

PUBLIC SUBMISSION

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Docket: NRC-2017-0081

Greater-than-Class-C and Transuranic Waste

Comment On: NRC-2017-0081-0014

Greater-than-Class-C and Transuranic Waste; Draft Regulatory Basis

Document: NRC-2017-0081-DRAFT-0028

Comment on FR Doc # 2019-15434

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General Comment

See attached file(s)

I absolutely oppose the NRC rulemaking plan to permit Greater Than Class C (GTCC) and Transuranic nuclear waste from being delegated from Federal DOE and NRC to state authority. This is an abrogation of responsibility for the safe and deep underground storage of our spent nuclear waste that the AEC and now NRC has failed to accomplish for over 60 years. Sidestepping that responsibility and allowing states like Texas and state agencies like TCEQ to manage a problem that has eluded the Federal authorities for all this time is patently dangerous.

This high-level, long-lived radioactive waste has no safe long term storage possibility in surface or near surface locations where natural forces such as erosion and man-made risks such as abandoned oil wells would allow this radiation to spread over vast land areas and

watersheds and into aquifers over the hundreds of thousands of years that it would be hazardous. Your own data, though limited to 10,000 years, shows the increasing off-site risk over time as the site decays with time. Your examples of an inadvertent intruder being affected in 500 years is ludicrous given the long half-lives and subsequent decay chains of the isotopes involved that stretch into millions of years.

We cannot allow this waste to be transported and buried in shallow graves on the Texas Plains under the guise of temporary solution because the NRC and DOE have shown no ability to find a permanent solution. Any temporary solution would likely last long past the time where the containers would begin to decay and it would result in a radioactive mess far greater than the West Valley disaster in New York state. This would be the height of irresponsibility.

The attached pdf is a blog (<https://albradenphoto.wordpress.com/2019/09/11/chernobyl-on-the-texas-plains/>) that I wrote for Austin Sierra Club and my blog site that expands my thoughts in much greater detail and is an important part of my public comment. In addition, it contains a link to my YouTube video of the public comments given during your Austin, Texas public hearing on August 27, 2019. Those public comments are also part of this record of overwhelming public opposition to the dangerous plan. See: http://bit.ly/NRC_YT.

I ask you to hear the serious public concerns and do not proceed with this plan.

Attachments

09-16-19 NRC Testimony

Chernobyl on the Texas Plains

Quick one-question survey:

Do you support having our nation's Incredibly dangerous nuclear wastes in the hands of TCEQ and [Waste Control Specialists \(WCS\)](#), a private company whose founder, [Harold Simmons](#), was Rick Perry's #2 all-time leading donor? Do you support burial of hot Greater-Than-Class C radioactive waste in shallow graves and above-ground storage of the hottest of all high-level radioactive waste, spent nuclear fuel rods, on High Plains of Texas?

- ☐ No
- ☐ NO WAY IN HELL!
- ☐ This dangerous plan is total lunacy!
- ☐ I still support "Radioactive Rick" Perry!

The Nuclear Regulatory Commission (NRC) is working on new rules that would skirt all established nuclear waste safeguards and make it allowable for states and private contractors to dispose of the nation's entire inventory of "Greater Than Class C" and "Transuranic" radioactive waste – with shallow burial in the Federal pit at Waste Control Specialists' site in Andrews County, Texas. Just say NO! Here's a link to Karen Hadden's website and the coalition fighting this: <http://nonuclearwasteaqui.org/>

The NRC is also currently reviewing the company's application to store 40,000 tons of "high-level" irradiated nuclear reactor fuel rods in thin steel canisters surrounded by concrete, above ground at the site for forty years, a timeline that could later be extended. We don't need these poisonous wastes in Texas, where they could contaminate our air, soil and water and imperil our health! Just say NO!

The federal government has always required these wastes to be buried deep underground in a permanent repository, the least risky approach, but cost-cutting is underway. It is unconscionable to consider burdening Texas with the nation's nuclear power waste to be stored in near-surface pits and above ground in dry casks.

Once it touches the precious soil of Texas - it will never move!

Help me out! Tell the Nuclear Regulatory Commission (NRC) your views during the public comment window ending September 20, 2019!

