1222 Bayard Avenue
Murfreesboro, TN 37130
July 17, 2007

Joyce Dunlap
TN Department of Environment and Conservation
8th Floor, L & C Tower
401 Church Street
Nashville, TN 37243

Dear Members of the Solid Waste Advisory Committee:

We live in the Hamptons Subdivision off Osborne Lane, approximately three miles south of the Middle Point Landfill. Our next door neighbors' house recently "sold," but the buyers backed out the day before closing. The reason? The news of radioactive dumping at Middle Point had just broken. The buyers decided the Hamptons is too close to the landfill for comfort.

Even worse, my elderly parents live on our ancestral family farm directly across the Stones River from the landfill. This property has been in our family for 150 years. One year before BFI acquired the property across the river, my parents built a very nice 4,000 square foot colonial home on the hill where the old home place had stood. Today that hideous mountain of filth, stench, and potential danger is in their back yard. My eighty-year-old parents are both saddened and angry at the situation. We all fear for the future of our small grandson who spends many days on the farm. People in positions of trust, sworn to protect and uphold our rights, have grievously betrayed us.

Someone should be held accountable for the unconscionable degradation of this beautiful farm. No level of government should have the right to authorize dumping of any kind, let alone radioactive waste, in a heavily populated area. Shame on all levels of government and the corporate greed which has so clouded our legacy. If the claim that the toxic soup at Middle Point is and will continue to be harmless proves true, wonderful. But that does not ease the current common-sense worry, the stench, the disgusting sight from our back door, and the devaluation of our property. Would any member of your committee wish to purchase a beautiful 78-acre farm on the banks of the Stones River in the shadow of this mountain?

Developers continue to build in the area and homes are being sold. No doubt home sales will be compromised by the newest disclosures as in the case of our neighbors. People who choose to locate in the area now do so knowingly. But what about us old timers with family farms? Who will accept accountability and offer restitution for the devaluation of our property? Who can we contact for resolution? Do other neighbors have a similar complaint? We will be pursuing these questions. Please be big enough to address this issue honestly as if your own family farm was at stake. If accountability is not soon established regarding waste disposal in this country, tomorrow it could be your property.

Sincerely,

Edward Pitts

Edward Pitts

Joyce Dunlap

From: "Mary Miller" <Stonesfan01@comcast.net>
To: <Joyce.Dunlap@state.tn.us>
Date: 7/16/2007 10:45 PM

If they are dumping radio active material....why is there even any questions that have to be asked. It has to stop. Are the people in charge in this county so ignorant that they cannot figure that out? God help us if we need to debate this!

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Solid Waste Advisory Committee
Written Comment Submission Form

Bulk Survey for Release (BSFR)
Community Meeting

July 17, 1007

Julian R. Fleming Center
Murfreesboro, TN

[Note: for clarity, please print all entries]

Name: TERRI HOGAN

Address 1: 1606 CYPRESS DRIVE

Address 2:

City: MURFREESBORO

State: TN

Zip: 37130

e-mail (optional): tbear1@bellsouth.net

Comment: THIS SHOULD NEVER HAVE BEEN DECIDED WITHOUT INFORMING THE LOCAL CITIZENRY. THAT RADIOACTIVE WASTE WAS DUMPED WITHOUT THE KNOWLEDGE OF THE LOCAL RESIDENTS MAKES ANYTHING STATED BY BFI, TDEC, AND OUR LOCAL GOVERNMENT HIGHLY SUSPECT. HOW CAN WE BELIEVE ANYTHING WE ARE TOLD AT THIS POINT. IS THERE ANY TRULY SAFE EXPOSURE DOSAGE OVER A LIFETIME? THERE IS SO MUCH THAT WE DO NOT KNOW. HAVING A LANDFILL ~~BY~~ UPSTREAM FROM OUR DRINKING WATER IS UNACCEPTABLE UNDER ANY CIRCUMSTANCE.

000003

Many of the states in the 34 NIRS agreement states you speak of, have strict laws which cannot allow for radioactive waste in landfills. Which other of these 34 states, by name, receive nuclear waste from decommissioned nuclear plants to municipal landfills?

Betsy Allgood

[redacted]

betsy@allgoodsystems.com

QUESTIONS: RADIOACTIVE MATERIALS MIDDLE POINT RECEIVES

We have asked TDEC for complete disclosure of the companies involved in producing radioactive trash. This includes the originating source, the materials involved, and the measurement of radioactivity. You have cited TN privacy act to keep the records confidential. ENDIT asks again, will you please disclose the originating sources, materials, and measurements of radioactivity coming into our landfills?

Which additional companies (other than IMPACt and Toxco) have dumped radioactive waste at Middle Point?

How many tritium containing "Exit" signs have been disposed of in the landfill? Which Companies have disposed of them?

TDEC has said that it is common practice for other states to accept LLRW into municipal landfills as TN does, implying that these states too accept radioactive waste from decommissioned nuclear plants. Many of the 34 NRC agreement states that you cite have laws prohibiting this practice. Please list the other landfills, outside TN, that accept LLRW from decommissioned power plants as TN does. Do not include Barnwell, Clive, or Hanford.

In fact WA State has its own facility at Hanford – why would Washington haul radioactive waste to TN instead of to Hanford? There are a lot of states in between CA/WA and TN – was there no other option for dumping the material in one of these states other than hauling soil/concrete all the way to TN?

When has the NRC physically inspected Middle Point? And what are the results from the inspection.

Do you know why CA has made it illegal to dispose of LLRW in municipal landfills?

Because Barnwell is closing in 2008 to outside compact states, TN & 35 other states will have no facility available for disposal of higher level radioactive waste after 2008. Since TN has so many radioactive processing companies, including Energy Solutions, one of the largest in the nation, what are the long term plans for disposal of higher level radioactive waste in TN after 2008? Are there plans to build a landfill or any other facility to dispose of or store Class A, B, and/or C radioactive waste? Energy Solutions owns world-wide companies. Europe produces lots of radioactive waste, and they don't know what to do with it either. Is TN planning to bring in radioactive waste from other countries?

Betsy Allgood
betsy@allgoodsystems.com

QUESTIONS: OTHER MATERIALS MIDDLE POINT RECEIVES

Is Middle Point Accepting Medical Waste? If so, please provide companies, items, and amount.

Is Middle Point accepting Biohazards? If so, please provide companies, items, and amounts.

Is Middle Point Accepting Hazardous or Toxic Waste? If so, please provide companies, items, and amounts.

Is Middle Point accepting tires? If so, please provide companies, items, and amounts.

Is AEDC is bringing "Special Waste" to Middle Point? If so what is it bringing?

From where is Middle Point still accepting sewer sludge, treated or untreated?

When do you plan on increasing the 1 millirem measurement? And what will be the maximum limit to TN municipal landfills? How will the public know if you increase the millirem?

When will you infer this BSFR program to additional TN landfills? (Or Increase the scope beyond the current 5 landfills ?)

Solid Waste Advisory Committee
Written Comment Submission Form

Bulk Survey for Release (BSFR)
Community Meeting

July 17, 1007

Julian R. Fleming Center
Murfreesboro, TN

[Note: for clarity, please print all entries]

Name: GENE OSEKowsky

Address 1: 2223 HOLLOW TREE WAY

Address 2:

City: MURFREESBORO

State: TN

Zip: 37128

e-mail (optional): PBS GENE @ COMCAST.NET

Comment:

#1 IF OUR DULY ELECTED REPRESENTATIVES CANT PROTECT THE LIFE AND WELFAIRE OF ITS CITIZENS, THEN ITS TIME FOR A NEW FORM OF GOVERNMENT

PERHAPS THE "LEAGUE OF THE SOUTH" WOULD DO A BETTER JOB!

#2 THE ORIGINAL SIGNATORY OF THE BFI (MAFIA) AND LOCAL RUTHERFORD CTY REPS NEED TO BE REVEALED

Solid Waste Advisory Committee
Written Comment Submission Form

Bulk Survey for Release (BSFR)
Community Meeting

July 17, 1007

Julian R. Fleming Center
Murfreesboro, TN

[Note: for clarity, please print all entries]

Name: Kathleen Ferris

Address 1: 3210 E. Compton Rd.

Address 2:

City: M'boro

State: TN

Zip: 37130

e-mail (optional):

Comment: enclosed

000009

My name is Kathleen Ferris, and I am one of the co-founders of Citizens to End Nuclear Dumping in Tennessee, also known as ENDIT.

One of our main concerns is the manner in which the BSFR program has been enshrouded in secrecy from the beginning. We want to know, precisely what materials are going into our landfill, and where they did they originate? And we want to know, what was put into Middle Point Landfill before the BSFR program was instituted? Why should information from firms that have long since been closed (Quadrex and American Ecology Recycle Center) be considered proprietary?

From our vantage point, it appears that TDEC made a secret deals with BFI/Allied Waste and with the nuclear processing corporations to impose this program on the people of Tennessee without our knowledge.

One of my questions is, what public hearings were conducted in Rutherford County (or elsewhere?) BEFORE the BSFR program was instituted? If so, where and when were such hearings conducted? How much public notice was given? How was it advertised?

And who, by name and office, was responsible for approving this program which allows dumping of radioactive waste in municipal landfills which were never intended for such use?

After the BSFR program was adopted, what notification was given in writing to our state legislators, to our Rutherford County Mayor, and to our County Commissioners to indicate that the state would be accepting radioactive waste produced out-of-state, and would be placing that waste in our municipal landfill? Or that radioactive waste would be taken from Oak Ridge and transported to Middle Point Landfill?

Nobody in TDEC mentions money, but the state of Tennessee is taking in large amounts of money from the BSFR program. So is Rutherford County. How much per ton is the state paid? The county? How much does that total per year, for each?

When hearings were held in 2006 to consider the expansion of Middle Point Landfill, the citizens were told that no toxic dumping would take place at Middle Point. Was any mention made of the very low level radioactive waste that was being dumped, or that it had been dumped there for at least 10 years?

We are curious about the name of this program BSFR. (When we first heard it, we thought it stood for BS for Rutherford.) Why wasn't the word "nuclear" or "radioactive" included to describe more accurately what this program does? Likewise, why is the term "special waste" used to indicate radioactive waste? Doesn't this sound like a further attempt at keeping the real nature of what is happening from public attention?

In response to our questions about what materials specifically are going into Middle Point Landfill, Mr. Paul Sloan quoted T.C.A. 68-202-217. This law says that information supplied to TDEC is defined as proprietary and is confidential. Who is responsible for this Tennessee law that protects the polluters instead of the people? Did BFI write the laws?

Why does this law supersede the Tennessee Open Records Law? What is so secretive that it must be protected? When things are considered "for official use only", as the news of the spill of highly activated uraniumin Oak Ridge was last year, it makes us think that something bad is being hidden.

