

WCS_CISFEISCEm Resource

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Subject: [External_Sender] Docket No. 72-1050: Joint Comments on Revision 2 of the Environmental Report (ER) for the WCS Consolidated Interim Spent Fuel Storage Facility
Attachments: FINAL LSLA and TRLA Scoping Comment.pdf

Dear U.S. Nuclear Regulatory Commission:
Please accept this comment on Docket No. 72-1050.
Respectfully,
Maggie Barnes

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November 19, 2018

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Office of Administration
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U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Re: Docket No. 72-1050; Joint Comments on Revision 2 of the Environmental Report (ER)
for the WCS 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 Environmental Report submitted by Waste Control Specialists, LLC (WCS) in connection with the license application for a Consolidated Interim Storage Facility (CISF) to highlight the potential impacts of this Project on the low income individuals living in their service area.

I. Reason for Concern

Lone Star Legal Aid and Texas RioGrande Legal Aid represent the interests of low income individuals and community organizations serving 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 (SNF) will be passing. SNF is inherently 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 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 Greater-Than-Class-C (GTCC) waste to WCS, 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 WCS comprises an intentional act by WCS 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) 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." §§ 3.2.1, p. 3-119. Nowhere in its ER does WCS define, diagram or mention a region of influence for public health and safety as the U.S. DOE did in the Yucca licensing case. The NRC has not fashioned a bright-line geographic proximity rule for the transportation aspects of spent nuclear fuel and greater-than-Class-C wastes, but has recognized in non-reactor adjudications radii of ½ mile to 17 miles as the basis for legal standing.

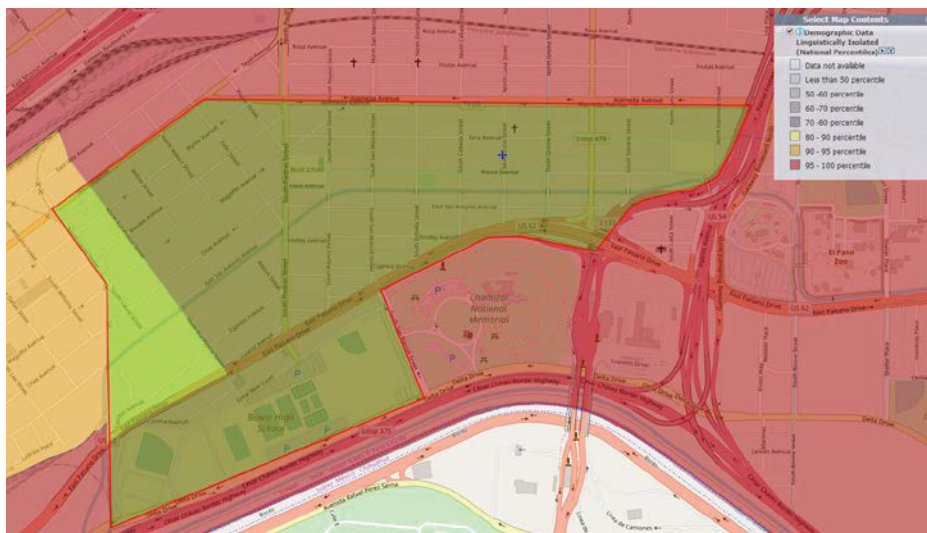
Both organizational groups represented by LSLA and TRLA have members and constituents of their services living between ½ mile to 17 miles of one or more of the proposed transportation routes.

A. Familias Unidas del Chamizal

Familias Unidas del Chamizal is a community-based organization focused on building community stability and a safe environment for the residents of the Chamizal neighborhood in El Paso, Texas. Members work together to fight injustices they face and to advance wellbeing in the community. In addition to voicing concern about proposed nuclear waste transportation directly next to their community, Familias Unidas also works on issues such as securing resources for neighborhood schools, preserving affordable housing, and resolving contamination and safety concerns stemming from a heavily trafficked nearby border crossing and industrial activity within the neighborhood.