Here is the link to the NRC Public Comment site:

<https://www.regulations.gov/comment?D=NRC-2017-0081-0014>

The screenshot shows the Regulations.gov website interface. At the top, there's a navigation bar with links for Home, Help, Resources, and Contact Us. Below this, a search bar is visible. The main heading reads "You are commenting on:" followed by the title "The Nuclear Regulatory Commission (NRC) Proposed Rule: Greater-than-Class-C and Transuranic Waste; Draft Regulatory Basis". A sub-link "Open Docket Folder" is provided. The form is divided into three steps: "Your Information", "Your Preview", and "Your Receipt". The "Your Information" step is active, showing a large text area for the comment (5000 characters remaining), an "Upload file(s)" button, and fields for "First Name" and "Last Name". There are also checkboxes for "I want to provide my contact information" and "I am submitting on behalf of a third party". A "Continue" button is at the bottom of the form. A footer section contains links for Home, About Us, Resources, Help, and Comment With.

(Graphic: NRC Website)

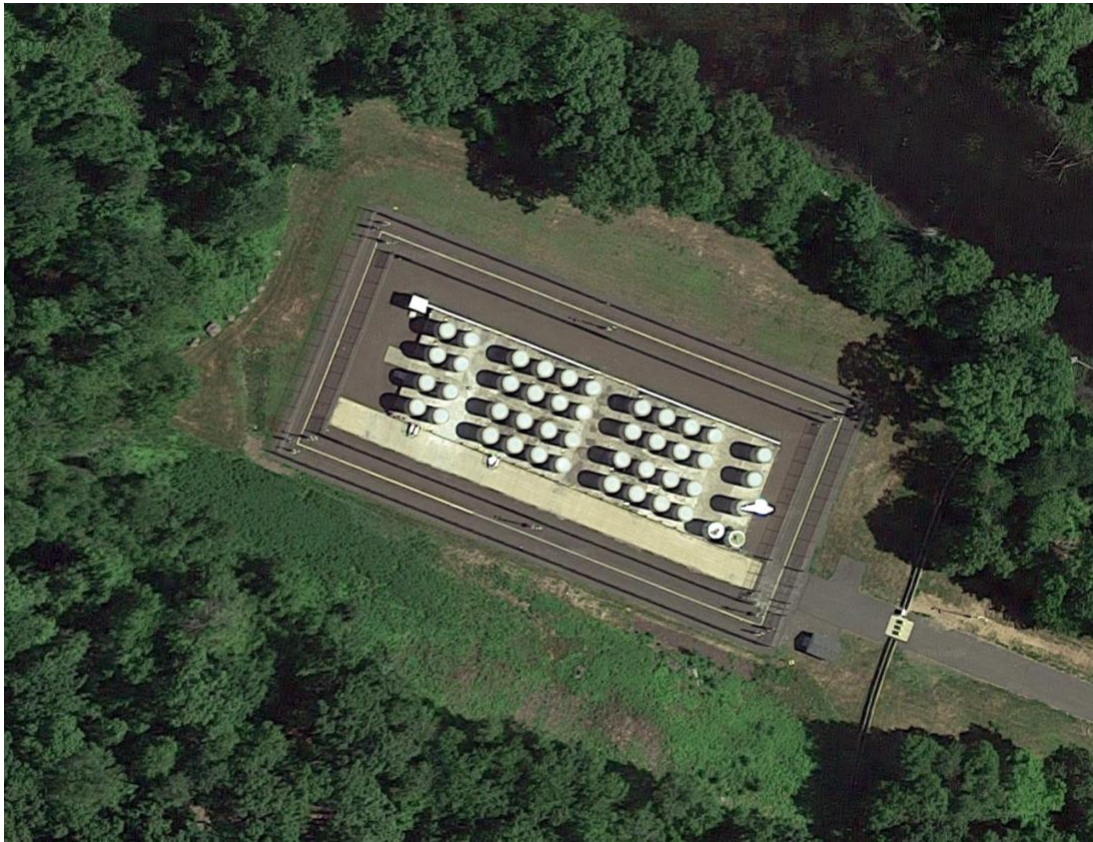
Hot Radioactive Topic. September 20th Deadline. The issues . . .

A letter from Texas Commission on Environmental Quality (TCEQ) dated January 20, 2015 asked the NRC about "Texas' authority to license disposal of GTCC waste." (Greater than Class C – as we'll describe later.) Recognizing that they had no framework to evaluate such a request - it has always been a Federal responsibility – the NRC began to evaluate TCEQ's questions. That got this whole unfortunate ball rolling on behalf of WCS – who NRC identifies as the only likely applicant in the whole country.