The first section of Tennessee's Sunshine Law, TCA 8-44-101, reads:

"The general assembly hereby declares it to be the policy of this state that the formation of public policy and decisions is public business and shall not be conducted in secret."

We think the spirit of that law should be applied to information which affects the public health.

The Tennessee Constitution has for its opening section:

"That all power is inherent in the people, and all free governments are founded on their authority, and instituted for their peace, safety and happiness. . . ."

We want TDEC and the SWAC to observe the Constitution.

Joyce Dunlap - SWM
Chuck H. - 7-17-07

Toxco

Toxco Materials Management Center (TMMC)
109 Flint Road, Oak Ridge, TN 37830
Phone: 865-482-553 Fax: 865-482-5605

RECEIVED
JUL 17 2007
TENNESSEE DEPARTMENT OF ENVIRONMENT & CONSERVATION

July 11, 2007

Chuck Head
401 Church St.
Nashville, TN 37243-0435

Mr. Head:

Toxco Inc. is one of four waste processors in the State of Tennessee authorized to utilize the Bulk Survey For Release (BSFR) Program approved under the regulatory authority of the Tennessee Division of Radiological Health. You are currently being inundated with large amounts of technical and emotional information regarding the BSFR Program from many different sectors. You must digest this information and make a recommendation concerning the Program in less than sixty days. We do not envy you for having this assignment and therefore will not present you with all of that information in this letter.

Typically information and voices from the "Anti" groups are the loudest you will hear as they are nationally organized against a particular cause. The voices of the silent majority seem never to be heard as loud as the "Anti" voices. This letter is being sent to you to express Toxco's support of the BSFR Program, the Tennessee Division of Radiological Health (TDRH), and the technical, scientific, and factual information TDRH is presenting to you. With the BSFR Program TDRH and the State of Tennessee has "stepped up" as a leader to establish a conservative and safe program for disposal of very low level radioactive waste. The BSFR program is a more conservative model of an approved United States Nuclear Regulatory Commission (NRC) program under which the NRC authorizes disposal of specifically defined very low level radioactive waste at municipal type landfills as requested.

Not all radioactive materials are the same nor do they all present the same hazards to the public and our environment. Groups who are Anti-nuclear have routinely presented all radioactive waste materials to be of an equal hazard which is not the case. The types of materials processed under the BSFR Program have been approved for disposal in municipal landfills by the United States NRC for years. Fact is that the BSFR program is much more restrictive than the NRC disposal program. To our knowledge, there is no evidence or proof that the type of material authorized for disposal under the BSFR program has been directly linked to any illness or environmental insult at the disposal facilities authorized to receive the BSFR material.

Emotions, dramatic media presentations, misinformation, derogatory clichés, biased information, fear, scientific facts, and data specific to the BSFR type materials will all be at your disposal when you participate in making the committee's recommendation. Toxco asks that you analyze the BSFR program based upon tested science and factual information relating to the **specific characterization of materials** that are allowed under the BSFR Program.

Toxco hopes that your consideration of the information will result in a recommendation to continue the BSFR program as a fundamentally sound disposal option allowed under Federal and State statutes. The BSFR program is not a "loophole" as it is a program that is regulatory approved and more restrictive than the program used by the NRC under which many states have allowed disposal of more activated material.

Sincerely,

David S. Eaker
Vice President, Metals
Toxco Inc.

TN DEPARTMENT OF ENVIRONMENT & CONSERVATION
JUL 13 2007
BUREAU OF ENVIRONMENT

Wayne Brashear - Fwd: Letter to Solid Waste Advisory Board--MURFREESBORO

From: Alan Leiserson
To: Brashear, Wayne
Date: 7/17/2007 11:08 AM
Subject: Fwd: Letter to Solid Waste Advisory Board--MURFREESBORO
Attachments: Letter to Solid Waste Advisory Board--MURFREESBORO

BURNT

17 July 2007

Deputy Commissioner Paul Sloan
Tennessee Department of Environment and Conservation *via e-mail*

RE: Guidelines for Radioactive Materials at Middlepoint Landfill

Dear Commissioner Sloan:

Please find in attached file our two page letter sent to members of the Solid Waste Advisory Committee. Our primary conclusions--

1. This is a solid waste problem not a problem of how much low level, background radiation is in the environment.

2. Tennessee must eliminate much of the waste stream from landfills. We need to have businesses which make profits from raw materials and composting food and yard waste rather than landfill this material in regional landfills like Middlepoint.

3. From New Johnsonville to Dickson County to Murfreesboro, Tennessee has a severe landfill problem which means we have severe water problems.

4. The apparent 'indpendent consultant' to the committee has a serious conflict of interest in professional work in this industry which disqualifies her. The Solid Waste group needs an indpendent consultant who knows landfills, shipping procedures for this waste, and quantities of this material which is landfilled in other states and landfills .

5. It is very siginificant that Middlepoint tests on leachate exceeded EPA Standards for Alpha and Beta emisisons in drinking water.

6. Tennessee should not accept this waste at all. We are placing at risk landfills at higher risk.

Bruce Wood
615-327-8515

BURNT

IMPROVING THE ENVIRONMENT THROUGH
CITIZEN INVOLVEMENT WITH GOVERNMENT,
BUSINESS, AND ACADEMIA

14 July 2007

Mr. Lewis D. Bumpus, Chair
Municipal Solid Waste Advisory Committee
Williamson County Solid Waste Director
5750 Pinewood Road
Franklin, Tennessee 37064

RE: Guidelines for Landfilling Radioactive Waste at Middlepoint

Dear Chairman Bumpus:

We appreciate the opportunity to comment. Middlepoint Landfill in Rutherford County is a particular threat with a river which is a source of drinking water running through the landfill. There is a 50 foot buffer between the landfill and the river. The underlying karst geology allows migration of groundwater pollution, which is a state wide landfill problem.

The TDEC presentation on the safety of this waste has a crucial weakness–it relies on the ability and understanding of humans handling vast quantities of radioactive waste which must be disposed somehow, somewhere. There are very few reliable, outside checkpoints. Facts are not clear on procedures for handling radioactive waste, shipping, the nature of the radioactive waste, and which landfills across the country accept this waste.

1. This Committee Needs Additional Expert Advice on Landfills

TDEC presented an optimistic view of the benign nature of this waste without considering that Tennessee landfills are usually located on karst geology with caves and caverns which allows migration of pollution. At Middlepoint, a major source of drinking water has a 50 foot buffer. Middlepoint will be a catastrophic water problem. More than 15% of all Tennessee waste is landfilled at Middlepoint–why add loosely controlled radioactive waste?

2. Is methane gas burned or vented at Middlepoint?

Apparently, methane gas is burned/processed at Middlepoint. Municipal landfills create a brew of propane, ethane, methane, and butane gasses which may make processing 'methane' gas may be unsafe. If 'methane' gas is vented or burned, ths may inject radioactive particulate matter into the atmosphere. What regulates venting or burning radioactive particulates?

3. Require Accurate Records Which Track Waste Back to Generators

Middlepoint was recently expanded with no consideration of years of radioactive waste disposal This decision to expand should be reopened. There does not seem to be clear records available

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NASHVILLE, TENNESSEE 37212
615. 327. 8515

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burnt.tn@ gmail.com

A Member Of
Community Shares

about the source, nature of waste, and amount of radioactive waste landfilled at Murfreesboro. The amount of money charged to dispose of the waste–the tip fee–is not public. BURNT strongly urges this Committee to demand public reports of all waste from each generator.

4. Shipping & Tracking Procedures Create Huge Loopholes in Safety

Present shipping and tracking radioactive waste is apparently the responsibility of for profit corporations who dispose of large quantities of radioactive waste of varying degrees of contamination. Human error and deliberate violations are possible. Higher contaminated radioactive waste may be buried within larger shipments of more benign waste to escape measurements which are taken only outside of the shipping container. State of Tennessee shipping protocols should require waste to arrive in Murfreesboro packaged by the generating source in sealed containers which only contain the same type of waste–construction waste, clothing, metal, and so on to prevent mixing of waste to camouflage more contaminated material.

5. TDEC Represents This Waste Is Routinely Landfilled Across the Nation

Why are massive shipments coming to Tennessee from California and Washington State if so many states landfill this material? TDEC should list all states and facilities and amount landfilled at each. According to DOE, **Tennessee has seven (7) sites**-- BFI/Allied Middle Point, Rutherford County (Tn.), BFI Carter Valley, Hawkinss County, (Tn.), BFI North Shelby, Shelby County (Tn.), BFI South Shelby, Shelby County, (Tn.), Chestnut Ridge Landfill & Recycling Center, Anderson County (Tn.), **Three (3) other sites**: BFI Pine Avenue (NY), BFI Conestoga Landfill, (Pa), and Grows Landfill, (Pa).

6. California Professor Disputes Tennessee Interpretation of Test Results

Tennessee has never tested air, water, or landfill dirt for radioactivity in 20 years of allowing such landfilling. The first test at Middlepoint revealed Gross Alpha radiation more than five times the EPA drinking water level and Gross Beta radiation as 66 times higher than EPA allows. Dan Hirsch, a Professor of Nuclear Policy termed the Alpha B radiation readings from leachate at Middlepoint as '...just astronomical..." [transcript, Channel 4 News story] A State of Tennessee Health Physicist said results were not a problem [enclosed] Middlepoint results far exceeded results from a Crossville landfill which does not accept radioactive materials.

Conclusion

RECOMMENDATIONS: No landfill which exceeds EPA Standards for Gross Alpha Radiation or Gross Beta Radiation should be allowed to accept any radioactive waste. State expert opinions about benign nature of this waste are irrelevant because of human error and mistakes in any for profit business. Shipping requirements, testing procedures, and records are part of a sloppy system. Landfills leak. Burning/venting of 'methane' gas [actually methane, propane, ethane, and butane gasses] propels radioactive particulates into the atmosphere. Our present policies do not protect the waters of the state or the people. This panel has the responsibility to fix this.

Thank you

Bruce Wood
BURNT
615-327-8515

Joyce Dunlap - Middle Point Landfill

From: "The Boerger's" <Boerger@Bellsouth.net>
To: <Joyce.Dunlap@state.tn.us>
Date: 7/18/2007 7:38 AM
Subject: Middle Point Landfill

I have one question that I would like to be added to the decision making process to end radioactive dumping in Walter Hill.

If what the landfill receives from out of state is so safe, why can it not be dumped in the state of origination?

I do not expect a direct reply. However, the answer should have nothing to do with money as money is not the answer that will suffice.