The Chamizal Neighborhood is located directly south of the proposed SNF route through El Paso and adjacent to the Mexican border. As seen in Figure 1 below, the majority of the Chamizal and surrounding neighborhoods are in the 95-100 percentile of linguistic isolation in the United States.

Figure 1: EJSCREEN Map of Linguistic Isolation in the Chamizal Neighborhood of El Paso, TX

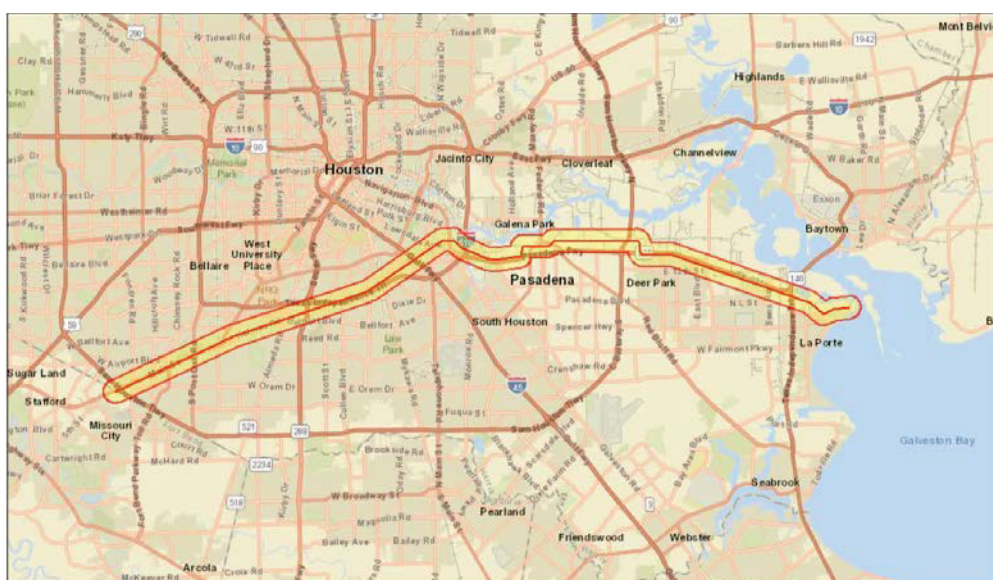


B. Caring for Pasadena Communities

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 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 that lie next 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 ER includes a potential radioactive waste route through Harris County, Texas on Union Pacific rail lines headed to Andrews County, Texas. Although not specifically disclosed as a transportation route, the potential Southern Route of Union Pacific rail line (Figure 2 below) travels through Pasadena, Texas and adjacent communities like Manchester, Meadowbrook, Lawndale, and Pecan Park, on the way from the ship channel through Harris County.

Figure 2: 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 RMP 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 (Figure 3 and Figure 4) 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, with many communities in the 90- 100th percentiles. 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:

Figure 3: Low-Income Population Near Southern Route of Union Pacific Rail Line Through Pasadena, TX