NRC is responsible for the management and safe disposal of the nation's non-defense nuclear waste. (Their boss, the Department of Energy (DOE) is responsible for the bomb related hazards which in many ways are even greater.)

The primary sources of non-defense nuclear waste are the aging fleet of nuclear power reactors and their spent fuel rods as well as nuclear isotopes used commercially in medicine, sterilization and instrumentation. In the 1960's the Atomic Energy Commission (AEC) was tasked with finding safe deep geologic storage for the growing high-level radioactive waste piling up across the country. 'Geologic' was defined as deep underground storage in stable formations removed from earthquake zones and critical aquifers.

I have a 1973 AEC memo describing their work to find a site in Kansas. Since then, through a combination of bureaucratic foot dragging, regional pushback and political stalemate, the AEC, NRC, DOE and Congress have all failed to create and operate a geologic storage site. In the meantime, nuclear waste piles up on-site in above ground casks at reactors and other facilities - near population centers where it was never envisioned to be allowed. As the nation's nuclear fleet ages out and decommissioning takes place at sites across the country, the pressure for disposal mounts rapidly. A massive amount of money is available to dispose of this high-level waste quickly.



(Photo: Typical onsite storage of spent nuclear fuel – Google Maps)

In contrast, Low-Level Radioactive Waste (LLRW in bureaucratic code) – is ranked in three categories – A, B and C – according to the intensity and type of radiation. It is currently disposed of in one of four shallow burial sites in South Carolina, Utah, Washington and the Andrews County, Texas, site of [Waste Control Specialists \(WCS\)](#).

Under an agreement with the NRC, states assume responsibility for low-level waste sites after closure – after the company and its owners have made all the money for accepting the waste in the first place and have long left the arena. Sounds like more corporate socialism: “Private Profit, Public Clean-Up!”

WCS began in 1989 as a landfill operator under the ownership of billionaire Harold Simmons - who became a major Rick Perry supporter. In 2009 WCS gained state approval under TCEQ to accept LLRW Types A, B and C and bury it west of Andrews – right on the New Mexico border. The burial technology boasts a seven-foot earthen liner including a foot of reinforced concrete. Wow – that will last for geologic time!



(Photo: Google Maps: WCS site in Andrews County)

Low-level wastes – often described as ‘gloves and booties’ - arrive from across the country for burial in casks ‘stabilized’ by dirt.

Harold Simmons died in 2013 and his successors developed a much more ambitious plan. Recognizing the NRC and DOE failure to provide for burial of high-level waste underground, they approached TCEQ in 2015 about the possibility of taking on high-level waste. This would be a massively lucrative business as nuclear waste is piling up across the country at both operating and decommissioned sites. In this dangerous situation, industry would pay dearly to be rid of it.

In January 2018, [J.F. Leman acquired WCS](#) and quickly formed a joint venture with [Orano USA](#) who specializes in – among other things – decommissioning nuclear plants. They needed a ready outlet for their high-level waste - GTCC in industry code, meaning “Greater Than Class C”. Transuranic nuclear fuel waste is also part of this. Orano USA is part of the French-based [Orano Group](#), specializing in the nuclear fuel cycle worldwide.

For Rick Perry - now Secretary of Energy - it’s a perfect way to help friends - and solve a generations long problem at the DOE: How to get rid of this stuff.

All you have to do is make a few rules changes and highly radioactive waste could be reclassified as suitable for storage in shallow graves on the High Plains of the Texas Panhandle. TCEQ could manage it – they’ve always been good at helping industry.

If you think it can’t happen in Texas, look at what happened to New York State in the 60’s when an industry consortium formed to process spent nuclear fuel in West Valley just south of Buffalo. Then necessary environmental safeguards were enacted – and industry bailed. That failed legacy constitutes a significant portion of high-level radioactive waste still looking for a home over 35 years later. This narrative by the [West Valley Citizen Task Force](#) details the problems they continue to face.

Don’t let it move to the Panhandle. Don’t hand this to TCEQ!

Fighting this outrage produced some strong alliances. Environmentalists, oil and gas drillers and Governor Abbott all have a dog in this fight:

[Environmentalists](#) to protect Texas from massive radioactive contamination, both at the site and potentially along the many rail and highway paths that lead to it and the watersheds and aquifers that lead from it.

