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Submitted by email to: Holtec-CISFEIS@nrc.gov; Docket ID NRC-2018-0052

Director Tappert,

On behalf of the New Mexico Environment Department (NMED), attached please find our comments on the March 2020 draft Environmental Impact Statement (EIS) for the Holtec International License Application for a Consolidated Interim Storage Facility for Spent Nuclear Fuel and High Level Waste in Lea County, New Mexico. The attachment includes comments from the New Mexico Radioactive Waste Consultation Task Force as well.

Sincerely,

James C. Kenney
Cabinet Secretary

Attachment (1)

cc: Courtney Kerster, Director of Federal Affairs, Office of Governor Michelle Lujan Grisham
Sandra Ely, Director, NMED Environmental Protection Division
Rebecca Roose, Director, NMED Water Protection Division
Stephane Stringer, Director, NMED Resource Protection Division

Attachment

Introduction

The U.S. Nuclear Regulatory Commission (NRC) prepared a draft environmental impact statement (EIS) as part of its environmental review of the Holtec International (Holtec) license application to construct and operate a consolidated interim storage facility (CISF) for spent nuclear fuel (SNF) and Greater-Than-Class C waste, along with a small quantity of mixed oxide fuel. The proposed CISF would be constructed in southeast New Mexico at a site located approximately halfway between the cities of Carlsbad and Hobbs, New Mexico. NRC's proposed action is the issuance of an NRC license authorizing the initial phase (Phase 1) of the project to store up to 8,680 metric tons of uranium (MTUs) [9,568 short tons] in 500 canisters for a license period of 40 years. Holtec plans to subsequently request amendments to the license to store an additional 500 canisters for each of 19 expansion phases of the proposed CISF (a total of 20 phases), to be completed over the course of 20 years, expanding the proposed facility to eventually store up to 10,000 canisters of SNF.

New Mexico has grave concerns about the inadequacy of the technical analysis in the draft EIS. The inadequate conceptualization of the geologically unsuitable site, the preclusion of a thorough evaluation due to vast technical deficiencies, the lack of inclusion of all applicable state regulatory oversight and environmental impact controls, and the omission of a full assessment of environmental justice concerns all contribute to a draft EIS that negligently fails to meet the requirements of Section 102(2)(c) of the National Environmental Policy Act (NEPA). New Mexico objects strongly to the recommended action of approving the Holtec CISF License and demands the No Action Alternative.

Comments

1. Moving spent nuclear fuel multiple times creates unnecessary risks to public health, safety and the environment.

The NRC stated in its Waste Confidence Decision¹ that spent fuel can be stored safely beyond the operating life of a power reactor, at their current locations, until a national repository for spent nuclear fuel is established. States and regional groups have consistently supported moving the fuel only once – from current locations to a national permanent repository. Moving spent nuclear fuel multiple times increases the likelihood of accidents within the State of New Mexico and elsewhere.

While the NRC provided some analysis on the No Action Alternative it did not fully meet its obligations. The NRC did not provide a detailed analysis because the alternatives *“either would not meet the purpose and need of the proposed project or would cause greater environmental impacts than the proposed action.”* (draft EIS pages xxiii – xxiv). Moreover, the NRC stated in its Waste Confidence Decision that spent nuclear fuel is safe at its current location, which is a viable No Action Alternative. It is clear the No Action Alternative is the appropriate course. The NRC neglected its obligation to the public by not including the facts and data it used to determine that the impacts of storage at a government-owned CISF, alternative design and storage technologies, an alternative location, and an alternative facility layout would either not meet the purpose and need of the proposed project or cause greater environmental impact than licensing the Holtec facility. The public has a right to review the data and provide public comment.

2. The proposed Holtec Consolidated Interim Storage Facility (CISF) site is geologically unsuitable.

Given that a permanent repository for high-level radioactive waste does not exist in the United States and there is no existing plan to build one, any “interim” storage facility will be an indefinite storage facility, including Holtec's CISF. The License Life for the application Holtec submitted to the NRC is forty (40) years,

1 SECY-14-0072: Final Rule: Continued Storage of Spent Nuclear Fuel (RIN 3150-AJ20), July 21, 2014, <https://www.nrc.gov/docs/ML1417/ML14177A474.pdf>.

and the License Life can be extended at every license renewal date. The Design Life for the storage facility and cask, canisters, and assemblies is eighty (80) years. The Service Life for the SNF storage site is one hundred and twenty (120) years. At this time, the NRC cannot guarantee that a permanent repository for SNF in the United States will be developed in 40, 80, or 120 years, or that the proposed Holtec CISF facility will not become a permanent repository. Even 80 years of storage at the Holtec CISF amounts to impacts beyond the lifetimes of everyone involved in this environmental review and licensing decision.

As early as the 1950s, the National Academy of Sciences recommended disposal of long-lived radioactive wastes in deep, geologically stable formations. Holtec, however, proposes to bury highly radioactive and toxic SNF to a depth of only 50 feet in an area that is underlain by shallow groundwater and subject to concerns about ground subsidence and sinkhole development. Holtec's proposed CISF site does not provide deep geologic isolation for indefinite SNF storage, and the proposed site is unsuitable for SNF storage over a period of decades. Therefore, New Mexico prefers the No Action Alternative. See comment 4 below for further discussion of karst and seismicity.

3. The draft EIS contains numerous technical deficiencies that preclude a thorough evaluation of the radiological and non-radiological environmental impacts of the proposed facility. Resolving technical deficiencies in the draft EIS and properly evaluating, with all available data, the description of the affected environment, waste transportation, waste characterization, potential contaminant release mechanisms and exposure pathways, potential risks from aging SNF canisters, and site monitoring will further support the No Action Alternative.

