



Andrews County Low-Level Radioactive Waste Disposal

# The Repository and the Risk

**Public Citizen Texas**

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A Report by Public Citizen

## **Acknowledgements**

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A report by Public Citizen on the Andrews County low-level radioactive waste disposal site.

## Background

In the early 1980's, the federal government urged the states to develop special landfills to dispose their radioactive waste. It also recommended that states cooperate with each other and form compact systems. In 1993, Texas signed an agreement with the States of Vermont and Maine to establish a low-radioactive waste disposal facility in Texas. Under the agreement, Vermont pays Texas to use 20 percent of any Texas low-level radioactive waste disposal facility. Maine opted out of the deal. Both Texas and Vermont agreed to form the Texas Low-Level Radioactive Waste Disposal Compact Commission that would have oversight on the disposal site and regulate its use<sup>1</sup>. There are eight members who sit on the commission, six of which are appointed by Governor Perry while the other two commissioners are appointed by the Governor of Vermont. The Compact Commission rule, proposed on November 26 of 2010 and adopted about a month later on January 4<sup>th</sup> of 2011, would allow the disposal site to receive radioactive waste



Canisters of radioactive waste awaiting burial at the Waste Control Specialist site.

Courtesy of WCS

from 36 states or more<sup>2</sup>. This could also permit waste from foreign countries to be disposed in Texas, if that waste was processed in the United States. The Barnwell disposal facility in South Carolina used to receive low-level radioactive waste from 36 states, but the state legislature became concerned that the site would soon reach its threshold capacity. This concern led to the South Carolina legislature restricting the site to the three states within its compact and no longer accepting radioactive waste from other states<sup>3</sup>.

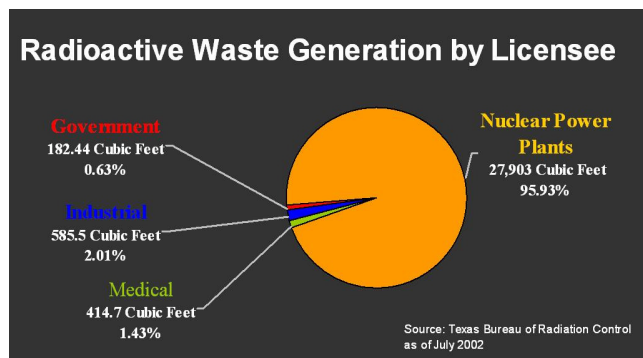
Receipt of such large quantities of waste at WCS from all across the country poses a tremendous environmental, health, transportation and security risk. Risk factors include the dump site's proximity to water, the waste transportation routes' proximity to major urban and populated areas, and the vulnerability of the site and vehicles to both accidents and terrorism.

The Commission rushed the process of approving the import rule. Public comments on the rule were published the day after Thanksgiving and were due on December 26, 2010. In addition to allowing only a small window of time for public input, the commission failed to provide a correct e-mail address on its website for people to send in their comments<sup>4</sup>. Even resorting to the judiciary wasn't sufficient to halt the process and extend the time for public input because neither a state nor a federal judge had the power to stop the Commission from acting on these rules<sup>5</sup>. Shortly after the approval of the rule, Waste Control Specialists, which holds the license for the site, started the construction process and says the facility will be ready to receive low-level waste at the end of this year or early 2012.

This process was rushed and didn't take into account the many risks which Texans face. According to Texas law, the kind of waste that will be disposed of at the facility must be monitored for 1000 years<sup>6</sup>. Texans must make sure they know what they are getting into before making a 1000-year commitment with their land. Radioactive waste disposal sites have leaked before and have cost hundreds of millions to billions of dollars to clean up<sup>7</sup>. This report sheds light on the proposed rule, location of the disposal site, and the risks associated with the disposal site and the transportation of the radioactive waste.

## Low-Level Radioactive Waste

According to Nuclear Regulatory Commission (NRC), low-level radioactive waste includes items that have become contaminated with radioactive material or due to exposure to neutron radiation<sup>8</sup>. However, the majority of the waste comes from nuclear power plants and the nuclear industry. It is true that some of the waste comes from academic research and medical use, but nationally both sources account for less than 1% of the waste disposed in the past decade. Most of the medical waste is only hazardous for eight months unlike waste from nuclear reactors, which stays hazardous for hundreds of thousands of years<sup>9</sup>. In Texas, industrial, medical, and academic sources combined account for just 3.9% of annual waste generated, with medical waste accounting for only 1.4%<sup>10</sup>. In a legislative briefing on the issue, the Texas Commission on Environmental Quality said that up to 90% of the waste generated in Texas comes from nuclear power plants.



