plant would have on all resource areas (e.g., land use, transportation, geology and soils, water resources, air quality, ecological resources, visual and scenic resources, historic and cultural resources, noise, socioeconomics, public and occupational health, and waste management).
- Mitigation measures that would be implemented to reduce the environmental impacts associated with construction, operation, and decommissioning of the batch plant on all resource areas.
- Any environmental measures, management plans, and monitoring that would be required during construction, operation, and decommissioning of the concrete batch plant to comply with state and local rules and regulations.

ER Section 2.2.2.6 states that a concrete batch plant may be constructed to facilitate storage module construction and future expansion of the site. The ER provides limited information on the construction, operation, and decommissioning activities associated with the batch plant. Specifically, additional information on the batch plant is needed to support the NRC staff's description of the proposed action and evaluation of environmental impacts, including cumulative impacts, in the EIS.

This additional information is needed in accordance with 10 CFR 51.45(b) and (b)(1), which requires that the ER include a description of the proposed action and discuss the impacts of the proposed action.

Response to RAI PA-2:

ISP will no longer construct and operate a batch plant as part of the proposed CISF. References to the batch plant have been removed from ER, including Sections 2.2.2, 2.2.2.6, 4.2.1, 4.2.3, and 4.14. The reference to the batch plant was removed from ER Section 4.6 as part of the response to RAI AQ-4.

Impact:

ER Sections 2.2.2, 2.2.2.6, 4.2.1, 4.2.3 and 4.14 have has been revised as described in the response.

RAI PA-3

Provide additional information concerning the site selection process.

ER Section 2.3 and Attachment 2-2 provide a discussion of the criteria and weighting factors that ISP used to identify potential locations to site the proposed CISF, as well as the scores for the four sites considered. Table 2.3-4 in the ER provides the overall scoring based on three criteria: siting, environmental considerations, and operational considerations. The discussion in ER Section 2.3.3 identifies certain criteria either as environmental considerations or as operational considerations; however, no siting criteria are identified. As a result, it is not clear how siting scores were determined in Table 2.3-4. Therefore, please clarify how the siting scores were calculated.

Additionally, in ER Section 2.3.7, ISP provides its review of a potential site in Eddy County, New Mexico, One of the references used is a 2015 report from Cox McLain Environmental Consulting. The NRC staff was not able to locate this report within ISP's license application. Therefore, please provide a copy of the report or point the staff to its location within the application.

This information is needed in accordance with 10 CFR 51.45(b) and (b)(3), which requires that the ER include a description of the proposed action and alternatives to the proposed action.

Response to RAI PA-3:

Siting scores were calculated using sub-criteria that were given a weighting based on the contribution of the sub-criteria to the following critical siting criteria:

- Criterion 1 – political support
- Criterion 2 – favorable seismological and geological characteristics
- Criterion 3 – rail access
- Criterion 4 – land parcel size
- Criterion 5 – land availability

Each county was given a score of 1 to 10 and the weighting scale was used to determine the final score. The siting score determination is given in the New ER Table 2.3-1a, and ER Sections 2.3.3 and 2.3.8 have been updated to provide reference to this new table.

The reference to the 2015 report from Cox McLain Environmental consulting regarding the potential site in Eddy County, New Mexico is provided in Enclosure 11, as requested. This reference was also provided in the November 16, 2016 ISP Response to RSI MD NP-1.1.

Impact:

ER Sections 2.3.3 and 2.3.8 have been revised and Table 2.3-1a has been added as described in the response.

NEPA PROCESS (NP)

RAI NP-1

Provide a list of relevant meetings, hearings, and presentations that have been made to organizations in the local communities and other parts of Texas and New Mexico that have been held to explain ISP's storage interests related to the proposed CISF.

The ER should provide a description of ISP's outreach efforts made to inform communities and affected populations within the region of the proposed CISF. This information would assist the NRC staff's analysis regarding the potential for disproportionate impacts to communities.

This information is needed in accordance with 10 CFR 51.45(c), which requires the ER to include sufficient data to aid the NRC in its development of an independent analysis.

Response to RAI NP-1:

ER Section 3.10 has been updated to provide a description of ISP's community outreach efforts to inform communities and affected populations within the region of the proposed CISF about the storage and transportation of spent nuclear fuel.

ISP and joint venture member, Waste Control Specialists, have recognized the need for local communication and outreach ever since Waste Control Specialists began to contemplate applying for a CISF license. From the time of its initial community-wide dinner to discuss its interest and the Andrews County declarations of support, through the establishment of website(s) in English and Spanish, social media accounts, appearances before governmental and civic groups, the conduct of many site tours (including offering a Spanish translation), hiring a Community Liaison, the re-opening of an office in Andrews, numerous and continuing informational advertisements and letters in print, these efforts are indications of our intent to keep all segments of state and local government and citizens informed of our activity.

Table NP-1-1 provides a digest of relevant local outreach efforts including meetings tours and print advertising, etc., that have been made by ISP and its joint venture members to explain ISP's storage interests related to the proposed CISF.

Table NP-1-1
List of Public Outreach Efforts

Date	Event
2014 Summary	**Engaged the community via a widely attended BBQ to discuss the proposal to spent fuel at the Waste Control Specialists Andrews Site and gave a presentation to the Eunice NM, City Council.**
12/1/14	Community wide BBQ to discuss proposal to store Spent fuel at the Waste Control Specialists Andrews Site
12/9/14	Gave presentation on Interim Storage of Spent Fuel to the Eunice, NM City Council
2015 Summary	**Issued Press Releases, provided multiple tours of the Waste Control Specialists Site and launched a website (WCSSTORAGE.com launched - now found at WCSTEXAS.com) for Interim Storage of Spent Fuel at the Waste Control Specialists Andrews Site**
2/15	Waste Control Specialists Press release on submittal of letter of intent to NRC
3/15	NEI Used Fuel Conference Presentation on Spent Fuel
5/24/15	Press release on partnership between Waste Control Specialists and Orano (formerly AREVA) for interim spent fuel storage in Andrews County News
7/15	US Congressmen Mike Conaway, Richard Hudson and Steve Pearce, along with local leadership toured the site provided a presentation on Spent Fuel and Waste Control Specialists
Throughout 2015	Multiple tours of the Waste Control Specialists site to include presentations on Spent Fuel Storage
2016 Summary	**Continued to conduct multiple tours of the Waste Control Specialists Site; sent mailings to all of the residents of Andrews County, informational articles published in local papers, including monthly updates and issued press releases on the status of the project**
Throughout 2016	Multiple tours of the Waste Control Specialists site to include presentations on Spent Fuel Storage
2016	Sent two CISF informational mail outs to all residents of Andrews County
4/21/16	Informational article about storage of spent fuel and the license application process in Andrews County News
4/28/16	Press release to announce Waste Control Specialists filing License Application with NRC for CISF
5/1/16	Update in Andrews County Newspaper on status of CISF Project
6/16	Update in Andrews County Newspaper on status of CISF Project
6/16	Mail outs on transportation of Spent Fuel sent out to Andrews County
6/26/16	Ad in Andrews County News about transportation of Spent Fuel
7/7/16	Update in Andrews County Newspaper on status of CISF Project
7/24/16	Update in Andrews County Newspaper on status of CISF Project
10/9/16	Update in Andrews County Newspaper on status of CISF Project
11/6/16	Ad in Andrews County News about transportation of Spent Fuel

Date	Event
2017 Summary	**Continued to conduct multiple tours of the Waste Control Specialists Site; send informational articles and placed ads published in local papers related to the project; and made statements during the Public Scoping Meetings for the WCS CISF.**
Throughout 2017	Multiple tours of the Waste Control Specialists site to include presentations on Spent Fuel Storage
1/29/17	Article in Andrews County News on NRC Acceptance of CISF License Application
2/17	Ran Ads in Andrews and Hobbs to announce NRC public meetings to promote attendance
2/13/17	Made Statements during Public Scoping Meeting for WCS CISF in Hobbs, NM
2/15/17	Made Statements during Public Scoping Meeting for WCS CISF in Andrews, TX
2/23/17	Made Statements during Public Scoping Meeting for WCS CISF in Rockville, MD (webcast)
4/6/17	Made Statements during Public Scoping Meeting for WCS CISF in Rockville, MD (webinar)
4/20/17	Press release announcing temporary suspension of NRC license application - Andrews County News and Hobbs News Sun
2018 Summary	**Continued to conduct multiple tours of the Waste Control Specialists Site; send informational articles and placed ads published in local papers related to the project; opened a new office in Andrews, Texas; held or participated in meetings with state and local leaders; and hired a community liaison.**
Throughout 2018	Multiple tours of the Waste Control Specialists site to include presentations on Spent Fuel Storage
3/2/18	Community Leaders of Andrews Presentation and tour of Waste Control Specialists Site to include discussion on CISF
3/5/18	Press release announcing intent to resume NRC license application with Orano USA - Andrews County News
3/22/18	Press release announcing Interim Storage Partners - Andrews County News
4/12/18	Article to update status of NRC license application
6/5/18	Opened new Waste Control Specialists office in Andrews to include information on CISF and models of storage systems and transportation casks for spent fuel
6/5/18	Hosted community leadership meeting to provide Waste Control Specialists update to include the NRC license application for spent fuel
6/7/18	Article to update status of NRC license application - Andrews County News
7/25/18	Article to update status of NRC license application - Andrews County News
8/6/18	Andrews ISD presentation to all staff - Included Waste Control Specialists information and discussion on CISF
8/15/18	Texas Legislators Tour to include discussion on storage and transportation of Spent Fuel
8/27/18	Press Release to announce NRC acceptance of ISP license application
9/13/18	Article in Andrews County News on Spent Fuel Storage
9/25/18	Met with Eunice, NM City Council to discuss the ISP Spent Fuel Project

Date	Event
10/1/18	Hired Waste Control Specialists Community Liaison to have direct interaction with community on a regular basis regarding Waste Control Specialists and the WCS CISF
10/2/18	Texas Compact Commission Tour to include discussion on transportation and storage of Spent Fuel
10/4/18	Spoke with Stanton, TX City Manager about the ISP Spent Fuel Project
10/17/18	Presentation to Gaines County Texas County Commissioners - Included Waste Control Specialists information and discussion on CISF
10/22/18	Called Midland County Commissioner Randy Prude to discuss the ISP Spent Fuel Project
10/23/18	Spoke with Odessa, TX City Manager about the ISP Spent Fuel Project
10/24/18	Spoke with Lubbock, TX Mayor and staff about the ISP Spent Fuel Project
11/7/18	Texas State Technical College Tour
11/13/18	Met with the Jal, NM City Council to discuss the ISP Spent Fuel Project
11/15/18	URENCO Tour for employees to include specific discussion on transportation and storage of Spent Fuel
12/2/18	Information article about Spent Fuel storage in Andrews County News
12/3/18	Information article about Spent Fuel storage in Midland Reporter Telegram
12/10/18	Met with the Stanton, TX City Council to discuss the ISP Spent Fuel project
12/19/18	Met with Andrews Leadership group to discuss current status of projects to include ISP
2019 Summary	**Continuing to conduct tours of the Waste Control Specialists Site; send informational articles and placed ads published in local papers related to the project; hold or participate in meetings with state and local leaders; participated in Oral Arguments related to the project; launched a companion Spanish language website on the WCS CISF project.**
2019	Multiple tours of the Waste Control Specialists site to include presentations on Spent Fuel Storage
6/5/19	Women In Nuclear Tour to include specific discussion on transportation and storage of Spent Fuel
6/5/19	Nuclear Legislative Working Group Tour to include specific discussion on transportation and storage of Spent Fuel
6/10-11/19	Oral Arguments on the matter of ISP WCS CISF held in Midland TX.
6/12/19	Met with Andrews Leadership group to discuss current status of projects to include ISP
6/18/19	Community Tours - Continuing to schedule additional dates - with specific discussion on transportation and storage of Spent Fuel
6/27/19	Community Tours - Continuing to schedule additional dates - with specific discussion on transportation and storage of Spent Fuel
7/28/19	Information article about Spent Fuel storage in Odessa American newspaper
7/28/19	Information article about Spent Fuel storage in Midland Reporter Telegram newspaper
8/4/19	Information article about Spent Fuel storage in the Andrews County News
8/28/19	Eunice Rotary Tour - with specific discussion on transportation of Spent Fuel

Date	Event
9/19/19	Community Tours - Continuing to schedule additional dates - with specific discussion on transportation and storage of Spent Fuel
9/24/19	Community Tours - Continuing to schedule additional dates - with specific discussion on transportation and storage of Spent Fuel

Impact:

ER Section 3.10 has been revised as described in the response.

REGULATORY REQUIREMENTS AND PERMITTING (RRP)

RAI RRP-1

Provide, in tabular format, a list of all Federal, State, Tribal, or local approvals, authorizations, certifications, consultations, and permits that would be necessary to construct and operate the proposed CISF and associated infrastructure. Include in the list the status of the approval, authorization, certification, consultation, or permit (e.g., yet to be submitted, submitted, under review, issued).

ER Section 1.3 provides a general discussion of applicable regulatory requirements, permits, and required consultations for construction and operation of the proposed CISF. Based on the NRC staff's review, it appears that some regulatory and permitting requirements are not discussed in the ER. For example, State permitting requirements may apply to construction and operation of the railroad side track that may extend into New Mexico (see ER Section 2.2.2.5 and ER Figure 4.5-1) and a new concrete batch plant (see ER Section 2.2.2.6). A complete discussion of applicable regulatory requirements is needed to support the NRC staff's description and evaluation of applicable statutory, regulatory, and permitting requirements in the NRC's EIS.

This additional information is needed in accordance with 10 CFR 51.45(d), which requires that the ER include a list of all Federal, State, regional, and local permits, licenses, approvals and other entitlements that the applicant must obtain, as well as a description of the status of compliance with these requirements.

Response to RAI RRP-1:

The railroad side track has been updated and no longer extends into New Mexico, which removes any permitting requirements (other than those noted below) with the State of New Mexico. The ISP Response to RAI PA-1 addresses the updated railroad layout.

ISP has removed the proposed concrete batch plant from the CISF project, which removes any permitting requirements associated with that system. ISP Response to RAI PA-2 addresses the removal of the proposed concrete batch plant.

Section 1.3 of the ER has been updated to point to new Table 1.3-1, which lists all federal, sate, tribal, or local approvals, authorizations, certifications, consultations, and permits necessary to construct and operate the proposed CISF and associated.

Impact:

ER Section 1.3 has been revised and ER Table 1.3-1 has been added as described in the response.

LAND USE (LU)

RAI LU-1

Provide a figure showing land use classification as identified in the ER within 8 km [5 mi] of the proposed CISF boundaries.

ER Section 3.1 states that land use classification in the vicinity of the proposed CISF is primarily rangeland, built-up land, and barren land. Provide specific information on the distribution of classes of land use within and surrounding the proposed CISF. NUREG-1748, Environmental Review Guidance for Licensing Actions Associated with NMSS Programs, recommends figures should be used to describe the area for land use (NRC, 2003). In addition, NUREG–1567, Standard Review Plan for Spent Fuel Dry Storage Facilities, recommends that land use should be described within an 8-km [5-mi] radius of independent spent fuel storage facilities (ISFSIs) (NRC, 2000). The requested information is needed to support the NRC staff's description of the affected environment and evaluation of environmental impacts in the EIS.

This additional information is needed in accordance with 10 CFR 51.45(b) and (b)(1), which requires that the ER include a description of the affected environment and discuss the impacts of the proposed action.

Response to RAI LU-1:

The United States Geological Survey (USGS) National Land Cover Database has data from 2016 that provides land uses in the project area. New ER Table 3.1-1 shows the land use types that appear within an 8 km (5 mile) radius of the project site, along with estimated acreages by land cover type.

New ER Table 3.1-2 shows the land use types that appear within the study area (these totals are a subset of the information shown in ER Table 3.1-1).

According to ER Table 3.1-1, approximately 97 percent of the land cover in the five-mile radius (more than 58.7k acres) is shrub/scrub. Developed, open space constitutes 1.5 percent of the land cover (902 acres) and all other land use categories that occur in this radius comprise less than one percent of the land cover.

In the Study Area, Table 3.1-2 shows that more than 99 percent of the land cover (322 acres) is shrub/scrub with just over one acre (0.4 percent) of barren land (rock/sand/clay).

New ER Figure 3.1-4 depicts where these various land use types occur. The land cover that is developed, open space occurs west of the study area near Eunice, New Mexico. Construction of the proposed facility would primarily convert Shrub/Scrub land to developed land uses.

ER Section 3.1 has been updated to reference the new Tables and Figure discussed above.

References:

1. United States Geological Survey (USGS), “National Land Cover Database, 2016-12-31.” Web Accessed 2019-07-23: https://data.tnris.org/collection/89b4016e-d091-46f6-bd45-8d3bc154f1fc

Impact:

ER Section 3.1 has been revised and Tables 3.1-1 and 3.1-2, and Figure 3.1-4 have been added as described in the response.

RAI LU-2

Provide information on the number and location of wells (including a figure) associated with oil and gas exploration and development within a 10-km [6-mi] radius of the proposed CISF. The figure should indicate the type of well (e.g., oil, gas, injection, salt water disposal, etc.) and its status (e.g., active, plugged, dry and abandoned, shut in, etc.). In addition, provide information on oil and gas leasing including a figure illustrating existing oil and gas leases within a 10-km [6-mi] radius of the proposed CISF.

ER Section 3.1 states that land uses within a few miles of the proposed CISF includes drilling for and production from oil and gas wells and that the Elliott Littman oil field is to the northwest, the Freund and Nelson oil fields are to the south, the Paddock South and Drinkard oil fields are to the southwest, and the Fullerton oil field is to the east. However, the ER does not provide specific information on the type, status, and location of the oil and gas wells in the area of the proposed CISF. Specifically, this information is needed to support the NRC staff's description of the affected environment and evaluation of environmental impacts.

This additional information is needed in accordance with 10 CFR 51.45(b), which requires that the ER include a description of the affected environment, and 10 CFR 51.45(b)(1), which requires that the ER discuss the impacts of the proposed action.

Response to RAI LU-2:

Information on oil and gas wells within a 10 km radius of the proposed CISF is provided in new ER Figures 3.1-5, 3.1-6, and 3.1-7. The proposed CISF location is shown as a red star on the figures. The figures include: 1) a summary figure with the Texas Land Survey overlay, showing the well locations, or cluster in the case of several wells, 2) well locations on a topographic overlay, and 3) well locations on a current aerial imagery overlay. Map information includes well or cluster location, well type (oil, oil/gas), dry hole, plugged oil, plugged gas, plugged oil/gas, permitted location, shut-in oil, shut-in gas, sidetrack surface location, horizontal drain hole, directional drilling surface location, injection/disposal well, injection/disposal from oil, injection disposal from gas, injection/disposal from oil/gas, canceled/abandoned location.

Detailed information on the subject oil and gas wells is also provided in Attachment LU-2-1, and as a native (spreadsheet) file format in Enclosure 13. The information in the spreadsheet includes map well identification number, latitude/longitude, state (Texas or New Mexico), operator, well name and number (per operator filing), total depth (ft), production type (oil/gas, salt water injection (SWD), injection, injection/disposal, water storage, horizontal drain hole), American Petroleum Institute (API) number, status (active, plugged, approved/expired temporary abandonment, new-not drilled/completed, cancelled Application for Permit to Drill (APD) (approved permit to deepen/re-enter), dry hole, permitted location, completion date, and plugged date.

New ER Figure 3.1-8 provides current oil and gas leases within a 10 km radius of the proposed CISF, reproduced from the Midland Map Company's Current Lease and Ownership Map (2019), and this figure is also provided in Enclosure 13.

ER Section 3.1 has been updated to provide reference to Figures 3.1-5, 3.1-6, 3.1-7, and 3.1-8.

Impact:

ER Section 3.1 has been revised, and ER Figures 3.1-5, 3.1-6, 3.1-7, and 3.1-8 have been added as described in the response.

RAI LU-3

Clarify the total site footprint (i.e., area) for the proposed CISF, including the area that would contain the new rail siding, and indicate whether the calculated total disturbed area and total disturbed soils take the rail siding into account.

ER Section 3.1 states that the proposed CISF would include 130 ha [320 ac] of land within the WCS property boundary. However, the description of the land area does not explicitly state whether the area includes land for the new rail siding. Therefore, clarification is needed on both the total land and soil areas disturbed by the proposed action (including the new rail siding). This information is needed to support the NRC staff's description of the proposed action and evaluation of environmental impacts in the EIS.

This additional information is needed in accordance with 10 CFR 51.45(b) and (b)(1), which requires that the ER include a description of the affected environment and discuss the impacts of the proposed action.

Response to RAI LU-3:

The CISF Owner Controlled Area (OCA) includes 130 ha [320 ac] of land within the Waste Control Specialists property boundary. In addition to the OCA, the following features would add to the total disturbed soils area:

Railroad Side Track - The railroad side track is updated as indicated in ISP Response to RAI PA-1. The majority of the railroad side track is located within the OCA. Approximately ¼ of a mile of railroad extends beyond the OCA boundary before it connects to the existing Waste Control Specialists railroad line.

Site Access Road - A Site Access Road would extend beyond the OCA. Approximately one mile of road extends south before it connects to existing Waste Control Specialists access roads.

Construction Lay Down Area – During construction an area south of the CISF OCA may be used for staging equipment and supplies.

Soil disturbing activities associated with construction of the CISF inside and outside the OCA include:

- 130 ha (320 acres) for the OCA, including all facility building and storage pads
- 0.6 ha (1.5 acres) for the rail side track outside of the OCA
- 1.2 ha (3 acres) for construction of the 1.6 km (1 mi) long site access road
- 1.6 ha (4 acres) for a construction lay down area south of the CISF

The total disturbed soil area is approximately 133.4 ha (330 acres)

Impact:

ER Sections 1.3.2 and 3.1 have been revised as described in the response.

GEOLOGY and SOILS (GS)

RAI GS-1

Describe erosion and sediment controls, soil stabilization practices, or structural controls that would be implemented during operation.

ER Section 4.3 identifies increased soil erosion as the result of construction activities due to site clearing and grading. ISP should identify and describe the planned best management practices (BMPs) that it will use to mitigate erosional impacts throughout the life of the CISF site. The additional information about BMPs would be used to assess the potential environmental impacts due to operation of the proposed CISF.

This additional information is needed in accordance with 10 CFR 51.45(b) and (c), which requires that the ER include a discussion of the impacts to the environment and alternatives available for reducing or avoiding adverse environmental effects.

Response to RAI GS-1:

ISP would utilize various temporary and permanent planned best management practices (BMPs) throughout all stages of the CISF facility including silt fences, diversion ditches, berms, designated concrete wash out locations, designated tire washout locations, straw bales, check dams, and straw mats. BMPs for the construction phases and operational phases of the facility are detailed in Section 4.1 of the ER. Section 4.3 of the ER has been updated to include a reference to Section 4.1 of the ER for the BMPs.

Rainfall records from July 2009 through December 2015, provided by Waste Control Specialists from a weather station near the CISF site, indicate an average annual rainfall of 12.6 inches and a maximum twenty-four hour rainfall total of 3.62 inches (Attachment A of the SAR). With an average annual evaporation rate of approximately 70 inches per year and the high infiltration rates given the relatively permeable soil at the CISF, rainfall events that could cause significant erosion are infrequent.

Berms and ditches upgradient of the storage area will be constructed of on-site available compacted red bed clay and armored with on-site available caliche in order to minimize erosion and seepage. The construction of the berms and ditches will occur during the first phase of the facility. Additional berms and ditches will not be needed for later phases. Inspection of the berms for erosion and ditches for sediment buildup will be part of the ongoing routine inspection operations for the facility during all phases. The area between the berms and the storage pads will also be routinely inspected for erosion, especially after a rainfall. Areas of the site impacted by erosion and sediment buildup will be repaired to original grades. Inspection and maintenance will occur after normal and extreme precipitation events and through all phases of the facility.