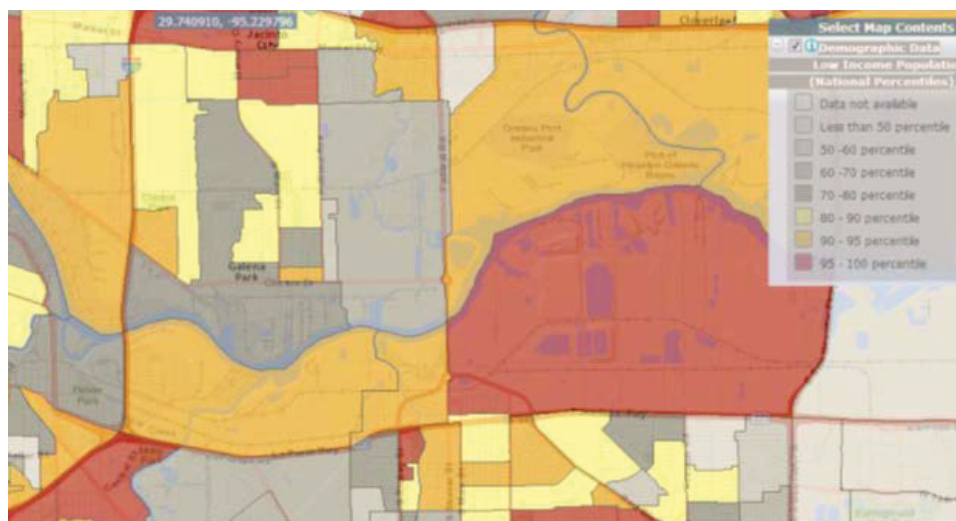
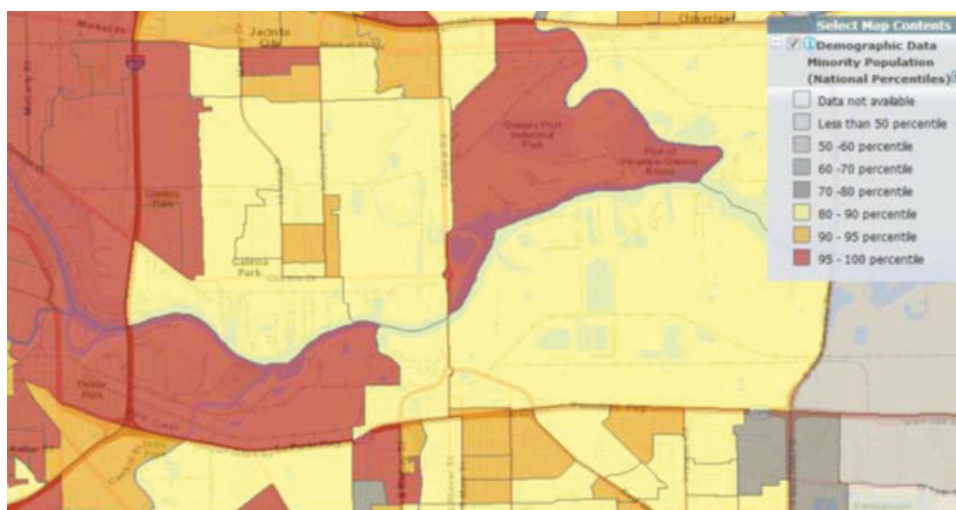


Figure 4: Minority Population Near Southern Route of Union Pacific Rail Line Through Pasadena, TX



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 5 and Figure 6 illustrate the income and minority characteristics of the Manchester, color coded for national percentiles. Note that the neighborhood has high concentration of low income and minority households, among the highest concentrations in the nation.