The term “low-level” is misleading because if measured by the bulk amounts of what is disposed, low-level waste can be even more radioactive than “high-level” by its sheer volume.

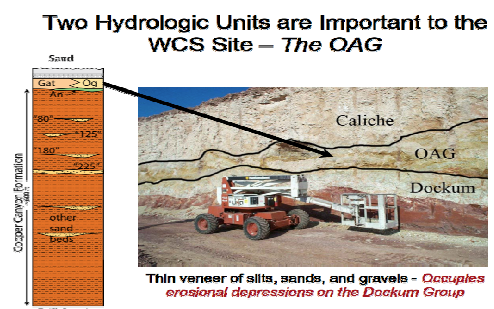
The DOE’s Manifest Information Management Systems, a data base that tracks volumes of low-level radioactive waste across the country shows that nuclear power plants and the nuclear industry make up more than two-thirds of the waste disposed in US disposal sites since the year 2000. Examples of

radioactive waste from power plant reactors can range from irradiated components and piping, to resins, sludge, and filters. In some cases, an entire nuclear power plant would need to be disposed of after being decommissioned, *from the reactor vessel to the concrete floor*. A typical reactor contains about 15,000 thousand cubic feet of contaminated concrete and reinforcing steel bars<sup>11</sup>. There are three categories of low-level radioactive waste depending on the level of radioactivity: class A, B, and C. Classes B and C are the more highly radioactive types of low-level radioactive waste<sup>12</sup>. The EPA confirms the label is confusing. It is easy to equate 'low-level radioactive' with 'low radioactive content'. However, there is no limit on the amount of radioactive material contained in 'low-level' radioactive waste<sup>13</sup>.

Exposure to radioactive materials can cause cancer, sterility, reduced immunity and even death, depending on the type of radioactive material and the level of exposure.<sup>14</sup> Being exposed to waste generated by a medical facility might not be very hazardous but it is more dangerous to be exposed to radioactivity from a nuclear reactor<sup>15</sup>. So just because it’s called low-level, doesn’t mean it’s low risk.

## Location of the Site

The site is located in the west Texas county of Andrews, east of the Texas-New Mexico boundary. According to the WCS permit application the site lies 31 miles west of the city of Andrews, 6 miles east of Eunice, New Mexico, and one mile north of Hwy 176. It was chosen because of the areas’ low annual rainfall;<sup>16</sup> however, parts of the disposal site sit below the Dockum and the Ogallala Aquifer (OAG), *the largest aquifer in the world*<sup>17</sup>, as depicted in the picture to the right. The edge of the site is just 150 feet from the water bearing strata.



*According to a TCEQ interoffice memo “groundwater is likely to intrude into the proposed disposal units and contact the waste from either or both of two water tables near the proposed facility”*

The Ogallala aquifer is one of the most important sources of water in the Plains Region, used for residential and industrial purposes as well as agriculture, the base of the economy in the area. Texas is one of the leading states irrigating from the aquifer, accounting for about 40% of Texas’ water use<sup>18</sup>.

## Capacity

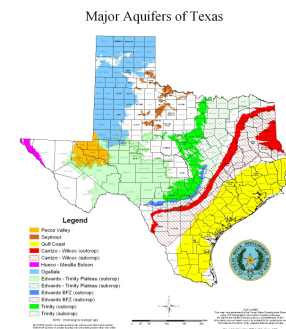
Waste Control Specialists is licensed for a capacity of 2.3 million cubic feet (CF) of material and 3.9 million curies<sup>19</sup>. This estimate is supposed to be sufficient for waste generators within the Texas / Vermont compact. WCS claims that excess capacity will be available at the facility even after receiving all the waste from compact generators. However, studies conducted by the Texas Commission on Environmental Quality and the Compact Commission show higher need by the compact generators than WCS claims. The Compact Commission study estimates that Texas will generate five million (5,000,000 CF) of low-level waste over a 50 year period between 1995 and 2045, and Vermont will generate 1 million CF<sup>20</sup>. The TCEQ study estimates 2,543,000 CF of waste will be generated in a 35 year period<sup>21</sup>. Both studies’ figures exceed the licensed capacity indicating WCS would not be able to take all the compact waste if they also imported waste from other states in the country.

