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Comment On: NRC-2016-0231-0342
Interim Storage Partners Consolidated Interim Storage Facility Project

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General Comment

See attached file(s)

Attachments

20-11-03 FINAL - DEIS Comments

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Washington, DC 20555–0001.

Re: Dkt. NRC–2016–0231/NUREG 2239; Joint Comments on Draft Environmental Impact Statement (DEIS) for the Integrated Storage Partners, LLC's Consolidated Interim Spent Fuel Storage Facility

Dear U.S. Nuclear Regulatory Commission:

On behalf of their respective clients identified below and their represented communities, Lone Star Legal Aid (LSLA) and Texas RioGrande Legal Aid (TRLA) submit these joint comments to the U.S. Nuclear Regulatory Commission (NRC) on the Draft Environmental Impact Statement (DEIS) and underlying Environmental Report, Revision 3 dated March 2, 2020 (3rd Revised ER or ER Rev. 3) submitted by Integrated Storage Partners, LLC (ISP) in connection with the license application for a Consolidated Interim Storage Facility (CISF) for spent nuclear fuel (SNF) and Greater-Than Class C (GTCC) waste, along with a small quantity of mixed oxide fuel. Although ISP's proposed CISF is in Andrews County, Texas, these comments highlight the potential impacts of this Project on the low-income individuals living in LSLA's and TRLA's

service area in 11 other counties in the State of Texas due to the necessary transportation of SNF and GTCC through these areas to the CISF.

I. REASON FOR CONCERN

Lone Star Legal Aid and Texas RioGrande Legal Aid represent the interests of low-income individuals and community organizations serving low-income populations that live in 11 counties potentially impacted by the transportation routes associated with the Project. LSLA's service area includes five counties in Texas along the proposed transportation routes to the CISF, specifically, Harris, Waller, Austin, Colorado, and Fayette Counties. TRLA's service area includes six counties in Texas along the proposed transportation routes, specifically, El Paso, Hudspeth, Culberson, Reeves, Jeff Davis, and Pecos Counties.

As such, clients of both LSLA and TRLA live, work and recreate near anticipated railroad, highway or barge route corridors through which canisters containing spent nuclear fuel will be passing. SNF is inherently a very deadly radiotoxic material, and each transport cask will contain considerably more radioactivity (200 times or more) than was dispersed by the Hiroshima nuclear bomb. SNF "poses a dangerous, long-term health and environmental risk. It will remain dangerous 'for time spans seemingly beyond human comprehension.'" *Nuclear Energy Inst., Inc. v. EPA*, 373 F.3d 1251, 1258 (D.C. Cir. 2004) (*per curiam*). The harms and threats from SNF include the potential for radiation exposures from being physically stuck in traffic proximate to truck or rail loads of SNF; spills and water runoff from accidents or leakage from those transport vehicles; downwind radioactive exposure from defective transport vehicles; and possible radioactive contamination of water sources caused by accidents. Cesium-137 (Cs-137) is one of hundreds of listed isotopes in the SNF. If there is a fire and leakage or surface radioactive contamination on a transport cask or vehicle, Cs-137 could quite readily volatilize and escape with the smoke, driven by the heat. Radionuclides could be inhaled by emergency responders and members of the public, could be carried downwind as fallout, and could be ingested (via drinking water or contaminated food), and then lodge in and attack human muscle tissue, including the heart or thyroid gland. Cs-137 and other likely SNF isotopes must be respected in transport accidents, especially those involving fires and leaks into surface waters. It may be difficult to assess the threats of airborne or waterborne radiation from such events with precision, but the threats cannot be dismissed out of hand.

The possibility of adverse effects logically applies as well to the transportation corridors and deliveries of SNF and GTCC waste to the CISF, which includes the 11 Texas counties in LSLA's and TRLA's service areas identified above. The presence of external contamination on a rejected, damaged and/or leaking cask ordered and in transit back to its sender by directive of ISP comprises an intentional act by ISP and creates a "viable mechanism by which significant radioactive materials would migrate off-site." Indeed, "return to sender" may violate the Atomic Energy Act. 10 C.F.R. § 72.122(h)(5) which states that "The high-level radioactive waste and

reactor-related GTCC waste must be packaged in a manner that allows handling and retrievability without the release of radioactive materials to the environment or radiation exposures in excess of part 20 limits. The package must be designed to confine the high-level radioactive waste for the duration of the license."

In the "Final Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada, Volume I" (February 2002), the U.S. Department of Energy pronounced that the "region of influence for public health and safety along existing transportation routes is 800 meters (0.5 mile) from the centerline of the transportation rights-of-way and from the boundary of rail yards for incident-free (non-accident) conditions. The region of influence was extended to 80 kilometers (50 miles) to address potential human health and safety impacts from accident scenarios."[1] While the region of influence was defined to a 50-mile radius, the region of influence is only applied to Andrews County, and no regions of influence are identified or evaluated along transportation routes—ignoring human health and safety impacts from transportation accident scenarios.[2] The NRC has not fashioned a bright-line geographic proximity rule for the transportation aspects of spent nuclear fuel and GTCC wastes, but has recognized in non-reactor adjudications radii of ½ mile to 17 miles as the basis for legal standing.

Both organizational groups represented by LSLA and TRLA have members and constituents of their services living between ½ mile to 17 miles of one or more of the proposed transportation routes.

A. FAMILIAS UNIDAS DEL CHAMIZAL

Familias Unidas del Chamizal is a neighborhood-based organization focused on building community stability and a safe environment for the residents of the Chamizal neighborhood. Members work together to fight injustices they face and to advance wellbeing in the community. Familias Unidas has addressed multiple relevant local issues, including advocating for more resources for Chamizal schools, preserving affordable housing, demanding lead testing and environmental assessments at area schools and public housing sites, and working to address contamination and safety concerns from adjacent industrial areas and semi-truck traffic leading through the neighborhood to the Bridge of the Americas International Port of Entry.

The Chamizal Neighborhood is located directly south of the proposed SNF route through El Paso and adjacent to the Mexican border. It is bordered to the north by the railroad, to the west by

[1] *See* Final Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada, Volume I, (February 2002), §§ 3.2.1 at. 3-119.
[2] ER Rev. 3 at 4-94.

industrial zoning, to the south by the Mexican border and highly industrialized *maquiladora* zones, and to the east by the busy international highway leading to the area's only free border crossing. The neighborhood is largely residential, containing single family homes, small apartment complexes, and three large public housing developments dating to the 1970s: Salazar Park, Tays North, and Tays South.

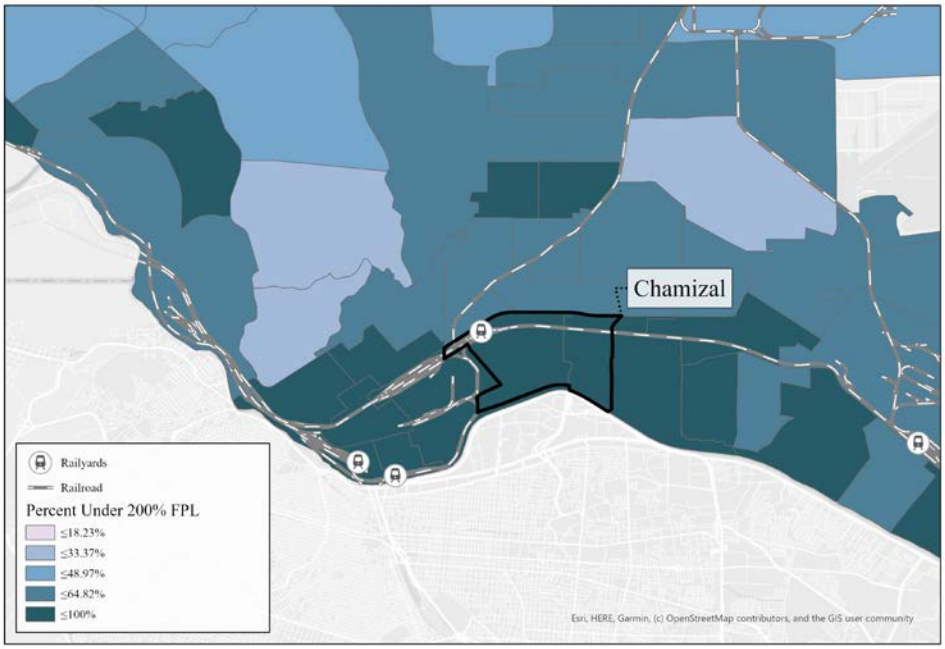
The Chamizal neighborhood also currently contains three public schools: Douglass Elementary School, Zavala Elementary School, and Bowie High School. Each of these schools is composed of at least 99% Hispanic students. Further, in the latest data set available from the U.S. Department of Education, 74.6% of Douglass Elementary School students and 86.3% of Zavala Elementary School students were listed as having limited English proficiency (LEP); 53.8% of Bowie High School students were also listed as LEP.[3]

As seen in the below maps, the Chamizal neighborhood, as a whole, is nearly all within half a mile of the railroad tracks and is very low income, is categorized as high LEP, is nearly entirely minority, and has a high Social Vulnerability Index score.

Even if the community's exposure to radiation from the SNF is low, the radiation the residents are expected to receive will add to their already high cumulative exposure to other pollutants. Further, due to their close proximity to the railroad tracks, there is a high likelihood that nearly all Chamizal residents would be exposed to high levels of radiation in the case of an accident in the El Paso area. The possible economic advantage of transporting SNF by rail through El Paso to Andrews, Texas does not outweigh the risk of harm to the already vulnerable Chamizal community.

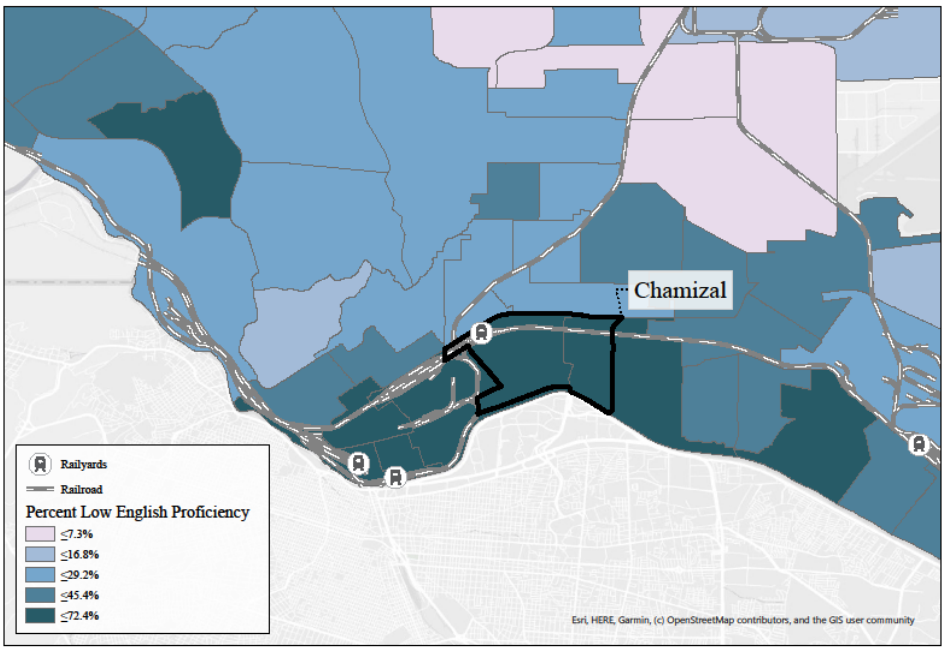
[3] U.S. Department of Education, Civil Rights Data Collection, accessed Nov. 2, 2020.

Figure 1: Map of Concentration of Low-Income Populations in and around Chamizal Neighborhood of El Paso, TX



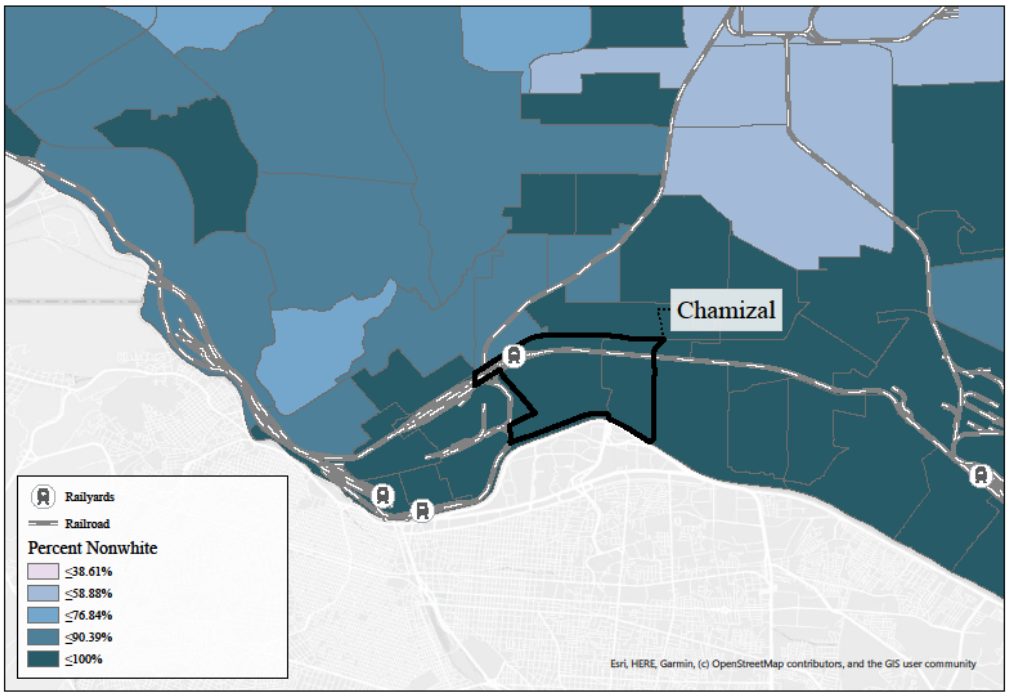
Percent Under 200% Federal Poverty Level
Chamizal Neighborhood

Figure 2: Map of Low English Proficiency in the Chamizal Neighborhood of El Paso, TX



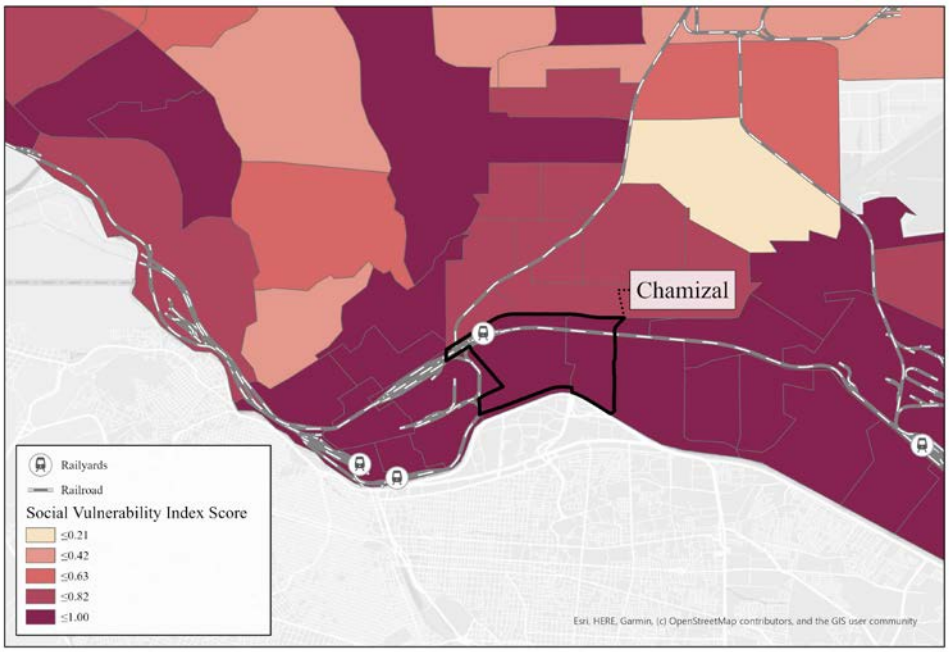
Percent Low English Proficiency by Census Tract
Chamizal Neighborhood

Figure 3: Map of Concentration of Minority Populations in and around Chamizal Neighborhood of El Paso, TX



Percent Nonwhite by Census Tract
Chamizal Neighborhood

Figure 4: Map of Social Vulnerability in and around Chamizal Neighborhood of El Paso, TX



Social Vulnerability Index Score by Census Tract
Chamizal Neighborhood

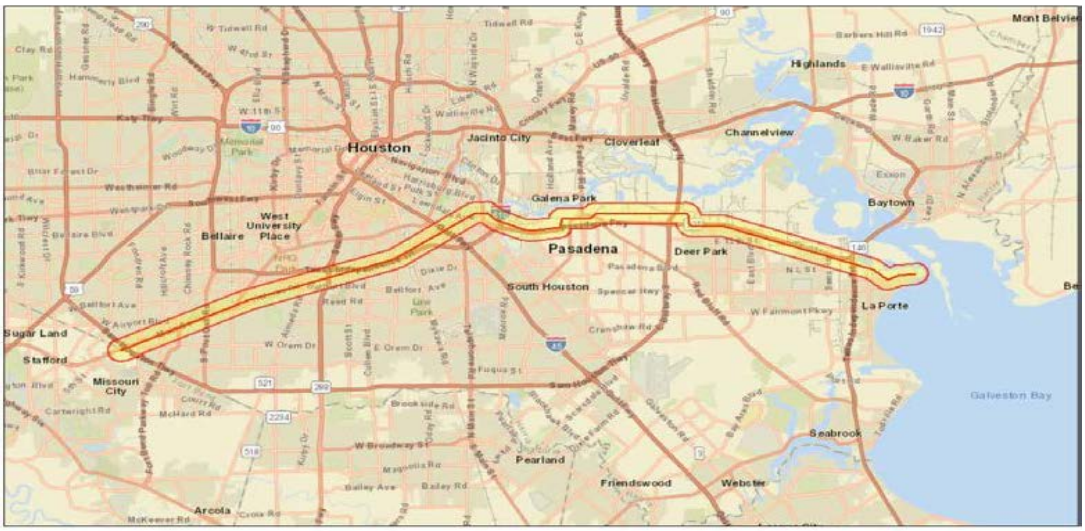
B. CARING FOR PASADENA COMMUNITIES

Caring for Pasadena Communities (CPC) is a non-profit organization based in Pasadena, Texas (Harris County), committed to raising awareness of issues affecting residents of Pasadena, Manchester, La Porte, and nearby communities. Particularly important to CPC are issues affecting the environment, public health and safety, and how those effects directly impact low-income residents of Pasadena and surrounding communities. CPC is organized to advocate for such communities, improve public education on environmental issues, and to ensure equal treatment for the low-income residents of the communities it serves. This work has involved direct involvement in the public participation process of numerous projects by highlighting environmental justice concerns for various permitting agencies that would otherwise go unnoticed and unaccounted for.

CPC is concerned for the numerous environmental justice communities adjacent to and/or very near the possible routes for the shipment of SNF, especially through Pasadena, Texas and the greater Houston area. The CISF contemplated by the 3rd revised ER includes a potential radioactive waste route through Harris County, Texas on Union Pacific rail lines headed to Andrews County, Texas. The DEIS analysis that follows is necessarily deficient because the routes were never defined in any iteration of the Environmental Report, the DEIS only contemplates that SNF would be transported from existing commercial nuclear power facilities across the U.S. to Monahans, Texas, using rail lines the Union Pacific Railroad operates.[4] Although not specifically disclosed as a transportation route, the potential Southern Route of Union Pacific rail line (Figure 5 below) travels through Pasadena, Texas and adjacent communities like Manchester, Meadowbrook, Lawndale, Pecan Park, and La Porte on the way from the ship channel through Harris County.

[4] DEIS § 3.3.1 at 3-8.