3.a. The draft EIS fails to provide a conceptual hydrologic site model.

A comprehensive and internally consistent hydrologic conceptual site model that includes precipitation, recharge, surface water, playas, groundwater and springs is lacking in the draft EIS, which contains inconsistent and contradictory statements about groundwater occurring in Quaternary alluvium and in the Santa Rosa Sandstone. A critical omission is that the draft EIS does not define hydraulic relationships between shallow groundwater, springs and playas in the area. The draft EIS does not adequately address groundwater recharge potential of the area within and surrounding the proposed CISF based on the topography, internal and surrounding drainage patterns, exposed bedrock geology, surface and shallow subsurface geology, and karst hydrogeology. Moreover, the draft EIS provides incomplete and contradictory statements about background water quality. Section 3.5.1 of the draft EIS (Surface Water Resources) states that salinity in the playas is attributed to evaporation of water while in Section 3.6.3 of the draft EIS the salinity is attributed to discharges from the oil and gas, and potash industries. The background quality of groundwater, which may be similarly impacted by oil and gas and potash discharges, also is not adequately addressed in the draft EIS.

These deficiencies preclude the complete and thorough evaluation of contaminant release scenarios, the resulting migration and exposure pathways, and potential risks to human and ecological health.

3.b. The draft EIS contains data gaps and erroneous statements.

The draft EIS contains statements that are either incorrect, or internally contradictory. Section 3.5.3 of the draft EIS discusses how the Quaternary piedmont alluvium and Triassic Santa Rosa Sandstone are utilized as water sources in the region, however 3.5.3.2 of the draft EIS incorrectly states, "*No potable groundwater is known to exist in the vicinity {i.e., within 10 km [6 mi]} of the proposed CISF project area...*" Figure 3.5-5 of the draft EIS shows a number of water wells within two to three miles of the proposed CISF site that are completed in Quaternary or Triassic formations, and some are identified as producing fresh water. The fact that potable groundwater has existed within 6 miles of the proposed CISF project area is confirmed by historical chemical analyses demonstrating that two such wells, located near Halfway southwest of the proposed site produced fresh water (Table 1).

*Table 1. Chemical Analyses of Water from Supply Wells near Halfway, N.M.
Analyses performed by Southwestern Laboratories on samples collected on 2/12/69.*

Well	Water Level (feet below ground surface)	Chloride (mg/L)	Sulfate (mg/L)	Specific Conductance (umho/cm)
Halfway Bar	42.5	362	309	1861
Stock Well	39.58	85	82	837

The draft EIS relies on an insufficient number of boreholes and monitoring wells to characterize the lithology, hydrology, and groundwater characteristics below the proposed CISF. The Holtec Environmental Report (Holtec ER), Appendix J, Figure 1, contains a map showing the locations of 29 proposed groundwater monitoring wells that would be installed to provide primary baseline groundwater sampling results, identify potential discontinuous aquifers, and to identify if there is a connection between shallow groundwater at the site and the playa lakes. In a May 21, 2020 meeting, NRC informed NMED that these wells had not been installed. Consequently, this critical data gap precludes a complete and thorough evaluation of groundwater contaminant release scenarios, the resulting migration and exposure pathways, and the resulting risks to human and ecological health. NRC must require that Holtec install these wells and include this new hydrogeologic information in the final EIS.

Statements regarding infiltration of precipitation, infiltration of contaminants discharged in leaks or spills, playa salinity, groundwater recharge, and mechanisms for water loss from playas must be revised for correctness and consistency in the final EIS. The draft EIS, for example, insufficiently and inconsistently addresses the existence and implications of groundwater accumulating in the Quaternary alluvium above the Dockum claystones. The draft EIS asserts that shallow groundwater does not exist at the site, but provides information about the saturated thickness of groundwater in Quaternary alluvium. The Holtec ER also states, “*Evapo-transpiration at the Site is five times the precipitation rate, indicating that there is little infiltration of precipitation into the subsurface.*” This statement reflects a lack of understanding of hydrogeologic processes in the arid Southwest and contradicts the statement in Section 4.5.2 of the draft EIS that discusses how significant recharge of precipitation actually does occur during storm events. The draft EIS and supporting documents also are inconsistent regarding which playa will receive surface water flow from the CISF.

The draft EIS fails to accurately measure seasonal variations of playa water levels and resultant subsurface infiltration, an important consideration in the effects of the project. The draft EIS also insufficiently describes the consequences of a significant storm event to the playas. The draft EIS insufficiently addresses surface water infiltration to the subsurface as stormwater transports from the CISF to the playas. Laguna Plata is the recipient of all impacted stormwater and possibly all facility wash-water and indoor spills originating at the CISF. This stormwater and industrial wastewater is proposed to flow in approximately two miles of unlined drainages from the CISF to the playa along which infiltration and contamination of alluvial groundwater may occur.

The final EIS must fill these data gaps and correct these erroneous statements.

3.c. Karst Conditions not Adequately Addressed

The draft EIS asserts that the CISF project area has a low potential for sinkhole development based on the absence of thick sections of soluble rock near the land surface. The CISF site, however, is located in an area of well-documented concern for development of both recent anthropogenic and long-term natural

geologic karst features such as sinkholes^{2, 3, 4, 5, 6, 7, 8, 9} The draft EIS makes inconsistent statements regarding the origin of topographic depressions in the region, many of which have been attributed to karstic collapse of the land surface in response to underlying salt and evaporite dissolution. Indeed, lithologic borings located within the proposed Holtec facility encountered slickensides, vertical to sub-horizontal fractures of many inches in length, highly fractured zones, and the presence of moisture in core sections in the Chinle Formation. The presence of subsurface deformation, fracture zones and moisture in post-Permian rock contradicts the draft EIS assertion of low risk for sinkhole development.