Impact:

ER Section 4.3 has been revised as described in the response.

RAI GS-2

Describe the land surface modification proposed, including the volume of material to be excavated and redistributed and how the natural topography and stratigraphy of the proposed CISF project area would be modified during site leveling.

ER Section 4.3 (Geology and Soils) states that cut-and-fill activities might be required for some portions of the site. Provide information about the land areas that would be leveled and the potential volumes of material that would be exhumed and or redistributed to level the site. ER Section 4.1 (Land Use Impacts) stated "[d]uring the construction phase of the CISF, conventional earthmoving and grading equipment would be used. The removal of very dense soil or caliche may require the use of heavy equipment with ripping tools. Soil removal work for foundations would be controlled to reduce over-excavation to minimize construction costs. In addition, loose soil and/or damaged caliche would be removed prior to installation of foundations for seismically designed structures." Additional information about ISP's land surface modification, including details about how the natural topography and stratigraphy at the site would be modified by the proposed action, is needed to assess the potential environmental impacts due to construction and operation of the proposed CISF.

This additional information is needed in accordance with 10 CFR 51.45(b) and (c), which requires that the ER include a discussion of the impacts of the proposed action and the alternatives available for reducing or avoiding adverse environmental effects.

Response to RAI GS-2:

The proposed surface modification involves soil disturbance to the approximately 330 acres described in the Response to RAI LU-3. The areas of primary disturbance include the protected area, rail side track, access road, and contractor laydown yard. Some level of clearing and grubbing will occur in all of the 330 acres with excavation and backfill mostly focused in the 133 acres of the protected area. In this location, soil will be removed to achieve the final grades required by the Flood Plain Analysis contained in WCS CISF SAR Chapter 2, Appendix B. Plans and profiles showing the extent of excavations and backfill are shown in the WCS CISF SAR Figures 2-26, 2-27, 2-28, 2-29, 2-30, 2-31, 2-32, and 2-33. Excavation activities include site grading, drainage berm and ditch construction, foundation work for storage pads and buildings, and rail construction. Excavation for site grading varies with the maximum depth approximately 7 feet in some areas. Average excavation over the entire area is approximately 3 feet, which results in a volume of approximately 650,000 cubic yards of material. Excavation for all other features is approximately 50,000 cubic yards. Total excavated material to be stockpiled is approximately 700,000 cubic yards. Backfill will be minimal. Material will be stockpiled at the existing material stockpiles northeast of the proposed CISF location.

The existing CISF storage area is undeveloped and the existing land surface is nearly flat with an average slope of 0.8% toward the southeast. Cut and fill activities proposed for the CISF will allow construction and operation of the facility and maintain overall grading and drainage in the same direction as the existing undeveloped area.

Effects of the excavation on stratigraphy will involve removal of the cover sands and part of the Blackwater Draw caliche.

ER Section 4.3 has been updated to include a summary of the above information.

The relatively shallow depth of excavation will be accomplished with conventional earth moving equipment. In localized areas, deeper excavation may be required for building foundations. Some of the caliches encountered may require using equipment with ripping tools or hydraulic hammers.

ER Section 4.1 is updated to clarify that it is anticipated that excavation will be limited to the cover sands and Blackwater Draw caliche, however if hard caliche is encountered, heavy equipment with ripping tools may be utilized.

Impact:

ER Sections 4.1 and 4.3 have been revised as described in the response.

RAI GS-3

Correlate the U.S. Department of Agriculture (USDA) soil types inferred on the proposed CISF site with the material property data that ISP collected from 18 onsite soil test borings.

A site-specific soil survey of the proposed CISF site has not been performed. Four soil types were previously inferred by USDA to occur on the proposed CISF site; it is unknown how the average material properties associated with these four soil types compare with the actual material properties of soils recently tested onsite. ISP should provide additional information to correlate between the inferred USDA soil types and the recent material property data obtained from onsite soil borings.

This additional information is needed in accordance with 10 CFR 51.45(b), which requires that the ER include a description of the affected environment.

Response to RAI GS-3:

The inferred soil types for the proposed CISF in the USDA Natural Resources Conservation Service Custom Soil Resource Report (ER Attachment 3-2) are consistent with the logs of onsite borings. However, it is expected that the surface soil material will be removed during re-grading of the site to prepare the site for construction, and during construction of each pad (see RAI Response PA-1 regarding excavation of deleterious material).

Geoservices advanced 18 boreholes in the Phase I and facilities areas, logging the upper approximately 0 to 5 feet as silty sand with caliche (WCS CISF SAR, Attachment E). These borings were all located within an area where Blakeney and Conger soils are inferred by the USDA Soil Survey (ER Figure 4.3-1). Table 3 of the USDA Soil Resource Report lists the percent of soil passing a No. 200 sieve for the Blakeney and Conger soils as ranging from 40 to 75 percent. The Geoservices Report in Appendix B lists the material properties from soil samples taken from the upper 5 feet as having 35 to 48 percent passing a No. 200 sieve, which is mostly within range of what is expected for the Blakeney soils according to the USDA Soil Resource Report. Previous onsite boring logs (WCS CISF SAR, Attachment C) where the Blakeney and Conger soils occur (TP-64, TP-84, TP-76, PZ-36 and TP-65) note 1 to 2 feet of dry, tan sandy silt overlying caliche, which is in agreement with the USDA description of the Blakeney and Conger soils as 0 to 18 inches of brown, fine sandy loam underlain by white, strongly cemented caliche. Previous onsite boring logs where the Jalmar-Penwell association occurs (PZ-46 and PZ-47) indicate 4 to 6 ft of orangish-tan, well-sorted sand, consistent with the USDA description of Jalmar-Penwell soils as sand to sandy-loam ranging in color from brown to reddish-yellow and extending to depths around 85 inches. There are no onsite borings that verify the characteristics of either the Ratliff or Triomass and Wickett soils which together occupy about 38 percent of the proposed CISF footprint. Based on the consistency between the USDA and recent and previous onsite boring descriptions, these soils are likely similar to the loam and fine sandy clay loam descriptions in the USDA report.

ER Section 4.3 has been updated to include the above information.

Impact:

ER Section 4.3 has been revised as described in the response.

RAI GS-4

Using available data from oil and gas well logs and any other available sources such as geophysical surveys, provide information on the depth and thickness of oil- and gas-producing geologic formations within a 10 km [6 mi] radius of the proposed CISF.

ER Section 3.1 states that land uses within a few miles of the proposed CISF includes drilling for and production from oil and gas wells. Provide information on oil- and gas-producing formations, such as depth and thickness, in the vicinity of the proposed CISF.

This additional information is needed in accordance with 10 CFR 51.45(b), (b)(1), and (c), which requires that the ER include a description of the affected environment, discuss the impacts of the proposed action, and contain sufficient data to aid the NRC in its development of an independent analysis.

Response to RAI GS-4:

[

]

Proprietary Information on Pages 25 through 27
Withheld Pursuant to 10 CFR 2.390

Impact:

ER Section 3.1 has been revised and Table 3.1-3 has been added as described in the response.

RAI GS-5

Provide information on deep well injection of wastewater at or near the proposed CISF. This information should include the number and location of injection wells within a 10-km [6-mi] radius of the proposed project area. For each identified injection well, provide information on the geologic formation that wastewaters are being injected into, the depth and thickness of the targeted geologic formation, and injected wastewater volumes and rates.

ER Section 3.1 states that land uses within a few miles of the proposed CISF includes drilling for and production from oil and gas wells, and identifies oil fields northwest, south, southwest, and east of the proposed CISF. The requested information would be used to more accurately describe these current activities in the affected environment.

This additional information is needed in accordance with 10 CFR 51.45(b) and (c), which requires that the ER include a description of the affected environment and contain sufficient data to aid the NRC in its development of an independent analysis.

Response to RAI GS-5:

The response to RAI LU-2 provides detailed information on injection of produced water or wastewater from the oil and gas industry. All of the wells labeled as 'injection' in Attachment LU-2-1 to RAI Response LU-2 are Class II UIC injection wells, used for secondary oil recovery. This RAI (GS-5) requests information on deep well injection of wastewater, interpreted to mean wastewater from other than the oil and gas industry, commonly referred to as Class I UIC injection wells.

There are no permitted Class I deep injection wells in Andrews County (Reference [1]). There are no permitted Class I deep injection wells in Lea County within 10 km of the proposed CISF (Reference [2]).

References:

1. TCEQ, 2019, pers. comm. August 9, 2019, Email from Texas Commission on Environmental Quality to M. Hubbard, INTERA Inc. re: Class I Well Locations.

2. NM OCD, 2019, pers. comm. August 9, 2019, Email from New Mexico Oil Conservation Division to M. Hubbard, INTERA Inc. re: Class I Well Locations.

Impact:

No change as a result of this RAI.

WATER RESOURCES (WR)

RAI WR-1

Obtain and provide a new U.S. Army Corps of Engineers (USACE) determination documenting the lack of jurisdictional wetlands at and adjacent to the proposed CISF.

The USACE letter concerning "Waste Control Specialists Disposal Site-Non-Jurisdictional Determination Request" (WCS Project No. SWF-2007-173) supplied in ISP's license application states that the determination was valid for 5 years. The determination, therefore, expired in 2012. Updated surface water information is needed for the NRC staff to assess the potential environmental impacts to surface and groundwater near the proposed CISF.

This additional information is needed in accordance with 10 CFR 51.45(d), which requires that the ER include a list all Federal permits, licenses, approvals, and other entitlements that the applicant must obtain and a description of the status of compliance with these requirements.

Response to RAI WR-1:

Waste Control Specialists obtained a new USACE determination to document the lack of jurisdictional wetlands at and adjacent to the proposed CISF. Environmental Report (ER) Section 4.4 has been updated to reference the new letter dated June 24, 2019 and the letter is included in Attachment 3-3 Agency Consultation.

Impact:

ER Section 4.4 and Attachment 3-3 have been revised as described in the response.

RAI WR-2

Describe in additional detail the potentially affected surface water environment at and near the proposed CISF, including:

- Seasonality of water in internally drained salt basins and surface depressions, including surface areas, seasonal water depths, shoreline lengths and monthly, quarterly, or other seasonal information about how much water the depressions contain throughout the year.
- Whether nearby industrial sites in New Mexico (i.e., Permian Basin Materials/Wallach Concrete Quarry, Sundance Services, LLC/Parabo Disposal Facility, Fish Pond), with artificial, standing surface water bodies, are harboring wetlands.
- Local surface water quality (i.e., surface water chemistry).

The additional information requested is needed to describe the surface water characteristics at and around the proposed CISF, and to evaluate potential impacts on surface water resources.

This additional information is needed in accordance with 10 CFR 51.45(b) and (b)(1), which requires that the ER include a description of the affected environment and an assessment of environmental impacts.

Response to RAI WR-2:

There are no surface water or wetland features on the CISF footprint. As discussed below, the adjacent Waste Control Specialists facility in Texas and the quarry and recycling facilities in New Mexico have localized wetland features such as playas and man-made excavations identified by the U.S. Fish and Wildlife Service (USFSW).

ER Figure 3.4-1 illustrates the USFSW classification of wetlands on the Waste Control Specialists facility and at neighboring facilities in New Mexico. The majority of the mapped features are classified as palustrine, seasonally or temporarily flooded over a few days to a few weeks. The palustrine classification system includes all nontidal wetlands dominated by trees, woody scrub shrubs, persistent emergent, and mosses or lichens. The palustrine features on the Waste Control Specialists facility are natural playas or localized impounded catchments. All of the palustrine features on the quarry of Permian Basin Materials/Wallach and commercial recycling facilities in New Mexico are classified as seasonally flooded man-made excavations.

Average annual precipitation is approximately 15.3 inches. Precipitation is typical of a semi-arid climate, with high intensity, short duration rainfall events generally during the months of July, August and September, when precipitation is generally highest (WCS CISF SAR Table 2-3). When precipitation rates exceed infiltration capacity, there is occasional ponding in the small, closed-drainage playas, which are typically a few acres or less in size. Ponded water depth in the playas is between a few inches and a few feet, with the water evaporating and infiltrating normally within a few days or weeks. The playas are typically dry throughout the year. A somewhat larger playa basin of about 30 acres occurs east of the Waste Control Specialists property, approximately 3.5 miles to the east of the CISF (SAR Attachment B Flood Plain Report Figure 1.1-1 identified as a Depression Pond). Water depth in this larger playa basin, mapped as intermittent water by the United States Geological Survey (USGS) on the Jumbo Hill Quadrangle, is generally less than a few inches, and it is often dry throughout the year (Reference [2]).

There is no permanent surface water feature on the Waste Control Specialists property. A sample of intermittently ponded surface water from the catchment at Baker Spring, west of the CISF in New Mexico, indicated a total dissolved solids content of 96 mg/L, pH of 7.46, total alkalinity (as $CaCO_3$) of 77.6 mg/L and biochemical oxygen demand of 3.7 mg/L (Reference [3]).

Finally, Section 9 is updated to add Reference [2].

References:

1. U.S. Fish and Wildlife Service, National Wetlands Inventory, Wetlands Mapper, last modified May 5, 2019. https://www.fws.gov/wetlands/data/Mapper.html.

2. U.S.G.S. Jumbo Hill Quadrangle, “Topographic Map, Scale 1:24,000,” 1971.

3. WCS (2007) (Waste Control Specialists LLC), Application for License to Authorize Near Surface Land Disposal of Low-Level Radioactive Waste, March 2007.

Impact:

ER Sections 3.4.2 and 9.0, and Figure 3.4-1 have been revised as described in the response.

RAI WR-3

Clarify whether Baker Spring water chemistry data analyzed to date have a chemical fingerprint associated with Gatuña Formation/Pecos Valley Alluvium groundwater, with Antlers Formation groundwater, or with meteoric surface water. Clarify the nature of two groundwater springs located near the proposed CISF:

- Is Baker Spring a groundwater-sourced spring, or is its name a misnomer because it only contains rainwater runoff?
- Identify the groundwater source (i.e., the formal hydrogeologic unit/geologic formation) of an unnamed groundwater spring located 4.8 km [3 mi] east of ISP (see ER page 3-21) and identify the location of this spring relative to the proposed CISF on a map.

Baker Spring is described variously in literature as either a seasonally intermittent surface water feature sourced by rainfall (e.g., ISP's description at ER page 3-18) or as a Gatuña Formation groundwater-sourced spring (e.g., page 17 of Lehman and Rainwater, 2000). Updated surface water characterization information about Baker Spring and the other local spring are needed to describe the affected environment and to assess the potential environmental impacts to surface water and groundwater near the CISF.

This additional information is needed in accordance with 10 CFR 51.45(b) and (b)(1), which requires that the ER include a description of the affected environment and an assessment of environmental impacts.

Response to RAI WR-3:

Baker Spring is not an aquifer-sourced spring, hence the name is somewhat of a misnomer. It is an area where surface runoff is impounded in a shallow excavation into the red bed clays, a remnant of a former quarry at the base of a caprock erosional bench. Two relatively short surface water drainages from the northwest and northeast discharge off the bench to the Baker Spring area. Occasionally ponded surface water may infiltrate into the Gatuna gravels at the base of the former quarry, eventually being released back to the excavation as bank storage seepage or evaporation. Baker Spring is visually inspected monthly by Waste Control Specialists environmental technicians, as are all the playas in the Waste Control Specialists facilities area. Over the past five years, water at Baker Spring has been noted only four times (July 2014; May 2015; January 2016; and January 2017). The pond has been dry during 2018 and 2019.

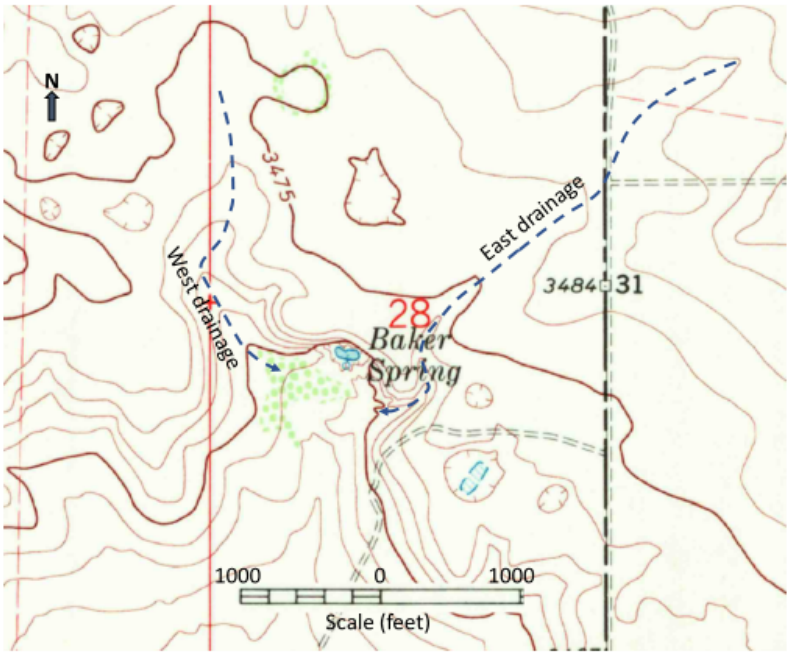

Figure WR-3-1
Surface Drainages to Baker Spring Area.

Although Lehman and Rainwater (2000, page 17 from Reference [4]) state that "water appears to discharge from the Gatuna Formation at Baker Spring," Dr. Lehman is quoted in the Low-Level Radioactive Waste (LLRW) Application (2007) as stating "I never observed water discharging from the gravels at Baker Spring" and further that it was an assumption that "water may have (or must have?) discharged there at some time (perhaps before the gravel pit was excavated)".

As presented in response to RAI WR-2, a sample of water from the pond at Baker Spring collected November, 2004 had a total dissolved solids content of 96 mg/L, pH of 7.46, total alkalinity (as $CaCO_3$) of 77.6 mg/L and biochemical oxygen demand of 3.7 mg/L (Reference [4], Attachment 6-4). Table WR-3-1 (Reference [4], Attachment 6-6) provides the analytical results of December, 2005 samples of ponded Baker Spring water and Ogallala/Antlers/Gatuña (OAG) groundwater (undifferentiated Ogallala, Antlers and Gatuna Formations) from a piezometer (TP-14) on the Waste Control Specialists site. TP-14 is located in a playa with occasionally ponded water about 1,000 ft east of the proposed CISF facility. Table WR-3-1 indicates the 2005 surface water samples at Baker Spring had about half the total dissolved solids (TDS) as the groundwater at TP-14 (which is infiltrated surface runoff) and the Baker Spring water was highly evaporated (isotopically much heavier) than the groundwater at TP-14. Darling (2006) in Reference [4], Attachment 6-6) states "The grab sample from Baker Spring is significantly more enriched than the OAG and Dockum samples. This point falls well below the global meteoric water line (GMWL), indicating that water at the discharge point of the spring is highly enriched by evaporation, compared with ground waters from the area." GMWL is the average relationship between the oxygen and deuterium stable isotopes ($\delta^{18}O$ and δD) in natural terrestrial waters. The C-14 ages of TP-14 water in Table WR-3-1 are modern: C-14 analysis was not done on Baker Spring water.

Table WR-3-1
Water Analyses of Baker Spring and TP-14 (from Reference [4]).

Sample ID	Units	Baker Spring	TP-14	TP-14
DATE		**12/24/2005**	**12/23/2005**	**1/23/2006**
Ca	mg//L	44	84	100
Mg	mg//L	12	17	ND
Na	mg//L	1.1	1.0	157
K	mg//L	ND	9.0	4
HCO3	mg//L	151	268	268
SO4	mg//L	11	17	14
Cl	mg//L	11	9	10
TDS	mg//L	241	398	509
Cond.	μmho/cm	228	451	454
pH	S.U.	7.74	7.36	7.15
Tritium	TU	4.32	6.13	6.01
^{14}C	PMC		94.8	98.84
$\delta^{2}H$	‰ SMOW	-15	-42	-42
$\delta^{18}O$	‰ SMOW	-1.2	-6.5	-6.5

The unnamed groundwater spring (Figure WR-3-2) located 4.8 km [3 mi] east of the proposed CISF, at latitude 32°26’ and longitude 102°59’, is identified on United States Geological Survey (USGS) topographic maps as Scratch Springs (USGS Jumbo Hill Quadrangle, 2019) and Kelly Windmill (USGS Jumbo Hill Quadrangle, 1971). An outcropping of indurated caliche occurs beneath the surface sand hills in the vicinity, suggesting the springs were groundwater discharging from the sand hills along the outcrop of the underlying caliche. Precipitation runoff and (previously) spring water discharge collects in a closed, salt-crusted depression about 1,500 ft southeast of the spring. Reference [1] states the springs were dry in 1923 when the then-current landowner arrived. A 10-meter deep well had been dug and two windmills at the site were pumping water into a tank. At a site visual inspection by Waste Control Specialists in 2005 the windmills and tank were in disrepair.

Figure WR-3-2
Location of Scratch Springs.

ER Section 3.4.2 has been updated to provide additional information related to Baker Spring. Section 9.0 has also been updated to include the new reference included in the Section 3.4.2 additional text.

References:

1. Brune, G., 1981, Springs of Texas: Branch-Smith, Inc., Forth Worth, TX, 566 p

2. United States Geological Survey, Jumbo Hill Quadrangle, 2019

3. United States Geological Survey, USGS Jumbo Hill Quadrangle, 1971

4. WCS (Waste Control Specialists LLC), “Application for License to Authorize Near Surface Land Disposal of Low-Level Radioactive Waste,” March 2007.

Impact:

ER Sections 3.4.2 and 9.0 have been revised as described in the response.

RAI WR-4

Clarify ER descriptions of site topography, water-balance parameters, surface water basins, and hydrogeologic characteristics at the proposed CISF by:

- Clarifying whether the statement on ER, page 3-19, that the proposed CISF is "located on a southwest-facing slope that transitions from the Southern High Plains to the Pecos Valley physiographic section" refers to the topographic slope upon which permitted WCS Low-Level Radioactive Waste (LLRW) facilities were constructed, or the location and natural slopes of the proposed CISF site, or to both (ER description appears vestigial from LLRW application-type documents, and therefore, possibly inaccurate relative to the proposed CISF site location).
- Clarifying whether or not the proposed CISF is located directly above a relatively flat-lying, local topographic high point above the Red Bed Ridge surface water/groundwater divide, whereas the existing WCS LLRW facility lies on a southwest-facing, lower elevation slope of the Red Bed Ridge, on the Rio Grande River Basin side of the surface water/groundwater divide. (ER description appears vestigial from LLRW application-type documents, and therefore, possibly inaccurate relative to the proposed CISF site location).
- Clarifying whether or not the proposed CISF is located entirely within the Rio Grande River Basin), which is separate from the adjacent Colorado River Basin, and whether or not the northwestern corner of the proposed CISF site is located at the river basin boundary.
- Providing a topographic map that illustrates the specific location of the surface water drainage divide between the Rio Grande and Colorado basins relative to the location of the proposed CISF at a scale that is commensurate with the scale of the ISP/WCS property.
- Clarifying site water-balance parameters; the ER states that infiltration and evapotranspiration would mitigate a significant amount of the potential runoff volume from the CISF site; quantify what is meant by the word "significant" and the other parameters of the site water-balance equation (i.e., evapotranspiration, runoff, storage, and infiltration/recharge).
- Clarifying planned usage of new or existing water-retention basins, if any, that would support CISF-construction, -operations, and -decommissioning activities.
- Clarifying planned or expected storm-water management facilities or activities.
- Clarifying whether or not local Gatuña Formation groundwater occurs within the Rio Grande River Basin (and not within the Colorado River Basin).
- Clarifying whether or not local Ogallala Formation groundwater occurs within the Colorado River Basin (and not within the Rio Grande River Basin).