Figure 5: Southern Route of Union Pacific Rail Line Through Greater Houston



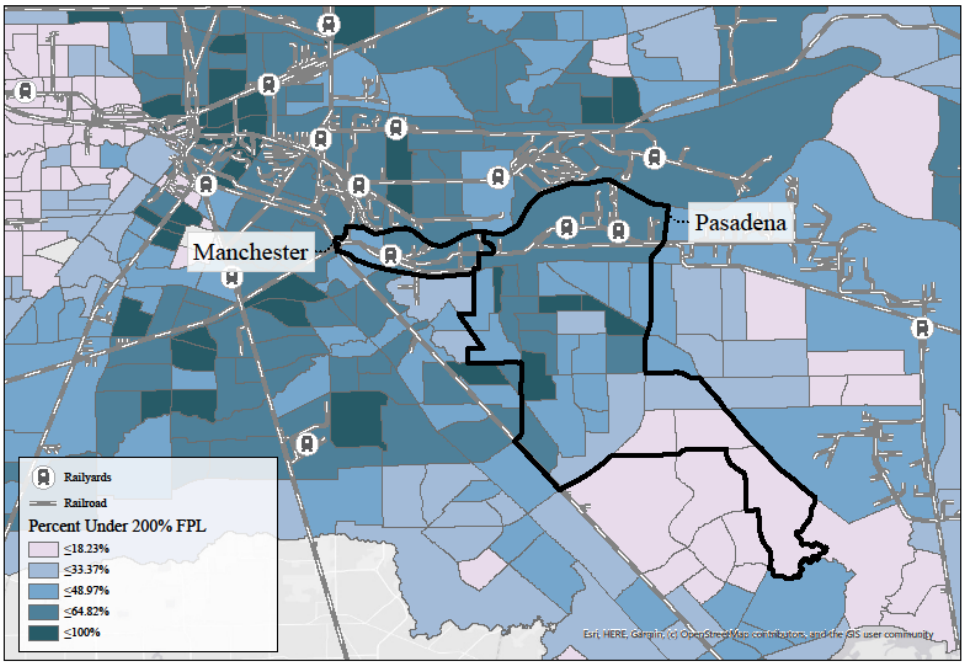
Pasadena, Texas is one of the most environmentally challenged communities in the greater Houston area. A brief look at data made available by the Environmental Protection Agency's (EPA) EJSCREEN Mapping Tool underscores this significant issue; residents of Pasadena remain disproportionately burdened by a host of environmental hazards. In terms of air toxics cancer risk, Pasadena residents are in 85th percentile nationally meaning that only 15% of the U.S. population has a higher risk of developing cancer from air toxins. In terms of superfund proximity, Pasadena residents are in the 94th percentile with only 6% of the U.S. population living in proximity to more superfund sites. Pasadena residents are in the 98th percentile for Risk Management Plan site proximity with only 2% of the U.S. population living in closer proximity to these sites— facilities that use extremely hazardous substances. Relative to particulate matter pollution Pasadena residents remain in the 86th percentile with only 14% of the U.S. population exposed to higher levels of PM 2.5 pollution. In fact, of all the risks classified by the EPA through their EJSCREEN mapping tool, Pasadena residents are in the 83rd percentile or worse, save one category. Clearly this is a community that should not bear the burden of additional hazards such as the passage of SNF through its low-income residential neighborhoods.

The maps below (Figures 6-12) show that the areas adjacent to the ship channel, which is hugged by the Southern Route of the Union Pacific rail lines, have some of the highest concentrations of low income and minority residents in the country. The northern sections of Pasadena run along the Union Pacific rail line while the community of Galena Park is found on the northern side of the Ship Channel.

Adjacent to Pasadena, Manchester remains a classic environmental justice community, bordered to the north and east by massive petrochemical plants and the Houston Ship Channel, to the

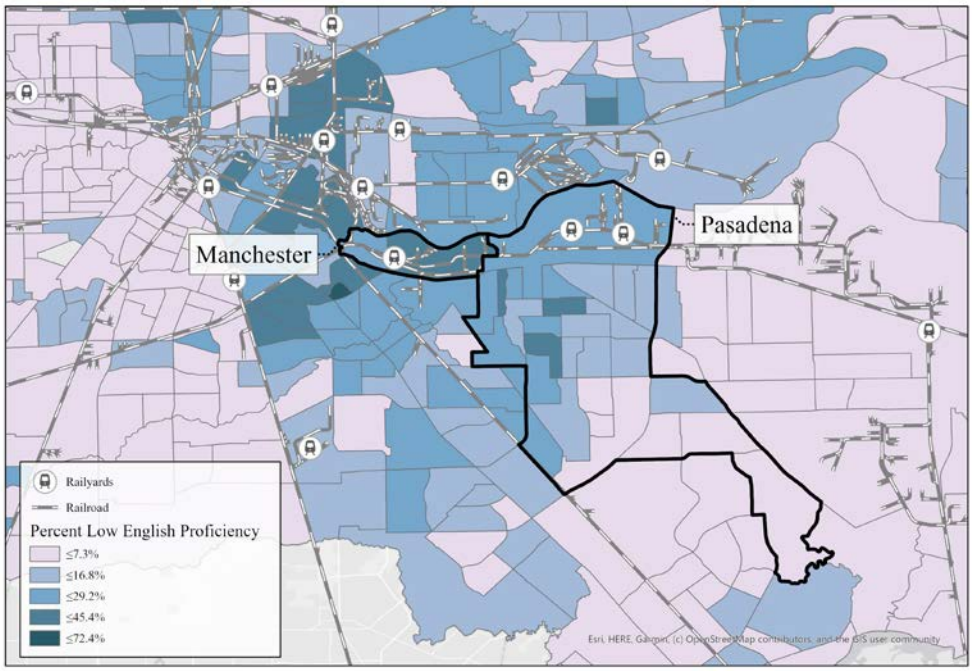
southeast by a rail yard which would play host to SNF, ship channel activity and numerous recycling facilities, and to the west by ten lanes of interstate highway. Petrochemical plants lie a few miles North and East. The concentration and magnitude of industrial sites poses a significant threat to nearby residents. Any decision to authorize the transport of SNF through Manchester will have adverse impacts on the quality of life and health of the people living there. According to data from the American Community Survey, 2011-2015 5-year estimates, Block Group 4820132420001 which includes the entire Manchester neighborhood, is home to a population which is 70% low income and 98% minority, compared to the Texas averages of 38% and 56%, and the United States averages of 34% and 38%, respectively. Further, demographic data from the American Community Survey reveals that within a one-mile radius from the Manchester neighborhood, disproportionate concentrations of minorities and low income households are prevalent. Here, the approximate population of 2,490 is 62% low income and 97% minority. Moving outward and expanding the area outside of Manchester to a two mile radius reveals a much larger population of 40, 817 that is 59% low Income and 95% minority.

Figure 6: Map of Concentration of Low-Income Populations in and around Manchester & Pasadena, TX



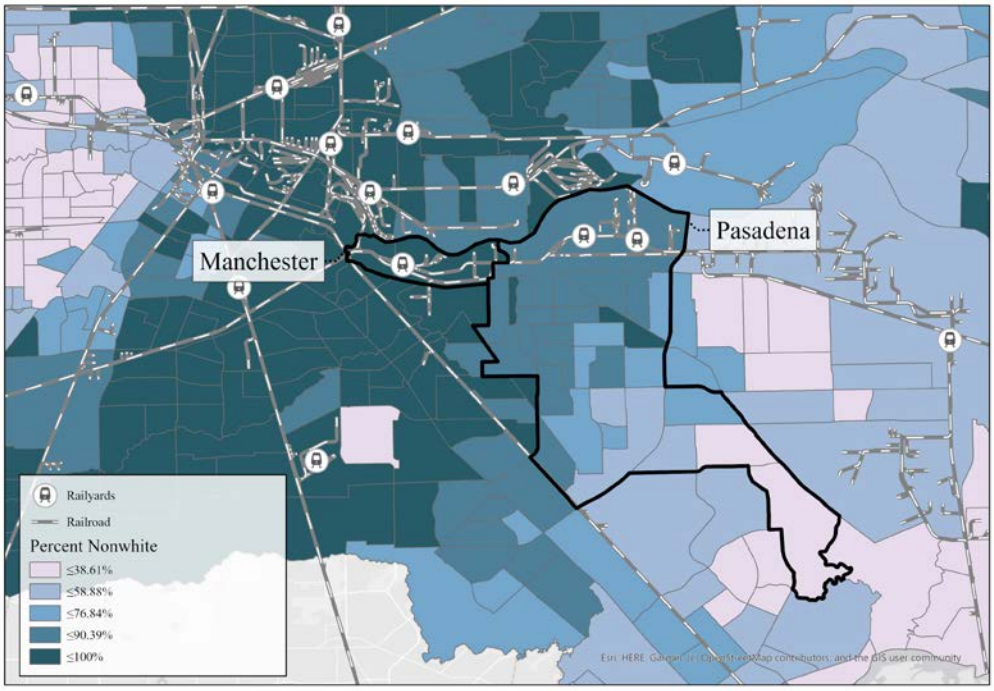
Percent Under 200% Federal Poverty Level
Manchester and Pasadena Neighborhoods

Figure 7: Map of Low English Proficiency in and around Manchester & Pasadena, TX



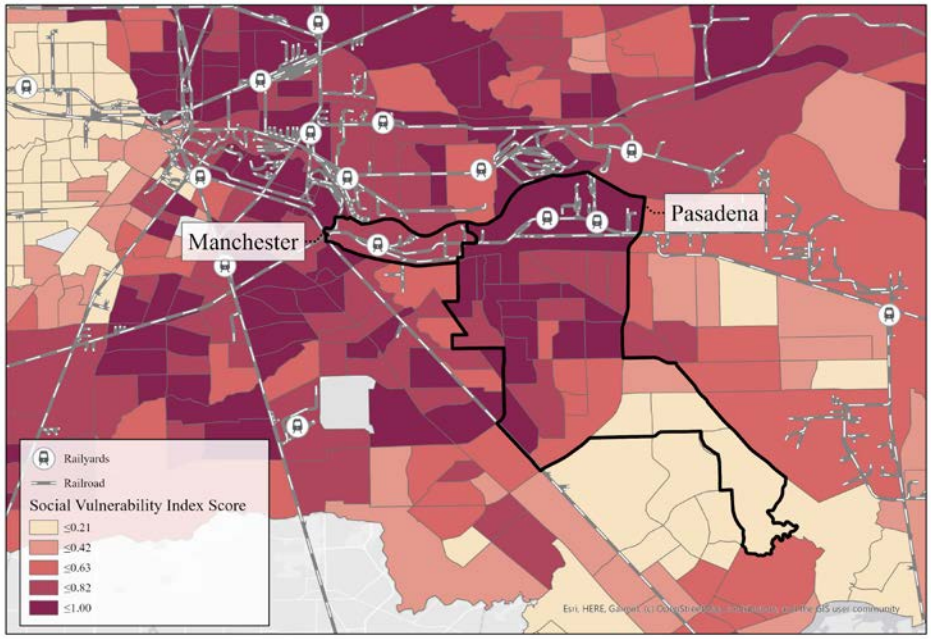
Percent Low English Proficiency by Census Tract
Manchester and Pasadena Neighborhoods

Figure 8: Map of Concentration of Minority Populations in and around Manchester and Pasadena, TX.



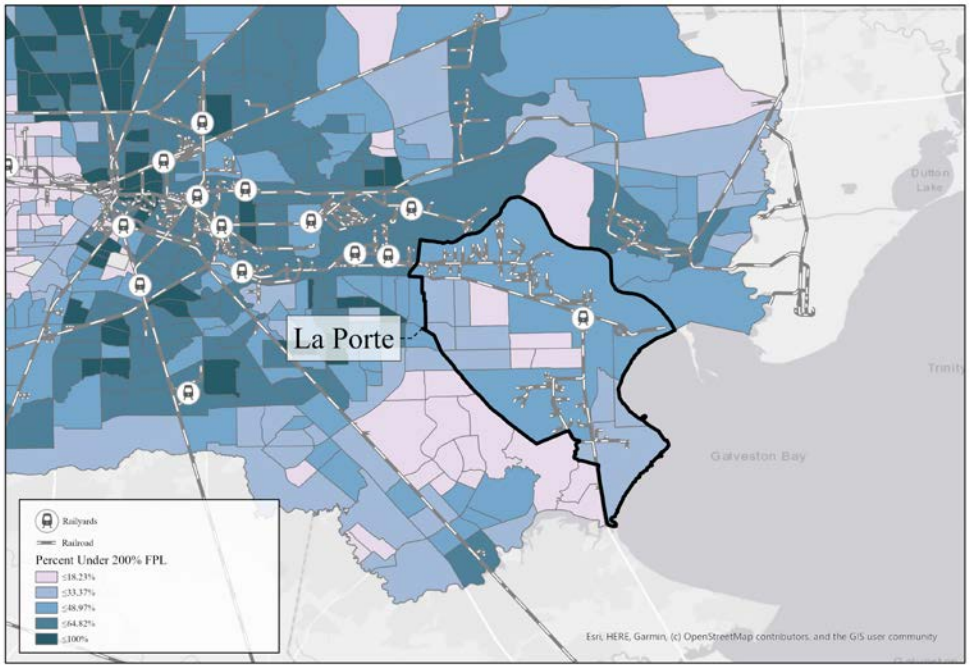
Percent Nonwhite by Census Tract
Manchester and Pasadena Neighborhoods

Figure 9: Map of Social Vulnerability in and around Manchester and Pasadena, TX.



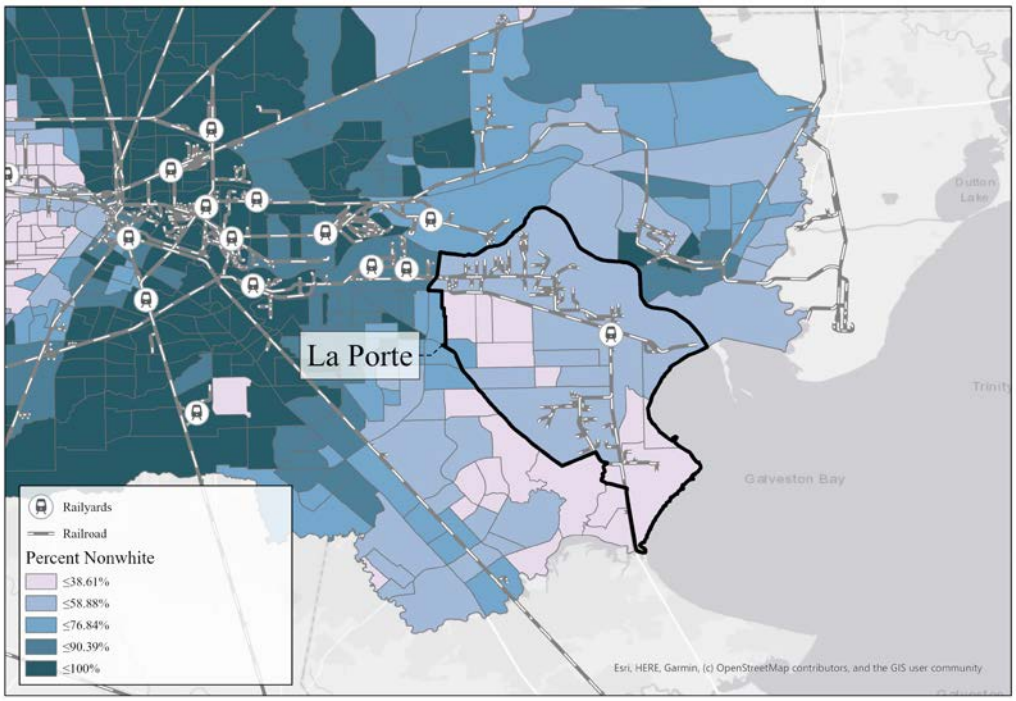
Social Vulnerability Index Score by Census Tract
Manchester and Pasadena Neighborhoods

Figure 10: Map of Concentration of Low-Income Populations in and around La Porte, TX.



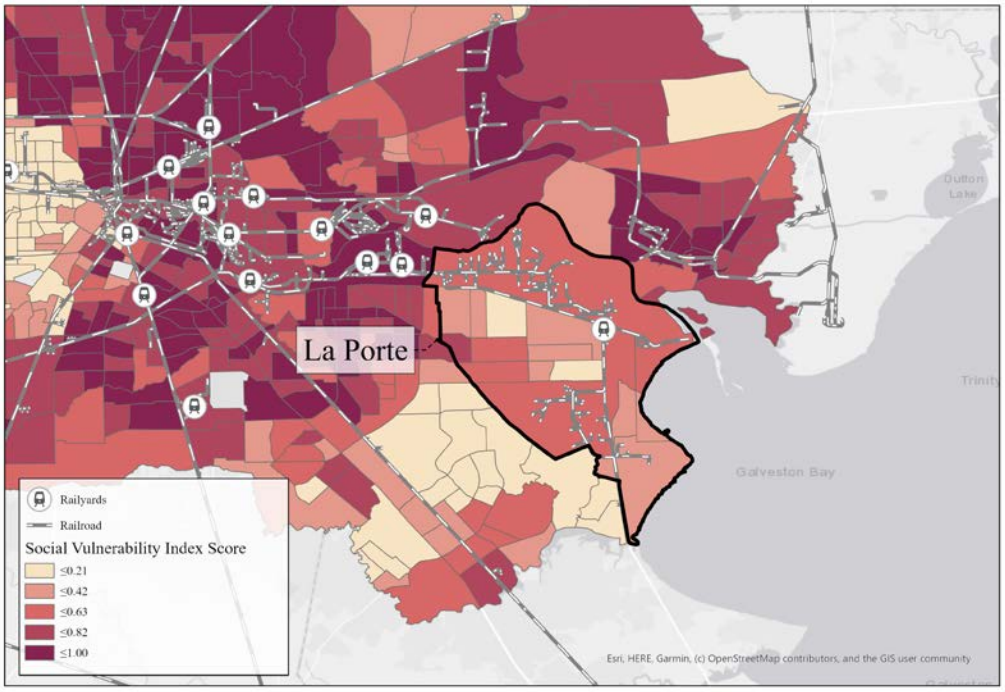
Percent Under 200% Federal Poverty Level
La Porte

Figure 11: Map of Concentration of Minority Populations in and around La Porte, TX



Percent Nonwhite by Census Tract
La Porte

Figure 12: Map of Social Vulnerability in and around La Porte, TX



Social Vulnerability Index Score by Census Tract
La Porte

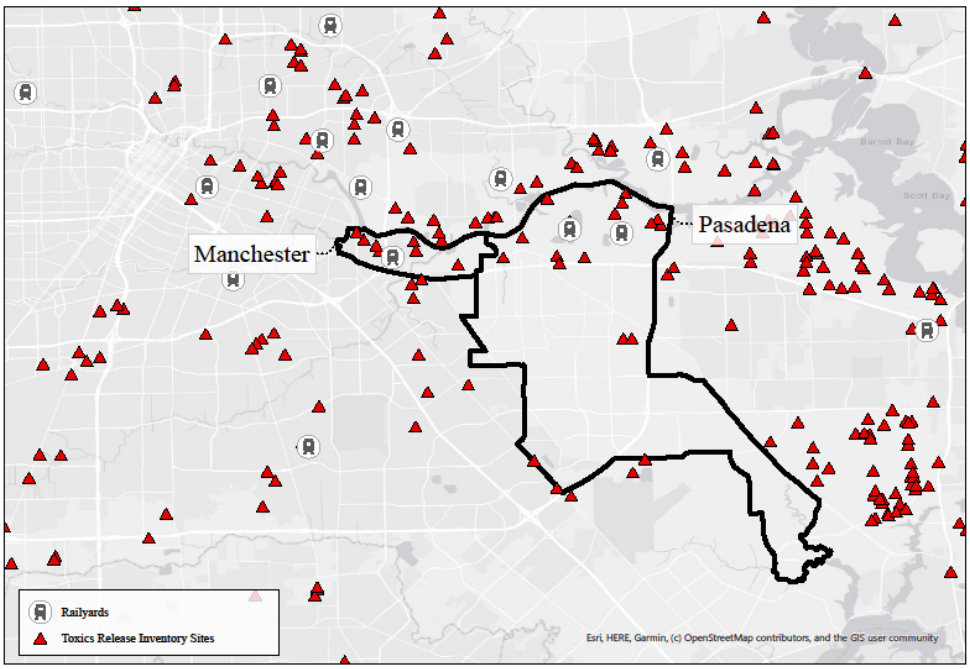
Three schools are located in the Manchester community: Milby High School, J.R. Harris Elementary School, and Deady Middle School. Profiles of these three schools make it clear that Manchester is an environmental justice community. Milby High School has an enrollment of 1,377 students 100% of whom are minorities, and 85% of whom qualify for free lunches. Deady Middle school maintains a minority population of 99%, while J.R. Harris Elementary School has a minority population of 97.5%. Further, only 34.5% of the students at Milby High School met minimum reading standards on the STARR test in 2016. This is a school system that needs help, not additional environmental and safety hazards.

For years, generations of Pasadena, Manchester, and La Porte residents have been exposed to abnormally high levels of environmental hazards. Below in Figures 13 and 14 are maps showing the Toxic Release Inventory for the Pasadena, Manchester, and La Porte communities. The demographic characteristics of affected residents raise additional concerns about public health and equity, with higher proportions of low-income households, and minority households when compared to those of Houston. CPC constituents may not be able to avoid radiological harm while living and travelling in Harris County near UP rail lines. The choice of routes is limited and travelers in the vicinity of a CISF transportation route may be unable to avoid radiological exposure and injury.[5] Moreover, the proposed southern route potentially crosses Harris County,

[5] *See Duke Cogema Stone & Webster (Savannah River Mixed Oxide Fabrication Facility)*, LBP-01-35, 54 NRC at 415 (2001).