Oil and gas operations and potash mining also have created ground subsidence and sinkholes in the region. Dissolution of the Salado Formation associated with oil and gas operations is the primary cause of the Jal, J.W.S., Winks 1&2, Denver, and the I&W brine well sinkholes. There are at least 18 abandoned and plugged wells located on the property that could contribute to the formation of sinkholes if the casing on these wells has been compromised. There is one plugged saltwater disposal well located north-east of the property boundary that could contribute to sinkhole formation and potential subsidence. Additionally, ground subsidence related to potash mine workings, as has been documented in the region, must be evaluated in greater detail as a potential risk to the stability of the CISF facility.

3.d. Seismicity not Adequately Addressed

The draft EIS asserts that operation of the proposed CISF project would not be expected to impact or be impacted by seismic events. The draft EIS provides general information about the history of earthquakes in the region, including a brief reference to earthquakes caused by fluid injection by the oil and gas industry, and asserts that CISF infrastructure will be designed to withstand seismic events, but does not provide specific information about these safeguards. Section 3.4.4 of the draft EIS discusses earthquakes that have occurred in the region, including one near Eunice, NM, with magnitudes of 5.0 or greater. On March 26, 2020, a magnitude 5.0 earthquake struck West Texas near the New Mexico border.

Further, the draft EIS fails to specifically consider the long-term effects of injection related to oil and gas enhanced recovery projects and the exponential increase of commercial disposal of produced water. The expansion of disposal activities into both shallow and deep intervals has increased the opportunity for induced-seismic events similar to conditions observed in oil and gas producing regions in Arkansas, Texas and Oklahoma. Again, the design considerations for the infrastructure offer no specifics to this future scenario as oil and gas operations continue in the Permian Basin.

Since seismic events of magnitude 5.0 or greater have already occurred in this area, there is the possibility that more powerful earthquakes may occur, and the Holtec facility must be designed to withstand these

2 Hill, C.A., 1999. "Intrastratal karst at the WIPP site, southeastern New Mexico." Caves and Karst of Southeastern New Mexico. New Mexico Geological Society, 57th Annual Fall Field Conference Guidebook.

3 Powers, D.W., Beauheim, R.L., Holt, R.M., Hughes, D.L. and Land, L., 2006. Evaporite karst features and processes at Nash Draw, Eddy County, New Mexico. Caves and Karst of Southeastern New Mexico. New Mexico Geological Society, Guidebook, 57, pp.253-266.

4 Lorenz, J.C., 2006. Assessment of the Geological Evidence for Karst in the Rustler Formation at the WIPP Site. Caves and Karst of Southeastern New Mexico, 57, p.243.

5 Stafford, K.W., 2013. Evaporite Karst and Hydrogeology of the Castile Formation: Culberson County, Texas and Eddy County, New Mexico. 13th Sinkhole Conference. National Cave and Karst Research Institute Symposium 2.

6 Land, L.E.W.I.S., 2009. Anthropogenic sinkholes in the Delaware Basin region, West Texas and Southeastern New Mexico. West Texas Geological Society Bulletin, 48(6), pp.10-22.

7 Land, L., Cikoski, C., McDraw, D., and G. Veni, 2018. Karst geohazards and geophysical surveys: US 285, Eddy County, New Mexico. National Cave and Karst Research Institute Report of Investigation 7, Carlsbad, New Mexico.

8 Lambert, S.J., 1983. Dissolution of evaporites in and around the Delaware Basin, southeastern New Mexico and west Texas. Albuquerque, New Mexico: Sandia National Laboratories, 82(461).

9 Stafford, K.W., Nance, R., Rosales-Lagarde, L. and Boston, P.J., 2008. Epigene and hypogene karst manifestations of the Castile Formation: Eddy County, New Mexico and Culberson County, Texas, USA. International Journal of Speleology, 37(2), p. 83-98.

more powerful seismic events. The sources used for the seismicity section of the draft EIS should include more recent research including the updated model of the reference used for the seismic hazard map and current seismic monitoring by the Texas Bureau of Economic Geology TexNet project and the New Mexico Tech Seismological Observatory.

3.e. Deficiencies Related to Waste Transportation

The NRC neglected to address the complexity of transporting spent nuclear fuel across the nation and specifically across the state of New Mexico in its transportation assessment in the draft EIS. The NRC did not provide any clear assessment of the method, routes for transport, transportation impact calculations for the assumed mostly rail scenario, and the many complex issues related to route selection, collaboration with states, and other requirements within the Nuclear Waste Policy Act, as amended. Since the NRC determined it would assess the full scope as “bounding analysis” of the Holtec project, it should have included transportation impact calculations to a permanent repository.