## Risks

There are many risks associated with the disposal and transportation of low-level radioactive waste in Andrews disposal site. These risks can impact the environment, public health, and security. More studies of the site need to be conducted before importing low-level radioactive waste to the state.

## Water Contamination:

Burial will most likely be the method of the disposal. Much of the lowest level wastes will be buried in unlined clay trenches<sup>22</sup>. Disposal sites of this type have all leaked in the past. One such site is the Maxey Flats facility in Kentucky which started operating in 1963. It closed after ten years due to contamination, and still being decontaminated to this day<sup>23</sup>. Due to the proximity of the WCS dump site in Andrews County to the Ogallala Aquifer and other aquifers, there are concerns that water contamination of the aquifer could occur in the event of a leak.



*The Texas Commission on Environmental Quality (TCEQ) was responsible for reviewing the permit for the WCS disposal site. Eight TCEQ staff members were charged with the task of reviewing the permit and they all recommended denying it, voicing concerns over water contamination that might be caused by the WCS site. “If you have water in the ground, you shouldn’t put a landfill there,” said hydrologist Patricia Bobeck, one of three TCEQ members who quit after their recommendation was overruled by the agency’s Executive Director.*

When TCEQ Executive Director, Glenn Shankle approved the application, he required WCS to do more testing on the site as a compromise. A few months later, Shankle went to work as a lobbyist for WCS.<sup>24</sup>

WCS’ own monitors show water within 14 feet from the sites’ cell base but when TCEQ staff examined the data, they found that water might be closer<sup>25</sup>. There are no geological barriers in the sediments to stop the waste from getting into the aquifer water if there was a spill. At a public hearing conducted by the



Compact Commission on the WCS site, Compact Commissioner Wilson asked Gerry Grisak, geologist and a groundwater professional who worked with WCS on the site, if there were any geological or geotechnical barriers that would prevent any spills at the site from migrating into the Ogallala aquifer. Gerry replied there are none<sup>26</sup>. Since there are no barriers, spills or leakages at the site could potentially carry to the aquifer's water and contaminate it<sup>27</sup>. Contamination of the Ogallala Aquifer would devastate the area environmentally and economically.



Water seeps from the ground at one of Waste Control's radioactive waste dumps.

photo by Diane Potet

The costs for decontamination of even a small aquifer can be staggering. After years of operation and numerous environmental assessments, it became clear that uranium mining and the associated waste disposal had contaminated South Texas's water. Nuclear wastes that were far more toxic than permitted were dumped into Conoco's El Conquista uranium strip mine pit and at the nearby Susquehanna-Western Uranium site outside of Falls City, TX. Then the uranium mining companies went bankrupt. It cost taxpayers \$22 million in state and federal money to cover up that site. The aquifer is now contaminated and according to the DOE, hazardous and radioactive materials leached into the aquifer below the site and migrated at least 2,500 feet from the tailings piles. The DOE agreed to take responsibility for cleaning the aquifer, but balked at the price tag: \$384 million.<sup>28</sup> This aquifer remains contaminated today.

## Transportation Risks

There are several ways to transport low-level radioactive waste, either by sea in ships or by land in trains or trucks. The most prominent method used in the United States is land transport by trucks.

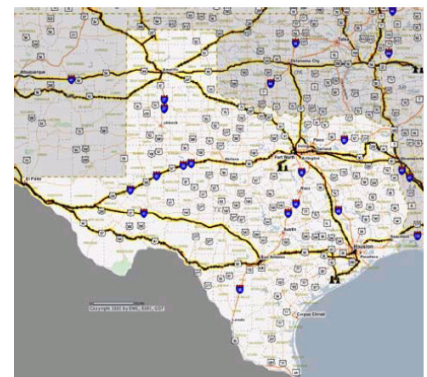
The transportation of the waste from Compact states will increase the number of trucks carrying radioactive waste on Texas highways by four thousand and four hundred and thirty-six (4,436) shipments annually according to WCS' own **Transportation Assessment**. This estimate doesn't include shipments coming from out-of-compact states, which would increase the overall number of shipments significantly<sup>29</sup>. More trucks on the highway will increase the risk of transportation accidents.