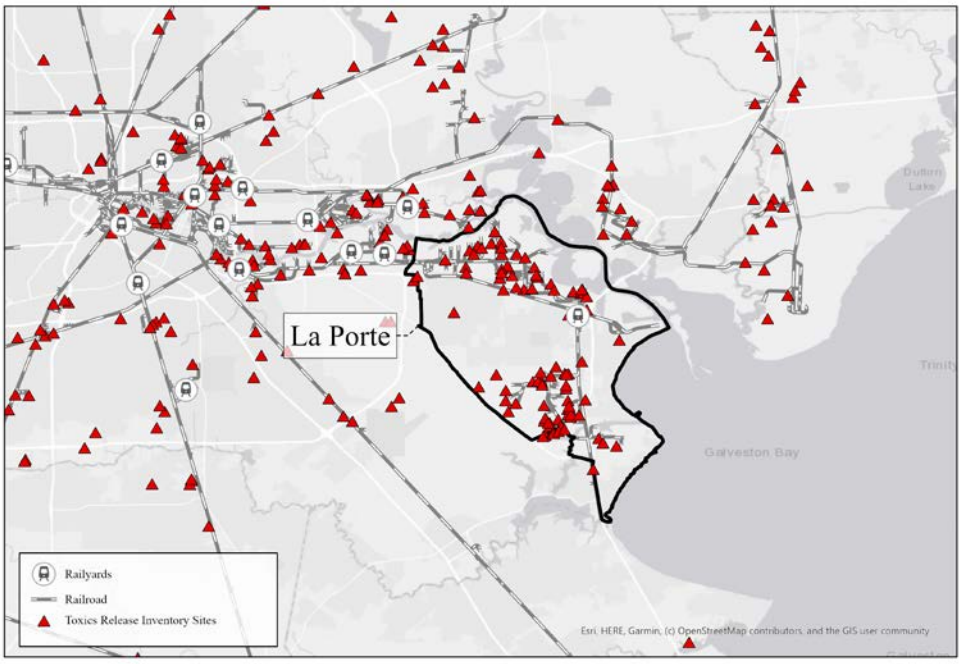
Waller County, Austin County, Colorado County, and Fayette County in Texas in LSLA's service area.

Figure 13: Toxic Release Inventory around Pasadena and Manchester



Toxic Release Inventory Sites
Manchester and Pasadena Neighborhoods

Figure 14: Toxic Release Inventory around La Porte

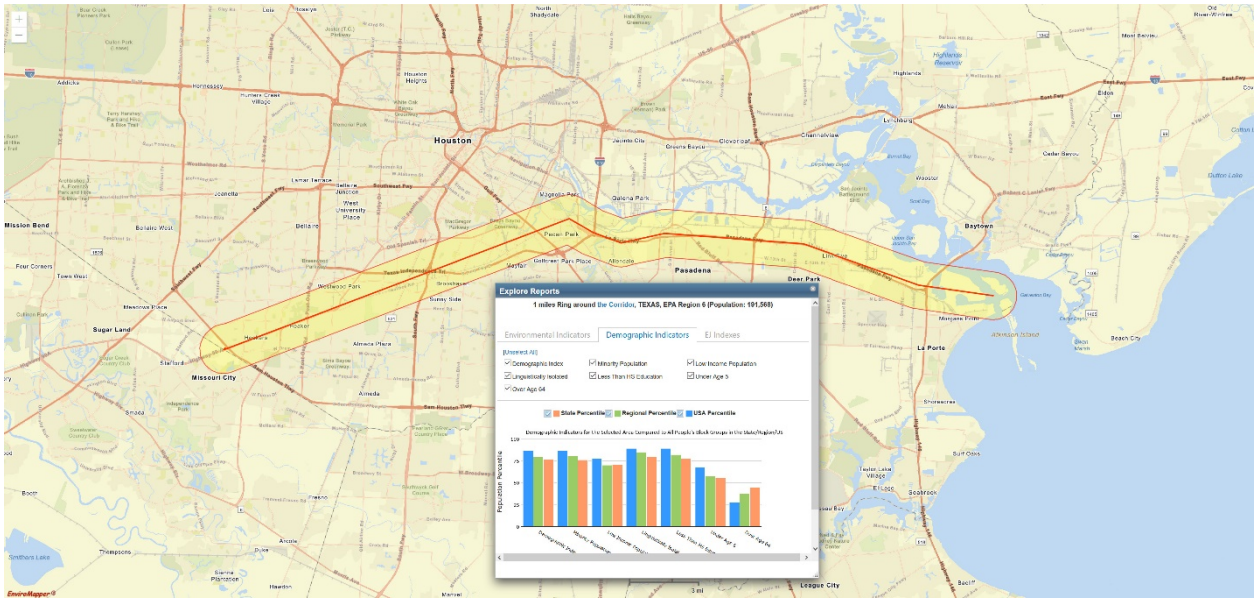


Toxic Release Inventory Sites
La Porte

1. Analyzing the Demographics of Potential ISP's Transport Routes through EJ Communities in Harris County, Texas

The site of concern is the region located from the mouth of the Houston Ship Channel to the railroad site intended to transport the nuclear waste stored as a fuel assembly from Houston Texas, to Andrews County, Texas. Fuel assemblies are composed of dozens to hundreds of spent fuel rods, no longer suitable for the necessary high density nuclear fission process used to power contemporary nuclear power plants, however, the SNF is still highly radioactive and produces a large amount of heat, which is why they are bound together in a lattice-like structure. While in these fuel assemblies (aggregates of spent fuel rods), the assemblies are constantly submerged in water, which is continuously cycled through the storage facility to keep the fuel assemblies at a constant heat. There are multiple dangers posed by this process, not least of which is the fact that many nuclear waste storage sites in the U.S. are currently operating far beyond their intended capacity.

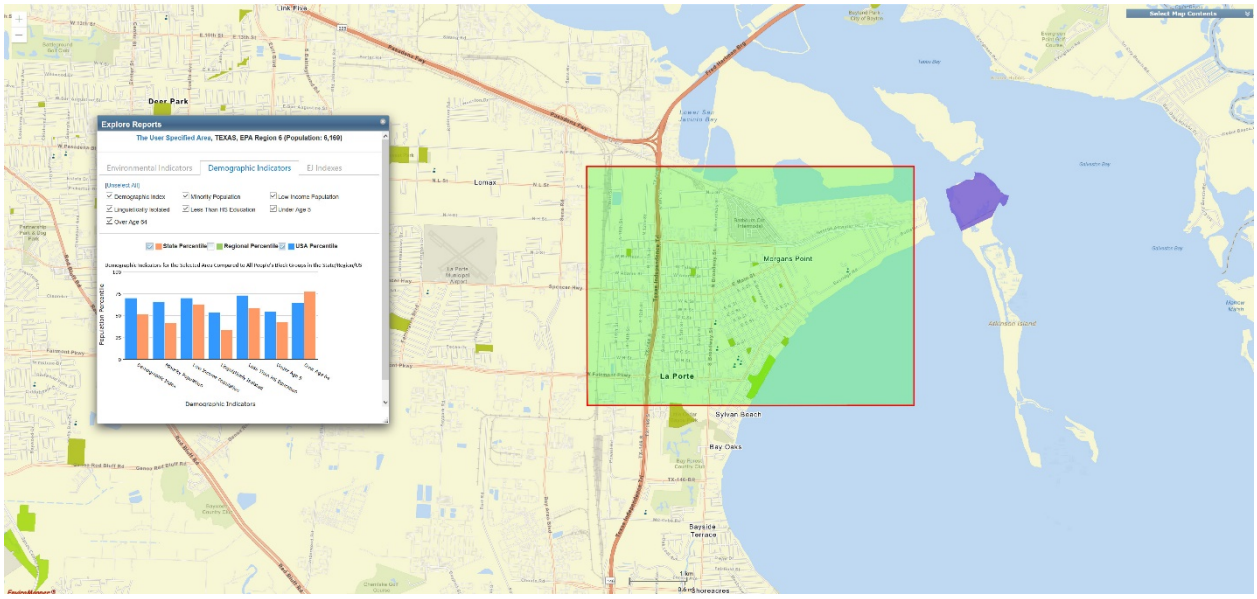
a. Potential Waterway to Railway Path



It is likely that ISP will offload the SNF at a location closer to the bay and load them onto a railway for transport to their disposal site located in Andrews County. This map looks at a 1-mile inclusive radius along a potential travel route through Harris County, Texas. Compared to a national level, this corridor is composed of roughly 87% minorities, and 89% of those in the area are linguistically isolated. Compared to the state, this corridor is composed of roughly 76% minorities with approximately 80% of those in the outlined area being linguistically isolated. With respect to income, compared to a national level, 78% of residents in the area are low-income with 89% possessing less than a high school level education. Compared to the state level, 71% of the residents in the area are low-income with 78% possessing less than a high school level education.

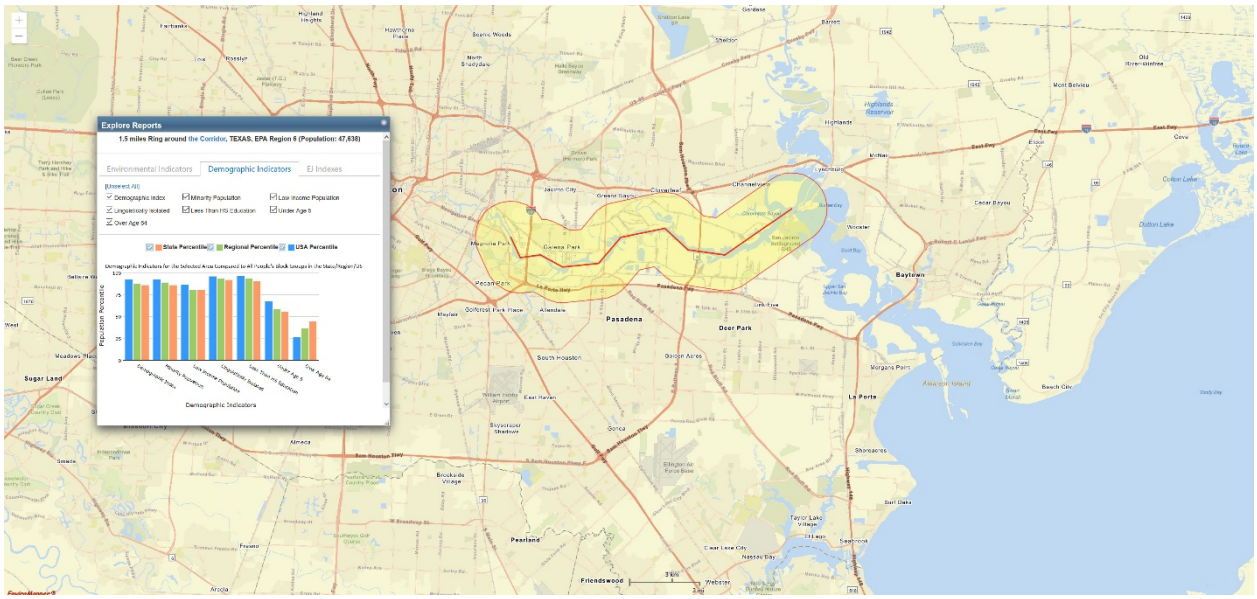
It should be noted that this map by its geographic nature will have a wider spread of population demographics as the transport line moves across many different areas, including some Houston suburbs.

b. Neighborhoods around the Potential Waterway Offloading Site



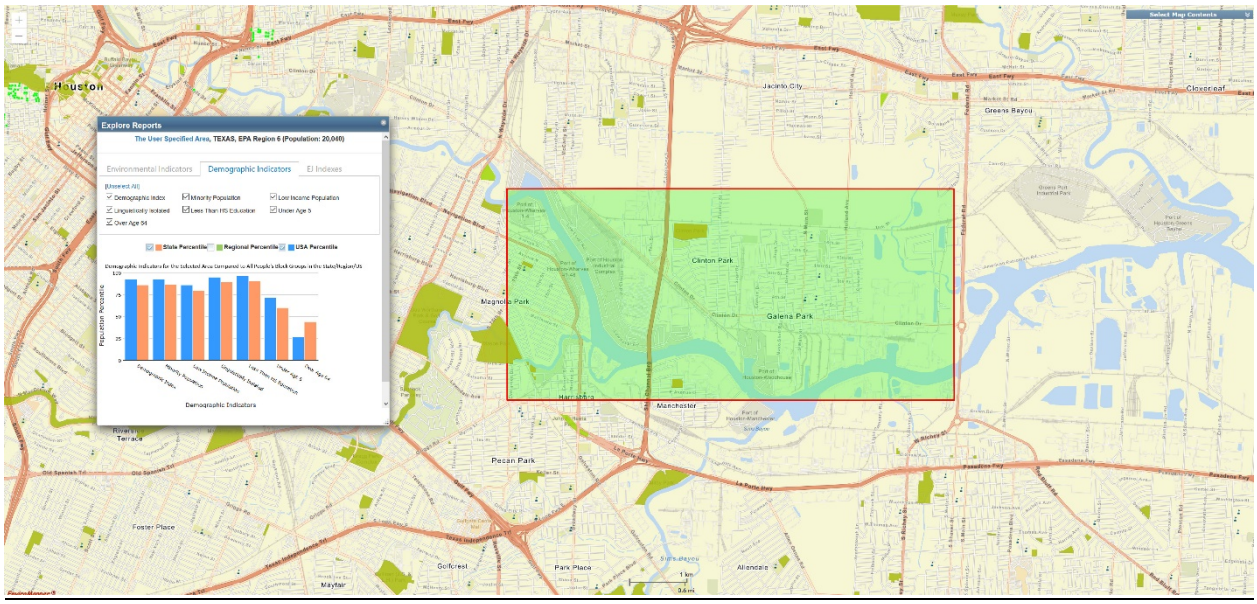
In an area of roughly five square miles, inclusive of Morgan's Point in the City of LaPorte, there are approximately 6,000 people living there, with six public schools and eight parks. On a national level this area is composed of 66% minority races and 54% of residents are linguistically isolated. On a state level this area is composed of 42% minority populations with 34% of the overall population being linguistically isolated as compared to the rest of the state. On a national level, 70% of the population in the area is considered low-income with 73% of the population possessing less than a full high school equivalent education. At a state level 63% of the population is considered low-income with 59% of the population possessing less than a complete high school level education or equivalent.

c. Potential Barge to Railway Path



It is also likely that ISP will use a location for offloading SNF canisters in the Port of Houston. The industrial complex appears to be an area between Magnolia Park and Galena Park, just northwest of Pasadena and is also close to railways. This area, mapped above, is centered roughly around 111 East Loop N, Houston, TX 77029. The racial breakdown of the areas within 1.5 miles of the potential danger zone and along the waterway are roughly 93% minority, with 96% of the population linguistically isolated compared to the national level. On a state level the area is composed of 86% minority population with 92% being linguistically isolated. This area is on a national level composed of roughly 88% low-income residents with 97% possessing less than a high school level education. On a state level this area is composed of approximately 82% low-income households and 92% of the population possess less than a high school level education compared to the state statistics.

d. Neighborhoods Around the Potential Barge Offloading Site



In an area of roughly six square miles, which is inclusive of the Port of Houston industrial complex and wharves there are approximately 20,000 people in residence, five public schools, and three public parks. On a national level this area is composed of 93% minorities and 95% of residents are linguistically isolated. On a state level 87% of the population in the area is composed of minorities and 90% are linguistically isolated. On a national level 86% of the population in the area is considered low-income and 97% has less than a completed high school level education. At a state level 80% of the population is low-income and 91% possess less than a full high school education.

2. <u>Summary of Potential Impacts to Pasadena-Area Neighborhoods</u>

Both of the assessed potential pathways –by rail or by barge – would increase the probability for potential harm to predominately low-income and minority populations. With the added fact of high levels of linguistic isolation and low levels of post-secondary degrees, the people within the identified regions are particularly at risk. This risk stems from the potential of the fuel rod assemblies to become damaged in transit and volatilize which would result in the release of radioactive isotopes (most common being Cs-137) which would necessitate governmental intervention in the immediate clean-up of any spill and ongoing monitoring for the inevitable health and environmental impacts.

Though incidences of damages or leaking fuel rods mid-transit are statistically low, the potential damage posed by such an event, especially in such a highly populated, and commercially important city, are very great and would seem to outweigh the proposed economic benefit especially when the agreement alterations by ISP are taken in to account.

II. DISCUSSION

A. THE DEIS FAILS TO ANALYZE TRANSPORTATION ROUTE OPTIONS FROM EACH SNF SOURCE SITE TO THE PROPOSED CISF.

1. The DEIS Fails to Evaluate Possible Rail Transportation Options

ISP is proposing to transport high-level nuclear waste on railcars through communities across the country.[6] Under federal regulations, a proposed nuclear waste storage facility "must be evaluated with respect to the potential impact on the environment of the transportation of spent fuel, high-level radioactive waste, or reactor-related GTCC waste within the region." 10 C.F.R. § 72.108.

With the information currently provided by ISP, evaluation of the environmental impact of transportation of SNF to the Andrews County facility would be impossible because transportation routes are not clearly defined. The lack of analysis of transportation routes also denies communities meaningful notice that they will have trains carrying nuclear waste passing through their communities or parked in neighboring rail yards. ISP's license application fails to address three crucial concerns regarding transportation routes to the facility: (a) the exact route from the 12 source sites named in the application, (b) why sites ISP has already identified as future source sites are not included in the current analysis, and (c) the effects of the piecemeal approach to analyzing transportation from source sites.

a. The DEIS fails to define transportation routes from the 12 named SNF source sites.

ISP's licensing application names 12 shutdown decommissioned nuclear reactor sites from which it expects nuclear waste will be shipped to the Andrews County facility.[7] Four of these sites are located on the West coast, four in the Midwest, three in the Northeast, and one in Florida.[8] ISP justifies the building of its facility with the claim that these sites can be returned to productive, communal benefit once the waste has been relocated.[9] However, ISP's application is lacking in meaningful information in regard to *how* the waste will travel to the CISF from these 12 named sites. By failing to exactly plot these routes, ISP's license application fails to provide meaningful notice to affected communities.

ISP has not bothered to project routes from each of the 12 named shutdown sites. ISP calculated the estimated distance, by rail, from 8 of these sites to the CISF. But these routes were chosen only to calculate cost, and therefore, ISP chose the shortest routes so the cost would be

[6] *ISP License Application*, Docket 72-1050 (July 19, 2018).
[7] ER Rev. 3 Table 2.2-1 at 2-6.
[8] DEIS, Figure 2.2-4 at 2-7.
[9] ER Rev. 3 at 1-5.

Figure 15: ISP's Currently Proposed

minimal.[10]

("The distance by rail from each facility to the CISF was based upon the shortest route of the train, which considered track weight capacity, but none of the other factors that might influence the routing of the train.").[11] In fact, the distance estimates do not even include barge or truck travel from the original site to rail access or the additional distances SNF will travel when transferring from rail line to rail line. For example the distance from the TNMR rail line to Union Pacific rail line.[12] Furthermore, ISP only mapped out three of the routes in their application: one from the Maine Yankee facility to the CISF, one from the San Onofre facility in a southern California facility to WCS, and one from the CISF to Yucca Mountain.[13] The DEIS offers even less defined potential routes at DEIS Figure 2.2-7 entitled Location of Railroads in West Texas and Southeastern New Mexico. Again, the routes were chosen with cost in mind, and, even then, the routes are merely vague outlines; the map which shows these routes does not have cities labeled.

[10] ER Rev. 3 at 7-25.
[11] ER Rev.3 Table 7.3-8 at 7-60.
[12] DEIS Table 3.3-1.
[13] ER, Figure 2.6-1, Page 2-78, (reproduced below as Figure 7).

Figure 16, below, shows the 12 shutdown sites named in ISP's application, three nuclear sites located in Texas (but not named in the application), and where these sites are located along U.S. railroads. While ISP included a "Rail Lines Map" in its application, 3rd Revised ER, figure 2.2-4, page 2-71 (Figure 17, below), that map leaves off many hundreds of miles of possible rail transportation routes. The rail lines map in the DEIS only shows the rail lines in the vicinity of the Andrews County Facility and completely omits greater transportation routes across the greater United States and the related affected communities.[14]

[14] *See* DEIS Figure 3.3-1.