The NRC completely failed to address known safety issues associated with transportation of spent nuclear fuel. The EMNRD provides the following from the U.S. Government and Accountability Office (GAO) as it indicated in its October 2015 testimony to Congress:

The transportation of large amounts of spent fuel to an interim storage or permanent disposal location is inherently complex and the planning and implementation may take decades to accomplish. The actual time it would take depends on a number of variables including distance, quantity of material, mode of transport, rate of shipment, level of security, and coordination with state and local authorities. For example, according to officials from a state regional organization we interviewed and the Blue Ribbon Commission report, transportation planning could take about 10 years, in part because routes have to be agreed upon, first responders have to be trained, and critical elements of infrastructure and equipment need to be designed and deployed.¹⁰

The NRC did not consider the technical challenges in transporting spent nuclear fuel in any of the GAO reports, the work the NRC engaged in with states and tribes in the Ad Hoc Working Group, or the work conducted by the Western Interstate Energy Board (WIEB) High Level Radioactive Waste Committee (HLRW). Many of the challenges within the October 2014 GAO report¹¹ were identified by experts who identified the uncertainties about the safety of newer fuel versus older fuel. Further, the NRC provided comments in the 2014 GAO report¹² to Congress regarding concerns it held on the transport of high-burn up fuels regarding hydrogen buildup and cladding becoming brittle. The DOE and the Electric Power Research Institute planned a joint development¹³ to investigate the high burn-up fuel, its cladding, and the cask during transport. The results would take several years with the DOE stating, “...their strategy would not involve transportation of large amounts of high burn-up fuels until at least 2025...giving more time for the development project to yield results,”¹¹.

Additionally, the 2014 GAO report¹⁴ included that the guidelines for storage of SNF radiation levels are significantly different than those allowed during transportation rendering some spent nuclear fuel in storage unsuitable and potentially dangerous for transport (only about 30 percent of existing spent nuclear fuel in dry storage is cool enough to transport). The NRC assessment in the draft EIS makes no reference to these very important points regarding the transport of SNF yet implies that the Holtec facility will be licensed up to 120 years and at its maximum buildout to include the entire SNF inventory across

10 “Spent Nuclear Fuel: Legislative, Technical and Societal Challenges to its Transportation”, GAO 16-121 (October 2015), pp. 3-4

11 “Spent Nuclear Fuel: Outreach Needed to Help Gain Public Acceptance for Federal Activities That Address Liability”, GAO 15-141 (October 2014) GAO-15-141, October 2014, <https://www.gao.gov/assets/670/666454.pdf>

12 GAO-15-141, October 2014, p. 25 Description of Concerns Related to High-Burn Up Fuel

13 High Burnup Dry Storage Cask Research and Development Project, 2014, <https://www.osti.gov/servlets/purl/1133392>

14 GAO-15-141, October 2014, p. 26 Some Stored Spent Nuclear Fuel May Not Be Readily Transportable

the nation. Additionally, the state of New Mexico has been actively engaged with the NRC through the DOE-NE office Rail/ Routing Ad Hoc working group to identify issues related to transportation of SNF to investigate these uncertainties. The NRC did not include any of the work conducted over the life of the Ad Hoc Working Group in its “bounding analysis.”

The draft EIS and supporting documents do not address the weight capacity of existing rail systems or the new rail spur proposed for construction in New Mexico. The weight capacity of rail systems is specified as weight per axle of the rail car. A rail car with 8 or 12 axles can carry a cask without exceeding any limitation, but 12 axles will not take sharp turns, and speed is a factor. The transportation from reactor sites to the proposed storage site in New Mexico is a potential risk that must be adequately addressed in order to maximize risk reduction for New Mexico residents and the environment.

Additionally, the Federal Rail Administration has established the S2043 rail car as the standard. The draft EIS fails to incorporate how this standard will be met in transportation planning with the licensee, shipper/railroad industry.

3.f. Deficient Waste Characterization

The draft EIS fails to provide details of the radionuclides and activities in the spent fuel rods, and only references metric tons of uranium (MTU) in the fuel rods that were originally placed in the nuclear reactors. Spent fuel rods can be much more radioactive than the original fuel rods due to the presence of a mixture of byproducts from uranium fission. Radionuclide activities in spent fuel rods can depend on age, uranium burnup and decay, and the type of reactor that was used.

The draft EIS does not adequately address the differences in SNF storage (pool storage, dry storage or both) at the commercial reactor sites. These differences are important as they may present challenges for SNF processing and storage at the proposed Holtec facility.

The draft EIS fails to discuss non-radiological contaminants that may potentially be discharged to soil, water and air during operation of the site. Without thorough characterization of non-radiological contaminants present, neither the NRC nor the state of New Mexico can properly and effectively eliminate or mitigate potential discharges.

3.g. Deficient Evaluation of Potential Contaminant Release Mechanisms and Exposure Pathways

The draft EIS insufficiently and inconsistently addresses the possibility of a release of radionuclides from the CISF and the associated risks or impacts to the environment. Draft EIS Section 4.15 addresses the categories of events or accidents, including “off-normal” and “accidental.”

The draft EIS states that off-normal events can be expected to occur with moderate frequency, or approximately once per year, and that these events could result in members of the general public being exposed to additional levels of radiation beyond those associated with normal operations. Off-normal events evaluated include off-normal pressure within a SNF storage canister, off-normal environmental temperature, leakage of an SNF storage canister seal weld, partial blockage of air inlet and outlet ducts in a SNF cask, and cask drop below the design allowable height.

The draft EIS states that accidental events could reasonably be expected to occur over the lifetime of the dry cask storage facility. Accidental events evaluated included fire, partial blockage of SNF storage canister basket vent holes, flood, earthquake, rupture of all fuel rods in a SNF storage canister, confinement boundary release, explosion, lightning, complete blockage of air inlet and outlet ducts, burial under debris, extreme environmental temperature, and cask drop or tip over.

The draft EIS explains that the Applicant evaluated each of these accidents and concluded that the CISF would not exceed applicable 10 CFR 72.106 dose limits to individuals at or beyond the controlled area boundary. The draft EIS does not explain, or is contradictory about, how each of the accident categories might impact environmental media including air, surface water, groundwater, and soil, and does not

explain possible impacts both inside and outside the controlled area boundary.