[Oil and gas drillers](#) fear possible contamination in the region where they are so active, both in water and soil contamination and risks of advanced fracking around the waste site.

[Governor Abbott](#) opposes the plan and wants a say in the matter - defending Texas from being the soft target of the nuclear industry's need for disposal.

[NRC held a hearing in Austin on August 27th](#) to explain how they would create a process for making the revised rules. It began with identifying 17 high level waste streams and deciding that 15 of them could be suitable for 'near-surface storage' - 30 meters or about 100 feet deep. You can see the presentation at the link above, or download the entire report [Disposal of Greater-than-Class C \(GTCC\) and Transuranic Waste, Docket NRC-2017-0081](#).

They did not, however, tip their hand on what these proposed new rules would actually say.



(Cardelia Maupin, Sr. Project Manager at NRC Hearing, Austin. Photo Al Braden)

Table 3-3 GTCC Waste Streams Sorted by Concentration of TRU Radionuclides

Waste Streams	Waste Stream	Volume (m ³)	Waste Type	Contact (CH) or Remote (RH) Handled	TRU Concentrations ¹ [half-lives > 5 years] (nCi/g)
Waste Streams with TRU radionuclides equal to or less than 100,000 nCi/g					
Sealed Sources – Small	sealed sources	1,800	GTCC	CH	85,900 (Am-241:54%, Pu-238: 43%)
WVDP Decontamination	other waste	540	GTCC-like	RH	13,300 (Am-241: 41%)
Waste Streams with TRU radionuclides equal to or less than 10,000 nCi/g					
Exhumation – SDA-SNAP	other waste	1,200	GTCC Potential	CH	9,600 (Pu-238: 100%)
WVDP Decommissioning	other waste	220	GTCC-like Potential	CH	6,700 (Am-241: 52%)
WVDP Decontamination	other waste	710	GTCC-like	CH	5,700 (Am-241: 60%)
WVDP Decommissioning	other waste	760	GTCC-like Potential	RH	3,500 (Am-241: 53%)
WVDP Exhumation – NDA	activated metals	210	GTCC Potential	RH	3,200 (Am-241: 57%)
Pu-238 Production	other waste	260	GTCC-like Potential	RH	1,900 (Pu-238: 99%)
Waste Streams with TRU radionuclides equal to or less than 1,000 nCi/g					
WVDP Exhumation – NDA	other waste	1,900	GTCC Potential	RH	530 (Am-241: 56%)
Exhumation – SDA	other waste	400	GTCC Potential	CH	310 (Pu-238: 70%)
Mo-99 Production – MURR	other waste	35	GTCC Potential	RH	300 (Pu-239: 100%)
Pu-238 Production	other waste	120	GTCC-like Potential	CH	160 (Pu-239: 37%, Am-241: 32%)
Mo-99 Production – MIPS	other waste	355	GTCC Potential	RH	150 (Pu-239: 97%)
Waste Streams with TRU radionuclides equal to or less than 100 nCi/g					
Exhumation – SDA	activated metals	525	GTCC Potential	RH	24 (Pu-238: 45%)
Reactors	activated metals	880	GTCC	RH	3
Reactors	activated metals	370	GTCC Potential	RH	3
Sealed Sources – Large	sealed sources	1,000	GTCC	CH	0

¹ Concentrations of TRU based on DOE 2016 except for reactors that is based on McCartin et al 2018 due to discrepancies in DOE 2016 for deriving values for that waste stream.

(Chart: NRC Report Disposal of Greater-than-Class C (GTCC) and Transuranic Waste, NRC-2017-0081)

Many citizens pushed back strongly, led by Karen Hadden and Smitty Smith – long time advocates against nuclear pollution of Texas. [Here on video, are many citizen comments.](#)



(Karen Hadden at NRC hearing in Austin, August 27th. Photo Al Braden)

NRC's strawman argument for 'safety' seemed to hinge on the concept of an individual 'inadvertent intruder' who might move to the area and homestead on the site after the '100 years of institutional control' had elapsed and perhaps another 500 years had passed.