Figure 16: Nuclear Sites and Railroad

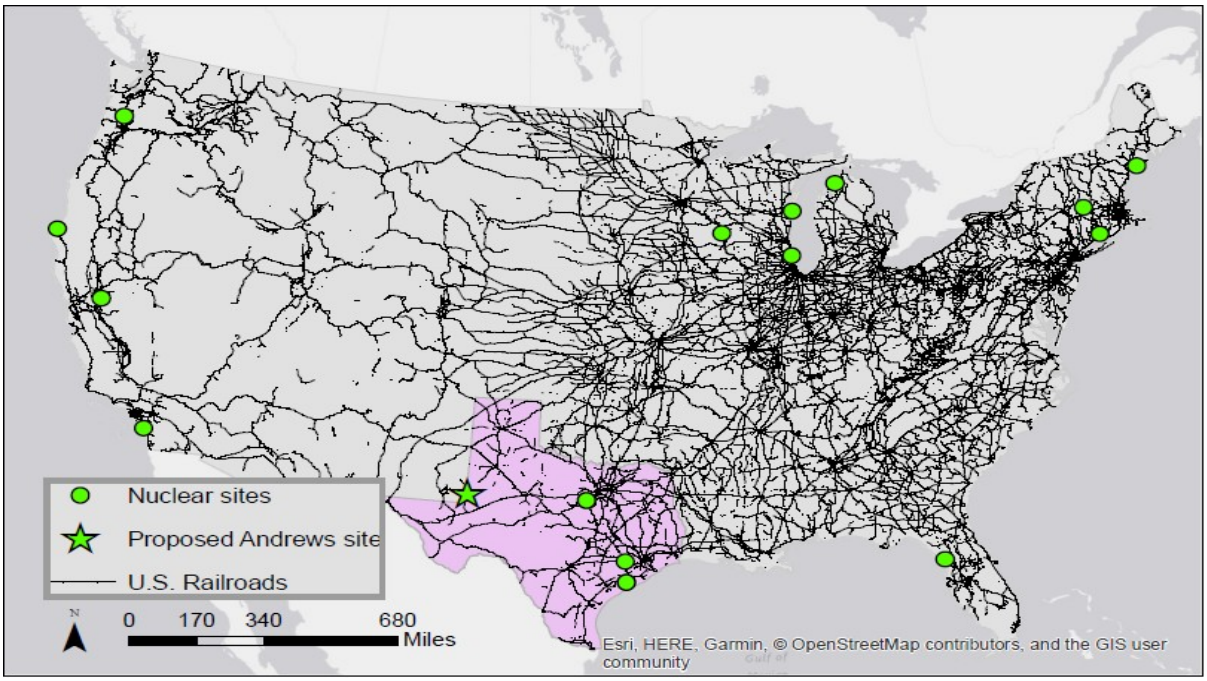
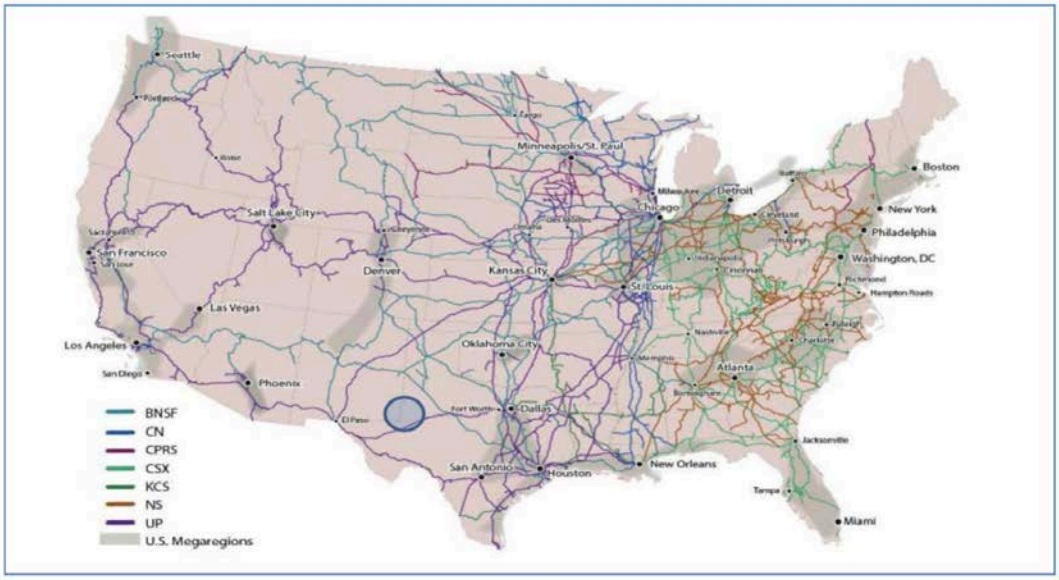


Figure 17: ISP Rail Lines Map



Title:	Figure:	Date:	
RAIL LINES MAP	2.2-4	11/16/2015	
		Scale: NONE	

The nation's thousands of miles of railroad track present innumerable route options to the proposed CISF in Andrews County. The potential routes are especially numerous in the Midwest and Northeast, where densely-populated urban centers have multiple lines running through them. Yet, ISP did not research the feasibility of transport along any of these numerous routes and has not defined the actual routes where the waste will travel.

We can also compare the Permian Basin railroad routes shown in the DEIS at Figure 2.2.-7[15] (Figure 18 below) with the myriad of possible rail road routes to Andrews County shown in Figure 19. Additionally, Figure 19 shows that the SNF cannot even travel directly by rail line to Andrews County, Texas from decommissioned sites because currently there are no direct rail routes.

[15] DEIS at 2-12

Figure 18: Permian Basin Railways

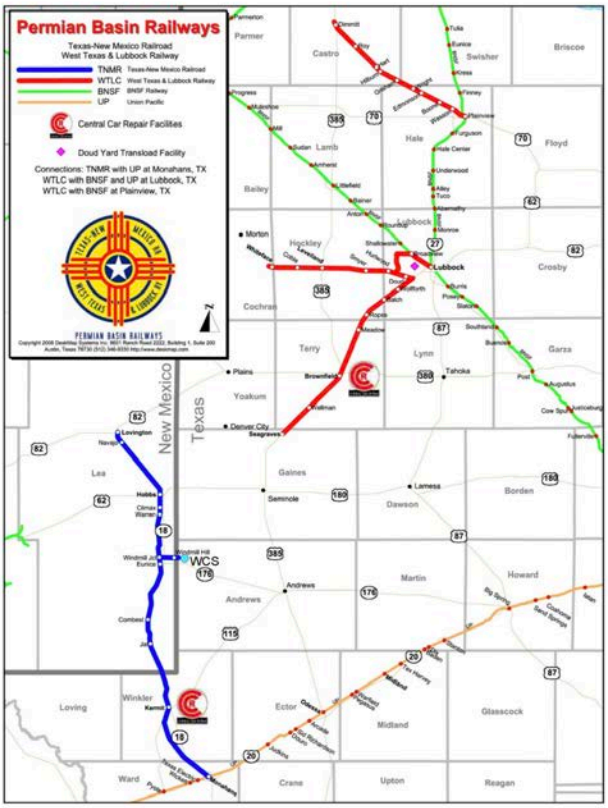
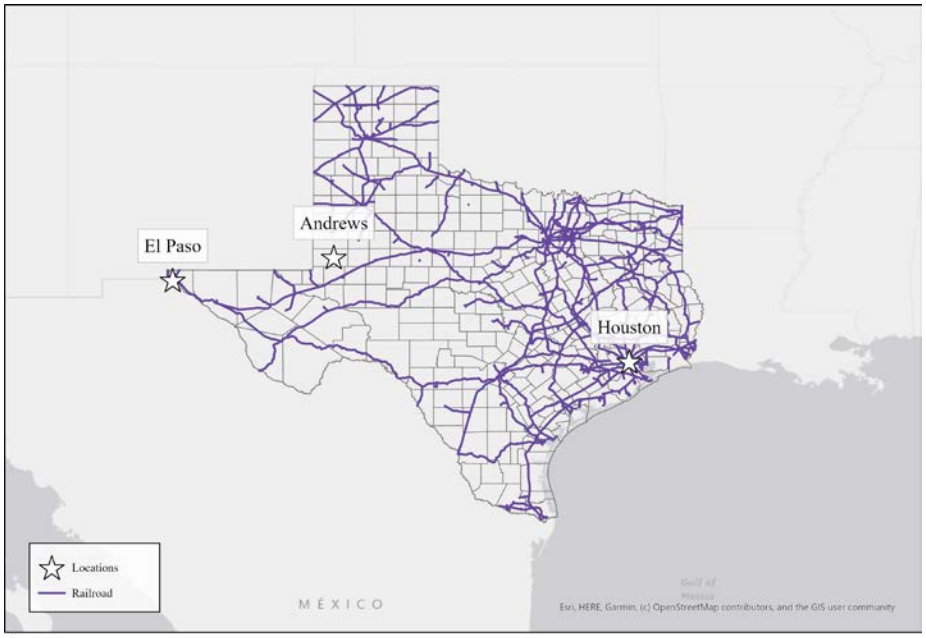


Figure 2.2-7 Location of Railroads in West Texas and Southeastern New Mexico (ISP, 2020)

Figure 19: Rail lines in the State of Texas



Texas Railroad Overview
State of Texas and Key Cities

Five of the twelve named sites in ISP's application are not accessible to "direct rail" routes.[16] The DEIS only reviews a "representative sample" of routes and still fails to identify exact routes that will be used in transporting SNF. These sites will have to rely on a combination of transportation methods—heavy haul trucks or barges—that require transfer to a railway. ISP does not define where these truck or barge routes will pass, and barely examines the different set of risks that these methods of transport pose.[17] For example, trucks have to travel much more slowly than trains, meaning longer exposure periods to radiation.[18] While the 3rd Revised ER in Attachment 4-1[19] does consider speeds of various transportation methods, the DEIS primarily analyzes transport from an "incident-free" perspective—stating that both collective and occupational doses of radiation were calculated for "incident-free shipments."[20] These calculations disregard the real risk of major accidents and incidents along transportation routes and then the subsequent catastrophic effect those accidents would have on neighboring communities. ISP states that the transport of waste will be the responsibility of the sites themselves, but facilities applying to store waste must also evaluate environmental impacts. 10 C.F.R. § 72.108. Once the waste facility is built, the pressure to approve waste to be shipped to it will be too high; these risks must be considered now.

The DEIS does not disclose exact transportation routes of the SNF, but the DEIS does include a chart with estimated distances at page 3-9 in Table 3.3-1 entitled: Origin, Destination, and Distance of Potential Rail Routes for Proposed Transportation of Spent Nuclear Fuel from Decommissioned Reactor Sites. This chart, however, still only lists 12 decommissioned sites. And, the estimated distances on the chart do not include barge or truck travel from the decommissioned sites to the nearest rail line. At the same time, the DEIS acknowledges that all of the decommissioned sites do not have rail access, making this chart an unrealistic analysis of even estimated distances. The DEIS states that "exact routes" will be determined in the future.[21] But, without defining exact routes the communities who will subjected to the impacts of waste transport are unknown. More obviously, the exact impacts, costs, or benefits can only be hypothesized without an exact transportation route. Not only that, but the most recent SNF transportation risk assessment was conducted in 2014 and still only analyzes potential routes. So, in effect, the actual risks associated with the actual routes the SNF will travel, have never been analyzed.

[16] ER Rev. 3 Table 4.2-3 at 4-15.
[17] DEIS at 2-11.
[18] ER Rev. 3 at 3-6.
[19] ER Rev. 3, Attachment 4-1, at 1-122.
[20] ER Rev. 3, Attachment 4-1, at 1.
[21] DEIS at 3-9.

b. While ISP expects to receive waste from up to 36 sites in the future, the application fails to name these anticipated future SNF source sites and fails to describes anticipated future transportation routes from these sites.

In the Second Revised ER, ISP noted that by the year 2053 (which would fall within its licensing period), there will be 71 shutdown reactor sites in the U.S.[22] Now, ISP states that it only expects to receive SNF from "approximately 36 shutdown sites."[23] Yet, the application includes no information on where these sites are located, nor how they would ship their waste to WCS CISF. ISP's environmental analysis also does not address any of the already-shutdown reactors at sites that also have operating reactors.[24] Because shutdown reactors at sites that *also* have operating reactors are *not* included in this evaluation, consequently these sites with operating reactors are also excluded from any DEIS analysis.[25]

While ISP justifies the building of its facility on this anticipated waste, none of these sites are named in its application. This means that entire communities have been left out in the safety and environmental analysis. And entire communities may believe that a nuclear facility in Andrews County, Texas, has no connection to their health and safety, when in reality nuclear waste will be passing through at regular intervals.

Transportation concerns likely include necessary upgrades to various infrastructure. While the DOE has conducted studies of the work needed near the 12 named shutdown sites, no similar studies have been done regarding these other sources.[26]

c. The DEIS fails to examine infrastructural, safety, and environmental concerns regarding transportation of SNF, instead leaving that process up to future, piecemeal applications from individual SNF source sites.

Rather than examining the impacts of waste transportation from the 12 named shutdown sites and the dozens more unidentified future source sites, ISP simply asserts that "[t]he DOE or SNF Title Holder(s) would be responsible for transporting spent nuclear fuel" from the shutdown reactors and existing commercial power reactors located across the country.[27] By pushing the "responsibility" onto the DOE and SNF Title Holders, ISP in effect pushes for a piecemeal approval process. ISP seeks to have its facility approved now, without having to consider these impacts, and simply asserts that when it comes time to transport the waste, these other entities will make sure that the transportation is "in compliance" with federal regulations. [28]

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[22] ER Rev. 2 at 7-4.
[23] ER Rev. 3 at 7-4.
[24] ER Rev. 3 at 3-6.
[25] *See*, ER Rev. 3 at 3-8.
[26] ER Rev. 3 at 3-6.
[27] ER Rev. 3 at 3-5.
[28] *See* ER Rev. 3 at 3-5.

To the extent not pre-empted by federal regulations promulgated by PHMSA and U.S. DOT, the Texas Commission on Environmental Quality is responsible for regulating movement of hazardous and industrial waste on public roads and rights-of way in Texas.[29] Further, local municipal regulations may also prohibit or limit truck transport of hazardous material/ waste within city limits like Houston. Specifically, in Houston, it is illegal for any truck transporting cargo of over 100 gallons (or over 1,000 pounds) of hazardous materials to travel upon any of the elevated freeways of the city within the boundaries of fire zones 1 and 2 (as these zones existed on December 1, 1969).[30] Trucks are not allowed to use any route, or street, within the portion of the city encompassed by Loop 610-North, West, South, and East unless (1) it is driving to or from that portion of the city where the truck is intended to be unloaded/loaded; (2) it is driving to or from property of the motor carrier owning such truck; or (3) it is driving to or from that portion of the city which is designated as a safe haven where the truck is to be parked for a period of not less than four hours.[31] Trucks, however, may travel on Loop 610-North, West, South, and East around the city's center.[32]

Further, without defined routes and proper analysis, the DEIS violates the National Environmental Policy Act of 1969 (NEPA), 42 U.S.C.A. §§ 4321 et seq. NEPA requires all federal agencies to make a detailed analysis of major federal actions affecting the quality of the human environment. Within that analysis, federal courts have held that an agency violates NEPA where the analysis is segmented, such as here. The court has held that it unlawful to segment a large project into smaller components to avoid complying with NEPA and not preparing an Environmental Impact Statement. *See*, *Susquehanna Valley Alliance v. Three Mile Island Nuclear Reactor*, 619 F.2d 231, 239-40 (3d Cir. 1980).

Here, the NRC is attempting to bifurcate the project into pieces limiting its analysis to storage in West Texas and omitting greater analysis of SNF transportation across the United States. However, without transportation there will be no SNF to store. The DEIS repeatedly points to analysis in the areas of construction, operations, and decommissioning, but fails to analyze impacts of transportation or potential accidents from transportation adequately.[33] Even the cumulative impacts analyzed with respect to transportation are limited only to: construction, operations, and decommissioning.[34] The cumulative impacts dealing with transportation avoid analysis of "the affected populations along the transportation routes" claiming that the cumulative impact analysis goes beyond the geographic scope of the analysis to various national origins or destinations."[35] The DEIS only focuses analysis on "incident-free transportation" as if accidents during transportation are so unlikely as to be all but impossible. Ultimately the DEIS

[29] 30 Tex. Admin. Code §§ 335.9-335.94.
[30] HOUSTON, TEX., CODE OF ORDINANCES Ch. 45, art. III, § 45-57 (1968).
[31] *Id.* at § 45-58.
[32] *Id.*
[33] *See* DEIS at xix.
[34] *See* DEIS at 5-17 to 5-19.
[35] DEIS at 5-17.

claims that transporting 5,000 metric tons of SNF across 200 million miles will have a *small* impact.[36]

Because ISP's application is only for consolidated interim storage of SNF, including the operation and construction of interim storage in Andrews County for 40 years, the application believes it can omit necessary transportation analysis to get the waste from origin and decommissioned sites to the proposed interim storage facility in Andrews County. The resulting analysis of accidents and incidents all but ignores transportation analysis. Omitting appropriate and adequate analysis of transportation risks attempts to avoid mandatory NEPA analysis for major federal actions.

The licensing review process should not proceed until the routes are defined—by both geography and method of transport—and communities living along the routes are given proper notice and opportunity to be heard. U.S. DOT plans to complete a transportation route study in 2022; this planning should also inform the licensing process.

B. THE ER FAILS TO DISCLOSE POTENTIAL FOR TRANSPORTATION BY BARGE SHIPMENTS.

The ER makes several statements that ISP plans to transport SNF exclusively by rail.[37] The majority of the discussion concerning rail lines concerns access to rail lines from the alternative storage sites and where rail lines may need to be constructed. However, because the ER does not disclose the exact transportation routes, as discussed above, it is difficult to comment on those potential impacts as well as to analyze the potential risks for transportation by other means than rail, such as by water via barge, which the ER acknowledges is an express possibility.[38] Transporting spent fuel and nuclear waste using barges in conjunction with trains is a viable option, and in several instances, it may be preferred for shipping spent fuel from reactors that may not be served by railroads or that are served by railroads but near good ports.[39] Without the required disclosures of expected water, highway and rail routes that the public has a right to see within the NEPA document, the ER and related DEIS are deficient.

Specifically, the DEIS states that the NRC staff considers that its disclosure of transportation routes is "sufficient" based on two previously published documents, neither of which mention any barge routes.[40] First, Section 2.1.7.2 of the DOE's Final Supplemental Environmental Impact Statement for a geological repository at Yucca Mountain (DOE 2008) does not reflect

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[36] *See* DEIS at 5-20.
[37] *See* ER Rev. 3 § 2-13 at 2-21.
[38] ER Rev. 3 at 4-11 to 4-12, Table 4.2.2; ER Rev. 3 at 4-14, 4-15, 4-19; DEIS at 2-11.
[39] Argonne National Laboratory, Technical Memorandum ANL/ER-TM-85-2, Preliminary Assessment of Costs and Risks of Transporting Spent Fuel by Barge (December 1985) at iii.
[40] DEIS at 3-9.

any barge routes, only rail.[41] Only one of these routes shows rail transportation connections to the South Texas Project in Texas.[42] Second, NRC's most recent SNF transportation risk assessment in NUREG-2125 does not mention any barge routes in any detail,[43] and none of the routes illustrated from Idaho National Labs, Indian Point, Kewanee or Maine Yankee go through any substantial portion of Texas, and especially not Andrews County, Texas.[44] The only location in Texas shown is Deaf Smith near Amarillo, Texas.[45]

There is only one map published in the 3rd Revised ER that shows any of the routes which will be taken for delivery of SNF and GTCC waste to ISP, and, it only mentions transport of radioactive material from two reactors. The information provided comes nowhere near disclosure of a 20-year transport campaign of an estimated 10,000 cask deliveries. Nor does it account for the various needs of facilities located around the United States that are likely to utilize this storage facility. Specifically, there are at least three decommissioned reactors mentioned in the ER that could contemplate shipping SNF by barge to the Port of Houston for later transport to Andrews County, Texas by rail. *See* Table 1.

Table 1: Listing and Location of Shutdown Decommissioned Reactor Sites with Potential Need for Transport by Barge to the Port of Houston, Texas for Transport to the CISF

Site	County	State	Adjacent Body of Water
Crystal River	Citrus County	FL	Crystal Bay, FL
CT Yankee	Haddam Neck	CT	Port of New Haven, CT
Maine Yankee	Lincoln County	ME	Black River, ME
Vermont Yankee	Vernon	VT	Port of Albany, NY

Three out of four of these sites are listed in Table 3.3-1 of the DEIS,[46] and the table notation expressly states that distance estimates do not include barge travel.[47] It is unclear from the DEIS whether there is any intention to transport from these facilities by barge and whether barge travel will end up being a more significant portion of the travel distance despite the DEIS' statement that barge travel will be from origin to the nearest rail line for those sites that do not have rail

[41] DOE's Final Supplemental Environmental Impact Statement for Yucca Mountain, Section 2.1.7.2, Figure 2-11, at 2-45 to 2-46 (DOE 2008).
[42] *Id.* at 2-46, Figure 2-11.
[43] NUREG-215, Section 2.1 at 15 (NRC 2014) (mentioning barge routes as potential mode of transportation but providing no detail on routes).
[44] NUREG-215 at pp. B-16 to B-19 (NRC 2014).
[45] *Id.* (NRC 2014).
[46] DEIS at 3-9.
[47] *Id.* at Table 3.3-1.

access.[48]

Moreover, barge shipments are likely to be necessitated by the fact that more than two-dozen U.S. atomic reactors lack direct rail access. Thus, to move the giant, 100+ ton rail-sized casks to the nearest railhead, either barges or heavy haul trucks must be used.[49] Table 2 identifies a number of nuclear facilities previously identified that would likely rely on barge shipments either in Table J-27 of Appendix J of the Department of Energy's "Final Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada" (February 2002), or in the Technical Memorandum offering a Preliminary Assessment of Costs and Risks of Transporting Spent Fuel by Barge published by Argonne National Laboratory in December 1985. It is unlikely that those circumstances have changed since those publications, which is why it is curious that the ER does not include or evaluate transportation to these locations by barge shipment. Kewanee, is the only site included on Table 3.3-1 in the DEIS, but, again, that table does not reflect the distance that could potentially include barge transport.[50]

Table 2: Listing and Location of Nuclear Reactor Sites with Potential Need to Transport by Barge to the Port of Houston, Texas for Transport to the CISF Site

Site	Location	Nearest Port
Browns Ferry 1, 2 & 3	Decatur, AL	Florence, AL
Brunswick	Brunswick County, NC	Cape Fear River
Calvert Cliffs 1 & 2	Lusby, MD	Port of Baltimore, MD
Cooper Station	Brownville, NE	Port of Omaha, NE
Diablo Canyon 1 & 2	Avila Beach	Oxnard, Port of Hueneme, CA
Farley	Dotham, AL	Chattahoochee River
Grand Gulf	Port Gibson, MS	Port of Vicksburg, MS
Hatch	Baxley, GA	Port of Charleston, SC
Indian Point	Buchanan, NY	Port of Jersey City, NJ
Kewaunee	Carlton, WI	Port of Milwaukee, WI
McGuire	Charlotte, NC	Port of Charleston, SC

[48] *Id.*
[49] Puller truck in front, pusher truck in back, and 200 wheels in between on the trailer. Heavy haul truck shipments can only go a few miles per hour, and cannot negotiate significant curves in the roadway.
[50] DEIS at 3-9.