Section 4.5.1 of the draft EIS states that the primary impact of a contaminant release to surface water would be from runoff from the impervious SNF storage pad. Section 4.5.1.1.2 of the draft EIS, however, states that there is no potential for a liquid pathway (such as runoff) to contaminate nearby surface waters with radioactive materials. In addition to being contradictory with regard to off-normal and accidental incidents that might release contaminants to surface water runoff, these statements do not address the possibility that groundwater also might transport contaminants from the proposed storage facility to surface water in nearby playas.

3.h. The draft EIS fails to evaluate potential human and ecological exposure pathways via groundwater.

Any release of contaminants to shallow groundwater at the proposed Holtec CISF site is significant with regard to the potential for contaminants to migrate into water supply wells, springs and playas in the area. Even if some groundwater contains elevated salinity, the migration of contaminated groundwater to springs and playas could create hazards to public health and the environment. These potential human and ecological exposure pathways must be evaluated.

3.i. The draft EIS fails to evaluate potential terrorism or sabotage along the shipping corridors in New Mexico.

The draft EIS fails to fully address and mitigate the potential for acts of terrorism or sabotage along shipping corridors in New Mexico, as is required by 10 CFR Part 73, and highlighted in Western Governors' Association Resolution 07-02, Expectations of Safety and Security of Shipments. The draft EIS fails to recognize that the acts of terrorism and sabotage do not simply impact the transportation safety of future shipments, but have huge liability impacts to communities, the environment, and social-economic factors that should be included in the analysis. The final EIS also should recognize that NRC's licensing of the proposed Holtec facility creates liability against the federal government arising from potential acts of terrorism and sabotage during transportation of spent nuclear fuel.

In addition, Western Governors' Association (WGA) Resolution 07-02 calls upon the NRC to *“fully address the consequences of attacks against all components of the nuclear waste handling and transport system, to include: attacks against transportation infrastructure, the theft of a shipment, use of high-energy explosives against a shipment cask, and direct attacks against a shipment cask using antitank missiles or other armament that could cause a loss of containment.”* WGA further requests that NRC *“strengthen its efforts to share information with state and local governments regarding spent fuel shipment vulnerabilities and consequences,”* recognizing that *“sharing of information must be conducted within the framework of preventing the release of sensitive or classified information to individuals without a need to know.”* The WGA Resolution 2018-10 calls upon the generator sites of spent nuclear fuel and high-level waste and the federal government to pay for all costs associated with assuring safe transportation, responding effectively to accidents and emergencies that may occur, and otherwise assuring public health and safety. Additionally, the Resolution calls upon nuclear utility companies to *“...adequately fund state and local emergency and medical responder training and resources in case of an accident or terrorist attack while shipping spent nuclear fuel.”*

3.j. Deficient Evaluation of Potential Risks from Aging SNF Cannisters

Some of the SNF cannisters proposed for shipment to the proposed Holtec facility have already been stored for decades. As fuel rods age they are subject to corrosion, damage or cladding, and the potential for explosive levels of hydrogen to build up inside the cannisters. The draft EIS does not adequately address these issues.

3.k. Deficient Site Monitoring

SNF contains radionuclides that emit alpha, beta, gamma, and neutron radiation. The monitoring system provided by Holtec must be capable of monitoring the radiation of all radionuclides in SNF.

Holtec proposes to use thermoluminescent dosimeters (TLDs) for measuring doses for gamma and beta radiation. TLD's do not measure alpha and neutron radiation in SNF. (e.g., 241 Am, 243 Am, 244 Cm, 238 Pu, 239 Pu, 230 Th, 238 U plus daughters) which is approximately thirty percent of the total activity of a Boiling Water Reactor SNF (spent full assembly - 4.0% enriched with 49,170 MWd/MTU burnup, 10-yr decay). Also, TLDs do not have the capability of measuring static or dynamic radiation doses, which are important in the determination of the radiation dose occurring over a period of time or all at one time.

It is not apparent that the TLDs along the perimeters of the restricted and controlled areas will be sufficient to detect releases of gaseous and particulate isotopes from the facility. In addition to the TLD detection system, continuous radiological air monitors for radioactive isotopes are necessary. These must be located at all potential air emission pathways of the cask transfer building, or any other facility building associated with transportation casks or canisters, in the event of a cask breach. Continuous air monitors for radioactive isotopes should also be located at the facility perimeter to determine if, in the event of a cask breach, hazardous radiological material has left the site via the air pathway and, consequently, may affect the public. It is also not apparent how the exit air from each vertical ventilated module (VVM) will be collected or managed. The outlet duct of each VVM lid must be equipped with a radiometric detector that can detect radioactive emissions in the event of a cask breach and prevent emissions to the ambient air that may potentially leave the facility boundary. Portable air samplers must be available to facility personnel and used as deemed appropriate. Any exceedance of the dose constraint or periodic reporting on air releases required by the NRC must also be sent to the state of New Mexico for evaluation. With implementation of the NRC constraint rule, the exposures resulting from air effluents are constrained to a level not to exceed 0.1 mSv (10 mrem) in a year.

Holtec states, *"local radiation monitors with audible alarms to be placed in the canister transfer building"* but fails to provide the type of monitor (i.e., Holtec does not specify the radiation types that the will monitors detect).