Andrea Boerger
102 Kindred Cove
Murfreesboro, TN 37129

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Joyce Dunlap - Middle Point Landfill

From: "Lindy" <giggynboro@comcast.net>
To: <Joyce.Dunlap@state.tn.us>
Date: 7/18/2007 11:14 PM
Subject: Middle Point Landfill

Dear Ms. Dunlap:

I live in the Hawksridge subdivision that is probably within five miles of the Middle Point landfill. I purchased my house in 1997. From my upstairs window in the room in which I am composing this message, I have watched the mountain of shame grow from one that initially could not be seen to one in which I can see the lights of the trucks make their way up the hill.

The people of this neighborhood as many others have suffered with the stench over the years. For much of the season when we should be able to enjoy our yards, the smell has kept us inside. The smell has been so bad at times that the odor has detected inside my home with all the doors and windows closed. At first, I called the gas company thinking there was a gas leak. The technician told me that I was smelling the landfill and they had received many calls regarding it. If you came to my neighborhood right now, you would not smell the odor. That is because since the nuclear waste issue has come to light, the odor has ironically improved. The same thing happened about two years ago when the landfill asked for expansion. The odor was horrific. Calls to the landfill authorities produced no noticeable action. Yet after the public hearing, the odor problem improved. They got the expansion and the smell started again soon after.

I know that there is a degree of radioactivity in everything in our environment. What concerns me more than this low level waste is the fact that the landfill sits where it does – so close to the Stones River which is a source of our drinking water. Being exposed to radiation and consuming it are too different things! I believe that the landfill authorities will treat the low level waste in the same manner in which it has treated the odor. When the public is watching will be one story and when the attention has died down, it will be a different story all together.

Something must be done about this landfill and many citizens want it to be closed. We should not be subjected to the waste from other towns let alone other states. Our common sense tells us that if the waste is so safe then why are other states sending the waste here? It simply does not sound reasonable.

Please do not let this continue until there is an environmental disaster here and it is too late.

Sincerely

Lindy Stem

Joyce Dunlap - Danger of Landfill

From: "Mattie" <vossie@isp.com>
To: <Joyce.Dunlap@state.tn.us>
Date: 7/17/2007 9:28 AM
Subject: Danger of Landfill

I am very concerned about the landfill at Walter Hill. It is right on the river where we receive our drinking water. I have lived in this community for 45 years and am very close to the landfill. I cannot believe our officials would let any radioactive materials be dumped there.

Mattie Vosburgh
5706 Jackson Trail
Murfreesboro, Tn 37129

000018

Joyce Dunlap - R'ford County landfills

From: <Jjslate@aol.com>
To: <Joyce.Dunlap@state.tn.us>
Date: 7/15/2007 1:34 PM
Subject: R'ford County landfills

My family and I are residents of M'boro. We do not think we should be accepting materials, hazardous or otherwise, into our county. We should be required to take care of materials that we produce in our county and definitely not accept anything from other areas.

Get a sneak peak of the all-new AOL.com.

Wayne Brashear - Fwd: Questions about Middlepoint radioactive waste

From: Alan Leiserson
To: Brashear, Wayne
Date: 7/20/2007 12:52 PM
Subject: Fwd: Questions about Middlepoint radioactive waste
Attachments: Questions about Middlepoint radioactive waste

BURNT

20 July 2007

RE: Questions about Middlepoint radioactive waste

Hello Ms. Carter--

We spoke a few weeks ago. I appreciate your consideration of the questions below--

1. Apparently Middlepoint leachate tested Gross Alpha radiation more than five times the EPA drinking water level and Gross Beta radiation as 66 times higher than EPA allows. Middlepoint results far exceeded results from a Crossville landfill which does not accept radioactive materials. Please explain why there is not a policy in Tennessee that any landfill which exceeds any radiation limit set by EPA is stopped from accepting this waste.

2. The state argues this low level waste is accepted by many states and many facilities. Please provide a list of facilities in each state with the amount of this waste accepted by each landfill in each state.

3. Apparently, methane gas is burned or processed at Middlepoint. However,

1. landfill gas is NOT only methane--it is a brew of methane, propane, ethane, and butane. Is it safe to burn this mix of gasses?

2. does burning or processing landfill gasses create particulate and if so why would it not create nuclear particulates in light of tests above?

4. How many holes does MIddlepoint have in the liner and what is the rate of leachate leakage? NOTE: testimony at Tuesday hearing about that.

5. The June 2007 TDEC 'Policy' on this waste does not consider obvious operator/human error working with a for-profit corporations. If waste is measured ONLY on the outside of the load at the landfill, what prevents packing hotter waste inside large loads of waste?

6. please provide *T.C.A.* Code governing permission to landfill such wastes as well as regulations governing implementation of the law.

7. at the hearing Tuesday, apparently several elected officials called for reopening the decision to allow expansion of Middlepoint because neither local officials or public knew about the special wastes. What provisions of the Code and Regulations govern reopening a

decision to expand a landfill on this basis?

8. what is the tip fee for this waste? What is total host tip fee received by local governments for municipal solid waste and low level radioactive waste?

I appreciate your efforts. I would like the answers as soon as possible before the next hearing on Tuesday. I understand you may be able to answer some of the questions faster than others in which case I would appreciate those answers as you get them.

Bruce Wood
ph. 244-1188

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Joyce Dunlap - Copy: Support for BSFR

From: "Alfred Brooks" <brooks50@comcast.net>
To: <joyce.dunlap@state.tn.us>
Date: 7/21/2007 9:59 AM
Subject: Copy: Support for BSFR

Dear Governor Bredesen:

I write briefly to state my support for the passage of the Bulk Survey for Release (BSFR) Landfill Disposal program. This problem, the disposal of minimally contaminated radioactive wastes in ordinary landfills, has been thoroughly discussed in Oak Ridge over several years. I have been associated with many of these discussions and I believe that the consensus among knowledgeable people is that the BSFR requirements only allow a level of risk to the public which is extraordinarily low. The risks are comparable to or less than several common exposures: a) normal background levels, b) outcroppings of Chattanooga shale, c) a bunch of bananas and many more. The belief that any additional man-made exposure, however small, should be prohibited, would deny so many benefits of industrial and medical progress as to be draconian in nature.

I shall not review the quantitative analysis of the proposal except to say that is seems to be very conservative and should meet the concerns of all reasonable people. Again the BSFR program has my support.

Sincerely,

Alfred A. Brooks

cc: Joyce Dunlap

Alfred A. Brooks Jr.
100 Wiltshire Drive
Oak Ridge, TN 37830
865 482 1559
Web Sites:
http://home.comcast.net/~brooks50/ or
http://home.comcast.net/~brooks50/PensionPlanInformer.htm

9

000022

Joyce Dunlap - Landfill in Rutherford County

From: Andrea Hale <ahale1973@yahoo.com>
To: <Joyce.Dunlap@state.tn.us>
Date: 7/25/2007 9:10 AM
Subject: Landfill in Rutherford County
CC: <ahale1973@yahoo.com>

Hello! I am 34 years old and have lived in Rutherford County most of my life. I lived in Murfreesboro before the landfill came and I don't know one person that was in favor of it to begin with, much less the bright idea of putting it so close to our water supply. It doesn't take a genius to realize that this was a bad idea, and it doesn't take a genius to realize that despite the best efforts made our water supply is in jeopardy. Now to find out that there is radio-active material being dumped there, and that other states are bringing in their waste is unacceptable. I not only have health concerns for myself, but for my children and family as well. The bottom line is simple.....We don't want radio-active materials to be dumped here, we don't want other states trash to be dumped here, and honestly we don't want the landfill itself. Please shut it down!!!!!!!!!!!!

Thank you for taking the time to view my concerns.

Sincerely,
Andrea Hale

Need a vacation? Get great deals to amazing places on Yahoo! Travel.

From: "DAVID B HALL" <davidbhall@comcast.net>
To: <Joyce.Dunlap@state.tn.us>
Date: 7/25/2007 9:50 AM
Subject: Fears grow over dumping at landfill

You have been sent the following article from DAVID B HALL as a courtesy of dnj.com.

Fears grow over dumping at landfill
http://www.dnj.com/apps/pbcs.dll/article?AID=/20070725/NEWS01/707250342

Comments:
Please see that all SWAC committee members get a copy of this article and comments.

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Fears grow over dumping at landfill

By TURNER HUTCHENS
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— Turner Hutchens, (615) 278-5161

Michelle Smith of Murfreesboro is still very worried about low-level radioactive dumping at the Middle Point Landfill in Rutherford County despite the repeated assurance of state and industry officials.

"I am afraid when my children drink a glass of water," Smith said. "I'm scared for them and their future."

ADVERTISEMENT


Smith was one of about a dozen people to attend a public hearing Tuesday in Nashville to voice their concerns about the dumping of the material in the landfill. The hearing was hosted by the Tennessee Solid Waste Advisory Committee.

The hearing was the second and final for the committee to take comments on Tennessee's Bulk Survey for Release program, which allows the disposal of low-level radioactive waste by private companies in five Tennessee landfills, including Middle Point Landfill on Jefferson Pike in the Walter Hill community.

The landfill is located on the Stones River, the primary source of water for most of Rutherford County.

Under the BSFR program, millions of pounds of low-level radioactive materials have been dumped in the Murfreesboro landfill.

Sammy Jones of Oak Ridge-based Impact Services, one of the companies which processes waste under the BSFR program and disposes of it at Middle Point, said the reason the low-level radioactive waste has been trucked in


submitted ph

Pictured is a Murfreesbor located on J the banks of most of Ruth

Be heard

Written con Joyce.Dunl Tennessee 8th Floor, L The Solid V received by

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from places such as Michigan and California is because it is faster than going through the federal regulatory process, which takes about a year and involves a lot of paperwork.

The trade off is that Tennessee's BSFR program is more restrictive than the federal program, which allows five times as much radiation in the same type of material, Jones said.

Answering concerns that the landfill's plastic liner might break, Jones said the models which are used to decide how much radiation is safe under the program doesn't account for the landfill liner at all.

"It assumes it's not there," he said. "It assumes it will get into the water."

Kathy Ferris, a member of the Rutherford County grass-roots Citizens to End Nuclear Dumping in Tennessee, asked the committee a series of questions on the methods of monitoring the BSFR program, including what state officials are doing to make sure the companies disposing of the waste are maintaining the standards they claim.

"Pardon my distrust, but the people of Rutherford County have been lied to and mislead repeatedly," Ferris said. "So our trust in TDEC (Tennessee Department of Environment and Conservation) is not high right now."

The committee will make recommendations on the program to state officials by Sept. 3 and the dumping at Middle Point in under a moratorium until then.

The BSFR program was brought to the attention of the public and the media in May from a report by the Nuclear Information and Resource Service, an environmental watchdog organization.