Site	Location	Nearest Port
Millstone	Waterford, CT	Niantic Bay
North Anna	Louisa County, VA	Port of Norfolk, VA
Oyster Creek	Forked River, NJ	Port of Newark, NJ
Palisades	Covert, MI	Port of Muskegon, MI
Peach Bottom	Peach Bottom, PA	Port of Baltimore, MD
Pilgrim	Plymouth, MA	Port of Boston, MA
Port Beach 1 & 2	Two Rivers, WI	Port of Milwaukee, WI
Robinson	Hartsville, SC	Port of Charleston, SC
Salem 1 & 2	Salem, NJ	Port of Wilmington, DE
St. Lucie 1 & 2	Hutchinson Island, FL	Port Everglades, Ft. Lauderdale, FL
Summer	Jenkinsville, SC	Port of Charleston, SC
Surry 1 & 2	Gravel Neck, VA	Port of Norfolk, VA
Susquehanna	Salem, PA	Port of Baltimore MD
Three Mile Island	Londonberry Township, PA	Port of Baltimore MD
Turkey Point 3 & 4	Florida City, FL	Port of Miami, FL

While the DEIS acknowledges that some of the plants are located on navigable waters, such as the rivers, the Great lakes, or oceans, and have facilities to receive and ship loads on barges,[51] none of the impacts of these water shipments are discussed in the DEIS. Moreover, the DEIS mentions power plants not served by rail may need to utilize trucks or barges to ship SNF to the nearest rail facility.[52] Again, none of these impacts are analyzed in the DEIS because it states "the exact locations of SNF shipment origins have not been determined."[53] Yet the potential locations can absolutely be analyzed and should have been. There are only a finite number of currently decommissioned reactor sites that would even need to be analyzed, and the NRC is fully aware of the other existing nuclear reactor sites that already exist nationwide. To not do a complete analysis of these potential routes is a severe deficiency in the DEIS. While the NRC might be able to take the position that since there may be additional reactor sites that might ship to the CISF developed after the application, or there could ultimately be a permanent geologic depository in a location still unknown, these potential impacts cannot be analyzed for these

[51] DEIS, § 3.3.2, at 3-8.
[52] *Id.*
[53] *Id.*

transportation routes. However, there is no excuse for not analyzing potential routes from known facilities – both shutdown and operating – to the proposed CISF, particularly given that it is the only CISF site currently under review by the NRC. Surprisingly, despite being aware that there are 17 out of 24 reactor sites that do not have direct rail access but are located on waterways,[54] the NRC has, in the past, evaluated these risks to conclude that there is no apparent difference in the potential risk from the modes of transport.[55] However, that does not alleviate the requirements that these impacts are disclosed and analyzed, which the DEIS fails to do except in a cursory and conclusory manner.

Should a water transportation option later be selected, it is not disclosed in the DEIS and none of the associated potential impacts are discussed. Some of the distances for the direct water shipments from these sites to Houston, Texas will range from 1,000 to over 2,000 miles over a period of 13 to 29 days.[56] Likewise, shipments from plants to port by rail and then to the Port to Houston by Barge will potentially average rail distances exceeding 100 miles, then by water from 1,000 to 2,000 miles over a period of 27 to 36 days.[57]

These are long distances and periods of time that could increase potential for risk of an accident. Figures showing these potential transportation routes to Houston both directly by water and by a combination of rail and water were closely analyzed by the Argonne National Laboratory in 1985.[58] Figures 3.1 and 3.3 from the Argonne National Laboratory's 1985 study are reproduced below for reference. *See* Figure 20[59] and 21[60].

[54] DEIS, § 4.3.1.2.1, at 4-10.
[55] *Id.*
[56] Argonne National Laboratory, Technical Memorandum ANL/ER-TM-85-2, Preliminary Assessment of Costs and Risks of Transporting Spent Fuel by Barge (December 1985) at Table 3.2 at 3-7.
[57] Argonne National Laboratory, Technical Memorandum ANL/ER-TM-85-2, Preliminary Assessment of Costs and Risks of Transporting Spent Fuel by Barge (December 1985) at Table 3.4 at 3-9.
[58] Argonne National Laboratory, Technical Memorandum ANL/ER-TM-85-2, Preliminary Assessment of Costs and Risks of Transporting Spent Fuel by Barge (December 1985) at p. 3-3 and 3-5.
[59] Argonne National Laboratory, Technical Memorandum ANL/ER-TM-85-2, Preliminary Assessment of Costs and Risks of Transporting Spent Fuel by Barge (December 1985) at Figure 3.1 at 3-3.
[60] Argonne National Laboratory, Technical Memorandum ANL/ER-TM-85-2, Preliminary Assessment of Costs and Risks of Transporting Spent Fuel by Barge (December 1985) at Figure 3.3 at 3-5.

Figure 20: Potential Routes for Direct Water Shipments to Houston

Figure 21: Potential Routes for Direct Water Shipments to Houston

The transportation component from nuclear reactors to ISP is expected to last 20 years and include at least 10,000 separate shipments, which the DEIS states nearly all of which will be by rail.[61] According to 10 C.F.R. § 51.45(b)(1), the DEIS must address impacts of the proposed action on the environment, and they "shall be discussed in proportion to their significance." The transportation aspects of the CISF are of high significance to completion of the project. Adverse environmental effects which cannot be avoided must also be addressed. 10 C.F.R. § 51.45(b)(2). Alternatives must be discussed. 10 C.F.R. § 51.45(b)(3). Also, any irreversible and irretrievable commitments of resources which would be involved in the proposed action, should it be implemented, must be disclosed. 10 C.F.R. § 51.45(b)(5). The DEIS currently does not sufficiently address these issues.

Nor did the DEIS include are any of the risks involved in the transfer of SNF from a barge facility to a rail facility or the methods or precautions necessary to safely accomplish such transfer. For example, the DEIS did not address the likelihood of real-world accidents such as immersion of a cask and the likelihood of a release of radioactive materials from the shipping casks. U.S. Nuclear Regulatory Commission (NRC) design criteria for atomic waste transport containers are currently inadequate to test the potential risks of transport by barge. The NRC should adopt more stringent underwater immersion design criteria than its current test of the

[61] DEIS at 2-11.

integrity of a slightly damaged container submerged under 3 feet of water for 8 hours. The NRC also tests undamaged cask for a 1 hour submersion under 656 feet of water. If a cask were accidentally immersed under water, or sunk by terrorists, it is not reasonable to think that the cask would not be more than slightly damaged. Given that barge casks could weigh well over 100 tons (even up to 140 tons), completion of the recovery process in under 1 hour or even 8 hours seems unlikely particularly if the barge is making shipments through open waters. Special cranes capable of lifting such heavy loads would have to be located, brought in, and set up to start the recovery process. Moreover, there are numerous wrecks lining the ocean floor that have never been recovered due to the depth and costs of recovery.

There are at least two dangers of nuclear waste cask submersion underwater. First, radioactivity could leak from the cask into the water. Each barge sized container could hold 200 times the long-lasting radioactivity given by the Hiroshima atomic bomb. Given high-level atomic waste's deadliness, leakage of even a fraction of the contents from the Cask into open water or surface waters could spell unprecedented catastrophe. Second, enough fissile uranium- 235 and plutonium is present in high-level atomic waste that water, with its neutron moderating properties, could actually cause a nuclear chain reaction to take place within the cask. Such an inadvertent criticality event took place in Sept. 1999 at a nuclear fuel factory in Japan led to the deaths of two workers; many hundreds of nearby residents, including children, received radiation doses well above safety standards.

For our clients, Caring for Pasadena Communities and Familias Unidas del Chamizal, to meaningfully participate in the NEPA process, and in order for the public and emergency response officials to even begin to understand the scope of the CISF project's transportation side, there must be unconditional disclosure of probable transportation routes, whether by barge, highway or rail. The DEIS is deficient for failing to make such disclosures or confirm that the only transport of SNF, which is Type B packaging,[62] will be by rail and on which rail lines.

Moreover, currently, the Port of Houston specifically restricts the shipping of radioactive material (Class 7) to Low Specific Activity (LSA) N.O.S.,[63] and the transport of such materials must meet shipping and handling requirements of the International Maritime Dangerous Goods (IMDG) Code or 49 CFR, Parts 171-180.[64] The DEIS does not discuss the capability of the Port of Houston to accommodate the nuclear waste shipments proposed by ISP. Specifically, Class 7 Radioactive Material is limited LSA UN2912, UN3321, UN3322, Surface Contaminated Objects

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[62] *See* Radiation Emergency Medical Management, Understanding Shipping Labels and Placards for Radioactive Materials, Regulations for Type B Packaging available at:, https://www.remm.nlm.gov/transportation_hazard_id.htm#packages.

[63] N.O.S. is a U.S. DOT abbreviation for Not Otherwise Specified. The same term is used in other fields as well. DOT regulations require that a Proper Shipping Name (PSN) be used when labeling shipments of hazardous materials.

[64] Port of Houston Authority, Rates, Rules, and Regulations Governing the Houston Ship Channel and the Public Owned Wharves at 25 (July 1, 2020).

(SCO) UN2913, Radioactive empties UN2908, and Radioactive material, Type A package, special form non fissile or fissile-excepted UN3332 in limited quantities. Thus, the Port of Houston does not currently accommodate the transport of SNF requiring Type B Packaging. There is no provision or discussion of these existing transport limitations at various Texas ports, including the Port of Houston, in the ER or the DEIS to address the feasibility of the proposed transport options based on existing regulations.

Additionally, 10 C.F.R. § 72.108 requires that "The proposed ISFSI . . . must be evaluated with respect to the potential impact on the environment of the transportation of spent fuel, high-level radioactive waste, or reactor-related GTCC waste within the region." NRC regulations mandate investigation of environmental effects of the act of transporting the SNF-filled canisters, whether they are being delivered to the CISF or returned to the point of origin. To accomplish this, the anticipated routes must be made known to the public. Again, ISP has failed to make such disclosures when it comes to knowing whether there will be any anticipated deliveries by barge.

The concern to communities, like those in Pasadena living near a large port, is that the SNF and GTCC waste might be transported by barge first, and then delivered to a rail line near the ship channel for transport to the CISF. The concerns regarding this transport plan would take the SNF and GTCC waste through populous counties like Harris County, Texas and potentially expose a larger number of people than estimated in the 3rd Revised ER. Because the DEIS fails to address or even mention transport by barge with specificity, the impacts cannot have been sufficiently addressed in the DEIS.

C. THE DEIS FAILS TO CALCULATE RISK OF ACCIDENTS AND EXPOSURE LEVELS APPROPRIATELY.

An agency conducting a NEPA process must examine both the probability of a given harm occurring and the consequences of that harm if it does occur. "Only if the harm in question is so "remote and speculative" as to reduce the effective probability of its occurrence to zero may the agency dispense with the consequences portion of the analysis." *State of New York v. Nuclear Regulatory Comm'n*, 681 F.3d 471, 482 (D.C. Cir. 2012). There is a risk of radiologic harm from an accident caused by shipments of spent nuclear fuel being transported to the CISF. ISP has failed to address these risks adequately in the ER for the following reasons:

1. The ER Fails to Properly Consider the Potential for Release of High Level Radioactive Waste in Case of Fire.

In September 2001, Radioactive Waste Management Associates (RWMA) published a report detailing a hypothetical scenario in which a spent nuclear fuel dry storage cask could be

subjected to the conditions of a tunnel fire that actually occurred in Baltimore earlier that year.[65] In that fire, a rail car carrying tripropylene caught fire and began an intense 3-day fire that caused internal temperatures of the rail cars to reach at least 1600°F at its peak. The conditions of the fire were then applied hypothetically to a dry storage cask to estimate the effects of a possible release caused by such a fire. It was estimated that the cask seals would begin to fail at an internal temperature of approximately 500°F, and that the spent fuel assemblies within would begin creep rupture and subsequent release at approximately 650°F. As RWMA believed then, this type of accident remains a real world possibility, and should be planned for when determining the design criteria for SNF transport. The following factors should be discussed when planning for SNF transport:

- **SNF Storage Options**: The simplest option would be to store SNF closer to its point of origin, and wait for a permanent solution to be devised so that the waste only needs to be moved once, instead of twice (at least once to Andrews County, and again to the permanent repository).
- **Shipment Restrictions**: If the SNF must be shipped over long distances by rail, the best way to avoid a fire such as the one in Baltimore is to create rules that restrict or forbid freight trains from hauling both flammable material and SNF in the same train.
- **Temperature of Cask Test**: The temperature of the currently required test (1475°F) is wholly inadequate, given that temperatures in the Baltimore fire reach at least 1600°F. As a practical matter, and with a safety buffer, we would recommend SNF that will be transported via commercial shipping routes be tested to 1650°F.
- **Duration of Cask Test**: The duration of the currently required test (30 min) is inadequate to assess whether or not the cask will fail. In the RWMA report, it was concluded based on experiments conducted at the Lawrence Livermore National Laboratory, that it would take approximately 31 minutes (59 minutes) for steel-lead-steel (monolithic steel) seals to reach failure temperature (500°F), and the creep rupture temperature of the SNF assemblies (650°F mid-thickness) to be reached in 6.3 hours (11 hours), far shorter than the 3 days the fire raged. Additionally, these figures are based on a fire temperature of 1475°F, so at the estimated peak temperature of the Baltimore fire (1600°F), these failure points would be reached more quickly.
- **Emergency Cooling Equipment**: There are currently no requirements for emergency cooling equipment in the event of a fire. A properly designed cooling system would substantially increase the time until certain failure points are reached by keeping a steady stream of water or other cooling medium during a potential fire event. Another option would be to transport the SNFDSC immersed in water with a reserve tank in an adjacent shipping container to maintain the cask submerged if the water surrounding it begins to evaporate
- **Fire Suppression Equipment**: Much like the emergency cooling equipment, an automatic fire suppression system would do a great deal to minimize the effects of any fire that may develop. Considering what is at stake, it is not unreasonable to require automatic fire suppression systems on board trains carrying SNF.

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[65] Radioactive Waste Management Associates, Radiological Consequences of Severe Rail Accidents Involving Spent Nuclear Fuel Shipments to Yucca Mountain: Hypothetical Baltimore Rail Tunnel Fire Involving SNF (September 2001).

- **Population Centers:** The RWMA report estimated that in a city such as Baltimore, the affected population would be approximately 345,000 people based on 2000 census data. With the US population on the rise, we can only expect the number of affected people to increase in any given city that one of these trains might go through. However, at least in Baltimore, population is actually on the decline,[66] so Baltimore is an example of a city where there would likely be fewer affected people. In contrast, Harris County, home to both Houston and Pasadena, has one of the fastest growing populations in the country. As of the 2010 Census, the population was 4,092,459, making it the most populous county in Texas and the third most populous county in the United States. According to a July 2017 Census estimate, Harris County's population had grown to 4,652,980, comprising over 16 percent of Texas's population.
- **Estimated Acute and Chronic Dose:** In the RWMA Report, the acute dose to that population was estimated to be 15,495 person-rem, or approximately 45 mrem per person. The one-year population dose was estimated to be approximately 438,500 person- rem, or 1.27 rem per person. And the fifty-year population dose was estimated at approximately 8.8 million person-rem, or 25 rem per person. Although we realize that all of these exposure levels are small when compared to the Federal legal limits (5 Rem/yr), it violates the principles of maintaining radiation exposure As Low As Reasonably Achievable (ALARA) to ignore this worst case scenario in planning for a potential accident that causes a release event.

2. <u>The DEIS Fails to Accurately Estimate an Accident with Release Dose.</u>

The Environmental Report as well as the DEIS use flawed logic relying on a reduction in impacts based on the conditional probability of an accident with a release occurring.[67] Even if the likelihood of an accident can be reduced by the conditional probability of the accident occurring, the likelihood of an accident occurring does not reduce the impacts that would result from that accident.

The probability of an accident and the conditional probability of a release are irrelevant in calculating the exposure in the event of a release. If a release occurs, the radiation is not going to care what the probability of the event occurring was. The radioactivity released is going to cause the estimated dose, and there should be no probability factors applied to this dose estimate, as they are irrelevant.

3. <u>The DEIS Fails to accurately assess risks and likelihood of transportation accidents.</u>

While the DEIS acknowledges that the consequences of an accident would be both "significant and destabilizing," there is no subsequent analysis. Instead the DEIS is just extremely optimistic taking the unsupported position that there is a low probability of an accident occurring in the first

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[66] Terence P. Jeffrey. <u>Chicago, Detroit, Baltimore Lead Nation in Population Loss; Maricopa County Has Biggest Gain</u>. (March 23, 2017), *CNSNews.com* (identifying Harris County, Texas as one of the largest population growth centers from July 2015 to July 2016).
[67] *See* ER Rev. 3 at 4-22 to 4-29 and DEIS at 4-17 to 4-18.

place.[68] In the portion of the DEIS that discusses cumulative impacts, transportation risks are again downplayed, and, all but dismissed. Significantly, the DEIS does not ever qualify or quantify **what** SNF will be transported, and instead just generally refers to all SNF the same—this grossly underestimates the potential impacts different types of SNF are capable of causing if it is released during an accident. For instance, risks posed to the workers transporting the SNF were not even considered as part of the analysis for the proposed project.[69] Table 5.3-1 in the DEIS at p. 5-19 only estimates impacts for uranium and very low level radioactive waste omitting and failing to analyze potential impacts for accidents occurring with other radioactive wastes like plutonium, cesium, and americium as well as other SNF to be transported.

Not only are the types of SNF not identified but the number of people who would be potentially affected if an accident were to occur is additionally not adequately analyzed. The NRC gives a wide range of populations along rail lines anywhere between: 132,939 to 1,647,190 people.[70] And, rail shipments are additionally designed to link major urban areas together, and, as a result, in the event of an accident, the transport of nuclear fuel by rail would harm the greatest number of people. By design railroads go from one major population center to the next, and the DEIS does not contemplate avoiding these major hubs—increasing the chance that an accident would affect a huge number of people if one occurred.

Another problem with the NRC's "incident free" accident analysis is that the United States has never shipped this magnitude of waste. For example, **over 30 years** the U.S. made 2,700 shipments of SNF and those shipments traveled 1.6 million miles.[71] The current proposal, however, includes shipping 5,500 metric tons of SNF to be shipped over 40 years.[72] And using Yucca Mountain statistics, there could be up to 105,985 truck shipments that would travel over 200 million miles—this could mean an average of 7 shipments a day over 4 decades.[73] Consequently, the risk for accident **should be** proportional to the number of shipments and miles those shipments will travel and **not based** on analysis of only 2.5% of the total shipments and 0.8% of the miles those shipments will travel.

The DEIS states that "no accidents of any severity would be expected during the proposed action (Phase 1) and less than three accidents of any severity would be expected to occur over a 20-year period applicable to full build-out (Phases 1-8)."[74] But, just looking at Union Pacific Railroad accidents on the Federal Railroad Administration Office of Safety Analysis website, ***conservatively*** over 100,000 accidents could take place with Union Pacific rail lines alone during the 40-year licensing period—truck transport and barge transport are still unaccounted for in

[68] DEIS at 4-95.
[69] DEIS at 5-18.
[70] DEIS at 5-19.
[71] Pierre Sadik. Public Interest Research Group. Nuclear Waste Transportation Accidents in the U.S. Fact Sheet.
[72] DEIS at xvii.
[73] Pierre Sadik. Public Interest Research Group. Nuclear Waste Transportation Accidents in the U.S. Fact Sheet.
[74] DEIS at 4-18.

these numbers.

Table 3: Estimated Train Accidents over 40-year License Period.