"The Holtec radiological environmental monitoring program (REMP), proposes the collection of data during the preoperational years for the CISF project in Lea County, NM. The data collected during the preoperational years will be used to establish baseline radiological information for the proposed site. The data collected would be used in determining and evaluating potential impacts from the operation of the proposed CISF project on the local environment." The REMP would be initiated at least one year before the operations stage. Radionuclides would be identified using technically appropriate analytical instruments (e.g., liquid scintillation or gamma/alpha spectrometry). As previously stated, compliance would be demonstrated through project boundary monitoring and environmental sampling data. Again, Holtec fails to provide the details of the REMP and the minimum detectable activities (MDAs). The testing methods (e.g., liquid scintillation, or gamma/alpha spectrometry), are not defined. Holtec states it will provide a summary report of the environmental sampling program to the NRC each year, with MDAs, and facility-related nuclides found in environmental samples. Holtec should monitor radiation continuously to ensure no airborne release above public dose limits total effective dose equivalent (TEDE), and the results exceeding the TEDE must be reported to the NRC.

Holtec states, *"external radiological exposure for the public from the operations stage of the proposed CISF project would be from the SNF storage pad through direct shine (i.e., direct radiation). Because the casks are sealed and welded shut, there is no radiological exposure air pathway."* An experiment conducted by Sandia National Labs¹⁵ of radionuclides for Pressurized Water Reactor spent fuel determined that the potential release of airborne particles could present a hazard to the public as well as workers in the nuclear facility. The airborne dose per gram of SNF experiment sample rod of spent fuel UO₂ is shown in Table 2 below. The dose values in Table 17 indicate exceedance of public dose limits (i.e., two mrem in any one hour), should an accidental release occur.

15 Calculation of the Radionuclides in PWR Spent Fuel Samples for SFR Experiment Planning, Naegeli, 2004, SANDIA REPORT, SAND2004-2757.

Table 2. Activity and Airborne Dose per Gram and per Sample Rod of Spent Fuel UO₂.¹⁶

Spent Fuel UO ₂ Sample	Spent Fuel UO ₂ Mass (g)	H. B. Robinson 72 GWd/MTU 36.8 g UO ₂ /Rod		Surry Average Power 38.6 GWd/MTU 42.4 g UO ₂ /Rod		Surry Real Power 38.6 GWd/MTU 42.4 g UO ₂ /Rod	
		Activity (Ci)	Dose (rem)	Activity (Ci)	Dose (rem)	Activity (Ci)	Dose (rem)
Per gram	1.0	0.6436	0.4090	0.2784	0.08452	0.2697	0.08772
Per rod	36.8	23.7	15.0				
Per rod	42.4			11.8	3.58	11.4	3.72

Holtec states that continuous air monitors, if deemed necessary, would be located in the exhaust of the cask transfer building and also available as portable air samplers. Also, Holtec states there is no requirement for liquid monitoring of SNF because there is no potential for a liquid pathway, and there is no liquid component of SNF casks. Holtec must define how continuous air monitors will be “deemed necessary,” and continuous monitoring should be clarified to mean using a continuous alpha and beta radiation monitor.

The draft EIS does not contain any provision for groundwater monitoring. This is a critical omission given that shallow groundwater exists at the site; this groundwater must be monitored for any evidence of a release into the subsurface. The draft EIS, 2017 Environmental Report, and Safety Analysis Report (SAR), Rev. H¹⁷ all acknowledge the presence of discontinuous and variable-depth groundwaters at the proposed CISF site and the potential for shallow groundwaters in the vicinity that may be controlled by playa lake levels. Despite three current groundwater monitoring wells and the need for additional groundwater characterization as specified in the SAR, Rev. H, and “...as noted in the CIS Facility Environmental Report, baseline groundwater monitoring, sampling, and testing will be performed prior to construction of the facility in order to establish baseline measurements,” the Surface Water and Groundwater Monitoring subsection within Section 7.3 of the draft EIS specifies no groundwater monitoring and fails to mention the applicant’s planned 12-month groundwater characterization study which includes additional monitoring wells.

Soil and Sediment Monitoring: “Quarterly soil sampling conducted in surface-water drainage areas coupled with weekly and monthly radiological surveys on the casks and storage pad would be conducted.” Holtec must clearly state and describe in detail what analysis will be performed.

Leakage Testing: Holtec states, “the confinement boundary is leak tested with a helium mass spectrometer leak detector in accordance with ANSI N14.5.” The MPC design helium leak rate is 5 x 10⁻⁶ atm-cm³/sec helium. The applicant committed to using an MSLD with a sensitivity of 2.5 x 10⁻⁶ atm-cm³/sec. The leak testing in accordance with ANSI N14.5 is for transportation and is not applicable to the storage of SNF at the site.

4. The draft EIS is significantly incomplete without inclusion of all applicable state regulatory oversight and environmental impact controls.

The draft EIS does not adequately and thoroughly address hazardous waste; in particular, it contains incomplete information on the processes generating this waste, its management, and the identification of the potential circumstances that might result in its release to the environment. Section 2.2.1.6 (Emissions, Waste Generation, Transportation) of the draft EIS states, “[f]or the proposed CISF, hazardous waste produced would primarily occur from the use of chemicals or other solvents. Hazardous waste would include any leaks resulting in spills of oil from operating equipment, or stormwater runoff carrying grease.”

¹⁶ NRC, Characteristics for the Commercial Spent Fuel Assembly for Preclosure Normal Operations, 2007, Table 17.