They modeled two scenarios:

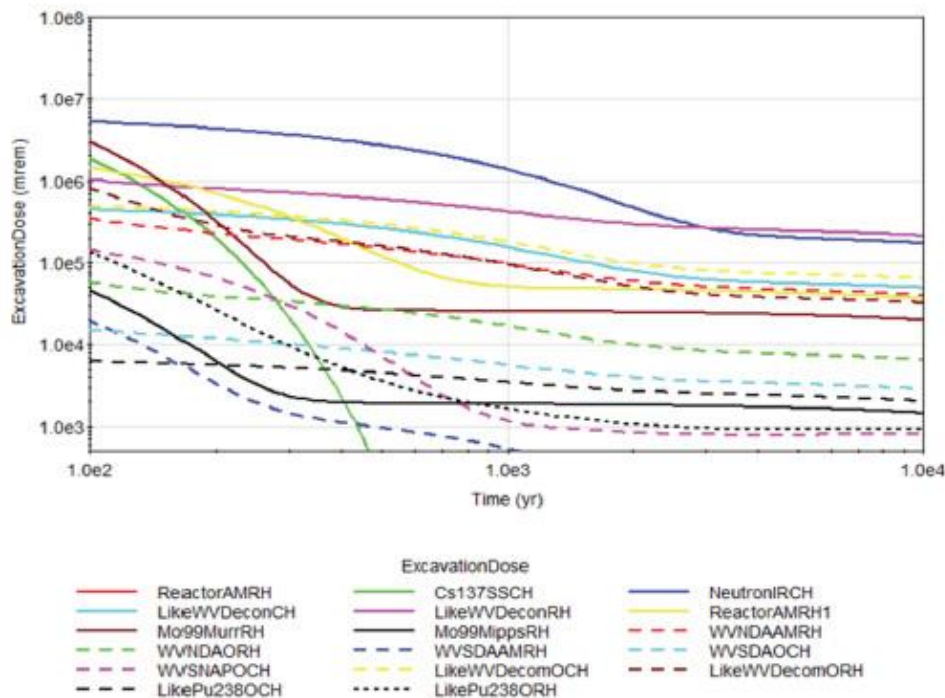


Figure B-1 Doses to an Inadvertent Intruder from the Excavation Exposure Scenario

(Chart: from NRC Report Disposal of Greater-than-Class C (GTCC) and Transuranic Waste, NRC-2017-0081)

Example one - the homesteader contacts the waste by digging a cellar for his house. (Actually, Texans rarely dig cellars.)

Problem solved, they said.

Make a cement cover that will last 500 years and cover it with 5 meters of dirt. He'll never dig a cellar that deep.

Note that the midpoint of the graph is 1,000 years and the right side is 10,000 years. The site is still highly radioactive 10,000 years or 500 generations later. Using a 500-year timeline is irresponsible given the data.