Federal Railroad Administration Office of Safety Analysis[75]		
Category of Accident	**2010-2020 Accident Totals for Union Pacific Railroad Company**	**Estimated totals for 40-year Period**
TRAIN ACCIDENTS	7,578	7,578(x4)=30,312
HAZMAT RELEASES	65	65(x4)=260
HIGHWAY RAIL ACCIDENTS	5,007	5,007(x4)=20,028
OTHER ACCIDENTS	12,459	12,459 (x4)=49,836
TOTALS	25,109	100,436

The DEIS ignores catastrophic accidents in its analysis, while real life disasters should be built into the NRC's analysis. Catastrophic accidents, like the incident that occurred April 18, 2018 when two trains collided in Monahans, Texas must necessarily be evaluated.[76] This train crash demolished about a dozen rail cars, and one rail car was traveling at over 70 miles per hour. Most recently, on October 29, 2020, 25 train cars derailed in Mauriceville, Texas and residents within one-mile of the accident were asked to evacuate.[77] Parents were required to pick up their children from school.[78] Five train cars suffered breaches—four that resulted in petroleum product leaking and one that resulted in corrosive product escaping which required containment.[79] This train car accident required deputies, firefighters, a hazmat team, and TCEQ emergency staff to respond, as well as air monitoring to ensure no hazardous chemicals were released into the air.[80] It was reported that this train car derailment affected 600 residents, but the derailed train cars additionally damaged power lines ultimately affecting power for 2,200 people. The DEIS does not offer evaluation of a train car disaster, and instead points to the unrealistic assessment that "***more than*** 99.999999 percent of all accident scenarios would not lead to either a release of

[75]Federal Railroad Administration Office of Safety Analysis https://safetydata.fra.dot.gov/OfficeofSafety/publicsite/Query/TenYearAccidentIncidentOverview.aspx
[76] Monica Martinez. OA Online. Crash takes out more than dozen train cars, (April 18, 2018), available at: https://www.oaoa.com/news/traffic_transportation/vehicle_accidents/article_f7e3395e-435a-11e8-bbe5-5b37334a3c03.html
[77]Scott Elsinger. Train Derailment forces mile radius evacuation. Local abc 10. (October 29, 2020), available at https://www.abc10.com/article/news/local/train-derailment-forces-evacuation-of-schools-in-mauriceville-thusday-morning/502-c87cabb0-b193-4361-99d1-a1b81a16fab9
[78] *Id.*
[79] *Id.*
[80] *Id.*

radioactive material or a loss of shielding."[81] Taking into consideration the two accidents described above, this is not an honest assessment of the potential for accidents.

Additionally, in 2016, there was a similar head-on collision that killed people and derailed train cars with a fire that burned for 12 hours. In this accident debris was scattered up to 400 yards from the site. [82] While the ER estimates that after a cask burned for 3 hours the shielding would lose integrity risking release, the DEIS does not evaluate an accident resulting in a release.[83] Instead, the DEIS, estimates that there will be "less than three rail accidents of any severity, and zero accidents that will result in a release of radioactive material or loss of shielding."[84] And, based on this optimistic unrealistic analysis, the NRC did **not** "directly quantify the economic cost of any particular hypothetical accident in this EIS."[85] Accidents like these are not uncommon and should be adequately evaluated when attempting to determine whether or not it is safe to transport SNF thousands of miles across Texas and the rest of the United States.

And, the Federal Railroad Administration (FRA) conducted a study that established risk criteria for among other things, transporting hazardous waste by rail. The DEIS should have employed this risk criteria or other similar risk criteria when evaluating the risk posed by transporting SNF by rail. First, "transportation risk should consider the risks that can occur anywhere along the length of the route and enumerate from them an overall risk."[86] Second, risk criteria for individual, as well a societal risk, should be identified, "particularly in the transportation of hazardous materials."[87] Specific criteria should be evaluated when determining the relative risk of hazardous material transport and the corresponding potential for resulting fatalities, and the FRA outlines the following criteria in their study:

- Whether the risk is acceptable or unacceptable for all populations given an estimated calculation of the potential for fatalities;
- Whether the risk is unacceptable for sensitive populations and places of public assembly (ex. schools, large institutions, major event centers, places of worship, prisons, nursing homes or other populated centers along the rail route) based on estimated calculations for potential fatalities; and

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[81] DEIS at 8-6.
[82] David Warren. Channel 5 NBC/DFW. Report: Train Didn't Heed Signal in Deadly Texas Crash, (July 14, 2016), available at: https://www.nbcdfw.com/news/local/report-train-didnt-heed-stop-signal-in-deadly-texas-crash/163575/
[83] ER Rev. 3 at 4-25 to 4-26.
[84] DEIS at 8-6.
[85] *Id.*
[86] U.S. DOT and Federal Railroad Administration. Office of Research and Technology. Evaluation of Risk Acceptance Criteria for Transporting Hazardous Material. Final Report. (February 2020), available at https://railroads.dot.gov/sites/fra.dot.gov/files/2020-02/Evaluation%20of%20Risk%20Acceptance%20Criteria.pdf at 1.
[87] *Id.*

- Whether the risk could be made "conditionally acceptable" by implementing mitigation measures agreed-upon by the applicant and the state or federal regulator that incorporate economic considerations and reduce the risk to as low as reasonably practicable.[88]

The FRA's study highlights that the project proponent, here, ISP, must show the regulator, the NRC, that the potential for individual deaths is as low as practicable and that any further risk reduction is not economically practicable. However, the DEIS fails to evaluate transportation risks, transportation risk criteria, and the NRC has not required ISP to comply with the Federal Railroad Administration and the United States Department of Transportation risk criteria as explained in the cited federal government's February 2020 study.

The study further explains how to calculate the risk for fatality over a projected railroad route. And, includes this guidance,

> "The proposed risk criteria should be applied to a calculated societal risk over the entire transportation route, and not evaluated (i.e., normalized) per-unit distance (i.e., kilometer or mile). This distinction is made to prevent the same expected frequency of fatalities from being deemed acceptable on a longer route but unacceptable on a shorter route. If the expected frequency of fatalities is normalized by track length to obtain risk, longer tracks could have lower normalized risk estimates than shorter tracks even if the tracks have an identical total frequency solely because of division by a larger number (i.e., longer track length)."[89]

So, here risks must be analyzed for the 200 million plus miles that the nuclear waste will travel, and that risk has not been assessed or evaluated in the DEIS. And,

4. <u>The DEIS Fails to Accurately Estimate Train Speeds.</u>

One of the NRC studies referenced by ISP in its Environmental Report is NUREG- 2125 Spent Fuel Transportation Risk Assessment.[90] In that study, the researchers used a very conservative 15 mph train speed in its dose estimate calculations,[91] which is well below the average Union Pacific train speed over the last five years.[92] ISP, on the other hand uses a train speed of 50 mph for its dose estimates,[93] almost double the aforementioned average Union Pacific speed. The doses should be recalculated using the more conservative value of 15 mph, rather than 50 mph. Further, the exposures vary depending on the type of rail cask used, i.e. rail-steel cask or rail-lead

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[88] *Id.* at 2.
[89] *Id.* at 3.
[90] United States Nuclear Regulatory Commission, <u>Spent Fuel Transportation Risk Assessment, Final Report, Office of Nuclear Materials Safety and Safeguards</u>, NUREG-2125 (2014) ("NUREG -2125").
[91] NUREG-2125 at B-37 (the average urban train speed is 24 kph (15 mph).
[92] https://www.statista.com/statistics/547745/average-train-speed-union-pacific-railroad/ (indicating average train speeds for Union Pacific of 24 mph to 26.6 mph from 2013 to 2017). The average speed may be influenced by velocity, volume transported and weather conditions.
[93] ER Rev. 3 at p. 4-14; Attachment 4-1, Table 1 (2018).

cask.[94] In this sense, it is impossible to calculate actual risk and exposure with the details of transport.

5. **The DEIS Fails to Address a Non-Release Accident.**

The vast majority of accidents that could happen while shipping SNF are ones that would not result in the release of radioactivity. Examples include the car carrying the SNF falling off the tracks, a collision with another train, or an earthquake. The casks are designed and tested such that these types of sudden movement events will not compromise the structural and shielding integrity of the cask. The primary concern in this situation is the car sitting in a stationary spot for extended periods of time. The DEIS assumes that the cask will be stationary for up to 10 hours. Regardless of how long it will be stationary, radiological controls technicians must establish a radiation area around the cask such that the exposure rate at the boundary of the area is no more than 1 mrem/hr (.001 mSv/hr), which should be approximately 14.4 ft away from the train. No member of the public should be allowed within that distance.

6. **The DEIS Fails to evaluate the significant and layered impacts posed to environmental justice communities near rail lines and rail yards.**

Transporting SNF by rail poses an added layer of health risks and impacts to communities already suffering with the health impacts railyards pose. Project ENRRICH published "A Public Health Assessment of Residential Proximity to a Goods Movement Railyard." This assessment concluded that asthma rates and cancer rates were both higher in communities situated near rail yards.[95] And that these communities experienced an overall "greater health burden" than those further away communities.[96] The study also found that adults living near major goods movement hubs need to be protected from potentially damaging exposure to pollutants.[97] Diesel locomotives and trucks that pass through rail yards are not subject to the same federal rules requiring stringent pollution controls.[98] The soot pollution from these rail yards can cause asthma attacks, cardiovascular problems, and shorten lifespans.[99] Other health impacts from living near railyards include: "respiratory illnesses, increased premature death, risk of heart disease, cancer risk, adverse birth outcomes, effects on the immune system, multiple respiratory effects, and neurotoxicity."[100]

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[94] Spent Fuel Risk Assessment for Comment, (May 2012) at 31.
[95] Loma Linda University. Project ENRRICH: A Public Health Assessment of Residential Proximity to a Goods Movement Railyard at 119-20 (May 29, 2014).
[96] *Id.*
[97] *Id.*
[98] Michael Hawthorne and Alex Richards. The Chicago Tribune. EPA finds rail yards transfer pollutants as well as freight, (June 27, 2014), available at: https://www.chicagotribune.com/news/ct-railyard-diesel-pollution-met-20140627-story.html
[99] *Id.*
[100] Rhonda Spencer Hwang. Journal of Environmental Health. 77(2). Experiences of a Rail Yard Community. (September 2014), at 2.

Additionally, the Environmental Justice and Health Alliance for Chemical Policy Reform and the Center for Effective Government found that, a considerably larger percentage of African Americans, Latinos, and people in poverty live next to industrial complexes that use toxic chemicals and present a great risk of chemical disaster.[101] Communities of color with great proportions of income inequality are most likely to be home to "chemical-intensive" facilities as well, and, as a result, these communities are the same communities at the greatest risk of a chemical accident or spill. [102] Referring back to Figures 13 and 14 on p. 13 of these comments, it is easy to visualize the problem that toxic releases pose to these communities. An example of a chemical disaster that is especially relevant to the analysis for the proposed interim storage project in Andrews County, is the major explosion that occurred at the West Texas fertilizer facility.[103] This facility housed ammonium nitrate and was in close proximity to residences, a nursing home, and school.[104] It is easy to understand how the risk of transport of SNF combined with the already present industrial risks near these communities poses a greatly increased risk of catastrophic accident and disaster to these already over-burdened communities.

Catastrophic accidents are not the only concern for neglected environmental justice communities in the Houston metropolitan area and communities of color along the Houston Ship Channel.[105] They are also fall prey to "daily chronic exposure to high levels of toxic pollution in the air, water, and soil."[106] Additionally, the Harrisburg/Manchester community's air pollution was evaluated and found to exceed safe levels for 7 of 112 air pollutants that were qualified as "**definite risks"** to these communities. [107]

Living near these major transportation corridors and rail lines poses significant threats to these communities and is just another instance where environmental justice communities are being asked to shoulder disproportionate and significant impacts from industrial projects. Relevant here, greater Houston neighborhoods were found to be closest **to major transportation corridors** as well as major pollutant sources—and at risk to chemical catastrophe.[108] These communities experience "[l]ong-term daily exposures to air pollution [which] can lead to health

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[101] Center for Science and Democracy at the Union of Concerned Scientists. Texas Environmental Justice Advocacy Series. Double Jeopardy in Houston: Acute and Chronic Chemical Exposure Pose Disproportionate Risks for Marginalized Communities (August 22, 2016), available at: https://www.ucsusa.org/resources/double-jeopardy-houston at 2.
[102] *Id.*
[103] *Id.* at 3.
[104] State Impact. Texas Energy and Environment Reporting for Texas. What we know about the West Texas Fertilizer Explosion. https://stateimpact.npr.org/texas/tag/west-fertilizer/
[105] Center for Science and Democracy at the Union of Concerned Scientists. Texas Environmental Justice Advocacy Series. Double Jeopardy in Houston: Acute and Chronic Chemical Exposure Pose Disproportionate Risks for Marginalized Communities. (August 22, 2016), available at: https://www.ucsusa.org/resources/double-jeopardy-houston at 3.
[106] *Id.*
[107] *Id.*
[108] *Id.*

effects that go unaddressed due to residents' limited financial and health care resources."[109] Rail lines surround Houston and intersect with most exits, complicating and slowing an emergency worker's ability to reach the site of a chemical release and address the subsequent harms.[110] In the event of a SNF release or accident during transport, emergency worker's response time would be slowed to address and mitigate the risks posed to the community. And, in a study authored by the Federal Railroad Administration, it states that generally, "[v]ulnerable/sensitive populations are typically treated differently at least in part due to the more limited ability to evacuate quickly away from a developing hazard."[111] However, here, the DEIS neither analyzes the impacts to these environmental justice communities in the greater Houston and La Porte areas that are surrounded by rail lines and dotted with rail yards—nor applies any tailored risk criteria when evaluating the impact on these communities, as the federal government study would seem to instruct.

Further, the National Academy of Sciences found that ***any*** exposure to radioactivity boosts cancer risk.[112] So parking cars in railyards overnight will increase cancer risks in already vulnerable communities who are already subject to higher than average cancer risks. But, the NRC incorrectly claims that radioactive waste transport will have a "negligible contribution to the number of [latent cancer fatalities] expected in the exposed population."[113] The DEIS also candidly states that the "highest accumulated exposures over time to this low level of radiation to members of the public would occur to those individuals who spend the most time within close proximity to the rail lines used for SNF transportation."[114] And, further complicating the ability to meaningful analyze impacts on those that live near rail yards is the fact that the transportation routes are not actually disclosed in the DEIS. Without disclosure there can be no analysis.

As the DEIS acknowledges, those members of the public who live and work near rail yards are those members of the public that will be most affected by the transport of this nuclear waste. The DEIS actually states that the "highest occupational exposures would occur to workers who spend the most time within close proximity to loaded SNF transportation casks" including "possibly rail yard workers."[115] The DEIS does not, however, detail risks and instead relies on the ill-conceived and misplaced concept that transport will be "incident-free."[116] Within the DEIS,

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[109] *Id.* at 6.
[110] *Id.*
[111] U.S. DOT and Federal Railroad Administration. Office of Research and Technology. Evaluation of Risk Acceptance Criteria for Transporting Hazardous Material. Final Report. (February 2020), available at https://railroads.dot.gov/sites/fra.dot.gov/files/2020-02/Evaluation%20of%20Risk%20Acceptance%20Criteria.pdf at 2.
[112] CBS News. Radioactive Leaks found at 75% of US Nuke Sites. (June 21, 2011), available at: https://www.cbsnews.com/news/radioactive-leaks-found-at-75-of-us-nuke-sites/
[113] DEIS at 5-19.
[114] DEIS at 4-15.
[115] DEIS at 4-10.
[116] DEIS at 4-11.

Table 4.3-1 only calculates risks from "incident-free" transportation, and does not analyze real risks that are posed by transport by rail or truck or barge.

Other radiological impacts these communities along rail lines and in proximity to railyards will suffer that are not considered here but were previously considered in the Yucca Mountain Final Supplemental Environmental Impact Statement. The current DEIS for the Andrews County project fails to analyze similar impacts. These impacts include the following:

> (1) routine exposures to members of the public residing near transportation routes and that includes cumulative total exposure of up to 2,500 person-rem dose and 1.5 latent cancer fatalities, and in certain special circumstances (for example, 0.016 rem to a person in a traffic jam);
>
> (2) routine exposures to transportation workers such as escorts, truck drivers, & inspectors, cumulative total up to 13,000 person-rem and 7.6 latent cancer fatalities (by administrative controls, DOE would limit individual doses to 0.5 rem per year; the allowable occupational dose is 5 rem per year);
>
> (3) release of radioactive material as a result of the maximum reasonably foreseeable transportation accident (probability about 5 in one million per year), involving a fully engulfing fire, 34 rem dose to the maximally exposed individual, 16,000 person-rem population dose and 9.4 latent cancer fatalities in an urban area, and cleanup-costs of $300,000 to $10 billion.[117]

Analyzing impacts similar to the above is critical to adequately evaluate the impact of the project on human health and the environment.

D. PUBLIC NOTICE MUST BE PROVIDED IN BOTH ENGLISH AND SPANISH IN PREDOMINANTLY SPANISH SPEAKING COMMUNITIES.

1. Railroad lines in Texas are adjacent to a high percentage of native Spanish speakers.

While the national transportation routes have not been defined, trains carrying nuclear waste to the Andrews County facility will likely have to pass through every major Texas city. While the exact routes are uncertain, as discussed above, Texas rail lines may see higher numbers of cars carrying SNF than anywhere in the country. The communities located alongside Texas's rails are overwhelmingly communities of color, and many are immigrant communities. In particular, Texas has a high number of monolingual-Spanish communities. People living in these communities have been denied meaningful notice and participation in the licensing process because the materials have not been translated into any language other than English. NRC must

[117] Robert J. Halstead. Yucca Mountain Transportation Lessons Learned: 1984-2009. WM2011 Conference, February 27 – March 3, 2011, Phoenix AZ citing: DOE, Final Supplemental Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada, DOE/EIS-0250F-S1 (June 2008) at Ref 12, pp.6-15 to 6-27, 8-41, G-56, CR-467.

make this process accessible to Spanish-speaking communities before it proceeds.

ISP has designed its facility to receive nuclear waste by train. All nuclear waste will be shipped to Monahans, TX, and then taken to the CISF. Waste that comes from the west coast will wind up in Monahans after being shipped through El Paso; waste from the east coast and Midwest will come through railways passing through Fort Worth or Houston, especially if the waste was shipped by barge.

Within and around the Cities of Pasadena and Houston, there is a high percentage of non-English speakers who would benefit from a process that is accessible in their language. The residential neighborhoods and communities along the southern route of the Union Pacific railroad that runs through the City of Pasadena and into Houston are made up of a sizeable minority of residents who speak English "less than well." Figure 12 below shows communities within CPC's service area whose linguistic data pulled from the Environmental Protection Agency's (EPA) EJSCREEN Mapping tool proves this point. The most salient parts of that linguistic data is presented in Table 3, which shows that anywhere from a fifth to a third of residents in each of the sampled communities speaks English less than well. Table 3 also shows that Spanish is spoken at home by a majority of residents in each of the sampled communities.

Figure 22: Sample Environmental Justice Communities Along Southern Rail Line of Union Pacific

Table 4: Linguistic Demographics of Sample Environmental Justice Communities Along South Rail Line of Union Pacific

Sampled Residential Area	Percentage Of Residents Who Speak English "Less Than Well"[118]	Population By Spanish Spoken At Home
Pecan Park/Lawndale	16-47 %	83 %[119]
Harrisburg/Manchester	19-38 %	70 %[120]
Meadowbrook/Allendale	28 %	74 %[121]
Northwest Pasadena	27 %	56 %[122]
Northeast Pasadena	27 %	56 %[123]

In West Texas, approximately 100,000 people live within half a mile of the Union Pacific line that travels the 250 miles from El Paso to Monahans.[124] Among those living in this corridor, 92% of this community identify as Hispanic and 84% do not speak English at home. 46% of people

[118] EPA EJSCREEN Mapping Tool (Version 2019), accessed October 29, 2020.
[119] Neighborhood Scout. Houston, TX (Pecan Park), available at: https://www.neighborhoodscout.com/tx/houston/pecan-park#:~:text=Pecan%20Park%20is%20also%20pretty,98.9%25%20of%20all%20U.S.%20neighborhoods.
[120] Super Neighborhood No. 65. Harrisburg/Manchester. (2017), available at: http://www.houstontx.gov/planning/Demographics/docs_pdfs/SN/65_Harrisburg_Manchester.pdf
[121] Super Neighborhood No. 75. Meadowbrook/Allendale. (2017), available at: https://www.houstontx.gov/planning/Demographics/docs_pdfs/SN/75_Meadowbrook_Allendale.pdf
[122]Neighborhood Scout. Pasadena, TX, available at: https://www.neighborhoodscout.com/tx/pasadena/pasadena-fwy
[123] *Id.*
[124] EPA EJSCREEN ACS Summary Report, accessed November 1, 2020.

living in this corridor speak English "less than very well," 26% speak English "less than well," and 13% speak English "not at all." Further, Spanish is the primary language spoken in roughly 10% of the households in this corridor considered to be "linguistically isolated."

This data underscores the need for NRC to make the licensing process accessible to non-English speakers, especially the Spanish speaking population, in order to ensure meaningful notice to and participation by these linguistic populations.

2. **Failure to provide public notice in both English and Spanish to predominantly Spanish speaking communities violates Federal Law.**

Title VI of the Civil Rights Act of 1964, 42 U.S.C. § 2000d et. seq., prohibits discrimination on the basis of race, color, and national origin in the programs and activities of federal agencies or entities receiving federal financial assistance such as NRC and ISP. The protections afforded by Title VI, which are based on the Equal Protection Clause of the 14th Amendment, are designed to prevent such entities from discriminating against persons whose native language is other than English by policies or actions that disparately impact them. The United States Supreme Court has held that language can be used as a proxy for national origin. *See Lau v. Nichols*, 414 U.S. 563, 568 (1974) (finding national origin discrimination without reliance on statistical evidence because instruction takes place only in English; "[i]t seems obvious that the Chinese-speaking minority receive fewer benefits [from the monolingual English instruction] than the English-speaking majority").