¹⁷ <https://www.nrc.gov/docs/ML1916/ML19163A062.pdf>

Spills of oil and grease in New Mexico do not usually constitute a hazardous waste and are instead considered a “special waste” with unique regulatory requirements. The draft EIS states that oil and grease discharges would be managed under the NPDES permit requirements, yet there are no specific requirements in either the Construction General Permit or Multi-Sector General Permit for oil and grease for these potential sectors in stormwater. In addition, based on NMED’s experience with construction projects, the Department is surprised by the statement in the draft EIS that hazardous wastes are not anticipated to be generated during construction. Table 2.2-3. of the draft EIS does not address a drain system in either the Cask Transfer Building or the Storage Building and does not address where that drain system would discharge. NMED considers the possible mismanagement of hazardous waste to pose a substantial threat to the environment, including groundwater and surface water, and therefore requires a thorough evaluation in the final EIS. As the draft EIS does not describe management of hazardous waste, NMED is concerned about these materials ending up in stormwater that leaves the facility.

The playas are regulated Surface Waters of the State and subject to Water Quality Standards at 20.6.4 New Mexico Administrative Code (NMAC) promulgated under New Mexico’s Water Quality Act.¹⁸ Before operation, the facility would be required to submit a Notice of Intent to Discharge to the NMED pursuant to 20.6.2.1201 NMAC. The draft EIS fails to describe any measures Holtec will take during facility construction and operation to mitigate or treat stormwater and other discharges from the facility prior to discharge into the playas. Section 4.5.1.1.1 (Construction Impacts).

5. The Proposed Action threatens minority and low-income populations in New Mexico that have already suffered disproportionately high adverse human health and environmental effects from nuclear energy and weapons programs of the United States. The Proposed Action must comply with Executive Order 12898 requiring that all federal agencies achieve environmental justice for vulnerable populations that would be disproportionately affected by programs of the United States.

The Proposed Action for indefinite storage of commercial spent nuclear fuel joins the ranks of uranium mining and milling, legacy contamination at national laboratories, and disposal of defense waste at the Waste Isolation Pilot Plant (WIPP), all of which have long presented risks to public health and the environment in the State of New Mexico that are disproportionately greater than such risks to the general population of the United States.

The draft EIS discusses the proportions of New Mexico population that are Hispanic, Latino or American Indian, as well as state residents living in low-income or poverty conditions. New Mexico’s percentages of these minority and low-income populations are significantly greater than in the United States’ general population (Table 3).

Table 3. New Mexico and United States Demographics.

Demographic	United States	New Mexico
Hispanic or Latino	18.3%	49.1%
American Indian	1.3%	10.9%
Persons in poverty	11.8%	19.5%
Source: U.S. Census Bureau QuickFacts: https://www.census.gov/quickfacts/fact/table/US/PST045219		

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority and Low-Income Populations, February 11, 1994, stated that “... each Federal agency shall make achieving environmental

¹⁸ Sections 74-6-1 et seq. NMSA 1978.

justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations of the United States.”¹⁹ The Council on Environmental Quality (CEQ) issued Environmental Justice Guidance under NEPA on December 10, 1997, that stated, “Agencies should consider the composition of the affected area, to determine whether minority populations, low-income populations, or Indian tribes are present in the area affected by the proposed action, and if so whether there may be disproportionately high and adverse human health or environmental effects on minority populations, low-income populations, or Indian tribes.”²⁰ On August 24, 2004, NRC issued a Policy Statement on the Treatment of Environmental Justice Matters in NRC Regulatory and Licensing Actions that stated, “NRC believes that an analysis of disproportionately high and adverse impacts needs to be done as part of the agency’s NEPA obligations to accurately identify and disclose all significant environmental impacts associated with a proposed action.”²¹

The draft EIS makes repeated, yet unsubstantiated, assertions that the Proposed Action will result in “no disproportionately high and adverse human health and environmental effects.” Given the geologic unsuitability of the proposed site, and the numerous other technical deficiencies as discussed above however, the draft EIS fails to demonstrate that residents of New Mexico, including vulnerable populations, will be adequately protected from exposure to the radioactive and toxic contaminants that could be released to air and water by the Proposed Action.

The Proposed Action threatens the high percentage of minority and low-income populations in the State of New Mexico that have already suffered disproportionately high adverse human health and environmental effects from nuclear energy and weapons programs of the United States. As such, the Proposed Action fails to comply with Executive Order 12898, CEQ guidance, or NRC’s own policy on environmental justice. Environmental justice deficiencies in the draft EIS include:

- a. Failure to identify and evaluate the cumulative history of adverse human health and environmental effects on New Mexico’s vulnerable populations; and
- b. Failure to quantify specific impacts and health consequences to vulnerable populations in New Mexico that might occur from the various accidents and release scenarios considered in the draft EIS.

The environmental justice deficiencies in the draft EIS must be corrected by preparation of a proper risk assessment that evaluates all potential release scenarios and that quantifies incident-specific and cumulative impacts to vulnerable populations in New Mexico. In accordance with Executive Order 12898, CEQ guidance, and NRC policy, every aspect of the Proposed Action must provide the highest level of protection to New Mexico citizens, including use of Best Available Technology in these safeguards. Our concerns about disproportionate impacts are another reason why NMED and EMNRD support the No Action Alternative.

6. The draft EIS fails to commit NRC to a comprehensive environmental oversight role during operation of the CISF.

The final EIS must address possible licensing conditions and NRC’s obligation to evaluate and respond to adverse impacts to environmental media, e.g., soil, surface water, groundwater.

7. The New Mexico Radioactive Waste Consultation Task Force presents the following comments regarding data provided by the NRC within the draft EIS.