The materials being disposed of under the program are not from nuclear reactors themselves, but are mainly construction debris, including parts of outbuildings, dirt and torn-up sidewalks, according to the state's Division of Radiological Health.

Tests of the landfill have returned higher than normal levels of some types of radiation, though state officials have said this could have other sources than the BSFR materials.

Tests of Murfreesboro city water for radioactivity have come back without reason for concerns, and the Consolidated Utility District, which supplies water to much of Rutherford County, is also running tests on its water supply to determine if there are any increased levels of radioactivity.

Rutherford County has commissioned independent testing for Middle Point, not only for radioactive material but for a slew of other organic and inorganic chemicals that might leak from the landfill.

TDEC officials will present their recommendations on the BSFR program to the committee on Aug. 16.

Smith said the best way to end all the debate over what level of radiation is safe and who is monitoring what is to just close the landfill.

"How many other fights are we going to have about this landfill — this eyesore, mountain of crap," she asked.

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STORYCHAT

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Hasnt anyone figured out yet that Tennnessee has sold OUT to other states that have strict laws against this??????????????My beautiful state of Tennessee is ruined now all in the name of MONEY.Do you not think that other states knew that Tennnessee was a back woods state desperate for money,we see all that now,how sad is that that??????????????Nissan spews toxic waste after midnight when no one is awake,but Nissan was a boom to Rutherford County right?????????????All you politicians that call Tenneseee home will suffer too,rivers run far and wide now my state is polluted with toxic waste,how sad

Posted: Wed Jul 25, 2007 9:38 pm

dmw, I was joking, but we need people like you to put your name out there and run if politicians, like the former County Executive, do not care about tomorrow for their citizens.

I get confused about local governments that want to over govern, yet they do not take issues like this radiation problem serious. Reason, they cannot pass a law quickly.

Posted: Wed Jul 25, 2007 4:50 pm

Anyone read about the 32 year old woman who wrote into the local paper last week - she was just diagnosed with breast cancer....lives across the street from Middle Point.

Posted: Wed Jul 25, 2007 3:13 pm

The reason we are tackling the radiation issue only right now is that is the only one the government is 'allowing' us to. If you go to one of the committee meetings you will find out that the members have been told to disregard any comments not relating to BSFR. First we need to end the radioactive dumping then we can attack the toxic dumping. Closing the dump is not the answer. Monitoring who is allowed to dump there (make it local...it is our land let it be our waste) and what we ALL put into our waste baskets is the answer (here is a scary statistic: 22 billion plastic water bottles end up in landfills instead of being recycled) . Furthermore, we need to address the pollution to our water supply now! It may or may not be there already but we need to have systems in place to avoid a disaster.
I am afraid the committee is in TDECs back pocket. The fact that TDEC is overseeing and orchestrating the meetings is a clear indication of this. TDEC is not protecting Rutherford county residents, they are protected their wallets and the wallets of the processors. It all boils down to money, radioactive waste is good for BFI and TDECs wallets.

One final note, here is a little quote from JFK. It still applies today.

"Even then, the number of children and grandchildren with cancer in their

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bones, with leukemia in their blood, or with poison in their lungs might seem statistically small to some, in comparison with natural health hazards. But this is not a natural health hazard--and it is not a statistical issue. The loss of even one human life, or the malformation of even one baby--who may be born long after we are gone--should be of concern to us all. Our children and grandchildren are not merely statistics toward which we can be indifferent."

Posted: Wed Jul 25, 2007 1:40 pm

Opining

I have not heard anyone push for a new dump. Closing this one does make since however we do have to find alternatives for our garbage. One way we could look at is like what Cookeville Tn is doing through a process of garbage seperation. The fact is sooner or latter we will have to pay for something different and doing something sooner only saves us money. The bottom line is people are tired of the lies and deceit. Now that the public officals know that there was lies and deceit coming from landfill owners all along where does that still leave us. Will the public officals allow landfill owners bully them and lie to them as they have shown they are capable of. We will see.

Posted: Wed Jul 25, 2007 1:26 pm

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Joyce Dunlap - Middle Point Landfill

From: <cssheldon@comcast.net>
To: <joyce.dunlap@state.tn.us>
Date: 7/25/2007 5:36 PM
Subject: Middle Point Landfill

I have one question I would like answered. Why do states like CA and MI deal with the expense of shipping "harmless" radioactive waste all the way to the state of TN? If it is as harmless as you say, why aren't they burying it in their own state?
Charlsie Sue Sheldon
406 Beverly Randolp Drive
Murfreesboro, TN 37129

000029

From: <hale8730@bellsouth.net>
To: <Joyce.Dunlap@state.tn.us>
Date: 7/25/2007 3:27 PM

Isn't it about time to close the landfill? We are tired of the stench for miles surrounding the landfill.

Joyce Dunlap - land fill

From: "Tommy Nokes" <ltnokes@comcast.net>
To: <Joyce.Dunlap@state.tn.us>
Date: 7/26/2007 6:03 PM
Subject: land fill

Dumping radioactive material here in Rutherford County cannot good for our folks no matter how low the reading is. In fact having a dump right on our water supply is dangerous to us all anyway. All kinds of junk are dumped there and there is no way you can stop the leakage into the ground. THE DUMP SHOULD BE CLOSED PERIOD AND IF THIS CANNOT BE DONE AT LEAST STOP THE RADIOACTIVE MATERIAL AS WELL AS OUT OF TOWN, OUT OF COUNTY GARBAGE FROM BEING DUMPED ON US. Some people are getting their money pockets lined real good for letting it remain here.

Signed:

Loyd T. Nokes

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7/26/2007

I have heard that the Native American knew not to put an outhouse upstream from where they got their drinking water. This is not a landfill, it is a Mountain of dumped trash of everything you might think of. I feel each county + each state should have to handle or take control of and dispose of their own trash and not be allowed to put it off on other Counties + States. They made it so they should have to take care of it. Nashville + Davidson complained until they closed their dumps. people wouldn't let them have another dump in their County, so now Rutherford County gets everyone's trash.

Ruth Smitty

RECEIVED
JUL 27 2007
TENNESSEE DEPARTMENT OF ENVIRONMENT & CONSERVATION

Joyce Dunlap - TDEC Solid Waste Advisory Committee

From: "Rich Henighan" <1mount@charter.net>
To: <joyce.dunlap@state.tn.us>
Date: 7/29/2007 8:34 AM
Subject: TDEC Solid Waste Advisory Committee

These are my comments to be considered by the Solid Waste Advisory Committee about dumping nuclear wastes (under the BSFR program) at Middle Point and other sites in the State.

Allowing the release of nuclear waste of any type into public landfills is not acceptable. While there may be some materials categorized as "low level" that could be safely disposed of , such a system requires the strictest oversight and safety controls. The problems of nuclear waste disposal is so large and so expensive that any programs such as the current one that is full of loopholes and allows the use of any public landfills WILL BE ABUSED and is nearly a guarantee for release of dangerous waste in our communities. The current program needs to be shut down.

Richard Henighan
619 Mt. View Dr.
Seymour,TN 37865

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From: "iruckae@juno.com" <iruckae@juno.com>
To: <Joyce.Dunlap@state.tn.us>
Date: 7/27/2007 3:25 PM
Subject: Middlepoint Landfill disposal comments (attached in Microsoft Word)
Attachments: nuclearcomments.doc

Good afternoon Joyce Dunlap, please see the attached document.

Thank-you.

Mr. Irucka Embry

27 July 2007

Joyce Dunlap
Tennessee Department of Environment and Conservation
Division of Solid Waste Management
8th Floor, L&C Tower
401 Church Street
Nashville, TN 37243-1535

VIA ELECTRONIC MAIL (AS AN ATTACHMENT) & US POSTAL SERVICE

RE: Scientific Inquiry/Public Comments to the Tennessee Solid Waste Advisory Committee concerning the disposal of solid waste with "extremely low levels of radioactivity" at the Allied Waste (formerly BFI) Middlepoint Landfill in Murfreesboro (Rutherford County), Tennessee

Dear Joyce Dunlap,

How are you?

My name is Irucka Embry and I am writing this scientific inquiry/public comment as a concerned citizen with regards to the disposal of solid waste with "extremely low levels of radioactivity" at the Allied Waste (formerly BFI) Middlepoint Landfill in Murfreesboro (Rutherford County), Tennessee.

I would like to begin this inquiry by addressing some common points that we can hopefully agree upon:

1) The main exposure pathways for the transmission of disease symptom-inducing agents and/or the transfer of chemicals into the human body, including radionuclides, are: absorption through the skin, adsorption through the skin, entry through a cut and/or wound in the skin, ingestion, inhalation, and injection[1].

2) "Ionizing radiation causes the ionizations of atoms which may affect molecules which may affect cells which may affect tissues which may affect organs which may affect the whole body[2]."

3) The chemicals in the landfill and surrounding environment are subject to the following types of chemical interactions: additive, synergistic, potentiation, and antagonism[3].

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There are several questions that I would like for the Solid Waste Advisory Committee to answer for the benefit of the public-at-large: the Tennessee Legislature and the people of the State of Tennessee concerning the Bulk Survey for Release Program (BSFR) and the disposal of solid waste with "extremely low levels of radioactivity."

1) In terms of the solid waste with the "low levels of radioactivity," which radionuclides are present in this waste?

2) Which decay process(es) exist(s) for those particular radionuclides: the emission of alpha particles, beta particles, and/or gamma rays[4]?

3) What are the half-lives of those radionuclides?

4) Does "low-level radioactive" waste stored in a municipal solid waste landfill in a separate section pose any possible ecological risks, including human health, and/or effects now and in the future[5]?

5) If so, then what are the ecological risks and/or effects now and in the future?

6) What are any possible human health effects associated with the exposure to those radionuclides based on all of the possible exposure pathways; i.e. what are the possible biological effects of low-level radiation[6]?

7) What are any possible ecological effects associated with the interactions of those radionuclides with the biological and chemical materials in the soil (including other wastes and gases), in the air, in the water (groundwater and surface water), and in biological bodies?

8) If the radionuclides interact with other radionuclides and/or non-radioactive chemicals, then what happens to the previous measured levels of radiation?

9) What is the biogeochemical fate of the radionuclides as those chemicals disperse through the soil to the groundwater (and to surrounding surface water bodies) and to terrestrial organisms?

10) What risks are possible with the bioaccumulation of those radionuclides into the ecological food web?

11) What is the biogeochemical fate of the radionuclides as those chemicals disperse through the air?

12) Concerning the study being conducted by the Solid Waste Advisory Committee, how many years do(es) the model(s) project into the future in terms of the risks associated with this disposal?

13) Which physiological characteristics of an exposed person will be assessed to properly determine the full extent of risks to everyone in the areas around these 5 landfills in the State of Tennessee?