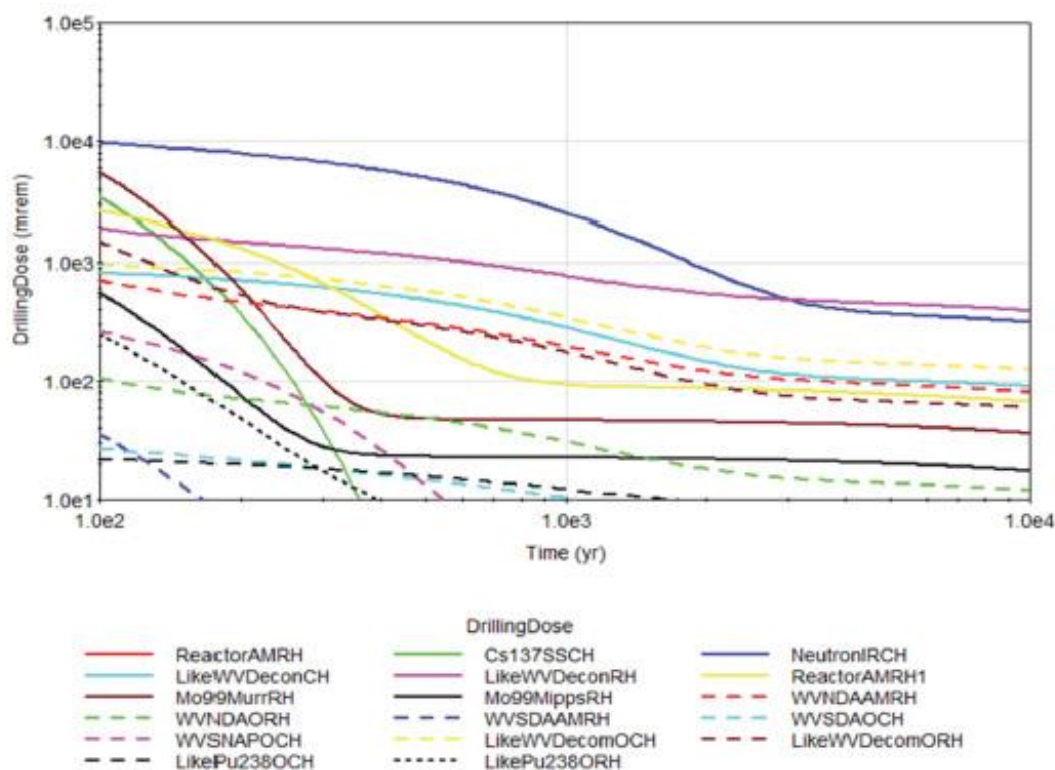


Figure B-2 Doses to an Inadvertent Intruder from the Well Drilling Exposure Scenario

Secondly – suppose he drills a well for water – or oil – as is common in this area. He might puncture one of the containers and be exposed to its radioactive contents. Their solutions included:

- increase the allowable radiation exposure by a factor of twenty, from 25 to 500 millirems,
- suppose that the amount of time he was actually drilling was the extent of his exposure – not the time living by the well and drinking from it, and

- c.) suppose that the containers would be only one layer deep so he would only contact one container – in direct contradiction of piling many layers – maybe 100 feet deep in the current practice.

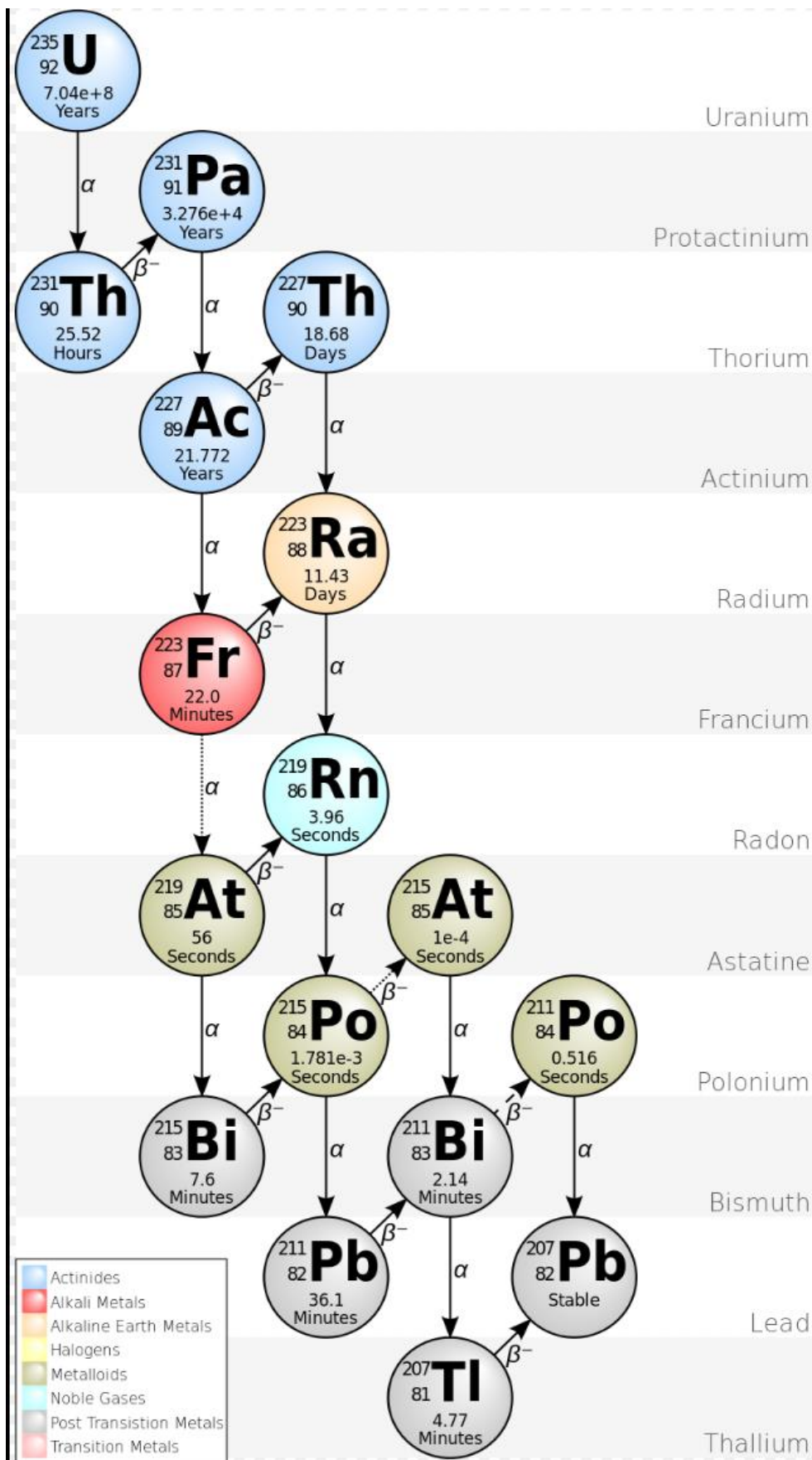
Laughable as these models are – they completely ignore the fact that the half-life of the three highest quantity transuranic nuclear isotopes of concern – in their own data - are as follows:

<u>Waste isotope</u>	<u>Half-Life</u>	<u>Decays to</u>	<u>Half-life</u>
Plutonium-239	24,110 years	Uranium-235	704,000,000 years
Plutonium-238	87.7 years	Uranium-234	245,500 years
Americium-241	432 years	Neptunium-237	2,140,000 years

Half-life means simply that half of something decays in the measured time. In the next equal time, half of the remaining decays, etc., so the progression is: 50%, 25%, 12.5%, ..., etc.

At the end of three full cycles, over 12.5% of the plutonium-239 is still there - 72,230 years after the end of 'institutional control.' The simple model of three isotopes above is compounded by the mirids of other radioactive isotopes in this toxic mix – each decaying at their own half-lives.

The transuranic isotopes are those with atomic numbers higher than uranium (92), whose decay process ultimately turns into lead-207 – a stable isotope. However, these waste streams include many highly radioactive fission byproducts such as iodine, cesium, strontium, xenon and barium as well as industrial isotopes such as cobalt and iodine who follow their own decay chains and are a significant part of the total radiation released from the site. Wikipedia has a really good refresher – here's one graphic example of the Transuranic isotopes - on this: [Decay Chain](#).



(Wikipedia: Decay Chain)

The idea of a homesteader drilling a well in 500 years is a bit of distraction from the real issue, because the report does show extensive radiation increasingly extending off-site over 10,000 years.

The NRC report ([Disposal of Greater-than-Class C \(GTCC\) and Transuranic Waste, Docket NRC-2017-0081](#)) acknowledges this greater problem: The general breakdown of the site over time.

A person off-site is under low risk during the “100-year institutional control period” but as the site is overtaken by natural elements: rain, wind, erosion, rusting of containers, burrowing of animals, buildup of heat and gases in the containers, aquifer contamination, possible open exposure of the material – the situation off-site begins to deteriorate.

Consider that the WCS site is on the Texas High Plains - draining to the west directly into the Pecos River watershed. Just a couple miles east, the plain drops into the headwaters of the Colorado River – feeding directly to Austin. As winds, storms and erosion begin to expose the decaying radioactive material – remember the half-life rule has a very long tail - much of the waste is still radioactive and dangerous. Contamination to the Pecos River and potentially the Colorado River begins – and continues for millions of years.

This is precisely why this waste has always been understood as requiring deep underground storage where it could never re-enter the watersheds, aquifers, soil and air.



(Google Maps: WCS and surrounding area in on the New Mexico Texas border.)

The region - pockmarked with oil wells - is one of the most drilled places on Earth. It lies directly over the Oglaala Aquifer – or next to the aquifer if your maps were influenced by WCS.

What happens as these oil wells – 100 or more years from now – begin to become rusty conduits for radioactive waste migrating into the aquifer and water supply of future Texans try to live and work these lands?