The Governor’s Radioactive Waste Consultation Task Force is authorized by the Radioactive and

19 <https://www.archives.gov/files/federal-register/executive-orders/pdf/12898.pdf>

20 <https://ceq.doe.gov/docs/ceq-regulations-and-guidance/regs/ej/justice.pdf>

21 <https://www.govinfo.gov/app/details/FR-2004-08-24/04-19305>

Hazardous Materials Act²² and is comprised of Cabinet Secretaries from the EMNRD, NMED, Department of Public Safety, Department of Health, and Department of Transportation, who represent the interests of the State of New Mexico regarding the safe and uneventful transportation of nuclear waste in and through the state. The Task Force negotiates on behalf of the State of New Mexico with the federal government in all areas relating to the siting, licensing, and operation of new federal disposal facilities for high-level, transuranic, and low level radioactive wastes; conducting technical and policy analyses of related issues; recommending legislation to implement the State's policies with respect to new federal disposal facilities; identifying and disseminating information on impacts associated with those disposal facilities; and coordinating any related investigations or studies undertaken by state agencies.

7.a. The NRC must thoroughly assess potential radiological impacts to workers to ensure incident-free transportation of SNF.

In section 4.3.1.2.2.1 the EIS states that *“a linear, no-threshold dose response assumes, for radiation protection purposes, that any increase in dose, however small, results in an incremental increase in health risk. The cancer risk coefficient is 5.7×10^{-2} health effects per person-Sv [5.7×10^{-4} per person-rem]...”* However, the draft EIS does not clarify whether the 5.7×10^{-4} represent a “maximum tolerable risk.” Similarly, the NRC has not provided sufficient explanation or detail to demonstrate that consideration was given, with engineering design upgrades to the shipment conveyance, to ensure risk reduction to a level of 10^{-6} that would signify a level of “acceptable risk” at which level no further improvements in safety are needed.

7.b. Radiological impacts to members of the public must be minimized by incident-free transportation of SNF.

The draft EIS posits in 4.3.1.2.2.2 that *“doses received by members of the public from transportation of SNF indicate low doses that are well below regulatory limits and are a small fraction of the annual dose attributable to naturally occurring background radiation.”* The NRC must demonstrate that the preoperational environmental sampling plan is designed to quantify natural background concentrations to completely assess radiological inventories outlined in the NRC catalog of interim CISF isotopes.

7.c. The NRC must thoroughly assess and avoid radiological impacts to workers and the public from SNF transportation accidents and must ensure local communities are prepared to promptly and effectively respond to an accident.

The EIS asserts that these computational forecast and transportation package designs are robust in containment of shipment contents, and further that *“All of the estimated radiological health effects to the public from the proposed SNF transportation under accident conditions are below the aforementioned International Commission on Radiological Protection (ICRP) threshold and are therefore likely to be zero.”* 4.3.1.2.2.3, page 4-18. In New Mexico, the WIPP and State of New Mexico have formulated a workable partnership to advance and enhance the emergency response capabilities of emergency response entities. In contrast, Holtec has no mechanism for major outreach and funding to local emergency responders, (i.e., law enforcement, fire and rescue teams, hospitals, and elected city officials, at the local and state levels, etc.) to ensure New Mexico’s emergency responders would be funded and prepared to address any transportation accidents or releases from Holtec’s CISF.

7.d. Radiological health effects references must be clarified and accessible.

The draft EIS states that, *“[a]ll of the estimated radiological health effects to workers and the public from the proposed SNF transportation under incident-free and accident conditions are below the aforementioned International Commission on Radiological Protection (ICRP) threshold and are therefore likely to be zero.”* 4.3.1.2.2.5, page 4-20. New Mexico questions this reference, and seeks a citation to the

²² Sections 74-4A-2 through 74-4A-14 NMSA 1978.

particular ICRP publication referenced.

7.e. Holtec’s described decommissioning and reclamation of project impacts is not guaranteed, potentially leaving New Mexico and its citizens responsible for the costs of responding to environmental and health effects of the CISF.

Holtec not included or proposed in Section 4.3.1.3 on Decommission and Reclamation Impacts any surety and warranty proposal to the State of New Mexico to ensure that site reclamations will be funded to the fullest extent. If Holtec should experience financial challenges or unplanned setbacks, this could require New Mexico to fund and direct any remaining decommissioning and reclamation needed to protect its citizens and to restore the environment.

7.f. The conclusion in the Summary of Transportation Cumulative Impacts about cancer deaths from the SNF does not adequately characterize the risk to the public.

“Considering the aforementioned estimated latent cancer fatalities (LCF) from the SNF transportation Holtec proposed for the CISF project at full build-out of 0.31 public LCFs, and 2.21 worker LCFs, and the preceding estimated LCF risk from other past, present, and reasonably foreseeable future actions of 3 LCFs, the cumulative LCF risk would remain a negligible contribution to the estimated baseline cancer risk within the exposed populations that were evaluated.” 5.3.1. The conclusory language in the summary Regarding the LCFs, does not explain whether this represents “tolerable risk” for members of the public, or “acceptable risk” at which no further improvements in safety need to be made. This section must be expanded to clearly identify, categorize and explain risks to the public.

7.g. The proposed radiological environmental monitoring and reporting program is incomplete and unclear.

The “REMP includes the collection of data during preoperational years to establish baseline radiological information that would be used in determining and evaluating potential impacts from operation of the proposed CISF project on the local environment. The REMF would be initiated at least 1 year prior to the operations stage.” 7.2 The draft EID does not explain if the preoperational baseline data collection will include the transportation roadways and rail spur, nor whether there will be monitoring in the local communities especially in populations identified in the Environmental Justice outreach cohort. Similarly, it is unclear if NMED will be a collaborative state agency for compliance with its regulatory framework. The proposed REMF must be expanded to provide a more thorough description of the program and New Mexico’s role in the REMF.