The US Department of Transportation has no specific rules or guidelines for selecting routes on which waste is transported. The main rule for transporters is to choose routes that minimize the risk<sup>30</sup>

In chapter 51 of the US Code on Transportation of Hazardous Materials, there is a requirement that when proposing a hazardous material transportation route, states must consider a list of factors:

- population densities
- the types of highways
- the types and amounts of hazardous material
- emergency response capabilities
- the results of consulting with affected persons
- exposure and other risk factors
- terrain considerations
- the continuity of routes
- alternative routes
- the effects on commerce
- delays in transportation, and
- other factors the Secretary considers appropriate.

## Radioactive Waste Routes



In Texas, it is uncertain which highway routes will be taken to Andrews County but it is assumed that they will be similar to the routes already being used to transport waste to the Waste Isolation Pilot Project (WIPP) facility in New Mexico. Potential routes for transporting waste from the Gulf Coast area would be I-10, going through Houston and San Antonio. Waste from southern states would be driven along I-20 and I-30 going through Dallas and Fort Worth. Midwestern and Northeastern waste would be transported on I-40 and I-27 through Lubbock and Amarillo. Western states would use routes that passed through the cities of El Paso and Odessa using I-10 and I-20<sup>31</sup>. Some of the communities that occupy the area surrounding the interstate lines are heavily populated. In Houston, the population residing within one mile of the radioactive waste routes is as large as a quarter million (2,500,000) and includes around 599 schools, and 76 hospitals<sup>32</sup>. Should any accidents take place, these communities could be exposed to radioactive materials and devastated by the damages of such accidents.

### Potential Routes for Low-Level Radioactive Waste Transportation

Origin of Waste	Potential Routes	Cities Along Routes
Gulf Coast area	I-10	Houston, San Antonio
Southern States	I-20, I-30	Dallas, Fort Worth
Midwestern and Northeastern States	I-40, I-27	Lubbock, Amarillo
Western States	I-10, I-20	El Paso, Odessa

The waste is transported in different types of containers. There are strong tight containers, Type A, which can come in the shape of wooden boxes or steel drums, and Type B which consist of shielded metal drums that are supposed to survive severe accidents. The safety of these containers has been under substantial criticism. The NRC conducted safety tests on the containers; however, those tests were conducted by computer simulation and weren't actual tests<sup>33</sup>.

There have been several accidents involving those containers and some of them resulted in release of radioactive materials. NRC says that strong tight containers don't have to pass integrity tests and 10% failed in accidents, 90% of which released their contents. 1% of Type A packages that were involved in accidents failed and 39% of those released their contents<sup>34</sup>.

#### Waste Transport Mishaps

- A transport carrying 22 tons of waste in route to the WCS site was lost for nearly a month in 2001. This waste was later found abandoned on a north Texas cattle ranch covered over with dirt. The driver of the transport was nowhere to be found.
- In 2001, a transport to WIPP strayed off of designated waste routes for miles before the satellite tracking operator noticed.
- In 2002, two collisions within a month apart occurred involving shipments to WIPP
- DOE documents show that between 1971 and 1994, there were 306 accidents involving 3,649 containers of low-level radioactive waste, 236 of them were damaged and 174 resulted in release of radiation into the environment<sup>35</sup>.

The Department of Energy conducted a study on Yucca Mountain, an area that has been under considered as a permanent U.S. disposal site for highly radioactive waste. The study documents the rapidity of the impacts on the area should a transportation accident occur<sup>36</sup> causing intense and long lasting fire and fuel oxidation in a 42 square mile area in a rural setting. It would cost more than six hundred million dollars (\$600,000,000). Accidents of this kind would be even more devastating in an urban area. Even though waste that will be going to Andrews will be low-level waste, the severity and potentiality of transportation accidents on the routes to the Andrews County Disposal Site shouldn't be dismissed. Statistics from the Texas Department of Transportation for 2008 on traffic crashes involving a truck/semi indicate the risk of

transporting radioactive materials on Texas Highways is too high. There were a total of 22,598 tractor/semi crashes in 2008 alone. In the company's low-level radioactive waste transportation assessment, WCS failed to address how much money is needed to pay for remediation or contamination, nor did it mention in what capacity the state and local governments should respond in case an accident took place.