Clarified topographic information, site water-balance information, descriptions of any planned usage of new or existing manmade surface water bodies, and hydrostratigraphic information for the units present immediately beneath the proposed CISF site is needed to assess potential environmental impacts to surface water and near-surface groundwater at the proposed CISF.

This additional information is needed in accordance with 10 CFR 51.45(b) and (b)(1), which requires that the ER include a description of the affected environment and an assessment of environmental impacts.

Response to RAI WR-4:

The response to each bulleted item in the RAI is provided in the corresponding bulleted item below:

- The description of the topographic situation of the proposed CISF (ER Section 3.4.1) is correct. Both the permitted Waste Control Specialists Low-Level Radioactive Waste (LLRW) facilities and the proposed CISF are located on the southwest-facing slope that transitions from the Southern High Plains to the Pecos Valley physiographic section. The proposed CISF is upslope of the Waste Control Specialists LLRW facilities but still on the southwest slope draining to the Pecos Valley section. Most of the surface drainage from the CISF discharges to the large playa (679.3 acres) to the east (SAR Attachment B Figure 1.1.2-2). Should the playa overtop, drainage would be to the south from Analysis Point AP 3 (see SAR, updated Attachment B, Flood Plain Report).
- Although the buried Red Bed Ridge, a drainage divide throughout Cenozoic time, has been described as being “approximately coincident” with the current topographic high between the Colorado and Rio Grande River Basins, they are not co-located. The buried Red Bed Ridge is approximately 1,200 ft south-southwest of the current topographic high. The axis of the buried Red Bed Ridge occurs from approximately the northwest corner of the neighboring Waste Control Specialists byproduct landfill to the southeast corner of the Compact Facility and continues southeastward beyond the Waste Control Specialists landfills (see Response to RAI NP-2.6-2).
- The proposed CISF is located entirely within the Rio Grande Basin (Pecos Valley) (see new ER Figure 4.4-1).
- A detailed site-specific topographic map with 1-foot contour intervals based on an aerial survey flown May 29, 2014 is provided in new ER Figure 4.4-1. The map illustrates the proposed CISF and the specific location of the surface water drainage divide between the Rio Grande (Pecos Valley) and Colorado River Basins and confirms the proposed CISF location is entirely within the Rio Grande River Basin.
- Please see the CISF Drainage Evaluation and Floodplain Analysis in SAR Chapter 2 Attachment B regarding site drainage.
- There is no planned usage of new or existing water-retention basins to support CISF-construction, -operations or -decommissioning activities.
- There are no additional planned or expected storm-water management facilities or activities outside of what is presented in the application.
- In the area of the neighboring Waste Control Specialists Facilities and the proposed CISF, the Gatuna Formation occurs on the southwest facing slope of the buried Red Bed Ridge; therefore any groundwater in the Gatuna Formation occurs within the Rio Grande River Basin.
- In the area of the Waste Control Specialists Facilities and the proposed CISF, the Ogallala Formation occurs on the northeast facing slope of the buried Red Bed Ridge; therefore, any groundwater in the Ogallala Formation occurs within the Colorado River Basin.

ER Section 4.4 has been updated to reference new Figure 4.4-1.

Impact:

ER Section 4.4 has been revised and Figure 4.4-1 has been added as described in the response.

SAR Attachment B Flood Plain Report has been updated as described in the response.

RAI WR-5

Further, describe the groundwater environment underlying and near the proposed CISF by identifying:

- The groundwater source (i.e., the formal hydrogeologic unit) that supplies the nearest downgradient potable water well at the Letter B Ranch and the location of this well on a map relative to the proposed CISF.
- All windmill-pumped groundwater wells located on and within an 8-km [5-mi] radius of the ISP/WCS property that historically pumped near-surface groundwater. Illustrate the locations of these wells relative to the proposed CISF on a map, and interpret site information to identify on the map whether each well was screened in the Ogallala, Antlers, or Gatuña Formations.
- All active, industrial groundwater wells located on the ISP/WCS property that provide non-potable water for a firewater tank, processing activities, dust suppression, or any other industrial use; show all such ISP/WCS well locations on a map and provide well-perforation depths. Identify the aquifer formation(s) of the non-potable water pumped from these wells (give specific formation names, such as Trujillo or Santa Rosa Formations; “Dockum Aquifer” is not sufficiently specific). Provide, per hydrostratigraphic unit, the annualized volume of non-potable groundwater now in use for ongoing activities at WCS, estimate any anticipated future changes to the annualized volume of non-potable water that will be consumed for non-CISF activities, and estimate the additional annualized volume of non-potable water per aquifer that ISP would use exclusively in activities associated with construction and operation of the CISF during its various phases. Clearly identify which proposed CISF-related activities would require use of site industrial groundwater, and how CISF buildout phase would affect consumptive use.
- The number of boreholes/wells/piezometers drilled and completed beneath the proposed CISF footprint into the upper unit of the Dockum Aquifer, which may provide information about the occurrence and lateral continuity of saturated sand that occurs as lenses within the Cooper Canyon Formation/Red Bed Ridge clay unit. Provide hydrogeologic information available to ISP that would clarify the location of saturated sands beneath the proposed CISF potentially occurring within the Cooper Canyon Formation.

This additional information is needed in accordance with 10 CFR 51.45(b) and (b)(1), which require that the ER include a description of the affected environment and an assessment of environmental impacts, including cumulative impacts, and (b)(5), any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented.

Response to RAI WR-5:

The potable groundwater well for the nearest house on the Letter B Ranch is located adjacent to the road north of Hwy 176, about 4,000 ft south of the house (Figure WR-5-1). The well has a slotted interval between 45 and 85 ft, logged as ‘sandstown’ (sic) from 35 to 62 ft, red clay from 62 to 73 ft, sand and gravel from 73 to 82 ft. and red clay from 82 to 85 ft. The most likely source of potable ground water in the well is the sands and gravels between 73 and 82 ft, interpreted herein as the Ogallala.

Figure WR-5-1
Potable Groundwater Well for the Nearest House on the Letter B Ranch

Windmills identified on United States Geological Survey (USGS) topographic maps are shown in Figure WR-5- 2 (USGS Hobbs, New Mexico, 1:250,000, USGS Jumbo Hill, Texas, 1:24,000; USGS Eunice, NE, Texas-New Mexico; USGS Brinson Ranch, Texas, 1:24,000; USGS Hobbs SE, Texas-New Mexico, 1:24,000). A current water well search conducted by Banks Environmental Data Inc. is included as Attachment WR 5-1, and a previous water well search conducted by Banks and Waste Control Specialists and submitted with the LLRW Application (Reference [6]) is included as Attachment WR 5-2. The water well search submitted with the LLRW application is the more comprehensive and to the extent the Waste Control Specialists well search can be correlated with the USGS-identified windmills, the interpretation is provided below in Table WR-5-1. It is assumed that shallow wells (less than 200 ft depth) are open to either the Ogallala, Antlers or Gatuña (also likely termed Cenozoic Pecos Alluvium in some areas) Formations. Deeper wells are likely open to sandstones in the Triassic Dockum Group. It may be speculated that shallow wells located in the Colorado River surface water drainage basin are potentially open to the Ogallala Formation, or possibly the Antlers/Ogallala undifferentiated, and that shallow wells located in the Rio Grande drainage basin are open to the Gatuña (Pecos Valley alluvium) Formation, or possibly the Antlers/Gatuna undifferentiated. The buried red bed ridge separates the groundwater systems of the Ogallala and Gatuña (Pecos Valley alluvium) Formations, however as discussed in RAI-WR-4, the drainage divide between the Colorado and Rio Grande basins is approximately coincident with the red bed ridge; however, they are not co-located, therefore, there is some uncertainty near the approximately coincident divides as to the groundwater system in which wells may be.

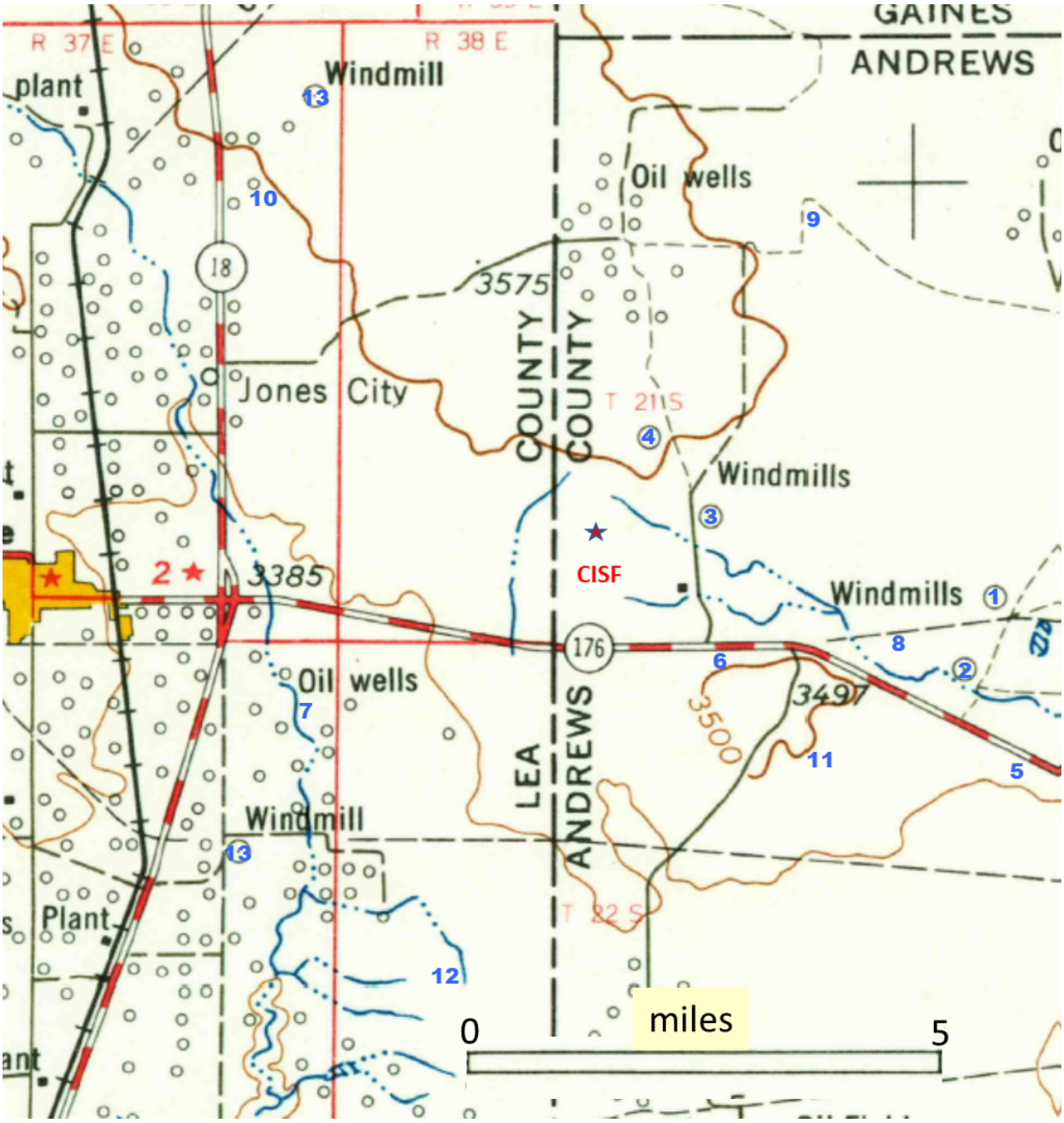

Figure WR-5-2
Windmills within 5 Miles of the Proposed CISF Identified on USGS Topographic Maps (1:24,000 & 1:250,000).

Table WR-5-1
Windmills within 5 Miles of the Proposed CISF Identified on USGS Topographic Maps

Well # on Figure	Well # in Attachment WR-5-2	Identifier	Depth (ft)	Formation: (see RAI response text for explanation and speculated completion formation)
1		Kelly Windmill	30	Formation: Shallow wells are in either Antlers, Ogallala or Gatuña (Pecos Valley Alluvium)
2	77	Ralph McWhorter	176	Formation: Shallow wells are in either Antlers, Ogallala or Gatuña (Pecos Valley Alluvium)
3	25	Ralph McWhorter	85	Formation: Shallow wells are in either Antlers, Ogallala or Gatuña (Pecos Valley Alluvium)
4	6		60	Formation: Shallow wells are in either Antlers, Ogallala or Gatuña (Pecos Valley Alluvium)
5				Formation: Shallow wells are in either Antlers, Ogallala or Gatuña (Pecos Valley Alluvium)
6	13	Southeast well	80	Formation: Shallow wells are in either Antlers, Ogallala or Gatuña (Pecos Valley Alluvium)
7	51	George Sims	85	Formation: Shallow wells are in either Antlers, Ogallala or Gatuña (Pecos Valley Alluvium)
8	67	Ralph McWhorter	201	Formation: Shallow wells are in either Antlers, Ogallala or Gatuña (Pecos Valley Alluvium)
9	81,87	John Goen	136,138	Formation: Shallow wells are in either Antlers, Ogallala or Gatuña (Pecos Valley Alluvium)
10	66,73	Wm O Stephens	unknown	Formation: Shallow wells are in either Antlers, Ogallala or Gatuña (Pecos Valley Alluvium)
11	38	Ed Tinsley	unknown	Formation: Shallow wells are in either Antlers, Ogallala or Gatuña (Pecos Valley Alluvium)
12	68	George Sims	386	Formation: Shallow wells are in either Antlers, Ogallala or Gatuña (Pecos Valley Alluvium)
13	88,94	Fullerton oil Co, Unknown	90,900 (?),90	Formation: Shallow wells are in either Antlers, Ogallala or Gatuña (Pecos Valley Alluvium)

The water for the existing potable water system at the current Waste Control Specialists facilities is supplied by Eunice, New Mexico via pipeline. This water supplies the water for all activities at the site including industrial activities such as the firewater tanks and processing. The proposed WCS CISF will tie in to the existing potable water system that serves the Waste Control Specialists facility and since this system is supplied with water from Eunice, there will be no impact to groundwater resources beneath the Waste Control Specialists property for the construction and operation of the CISF during its various lifecycle stages and development phases.

There are no borings into the sandstone/siltstone lenses of the upper units of the Dockum (Cooper Canyon Formation). The borings within the footprint of the CISF were terminated at the contact between the Dockum and the overlying undifferentiated Ogallala/Antlers.

References:

1. USGS Hobbs, New Mexico, 1:250,000

2. USGS Jumbo Hill, Texas, 1:24,000

3. USGS Eunice, NE, Texas-New Mexico

4. USGS Brinson Ranch, Texas, 1:24,000

5. USGS Hobbs SE, Texas-New Mexico, 1:24,000

6. Waste Control Specialists LLC, “Application for License to Authorize Near Surface Land Disposal of Low-Level Radioactive Waste,” March 2007.

Impact:

No change as a result of this RAI.

RAI WR-6

Provide an ISP CISF site-specific hydrostratigraphic column to clarify the composition of the local hydrostratigraphic units underlying the proposed CISF site, which have a much simpler configuration than what is shown in the regional stratigraphic column of Safety Analysis Report (SAR) Figure 2-13.

The regional stratigraphic column illustrated in SAR Figure 2-13 is too complicated (it shows units that are not present at ISP-WCS) and does not clearly describe the local subsurface geologic situation at the CISF. More simplified and accurate visual information is needed to clearly describe and communicate the affected groundwater and vadose zone environments at the proposed CISF, and to facilitate assessments of the potential environmental impacts of CISF construction, operation, and decommissioning.

This additional information is needed in accordance with 10 CFR 51.45(b) and (b)(1), which require that the ER include a description of the affected environment and an assessment of environmental impacts.

Response to RAI WR-6:

A CISF site-specific geologic column with the presence or absence of groundwater is included as Figure 2-37 in the SAR, which was updated as part of the response to RAI P-2.6-1. The geologic column is reproduced in Figure WR-6-1 below, which describes the subsurface at the site including the formation name, composition or lithology, USCS designation as appropriate, age, and material properties. The CISF geologic column shows the Ogallala Formation unconformably overlying the Cooper Canyon Formation of the Dockum Group. The geologic investigations conducted by Waste Control Specialists throughout the LLRW area did not differentiate between the Ogallala/Antlers/Gatuna sands and gravels which are in the same hydrostratigraphic position overlying the Cooper Canyon. In an earlier investigation, Lehman and Rainwater (2000) (WCS, 2007, Reference [1]), interpreted where these individual sand and gravel formations occurred, generally placing the Cretaceous Antlers over the crest of the red bed ridge, with the Ogallala Formation situated to the northeast and the Gatuna to the southwest. However, their interpretation was not based on sufficient boring data to distinguish the contacts between the Antlers and the Ogallala in the proposed CISF area, nor between the Antlers and the Gatuna on the south side of the ridge. The geologic column shows Ogallala overlying the Dockum, though it may also be considered as Antlers/Ogallala undifferentiated, as shown in the contour map (Figure WR-7-2) in response to RAI WR-7.

Years BP (millions)	ERA	PERIOD	FORMATION	THICKNESS	USCS	LITHOLOGY
0.01	CENOZOIC	QUATERNARY	COVER SANDS	1'-10'	SP	SAND, FINE GRAINED, WELL SORTED, **UNCONSOLIDATED**, LOOSE, ORANGE TO TAN, **DRY**
			CALICHE	4'-28'	NA	CALICHE WITH SAND MATRIX, **CONSOLIDATED**, FIRM TO MODERATELY HARD, WHITE TO TAN, **DRY**
			BLACKWATER DRAW	14'-38'	SP/SC/SM	SAND, W/SILT & CLAY, FINE GRAINED, WELL SORTED, **UNCONSOLIDATED**, ORANGE TO TAN, **DRY**
2.6		TERTIARY	CALICHE	19'-28'	NA	CALCAREOUS SAND, **CONSOLIDATED**-VERY HARD, LIGHT GRAY TO WHITE, **DRY**
			OGALLALA	35'-51'	SW/GW	SAND WITH GRAVEL GRADING DOWNWARD TO A GRAVEL WITH SAND, UPPER SAND IS WELL GRADE, **UNCONSOLIDATED**, TAN, **DRY**, LOWER GRAVEL WITH SAND MATRIX, POORLY SORTED, WELL TO POORLY CEMENTED, SUBANGULAR TO SUB ROUNDED, **DRY** IN THE SOUTHERN PORTION OF CISF SITE, 1-5 FEET OF GROUNDWATER PRESENT IN THE NORTHERN PORTION OF THE CISF SITE
			ERODED OR NOT DEPOSITED			
66	MESOZOIC	CRETACEOUS				
145		JURASSIC				
201		TRIASSIC	DOCKUM/ COOPER CANYON	~1400'/~500'	CL-CH	CLAY, CLAYSTONE, PLASTIC, STIFF, **CONSOLIDATED** MAROON TO RED, **DRY**

Note: Ogallala may also be considered Antlers/Ogallala undifferentiated, as the contact between the formations is not defined, nor was a distinction attempted in the Waste Control Specialists boring logs.

Figure WR-6-1
CISF Site-Specific Geologic Column

References:

1. Waste Control Specialists LLC, “Application for License to Authorize Near Surface Land Disposal of Low-Level Radioactive Waste,” March 2007.

Impact:

No change as a result of this RAI.

RAI WR-7

Provide isopach maps for the tops of hydrogeologic units beneath the proposed CISF site, including isopach maps for the tops of all formally named formations and for the tops of water-bearing sand lenses occurring within the Cooper Canyon Formation.

Additional information about the depths to the tops of the local hydrogeologic units at the CISF site is needed to compare with potentiometric surface maps of hydraulic head and to accurately describe the affected groundwater and vadose zone environments at the proposed CISF to support the assessment of the potential environmental impacts of CISF construction and operation.

This additional information is needed in accordance with 10 CFR 51.45(b) and (b)(1), which require that the ER include a description of the affected environment and an assessment of environmental impacts.

Response to RAI WR-7:

Reference [1] includes information for numerous borings and piezometers in the proposed CISF area, with the primary objective of identifying the top of the Triassic Cooper Canyon mudstones. Based on these borings, structure maps for the tops of the Blackwater Draw and Antlers/Ogallala (undifferentiated) Formations are provided in Figures WR-7-1 and WR-7-2. The Quaternary Blackwater Draw (Figure WR-7-1) is situated immediately beneath the Recent cover sands, which are relatively thin in the proposed CISF area, generally less than about 2 ft. The Blackwater Draw silty sands have various stages of caliche development, whereas the cover sands are relatively loose with no discernable caliche. The top of the Blackwater Draw structure map in Figure WR-7-1 is based on the first occurrence of caliche in the Waste Control Specialists boring logs. The eighteen SAR Phase I/Admin/Transfer area geotechnical investigation boring logs (WCS CISF SAR Attachment E) in the southwest corner of the proposed CISF area are reasonably similar to the Waste Control Specialists logs (WCS CISF SAR Attachment C), showing loose- to medium-dense silty sand in the upper 2.5 to 6 ft, with caliche mentioned, but the contact between the loose cover sands and the first silty sand with caliche is not specifically identified. Therefore, the Geotechnical Borings in Attachment E of the WCS CISF SAR are not explicitly included in Figure WR-7-1. Their inclusion would result in only a few feet variation of the top of the Blackwater Draw.

The Blackwater Draw Formation is underlain by the caprock caliche, a hard, well-developed pedogenic calcrete developed on all pre-Quaternary formations in the southern High Plains. The boring rig used for the WCS CISF SAR geotechnical investigation could not penetrate the caprock. The WCS CISF SAR geotechnical borings terminated at either caprock refusal or 25 ft. The caprock at the proposed CISF is 20 to 30 ft thick.

The caprock is developed on the Cretaceous Antlers and Tertiary Ogallala Formations, which occupy the same hydrostratigraphic position, overlying the Dockum red beds. They are contiguous only in the hydrostratigraphic sense, not in time. Where the caprock caliche has not developed all the way to the Dockum red beds (mudstones, clays), there are undifferentiated Antlers and Ogallala sands and gravels between the caprock and Dockum Group mudstones. These formations (Antlers and Ogallala), along with the Gatuna in the same hydrostratigraphic position on the southern side of the red bed ridge, are locally termed by Waste Control Specialists as the undifferentiated “OAG Unit”.

Section 3.4.14 was updated to clarify that the shallowest water bearing zone referenced at 225 ft deep is at the neighboring Waste Control Specialists facility.

Section 3.4.14.3 has been updated to state that there are no borings into the sandstone/siltstone lenses of the Cooper Canyon Formation within the CISF footprint on which structure contour maps can be based.

Relevant information regarding the hydrogeologic units at the site can also be found in RAI WR-8.