Figure 5: Concentration of Low-Income Populations in and around Manchester

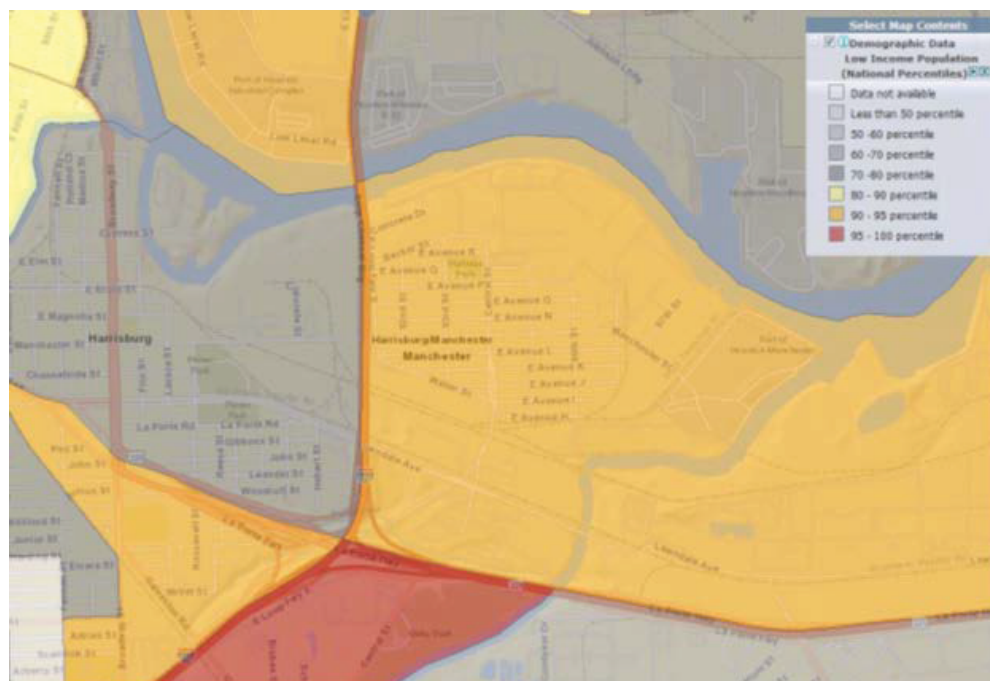
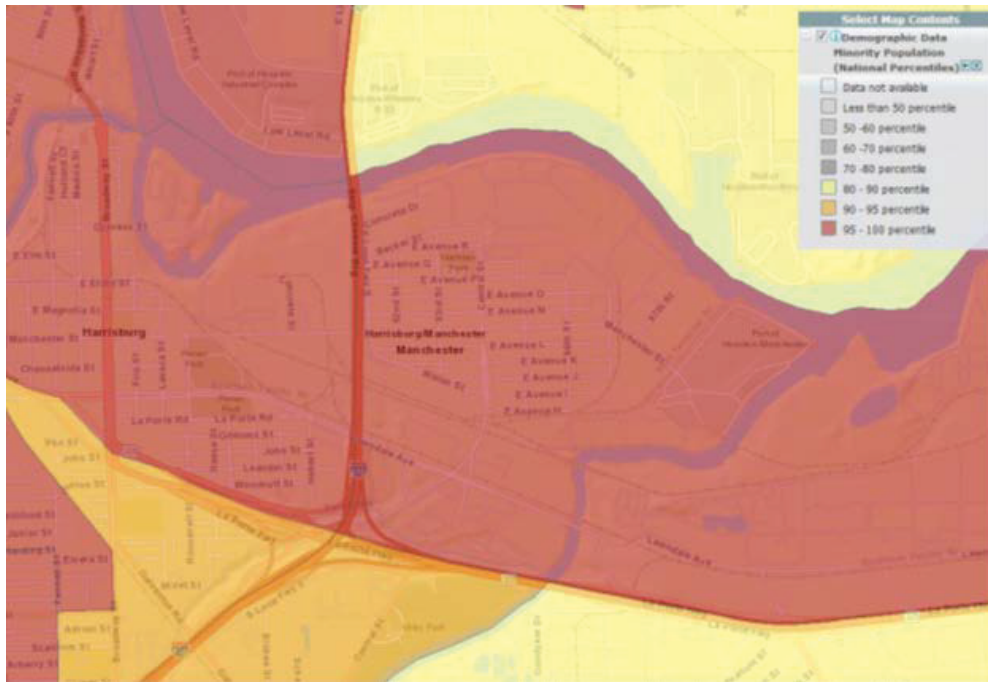


Figure 6: Concentration of Minority Populations in and around Manchester



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 and Manchester residents have been exposed to abnormally high levels of environmental hazards. 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. *See Duke Cogema Stone & Webster (Savannah River Mixed Oxide Fabrication Facility)*, LBP-01-35, 54 NRC at 415 (2001). Moreover, the proposed southern route potentially crosses Harris County, Waller County, Austin County, Colorado County, and Fayette County in Texas in LSLA's service area.