Statewide Reportable Motor Vehicle Traffic Crashes Involving Tractor/Semi's (2008)

Fatal Crashes	344
Incapacitating Injury Crashes	736
Non-Incapacitating Injury Crashes	2,321
Possible Injury Crashes	3,505
Non-Injury Crashes	15,442
Unknown Injury Crashes	250
Total Crashes	22,598

The risk associated with the transportation of radioactive materials is too high. The vehicles will be travelling on routes within urban and rural settings that are too close to residents and are surrounded by many public buildings such as schools and hospitals. Past experience has shown that property values tend to decline in areas that run along both actual **and** potential routes for transporting nuclear waste<sup>37</sup>.

## Funding for Accident Cleanup

According to the Texas Health and Safety Code, Code 401.052 requires the Texas Department of Health Services to establish a fee program for the companies shipping the low-level radioactive waste at rate not exceeding ten dollars (\$10) per cubic foot. The funds are to be used for equipment and training of first responders and to cover for cleanup costs should an accident takes place. The fund is capped at only \$500,000, at which point no more fees will be collected. The fee can be reinstated when the pool drops below \$350,000. A study done by the National Low Level Waste Management Program estimates **decontamination costs for an accident can be up to a billion dollars**. Should a carrier's insurance coverage be inadequate to pay the claim for cleanup costs, which is likely in the event of a major accident, this fund could be depleted<sup>38</sup>, and taxpayers would end up paying the remainder of the costs.

## Security and Terrorism Threat

The disposal site will be vulnerable and susceptible to security and terrorism threats<sup>39</sup>. Nuclear power plants have to meet tough physical security standards, but there is no federal or state law that mandates substantial security measures at the disposal site in Andrews County.

The vehicles transporting the waste to the WCS site could be vulnerable targets for terrorist attacks. In a study of transportation risks, the EPA says, "The detonation of an improvised nuclear device could result in significant property damage. People would be killed or injured from the blast and might be contaminated by radioactive material. Many people could have symptoms of acute radiation syndrome. After a nuclear explosion, radioactive fallout would extend over a large region far from the point of impact, potentially increasing people's risk of developing cancer over time."<sup>40</sup>

A 2004 study shows that a radioactive explosion in a metropolitan area can cripple the local economy, with contamination that will extend over 57 miles and over three thousand (3000) fatalities<sup>41</sup>. Such a scenario would be devastating.

In February of 2011, a Texas Tech chemical-engineering student from Saudi Arabia was arrested for plotting terrorist attacks on several locations, one of which was a nuclear site in Lubbock. The student had purchased chemicals for making explosives<sup>42</sup>. Had he succeeded in following through with his plans, it could have had a devastating impact on the area surrounding the nuclear site.

With few substantial security measures in place at WCS' remote disposal location, radioactive materials would be more easily accessible than those at nuclear power plants or weapons facilities. Terrorists



would be able to plot attacks of greater devastation more easily because they wouldn't have to smuggle radioactive material into the United States. They are already there, sitting in our land or being openly driven on Texas highways.

## First Responders

Due to the risk associated with the transportation of radioactive waste, teams of first responders must be well-prepared for the aftermath, should a transportation accident occur. The recent wild fires Texas is experiencing has shown us the vulnerabilities of our first responders in many parts of the state. Local firefighters have been stretched thin, with limited resources and manpower. Over seventy-five percent (75%) of them are volunteer firefighters who have other jobs<sup>43</sup>. Some of these men spend out-of-pocket money to fill up their trucks with gas because of funding limitations. A Texas Sunset Advisory Report shows that the majority of the counties with high risk of wildfire received only a small portion of the grants the state awards volunteer fire departments. If radioactive waste is going to travel through these communities, first responders must possess adequate training and equipment to be able to properly deal with radioactive accidents<sup>44</sup>.



The rule adopted by the Compact Commission has no provisions or guidelines regulating the transportation of radioactive waste that would be carried on trucks through Texas communities. If an accident occurs, local governments will be the ones closest to the accidents and responsible for first line emergency response. The US Department of Transportation, the Nuclear Regulatory Commission, and the U.S Department of Energy all claim to have emergency responders and procedures available, but are unlikely to be first on the scene. While the Compact Commission's importation rule is likely to increase the volume of traffic and risk of accident, the Commission doesn't work with local governments and municipalities along the transportation routes to verify they have teams of first responders who are trained and properly-equipped to deal with radioactive waste accidents.

## Conclusions

There are some clear problems that have not been addressed that would leave our state vulnerable to unfunded taxpayer liabilities. This report has revealed many of the issues that should be studied before we move forward.