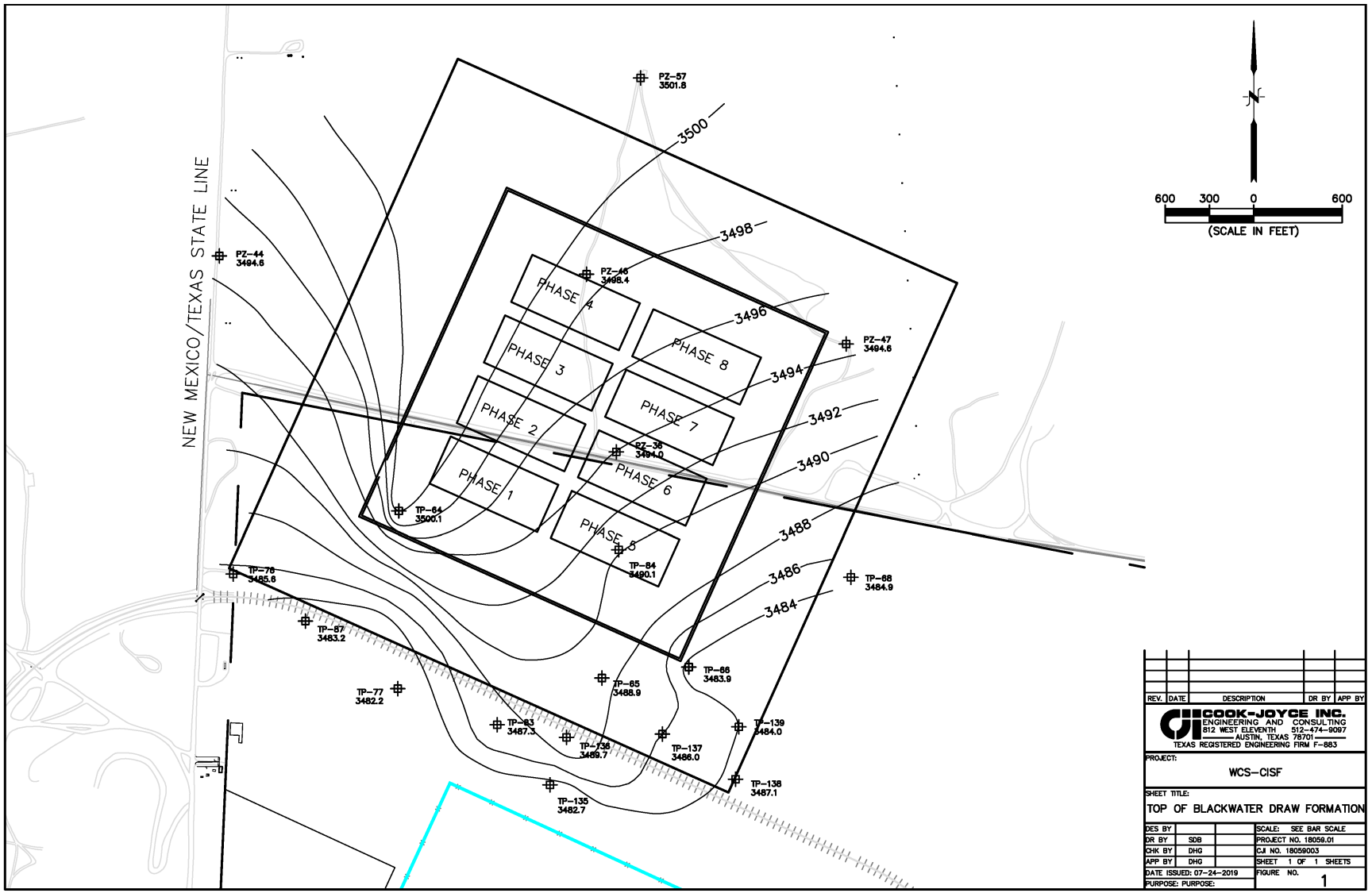

Figure WR-7-1
Top of Blackwater Draw Formation

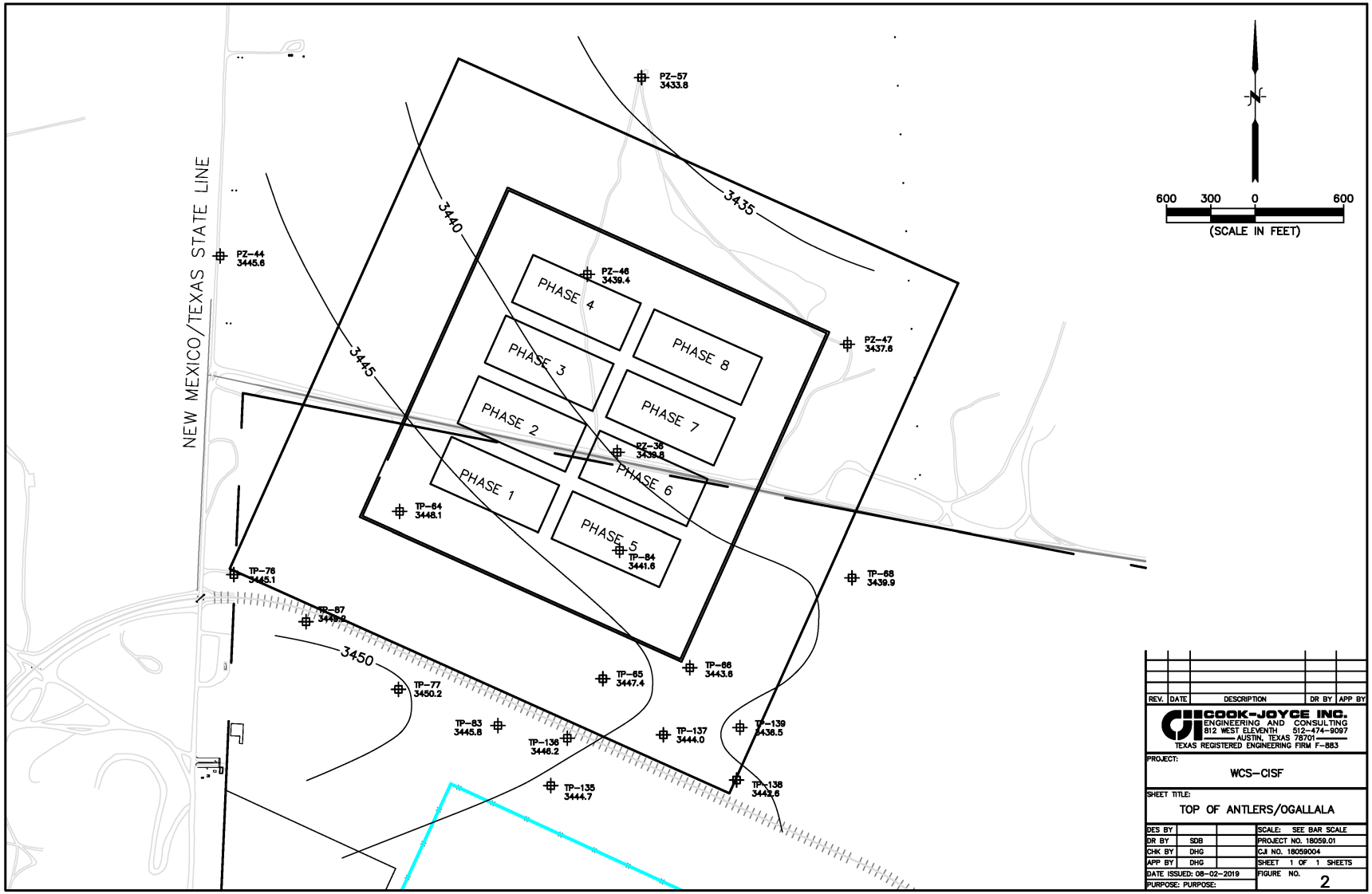

Figure WR-7-2
Top of Antlers/Ogallala

References:

1. Waste Control Specialists LLC, “Application for License to Authorize Near Surface Land Disposal of Low-Level Radioactive Waste,” March 2007.

Impact:

ER Sections 3.4.14 and 3.4.14.3 have been revised as described in the response.

RAI WR-8

Provide geologic formation names instead of generic material labels on updates to SAR Figures 2-16 and 2-17 (i.e., geologic cross-sections). The affected groundwater environment must be clearly described.

The CISF is located at or near a surface water/groundwater basin divide, where three near-surface geologic units have discrete interfaces within relatively short distances (i.e., Ogallala Formation, Antlers Formation, and Gatuña Formation). For the adjacent LLRW site, Lehman and Rainwater (2000) clearly indicated what units lay beneath the proposed facility. In contrast, SAR Figures 2-16 and 2-17 only provide generic material type labels on the geologic cross-sections for the proposed CISF, and are, therefore, not explicit about which formations underlie the proposed facility. The proposed CISF would be located above regionally extensive, formally named geologic units having characteristics that are well-described in the literature. Additional information is needed about which hydrogeologic formations underlie the CISF site to accurately describe the affected groundwater and vadose zone environments at the proposed CISF and support assessment of the potential environmental impacts of CISF construction, operation, and decommissioning.

This additional information is needed in accordance with 10 CFR 51.45(b) and (b)(1), which require that the ER include a description of the affected environment and an assessment of environmental impacts.

Response to RAI WR-8:

SAR Figures 2-16 and 2-17 and ER Figures 3.3-2 and 3.3-3 have been updated to include the geologic units as opposed to the generic material labels and the location of any groundwater encountered. The geologic formation names correlate with the site-specific stratigraphic column found as Figure 2-37 in the SAR. All of the boreholes were dry when drilled with the exception of PZ-57 and PZ-47 and the monitoring wells installed in the boreholes are dry with the exception of PZ-57 and PZ-47, which are located north of the Protected Area for the proposed CISF. SAR Figures 2-16 and 2-17 have been updated to include the level of groundwater located in the monitoring wells PZ-57 and PZ-47. See RAI Response WR-5 for more information regarding the groundwater environment underlying the site.

The Lehman and Rainwater (2000) report, included in the 2007 Waste Control Specialists License Application for the neighboring Low-Level Radioactive Waste (LLRW) facility, mapped/interpreted the Antlers Formation beneath the proposed CISF; however, they did not have borehole control in the area of the CISF (Reference [1]). Subsequent geological subsurface investigations completed post-2000 included borings within and near the proposed CISF footprint (Reference [1]). These investigations indicate the sands and gravels beneath the proposed CISF are undifferentiated with respect to the Ogallala and Antlers Formations (Reference [1]). Geotechnically, these two formations are similar, with the primary difference being the gravel lithology (Reference [1]).

As discussed in Lehman and Rainwater (2000), it is difficult to discriminate the Antlers and Ogallala solely on the basis of well cuttings. The Ogallala and Antlers occupy the same stratigraphic position in this area and most likely interfinger, with the Cenozoic Ogallala deposited adjacent to and continuous with the remnant Cretaceous Antlers. The post 2000 boreholes on and near the proposed CISF footprint (Figure 2-15) log the stratigraphy above the Cooper Canyon as poorly cemented sandy gravel and various colored chert gravel. There is no distinction between the gravels based on the presence or abundance of igneous, metamorphic and sedimentary (limestone and sandstone) gravel clasts, suggested by Lehman and Rainwater as a potential means of distinguishing the formations. Various colored chert gravels are characteristic of both the Antlers and Ogallala Formations, as most of the gravel clasts in the Ogallala are derived from eroded Antlers sands and gravels. Two of the boreholes (TP-64 and TP-66) logged fossils in the unconsolidated sands and gravels, suggesting these deposits may be Ogallala, or interfingered Antlers and Ogallala.

References:

1. WCS (2007) (Waste Control Specialists LLC), “Application for License to Authorize Near Surface Land Disposal of Low-Level Radioactive Waste,” March 2007.

Impact:

SAR Figures 2-16 and 2-17 have been revised as described in the response.

ER Figures 3.3-2 and 3.3-3 have been revised as described in the response.

RAI WR-9

Quantify the annualized volume of potable groundwater now in use for ongoing activities at WCS, estimate any anticipated future changes to the annualized volume of potable groundwater consumed for non-CISF activities, and estimate the additional annualized volume of potable groundwater that ISP will use exclusively to construct and operate the CISF during its various lifecycle stages and development phases.

ER Section 4.4 states that during construction and operation of the proposed CISF, potable water will be supplied by the existing potable water system that serves the WCS facility. Additional information is needed to support assessment of the environmental impacts that ISP's CISF potable groundwater consumptive use will have on groundwater resources and cumulative impacts.

This additional information is needed in accordance with 10 CFR 51.45(b) and (b)(1), which require that the ER include descriptions of the proposed action, the affected environment, and the impacts of the proposed action, including cumulative impacts.

Response to RAI WR-9:

The water for the existing potable water system at the current Waste Control Specialists facilities is supplied by Eunice, New Mexico via pipeline. The proposed WCS CISF will tie into the existing potable water system that serves the Waste Control Specialists facility and since this system is supplied with water from Eunice, there will be no impact to groundwater resources beneath the Waste Control Specialists property for the construction and operation of the CISF during its various lifecycle stages and development phases. The total gallons of potable water supplied to ISP partner Waste Control Specialists by Eunice, NM for the neighboring Waste Control Specialists facilities for the years 2014 to 2018 ranged from 882,815 gallons (2016) up to 3,631,508 gallons (2018). The increase in 2018 was due to the expansion of the Waste Control Specialists landfill facilities. For construction and operation of the proposed WCS CISF, the potable water usage is expected to be minimal. Water needs during construction (5,000 gallons/day) and operation (1,800 gallons/day) of the WCS CISF are conservative. During operation, water usage would be similar to a light industrial facility with 24-hour a day security personnel. Highest water demand is associated with dust suppression and increased personnel during initial construction. Construction and operation of the WCS CISF will have little measurable off-site effects on water quality or levels from the City of Eunice. ER Section 4.4 has been updated to clarify the above.

Impact:

ER Section 4.4 has been revised as described in the response.

RAI WR-10

Provide groundwater unit information that corresponds with the water quality data provided in the application to support the ER. ISP should clearly identify the names of the individual hydrogeologic formations that are associated with the groundwater quality described in ER Sections 3.4.14.1 and 3.4.14.5.

ER Sections 3.4.14.1 and 3.4.14.5 use terminology [e.g., 55 m and 69 m (180 ft and 225 ft) zones] that is not defined in the ER. Additional information about which geochemical data are associated with the sampled groundwater formations (e.g., Gatuña, Antlers, Ogallala, Cooper Canyon, Santa Rosa, and or Trujillo) is needed to support assessment of the potential environmental impacts to groundwater quality at or near the proposed CISF. Please provide a map that spatially indicates where geochemical samples were acquired from wells/boreholes, relative to the footprint of the proposed CISF.

This additional information is needed in accordance with 10 CFR 51.45(b), which requires that the ER include a description of the affected environment.

Response to RAI WR-10:

The groundwater geochemical samples discussed in Section 3.4.14.1 were presented in the Waste Control Specialists LLRW License Application (Reference [1]), Section 6.2.7. The results for the shallow wells discussed in Section 6.2.7 are provided in Table WR-10-1. The samples were obtained from the hydrostratigraphic unit at the current Waste Control Specialists site termed the Ogallala/Antlers/Gatuña (OAG), comprising undifferentiated Ogallala/Antlers/Gatuna Formation sediments. These wells correspond to the hydrogeologic formations identified in Table WR-10-1, below: the undifferentiated Antlers/Ogallala (well 26-40-201), or the undifferentiated Antlers/Ogallala/Gatuña (well 26-40-601, and well 26-40-602). The approximate location of these wells relative to the proposed CISF is shown on Figure WR-10-1.

Table WR-10-1
Groundwater Geochemical Samples for Shallow Wells at the Waste Control Specialists Site (Reference [1])

	Well No. 26-40-201		Well No. 26-40-601		Well No. 26-40-602
Aquifer	Antlers/Ogallala undifferentiated		Antlers/Ogallala/Gatuna undifferentiated		Antlers/Ogallala undiffferentiated
Well Depth (feet)	Unknown		Unknown		80
Sample Date	10/09/80	05/22/96	10/09/80	08/01/74	10/10/90
Calcium (mg/L)	206	NR	62	60	78
Magnesium (mg/L)	17	NR	8	11	21
Sodium (mg/L)	92	NR	20	20	36
Bicarbonate (mg/L)	205	166	233	231	249
Sulfate (mg/L)	196	150	19	15	39
Chloride (mg/L)	265	317.5	8	9	39
Nitrate (mg/L)	65.5	NR	23.2	24	4.07
Fluoride (mg/L)	0.4	0.51	0.8	1	0.76
Silica (mg/L)	53	34.3	44	39	43
TDS (mg/L)	1070	NR	308	293	429
Cond (mmhos/cm^3)	1250	1109	415	437	459
pH	8.1	8.15	8.0	8.0	7.14

mg/L = miligrams per liter
mmhos/cm = micromhos per cubic centimeter
NR: Not Reported

Note: Geochemical results are presented in Table WR-10-1

Figure WR-10-1
Location of Shallow Groundwater Wells Sampled

The groundwater geochemical samples discussed in Section 3.4.15.5 are from the 225-foot zone, a saturated, fine-grained sandstone in the Cooper Canyon Formation of the Triassic Dockum Group at a depth of about 225 ft below ground surface at the Waste Control Specialists site. The 225-ft zone, the first continuous saturated sandstone in the Cooper Canyon Formation, is under confined conditions with a hydraulic conductivity of approximately 4E-08 cm/s. The '225' is defined for regulatory monitoring purposes at the neighboring Waste Control Specialists facility as the "uppermost aquifer", despite a hydraulic conductivity less than a Resource Conservation and Recovery Act (RCRA) landfill clay liner. The groundwater geochemical results are provided in Table WR-10-2 and the locations of these 225-ft zone wells sampled relative to the proposed CISF are shown in Figure WR-10-2.

Table WR-10-2
Groundwater Geochemical Samples for Wells in the 225-ft zone of the Cooper Canyon Formation at the Waste Control Specialists Site (Reference [1])

Well Number	Ca (mg/L)	Mg (mg/L)	Na (mg/L)	Cl (mg/L)	SO_4 (mg/L)	HCO_3 (mg/L)	Total Dissolved Solids (mg/L)[3]	Ion Balance*
225 foot zone								
DW-35A[1]	170	54	1200	1000	1800	150	4600	0.95569
DW-35B[1]	160	51	1300	980	1700	150	4700	1.049329
MW-1A[1]	150	46	1100	520	2100	120	4600	0.979472
MW-1B[1]	170	49	1100	570	2300	110	4600	0.91782
DW-33A[1]	120	41	970	490	1700	180	3800	0.988279
DW-33B[1]	NM	NM	NM	490	1700	170	3800	NC
MW-3A[1]	140	43	1100	470	2000	140	4100	1.02063
MW-3B[1]	130	37	1100	480	2000	110	4100	1.006966

* Ion balance calculated as (Ca + Mg + Na) / (Cl + CO_4 + HCO_3): units of meq

[1] Sampled 4/20/2004

[2] Sampled June 2001

[3] Total Dissolved solids calculated as electrical conductivity (uSiemens/cm) X 0.6: (Chem Nuclear Systems, 2001)

NM: not measured

NC: not calculated

Note: Geochemical results are presented in Table WR-10-2

Figure WR-10-2
Location of 225-ft Zone Groundwater Wells Sampled
(Geochemical results are presented in Table 2)

References:

1. Waste Control Specialists LLC, “Application for License to Authorize Near Surface Land Disposal of Low-Level Radioactive Waste,” March 2007.

Impact:

No change as a result of this RAI.

RAI WR-11

Identify the shallowest groundwater located beneath the proposed CISF footprint by name and depth below the CISF land surface, whether in the Antlers, Ogallala, Gatuña, or Cooper Canyon Formation. In future documentation associated with the proposed action, name the specific aquifers in the Dockum Group that are discussed, whether the Cooper Canyon, Trujillo, or Santa Rosa Formations. In response to this RAI, use of the lumped term "Dockum Aquifer" should be avoided because it applies to the entire thick sequence of the Dockum Group (to both aquifers and aquitards) and does not clearly denote the site-specific aquifer that is being referenced at the proposed CISF. ISP's license application should also call out by name the near-surface groundwater formations (Antlers, Ogallala, or Gatuña) that are referred to in any related text or that are associated with any data provided.

In response to RSI 9.6, the applicant indicated, "The…nearest aquifer is located at a depth of 245 to 305 m [800 to 1,000 ft] below ground surface." The response to RSI 9.6 does not indicate by name a hydrogeologic formation associated with this aquifer. The applicant should clarify if they are referring to a water-bearing sandy zone within the Cooper Canyon Formation or to another aquifer deeper in the Dockum Group. Also in response to RSI 9.6, the applicant indicated that "(t)he WCS site is separated from that [unspecified nearest] aquifer by the Dockum Formation, consisting of low permeability clays (10−9 cm/s)." The applicant should clarify whether it meant, "separated from that aquifer by the Cooper Canyon Formation," given that the Dockum Group contains two aquifers at the ISP/WCS property located below the Cooper Canyon Formation, as well as additional water-bearing sandy zones within the otherwise clayey Cooper Canyon Formation.

This additional information is needed in accordance with 10 CFR 51.45(b) and (b)(1), which require that the ER include a description of the affected environment and an assessment of environmental impacts.

Response to RAI WR-11:

The shallowest groundwater beneath the proposed CISF footprint is a few inches to a few feet of saturation in the undifferentiated Antlers/Ogallala sediments starting at the northern fence line of the Protected Area boundary in the northeast corner. The sands and gravels containing the water at a 90- to 100-foot depth are part of the hydrostratigraphic unit termed the Antlers/Ogallala/Gatuña (OAG) by ISP joint venture member Waste Control Specialists. The OAG comprises laterally contiguous sands and gravels of the Tertiary Ogallala, Cretaceous Antlers and Cenozoic Gatuña Formations and at the Waste Control Specialists facility this unit is discontinuous and largely dry or unsaturated beneath the Waste Control Specialists facilities.

The shallowest water bearing zone at the neighboring Waste Control Specialists facility is located in a siltstone/sandstone lense at a depth of approximately 225 feet below ground surface. There are no borings into the sandstone/siltstone lenses of the Cooper Canyon Formation within the CISF footprint. There is no cross-formational flow between the hydrostratigraphic units.

The “aquifer” referenced in RSI 9.6 referred to the Trujillo aquifer located in the Trujillo sandstone, which is part of the Dockum Group. The Trujillo is located within the Dockum Group, which is overlain by the Cooper Canyon Formation (WCS CISF SAR Figure 2-13). The Trujillo Aquifer is confined by the overlying Cooper Canyon Formation, which consists of low permeability clays (10^{-9}cm/s).

Impact:

No change as a result of this RAI.

ECOLOGY (ECO)

RAI ECO-1

Provide updated ecological studies for the proposed CISF and associated rail siding in Texas and New Mexico, if available, and provide an estimated timeframe when the updated ecological studies will be available. Provide written documentation in response to Texas Commission on Environmental Quality (TCEQ) license conditions.

Ecological studies at the WCS site were conducted during 1996, 1997, 2004, and 2006. Some of these surveys covered the entire proposed CISF area while others covered only a portion of the proposed CISF area; however, due to the age of these surveys and the natural changes of plants and animals over time, the presence or absence of State and Federal species of concern, including threatened and endangered species, should be confirmed. The NRC staff understands that it takes more than one growing and breeding season to conduct baseline ecological surveys.

The NRC staff's review of WCS's Radioactive Material License R04100, Amendment No. 31 (October 2017) suggests that updated written documentation from the U.S. Fish and Wild Service (USFWS) and the Texas Parks & Wildfire Department (TPWD) may be available as a result of License Condition #160, which states "The Licensee must provide to the executive director every five (5) years written documentation from the Texas Parks and Wildlife Department and the United States Fish and Wildlife Service regarding the presence of threatened or endangered species occurring near the site." In addition, License Condition #161 noted in WCS's Radioactive Material License Amendment No. 12 from 2012 stated, "The Licensee must recognize Baker Spring as a perennial water body and conduct appropriate aquatic surveys to establish baseline conditions and to identify the supported species, including aquatic and benthic invertebrates." Specifically, the additional information requested regarding ecological studies conducted after 2006 and baseline ecological studies and surveys previously conducted for Baker Spring is needed to describe the most recently observed ecological characteristics at and around the proposed CISF, and to evaluate potential impacts on ecological resources, including sensitive species.

This additional information is needed in accordance with 10 CFR 51.45(b)(1) and (2), which require that the ER discuss the impacts and adverse effects of the proposed action, and the Endangered Species Act.

Response to RAI ECO-1:

An ecological study for the entire footprint of the proposed CISF has been completed over the period of 2018 and 2019 to provide an updated assessment for the entire area of the proposed CISF, and has been included in new Attachment 3-6.