II. DISCUSSION

A. The Environmental Impact Statement (“EIS”) must define and analyze transportation route options from each SNF source site to the proposed Waste Control Specialists (“WCS”) Consolidated Interim Storage Facility (“CISF”)

1. *The ER Fails to Evaluate Possible Rail Transportation Options*

ISP is proposing to transport high-level nuclear waste on railcars through communities across the country. *ISP License Application*, Docket 72-1050 (July 19, 2018). 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. ISP’s license application fails to address three crucial concerns regarding transportation routes to the facility: the exact route from the 12 source sites named in the application, why sites ISP has already identified as future source sites are not included in the current analysis, and the effects of the piecemeal approach to analyzing transportation from source sites.

a. The application does not clearly 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. ER, Table 2.2-1, Page 2-6. Four of these sites are located on the West coast, four in the Midwest, three in the Northeast, and one in Florida. ER, Figure 2.2-8, Page 2-75. 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. ER, Page 1-5. 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 WCS CISF. But these routes were chosen only to calculate cost, and therefore, ISP chose the shortest routes so the cost would be minimal. ER, Page 7-25 (“The distance by rail from each facility to the WCS 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.”). Furthermore, ISP only mapped out three

of the routes in their application: one from the Maine Yankee facility to WCS, one from the San Onofre facility in a southern California facility to WCS, and one from WCS to Yucca Mountain. ER, Figure 2.6-1, Page 2-78 (reproduced below as Figure 7). 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.

Figure 7: ISP's Currently Proposed Routes



Figure 8, 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, ER, figure 2.2-4, page 2-71 (Figure 9, below), that map leaves off many hundreds of miles of possible rail transportation routes.