In 2000, President Clinton issued Executive Order 13166, which stated that "each Federal agency shall examine the services it provides and develop and implement a system by which [persons with Limited English Proficiency (LEP)] can meaningfully access those services consistent with, and without unduly burdening, the fundamental mission of the agency."[125] In keeping with that order, the NRC developed its own LEP Plan, which acknowledges that monolingual English services may make federal agencies inaccessible to "millions of adults who are LEP, or who speak English less than 'very well.'"[126]
NRC's plan mandates four factors be considered when determining when and how to "provide LEP persons meaningful access to [its] programs and activities." Those four factors are:

> 1. Number or proportion of LEP persons served or encountered in the eligible population ("The greater the number or proportion of LEP individuals from a particular language group … weighs in favor of greater agency efforts to provide LEP persons equal and meaningful access…");

[125] Exec. Order No. 13166, 65 Fed. Reg. 159 (Aug. 16, 2000).
[126] *Limited English Proficiency Plan*, NRC, available at: https://www.nrc.gov/about-nrc/civil-rights/lep-plan-8-17-11.pdf.

2. Frequency with which LEP persons come in contact with the program or activity;

3. Nature and importance of the program or activity to people's lives ("More affirmative steps must be taken in programs where the denial or delay of access may have life or death implications…"); and

4. Resources available.

NRC's own policy demands that notice of this licensing process and access to public participation be made available to individuals and communities that are primarily Spanish-speaking. Our clients come from communities where at least a quarter of the population do not speak English "well," and an even greater number do not speak English "very well." Moreover, these are the communities that are living closest to the rail lines that carry nuclear waste through to the Andrews County facility. Residents of communities have limited English proficiency, and they have not been included in this licensing process.

ISP is uncertain about the frequency of shipments—waiting to leave those details up to the SNF title holders in the future—but currently "anticipates that no more than 200 shipments of SNF would be received annually at the CISF."[127] As discussed above, our client communities in Texas will see the highest percentage of these shipments passing through their communities. Likely, they will see multiple shipments a week.

The NRC's plan further states that "[m]ore affirmative steps must be taken in programs where the denial or delay of access may have life or death implications." As is discussed in other parts of this comment, at best the communities near nuclear waste transport routes face health hazards from the repeated (and possibly prolonged) radiation exposure. At worst, these communities may have to face the aftermath of a major accident involving one or more of the nuclear waste casks. Communities have the right to know about these hazards before they are forced to face them.

NRC's own policy suggests that materials should be made available in Spanish. Individuals without English proficiency deserve to have proper notice of this project and an opportunity to participate and be heard in public comments and discussions.

E. THE DEIS FAILS TO CONSIDER TO ENSURE ADEQUATE FINANCIAL ASSURANCE FOR TRANSPORTATION LIABILITIES AND DECOMMISSIONING COSTS.

All Texans, including those members of the advocacy groups submitting these comments, should be concerned about the costs of cleaning up a transportation accident, a contaminated waste facility or having to remediate an abandoned high-level radioactive site. The DEIS does not take

[127] ER Rev. 3 at 2-67.

much time to evaluate any of these potential issues or the related cost of cleanup or the proper financial assurances are in place for decommissioning. In fact, these costs, although extremely significant to such a project, are minimized throughout the DEIS.

1. **The NRC must ensure adequate financial assurance for transport liability exists.**

The DEIS describes a maximum capacity for the CISF of 3,400 canisters, estimated at 200 canisters per year or 425 canisters for each phase, for over 20 years or more.[128] However, despite the number of shipments anticipated, the NRC assumes the risk of any transportation accident is small.[129] Specifically, the NRC staff states that more than 99.999999 percent of all accident scenarios would not lead to either a release of radioactive material or loss of shielding and predicts only 3 rail accidents of any severity.[130] The DEIS then suggests any transportation accident involving SNF could range from $1 million to $10 billion. Thus, the associated costs of 3 accidents might be $3 million to $30 billion, and there is no explanation of how the NRC is going to be protect the U.S. Taxpayer from having to absorb these costs or the potential health impacts to those along those unfortunate hypothetical three routes.

The Price-Anderson Nuclear Industries Indemnity Act (commonly called the Price-Anderson Act) is a United States federal law, first passed in 1957 and since renewed several times, most recently through the "Energy Policy Act of 2005," extending it through December 31, 2025. The Price-Anderson Act governs liability-related issues for all non-military nuclear facilities constructed in the United States before 2026. The main purpose of the Act is to partially compensate the nuclear industry against liability claims arising from nuclear incidents while still ensuring compensation coverage for the general public. The scope of the Act includes nuclear incidents in the course of the operation of power reactors; test and research reactors; Department of Energy nuclear and radiological facilities; and transportation of nuclear fuel to and from a covered facility

The Act establishes a no fault insurance-type system in which the first approximately $12.6 billion (as of 2011) is industry-funded as described in the Act. Any claims above the $12.6 billion would be covered by a Congressional mandate to retroactively increase nuclear utility liability or would be covered by the federal government. The Price-Anderson Act, thus, would not be adequate to cover the possible liabilities due to transportation accidents projected by the DEIS to the extent it exceeds $13 billion.

2. **The NRC must ensure adequate financial assurance for decommissioning exists.**

In the event that there has been contamination at the CISF, at decommissioning, ISP must

[128] DEIS at 2-21.
[129] DEIS at 2-11.
[130] DEIS at 8-6.

identify and remove radioactive contamination having activities above the NRC release limits.[131] The NRC staff concludes that the land use impact associated with decommissioning is "small."[132] However, at the very least, this assumption appears inconsistent with the analysis that conservatively, the NRC staff is assuming 20% contamination of the facility at decommissioning.[133] ISP must provide reasonable assurance that ISP will have adequate funds available for decommissioning. 10 CFR §72.30. Currently, no such means for financial assurance is disclosed in the DEIS.

ISP's Application discusses only one funding method for the decommissioning liability: a written contract between ISP and the DOE.[134] As to a proposed contract with the DOE, the license application provides: "Pursuant to a contract with DOE, DOE shall take legal title of the SNF prior to receipt and shall also be responsible for all costs associated with the decommissioning of the CISF pursuant to 10 CFR Part 7 Subpart E at the time of license termination (SAR 13.6.2 Cost of Decommissioning). The application should discuss the goals and minimal terms that would be involved in such a contract, in order for the public to assess whether financial assurance would be anywhere close to adequate. Instead, Appendix D simply states, for clients other than the DOE, that there will be an allocation of legal and financial liability between ISP and its clients who store the SNF at the CISF and then appropriate financial assurance to cover these decommissioning obligations. The lack of specificity here is appalling given the nature of the material and that fact that many of the facilities which are being decommissioned already have huge environmental liabilities associated with them that have already been assumed by the DOE.

Moreover, the proposed cost estimate of a mere $12 million provided by ISP[135] uses labor rates from 2015[136] to project out what decommissioning project will likely cost in 2040 or later. Even with a contingency factor of 25 percent,[137] this estimated sum seems insufficient to ensure that there will be adequate funds to cover this cost.

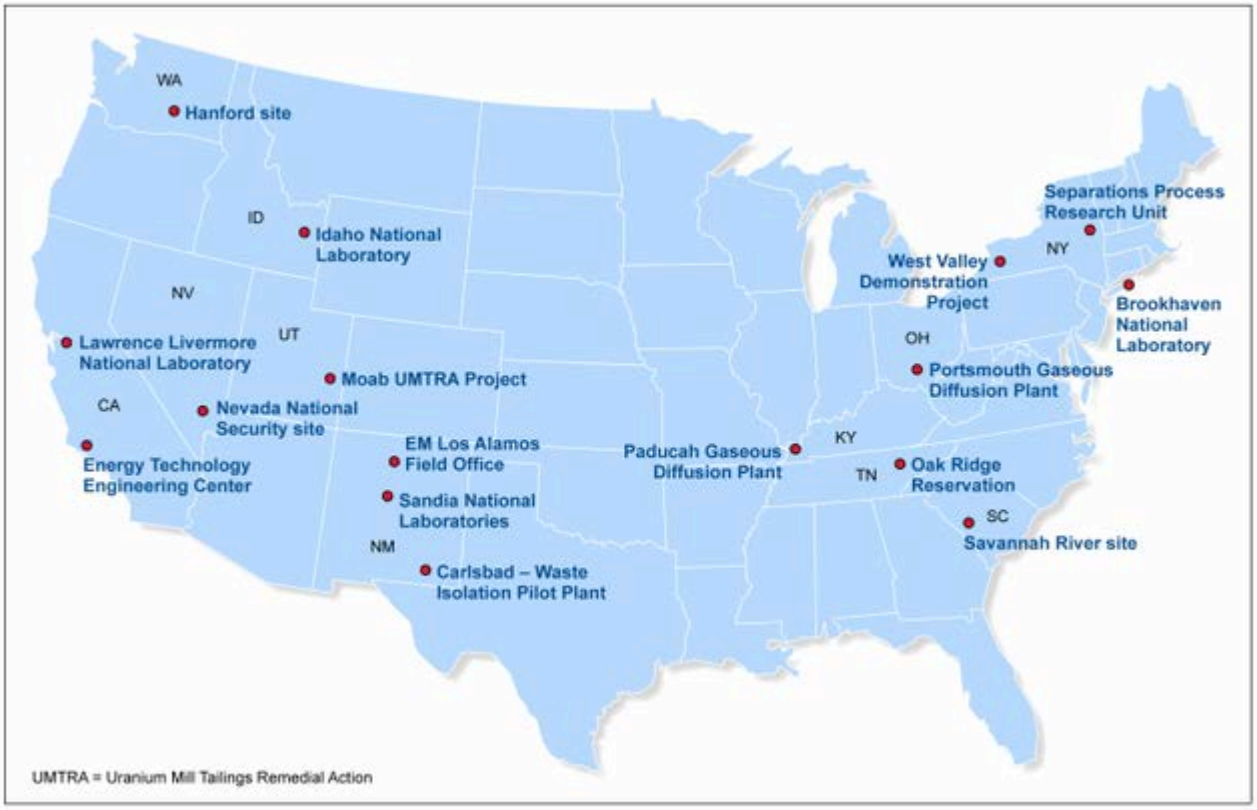
While Commenters agree that there is no expected generation of nuclear waste at the CISF, there are still risks of contamination, as frankly acknowledged by the DEIS. Known projected liability related to existing and planned cleanup or decommissioning projects where nuclear was involved already exceeds $377 billion according to the General Accounting Office estimates for the sixteen sites for which the DOE's Office of Environmental Management is already responsible

[131] ISP Application, Appendix B, Rev. 3 at 2-1.
[132] DEIS, § 4.2.1.3, at 4-5.
[133] ISP Application, Appendix B, Rev. 3 at 2-3, 4-2; *see also* Appendix D, Rev. 3, at 3-6, 3-7.
[134] ISP Application, Appendix D, Rev. 3 at 2-1.
[135] ISP Application, Appendix D, Rev. 3 at 3-22.
[136] ISP Application, Appendix D, Rev. 3 at 3-2.
[137] ISP Application, Appendix B, Rev. 3 at 4-3.

shown in the figure below from the same cited report.[138]

Figure 22: DOE Environmental Management Sites still needing Cleanup

Figure 1: Department of Energy Office of Environmental Management (EM) Sites Where Cleanup Remains



Sources: GAO analysis of Department of Energy information; Map Resources (map). | GAO-19-28

[138] United States Government Accountability Office, Report to the Chairman of the Subcommittee on Strategic Forces, Committee on Armed Services, U.S. Senate, Program-Wide Strategy and Better Reporting Needed to Address Growing Environmental Cleanup Liability for the U.S Department of Energy (January 2019), available at: https://www.gao.gov/assets/700/696632.pdf

Table 5: DOE Sites and Estimated Remediation Cost and Estimated Cleanup Duration

Description of DOE Site	State	Cost of Remediation Estimated	Estimated Duration of Cleanup
Brookhaven National Laboratory	NY	$491 million[139]	2020[140]
Carlsbad – Waste Isolation Plant	NM	$7.5 billion[141]	2036-2042[142]
EM Los Alamos Field Office	NM	$6.2 billion – $7.3 billion[143]	2036[144]
Energy Technology Engineering Center	CA	$361 million[145]	TBD[146]
Hanford Nuclear Reservation	WA	$300 billion ($2.4 billion/year)[147]	2079-2102[148]
Idaho National Laboratory[149]	ID	$21.4 billion[150]	2045 to 2060[151]
Lawrence Livermore National Laboratory	CA	$150 million[152]	Est. 2050[153]
Moab UMTRA Project	UT	$1.9 billion[154]	2034[155]
Nevada National Security Site	NV	$2.6 billion[156]	2030[157]
Oak Ridge Reservation	TN	$18.7 billion[158]	2046[159]

[139] Exchange Monitor, 2018 State of the Sites (2018), available at https://www.exchangemonitor.com/2018-state-of-the-sites-v2/
[140] Exchange Monitor, 2018 State of the Sites (2018).
[141] Exchange Monitor, 2018 State of the Sites (2018).
[142] NGA, Cleaning Up America's Nuclear Weapons Complex (2019).
[143]Exchange Monitor, 2018 State of the Sites (2018).
[144] NGA, Cleaning Up America's Nuclear Weapons Complex (2019).
[145] Exchange Monitor, 2018 State of the Sites (2018).
[146] Exchange Monitor, 2018 State of the Sites (2018) (citing DOE as stating that Office of Environmental Management will continue to aggressively pursue cleanup at ETEC in accordance with the administrative order on consent while working with regulators to facilitate cleanup as quickly as possible).
[147]National Governors' Association (NGA), Cleaning Up America's Nuclear Weapons Complex, 2019 Update for Governors, available at https://www.nga.org/wp-content/uploads/2019/07/weapons-complex-050919-final.pdf
[148] NGA, Cleaning Up America's Nuclear Weapons Complex (2019).
[149] GAO, NUCLEAR WASTE CLEANUP, DOE Faces Project Management and Disposal Challenges with High-Level Waste at Idaho National Laboratory (September 2019), available at https://www.gao.gov/assets/710/701252.pdf
[150]Exchange Monitor, 2018 State of the Sites (2018).
[151] *Id.*
[152] *Id.*
[153] Exchange Monitor, 2018 State of the Sites (2018),
[154]Exchange Monitor, 2018 State of the Sites (2018).
[155] DOE, Moab UMTRA Project, Fact Sheet (Jan. 2020), available at https://www.gjem.energy.gov/documents/factsheets/OverviewFactSheet_Jan2020.pdf
[156]Exchange Monitor, 2018 State of the Sites (2018).
[157] NGA, Cleaning Up America's Nuclear Weapons Complex (2019).
[158] Exchange Monitor, 2018 State of the Sites (2018), available at https://www.exchangemonitor.com/2018-state-of-the-sites-v2/
[159] NGA, Cleaning Up America's Nuclear Weapons Complex (2019).

Description of DOE Site	State	Cost of Remediation Estimated	Estimated Duration of Cleanup
Paducah Gaseous Diffusion Plant	KY	$34.9 billion- $41.1 billion[160]	2065-2070[161]
Portsmouth Gaseous Diffusion Plant	OH	$11 billion[162]	2041[163]
Sandia National Laboratories	NM	$285 million[164]	2028[165]
Savannah River Site	SC	$54.7 billion[166] ($1.4 billion/year)	2065[167]
Separations Process Research Unit	NY	$460 million[168]	2021[169]
West Valley Demonstration Project	NY	$1.9 to $2 billion[170]	2040-2045[171]

Other Sites or Facilities	State	Cost of Remediation Estimated	Duration of Cleanup
Vermont Yankee	VT	$287.8 million[172]	Through 2060
Fernald Feed Materials Production Center	OH	$4.4 billion[173]	@28 years
Pantex Plant	TX	$206 million[174]	Monitoring Phase[175]

[160] Exchange Monitor, 2018 State of the Sites (2018), available at https://www.exchangemonitor.com/2018-state-of-the-sites-v2/
[161] United States Government Accountability Office (GAO), Report GAO-20-63, Nuclear Cleanup, Actions Needed to Improve Cleanup Efforts at DOE's Three Former Gaseous Diffusion Plants (December 2019), available at https://www.gao.gov/assets/710/703299.pdf; NGA, Cleaning Up America's Nuclear Weapons Complex (2019).
[162] Jessica Wehrman, Columbus Dispatch, *Piketon cleanup riddled with problems, GAO watchdog agency says* (May 26, 2019), available at https://www.dispatch.com/news/20190526/piketon-cleanup-riddled-with-problems-gao-watchdog-agency-says
[163] GAO, Report GAO-20-63, NUCLEAR CLEANUP, Actions Needed to Improve Cleanup Efforts at DOE's Three Former Gaseous Diffusion Plants (December 2019); NGA, Cleaning Up America's Nuclear Weapons Complex (2019).
[164] Exchange Monitor, 2018 State of the Sites (2018), available at https://www.exchangemonitor.com/2018-state-of-the-sites-v2/
[165] NGA, Cleaning Up America's Nuclear Weapons Complex (2019).
[166] NGA, Cleaning Up America's Nuclear Weapons Complex (2019).
[167] NGA, Cleaning Up America's Nuclear Weapons Complex (2019).
[168] Office of Inspector General, DOE, AUDIT REPORT, DOE-OIG-18-27, Decontamination and Decommissioning Activities at the Separation Process Research Unit (March 23, 2018), available at https://www.energy.gov/sites/prod/files/2018/03/f49/DOE-OIG-18-27.pdf
[169] Exchange Monitor, 2018 State of the Sites (2018), available at https://www.exchangemonitor.com/2018-state-of-the-sites-v2/
[170] *Id.*
[171] NGA, Cleaning Up America's Nuclear Weapons Complex (2019).
[172] Susan Smallheer, Brattleboro Reformer, *Doubts persist about Vt Yankee decommissioning money* (December 30, 2019) at https://www.reformer.com/uncategorized/doubts-persist-about-vt-yankee-decommissioning-money/article_b0c67fbd-163f-52ea-a689-84b60fa5abbc.html
[173] NGA, Cleaning Up America's Nuclear Weapons Complex (2019).
[174] Exchange Monitor, 2018 State of the Sites (2018).
[175] Consolidated Nuclear Security, LLC, Annual Site Environmental Report, Pantex Plant (2018), available at https://pantex.energy.gov/sites/default/files/2018_site_environmental_report.pdf

Moreover, the Application's proposed cost estimate of a mere $12 million provided by ISP[176] uses labor rates from 2015[177] to project out what decommissioning project will likely cost in 2040 or later. Even with a contingency factor of 25 percent,[178] this estimated sum seems insufficient to ensure that there will be adequate funds to cover the potential decommissioning costs in 2055. Commenters would like to see more of a contingency built in and more details around how ISP is going to reserve for future liabilities associated with decommissioning.

F. THE DEIS FAILS TO EXAMINE FUTURE IMPACTS IF A MAJOR DISASTER OCCURRED.

1. The DEIS fails to consider the possibility and aftermath of major historical disasters involving nuclear facilities.

It is easy to chronicle a disturbing history of major nuclear accidents that were tragic and catastrophic with lasting harmful effects. With the transport of SNF comes the possibility of unimaginable disaster. And, the NRC needs to evaluate this project with the possibility of a major disaster in mind. If, as we have here with the current DEIS, the only analysis that is done is one that is essentially risk-free, then, we will be unprepared in the event that a major upset like any of the incidents below does occur. Without proper analysis or precautions and by just banking on incident-free transport, we will not be prepared for the inevitable catastrophic event. These risks must be realistically analyzed. And, as already discussed financial and other infrastructure necessary to deal with a disaster must be secured prior to the project moving forward. Below is a brief history of historical nuclear disasters and their lasting effects.

Sodium Reactor Experiment

In Los Angeles, in July 1959, a cooling blockage caused a reactor to overheat which resulted in a partial meltdown.[179] During this meltdown, atomic fragments were released during this meltdown into the facility and through the facility's vents into the atmosphere. [180] This incident release radioactive material into the air, and this consequence is not contemplated by the DEIS.

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On January 3, 1961, a single fuel rod was removed which caused a catastrophic power surge and steam explosion killing every worker who was on duty at the time of the explosion.[181] Death or major injury by SNF release or transportation explosion is not contemplated by the DEIS.