Pursuant to Radioactive Material License No. R04100; License Condition 160, the neighboring Waste Control Specialists facility to the proposed CISF, provides to the Texas Commission on Environmental Quality (TCEQ) a report every five years regarding the presence of threatened or endangered species occurring near the site. This report was last submitted on July 11, 2014 and is included as Attachment ECO-1-1 to this RAI response.

Pursuant to previous amendments of the Radioactive Material License No. R04100 License Condition 161 was removed in 2013 with the approval of Amendment 23 by the TCEQ. The basis for removal was that Waste Control Specialists had conclusively demonstrated that Baker Spring is not a perennial water body. Further information regarding Baker Spring can be found in RAI Response WR-3.

Impact:

ER Section 3.5 has been revised and Attachment 3-6 has been added as described in the response.

AIR QUALITY (AQ)

RAI AQ-1

Supplement the existing description of applicable air permits to address the following:

- Whether the TCEQ permit would be a new permit or a modification of the existing WCS site permit
- Whether the New Mexico Environment Department air permitting requirements could apply to the proposed action (specifically, construction of the rail side track).

ER Section 1.3.2.3 states that ISP would obtain from the TCEQ any required air permits to support construction and operation of the proposed action. However, the ER is unclear whether this would be a new permit or a modification to the existing WCS site air permit. In addition, it is unclear whether some of the railroad side track construction occurs in New Mexico (see RAI PA-2); however, the ER does not provide information about air permitting associated with the New Mexico Environment Department. Specifically, this information is needed to support the NRC staff's description and evaluation of applicable statutory, regulatory, and permitting requirements in the NRC's EIS.

This information is needed in accordance with 10 CFR 51.45(d), which requires that the ER include a description of the status of compliance with applicable environmental quality standards and requirements, including limitations and requirements which have been imposed by Federal, State, regional, and local agencies having responsibility for environmental protection.

Response to RAI AQ-1:

Construction of the proposed CISF will take place completely within the state of Texas. The proposed rail spur that was to be constructed partially within the state of New Mexico has been removed from the project and will not be built (See response to RAI PA-1). Therefore, permitting obligations that relate to the state of New Mexico are no longer necessary, with permitting requirements taking place in the state of Texas under the jurisdiction of the Texas Commission on Environmental Quality (TCEQ). ER Section 1.3.2.3 has been updated to explicitly state that all construction will take place within the state of Texas and to summarize the following information:

- Since the proposed CISF will not directly affect operations or emissions from the existing areas of the site that are covered under the New Source Review (NSR) permit or other Permits By Rule (PBR) at the site, potential stationary sources at the proposed CISF are likely eligible for a new authorization under PBR per 30 TAC §106.4 without amending the site's existing NSR permit.

- Permitting requirements typically apply to stationary sources of emissions at a site. Emissions evaluated for this project pertain to mobile on-road and non-road sources that are not subject to permitting requirements. Therefore, it is not expected that the emissions quantified for this exercise will require permitting from the state as they are not stationary and are temporary as they pertain to construction at the site. Equipment in use for storage module transport are mobile sources and will not be subject to permitting requirements. Additionally, it is expected that the buildings and other structures at the site that require electricity will be connected to existing infrastructure, and the need for electric generating units (EGUs) will not be required for electrical power. Therefore, EGUs have not been quantified for the purpose of this exercise.

Impact:

ER Section 1.3.2.3 has been revised as described in the response.

RAI AQ-2

Provide either summarized onsite meteorological data (e.g., yearly, seasonally, monthly) or provide the data in Attachment A of the SAR Chapter 2 in a spreadsheet rather than a PDF file.

Attachment A of the SAR Chapter 2 (a PDF file about 5,000 pages long) contains the hourly data from four onsite meteorological stations over a 6 year period from 2010 to 2015. However, summary information for the onsite meteorological stations is limited to wind speed and direction averaged over a 5 year period (see ER Section 3.6.4). Onsite meteorological data supports the general description of the affected environment, and any inclusion of this data in the EIS would be in summary form. Specifically, additional information on the onsite meteorological data is needed to support NRC's description of the proposed action and the affected environment in the EIS.

This information is needed in accordance with 10 CFR 51.45(b), which requires that the ER include a description of the affected environment.

Response to RAI AQ-2:

The native files (Excel™ spreadsheets) containing the meteorological data in Attachment A of SAR Chapter 2 is provided in Enclosure 13, as requested.

Impact:

No change as a result of this RAI.

RAI AQ-3

Supplement the regional characterization of the annual air emissions by:

- Expanding the current emission estimates in ER Table 3.6-8 to include (i) particulate matter PM_{10} and non-radiological hazardous air pollutants emission estimates and (ii) emissions data from New Mexico where some of the proposed action activities might occur.
- Addressing future estimated regional emissions over the 40-year timeframe of the proposed action (e.g., how the current emission estimates in ER Table 3.6-8 are expected to change over time).
- If available, addressing both current and future air emissions from the existing WCS site activities.

ER Table 3.6-8 provides current annual emissions for some criteria pollutants for Andrews County and the State of Texas. However, this table does not include estimates for particulate matter PM_{10} or non-radiological hazardous air pollutants. Also, this table does not include emission estimates from New Mexico, where a portion of the proposed action's activities, the construction of the CISF railroad side track, might occur (see RAI PA-2). Finally, ER Table 3.6-8 only presents a snapshot of current conditions and does not address regional emissions over the 40-year lifetime of the proposed action. Specifically, the regional annual air emissions are needed, including key air emissions (e.g., particulate matter PM_{10}), to support the NRC staff's characterization of the environment where the proposed action's activities occur over the lifetime of the proposed action. The ER does not provide the air emission generated by the existing WCS facilities, which are located in close proximity to the proposed CISF site.

This information is needed in accordance with 10 CFR 51.45(b), which requires that the ER include a description of the affected environment.

Response to RAI AQ-3:

Emissions of PM_{10} and non-radiological hazardous air pollutants (HAPs) as defined by the Federal Clean Air Act have been included for this response and are included in replacement ER Table 3.6-8.

The rail spur that was planned to be partially constructed in New Mexico has been removed from the overall project. Therefore, there is not a need to expand the current emissions estimates found within ER Table 3.6-8 to include emissions data from the state of New Mexico as no permitting or construction activities will take place there.

The most recently available emission data for the State of Texas and Andrews County are contained within the Environmental Protection Agency's (EPA's) National Emission Inventory database. The most recently available data for the National Emission Inventory is from 2014. The next cycle of Emission Inventory data is for 2017, but will not be available until March 31, 2020 at the earliest according to EPA.

Based on currently available data, emission increase trends were determined and applied to 2014 baseline data and increased every five years until 2059 (assuming the CISF closes in 2061). Emissions of CO, NO_X, PM_{10}, $PM_{2.5}$, and SO_2 experienced a decline based on data trends from 2002-2014. As a conservative assumption, a 1% increase was applied every year to these pollutants. Emissions of volatile organic compounds (VOCs) and HAPs have shown an increase based on available data and this exercise uses trends determined from these datasets to estimate future emissions of these pollutants. Estimations of projected area emissions for Andrews County and the State of Texas are included in revised ER Table 3.6-8.

Emissions of pollutants at the existing Waste Control Specialists site in Andrews County have remained largely consistent from year to year for regulated pollutants. Depending upon customer demands and the amount of waste received year to year, there may be slight variation in the amount of emissions that originate from the existing site due to waste processing and earthmoving operations within the landfills. ISP and Waste Control Specialists do not expect to expand the site beyond what is presently authorized and what is proposed in this NRC filing for the foreseeable future. Actual annual emission totals from the last five years (2013-2018) at the existing Waste Control Specialists site are included in Table AQ-3-1.

Section 3.6 has also been updated to point to ER Section 4.6 where more air quality information can be found.

Table AQ-3-1
Existing Site Actual Annual Emissions (tpy) - 2013-2018

Pollutant	2013	2014	2015	2016	2017	2018
NOx	0.30	0.30	0.68	1.66	1.18	0.99
CO	0.11	0.11	0.18	0.37	0.26	0.22
SO_2	0.02	0.02	0.05	0.12	0.08	0.07
PM_{10}	3.90	3.67	5.33	5.40	1.02	8.25
$PM_{2.5}$	0.55	0.51	0.77	0.85	0.20	1.20
VOC	1.25	1.43	1.26	2.22	0.75	0.68

Notes:

NO_X = Nitrogen oxides; CO = Carbon monoxide; SO_2 = Sulfur dioxide; PM_{10} = Particulate Matter less than 10 microns; $PM_{2.5}$ = Particulate Matter less than 10 microns; VOC = Volatile Organics Compound

Impact:

ER Section 3.6 and Table 3.6-8 have been revised as described in the response.

RAI AQ-4

Characterize the potential air emissions based on the entire range of the proposed action's emission sources. Consideration should be given, but not limited, to the following:

- Combustion emissions from mobile sources, including onsite, local, and national (i.e., SNF) transportation.
- Combustion emissions from cross-country transport of precast concrete pieces to the proposed site if an onsite concrete batch plant is not used.
- Emissions from the railroad side track construction, if not already included.

ER Section 1.3.2.3 indicates that mobile sources (e.g., train, heavy haul trucks, transporters, and private vehicles) were not included as part of the air quality impact analyses because these sources are not regulated by TCEQ.

ER Section 2.2.2.6 states that if an onsite concrete batch plant is not constructed, then precast concrete pieces will be transported cross country to the proposed WCS site. Potential emissions from this activity were not included in the ER analyses.

ER Section 3.2.3 states that a railroad side track will be constructed. It is unclear if emissions from this activity were included in the project emission estimates described in ER Section 4.2.1. This information is needed to accurately characterize the entire range of emission sources and project emissions from the proposed action in the EIS.

This additional information is needed in accordance with 10 CFR 51.45(b), which requires that the ER include a description of the proposed action and its potential impacts on the environment.

Response to RAI AQ-4:

Emission estimates for the construction and operational phases of the CISF have been quantified and are included in updated ER Section 4.6. The emission estimates are calculated in Excel™ Spreadsheet T190815_EMISSIONS ESTIMATES.xlsx, which is provided in Enclosure 13 for staff use. Emission factors are taken from the EPA's AP-42 [1], Chapter 3.3 (Gasoline and Diesel Industrial Engines) and Chapter 11.9 (Western Surface Coal Mining). Emissions estimated include those of the combustion products from equipment and vehicles and fugitive particulate matter from earthmoving during construction and operations. Estimates include the construction of the buildings and the rail side track to be built in Texas. Rail construction in New Mexico has been eliminated from the project.

Emissions regarding spent nuclear fuel (SNF) transportation are discussed in ER Section 4.2.9.

Emissions from cross-country transportation of precast concrete pieces has been eliminated from this project. Concrete construction will take place on site using Ready-Mix trucks from local vendors. Emissions from these activities have been quantified for this project.

An emission factor for pollutant $PM_{2.5}$ from internal combustion engines is not provided in AP-42 Chapter 3.3, only emissions of PM_{10}. In an effort to fully demonstrate emissions from the project and compliance with National Ambient Air Quality Standards (NAAQS), emissions of $PM_{2.5}$ have been conservatively set as equal to emission of PM_{10} for internal combustion engine sources.

Emissions from the proposed CISF are not expected to fall into the major source category, and therefore the site is considered to be a minor source for air pollutants. The site will not be required to obtain a Federal Operating Permit under 30 TAC §122 (Title V Permit) or a Prevention of Significant Deterioration (PSD) permit for operation.

References:

1. EPA (1995), (Environmental Protection Agency), “Compilation of Air Pollutant Emission Factors, Volume 1, Stationary Point and Area Sources,” Fifth Edition AP-42, January 1995.

Impact:

ER Section 4.6 has been revised and Tables 4.6-1, 4.6-2, 4.6-3, and 4.6-4 have been added as described in the response.

RAI AQ-5

Characterize the peak year emission levels. Consideration should be given, but not limited, to the following:

- Overlap of the various stages (i.e., construction, operation, and decommissioning) within the framework of the planned eight phases.
- Distinctions in construction emission levels between Phase 1 and subsequent phases.
- Individual pollutants other than just particulate matter (e.g., other criteria pollutants, volatile organic compounds, non-radiological hazardous air pollutants) because the peak year for particulate matter could be different than the peak year for other pollutants.
- Complete range of emission sources and activities associated with the proposed action (see RAI AQ-4).
- Provide estimated emission levels (e.g., tons per year) for the activities and sources associated with the proposed CISF accounting for the various topics raised in the previous bullet points specified in this RAI (i.e., individual stages, overlapping of stages and phases, pollutants other than particulate matter PM_{10}, range of emission levels) or provide a basis for not providing any aspects of this information.

ER Section 1.3.2.3 identifies that both the construction and the operation activities generate air emissions. ER Section 4.5.3 states that the CISF could be built in eight phases and indicates that this phased approach means that construction and operation activities could overlap at times. ER Section 4.5.3 also indicates that the first phase would also include site infrastructure construction (e.g., facilities, the railroad side track, possibly a new concrete batch plant). The air impact analysis in ER Section 4.6 (i) does not clearly identify the proposed action's highest annual or peak year emissions considering the possible overlap of stages (i.e., construction, operation, and decommissioning) or phases as well as the distinction in construction emission levels between Phase 1 and the subsequent phases, (ii) only considers particulate matter, (iii) does not consider combustion emissions from mobile sources, and (iv) only provides estimated annual emission levels for the concrete batch plant (note that these emission level estimates in ER Table 4.6.2 do not specify units). The EIS analyses need to consider the peak year emission levels since this relates to the largest potential impacts from the proposed action.

This information is needed in accordance with 10 CFR 51.45(b)(1), which requires that the ER include a description of the proposed action and its potential impacts on the environment.

Response to RAI AQ-5:

Emission estimates have been developed for construction and operations activities at the CISF and may be found in Tables 1-9 of Excel™ Spreadsheet T190815_EMISSIONS ESTIMATES.xlsx included as an Enclosure referenced in RAI Response AQ-4. Emissions are broken down by equipment/activity type and are based on the construction phase and operations year.

The majority of emissions associated with the CISF are estimated to take place during the initial construction phase (Phase 1) and will constitute the project's "peak year" emissions (Table 7 of Excel™ Spreadsheet T190815_EMISSIONS ESTIMATES.xlsx). Phase 1 construction is expected to begin in 2021. Each subsequent construction phase is expected to have the same level of emissions and will take place approximately every 2 to 3 years starting in 2024. Operations emissions are expected to remain the same from year to year (Table 8 of Excel™ Spreadsheet T190815_EMISSIONS ESTIMATES.xlsx) and will overlap construction Phases 2-8 (Table 9 of Excel™ Spreadsheet T190815_EMISSIONS ESTIMATES.xlsx). Figure AQ-5-1 illustrates emission estimates by pollutant for each phase of construction with the exception of CO_2, which is included in Table 7 of Excel™ Spreadsheet T190815_EMISSIONS ESTIMATES.xlsx.

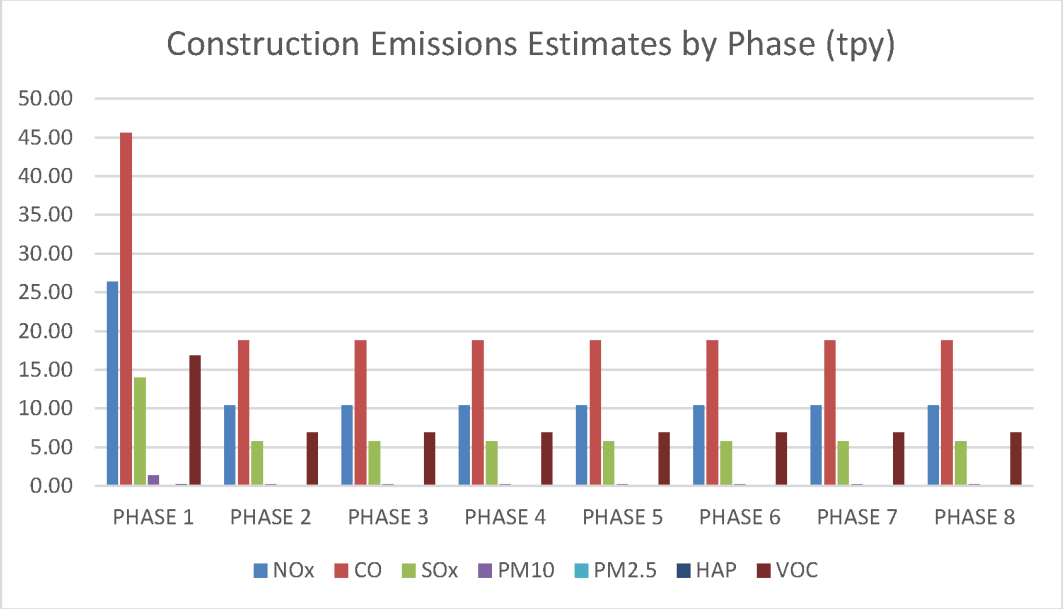

Figure AQ-5-1
Emission Estimates by Pollutant for Each Phase of Construction for the CISF

Table 7 of Excel™ Spreadsheet T190815_EMISSIONS ESTIMATES.xlsx is an emission summary of pollutants that are estimated for all construction phases of the project. Table 8 of Excel™ Spreadsheet T190815_EMISSIONS ESTIMATES.xlsx includes emission calculations for routine operations at the site with an emission summary pollutants. Table 9 of of Excel™ Spreadsheet T190815_EMISSIONS ESTIMATES.xlsx is a summary of emissions from year-to-year, including overlaps of emissions from construction and operations activities for the projected life of the site.

Decommissioning emissions will be negligible. Facilities will be surveyed, decontaminated if necessary, and abandoned in place.

Impact:

No change as a result of this RAI.

RAI AQ-6

Provide a greater level of detail for the site-specific air dispersion modeling. Examples of additional information to provide include, but are not limited to, the following:

- Estimated emission levels for the various pollutants generated by the proposed CISF activities that were used as input for the air dispersion modeling.
- Details about the emission inventory assumptions, inputs, and calculations (e.g., types and number of emission sources, horsepower, load factors, and emission factors).
- Baseline ambient air concentrations.
- Air dispersion modeling results, which allow for comparison to the various National Ambient Air Quality Standards (NAAQS) and Prevention of Significant Deterioration (PSD) thresholds.
- Basis for why the air dispersion modeling did not include (i) pollutants other than particulate matter PM_{10}, and (ii) sources other than fugitive dust from construction.
- Identify who conducted the air dispersion modeling and when it was conducted.

ER Sections 4.2.1 and 4.6 state that air dispersion modeling was conducted to assess impacts of the proposed CISF. However, information in the ER concerning the modeling input is limited and did not include the emission inventory used as input for the modeling. ER Section 4.6 stated that construction stage particulate matter PM_{10} emission were below the NAAQS. However, the analyses in the ER did not (i) provide the actual modeling results, (ii) compare the results to PSD thresholds, (iii) provide baseline ambient pollutant concentrations for inclusion in the NAAQS assessment, or (iv) explain why the air dispersion modeling was limited to the particulate matter PM_{10} emissions from fugitive dust from the construction stage. The requested detailed information provides a basis for characterizing the quality of the air dispersion modeling results.

This information is needed in accordance with 10 CFR 51.45(c), which requires that the ER include sufficient data to aid the NRC in its development of an independent analysis.

Response to RAI AQ-6:

Air quality dispersion modeling was conducted for construction and operations at the proposed CISF using the Environmental Protection Agency's (EPA's) AERMOD modeling system (version 15181), details for which can be found in the User's Guide for the AMS/EPA Regulatory Model (AERMOD) [1]. A general purpose meteorological preprocessor, the EPA's AERMET preprocessor (version 16216), was used to enter available meteorological data into a format suitable for AERMOD. The User's Guide for the AERMOD Meteorological Preprocessor (AERMET) [2] provides instructions for setting up and running the AERMET preprocessor.

The dispersion calculations are based on emission estimates generated in the spreadsheet included in ISP Response to RAI AQ-4. Each criteria pollutant was evaluated and compared to its respective National Ambient Air Quality Standard (NAAQS) and Significant Impact Level (SIL) for each pollutant's respective averaging period. Each source was evaluated using AERMOD version 15181 and AERMET version 16216 as previously discussed. Meteorological data for Andrews County, Texas, from the TCEQ was pre-processed in AERMET and used in the AERMOD model. Due to the relatively flat terrain associated with the proposed CISF, the model employed flat terrain for receptors and low wind speeds in AERMET for low-level sources.

On-road and non-road sources were evaluated as point sources using a 1 lb/hr basis to create a unit impact multiplier in units of (µg/m³)/(lb/hr), to which estimated emissions were applied. Each point source used similar stack parameters and varying exit velocities based on engine horsepower. Emissions of nitrogen oxides (NO_x) were converted to nitrogen dioxide (NO_2) using EPA's Ambient Ratio Method 2 (ARM2) with a minimum of 0.5 and a maximum of 0.9. Emissions of sulfur oxides (SO_x) assumed a full conversion to SO_2. Since AP-42, the EPA's Compilation of Air Pollutant Emission Factors (EPA, 1995) does not provide diesel engine emission factor values for $PM_{2.5}$, only PM_{10} was evaluated for point sources.

Fugitive dust sources relating to earthmoving activities at the site were evaluated as volume sources using a 1 lb/hr basis to create a unit impact multiplier in units of (µg/m³)/(lb/hr), to which estimated emissions were applied. It is assumed that, in one hour, an area of approximately 417.5 feet by 20.5 feet of earth will be moved. Using these dimensions and the dimensions of the earthmoving equipment as a basis, a series of volume sources were developed, and the 1 lb/hr emission rate was divided evenly among these sources to determine the hourly impacts. Emissions of PM_{10} and $PM_{2.5}$ were evaluated for fugitive sources.

Background concentrations for each pollutant were determined using the most recently available data at the nearest air quality monitoring stations to the proposed CISF. Air monitors used for this evaluation include those that are part of the Texas Air Monitoring Information System (TAMIS) and are based in Odessa, Big Spring, Socorro, and El Paso, Texas.

Based on the modeled impacts of the construction and operations phases at the proposed CISF, it was determined that NAAQS have been met for each criteria pollutant for their respective averaging periods. Compliance with NAAQS is demonstrated in the spreadsheet included in ISP Response to RAI AQ-4.

Since the emissions from the construction and operations phases of the proposed CISF are not expected to achieve major source thresholds and are located in an area in attainment with NAAQS, an evaluation of the impacts from this project was not conducted with regard to Prevention of Significant Deterioration (PSD) requirements as it will not trigger said requirements. A demonstration of impacts with regard to both the SIL and the NAAQS standard are sufficient to demonstrate compliance for the purpose of minor source permitting.

ER Sections 3.6.9 and 4.2.1 were updated to provide reference to sections that reflect this discussion.

References:

1. EPA (2018) (Environmental Protection Agency), “User’s Guide for the AMS/EPA Regulatory Model (AERMOD),” EPA-454/B-18-001, April 2018. Available from: www.epa.gov/scram/air-quality-dispersion-modeling-preferred-and-recommended-models#aermod

    1. EPA (2018) (Environmental Protection Agency), “User’s Guide for the AERMOD Meteorological Preprocessor (AERMET),” EPA-454/B-18-001, April 2018. Available from: www.epa.gov/scram/meteorological-processors-and-accessory-programs#aermet

Impact:

ER Sections 3.6.9 and 4.2.1 have been revised as described in the response.

RAI AQ-7

Revise the air quality impact analyses as appropriate to address the following:

- The entire range of emission sources associated with the proposed action as described in RAI AQ-4.
- The peak year emission levels as described in RAI AQ-5.
- Pollutants other than particulate matter PM_{10} (e.g., other criteria pollutants, volatile organic compounds, non-radiological hazardous pollutants).