Figure 8: Nuclear Sites and Railroad Routes

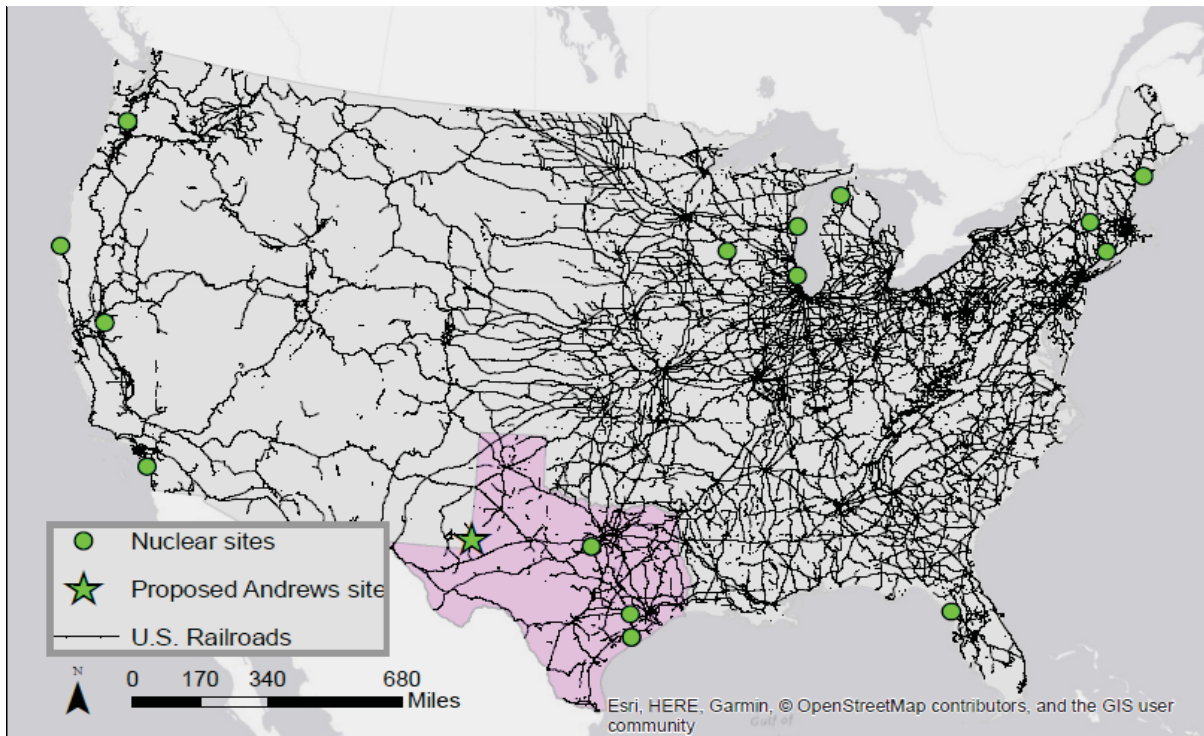
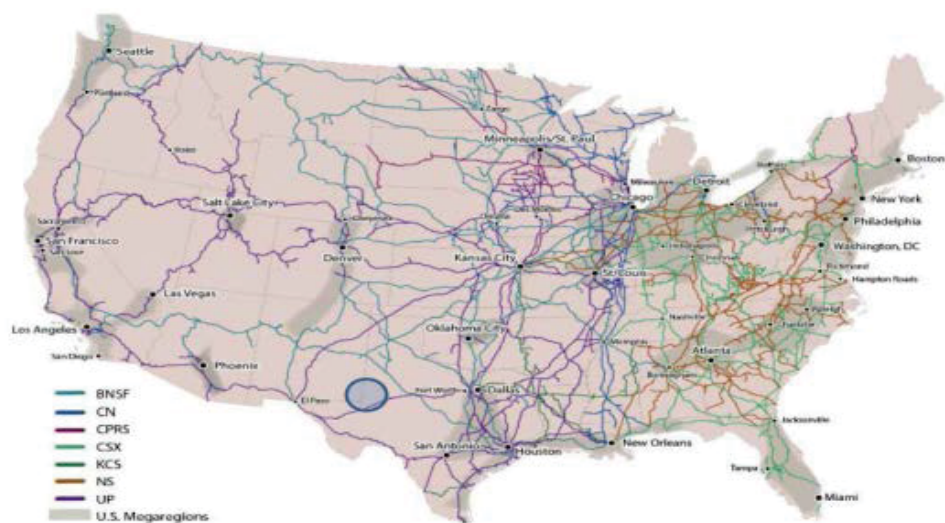


Figure 9: ISP’s “Rail Lines Map”



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.

Additionally, five of the twelve named sites in ISP's application are not accessible to "direct rail" routes. ER, Table 4.2-3, Page 4-17. 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. For example, trucks have to travel much more slowly than trains, meaning longer exposure periods to radiation. ER, Page 3-6. 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.

Without defined routes, affected communities have no notice that these trains will be passing through and that they will be exposed to the hazards discussed in other parts of this comment.

- b. While ISP expects to receive waste from up to 51 sites in the future, the application neither names these anticipated future SNF source sites nor describes anticipated future transportation routes from these sites.

ISP notes that by the year 2053 (which would fall within its licensing period), there will be 71 shutdown reactor sites in the U.S. ER, Page 7-4. ISP explicitly expects to receive SNF from "approximately 51 shutdown sites." ER, Page 7-4. 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. ER, Page 3-6.

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. ER, Page 3-6.

- c. The application 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. ER, Page 3-5. 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. See ER, Page 3-5.

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. The USDOT plans to complete a transportation route study in 2022; this should also inform the licensing process.

2. 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. See ER at 2-13, 2-21. 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. 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.¹ 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 is deficient.

There is only one map published in the ER that shows any of the routes which will be taken for delivery of SNF and GTCC waste to WCS, 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

¹ 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.

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 WCS

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

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.² 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 by barge shipment.