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14) Who will be most at risk due to this disposal?

15) Will this study review acute, intermediate, and chronic exposure durations?

16) Will this study assess acute, subacute, and chronic health effects?

17) Does this study review the possible effects if the leachate seeps through the liner into the groundwater and beyond?

I am submitting this scientific inquiry/public comment along with the resources in Appendix A to stimulate further discussion and prompt more scientific inquiry focusing on the disposal of solid waste with "extremely low levels of radioactivity" in Tennessee.

Thank-you in advance.

Sincerely,

Mr. Irucka Embry
919 Kay Street
Murfreesboro, TN 37130
iruckaE@juno.com

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APPENDIX A

LANDFILLS

http://www.zerowasteamerica.org/Landfills.htm
Landfills: Hazardous to the Environment

http://www.atsdr.cdc.gov/HAC/landfill/html/intro.html
Landfill Gas Primer: An Overview for Environmental Health Professionals

http://www.gfredlee.com/
G. Fred Lee & Associates

http://www.gfredlee.com/plandfil2.htm
Recent Publications on Landfills - Solid and Hazardous Waste and Groundwater Quality Protection: G. Fred Lee & Associates

http://www.gfredlee.com/landfill.htm
Landfills - Solid and Hazardous Waste and Groundwater Quality Protection: G. Fred Lee & Associates

http://www.members.aol.com/annejlee/LF-DredgedSed.pdf
Disposal of Contaminated Sediments/Soils in MSW Landfills: Need to Consider the True Cost: G. Fred Lee & Associates

http://www.gfredlee.com/lf_birth_2001.pdf
"Landfill link to birth defects strengthened"

http://www.members.aol.com/apple27298/SubtitleDFlawedTechnPap.pdf
Flawed Technology of Subtitle D Landfilling of Municipal Solid Waste: G. Fred Lee & Associates

http://www.members.aol.com/annelhome/EnvironHealthDiabetes.pdf
Increased Rate of Hospitalization for Diabetes and Residential Proximity of Hazardous Waste Sites

http://www.members.aol.com/annejlee/HazChemSites-Illness.pdf
Association Between Hazardous Chemical Sites and Illness

http://www.grrn.org/landfill/usnrc_06-30-03.html
Re: Proposed 10 CFR PART 20: Comments by the Grassroots Recycling Network in Opposition to Proposed Rule -- permit low level radioactive waste to enter general commerce and/or be disposed of in municipal solid waste landfills

http://www.ejnet.org/rachel/rhwn069a.htm
Landfilling Low-Level Radioactive Waste Is A Problem For All States

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http://www.ejnet.org/rachel/rhwn037.htm
EPA Says All Landfills Leak, Even Those Using Best Available Liners

"LOW-LEVEL" & "HIGH-LEVEL" RADIOACTIVE WASTE

http://www.checnet.org/healthehouse/education/articles-detail.asp?Main_ID=961
Low Levels of Ionizing Radiation May Cause Harm

http://books.nap.edu/catalog.php?record_id=11340#toc
Health Risks from Exposure to Low Levels of Ionizing Radiation: BEIR VII Phase 2

http://www.ag.ohio-state.edu/~rer/rerhtml/rer_44.html
Lessons Learned from Existing Low-Level Radioactive Waste Disposal Facilities: The Ohio State University

http://www.nirs.org/radwaste/llw/llwhome.htm
"Low-Level" Radioactive Waste

http://www.nirs.org/radwaste/recycling/recyclinghome.htm
Radioactive Waste and Materials being used to make Household Items

http://www.besafenet.com/NuclearRecycling.pdf
Nuclear Power & Weapons Waste In Everyday Household Items & Landfills: Prevent Radioactive Waste from Entering the Marketplace & Trash

http://www.motherjones.com/news/outfront/2002/07/radioactive_recycling.html?welcome=true
"Radioactive Recycling: If the Department of Energy has its way, the nation's nuclear garbage could end up in everyday items like bicycles, frying pans, and baby strollers."

http://www.nirs.org/radwaste/outofcontrol/outofcontrol.htm
Out of Control - On Purpose: DOE's Dispersal of Radioactive Waste into Landfills and Consumer Products

http://www.nirs.org/radwaste/hlw/hlw.htm
Highly Radioactive Waste

http://www.nv.doe.gov/default.htm
U.S. Department of Energy National Nuclear Security Administration Nevada Site Office

http://www.atsdr.cdc.gov/2p-hazardous-waste-sites.html
Hazardous Waste Sites (U.S. Department of Health and Human Services Agency for Toxic Substances and Disease Registry)

http://www.atsdr.cdc.gov/HAC/oakridge/index.html
Oak Ridge Reservation: Public Health Home (U.S. Department of Health and Human Services Agency for Toxic Substances and Disease Registry)

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BIOLOGICAL EFFECTS OF IONIZING RADIATION

http://www.ieer.org/reports/badtothebone/index.html
Bad to the Bone: Analysis of the Federal Maximum Contaminant Levels for Plutonium-239 and Other Alpha-Emitting Transuranic Radionuclides in Drinking Water
By: Arjun Makhijani, Ph.D.
Institute for Energy and Environmental Research
August 2005

http://www.icsu-scope.org/downloadpubs/scope50/contents.html
Scope 50: Radioecology after Chernobyl - Biogeochemical Pathways of Artificial Radionuclides

http://www.wrongdiagnosis.com/risk/radiation.htm
Risk Factor: Radiation: WrongDiagnosis.com

http://www.wrongdiagnosis.com/artic/ninds_cephalic_disorders_information_page_ninds.htm
NINDS Cephalic Disorders Information Page: NINDS: WrongDiagnosis.com

http://www.wrongdiagnosis.com/r/radiation_sickness/intro.htm
Radiation sickness: WrongDiagnosis.com

http://www.ratical.com/radiation/
The Health Costs of Low-Level Ionizing Radiation

http://www.ratical.com/radiation/NRBE/index.html
No Immediate Danger: Prognosis for a Radioactive Earth by Dr Rosalie Bertell

http://www.ratical.com/radiation/CNR/
The Committee For Nuclear Responsibility (CNR)

http://www.ratical.com/radiation/CNR/HEIRreports.html
The Committee for Nuclear Responsibility's Health Effects of Ionizing Radiation (HEIR) Reports

http://www.ratical.com/radiation/CNR/NoSafeThresh.html
What Is Factually Wrong with This Belief: "Harm from Low-Dose Radiation Is Just Hypothetical --- Not Proven"

http://www.ratical.com/radiation/CNR/RIC/
Radiation-Induced Cancer From Low-Dose Exposure: An Independent Analysis by John W. Gofman, M.D., Ph.D.

http://www.ratical.com/radiation/CNR/synapse.html
Gofman on the health effects of radiation: "There is no safe threshold"

http://www.ratical.com/radiation/CNR/synapse.html#Part2

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Gofman on the health effects of radiation: Challenging The Nuclear Establishment

http://www.ratical.com/radiation/CNR/CAmonthly.html
California Q&A: A Conversation with John Gofman, Ph.D. '43: A conversation with the Berkeley scientist who helped to build the atomic bomb and to unbuild this country's nuclear energy program.
By Russell Schoch

http://www.ratical.com/radiation/CNR/PlowboyIntrv.html
The Plowboy Interview John Gofman: Nuclear And Antinuclear Scientist

http://www.ratical.com/radiation/inetSeries/nwJWG.html
Nuclear Witnesses, Insiders Speak Out: John W. Gofman, Medical Physicist

http://www.ratical.org/radiation/DU/KYagasakiOnDU.pdf
Depleted Uranium Shells, The Radioactive Weapons - Perpetuation of War Damage by Radiation -YAGASAKI Katsuma Group of Peace Education Against Nuclear Weapon, University of the Ryukyus

http://www.nuclearpolicy.org/index.cfm
Nuclear Policy Research Institute

http://www.nirs.org/home.htm
Nuclear Information and Resource Service & World Information Service on Energy

http://www.citizenstoendit.org/
Citizens to end Nuclear Dumping in TN (ENDIT)

http://www.ananuclear.org/
Alliance for Nuclear Accountability

http://www.helencaldicott.com/articles.htm
Helen Caldicott, MD: Articles

http://www.nsbri.org/Radiation/HumanAffects.html
Radiation: Affects on Humans

http://www.jlab.org/div_dept/train/rad_guide/intro.html
Radiation Worker Training (RWT)

http://www.jlab.org/div_dept/train/rad_guide/effects.html
Radiation Biological Effects

http://www.nrc.gov/reading-rm/basic-ref/teachers/09.pdf
Biological Effects of Radiation: The U.S. Nuclear Regulatory Commission (NRC)

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http://www.nrc.gov/reading-rm/doc-collections/fact-sheets/bio-effects-radiation.html
The U.S. Nuclear Regulatory Commission (NRC) Fact Sheet on Biological Effects of Radiation

http://www.nsc.org/issues/rad/risks.htm
National Safety Council: The Risk: Health Effects

http://www.hps.org/publicinformation/ate/q647.html
Health Physics Society: Relative biological effectiveness (RBE)

http://www.bt.cdc.gov/radiation/ars.asp
Acute Radiation Syndrome

http://physics.bu.edu/~duffy/PY106/NuclearReactions.html
Nuclear reactions

http://web.princeton.edu/sites/ehs/osradtraining/biologicaleffects/page.htm
Open Source Radiation Safety Training: Module 3: Biological Effects

http://web.princeton.edu/sites/ehs/radiation/index.html
Princeton University: Radiation Safety

http://www.cehs.siu.edu/radiological/Training%20Modules/biological.htm
Southern Illinois University Carbondale (SIUC) Center for Environmental Health and Safety: Module 3: Biological Effects of Radiation

http://www.cehs.siu.edu/sitemap.htm
Southern Illinois University Carbondale (SIUC) Center for Environmental Health and Safety

http://www.chemcases.com/2003version/nuclear/nc-14.htm
Nuclear Chemistry: The Biological Effects of Nuclear Radiation

http://www.fas.org/nuke/guide/usa/doctrine/dod/fm8-9/1ch5.htm
FM 8-9: NATO Handbook On The Medical Aspects Of NBC Defensive Operations: AMedP-6(B): Chapter 5: Biophysical And Biological Effects Of Ionizing Radiation