ER Section 1.3.2.3 identifies two primary types of air emissions associated with the proposed action: combustion emissions from construction equipment and fugitive dust from excavation activities and construction equipment. However, the air quality impact analyses in ER Section 4.6 is limited to fugitive dust. The EIS impact analyses need to consider the entire range of emission sources (see RAI AQ-4), the peak year emission levels (see RAI AQ-5), as well as the entire range of pollutants generated by the proposed CISF to accurately characterize the air quality impacts. If additional air dispersion modeling is conducted in response to this RAI, consideration should be given to the information requests in RAI AQ-6 associated with the existing air dispersion modeling.

This additional information is needed in accordance with 10 CFR 51.45(b) and (b)(1), which require that the ER include a description of the proposed action and discuss the impacts of the proposed action.

Response to RAI AQ-7:

Emission estimates for the construction and operational phases of the proposed CISF have been quantified and may be found in the spreadsheet included in the ISP response to RAI AQ-4. Emission factors are adopted from the EPA's AP-42 [1], Chapter 3.3, "Gasoline and Diesel Industrial Engines" and Chapter 11.9, "Western Surface Coal Mining." Emissions estimated include those of the combustion products from equipment and vehicles and fugitive particulate matter from earthmoving during construction and operations.

As presented in the ISP response to RAI AQ-5, the majority of emissions associated with the proposed CISF are estimated to take place during the initial construction phase (Phase 1) and will constitute the project's peak year emissions.

References:

1. EPA (Environmental Protection Agency), "Compilation of Air Pollutant Emission Factors, Volume 1, Stationary Point and Area Sources, Fifth Edition AP-42, January 1995.

Impact:

No change as a result of this RAI.

RAI AQ-8

Provide a technical basis for the assumption of a 50-percent reduction in emissions from dust suppression, given that various factors influencing the level of dust suppression activities are yet to be determined (e.g., identifying the specific mitigation measures that would be implemented). If a different efficiency value is warranted, then specify the value, provide a basis, and revise the emission inventory and impact analyses accordingly.

ER Section 4.6 states that the air emission inventory used for assessing impacts assumes a 50-percent reduction in fugitive dust emissions for dust suppression activities. However, the ER does not identify the actual, specific mitigation measure that would be implemented or the basis for the using this 50 percent value. Other ER text identifies several factors that influence the level of dust suppression activities: water conservation (see ER Section 4.2.3), possible requirements from an air permit, which has not yet been obtained (see ER Section 1.3.2.3), and implementation of a Best Management Emission Control Plan, which has not yet been developed (see ER Section 1.3.2.3). Providing a basis for the effectiveness of the dust suppression mitigation allows for an accurate characterization of the air emissions and associated impacts.

This additional information is needed in accordance with 10 CFR 51.45(c), which requires that the ER include sufficient data to aid the NRC in its development of an independent analysis.

Response to RAI AQ-8:

Surfaces throughout the proposed CISF will be watered in regular intervals to reduce fugitive dust emissions during the construction phase of the project. TCEQ's emission calculation workbook for rock crushing plants [1], allows regulated entities to claim a 50% reduction in emissions for "wet material." Since the fugitive dust that is expected to be emitted at the site is similar to the fugitive dust at similar plants around the state of Texas that adhere to this calculation methodology, it is an appropriate reduction to apply to fugitive dust emissions at the site. ER Section 4.2.3 has been revised to reflect this discussion and for consistency with ISP response to RAI PA-2.

References:

1. TCEQ (Texas Commission on Environmental Quality), "Rock Crushing Facility Emission Rate Calculation Worksheet" [Microsoft Excel spreadsheet], APDG6490v1 (Version 1.0), Last updated February 19, 2019. Available from: https://www.tceq.texas.gov/assets/public/permitting/air/Guidance/NewSourceReview/emiss-calc-rock1.xlsx

Impact:

ER Section 4.2.3 has been revised as described in the response.

CLIMATE CHANGE (CC)

RAI CC-1

Address the following aspects of climate change and the proposed action's greenhouse gas emissions:

- Describe any relevant regional, state, or local goals or laws that address climate change.
- Characterize the proposed action's greenhouse gas emission levels from stationary, mobile (e.g., onsite, local, and national), and indirect sources.
- Disclose whether any mitigation, project design, or adaptation measures will be implemented to address greenhouse gas emissions from the proposed action.
- Describe any areas where the environmental impacts of climate change overlap with the environmental impacts of the proposed action (e.g., water usage and availability).

The discussion of greenhouse gas emissions is limited to text in ER Section 8.5, citing NUREG–2157, and states that the proposed action's emission would be small but would add to the overall atmospheric burden of emissions that could contribute to potential long term impacts (NRC, 2014). The EIS needs to address the project's greenhouse gas emissions and the potential overlap of environmental impacts from climate change and the storage of SNF at the WCS site.

This additional information is needed in accordance with 10 CFR 51.45(b) through (d), which require that the ER include: a description of the proposed action and the environment affected; a discussion of the impacts of the proposed action; sufficient data to aid the NRC in its development of an independent analysis; and a description of the status of compliance with applicable environmental quality standards and requirements, including limitations and requirements which have been imposed by Federal, State, regional, and local agencies having responsibility for environmental protection.

Response to RAI CC-1:

On January 2, 2011, EPA began requiring sites that are major sources of Greenhouse Gases (GHGs) to obtain permits under federal Title V and Prevention of Significant Deterioration (PSD) rules, which the State of Texas adopted in adopted in Title 30 Texas Administrative Code (TAC), Chapter 116, Subchapter B, Division 6. The threshold for being considered a major source of GHGs is 75,000 tons per year (tpy) of carbon dioxide (CO_2) equivalents (CO_{2e}), as outlined in 30 TAC § 116.164. On June 23, 2014, the United States Supreme Court held in Utility Air Regulatory Group v. EPA, 573 U.S. 302(2014), that sites cannot be compelled to obtain such permits unless other pollutants that are regulated trigger such major source permitting as well, invalidating the existing "Tailoring Rule" that EPA had developed for evaluating sources for GHG PSD applicability based on GHGs alone. The proposed CISF does not exceed major source thresholds for GHGs or other regulated pollutants and is therefore not subject to such rules. ISP is not aware of any local GHG laws or rules.

The Greenhouse Gas Reporting Program (GHGRP) is an annual reporting program of the EPA promulgated under 40 CFR Part 98. Sources of GHG emissions that exceed 25,000 metric tons (mt) of CO_{2e} are required to report their actual emissions of GHGs annually to the EPA. Since the proposed CISF does not exceed the 25,000 mt CO_{2e} reporting threshold, rules promulgated under 40 CFR Part 98 do not apply to the CISF site and reporting is not required.

Emission estimates of the GHG CO_2 have been quantified for construction and operations at the CISF site. Peak CO_2 emissions are estimated to occur during Phase 1 of the construction process and are not expected to exceed 7,849.33 tpy, well below the threshold of 75,000 tpy CO_{2e}. Emission estimates are based on factors found in EPA's AP-42 Chapter 3.3, and may be found in Excel™ Spreadsheet T190815_EMISSIONS ESTIMATES.xlsx included in RAI Response AQ-4. Emissions of GHGs are considered to be a minimal contribution to the overall emissions of the site, and existing engine manufacturer design and controls provide sufficient reductions to minimize emissions. Therefore, no further mitigation, project design, or adaptation measures are included with this project, and no significant overlap with climate change impacts is expected from a GHG emissions perspective.

ER Section 8.5 has been updated to incorporate the above discussion about GHGs and to point to ER Section 4.6 for emission estimates based on factors found in EPA's AP-42 Chapter 3.3.

References:

1. EPA (Environmental Protection Agency)," Compilation of Air Pollutant Emission Factors," Volume 1, Stationary Point and Area Sources, Fifth Edition AP-42, January 1995.

2. Federal Register, "Greenhouse Gas Reporting Rule," EPA 40 CFR Part 98, October 22, 2015.

Impact:

ER Section 8.5 has been revised as described in the response.

NOISE (NOI)

RAI NOI-1

Provide current information on measured background or ambient noise levels at the proposed CISF.

ER Sections 3.7.1 and 4.7.3 provide information on background noise levels at the neighoring URENCO facility measured in September 2003. In ER Section 4.7.3, ISP assumes that the measured September 2003 background noise levels at URENCO would be similar to current background noise levels at the proposed ISP CISF. Current site-specific information on background noise levels is necessary to describe the affected environment and establish background/ambient (baseline) conditions of the site so that the NRC staff can evaluate the impacts of construction and operation of the proposed CISF.

This additional information is needed in accordance with 10 CFR 51.45(b) and (b)(1), which require that the ER include a description of the affected environment and a discussion of the impacts of the proposed action.

Response to RAI NOI-1:

ISP performed an acoustical analysis of the background sound levels in July of 2019 in areas surrounding the proposed CISF. Measurements were taken at and around the existing Waste Control Specialists facility and in and around the city of Eunice, NM. Roadway traffic is the primary noise contributor at all locations monitored.

In general it was found that the Noise Sensitive Areas (NSA) in Eunice, NM, which are nearest to the proposed CISF are also very near to highways NM 176 and NM 18, as well as the gas plant located on the south side of the city. These Eunice NSA measurements possess elevated background levels above L_{dn} 55. At the current northeast corner of Eunice, NM, sound levels are more moderate. The EPA's 1974 recommendation for residential communities is L_{dn} 55. Sounds originating at the CISF are unlikely to be audible in Eunice and are not expected to exceed the EPA's recommended guideline.

NSAs along the western Waste Control Specialists property line are in the 30s and 40s L_{dn}. Construction is likely to be generally audible at these locations. Operations at the CISF are expected to only be audible from time to time. The EPA's 1974 recommendation for industrial sites, as well as for "Farm Land and General Unpopulated Land" is L_{dn} 70. Sounds originating at the CISF are not expected to exceed the EPA's recommended guideline.

ER Sections 3.7.1 and 4.7.2 and 4.7.3 have been revised to include the above information. Section 9 has also been updated to include add: Nelson Acoustics. (2019). "Noise Assessment for ISP CISF," Austin, TX as a reference document for the ER.

References:

1. Nelson Acoustics, "Noise Assessment for ISP CISF," Austin, TX, 2019.

Impact:

ER Sections 3.7.1, 4.7.2, 4.7.3 and 9.0 have been revised as described in the response.

RAI NOI-2

Provide estimates of peak noise levels that would be generated during construction and operation of the proposed CISF, for example, estimates of peak noise levels generated by vehicular and rail traffic, construction and operational equipment, and ancillary activities such as operation of the concrete batch plant.

ER Section 4.7.1 concludes that, "(p)redicted noise levels, background noise levels, calculated construction noise levels, and operational noise levels should typically be well below both HUD and Environmental Protection Agency (EPA) guidelines." However, the ER should estimate peak noise levels that would be generated during construction and operation of the proposed CISF to support this conclusion. Estimates of peak noise levels generated during construction and operation are needed to support the NRC staff's evaluation of potential noise impacts to offsite and onsite receptors.

This additional information is needed in accordance with 10 CFR 51.45(b) and (b)(1), which requires that the ER include a description of the affected environment and a discussion of the impacts of the proposed action.

Response to RAI NOI-2:

ISP performed an acoustical analysis of the background sound levels in July of 2019 in areas surrounding the proposed CISF [1]. This formed the basis for determining estimates of noise levels that would be generated during construction and operation at the proposed CISF. Estimates were performed for nine noise-sensitive areas (NSA) around the proposed CISF and the city of Eunice, NM. New ER Figures 4.7-1 and 4.7-2 have been added to provide the locations for each of the NSAs.

Equipment types and counts were based on the types and quantity of equipment used for the air quality evaluation performed in the ISP Response to RAI AQ-5. Additional noise sources related to mechanical equipment associated with the CISF Security and Administration Building and the Cask Handling Building. In addition, noise from vehicle backup alarms were added (Reference [1]).

A-weighted sound power level and temporal usage factors for construction vehicles were obtained from the Federal Highway Administration's Road Construction Model [2]. Typical construction octave band spectral shapes and Sound Power Levels for other equipment were obtained from various resources as stated in the report [1]. Noise emission levels from the Waste Control Specialists locomotive were extracted from direct measurements performed during the site visit. Factors for geometric divergence and excess attenuation due to air and ground absorption were computed in accordance with ISO 9613-2 [3], then applied to yield sound pressure level estimates. No credit was taken for intervening terrain or material stockpiles that could further reduce offsite levels since occasional weather conditions can cause these barriers to be bypassed.

During construction, increased sound levels may be noticeable from directly neighboring facilities (URENCO, Sundance Services, and Permian Basin Materials), especially during Phase 1 construction. During operation of the facility, the nominal average sound levels increase primarily due to the potential of the passage of an additional train per day. The day-night average sound level, L_{dn}, which is the average noise level over a 24-hour period, for construction and operation is well below the Environmental Protection Agency (EPA) guideline for industrial land use.

Residents of Eunice will be unable to hear construction activities during any phase of construction due to the relatively high level of traffic noise already in the area. During operation the nominal average sound levels increase primarily due to the potential passage of an additional train per day adjacent to Eunice. The L_{dn} at the proposed CISF during construction and operation are well below both the EPA guideline for residential properties and prevailing background levels.

Estimated L_{dn} values during construction and operation of the proposed CISF have been provided in New ER Tables 4.7-1, 4.7-2, and 4.7-3.

ER Section 4.7 has been updated to reflect this discussion.

The concrete batch plant has been eliminated from the proposed CISF as discussed in the ISP response to RAI PA-2, so it was not considered for the noise evaluation.

References:

1. Nelson Acoustics, “Noise Assessment for ISP CISF,” Austin, TX, 2019.

2. Federal Highway Administration (FHWA),” FHWA Roadway Construction Noise Guide Users’s Manual,” FHWA-HEP-05-054, January 2006.

3. International Organization for Standardization (ISO), “Acoustics – Attenuation of Sound During Propagation Outdoors – Part 2: General Method of Calculation,” ISO 9613-2, December 1996.

Impact:

ER Sections 4.7 and 9.0 have been revised, and Tables 4.7-1, 4.7-2, and 4.7-3 and Figures 4.7-1 and 4.7-2 have been added as described in the response.

RAI NOI-3

Provide information on peak noise to workers during construction and operation of the proposed CISF. This information should include:

- Estimated peak noise levels that workers would be exposed to.
- Comparison of estimated peak noise levels to workers with Occupational Safety and Health Administration (OSHA) regulatory limits.
- Mitigation measures that would be implemented to reduce noise levels to workers.

The ER should assess the environmental impacts of noise to workers during construction and operation of the proposed CISF. Specifically, estimates of peak noise levels that workers will experience during construction and operation of the proposed CISF are needed to support the NRC staff's evaluation of noise impacts to onsite receptors.

This additional information is needed in accordance with 10 CFR 51.45(b) and (b)(1), which requires that the ER include a description of the affected environment and a discussion of the impacts of the proposed action.

Response to RAI NOI-3:

The acoustical analysis performed for ISP in July of 2019 [1] estimated the maximum noise levels to workers that would occur during construction and operation of the proposed CISF. Personnel noise exposure is a function of the shift average sound pressure level $L_{A,EQ}$, identical to time-weighted average (TWA) as defined by the Occupational Safety and Health Administration (OSHA) for continuous noise sources, and slightly less for the sources contemplated in the report. OSHA regulations per 29 CFR 1910.95 Table G-16 require that personnel do not receive an unprotected noise dose in excess of 90.0 dBA for an 8-hour shift and 88.4 dBA for a 10-hour shift.

Some of the estimated A-weighted (adjusted sound levels to express relative loudness of sounds in air as perceived by the human ear) work area sound levels exceed 90 dBA in large part because of backup alarms. Generic backup alarms are typically 115 dBA at 4 feet, which is usually considerable more than necessary to assure awareness of moving vehicles.

Estimated shift-average construction levels are high especially in the work areas for the buildings due to the amount of equipment active in a relatively small area. Levels are lower on the more extended areas (General Earthwork, Protected Area, Storage Pad Construction). Levels are dependent on the assumed source sound power levels and utilization percentages.

New ER Tables 4.7-4, 4.7-5, and 4.7-6 provide estimated TWA and Shift-Maximum (L_{pA}) sound levels for construction and operation of the proposed CISF.

Based on the estimated noise levels, hearing protection is recommended for most of these activities (TWA>80 dBA). Noise reduction ratings (NRRs) of hearing protectors should be capable of reducing at-the-ear exposure to 85.0 dBA (8-hour, Operation) and 83.2 dBA (10-hour, Construction). For maximum sound levels (L_{pA}) there is not an explicit OSHA limitation. The maximum sound levels occur on rare occasions when everything at a facility/operation occurs at the exact same time. The TWA are based on the fact that noise producing activities are starting and stopping for the given utilization and the maximum sound levels are included in the TWA.

ER Section 4.7 has been updated to reflect this discussion.

References:

1. Nelson Acoustics, “Noise Assessment for ISP CISF,” Austin, TX, 2019.

Impact:

ER Section 4.7 has been revised and ER Tables 4.7-4, 4.7-5, and 4.7-6 have been added as described in the response.

CULTURAL AND HISTORIC RESOURCES (CHR)

RAI CHR-1

Clarify whether additional historic and cultural resources identification work, surveys, and Federal, State, or Tribal agency coordination will be needed prior to construction and operation of the proposed CISF because of construction activities potentially extending into New Mexico. If so, provide a description of the identification work, surveys, and agency coordination that would need to be completed and an anticipated schedule.

In response to its review of ISP's archeological survey of the proposed CISF site, the New Mexico State Historic Preservation Officer (NM SHPO) stated, "The SHPO concurs that no additional cultural resources identification efforts are needed for this undertaking with the condition that all new ground-disturbing and construction activities are confined to Texas. If, however, any construction related ground disturbances such as staging areas, equipment or materials storage yards, or access roads are needed in New Mexico, then a cultural resource survey will be required to identify and evaluate historic properties in the area of potential effects." (see ER Appendix A, Attachment 3-3). Figures in the ER and SAR show that the railroad side track to be built as part of the proposed CISF would extend into New Mexico (e.g., ER Figures 3.3-1, 3.6-1, 4.5-1, 4.12-1, and 6.1-1 and SAR Figures 1-1, 1-2, and 2-1). Therefore, the route of the railroad side track would result in new ground-disturbing and construction activities in New Mexico. Specifically, the requested information is needed to support the NRC staff's evaluation of applicable agency coordination and consultation requirements and complete the NRC staff's description of the affected environment and assessment of environmental impacts on cultural and historic resources in the EIS.

This additional information is needed in accordance with 10 CFR 51.45(b) and (d), which require that the ER include a description of the affected environment and a description of the status of compliance with applicable environmental quality standards and requirements, including limitations and requirements which have been imposed by Federal, State, regional, and local agencies having responsibility for environmental protection.

Response to RAI CHR-1:

As of June 2019, ISP no longer plans to include project elements located in New Mexico; the project will be entirely confined to the state of Texas. See RAI Response PA-1 regarding removal of the New Mexico rail side track from the project and updates to the ER.

Impact:

No Changes as a result of this RAI.

RAI CHR-2

Provide a copy (electronic or website link) of the draft report or final report, if prepared, for the archeological survey conducted in May 2015 to inventory and evaluate archeological resources within the footprint of the proposed CISF.

ER Section 3.8.2 states that, "In May 2015, a pedestrian archeological survey was completed in order to inventory and evaluate archeological resources on private land within the footprint of the proposed spent nuclear fuel CISF at the existing Waste Control Specialists waste disposal facility in western Andrews County, Texas." Information in ER Appendix A and D, indicates that the draft report for this survey entitled, "Intensive Archeological Survey of the Proposed Waste Control Specialists Spent Nuclear Fuel Consolidated Interim Storage Facility, Andrews County, Texas," was submitted for review to the Texas Historical Commission (THC) on July 2, 2015. The requested information is needed to support the NRC staff's description of the affected environment and assessment of environmental impacts on cultural and historic resources in the EIS.

This additional information is needed in accordance with 10 CFR 51.45(b) and (b)(1), which requires that the ER include a description of the affected environment and a discussion of the impacts of the proposed action.

Response to RAI CHR-2:

The archeological survey completed in 2015 for the WCS CISF titled Intensive Archeology Survey of the Proposed WCS CISF in Andrews County, TX has been added to the ER as Attachment 3-4. In addition, Section 3.8.2 has been updated to point to Attachment 3-4 for the report.

A previous cultural resource survey was completed in 1994 for the neighboring Waste Control Specialists Facility. The 1994 survey and 1994 and 2004 "No Effect" confirmation letters from the Texas Historical Commission have been incorporated into the ER as Attachment 3-5. In addition, Section 3.8.3 has been updated to point to Attachment 3-5 for the report.

The 2015 survey defined the Area for Potential Effect (APE) as a footprint of 216 acres, which covers the entire Protected Area (PA), where a majority of ground disturbance activities are expected. The 2015 APE covers 44% of the Owner Controlled Area (OCA), where limited ground disturbance beyond the footprint is planned.

Impact:

ER Sections 3.8.2 and 3.8.3 and Attachments 3-4 and 3-5 have been revised as described in the response.

SOCIOECONOMICS (SOC)

RAI SOC-1

Provide tax revenue information on a county and state level over a 40-year period.

Appendix A of the ER provides estimated employee compensation and regional tax impacts of the proposed CISF between 2019 and 2028. The iMpact analysis for PLANning (IMPLAN) model was run for a period of 20 years; however, ISP is requesting a license for a term of 40 years. This additional information is needed to evaluate the potential socioeconomic impacts on the states and the counties within the region during the requested license period.

This information is needed in accordance with 10 CFR 51.45(b)(1), which requires that the ER include a description of the impacts of the proposed action.

Response to RAI SOC-1:

Various assumptions within the Benefit-Cost Analysis (ER Chapter 7) were revised in response to RAIs CB-1 through CB-4, and many of these revisions affected the assumptions in the Socioeconomic Impact Analysis (ER Appendix A). As a result, the Socioeconomic Impact Analysis has been updated using 2017 IMPLAN data for Andrews County, TX. ER Appendix A Chapter 2 has been revised to incorporate this new information, including data through the 40-year license period and new tables that offer more detail or reformatted model results for easier review. This affected the following tables:

- Appendix A Table 2-2 (remains Appendix A Table 2-2)
- Appendix A Table 2-3 (remains Appendix A Table 2-3)
- Appendix A Table 2-4 (remains Appendix A Table 2-4)
- Appendix A Table 2-5 (now Appendix A Table 2-10)
- Appendix A Table 2-6 (now Appendix A Table 2-11)
- Appendix A Table 2-7 (now Appendix A Table 2-12)
- Appendix A Table 2-8 (now Appendix A Table 2-13)

The following tables are added:

- Appendix A Table 2-5: Total Estimated Annual Operating Costs at CISF – New table providing estimated annual operating costs for the CISF by expenditure category.
- Appendix A Table 2-6: Estimated Direct Impacts from Proposed Operations, 2020-2059 (2018 $) – New table with direct impacts from the IMPLAN model for each year of the license.

- Appendix A Table 2-7: Estimated Indirect Impacts from Proposed Operations, 2020-2059 (2018 $) – New table with indirect impacts from the IMPLAN model for each year of the license.

- Appendix A Table 2-8: Estimated Induced Impacts from Proposed Operations, 2020-2059 (2018 $) – New table with induced impacts from the IMPLAN model for each year of the license.

- Appendix A Table 2-9: Estimated Total Impacts from Proposed Operations, 2020-2059 (2018 $) – New table with total impacts from the IMPLAN model for each year of the license.

ER Appendix A Table 2-12 provides updated county and state taxes generated by the proposed action over its 40-year licensure (the standalone IMPLAN program does not disaggregate these data into separate state and local categories). ER Appendix A Table 2-13 provides updated data for federal tax revenue generated by operations at the proposed WCS CISF.

Impact:

ER Appendix A, including updated and new tables and figures, has been revised as described in the response.