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 WCS CISF Site in Andrews County, Texas

Site	Location	Nearest Port
Calvert Cliffs 1 & 2	Lusby, MD	Port of Baltimore, MD
Surry 1 & 2	Gravel Neck, VA	Port of Norfolk, VA
Salem 1 & 2	Salem, NJ	Port of Wilmington, DE
Oyster Creek	Forked River, NJ	Port of Newark, NJ

² 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.

Indian Point	Buchanan, NY	Port of Jersey City, NJ
Pilgrim	Plymouth, MA	Port of Boston, MA
Palisades	Covert, MI	Port of Muskegon, MI
Kewaunee	Carlton, WI	Port of Milwaukee, WI
Port Beach 1 & 2	Two Rivers, WI	Port of Milwaukee, WI
Grand Gulf	Port Gibson, MS	Port of Vicksburg, MS
Browns Ferry 1, 2 & 3	Decatur, AL	Florence, AL
Cooper Station	Brownville, NE	Port of Omaha, NE
Diablo Canyon 1 & 2	Avila Beach	Oxnard, Port of Hueneme, CA
St. Lucie 1 & 2	Hutchinson Island, FL	Port Everglades, Ft. Lauderdale, FL
Turkey Point 3 & 4	Florida City, FL	Port of Miami, FL
Hatch	Baxley, GA	Port of Charleston, SC
McGuire	Charlotte, NC	Port of Charleston, SC
North Anna	Louisa County, VA	Port of Norfolk, VA
Peach Bottom	Peach Bottom, PA	Port of Baltimore, MD
Robinson	Hartsville, SC	Port of Charleston, SC
Summer	Jenkinsville, SC	Port of Charleston, SC
Susquehanna	Salem, PA	Port of Baltimore MD
Three Mile Island	Londonberry Township, PA	Port of Baltimore MD
Brunswick	Brunswick County, NC	Cape Fear River
Farley	Dotham, AL	Chattahoochee River
Millstone	Waterford, CT	Niantic Bay

Should a water transportation option later be selected, it is not disclosed in the ER 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.³ 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.⁴ 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 1985.⁵ Figures 3.1 and 3.3 from the Argonne National Laboratory's 1985 study are reproduced below for reference. *See* Figure 10⁶ and Figure 11⁷.

Figure 10: Potential Routes for Direct Water Shipments to Houston



³ 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.

⁴ 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.

⁵ 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 3-3 and 3-5.

⁶ 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.

⁷ 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 11: Potential Routes for Direct Water Shipments to Houston



The transportation component from nuclear reactors to WCS is expected to last 20 years and include at least 10,000 separate shipments, which the ER states nearly all of which will be by rail. According to 10 C.F.R. § 51.45(b)(1), the ER must address impacts of the proposed action on the environment, and they “shall be discussed in proportion to their significance.” The transportation aspects of WCS are of high significance to completion of the project. Adverse environmental effects which cannot be avoided must also be addressed. *Id.* at (b)(2). Alternatives must be discussed. *Id.* at (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. *Id.* at (b)(5). The ER currently does not sufficiently address these issues.

Nor did the ER include 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 ER 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 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), 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 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 WCS project's transportation side, there must be unconditional disclosure of probable transportation routes, whether by barge, highway or rail. The ER is deficient for failing to make such disclosures or confirm that the only transport 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.,⁸ and the transport of such materials must meet shipping and handling requirements of the International Maritime Dangerous Goods (IMDG) Code or 49 CFR, Parts 171-180.⁹ The ER does not discuss the capability of the Port of Houston to accommodate the nuclear waste shipments proposed by ISP.

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 WCS CISF or returned to the point of origin. To accomplish this, the anticipated routes must be made known to the public. Again,

⁸ 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.

⁹ Port of Houston Authority, Rates, Rules, and Regulations Governing the Houston Ship Channel and the Public Owned Wharves (January 1, 2018).