RADIATION

http://www.bt.cdc.gov/radiation/glossary.asp
Department of Health and Human Services Centers for Disease Control and Prevention: Glossary of Radiological Terms

https://www.orau.gov/ddsc/
The Decontamination & Decommissioning Science Consortium (DDSC)

http://hps.org/
Health Physics Society

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http://chemed.chem.purdue.edu/genchem/topicreview/bp/ch23/radiation.php
Ionizing Radiation

http://en.wikipedia.org/wiki/Atomic_radiation
Ionizing radiation

http://chemed.chem.purdue.edu/genchem/topicreview/bp/ch23/natural.php
Natural Versus Induced Radioactivity

http://www.sc.doe.gov/ober/ober_top.html
U.S. Department of Energy Office of Biological & Environmental Research

http://www.lowdose.energy.gov/
U.S. Department of Energy Low Dose Radiation Research Program

http://www.sc.doe.gov/ober/LSD/lowdose.html
U.S. Department of Energy Office of Biological & Environmental Research Low Dose Radiation

http://www.nsc.org/issues/radisafe.htm
National Safety Council: Understanding Radiation

http://hacd.jsc.nasa.gov/projects/space_radiation.cfm
NASA Human Adaption and Countermeasures Division Space Radiation Project

NUCLEAR POWER

http://www.topix.net/tech/nuclear-energy
Nuclear Energy News from *The Daily News Journal*

http://www.ucsusa.org/clean_energy/nuclear_safety/
Nuclear Safety

http://www.fas.org/ssp/fc/
The Nuclear Fuel Cycle

http://ccnr.org/open_letter.html
The Dangers of Nuclear Power: An Open Letter to Physicists

http://www.i-sis.org.uk/ESIGW.php
Energy Strategies in Global Warming: Is Nuclear Energy the Answer</A>? Nuclear energy makes economic nonsense and ecological disaster and provides great opportunities for terrorists.

http://www.i-sis.org.uk/DTNPM.php
Deconstructing the Nuclear Power Myths

http://www.i-sis.org.uk/ESIGW.php
Energy Strategies in Global Warming: Is Nuclear Energy the Answer?

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http://www.i-sis.org.uk/SNGNP.php
Safe New Generation Nuclear Power?: The Pebble Bed Modular Reactor

http://www.i-sis.org.uk/LITD.php
Nuclear Power: A Leap into the Dark Energy Chasm

http://www.progress.org/2006/nuclear09.htm
Cold War Nuclear Plant Created Secret Dump, Set Own Rules

http://www.nukewatch.com/
Nukewatch

http://www.nukewatch.com/pathfinder/spring02/sp0221.html
"New Law Won't Keep UK Nukewatchers Quiet"

http://www.besafenet.com/
The Center for Health, Environment & Justice's BE SAFE campaign: BE SAFE, Center for Health, Environment & Justice

http://www.nirs.org/about/edasner41504.htm
"An Angry Man Talks About Nuclear Power"

http://www.usatoday.com/news/washington/2004-03-29-nuclear-gns_x.htm
Report: Nuclear sites put drinking water sources at risk

RISK ASSESSMENT

http://www.biotech-info.net/paradigm_shift.html
"A Paradigm Shift: Rethinking Environmental Decision Making and Risk Assessment"

http://www.envirotools.org/exposurepathways.shtml
Exposure Pathways (EnviroTools)

http://www.envirotools.org/index.html
EnviroTools Home

http://www.atsdr.cdc.gov/
U.S. Department of Health and Human Services Agency for Toxic Substances and Disease Registry

http://www.atsdr.cdc.gov/mrls/index.html
Minimal Risk Levels (MRLs) for Hazardous Substances [U.S. Department of Health and Human Services Agency for Toxic Substances and Disease Registry]

http://www.epa.gov/ceampubl/
Exposure Assessment Models (EPA)

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http://www.epa.gov/iris/
Integrated Risk Information System (EPA)

http://www.epa.gov/region5superfund/ecology/index.html
Ecological Risk Assessment and the Ecological Technical Center (EPA)

SCIENTIFIC INTEGRITY

http://www.cspinet.org/integrity/
Center for Science in the Public Interest: The Integrity in Science Database

http://www.cspinet.org/
Center for Science in the Public Interest

http://www.ucsusa.org/scientific_integrity/
Union of Concerned Scientists Scientific Integrity Program

http://ori.hhs.gov/
U.S. Department of Health and Human Services Office of Research Integrity (ORI)

http://www.ieer.org/index.html
Institute for Energy and Environmental Research (IEER): Where Science and Democracy Meet

http://www.ieer.org/clssroom/index.html
IEER On-Line Technical Training Classroom

http://www.ieer.org/fctsheet/index.html
IEER's Fabulous Factsheet File

http://www.ieer.org/links.html
Links

BOOKS

Multiple Chemical Interactions
Edward J. Calabrese

Our Stolen Future: Are We Threatening Our Fertility, Intelligence and Survival? A Scientific Detective Story
Theo Colborn, Dianne Dumanoski, John Peter Meyers

No Immediate Danger: Prognosis for a Radioactive Earth
Dr. Rosalie Bertell

Introduction to Biological Radiation Effects: An Overview of Terrestrial and Space Radiation Effects on Humans
U. L. Prenn

000045

Radiation And Human Health
John W. Gofman, M.D., Ph.D.

X-Rays: Health Effects of Common Exams
John W. Gofman, M.D., Ph.D.

Radiation-Induced Cancer From Low-Dose Exposure: An Independent Analysis
John W. Gofman, M.D., Ph.D.

Chernobyl Accident: Radiation Consequences for This and Future Generations
John W. Gofman, M.D., Ph.D.

Unacceptable Risk: The Nuclear Power Controversy
McKinely C. Olson

Living With Nuclear Weapons
The Harvard Nuclear Study Group: Albert Carnesale, Paul Doty, Stanley Hoffmann, Samuel P. Huntington, Joseph S. Nye, Jr., Scott D. Sagan

Living Without Landfills: Confronting the Low-Level Radioactive Waste Crisis
Marvin Resnikoff

1

http://www.bt.cdc.gov/radiation/glossary.asp#e
Exposure pathway definition (Department of Health and Human Services Centers for Disease Control and Prevention: Glossary of Radiological Terms)

http://www.envirotools.org/exposurepathways.shtml
Exposure Pathways: EnviroTools

http://en.wikipedia.org/wiki/Absorption_(skin)
Absorption (skin)

http://en.wikipedia.org/wiki/Adsorption
Adsorption – Wikipedia

http://www.wrongdiagnosis.com/medical/adsorption.htm
Adsorption: WrongDiagnosis.com

American Red Cross First Aid: Responding To Emergencies
American Red Cross

2

http://www.nrc.gov/reading-rm/basic-ref/teachers/09.pdf

000046

3

http://zoology.muohio.edu/oris/ZOO462/notes/05_462.html
Chemical Interactions -- Dr. James T. Oris of Miami University

http://www.ourstolenfuture.org/NewScience/synergy/mixtures.htm
The Impacts of chemical mixtures – *Our Stolen Future* website

http://www.ourstolenfuture.org/NewScience/synergy/synergy.htm
New scientific studies of mixtures and synergy – *Our Stolen Future* website

Multiple Chemical Interactions
Edward J. Calabrese

Our Stolen Future: Are We Threatening Our Fertility, Intelligence and Survival? A Scientific Detective Story
Theo Colborn, Dianne Dumanoski, John Peter Meyers

4

http://www.bt.cdc.gov/radiation/glossary.asp#r
Radioactivity definition (Department of Health and Human Services Centers for Disease Control and Prevention: Glossary of Radiological Terms)

5

http://www.gfredlee.com/
G. Fred Lee & Associates

http://www.gfredlee.com/plandfil2.htm
Recent Publications on Landfills - Solid and Hazardous Waste and Groundwater Quality Protection: G. Fred Lee & Associates

http://www.gfredlee.com/landfill.htm
Landfills - Solid and Hazardous Waste and Groundwater Quality Protection: G. Fred Lee & Associates

http://www.members.aol.com/annejlee/LF-DredgedSed.pdf
Disposal of Contaminated Sediments/Soils in MSW Landfills: Need to Consider the True Cost: G. Fred Lee & Associates

http://www.gfredlee.com/lf_birth_2001.pdf
"Landfill link to birth defects strengthened"

http://www.members.aol.com/apple27298/SubtitleDFlawedTechnPap.pdf

000047

Flawed Technology of Subtitle D Landfilling of Municipal Solid Waste: G. Fred Lee & Associates

http://www.members.aol.com/annelhome/EnvironHealthDiabetes.pdf
Increased Rate of Hospitalization for Diabetes and Residential Proximity of Hazardous Waste Sites

http://www.members.aol.com/annejlee/HazChemSites-Illness.pdf
Association Between Hazardous Chemical Sites and Illness

http://www.grrn.org/landfill/usnrc_06-30-03.html
Re: Proposed 10 CFR PART 20: Comments by the Grassroots Recycling Network In Opposition to Proposed Rule -- permit low level radioactive waste to enter general commerce and/or be disposed of in municipal solid waste landfills

http://www.ejnet.org/rachel/rhwn069a.htm
Landfilling Low-Level Radioactive Waste Is A Problem For All States

http://www.ejnet.org/rachel/rhwn037.htm
EPA Says All Landfills Leak, Even Those Using Best Available Liners

[6]

See the internet resources under the heading of BIOLOGICAL EFFECTS OF IONIZING RADIATION in Appendix A.

000048

Joyce Dunlap - ETEBA Comments on TN Bulk Survey for Release Program

From: "Alice Murphy" <alice@eteba.org>
To: "Joyce Dunlap" <joyce.dunlap@state.tn.us>
Date: 7/30/2007 2:59 PM
Subject: ETEBA Comments on TN Bulk Survey for Release Program
CC: <grace@eteba.org>
Attachments: TN BSFR Program - ETEBA Position Paper 7.30.07.doc; TN BSFR - Letter 7.30.07.doc

Ms. Dunlap,

Please find attached ETEBA's official comments on the current Tennessee Bulk Survey for Release Program (BSFR). These comments are provided in response to the call for public comments. A hard copy with signature will be mailed to you.

Please let me know that you have received this email and entered our comments.

Thank You,
Alice

Alice Q. Murphy
Executive Director, ETEBA
Energy, Tech. & Environmental Business Assoc.
Phone: 865-945-1386
Fax: 865-945-1385
Cell: 865-386-3373
alice@eteba.org

000049

ETEBA
energy, technology and environmental business association
www.eteba.org

July 30, 2007

Solid Waste Advisory Committee
Attn: Ms. Joyce Dunlap
Division of Solid Waste Management
Tennessee Department of Energy and Conservation (TDEC)
L&C Tower, 8th Floor
401 Church Street
Nashville, TN 37243-1535

Subject: Tennessee Bulk Survey for Release (BSFR) Program

Ladies and Gentlemen:

The Energy, Technology and Environmental Business Association (ETEBA) is composed of more than 150 large and small businesses. While several of our business members are based in various parts of the United States, our organization is headquartered in Oak Ridge, Tennessee, where the majority of our members are present to provide a variety of technical services to federal agencies. Company capabilities include a broad range of services such as engineering, construction, waste management, security, health & safety, etc., but they have special nuclear capabilities such as dismantling nuclear facilities, soil and groundwater remediation, etc.