PUBLIC AND OCCUPATIONAL HEALTH (POH)

RAI POH-1

Provide a map or figure showing monitoring locations for background radiation levels.

ER Section 3.11.1.1 (Background Radiation Levels at the CISF) provides monitoring results in Table 3.11-1, but should also include a figure showing the monitoring locations. Monitoring results should include information about the locations where the monitoring occurred. The requested information would allow the NRC staff to evaluate the applicability of measurements to the proposed CISF location.

This information is needed in accordance with 10 CFR 51.45(c), which requires ERs to contain sufficient data to aid the NRC in its development of an independent analysis.

Response to RAI POH-1:

ER Section 3.11.1.1 and ER Table 3.11-1 have been updated to include a reference to ER Figures 4.12-7, 4.12-8, and 4.12-9.

Impact:

ER Section 3.11.1.1 and Table 3.11-1 have been revised as described in the response.

RAI POH-2

Provide a map or figure of monitoring locations for historical exposures to radioactive materials.

ER Section 3.11.1.3 (Historical Exposure to Radioactive Materials at WCS) provides a table of monitoring results but should also include a map figure showing the monitoring locations. Monitoring results should include information about the locations where the monitoring occurred. The requested information would allow the NRC staff to evaluate the applicability of measurements to the proposed CISF location.

This information is needed in accordance with 10 CFR 51.45(c), which requires ERs to contain sufficient data to aid the NRC in its development of an independent analysis.

Response to RAI POH-2:

ER Section 3.11.1.3 and ER Table 3.11-3 have been updated to include a reference to ER Figure 4.12-10.

Impact:

ER Section 3.11.1.3 and Table 3.11-3 have been revised as described in the response.

WASTE MANAGEMENT (WM)

RAI WM-1

Provide generated waste volume estimates by waste type and facility lifecycle phase.

ER Section 3.12 (Waste Management) describes the wastes expected to be generated by the proposed action, including liquid (nonradioactive wastewater; sanitary) and solid waste (low-level radioactive waste, nonhazardous solid waste, hazardous waste). These descriptions do not provide information by lifecycle stage (i.e., construction, operations, decommissioning) and the expected volume of each waste that would be generated is not quantified. Volume estimates should be provided for any solid wastes that could be generated in larger than negligible quantities, for example:

- *Annual and cumulative volumes of nonhazardous solid waste that would be generated from the fabrication of 3,200 storage systems over 20 years (ER Section 3.12.1.3)*
- *Annual and cumulative volume of nonhazardous solid waste that would be generated during decommissioning*

The requested information will allow the NRC staff to evaluate the magnitude of potential waste management impacts for each proposed facility lifecycle stage. This includes impacts of waste generation on available capacity and operational life of disposal facilities.

This information is needed in accordance with 10 CFR 51.45(c), which requires ERs to contain sufficient data to aid the NRC in its development of an independent analysis.

Response to RAI WM-1:

ER Section 3.12 has been updated to include waste volume estimates for construction, operations, and decommissioning lifecycle phases of the CISF, with the specific volume estimates provided in new ER Tables 3.12-2, 3.12-3, and 3.12-4, respectively. The tables provide annual and cumulative volumes of nonhazardous solid waste, low-level radioactive solid waste, hazardous solid waste, and sanitary waste water (non-hazardous and non-radioactive). Cumulative lifetime waste volume estimates are provided in new ER Table 3.12-5.

Impact:

ER Section 3.12 has been revised and Tables 3.12-2, 3.12-3, 3.12-4, and 3.12-5 have been added as described in the response.

RAI WM-2

Provide additional information about the local municipal landfill and the WCS LLRW disposal facility, including the available capacity, annual disposed volume of waste, and currently projected operational life of these facilities.

ER Sections 3.12.1.3 (Solid Wastes) and 3.12.1.3.1 (Solid Low-Level Radioactive Waste) describe that nonhazardous solid waste and Low-Level Radioactive Waste (LLRW) would be disposed at a municipal landfill and the adjacent WCS LLRW facility, respectively, but provides no description of characteristics of these facilities. The characteristics of affected disposal facilities such as available capacity, annual disposed volume, and operational life will allow the NRC staff to evaluate the impacts of proposed waste generation on these facilities.

This information is needed in accordance with 10 CFR 51.45(c), which requires ERs to contain sufficient data to aid the NRC in its development of an independent analysis.

Response to RAI WM-2:

Low-level radioactive waste (LLRW) generated by the CISF would be sent to the Compact Waste Facility (CWF) within the Waste Control Specialists LLRW facility. The CWF is licensed to dispose of 9,000,000 cubic feet of waste over its lifetime. The facility, which opened in 2011, is currently in the first of nine planned phases of operation. As a phase nears its design capacity, the next phase will be constructed in order to provide available disposal capacity before the previous phase is full. The current phase (Phase 1 of 9) has a waste volume capacity of approximately 475,000 cubic feet. Existing waste volume (2019) in Phase 1 is approximately 200,000 cubic feet. The disposal rate for CWF is approximately 25,000 cubic feet per year. The remaining disposal capacity (constructed and planned) for the CWF is sufficient for the expected life of the CISF.

Hazardous waste generated by the CISF (See Response to RAI WM-4) would be sent to the Waste Control Specialists Resource Conservation and Recovery Act (RCRA) Subtitle C Landfill. The landfill is permitted to dispose of 62,370,000 cubic feet of waste over its lifetime. The facility was permitted in 1994 and has been operating for 24 years. The existing waste volume in the landfill is approximately 20,000,000 cubic feet (2019). The Landfill is constructed in phases ranging in size from approximately 3,000,000 cubic feet to 10,000,000 cubic feet. As currently constructed, the available airspace capacity is approximately 10,000,000 cubic feet (2019). New phases will be constructed as available airspace capacity is filled. The average annual receipt rate for the landfill is approximately 830,000 cubic feet. The remaining disposal capacity (constructed and planned) of the RCRA Landfill is sufficient for the expected life of the CISF.

The Lea County Landfill is the nearest municipal landfill and would be the first option for nonhazardous waste disposal. The landfill is permitted under New Mexico Solid Waste Bureau permit number SWM-130402. The facility was permitted in 1998 with a planned life of 80 years. The facility expands and constructs additional disposal area as needed. Currently, the facility has used approximately 75 acres of area for disposal with the ability to expand to 268 acres over its expected lifetime. Annual waste receipts are approximately 100,000 tons per year. ER Section 3.12.1.3, including the appropriate subsections, have been updated to include this information.

Impact:

ER Section 3.12.1.3 has been revised as described in the response.

RAI WM-3

Clarify which NRC Regulatory Guide applicable to release of waste materials for disposal the application relies on.

ER Section 3.12.1.3.2 (Non-Radioactive Solid Waste) references NRC Regulatory Guide 1.86 for limits applicable to releasing waste materials for disposal. NRC Regulatory Guide 1.86 has been retired, but similar limits are referenced in Regulatory Guide 8.30. The commitments to follow NRC guidance in the application should reflect the currently applicable guidance.

This information is needed in accordance with 10 CFR 51.45(c), which requires ERs to contain sufficient data to aid the NRC in its development of an independent analysis.

Response to RAI WM-3:

ER Section 3.12.1.3.2 has been revised to add Table 3.12-1,which provides the acceptable surface contamination levels for uncontrolled release of materials and equipment that were formerly included in NRC Regulatory Guide (RG) 1.86 and Table 1.

Discussion:

As noted in the RAI, NRC RG 1.86 was withdrawn on August 12, 2016. According to the Federal Register Notice (NRC-2016-0160) withdrawing the RG 1.86, ". . .Table 1 in RG 1.86 is now included in RG 8.23 and is titled, 'Table 3 Acceptable Surface Contamination Levels for Uncontrolled Release of Equipment.'"

RG 8.23 was also withdrawn on August 7, 2018. NRC guidance applicable to Radiation Safety Surveys at Medical Institutions in RG 8.23 is now available in Table R.3 of NUREG-1556, Volume 9. Table R.3 *Surface Contamination Levels in Unrestricted Areas (dpm/100 cm^2)* contains similar release levels as those formerly included in RG 1.86 Table 1 and RG 8.23 Table 3. Uranium and associated decay products, Transuranics, and Thorium are no longer addressed in Table R.3 of NUREG-1556 Volume 9. These radioactive materials are now addressed in Table 2 of RG 8.30, applicable to Uranium recovery facilities, which only includes these types of materials, not Beta-gamma emitters, etc.

Finally, the state of Texas also includes Acceptable Surface Contamination Levels for releasing material to unrestricted use in 30 Texas Administrative Code 336.364 Appendix G. The Table in §336.364, Appendix G is consistent with the RG 1.86 Table 1 with the exception that it combines Transuranics, Ra-226, Ra-228, Th-230, Th-228, pa-231, Ac-227, I-125 and I-129 with the other alpha emitters in the RG table and treats these radionuclides consistent with other alpha emitters.

Therefore, including Table 3.12-1 in the ER is appropriate and the contamination limits specified therein are consistent with the current NRC guidance and Texas Administrative Code limits discussed above.

Impact:

ER Section 3.12.1.3.2 has been revised and Table 3.12-1 has been added as described in the response.

RAI WM-4

ISP should clarify ER statements about whether hazardous waste would be generated by the proposed action.

ER Section 1.3.2.4 (Pollution Prevention and Waste Management) states that small quantities of hazardous wastes would be generated and are expected to be much less than 100 kg in a month. This information appears to conflict with the statement in ER Section 3.12.1.3 (Solid Wastes) that indicates mixed and hazardous waste is not expected to be generated at the CISF. If hazardous waste is generated by the proposed action, ISP should clarify if the hazardous waste would be disposed at the adjacent WCS Resource Conservation and Recovery Act (RCRA) facility.

This information is needed in accordance with 10 CFR 51.45(c), which requires ERs to contain sufficient data to aid the NRC in its development of an independent analysis.

Response to RAI WM-4:

Mixed wastes are not expected to be generated at the CISF. Small quantities of potentially hazardous waste may be generated as stated in ER Section 1.3.2.4. ER Section 3.12.1.3 has been updated to be consistent with ER Section 1.3.2.4. Hazardous waste generated at the CISF would be disposed of at the adjacent Waste Control Specialists Resource Conservation and Recovery Act (RCRA) facility. In addition to the Waste Control Specialists RCRA facility, there are currently two additional RCRA permitted facilities in the state of Texas and at least 20 permitted facilities nationwide.

ER Section 3.12.1.3, and appropriate subsections, have been updated to include this additional information.

Impact:

ER Section 3.12.1.3 has been revised as described in the response.

CUMULATIVE IMPACTS (CI)

RAI CI-1

Identify and describe past, present, and reasonably foreseeable future actions that may result in a potential for cumulative environmental impacts within an 80-km [50-mi] radius of the proposed CISF.

ER Section 2.6 provides a description of present actions within a 48-km [30-mi] radius of the proposed CISF that have a potential for cumulative environmental impacts. However, other past, present, and reasonably foreseeable future actions within and outside an 80-km [50-mi] radius of the proposed CISF have the potential for cumulative environmental impacts. For example, oil and gas development and production activities, livestock grazing, renewable energy projects (e.g., wind and solar farms), and a number of reasonably foreseeable future actions (e.g., the proposed Eddy Lea Energy Alliance/Holtec CISF, the Ochoa Potash Mine Project, and the DK Disposal E & P Landfill and Processing Facility) all have the potential for cumulative environmental impacts. The requested information is needed to support the NRC staff's evaluation of cumulative impacts in the EIS.

This additional information is needed in accordance with 10 CFR 51.45(c), which requires that the ER contain an analysis of cumulative impacts that may result from the proposed action.

Response to RAI CI-1:

New ER Section 4.15 has been added to address past, present, and reasonably foreseeable future actions within and outside an 80-km [50-mi] radius of the proposed WCS CISF. This includes such activities as oil and gas development and production activities, livestock grazing, renewable energy projects, the proposed Eddy Lea Energy Alliance/Holtec CISF, the Ochoa Potash Mine Project, and the CK Disposal E & P Landfill and Processing Facility. It also includes current and proposed future activities of the Lea County Landfill Facility, proposed Sundance West Surface Waste Management Facility, proposed Rice Operating Company Railroad Bore Easement (for a saltwater disposal pipeline), proposed Sprint Andrews County Disposal Facility, permitted OWL Landfill Services LLC Facility, Urenco USA National Enrichment Facility, Department of Energy Waste Isolation Pilot Plant, and International Isotopes Fluorine Products Inc. licensed but unbuilt Depleted Uranium Deconversion Plant (FEP/DUP). Potential cumulative impacts to the resource areas previously discussed in the ER are also discussed.

New ER Tables 4.15-1, 4.15-2, and 4.15-3 have been added to provide information on cumulative impacts to (1) land use, (2) nuclear-related transportation, and (3) cumulative radiological doses to the maximally exposed individual resulting from past, present, and reasonably foreseeable future actions within and outside an 80-km [50-mi] radius of the proposed WCS CISF, respectively.

New ER Figures 4.15-1, 4.15-2, 4.15-3, 4.15-4, 4.15-5, 4.15-6, and 4.15-7 have been added to provide information on the (1) road transportation, (2) projects and facilities, (3) land use, (4) land cover, (5) location of proposed Sundance West Surface Waste Management Facility, (6) location of proposed Sprint Andrews County Disposal Facility, and (7) location of proposed Holtec Hi-Store CIS Facility within the 50-miles Region of Interest, respectively.

ER Section 4.0 has been revised to refer to New ER Section 4.15, and ER Section 9.0 has been updated with new references discussed in Section 4.15.

Impact:

ER Section 4.0 and 9.0 have been revised, and ER Section 4.15, ER Tables 4.15-1, 4.15-2, and 4.15-3, and ER Figures 4.15-1, 4.15-2, 4.15-3, 4.15-4, 4.15-5, 4.15-6, and 4.15-7 have been added as described in the response.

RAI CI-2

Provide additional information to support the analysis of cumulative impacts of both nuclear and non-nuclear past, present, and reasonably foreseeable future activites for all resource areas.

The analysis of cumulative impacts presented in ER Section 2.6 is limited to brief statements regarding (i) air quality attributable to expansion of the WCS-Controlled Compact Waste Facility and Federal Waste Facility, operations at Permian Basin Materials, and manufacture of concrete at WCS's existing concrete batch plant; (ii) competition for and use of aggregate, crushed rock, and other mineral resources; and (iii) radiological doses attributable to the nearby URENCO USA uranium enrichment facility and WCS's low-level radioactive waste disposal facilities. To support the NRC staff's analysis of the potential cumulative impacts of the proposed action, address potential cumulative impacts relevant to all resource areas, including an evaluation with supporting information of the environmental impacts of nuclear acitivities (e.g., URENCO USA, WCS's low-level radioactive waste facilities, and the proposed Eddy Lea Energy Alliance/Holtec CISF) and non-nuclear activities (e.g., oil and gas exploration and development, potash mining, and livestock grazing) within an 80-km [50-mi] radius of the proposed CISF. The requested information is needed to support the NRC staff's evaluation of cumulative impacts in the EIS.

This additional information is needed in accordance with 10 CFR 51.45(c), which requires that the ERs contain an analysis of cumulative impacts that may result from the proposed action.

Response to RAI CI-2:

Because cumulative impacts result from direct and indirect impacts, the resources that would be minimally affected by the proposed CISF are listed in RAI CI-1, followed by the resources that would potentially result in more than minimal impacts. Those are the resources that could potentially contribute to cumulative impacts. A discussion has been provided in RAI Response CI-1 considering facilities in the Region of Influence and their potential to contribute to cumulative impacts to resources affected by the CISF. New Section 4.15 was added to the Environmental Report as part of the response to RAI CI-1.

Impact:

No change as a result of this RAI.

ENVIRONMENTAL MEASURES AND MONITORING (EMM)

RAI EMM-1

Provide additional information on the proposed pre-operational and operational Radiological Monitoring Program for the proposed CISF. The additional information should include:

- Media or effluents to be sampled.
- Number and location of sample collection points, including distal control sample collection points.
- Radiological measuring devices or methods of analysis and the radiological constituents to be analyzed, including lower limits of detection.
- Procedures/protocols for sample collection (e.g., sample size, sample collection frequency, and sampling duration), handling, preservation, and transport.
- Discussion that justifies the choice of sample locations, analyses, frequencies, duration, sizes, and lower limits of detection.

ER Section 6.3 provides a limited discussion and few details about the pre-operational and operational Radiological Monitoring Program for the proposed CISF. Specifically, the additional information is needed to support the NRC staff's description of the applicant's pre-operational and operational Radiological Monitoring Program and the NRC staff's environmental evaluation of the adequacy of radiological monitoring activities for the proposed CISF to demonstrate compliance with the requirements in 10 CFR 72.104 (Criteria for radionuclide material in effluents and direct radiation from an ISFSI or MRS).

This information is needed in accordance with 10 CFR 51.45(c), which requires ERs to contain sufficient data to aid the NRC in its development of an independent analysis.

Response to RAI EMM-1:

Information concerning the pre-operational Radiological Monitoring Program is included in ER Section 4.12.2.3, which states that "[Interim Storage Partners] joint venture member Waste Control Specialists conducts a comprehensive environmental sampling and analysis program, commonly referred to as the consolidated REMP." "As part of the Radiological Environmental Monitoring Program (REMP), samples of media and effluents, including gases and vapor, air particulates, soil, sediment, fauna, vegetation, surface water, waste waters, and groundwater, are collected and analyzed. A monitoring network of OSLs is also used to measure ambient gamma radiation. The sampling media and sampling locations included in the REMP provide a measure of the routine operations within and around the facility and monitor the potential impact of the facility operations on the off-site environment, including the general public." ER Section 6.3 has been updated to reflect the use of sample data collected as part of the existing Waste Control Specialists REMP for use as part of the pre-operational Radiological Monitoring Program for the proposed CISF.

WCS CISF SAR Section 9.6.2.4 was updated as a part of the responses to RAIs NP-9-3 and NP-9-4 and now provides specific information on the Radiological Monitoring Program including 1) number of samples; 2) sample locations; 3) collection frequency; 4) sample analysis to be performed; and 5) sample analysis frequency. The WCS CISF SAR also references the figures in ER Chapters 4 and 6 for the current monitoring locations and the proposed CISF OCA dosimeter monitoring locations.

The bulleted list below provides responses to each of the bulleted items included in the RAI.

- Media or effluents to be sampled are air, soil and ambient radiation as stated in Section 9.6.2.4 of the WCS CISF SAR.

- Number and location of sample collection points, including distal control sample collection points are as indicated on ER Figure 6.1-1. An additional four optically stimulated luminescence (OSL) locations and two soil sample locations are being proposed for the CSIF to supplement the existing Waste Control Specialists REMP sampling locations indicated in ER Figures 4.12-7 through 4.12-12. Three existing OSL locations are shown in ER Figure 6.1-1; there are two existing soil sample locations and three existing air sample locations that are co-located with these existing OSL locations. These three existing air locations will be the air monitoring locations for the CISF in addition to the operational air monitoring within the Cask Transfer Building. With the two existing soil sample locations and three existing OSL locations, there will be a total of six soil sample locations and seven OSL locations proximal to the CISF (not counting the other Waste Control Specialists REMP sampling locations more distant). The distal control sample location (air, soil and ambient/OSL) is three miles east of the Waste Control Specialists Facility on the south side of State Highway 176 as indicated in the bottom right corner of ER Figures 4.12-7, 4.12-9, and 4.12-10. ER Figure 6.1-1 has been updated to reflect the updated path of the rail spur to the proposed CISF. ER Figures 4.12-7 through 4.12-12 show the locations of the various types of environmental samples that are collected at Waste Control Specialists. One of the background locations (Station 9) is located in the bottom right corner of Figures 4.12-7, 4.12-9 4.12-10 and 4.12-12.

- Radiological measuring devices or methods of analysis and the radiological constituents to be analyzed, including lower limits of detection: WCS CISF SAR Section 9.8 was added in response to RAI NP-9-5 and it provides the radiological measuring devices to be used on-site and the specifications including the lower limits of detection. Methods of analysis will be per EPA SW846 methodology and the requirements of the Department of Energy (DOE) “Environmental Measurement Laboratory Manual” (HASL 300, DOE 1997) and analysis will be performed at an approved NELAC/NELAP laboratory. ER Section 6.3 has been updated to provide reference to the radiological measurement device specifications as updated in response to RAI NP-9-5, and reflect the methods of analysis for data collected as part of the proposed CISF Radiological Monitoring Program.

- Procedures/protocols for sample collection (e.g., sample size, sample collection frequency, and sampling duration), handling, preservation, and transport will be those currently established under the existing Waste Control Specialists REMP, in accordance with EPA SW846 analytical methods and the requirements of Department of Energy (DOE) “Environmental Measurement Laboratory Manual” (HASL 300, DOE 1997), with analysis performed at an approved NELAC/NELAP laboratory. ER Section 6.3 has been updated to reflect the procedures/protocols for sample collection as outlined in SAR Section 9.6.2.4, itself updated in response to RAIs NP-9-3 and NP-9-4.

- Discussion that justifies the choice of sample locations, analyses, frequencies, duration, sizes, and lower limits of detection: Justification is discussed in ER Section 4.12.2.2, which determined that the only significant radiological exposure pathway impacting human health or the environment at the CISF during normal operations is from external sources of gamma-rays and neutrons resulting from radioactive decay of irradiated fuel. All other radiological pathways, such as air, drinking water, soil ingestion, milk, and other foodstuff are not applicable. Additionally, no credible accidents were identified that result in a release of radioactive materials to the environment and thereby expose members of the public as discussed in Chapter 12 of the WCS CISF SAR. Based on this discussion, the choice of locations, analyses and frequencies were determined and stated in SAR Section 9.6.2.4. ER Section 6.3 has been updated to reference this discussion. Finally ER Section 9.0 was updated to include the WCS CISF SAR as a reference used in ER.

Impact:

ER Sections 6.3 and 9.0 and Figure 6.1-1 have been revised as described in the response.

COST–BENEFIT (CB)

RAI CB-1

Revise the quantitative cost and benefit estimates in ER Chapter 7 to include discounting and provide details and assumptions (e.g., a project schedule by year specifying when activities occur) or provide a basis for not doing so for any of the cost factors.

Discounting was not used for any of the estimated costs and benefits of the proposed action and no-action alternative presented in ER Chapter 7. ER Section 7.2.1 explains that discounting was not used because ISFSI operations include substantial labor, technological, and regulatory compliance expenditures, and it was assumed that these expenses remain relatively constant. The justification for not discounting appears to focus only on ISFSI operational costs associated with the eliminated storage costs presented in ER Section 7.2.1. However, this only represents one of the three key cost factors presented in the analysis and the nature of the other two costs is somewhat different than the ISFSI operation cost. The cost for the development of the CISF and relocation of SNF described in ER Section 7.3 includes significant capital and infrastructure costs (see ER Table 7.4-2). The cost-benefit analysis for the repurposed land in ER Section 7.2.2 accounts for the future estimated value of the land at decommissioned nuclear-purposed land once the license is terminated (see ER Table 7.2-6). The net benefit calculation in ER Section 7.4.1 uses the undiscounted values from all three of these key qualitative estimates. Discounting is appropriate when analyzing this proposed action because of the 40-year timeframe and the nature of some of the costs. Specifically, discounting the quantitative estimates is needed to support the description of the costs and benefits in the NRC's EIS. Discounting requires specifying the timing (i.e., the specific years) in which activities occur. Key "high dollar" activities include the construction, operation, and decommissioning of the CISF as well as the SNF transportation. The details and assumptions associated with the calculation (e.g., a project schedule by year specifying when activities occur) are needed to support NRC's staff's understanding of how the discounting calculations were performed and for evaluation of cost and benefits of the proposed action and no action alternative.