WCS 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 WCS 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 originally estimated in the ER. Because the ER fails to address or even mention transport by barge, the impacts cannot have been sufficiently addressed in the ER.

B. The EIS must 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. WCS 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.¹⁰ 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:

¹⁰ 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).

- **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.
- **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,¹¹ so Baltimore is an example of a city

¹¹ Jeffrey, Terence P. (March 23, 2017). Chicago, Detroit, Baltimore Lead Nation in Population Loss; Maricopa County Has Biggest Gain, *CNSNews.com* (identifying Harris County, Texas as one of the largest population growth centers from July 2015 to July 2016).

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. The ER Fails to Accurately Estimate an Accident with Release Dose.

In section 4.2.8.2 of the Environmental Report, the following paragraph appears:

“Under this scenario, the probability of an accident is combined with the conditional probability of a severe accident leading to a release of radioactive materials; this combined probability is then multiplied by the estimated dose of radiation a population or an individual may receive.”

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. The ER Underestimates Likely Train Speeds.

One of the NRC studies referenced by WCS/ISP in its Environmental Report is NUREG-2125 Spent Fuel Transportation Risk Assessment.¹² In that study, the researchers used a very conservative 15 mph train speed in its dose estimate calculations,¹³ which is well below the

¹² United States Nuclear Regulatory Commission, Spent Fuel Transportation Risk Assessment, Final Report, Office of Nuclear Materials Safety and Safeguards, NUREG-2125 (2014) (“NUREG -2125”).

¹³ NUREG-2125 at B-37 (the average urban train speed is 24 kph (15 mph)).

average Union Pacific train speed over the last five years.¹⁴ WCS/ISP, on the other hand uses a train speed of 50 mph for its dose estimates,¹⁵ almost double the aforementioned average UP speed. The faster a radiation source is moving, the shorter the time period someone will be in the zone of exposure, and the less conservative the resultant dose estimate is. The doses should be recalculated using the more conservative value of 15 mph, rather than 50 mph.

4. The ER 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 ER 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.

C. Public Notice of the Licensing Application and EIS Process 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 make this process accessible to Spanish-speaking communities before it proceeds.

¹⁴ <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.

¹⁵ ER at 4-14; Attachment 4-1, Table 1 (2018).

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



Table 3: 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”	Population By Spanish Spoken At Home
Pecan Park/Lawndale	28 %	80 %

Harrisburg/Manchester	32 %	80 %
Meadowbrook/Allendale	22 %	82 %
Northwest Pasadena	23 %	58 %
Northeast Pasadena	19 %	58 %

This data underscores the need for NRC to make the EIS 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.

In West Texas, over 100,000 people live within half a mile of the Union Pacific line that travels the 250 miles from El Paso to Monahans.¹⁶ Ninety-two percent of this community identify as Latino/a and 84% do not speak English at home. Forty-two percent of people speak English “less than very well;” 26% speak English “less than well;” and 10% are living in “linguistically isolated households,” meaning that no one 14 and over in the household speaks English “very well.”

2. Public Notice must be provided to predominantly Spanish speaking communities in both English and Spanish to comply with Title VI of the Civil Rights Act, the National Environmental Policy Act, and Executive Order 13166.

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 and therefore “[i]t seems obvious that the Chinese-speaking minority receive fewer benefits 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

¹⁶ EPA EJSCREEN ACS Summary Report, accessed October 1, 2018.

consistent with, and without unduly burdening, the fundamental mission of the agency.”¹⁷ 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.’”¹⁸

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...”);
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.” ER, Page 2-67. 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

¹⁷ Exec. Order No. 13166, 65 Fed. Reg. 159 (Aug. 16, 2000).

¹⁸ *Limited English Proficiency Plan*, NRC, <https://www.nrc.gov/about-nrc/civil-rights/lep-plan-8-17-11.pdf>.

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.

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 ISP's Environmental Report: 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, ISP's Environmental Report 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.

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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