ETEBA supports the continuation of Tennessee's current Bulk Survey for Release (BSFR) program. We believe the criteria for accepting material under the BSFR program are extremely conservative. Even though these materials are being surveyed for extremely low levels of radiation, the level of "radioactivity" of the BSFR materials is much less than that occurring in every day human exposures to naturally occurring environmental sources in nature and materials all around us.

It is worth noting that materials that are candidates for the BSFR program are of such low levels that other states generally exempt them from further regulation as a radioactive material and allow their unrestricted disposal, while Tennessee, in a conservative manner, has developed a regulatory framework for it. We believe the process for acceptance and disposal of BSFR material is heavily regulated through measuring, monitoring, and safety techniques used by state experts and licensed processors. By allowing waste that does not pose any significant risk to be disposed of under the BSFR program, space in the limited number of radioactive waste facilities can be conserved for the material that truly requires that type of disposal.

Attached is an Issue Paper which provides additional points and information. We are sharing this paper with interested stakeholders. If you have any questions, please feel free to contact me at 865-945-1386 or alice@eteba.org.

Sincerely,

Alice Q. Murphy
Executive Director

Enclosure

P.O. Box 5483 ▪ Oak Ridge, TN 37831 ▪ T (865) 945-1386 ▪ F (865) 947-4788

000050

cc: The Honorable Lamar Alexander, Tennessee
The Honorable Bob Corker, Tennessee
The Honorable Lincoln Davis, Fourth District, Tennessee
The Honorable Bart Gordon, Sixth District, Tennessee
The Honorable Zach Wamp, Third District, Tennessee
Mr. Robert Gowan, Office of the Governor
Mr. Paul Sloan, Deputy Commissioner, TDEC
Mr. John Owsley, Manager, Oak Ridge Office, TDEC
The Honorable Randy McNally, District 5
The Honorable Dennis Ferguson, District 32
The Honorable Jim Hackworth, District 33
Ms. Susan Gawarecki, Oak Ridge Local Oversight Committee
Mr. Lance Mezga, Oak Ridge Site Specific Advisory Board

P.O. Box 5483 ▪ Oak Ridge, TN 37831 ▪ T (865) 945-1386 ▪ F (865) 947-4788

Tennessee's Bulk Survey for Release (BSFR) Program

ETEBA Position Paper

ETEBA

The Energy, Technology and Environmental Business Association (ETEBA) is composed of more than 150 large and small businesses. While several of our business members are based in various parts of the United States, our organization is headquartered in Oak Ridge, Tennessee, where the majority of our members are present to provide a variety of technical services to federal agencies. Company capabilities include a broad range of services such as engineering, construction, waste management, security, health & safety, etc., but they have special nuclear capabilities such as dismantling nuclear facilities, soil and groundwater remediation, etc.

These enterprises have a large economic presence in the state of Tennessee. A survey conducted by the University of Tennessee in 2005 summarized the economic benefits that ETEBA businesses create through payroll and non-payroll spending, subcontracting and other linkages with businesses in the state. The total income benefit of ETEBA businesses for Tennessee and its residents, including the influence of the multiplier, is $1.1 billion. The total job benefit for the state is 22,000. In addition, workers in ETEBA firms are well educated. About 40 percent hold bachelors degrees, while 25 percent of workers hold advanced degrees.

BSFR Background

The Bulk Survey for Release (BSFR) program was developed approximately 20 years ago to provide a standardized licensed process, approved by the Tennessee Department of Environment and Conservation (TDEC), to analyze materials with extremely low levels of radioactive contamination and allow disposal at five different Class I landfills in Tennessee. Materials that are candidates for the BSFR program are of such low levels that other states generally exempt them from further regulation as a radioactive material and allow their unrestricted disposal. In contrast, Tennessee has developed a regulatory framework to ensure safe, proper disposal.

Examples of materials analyzed under the program are bulk materials such as building rubble, metals, soils, asphalt, paper, plastics and wood that have been exposed to a radioactive source. Nuclear power plants and other industrial, academic and medical sites that utilize very low-level radioactive materials may send their waste to one of four Tennessee - licensed facilities for processing. The four licensees in Tennessee that are currently authorized to conduct the BSFR program are IMPACt, Studsvik-RACE, Toxco and Duratek/Energy Solutions.

Before going to the licensee's facility for processing, these materials are evaluated at the generator's site to ensure the material does not exceed predetermined limits set by the BSFR program. Upon receiving these materials from the generator, the licensed processor will also sample, measure and evaluate the material to make sure it meets BSFR criteria prior to being disposed of as part of this program. The Division of Radiological Health staff conducts regular inspections of licensed processors in order to review their operation for compliance with all standards, regulations and required conditions.

There are five Class I landfills in Tennessee authorized to receive wastes under the BSFR program: Chestnut Ridge landfill facility in Heiskell (Anderson County), North Shelby County, South Shelby County, Middle Point in Rutherford County, and Carter Valley in Hawkins County. BSFR waste cannot contribute more than five percent of the total landfill waste, and it cannot contribute a dose of more than one millirem per year to any member of the public (a dose calculated assuming a person lived on the closed site and ate food off the land there). To put that in perspective, the public is exposed to approximately 300 millirem per year (mrem/y) in Tennessee. More than 80% of that exposure comes from naturally occurring radiation in the environment, such as sunlight, soil, and certain types of rock.

Any material that does not meet the strict requirements of Tennessee's BSFR program must be disposed of in a licensed radioactive waste facility. There are three such commercial facilities in the United States.

Current Issue

The Nuclear Information and Resource Service (NIRS), an anti-nuclear special interest group based in Washington D.C., has recently launched a series of dramatic attacks on TDEC's BSFR program. As a result, the state legislature recently passed a moratorium on the program until the state's Municipal Solid Waste Advisory Committee could study the BSFR program and its impact at Middle Point landfill. The Committee is conducting two public hearings and taking public comment. A report is due by September 3, 2007.

ETEBA's Analysis & Conclusions

The level of "radioactivity" of the BSFR materials is much less than that occurring in every day exposures to food, building materials we live and work in, and naturally-occurring cosmic rays and radon. Almost 80% of our annual 300 millirem radioactive exposure in Tennessee comes from naturally occurring radioactivity found in nature and materials all around us. Thus, as has been stated, very low-level radioactive material is disposed of everywhere, all the time. The other 20% comes from man-made sources. For example, according to the Environmental Protection Agency, just watching television over the course of a year, adds one additional millirem of exposure per year, the same level of additional exposure as regulated under the BSFR program. As another example, a person taking a cross-county flight receives about 2-5 millirem of radiation per round trip.

Continued regulations over the decades have allowed materials present at below low-level radioactive waste (LLRW) levels to be exempted from regulatory control. Even so, the State of Tennessee has adopted extremely conservative criteria for defining and accepting material under the BSFR program. BSFR waste is NOT: nuclear reactor shielding from DOE facilities, DoD weapons projects, nuclear weapons materials, or internal components from nuclear power generating facilities. BSFR waste is: construction debris, soils, and debris from decommissioning at commercially licensed facilities.

The Health Physics Society has stated that an acceptable level of exposure to a member of the public from all man made sources is 100 mrem/y. Federal and State drinking water standards allow for 4 mrem/y. The Health Physics Society is in favor of a radiation level, below which, materials can be released from control; this level is 1 mrem/y. From 1999 to 2007, just over 11,000 tons of BSFR materials and over 9 million tons of regular solid wastes went to the landfill at Murfreesboro for an annual projected dose of 0.02 mrem/y. The Health Physics Society is in favor of waste disposal of radioactive materials that carry an extremely low or no public risk (e.g. BSFR) in a manner consistent with non-radioactive chemical/biological waste that is based on its potential risk to public health and safety, not on its origin or legislative stature.

Materials that are candidates for the BSFR program are of such low levels that many states exempt them from further regulation as a radioactive material and allow their unrestricted disposal, while Tennessee, in a conservative manner, has developed a regulatory framework for it. The process for acceptance and disposal of BSFR material is heavily-regulated through measuring, monitoring, and safety techniques used by state experts and licensed processors. By allowing waste that does not pose any significant risk to be disposed of under the BSFR program, space in the limited number of radioactive waste facilities can be conserved for the material that truly requires that type of disposal.

ETEBA supports the continuation of Tennessee's current BSFR program.

Joyce Dunlap - waste

From: bruce burr <burrchuckey@yahoo.com>
To: <joyce.dunlap@state.tn.us>
Date: 7/30/2007 4:55 PM
Subject: waste

i left western ny 20 yrs ago remember west valley ,well i thought i found a new shangrala in east tenn(chuckey),and 3 years ago heard there was rad waste in the nolichuckey river.now tenn wants to welcome more ,this is easy ,ill move,bruce burr

Get the free Yahoo! toolbar and rest assured with the added security of spyware protection.

000054

July 31, 2007

RECEIVED
JUL 31 2007
TENNESSEE DEPARTMENT OF ENVIRONMENT & CONSERVATION

TN Dept, of Environment and Conservation
8th Floor, L&C Tower
401 Church St.
Nashville, TN 37243

Attn: Joyce Dunlap

Dear Ms. Dunlap,

We are writing this letter today to request a permanent moratorium on nuclear and toxic waste dumping at Middle Point Landfill.

We were appalled to read in our local newspaper that the Middle Point Landfill has been receiving LOW-LEVEL RADIOACTIVE waste since at least the early 1990's!
The BSFR program approved by the state allowed this dumping.

We are concerned about LOW-LEVEL RADIATION in our neighborhood. The Middle Point Landfill is located next to the Stones River, which is the main source of drinking water for most of Rutherford County. We are concerned about the safety of our water supply. We are also concerned about the hazards of having this kind of waste near a residential area. What are the immediate and long term dangers to the public?

Our local paper reported that between 1999 and 2007, Middle Point received about 12,000 tons of waste through the BSFR program! What is the cumulative effect on the storage of this waste? What about leachate radioactive levels???

Why were we not informed of the presence of LOW-LEVEL RADIOACTIVE waste when BFI proposed the 70 acre expansion with a 15 year extension on the lifespan of the landfill. TDEC held public meetings to address odor, traffic, noise and litter complaints. The public was never told about the BSFR deal which allowed this LOW-LEVEL RADIOACTIVE dumping. If we had known about this, it would have been discussed in detail. WOULD THE EXPANSION BEEN DENIED? This LOW-LEVEL RADIATION DUMPING would have been more of a concern as opposed to odor!

At what point does the EPA step in and investigate the water supply and safety to the public? This Middle Point Landfill is located in a residential area near our main water supply.