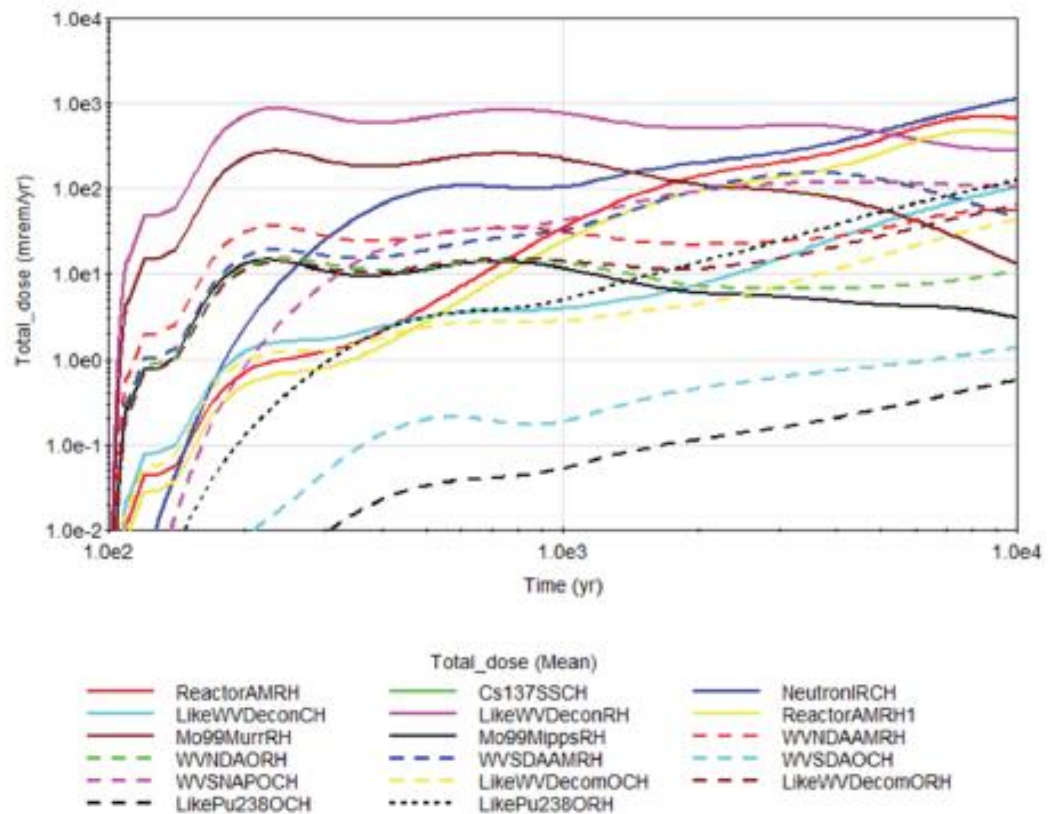


Figure B-5 Mean Dose Result for Each GTCC Waste Stream

(Chart: NRC Report Disposal of Greater-than-Class C (GTCC) and Transuranic Waste, NRC-2017-0081)

NRC's own charts show the problem off-site getting worse over time as the shallow disposal site begins to break down and natural processes spread its toxic radiation over wider and wider areas - well beyond the 10,000 years plotted here.

The Chernobyl I am describing is not from one massive mistake as happened at one nuclear plant in Russia.

What I am describing is from the thousand times greater mistake of government sanctioned rulemaking that could result in burying all of the dangerous high-level nuclear waste of America's entire nuclear power legacy on the High Plains of Texas in shallow graves – and believing that somehow that will work out OK!

Really NRC! You are modeling some settler in 500 years digging a cellar hole?

I am concerned about the massive contamination of Texas – channeled through the Pecos/Rio Grande/Rio Bravo and Colorado River watersheds – spilling radioactive waste over the whole core of Texas for 10,000++++ years. I am concerned about aquifer contamination as containers break down and wastes seep into this fracked Texas/New Mexico landscape. I am concerned about a vast area of Texas being contaminated by windborne dust after the site breaks down over time.

The individual settler is the least of my concern!

That is a legacy we cannot accept.

We must demand that you stop your rulemaking exercise and stand up for our future. There are no rules that make the physics ok. There are no rules that make near-surface storage of GTCC and Transuranic waste any more than an environmental disaster. Denial of science does not make it go away.

We know from Gault and Folsom that humans have made their homes here for more than 10,000 years. It is unconscionable that we – possessed with the greatest riches, resources and knowledge of any civilization ever on this planet – do not plan as far ahead!

500-year planning is a sham when dealing with GTCC and Transuranic wastes that are toxic and radioactive for millions of years. It all belongs very deep underground. Rulemaking can't change that.

10,000 years – 500 generations - is a minimum planning horizon – but really – NEVER is the answer!

Never in Andrews!

Never in Texas!

Never on our watch!

Make your views known to the Nuclear Regulatory Commission now!

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September 3, 2019

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