The requested information is needed in accordance with 10 CFR 51.45(c), which requires that the ER include consideration of the benefits and costs of the proposed action and its alternatives as well as contain sufficient data to aid the NRC in its development of an independent analysis.

Response to RAI CB-1:

The costs and benefits for the proposed action have been recalculated to take into account revisions to the spent nuclear fuel (SNF) transportation schedule, plant closure assumptions, and updated cost estimates for storing SNF. Additionally, the benefit and cost estimates were recalculated using a discount rate of 3.4 percent, which is based on a December 2018 update to the treasury rates, and an inflation rate of 2.4 percent, based upon the latest Congressional Budget Office (CBO) forecast. These assumptions align with the method described in the U.S. Department of Energy's (DOE) 2016 report, *Cost Implications of an Interim Storage Facility in the Waste Management System*. The analysis did not assume cost escalations that would exceed the rate of inflation. The revised benefit-cost ratio of the proposed action is estimated to be 1.68. Additional details about the assumptions in the revised estimates are provided in the paragraphs below.

SNF Storage Cost Revisions

The assumed costs of storing SNF were updated to reflect cost estimates found in the U.S. Department of Energy's (DOE) 2016 report, *Cost Implications of an Interim Storage Facility in the Waste Management System*. This report was prepared for the DOE and led by researchers at the Oak Ridge National Laboratory. In the report, the estimated cost of storing SNF when a plant is operating or immediately after shutdown and in decommissioning mode (i.e., five years after shutdown) is $1 million annually (2014 dollars). In the revised benefits analysis, the value was adjusted to 2018 dollars using the consumer price index (CPI) to $1,060,703. The DOE study's cost estimate for dry cask storage after the initial five-year cooling period was estimated to be $10 million annually, adjusted to $10,607,030 in 2018 dollars. [

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Transportation Schedule for SNF

The SNF transportation schedule and associated assumptions have been updated to be congruent with revisions to the Transportation section of the ER in response to RAIs TR-1 through TR-10. Additional details about the transportation schedule, which affects the timing of the proposed action's costs and SNF storage costs, are provided in the response to RAI CB-2.

Plant Shutdown Schedule

The assumed schedule of plant shutdowns is based upon the expiration date of each plant's existing permit. Although it is recognized that some plants may seek to extend their operating license, it also likely that other plants will choose to shutdown prior to reaching the end of their licensed operating period. Additional details about the plant shutdown schedule, which affects the timing of the proposed action's costs and SNF storage costs, are provided in the response to RAI CB-2.

Revised Benefits of the Proposed Action

The revised estimate of benefits from the proposed action, calculated by year, is found in new ER Table 7.2-2, based upon the new assumptions for fuel storage costs and discounting. A detailed description of storage cost by year and by plant is provided in the response to RAI CB-3. The estimates of land values at closed power plants were revised to identify the assumed year that the land would return to the market. For each facility, it was assumed the land would return to market ten years after the complete removal of spent fuel from the plant site, which would be 20 or more years after the assumed plant shutdown date. ER Table 7.2-14 shows the discounted value of land at each plant.

Revised Benefits and Costs of the Proposed Action

The revised estimate of costs from the proposed action were recalculated and are presented by year and by expense category in ER Table 7.4-2. All costs in the table have been discounted.

The following summarizes the changes to Chapter 7 of the ER.

The modification of assumptions used in the analysis resulted in a number of changes to the document. All values in the benefit-cost analysis were updated from 2015 to 2018 dollars, adjusted by the consumer price index from the U.S. Bureau of Labor Statistics. The revision of cost estimates to 2018 dollars affected the following tables:

- Table 7.2-2 (remains Table 7.2-2) and Table 7.2-3 (remains Table 7.2-3)
- Table 7.2-4 (now Table 7.2-12) , Table 7.2-5 (now Table 7.2-13), and Table 7.2-6 (now Table 7.2-14)
- Tables 7.3-1 through 7.3-7 (remain Tables 7.3-1 through 7.3-7)
- Table 7.3-9 and Table 7.3-10 (remain Table 7.3-9 and Table 7.3-10)
- Tables 7.4-1 and 7.4-2 (remain Tables 7.4-1 and 7.4-2)
- Tables 7.4-3 (now Table 7.4-6), Tables 7.4-4 (now Table 7.4-7), Tables 7.4-5 (now Table 7.4-8), and Tables 7.4-6 (now Table 7.4-9)

The following tables are added:

- Table 7.2-4: Assumed Schedule of SNF Canister Transfers from Plant Site to CISF
- Table 7.2-5: Storage Cost Assumptions in the Benefit Cost Analysis
- Table 7.2-6: Assumed Storage Costs by Facility of No Action, Discounted (2018 $)
- Table 7.2-7: Estimated Indirect Impacts from Proposed Operations, 2020-2059 (2018 $)
- Table 7.2-8: Estimated Induced Impacts from Proposed Operations, 2020-2059 (2018 $)
- Table 7.2-9: Estimated Total Impacts from Proposed Operations, 2020-2059 (2018 $)
- Table 7.2-10: Summary of Economic Impacts from Operations, 2020-2059 (2018$)
- Table 7.2-11: Local, State, and Federal Estimated Tax Impacts of Construction (2018 $)
- Table 7.4-3: Estimated Costs to Operate Phase 1 of the Proposed Action over 40-Year Licensure, Discounted
- Table 7.4-4: Summary of Benefit Cost Analysis Assuming Market Value of Land, Discounted
- Table 7.4-5: Summary of Benefit Cost Analysis without Including Market Value of Land, Discounted

Impact:

ER Chapter 7, including updated and new tables and figures, has been revised as described in the response.

RAI CB-2

Clarify and supplement the SNF transportation schedule and associated assumptions as appropriate in the ER to

- Ensure the SNF transportation schedule and associated assumptions used for the cost benefit analysis are consistent with this information, as described in other parts of the ER or revise the analyses accordingly.
- To the extent it is known, provide greater detail for the assumptions for the shipment of SNF to the proposed CISF in future potential expansions of the CISF beyond the currently proposed 5000 MTU's ER Section 7.2.1 describes that SNF transport occurs over a 31 year period. ER Section 4.2.7.1 states that the SNF would be transported over a 20 year period, assuming up to 200 canisters of SNF being transported to the CISF annually. The detailed assumptions for the SNF transport in ER Section 7.2.1 address the initial transportation at a greater level of detail than the potential future expansion (e.g., ER Table 7.2-3).

This information is needed in accordance with 10 CFR 51.45(b) and 10 CFR 51.45(c), which require that the ER include a description of the proposed action and sufficient data to aid the NRC in its development of an independent analysis.

Response to RAI CB-2:

The spent nuclear fuel (SNF) transportation schedule and associated assumptions have been updated to be congruent with recent revisions to the Transportation section of the ER.

The assumed schedule of plant shutdowns is based upon the expiration date of each plant's existing permit (see ER Table 7.2-3). Although it is recognized that some plants may seek to extend their operating license, it also likely that other plants will choose to shutdown prior to reaching the end of their licensed operating period. Many plants have more than one reactor, so the assumed shutdown date for a plant is when the final operating reactor's permit expires. By Year 3 of the CISF's licensure, which is when it is assumed to be permitted to accept spent nuclear fuel, there will be ten shutdown nuclear power plants, eight of which could immediately send SNF canisters to the CISF.

The assumed transportation schedule for SNF canisters by year is shown in ER Table 7.2-4. Under Phase 1, the CISF operator would accept fuel from the original eight plant shutdown sites. The transport of containers to the CISF is assumed to begin in Year 3, with 25 canisters moved during the year. As the inventory of rolling stock is expanded, the number of canisters transported will grow to 100 canisters in Year 4. During Year 5, and for every subsequent year, it is assumed that up to 200 canisters will be moved, based upon the availability of cooled SNF. **[**

] It is assumed in the analysis that SNF will only be transferred to the CISF from plant locations that will send their entire inventory, since the purpose of the CISF is to close the interim storage facilities (ISFs) at the plant sites to achieve cost savings for the federal government. **[**

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Table 7.2-3 is added to the ER and provides the assumed shutdown date for each of the 36 facilities (as opposed to the eight shutdown plants in the original table) and the assumed completion date for the removal of spent fuel from the power plant and its transfer to the CISF. Updated ER Table 7.2-4 provides detailed assumptions about the removal of spent fuel from each facility, according to timing (as outlined in ER Table 7.2-3), number of canisters and MTU removed, number of trains required to move the spent nuclear fuel, and the number of plants closed each year.

The revised transportation schedule affects additional tables in the document, which include:

- Table 7.2-2 (remains Table 7.2-2) Estimated Net Benefits of the Proposed Action, Discounted – The costs of SNF storage under the proposed action have changed to reflect the revised transportation schedule. The response to RAI CB-1 provides additional details.

- Table 7.3-2 (remains Table 7.3-2) Estimated Costs of Transportation Infrastructure – the number of rail cars acquired has been updated to reflect the new configuration and number of trains. References to table updated in Section 7.3.2.1.

- Table 7.3-5 (remains Table 7.3-5) Administrative Operating Costs – a train configuration with more cars will require fewer train trips, which reduces the expenses for the train crew's travel and living expenses. References to table updated in Section 7.3.3.1.

- Table 7.3-9 (remains Table 7.3-9) Assumptions for Other Operating Costs – The revised train configuration reduces the total number of trips required to move the fuel canisters. References to table updated in Section 7.3.3.5.

- Table 7.4-2 (remains 7.4-2) Summary of Costs for CISF over 40-Year Licensure, Discounted – Adjustments to the estimated costs in the aforementioned tables are reflected in this summary table.

- Table 7.4-5 (now Table 7.4-8) Summary of Quantified Benefits from CISF over 40-Year Licensure- Adjustments to the estimated costs in the aforementioned tables are reflected in this summary table.

- Table 7.4-6 (now Table 7.4-9) Summary of Costs for Eliminated Alternative CISFs over 40-Year Licensure, Discounted - Adjustments to the estimated costs in the aforementioned tables are reflected in this summary table for alternate CISF sites.

Additional tables have been added to the ER, which are affected by the changes requested under CB-2. The table numbering refers to the new Table numbers.

- Tables 7.2-7 through 7.2-11 have been added to the ER to provide additional detail on the assumptions behind spent fuel storage costs. These tables detail storage costs by plant and by each year of the license under the proposed action.

- Table 7.4-3 - Estimated Costs to Operate Phase 1 of the Proposed Action over 40-Year Licensure, Discounted – Table added in response to RAI CB-4. Incorporates the revised transportation schedule.

- Table 7.4-9 - Summary of Costs for Eliminated Alternative CISFs over 40-Year Licensure, Discounted - Incorporates the revised transportation schedule.

- Figure 7.2-1 - Federal Expenditures No Action Scenario vs. Proposed Action Scenario, Discounted - Incorporates the revised transportation assumptions.

Impact:

ER Chapter 7, including updated and new tables and figures, has been revised as described in the response.

RAI CB-3

Provide additional information, supplement the calculation and associated assumptions for the total SNF storage costs presented in ER Table 7.2-2. This should include the following:

- Provide the detailed calculation and associated assumptions for the total SNF storage cost for both potential future expansions (all eight phases) and no action currently presented in ER Table 7.2-2.
- Supplement the current information in ER Table 7.2-2 to provide the cost estimates for implementing just phase 1 (i.e., the initial license request) and the detailed calculation and associated assumptions or provide a basis for not doing so.
- Supplement ER Table 7.2.2 to also include cost estimates, which assume no additional reactors are shutdown (i.e., use an annual cost of storing SNF for an operating reactor) and revise the cost benefit analyses in ER Chapter 7 accordingly or provide a basis for not doing so.
- Identify the reference for the statement in ER Section 7.2 that by 2053 there will be a total of 71 shutdown reactor sites in the United States according to NRC data (see AIN-1).

ER Table 7.2-2 contains the assumed total cost of storing SNF storage at the various generation sites over the 40 years (i.e., the proposed CISF 40-year license period) for both the full build out (i.e. all eight phases) (with a CISF) and no-action alternative (without a CISF). The difference between these two values is the avoided reimbursement cost. ER Section 7.2.1 provides a general description on how these values were calculated based on the transition of SNF from the current storage locations to the proposed ISP site. However, the ER does not provide sufficient information for the NRC staff to determine exactly how the particular values in Table 7.2-2 (and the associated Figure 7.2-1) were calculated. ER Table 7.2-2 also does not provide the cost estimate information for just phase 1 (i.e., the initial license request).

ER Table 7.2-2 assumes an annual cost of storing SNF at each generation site based on this activity occurring at a shutdown reactor. NRC staff requests that this table be supplemented to also include estimates assuming an annual cost of storing SNF based on this activity occurring at an operating reactor (i.e., no additional reactors are shut down). Using an annual storage cost based on a value for an operating reactor could alter the estimated benefit as calculated in ER Table 7.2-2. NRC staff consider this an important component for characterizing the costs and benefits. As requested in this RAI for the current estimate in ER Table 7.2-2, provide the detailed calculation and associated assumptions for the calculation so NRC staff can follow exactly how theses cost estimates were generated. Specifically, this additional information is needed to support NRC staff's description of the total cost for the proposed action and the no-action alternative in the NRC's EIS.

The requested information is needed in accordance with 10 CFR 51.45(c), which requires that the ER include consideration of the benefits and costs of the proposed action and its alternatives as well as contain sufficient data to aid the NRC in its development of an independent analysis.

Response to RAI CB-3:

The costs and benefits for the proposed action have been recalculated to take into account revisions to the spent nuclear fuel (SNF) transportation schedule, plant closure assumptions, and updated cost estimates for storing SNF. Additionally, the benefit and cost estimates for the proposed action were recalculated using a discount rate of 3.4 percent, which is based upon a December 2018 update to the treasury rates, and an inflation rate of 2.4 percent, which is based upon the latest Congressional Budget Office (CBO) forecast. These assumptions align with the method used in the U.S. Department of Energy's (DOE) 2016 report, *Cost Implications of an Interim Storage Facility in the Waste Management System*. The analysis did not assume cost escalations that would exceed the rate of inflation.

SNF Storage Cost Revisions

The assumed costs of storing SNF were updated to reflect cost estimates found in the U.S. Department of Energy's (DOE) 2016 report, *Cost Implications of an Interim Storage Facility in the Waste Management System*. This report was prepared for the DOE and led by researchers at the Oak Ridge National Laboratory. In the report, the estimated cost of storing spent nuclear fuel (SNF) when a plant is operating or immediately after shutdown and in decommissioning mode (i.e., five years after shutdown) is $1 million annually (2014 dollars). In the revised benefits analysis, the value was adjusted to 2018 dollars using the consumer price index (CPI) to $1,060,703 (see ER Table CB-3-1). The DOE study's cost estimate for dry cask storage after the initial five-year cooling period was estimated to be $10 million annually, adjusted to $10,607,030 in 2018 dollars. [

]

Table CB-3-1
Summary of Assumptions for Benefit Cost Analysis

AMOUNT	ASSUMPTIONS
$1,060,703	Plant in operation/Annual cost of storing SNF in pool post-closure [ ]
$10,607,030	Spent fuel transferred to dry storage to continue cooling over initial post-closure period for [ ]
$10,607,030	Annual cost of dry storage of SNF beyond initial post-closure period, at which point it is available for removal [ ]
25	Maximum canisters moved during Year 3 of CISF accepting SNF
100	Maximum canisters moved during Year 4 of CISF accepting SNF
200	Maximum canisters moved to CISF during Year 5 and subsequent years
36	Average number of canisters moved from initial eight closed plants
110	Average number of canisters moved from all closed plants after initial eight

Transportation Schedule for SNF

The SNF transportation schedule and associated assumptions have been updated to be congruent with recent revisions to the Transportation section of the ER. Additional details about the transportation schedule, which affects the timing of the proposed action's costs, are provided in the response to RAI CB-2.

Plant Shutdown Schedule

The assumed schedule of plant shutdowns is based upon the expiration date of each plant's existing permit. Although it is recognized that some plants may seek to extend their operating license, it also likely that other plants will choose to shutdown prior to reaching the end of their licensed operating period. Additional details about the plant shutdown schedule, which affects the timing of the proposed action's costs, are provided in the response to RAI CB-2.

Revised Benefits and Costs of the Proposed Action

A summary of the revised estimate of benefits from the proposed action, calculated by year, is found in ER Table 7.2-14 updated in RAI CB-1. ER Table 7.2-5 provides a key to the colored coding of ER Tables 7.2-6 through 7.2-11, which provide the detailed assumed costs of SNF storage under the No Action scenario and the Proposed Action scenario, respectively.

ER Table 7.2-6 provides the detailed assumptions of the storage costs by plant and by year under the No Action scenario. ER Table 7.2-7 provides the assumptions of storage costs by plant and year under the Proposed Action scenario for all eight phases of the CISF.

The estimated storage costs of the No Action scenario, assuming only implementing Phase 1 are provided in ER Table 7.2-8. The estimated storage costs of the Proposed Action scenario, assuming only implementation of Phase 1 are provided in ER Table 7.2-9. The associated assumptions for calculating these values are outlined in this RAI (CB-3), as well as RAI CB-2.

The estimated storage costs of the No Action scenario, which assumes only implementing Phase 1 and that no additional power plants are shut down (in addition to those already shutdown) is provided in ER Table 7.2-10. Table 7.2-11 shows the assumed storage costs by facility for Phase 1 only and assuming no additional plant closures. The estimated storage costs of the Proposed Action scenario, assuming only implementation of Phase 1 are provided in ER Table 7.2-8. The associated assumptions for calculating these values are outlined in this RAI (CB-3), as well as RAI CB-2.

The sentence in ER Section 7.2 that indicates that by 2053 there will be a total of 71 shutdown reactor sites in the United States according to NRC data (see AIN-1) is removed.

The changes to the spent fuel storage cost assumptions used in the analysis (summarized in Table CB-3-1), resulted in a number of tables being added to Chapter 7 of the ER, which include:

- New ER Table 7.2-5: Storage Cost Assumptions in the Benefit Cost Analysis – This table details the assumptions for cost incurred by the federal government to store spent fuel at the power plant.

- New ER Table 7.2-6: Assumed Storage Costs by Facility of No Action, Discounted – Provides detailed information about the assumed storage costs incurred by the federal government under the No Action Scenario, by plant.

- New ER Table 7.2-7: Assumed Storage Costs by Facility of Proposed Action, Discounted - Provides detailed information about the assumed storage costs incurred by the federal government under the Proposed Action Scenario for all eight phases.

- New ER Table 7.2-8: Assumed Storage Costs by Facility of No Action – Phase 1 Only, Discounted - Provides detailed information about the assumed storage costs incurred by the federal government under the No Action Scenario for Phase 1 of the CISF.

- New ER Table 7.2-9: Assumed Storage Costs by Facility of No Action – Phase 1 Only, Discounted - Provides detailed information about the assumed storage costs incurred by the federal government under the Proposed Action Scenario for Phase 1 of the CISF.

- New ER Table 7-2.10: Assumed Storage Costs by Facility of No Action and No Additional Plant Closures, Discounted - Provides detailed information about the assumed storage costs incurred by the federal government under the No Action Scenario for Phase 1 of the CISF and assuming currently operating plants do not shutdown.

- New ER Table 7.2-11: Assumed Storage Costs by Facility of Phase 1 and No Additional Plant Closures, Discounted - Provides detailed information about the assumed storage costs incurred by the federal government under the Proposed Action Scenario for Phase 1 of the CISF and assuming currently operating plants do not shutdown.

- New ER Table 7.4-4: Summary of Benefit Cost Analysis, Discounted – Summarizes benefits and costs for each of the three scenarios and provide the benefit/cost ratio.

- New ER Table 7.4-5: Summary of Benefit Cost Analysis without Including Market Value of Land, Discounted – Summarizes benefits and costs for each of the three scenarios without including the market value of land and provides the benefit/cost ratio.

Impact:

ER Chapter 7, including updated and new tables and figures, has been revised as described in the response.

RAI CB-4

Provide additional information, supplement the descriptions in ER Section 7.3 concerning the calculation, and associated assumptions for the costs of constructing, operating, and decommissioning the facility. This should include the following:

- Supplement the current information to provide the cost estimates for implementing just phase 1 (i.e., the initial license request) or provide a basis for not doing so.
- Clarify whether the staffing estimates in ER Table 7.3-10 represent the total number of employees supporting the ISP operations or only the additional new hires augmenting the existing WCS staff.

ER Section 7.3 explains that the costs for developing the proposed CISF, relocating the SNF to this facility, and operating the ISFSI incorporates the assumptions and cost estimates from a 2009 EPRI report (EPRI, 2009) and adjusts values, where appropriate, for the circumstances of the proposed CISF. However, the cost estimates in ER Section 7.3 appear to include future expansions (i.e. all eight phases) and do not include such estimates for just phase 1 (i.e., the initial license request). It is unclear whether the staffing estimates in Table 7.3-10 represent the total number of employees supporting the ISP operations or only the new employees augmenting the existing WCS staff. Specifically, this additional information is needed to support the NRC staff's description of the total cost for developing the proposed CISF, relocating the SNF to this facility, and operating this facility in the NRC's EIS.

The requested information is needed in accordance with 10 CFR 51.45(c), which requires that the ER include consideration of the benefits and costs of the proposed action and its alternatives as well as contain sufficient data to aid the NRC in its development of an independent analysis.

Response to RAI CB-4:

Updated calculations and assumptions on the estimated costs to construct, operate, and decommission the facility are provided in the response to RAI-1 and ER Table 7.4-2.

New ER Table 7.4-3 shows the estimated costs for Phase 1 only, assuming three operating trains. The total estimated cost for Phase 1 only would be $1,245,559,274 in discounted dollars. The facility would store 406 canisters (17 of these canisters would contain greater than Class C (GTCC) waste) or 4,751 MTUs transported over a seven-year period. This number of canisters would remove all spent nuclear fuel (SNF) from nine shutdown power plants and 17 GTCC canisters.

The staffing estimates in ER Table 7.3-10 represent the total number of new hires. Section 7.3.3 Labor Costs has been updated to clarify the number of workers who are new hires.

Impact:

ER Chapter 7, including updated and new tables and figures, has been revised as described in the response.

REFERENCED INFORMATION

RAI RI-1

Provide an electronic copy or active website link to the final version of WCS's "Application for License to Authorize Near Surface Land Disposal of Low-Level Radioactive Waste" (dated 2007).

Citations in the ER indicate that relevant information and studies can be found in WCS's "Application for License to Authorize Near Surface Land Disposal of Low-Level Radioactive Waste" (dated 2007). The requested information is needed to confirm information presented in the ER and to support NRC's evaluation of environmental impacts in the EIS.

This information is needed in accordance with 10 CFR 51.45(c), which requires ERs to contain sufficient data to aid the NRC in its development of an independent analysis.

Response to RAI RI-1:

An electronic copy of the applicable portions of the final version of Waste Control Specialists' "Application for License to Authorize Near Surface Land Disposal of Low-Level Radioactive Waste" (dated 2007) is provided in Enclosure 10. The portions provided include:

1. Appendix 2.3.1: Meteorological and Climatology Data
2. Appendix 2.3.1-2: Meteorological System
3. Figures 5-10 and 5-10a of Appendix 2.6.1
4. Attachment 2-1 to Appendix 2.6.1.pdf
5. Attachment 6-4 (Water Quality Analysis Of Baker Spring Ponded Water, November 2004) to Appendix 2.6.1
6. Attachment 6-6 (Groundwater Age Dating) to Appendix 2.6.1
7. Appendix 2.9.1: Ecological Assessment
8. Section 2.4.2 (Transportation Impact Analysis) of Attachment A to Appendix 11.1.1.
9. Figures 1 through 24 of Attachment A to Appendix 11.1.1
10. Appendix 11.9.2: Ecological Baseline Assessment

Impact:

No change as a result of this RAI.