- Texas taxpayers would bear a significant unfunded liability if this facility leaks or there is a major transportation accident. At this time cleanup funds are inadequate to cover the cost of cleaning up if there is a significant accident.
- There is no proof or state agency finding that there is, in fact, excess capacity that can be sold to out of compact generators.
- If excess capacity is sold, Texas may not have a place to dispose of waste from its own nuclear reactors when we need it.

## Recommendations

The Compact Commission's importation rule, which was approved in January of this year, makes Texas the nation's radioactive dump, bringing waste from 36 states or more. The radioactive waste will be travelling along Texas highways, exposing Texans' health and safety to many risks. The majority of the waste will be transported in trucks to the WCS disposal site in Andrews County. The rule is misleading. It focuses on explaining the economic impact the WCS site will have on Texas but fails to assess the impact it will have on the environment and public health. Economic rewards, which will benefit a few

individuals, shouldn't trump the environmental and public health risks the site poses. Therefore, Public Citizen recommends the following:

- Prior to importation of waste from other states, a capacity study should be conducted to assess the validity of WCS claims that the site has excess capacity, and to assure adequate disposal capacity for Texas and Vermont waste generators.
- Teams of first responders should be prepared and properly trained to deal with any accidents that might occur on the site or during the transportation of the waste.
- There needs to be an assessment of damages and costs of decontamination and cleanup in Texas urban and rural areas in cases of transportation accidents and contamination of an aquifer.
- The cleanup fund established by Code 401.052 of the Texas statutes needs to be expanded so that it is sufficient for cleanup and decontamination if an accident occurs on any of the Texas highway routes.
- Assure adequate funding for remediation and decontamination in case the site leaks and contaminates the surrounding water tables.

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# **The Repository and the Risk**

## **Andrews County Low-Level Radioactive Waste Disposal**

### **Summary**

- Texas has radioactive waste regulatory authority through the Texas Low-Level Radioactive Waste Disposal Compact Commission which oversees the disposal of radioactive waste in the Texas Compact that consists of Texas and Vermont
- The Compact Commission recently approved a rule that would allow importation of radioactive waste from 36 or more states outside the Texas Compact.
- The license holder for the site is Waste Control Specialists (WCS), a Dallas-based company. The company was licensed with a capacity of 2.3 million cubic feet and 3.9 million curies. The company says there is about seven hundred thousand (700,000) cubic feet in excess capacity; however, the only official radioactive waste projections for the Texas Compact come from two studies; one done by the Texas Commission on Environmental Quality (TCEQ) which estimates 2,453,000 million cubic feet of low-level radioactive waste will be generated by the compact states over a 35 years period, and the other study was done by the Compact Commission which projects 6 million cubic feet of waste will be generated over a period of 45 years.
- WCS was given a license after a TCEQ technical review team unanimously recommended against the licensing the site, citing water concerns. Three of the 8 member of the TCEQ technical review team quite their jobs because of their grave concerns after their recommendations were ignored.
- Importation of waste will increase the risk of radioactive exposure to Texas, as waste from 36 or more states will rumble across Texas highways
- The teams of first responder in the areas surrounding the site are more than 75% volunteers and have limited resources and funding.

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### **Recommendations**

The Compact Commission's importation rule, which was approved in January of this year, makes Texas the nation's radioactive dump, bringing waste from 36 states or more. The radioactive waste will be travelling along Texas highways, exposing Texans' health and safety to many risks. The majority of the waste will be transported in trucks to the WCS disposal site in Andrews County. The rule is misleading. It focuses on explaining the economic impact the WCS site will have on Texas but fails to assess the impact it will have on the environment and public health. Economic rewards, which will benefit a few individuals, shouldn't trump the environmental and public health risks the site poses. Therefore, Public Citizen recommends the following:

- Prior to importation of waste from other states, a capacity study should be conducted to assess the validity of WCS claims that the site has excess capacity, and to assure adequate disposal capacity for Texas and Vermont waste generators.
- Teams of first responders should be prepared and properly trained to deal with any accidents that might occur on the site or during the transportation of the waste.
- There needs to be an assessment of damages and costs of decontamination and cleanup in Texas urban and rural areas in cases of transportation accidents and contamination of an aquifer.
- The cleanup fund established by Code 401.052 of the Texas statutes needs to be expanded so that it is sufficient for cleanup and decontamination if an accident occurs on any of the Texas highway routes.
- Assure adequate funding for remediation and decontamination in case the site leaks and contaminates the surrounding water tables.