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[176] ISP Application, Appendix D, Rev. 3 at 3-22.
[177] ISP Application, Appendix D, Rev. 3 at 3-2.
[178] ISP Application, Appendix B, Rev. 3 at 4-3.
[179] Brief History of Nuclear Accidents Worldwide. Union of Concerned Scientists, (October 1, 2013), available at: https://www.ucsusa.org/resources/brief-history-nuclear-accidents-worldwide
[180] *Id.*
[181] Brief History of Nuclear Accidents Worldwide. Union of Concerned Scientists, (October 1, 2013), available at: https://www.ucsusa.org/resources/brief-history-nuclear-accidents-worldwide

Chernobyl

On April 26, 1986 Chernobyl exploded, when a power surge during a nuclear reactor test caused a fire and an explosion which forced 220,000 people in the western Soviet Union and Europe to relocate. [182] The Chernobyl incident occurred during routine maintenance. [183] The resulting fires caused significant radioactive releases.[184] Chernobyl released over 50 tons of radioactive material into the atmosphere.[185]

Thirty-one people died within a few weeks of the accident due to the initial steam explosion, thermal burns, and radioactive exposure.[186] In 2018, the United Nations Scientific Committee on the Effects of Atomic Radiation linked the Chernobyl incident to 20,000 cases of thyroid cancer from releases of radioactive iodine.[187] This radioactive idione contaminated pastures where livestock grazed and ultimately tainted milk that children drank. [188] Leaving lasting effects on the people and communities that lived through the incident. Future impacts from a major disaster caused by the transportation or storage of SNF are note analyzed in the DEIS in any section. In fact, Table 9.1-1 has a column entitled "Irreversible and Irretrievable Commitment of Resources" the NRC states there will be "No Impact." Thereby the NRC is alleging that throughout the construction, operation, and decommissioning of this facility to house highly volatile SNF, there will be no impact, and, all the land the SNF will be stored on can even be "reclaimed and made available for other uses."[189] But, this analysis completely omits discussion of a lasting disaster.

Fukushima

In March of 2011, an earthquake and a tsunami caused all the reactors at Fukushima Daiichi nuclear facility to lose power. And according to a report published by Greenpeace in 2019, "[e]ight years after the start of the Fukushima Daiichi nuclear disaster . . . radiation levels remain too high for the safe return of thousands of Japanese citizen evacuees."[190] A study conducted in 2015 analyzed 308,297 workers and found a significant risk of leukemia in nuclear workers

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[182] A Brief History of Nuclear Accidents Worldwide. Union of Concerned Scientists, October 1, 2013 Available at: https://www.ucsusa.org/resources/brief-history-nuclear-accidents-worldwide
[183] *Id.*
[184] *Id.*
[185] Yuri Rojavin, Civilian nuclear incidents: An overview of historical, medical, and scientific aspects. Journal of Emergencies Trauma and Shock. (April-June 2011), available at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3132367/
[186] Nuclear Energy Institute. Chernobyl Accident and its Consequences. (May 2019), available at: https://www.nei.org/resources/fact-sheets/chernobyl-accident-and-its-consequences#:~:text=However%2C%20the%20psychological%20effects%20of,Nations%20study%20published%20in%202008.
[187] *Id.*
[188] *Id.*
[189] DEIS at 9-2 to 9-3.
[190] Greenpeace. On the Frontline of the Fukushima Nuclear Accident: Workers and Children. Radiation Risks and Human Rights Violations. (March 2019) at 4.

nuclear workers exposed to radiation in the range of 1-5 mSv/y.[191]

According to the Nuclear Regulatory Commission (NRC), the potential radiological health impacts to the public transportation of SNF to and from the CISF will occur from exposures to radiation released during the loading and unloading of casks.[192] Table 4.3-2 at p. 4-15 of the DEIS estimates population doses between 1 and 8 mSv/y throughout all phases of the project. There is a significant risk of leukemia at these same exposure levels, 1 and 8 mSv/y, according to the above-cited study.

At Fukushima the contamination also affected the food chain because the radioactive particles became bound to dust and then fell on water and crops.[193] And even after the radioactive particles land on food sources, predators can then move the radioactive particles around the food chain, so much so that cesium-137 has been found as a contaminant in U.S. fish.[194] The DEIS does not address the potential for SNF to contaminate the food supply.

Recent research also shows cesium-rich micro-particles in Fukushima soil.[195] These particles are primarily made of glass and contain cesium, radium, and technetium. [196] Additionally, the particles are small enough to inhale and do not dissolve.[197] Scientists believe that if these particles are inhaled they could cause long-term health risks to humans.[198] The DEIS does not contemplate a release of radioactive material or the potential for that material to be inhaled.

And still more issues persist today, like what to do with the water from the Fukushima disaster. Tokyo Electric Power is storing tanks of contaminated water, and now there are over one million tons of contaminated water in storage tanks that resulted from Fukushima. While Tokyo Electric Power has attempted to remove the radionuclides from the water as well as the radioactive hydrogen isotope, tritium, they are unable to clean the water. Further, Tokyo Electric Power anticipates that storage capacity will be reached by Summer 2022.[1] The Japanese government spent 34.5bn yen ($325,167,675 USD) to construct a frozen underground wall to stop groundwater from reaching the three reactor buildings. However, the wall, has only reduced the flow of groundwater from about 500 tons a day to about 100 tons a day, rather than stopped flow altogether. This is only creating additional contamination and potential for contamination.[1]

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[191] *Id.* at p. 46.
[192] United States Nuclear Regulatory Commission. Overview of the Draft Environmental Impact Statement for Interim Storage Partners LLC Proposed Consolidated Interim Storage Facility (May 2020) at 13.
[193] Yuri Rojavin. Civilian nuclear incidents: An overview of historical, medical, and scientific aspects. Journal of Emergencies Trauma and Shock. (April-June 2011), available at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3132367/
[194] *Id.*
[195] Fukushima radioactive particle release was significant says new research. University of Manchester. (May 24, 2018).
[196] *Id.*
[197] *Id.*
[198] *Id.*

These accidents are catastrophic and with effects lasting decades. The DEIS does not account for anything of this magnitude in its analysis.

2. **<u>The DEIS fails to evaluate accidents involving rail lines and nuclear waste transportation.</u>**

According to a fact sheet authored by the Public Interest Research Group, the Department of Energy has, at best, inconsistently reported nuclear waste transportation accident rates. For example, Department of Energy studies have reported a range of accidents from 66 to 310.[199] The Fact Sheet reports that the State of Nevada undertook their own analysis and "concluded that 160-390 accidents would be expected over 38 years."[200] While it is unclear the number of nuclear accidents that have occurred over time, it is clear that these accidents have been poorly documented and that accidents do occur.

Other sources have added detail to these incidents that were poorly reported. For example, on August 20, 1980, a truck transportation cask arrived at San Onfre nuclear plant in California. This particular cask was used four months prior to ship a fuel assembly but had become so contaminated that the cask was a threat to public health and safety and external lead shielding had to be added to the cask to try to lower exposure.[201] Even after the lead shielding was applied, the cask still emitted anywhere between 11 and 40 times the legal limit of radiation, and further mishandling of the cask at San Onfre lead to $125,000 of fines for lax health physics supervision exposing workers to dangerous levels of radiation. [202] The DEIS does not evaluate what happens if a cask's shielding becomes compromised and the subsequent risk of exposure.

Notably, just over the last several months in 2020, major accidents have occurred that involve rail lines, nuclear waste transportation, and nuclear waste transportation preparation. As recently as June 11, 2020, a rail car carrying radioactive material caught fire. In the report authored about the incident, the Illinois Management Team reporting stated: "*It is believed that the friction due to transport created pyrophoric zirconium dust which reacted with the surrounding building debris and combustible waste. This debris and combustible waste was also contaminated with radioactive material - approximately 0.8 mCi of Co-60, Cs-134 and Cs-137 each.*" Here, natural elements created from friction during transport mixed with radioactive cargo and caused a fire. This is an inherent and unavoidable risk in transporting waste by rail—friction caused by rail line transport cannot be avoided. However, the DEIS includes no analysis on this kind of incident.[203] Then, on June 22, 2020, a 12-axle trailer pulled by a large tractor unit carrying a cask for SNF storage, weighing upwards of 50 tons drove off the shoulder and crashed heading to the Vermont

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[199] Pierre Sadik. Public Interest Research Group. <u>Nuclear Waste Transportation Accidents in the U.S. Fact Sheet</u>.
[200] *Id.*
[201] *Id.*
[202] *Id.*
[203] U.S. Nuclear Regulatory Commission Operations. Event Notification Report (June 11-12, 2020), available at https://www.nrc.gov/reading-rm/doc-collections/event-status/event/2020/20200612en.html

Yankee Power Plant. A 36-hour effort followed to recover the casks.[204] On July 1, 2020, an 80 mile per hour wind derailed 86 train cars filled with cargo.[205] And, on August 26, 2020, a radioactive spill closed three lanes southbound and two lanes northbound traffic on I-45 in Montgomery County, Texas. Accidents like these must be evaluated and accounted for in the NRC's risk analysis and safety assessment of the proposed interim storage project in Andrews County, and these risks are not evaluated.

3. **The DEIS fails to accurately evaluate seismic events in West Texas.**

Recently, West Texas has experienced a dramatic uptick in earthquakes. A study published by the University of Texas quantified the increase from 19 earthquakes in 2009 to 1,600 in 2017.[206] Section 3.4.5 of the DEIS only evaluates seismology data from 1973-2015 and disregards the reality of the recent increase in seismic activity in West Texas where the interim storage facility is proposed.[207] And, DEIS incorrectly states the "proposed CISF would be located in an area of west Texas that has low seismic risk."[208] In fact, the proposed CISF will be located in the part of Texas with the *highest* seismography [209] because West Texas now has the highest seismography in the state.[210]

The DEIS additionally cites to a study from 2018 concluding that there is low risk of seismic activity in the Permian Basin, but the study the NRC depends on also failed to evaluate the most recent seismic activity relevant here.[211] On March 26, 2020, an earthquake with a 5.0 magnitude on the Richter scale struck the Texas and New Mexico border, and seismic instruments indicate the earthquake originated at a depth of 5.3 miles.[212] At least 10 earthquakes with ranges from 2.0

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[204] Susan Smallheer. Truck carrying empty nuclear waste cask crashes. (June 22, 2020), available at https://www.reformer.com/uncategorized/truck-carrying-empty-nuclear-waste-cask-crashes/article_09511173-3b7a-59a2-9fa8-fcfde0f271fc.html

[205] Downburst Derails 86-car Train in Texas. (July 1, 2020), available at https://www.weathernationtv.com/news/downburst-derails-86-car-train-in-texas/

[206] Stacy Fernandez. Texas Tribune. Earthquakes in West Texas have dramatically increased, according to new University of Texas study (November 4, 2019), available at https://www.texastribune.org/2019/11/04/earthquakes-west-texas-have-increased-dramatically-ut-study-finds/

[207] DEIS at 3-20.

[208] DEIS at 4-27.

[209] *See*, Anthony Lomax and Alexandros Savvaidis. Improving Absolute Earthquake Location in West Texas Using Probabilistic, Proxy Ground-Truth Station Corrections. (November 7, 2019) and Stacy Fernandez. Texas Tribune. Earthquakes in West Texas have dramatically increased, according to new University of Texas study (November 4, 2019), available at https://www.texastribune.org/2019/11/04/earthquakes-west-texas-have-increased-dramatically-ut-study-finds/

[210] Stacy Fernandez. Texas Tribune. Earthquakes in West Texas have dramatically increased, according to new University of Texas study (November 4, 2019), available at https://www.texastribune.org/2019/11/04/earthquakes-west-texas-have-increased-dramatically-ut-study-finds/

[211] DEIS at 5-20 to 5-21.

[212] United States Geological Survey. M5.0 Earthquake Hits West Texas, New Mexico Border (March 26, 2020), available at https://www.usgs.gov/news/m50-earthquake-hits-west-texas-new-mexico-border

to 5.0 have occurred in the Permian Basin since February 2020.[213] Below is a summary of recent seismic events in the Permian Basin:

Table 6: Seismic Events in the Permian Basin

SEISMIC EVENTS IN THE PERMIAN BASIN FEBRUARY 2020- JUNE[214] & OCTOBER, 2020[215]		
Magnitude	**Location of Seismic Event**	**Date**
3.3	Near Gardendale	2/19/20
3.0	Seven miles northeast of Odessa	3/1/20
5.0	Near Mentone, 77 miles west of Odessa in Loving County	3/26/20
3.6	Near Mentone	3/28/20
3.1	Seven miles northeast of Odessa	4/21/20
2.9	Van Horn, 163 miles west-southwest of Odessa	4/25/20
2.4	Northeast of Odessa	4/27/20
2.4	Between Odessa and Midland	5/6/20
2.0	Area of Faudree Road and Highway 191	5/16/20
3.2	Area of Faudree Road and Highway 191	6/1/20
2.6	12 km NNW of Midland, Texas	10/7/20
2.6	17 km SE of Ackerly, Texas	10/11/20
2.5	10 km SSE of Gardendale, Texas	10/13/20
3.0	42 km NW of Toyah, Texas	10/21/20

G. THE DEIS LACKS SUFFICIENT DETAIL REGARDING MONITORING AND MITIGATION MEASURES AND THUS FAILS TO DESCRIBE HOW IT WILL REDUCE POTENTIAL ADVERSE IMPACTS ON BOTH THE PUBLIC HEALTH OF VULNERABLE COMMUNITIES, AS WELL AS THE NATURAL ENVIRONMENT.

The DEIS is deficient for multiple reasons regarding mitigation of adverse impacts of the project and the monitoring of possible leaks along the transportation routes and within residential communities along those same routes. Section 6 of the DEIS purports to lay out mitigation measures but is lacking in specific enough detail to give communities along transportation routes any confidence that their health and safety as well as the integrity of the natural environment around them are all to be protected. Specifically, on Tables 6.3-1 and 6.3-2, which contain

[213] Bob Campbell. Earthquakes continue to rock the Basin (June 7, 2020) available at https://www.oaoa.com/news/local/earthquakes-continue-to-rock-the-basin/article_54db7700-a81e-11ea-99f5-eb700915d1c1.html
[214] *Id.*
[215] United States Geological Survey https://earthquake.usgs.gov/earthquakes/map/?currentFeatureId=us6000c6el&extent=24.18685,-111.15967&extent=38.18639,-88.02246&range=month&magnitude=all&listOnlyShown=true&showUSFaults=true&baseLayer=terrain

mitigation measures proposed by either ISP or the NRC, there are multiple instances where the DEIS could have included more in-depth information and analysis of the stated mitigation and monitoring efforts.[216] Commenters wish to highlight the following deficiencies:

1. **The DEIS fails to identify adequate mitigation measures related to Transportation Safety.**

The only measures proposed when addressing transportation safety are to use staged construction and operations to disperse impacts and using existing rail and rail sidetrack for SNF shipments in order to reduce the number of shipments and thereby reduce risk of accidents. There is no mention of securing the SNF.

Specific mitigation measures that could be employed here to lower risk in rail transportation of SNF include:

(1) decreasing train speed in more densely populated areas;
(2) decreasing the quantity of hazardous material being transported; and
(3) modifying containers for shipment.[217]

Commenters are concerned that the DEIS fails to address or evaluate any mitigation with the respect to transporting SNF by rail.

2. **The DEIS fails to adequately develop a disaster response plan as a form of mitigation.**

The DEIS simply states that there will be emergency response coordination with local authorities, fire departments, medical facilities, and other emergency response services before operations begin. This information is vague and thus unconvincing. The commenters urge that more detailed information is needed. Specifically, Commenters request that the NRC and ISP designate, county by county, city by city, its disaster response plan. Such information would include the names of which local entities that are to be involved, a description of each their capabilities when responding to disaster, a description of which of these entities would be in charge of detecting a disaster and disseminating information to others and the public, and the particular roles of each entity during a disaster. Without a detailed disaster response plan, the DEIS is deficient.

This response plan would also need to discuss whether or not these local partners have had a meaningful opportunity to inform the NRC and other relevant agencies about their current capabilities so as to assess potential gaps in their ability to respond. It is important to discover

[216] DEIS at 6-3 to 6-12.
[217] U.S. DOT and Federal Railroad Administration. Office of Research and Technology. Evaluation of Risk Acceptance Criteria for Transporting Hazardous Material. Final Report. (February 2020), available at https://railroads.dot.gov/sites/fra.dot.gov/files/2020-02/Evaluation%20of%20Risk%20Acceptance%20Criteria.pdf at 4.

now where gaps might be so that local communities can assess whether or not the local authorities are equipped to respond adequately to disaster. Without information on the capabilities and limitations of local entities to respond to disasters, the DEIS is deficient.

Additionally, the DEIS is silent on the issue of public notification in the event of a disaster. Commenters urge the NRC and ISP to work with local governments to develop a public notification system that is not only wide-reaching but also capable of delivering messaging in real time as would be essential in the event of a radioactive leak. Such a public notification system would also need to be in languages other than English whenever the demographics of the local community demonstrate that need. The DEIS is deficient for not having even considered the need for such a notification system.

The lack of an in-depth discussion on the need for a developed emergency response plan more than likely has to do with the DEIS limited definition of the "impacted environment" in Section 3.[218] Specifically, Section 3.3.2 discusses in a very superficial way that the affected environment is comprised of those communities along possible transportation routes, including the rural, suburban and urban environments, all of which would be at risk of exposure to a range of radiation from the SNF.[219] This section goes on to state that possible routes are not yet known at this time. It is this gap in knowledge that concerns commenters, precisely because there is no way for them to identify with any certainty communities along the routes for the purposes of assessing emergency response capabilities. Without a definitive listing of the communities that are to be along the transportation routes the residents of these potentially impacted communities are kept completely in the dark about whether or not SNF is to pass through their communities and are thus unable to participate in a meaningful way regarding a what an adequate emergency and disaster response plan needs to contain.

3. <u>The DEIS fails to establish adequate Monitoring within vulnerable communities near railyards as well as Monitoring of water resources.</u>

Commenters are extremely worried about the lack of monitoring in vulnerable communities along SNF transportation routes and encourage of ISP and NRC to develop and deploy a monitoring plan to protect such communities. The DEIS calls for monitoring of the constructed site and commenters believe that such monitoring can and should be implemented along the train route since it is possible to do so at the actual storage facility. For example, Section 7.2 mentions the use of dosimeters, but limits their use to the area surrounding the CISF project area and the associated SNF storage pad.[220] This is concerning to the commenters because the DEIS makes no announcement of any community-based radiation monitoring that is to be deployed along the transportation routes in areas with sensitive residential populations. Commenters call for the use

[218] *See* DEIS at 3-1 to 3-107.
[219] DEIS at 3-8 to 3-9.
[220] DEIS at 7-2.

of such dosimeters in populated areas along the train routes but especially in train yards, railroad intersections with public roadways, and any location where a train carrying SNF might come to a stop and thus expose nearby residents and passersby to radiological exposure. Such a system would allow real time monitoring as well as registry of monitoring data results that could be public facing. Such a system would allow the residents of these vulnerable communities to know how much radiation they are being exposed to over the course of time. Without such a monitoring plan, vulnerable and already overly burdened communities along possible SNF transportation routes are left unprotected. The DEIS fails to mitigate this adverse public health and environmental impact.

Additionally, the DEIS is completely silent on the way that leaks into water resources are to be managed along the train routes leading to the facility. Sections 7.3 mentions monitoring surface water runoff as an additional step in the radiation control process.[221] This section than goes on to describe, superficially, a two-step process to detect radionuclide detection of surface water impacts *around the storage pad and the CISF project area* only. Commenters are surprised and troubled to see that there is no mention whatsoever of any plans to protect impacted waters along the transportation routes, much less monitor such water ways. The trains carrying SNF will undoubtedly traverse rivers, lakes, streams and other bodies of water on their way to Andrews County. The DEIS' silence on how theses water bodies are to be protected is a glaring deficiency. However, this silence is not surprising given that Section 3.5, which has to do specifically with the impacts expected on water resources, limits the analysis to those resources near and within the CISF project area.[222] The analysis therefore goes no farther than Andrews County within the Colorado River Basin. Commenters are not satisfied that waterways across the state of Texas will be adequately monitored and stress the need for ISP and the NRC to develop, elaborate upon, and ultimately implement a monitoring system for these waterways. Until then, the DEIS has failed to demonstrate how it is to protect vital surface and subsurface water resources across the State.

III. CONCLUSION

The licensing application submitted by Interim Storage Partners is deficient both in its content and the lack of notice to communities that will be directly impacted by the building of the CISF. This comment addresses a number of inadequacies in the DEIS and other underlying documents like ISP's Environmental Reports and its revisions: the inaccurate analysis of potential accidents and radiation exposure levels, the failure to define railway transportation routes, and lack of discussion regarding the impact of barge shipments. Basically, the DEIS omits analysis of very serious environmental impacts that also raise health and safety concerns. The application should not be allowed to move forward with these omissions.

[221] DEIS at 7-2 to 7-4.
[222] DEIS at 3-22 to 3-26.

ISP's application also fails to provide affected communities with proper notice, not just because of these deficiencies in content, but also due to the lack of Spanish-language material. Spanish-speaking communities living along rail lines deserve the opportunity to meaningfully participate in this process. NRC's own policy mandates that resources be devoted to increase public participation of individuals not proficient in the English language when there are a large number of LEP persons who will be regularly affected by activities or programs that may have life or death implications. The communities our organizations represent are communities likely to experience the most exposure to SNF passing through; they are also communities that have high rates of LEP persons. We ask that the NRC process be made available to them.

Respectfully Submitted,

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