In conclusion, we are requesting a permanent moratorium on nuclear and toxic waste dumping at Middle Point Landfill.

Sincerely,

Ray and Catherine Woolley
903 Wood Valley Dr.
Murfreesboro, TN37130

Ray W. Woolley Catherine Woolley

CC:Gov.Phil Bredeson Fax#615-532-9711

Sen. Bill Ketron Fax#615-253-0282

Sen. Jim Tracy Fax#615-741-2255

Rep. Kent Coleman Fax#615-253-0332

Rep. John Hood Fax#

TN DEPT OF ENVIRONMENT AND CONSERVATION
JOYCE DUNLAP FAX#615-532-0199

000056

Joyce Dunlap - My opinions for SWAC

From: <plong@cudrc.com>
To: <joyce.dunlap@state.tn.us>
Date: 7/31/2007 8:12 AM
Subject: My opinions for SWAC

I would like to go on record as being opposed to any radioactive material be allowed to enter the waste stream at Middlepoint landfill. I would like to see the legislature make the moratorium permanent. The long term effects are not known, and truthfully cannot be accurately predicted. Five years ago, doctors predicted that one in 500 children would be born with autism - today that number is one in 150. Has this increase in the frequency of this disorder been brought about by environmental exposure? No one knows, and that is just one example of the problem.

Our landfill is located much to close to the Stones River, our source of drinking water. All of the public water suppliers have intakes downstream from the landfill and consequently have to deal with whatever contaminants are in the water supply. Oddly, to my knowledge, none of them were ever advised that radioactive material would be deposited at Middlepoint, and could possibly affect the water supply.

Lastly, if this material is as safe as all of the experts say that it is, why isn't it dumped at all currently operating landfills in Tennessee? Why only a handful? Adn why is it not disposed of in the state in which it was generated.

Middlepoint's recently acquired expansion permit should be revoked due to the fact that this information was withheld during the debate.

Thank you,

Paul Long
7128 Cloverdale Way
Murfreesboro, TN 37129
(Walter Hill Community)

Joyce Dunlap - Land Fill Walter Hill, Murfreesboro TN

From: "Roni Robinson" <roni_robinson@hotmail.com>
To: <joyce.dunlap@state.tn.us>
Date: 7/31/2007 10:52 AM
Subject: Land Fill Walter Hill, Murfreesboro TN

Somebody hasn't done their homework. This landfill is located directly above the water source for much of Murfreesboro. Gravity tells me that the toxic stuff that is being dumped into the landfill is slowly making its way into the underground aquifer which distributes the water in different directions. We learned recently that part of the dump doesn't even have a liner. And, what are the liners anyway but just plastic. Plastic that can have holes punched in it, or even eaten away by some chemicals, making it worthless.

This dump needs to be closed immediately and investigation began immediately to see what needs to be done to clean it up and make it safe.

This is a great source of concern for the neighborhood as well as the other residents in Murfreesboro and somebody needs to be bold enough to do what really needs to be done instead of passing it off to someone else or another group. Just close the dump.

Sharron A. Robinson, resident of Walter Hill

roni_robinson@hotmail.com

Missed the show? Watch videos of the Live Earth Concert on MSN.

Joyce Dunlap - Comments re: nluclear waste in TN landfills

From: "Sandra Garrett" <peacetn@gmail.com>
To: <joyce.dunlap@state.tn.us>
Date: 7/31/2007 11:21 AM
Subject: Comments re: nluclear waste in TN landfills

Dear Ms. Dunlap;

I understand you are the person to whom we should direct comments about nuclear waste in TN landfills. If not, please pass this to the appropriate party.

Nuclear waste does not belong in landfills in ANY amount. This is the inherent problem with using nuclear fuel as a source of energy or weapons - what do you do with the waste?

I do not need to tell you of the dangers of nuclear contaminations, I am sure - nor do I need to mention the half-life of nuclear waste. I am sure you are more informed on this than I am. Regardless, I do know that nuclear waste in our landfills will be a hazard to the communities that are near these landfills, as well as to those who live on the routes by which these wastes are delivered to those landfills, and to the workers who transport them.

Thank you for allowing us to make these comments about an issue that has a potentially critical impact on all of us. I would have known nothing about this opportunity if it had not been for a friend who spends a great deal of time and energy monitoring the nuclear industry in TN. A greater effort to inform citizens about these comment opportunities on the part of the state would be even more appreciated.

Yours in true democracy,
Sandra Garrett
119 Unaka Subdivision Rd
Elizabethton, TN 37643
423.474.3003

Joyce Dunlap - Hopfully Tennessee can do better

From: "Joe Whetstone" <pj3whetstone@hargray.com>
To: <joyce.dunlap@state.tn.us>
Date: 7/31/2007 1:11 PM
Subject: Hopfully Tennessee can do better

Ms. Dunlap,

Hopefully the beautiful state of Tennessee will not be so short sighted as to allow Nuclear Waste to be buried in landfills.

Here in Bluffton, S.C. our drinking water from the Savannah River is contaminated with radioactive tritium from the Savannah River Site, Plant Vogtle, and the Barnwell Low Level Nuclear waste dump.

Hopefully Tennessee will do a batter job than South Carolina has done at protecting your precious resources from radioactive contamination.
Please protect present and future generations by not allowing nuclear waste in landfills .

Sincerely,

Joe Whetstone
10 Hamilton Drive
Bluffton, SC 29909-4437
(843) 705-9128

Frances Lamberts, 113 Ridge Lane, Jonesborough, TN 37659

July 31, ~~2007~~



Tennessee Department of Environment and Conservation
Division of Solid Waste Management
8th Floor, L&C Tower
401 Church Street
Nashville, TN 37243-1535

Re: Radioactive waste release

Dear Ms Dunlap:

I note your announced efforts to enable more disposal options for waste materials that are radioactively contaminated. Please accept for the public record a few remarks that reflect my concerns about these materials. I thank you, first, for providing various informational background materials on your web page, relevant to the Release (BSFR) program.

1. While Tennessee's "uniqueness" in having more processors of radiological waste may be a reality for historical reasons, its desirability is something is sincerely question. I would have our State, instead, adopt precautionary policies that reduce and discourage generation of such materials. Facilitation of disposal options is counter to this goal.

2. It is known, from authoritative scientific sources such as a National Academy of Sciences report and radiation-biology research, that biological effects of ionizing radiation have no absolutely safe threshold. Health damaging cellular and genetic effects can occur even at below-detectable levels; their multiplicative damage through exposure from numerous exposure routes cannot be excluded, nor perhaps measured. Any known addition of radioactive source materials into the realm of public life and commerce should be avoided where this is possible.

3. My preference and recommendation are, therefore, that even very-low-level nuclear contaminated materials, such as we must deal with because generated in Tennessee, remain under the safeguards of facilities licensed to process nuclear wastes. I oppose their "release" for disposal in public (Class I) landfills.

4. I hold the assumption of these materials' dangerousness being "below regulatory concern" to be risky. I fear as well that financial incentive for producers and processors, to shift to "release" instead of rad-waste-licensed disposal, and a tradition (through under-staffing) of scarce TDEC oversight in its enforcement programs could enhance future exposure hazards to the public.

5. I doubt the premise of no danger to surrounding communities when the rad-waste "contribution" in respective landfills is limited to five percent. This concern stems from the previously mentioned factors of lack of risk threshold, and of cumulative damage through exposure events from many sources. The man-made sources should not be expanded but reduced, where this is possible.

6. I would favor Tennessee landfills not to become contract repositories for radiation-contaminated waste from outside the state.

7. I encourage TDEC to make permanent the current, temporary moratorium on disposal of these materials at one of the proposed landfills, and to apply it across the state to all landfills.

Very sincerely,

Frances Lamberts

Frances Lamberts

Joyce Dunlap - Nuclear waste at landfills comments

From: "Danielle White" <daniellewhite717@msn.com>
To: <joyce.dunlap@state.tn.us>
Date: 7/31/2007 1:56 PM
Subject: Nuclear waste at landfills comments

Dear Ms. Dunlap,

I am writing regarding my concerns with nuclear waste processing in Tennessee.

The citizenry here is mostly unaware of the toxic waste surrounding them and have been consistently denied transparentability by the state regarding nuclear waste storage and dumping at local landfills.

I would like to see TDEC make the moratorium at Middle Point permanent and expand it to all the solid waste facilities in the state.

In addition, I am asking you to prevent increased unnecessary risks by keeping nuclear waste under radiological controls. I absolutely do not believe we should be storing these nuclear waste laced with cesium, strontium and other radioactive waste in our landfills, being incinerated or recycling it back into pots and pans, etc.

* Stop allowing long-lasting, man-made nuclear power and weapons waste to go to regular or industrial solid waste facilities under the BSFR program or otherwise.

* Open up for public comment all the "Free Release" licenses that TDEC gives including the BSFR and any others that allow radioactive "Free Release" to landfills. I am disgusted by the hidden agendas and actual lack of information to the public.

* The risks to local communities is simply not worth taking. I am not willing to

000063

take for the

sake of nuclear waste generators access to cheaper disposal. The risks from dumping nuclear waste in landfills (many of which are already leaking and have hazardous chemicals in them) are not really known and the predicted doses cannot be verified or enforced. Health effects of combined radioactive and hazardous pollutants can be worse than each alone. Chemicals can help radioactive materials leak out faster.

* I do not trust computer models to keep me and my children safe.

The RESRAD computer model used to justify releasing nuclear waste to landfills has been compared to other computer models (benchmarked) but it has never been shown to give accurate or correct predictions based on real-life landfill situations.

Sincerely,

D. Whiten

000064

* Open up for public comment all the "Free Release" licenses that TDEC gives including the BSFR and any others that allow radioactive "Free Release" to landfills. I am disgusted by the hidden agendas and actual lack of information to the public.

* The risks to local communities is simply not worth taking. I am not willing to take for the sake of nuclear waste generators access to cheaper disposal. The risks from dumping nuclear waste in landfills (many of which are already leaking and have hazardous chemicals in them) are not really known and the predicted doses cannot be verified or enforced. Health effects of combined radioactive and hazardous pollutants can be worse than each alone. Chemicals can help radioactive materials leak out faster.

* I do not trust computer models to keep me and my children safe. The RESRAD computer model used to justify releasing nuclear waste to landfills has been compared to other computer models (benchmarked) but it has never been shown to give accurate or correct predictions based on real-life landfill situations.

Sincerely,

D. Whiten

July '07

RECEIVED
JUL 31 2007
TENNESSEE DEPARTMENT OF ENVIRONMENT & CONSERVATION

My name is Pat Pelot Sanders and I have lived in MURFREESBORO almost 44 years. My late husband, Dr. Bob Sanders, was an employee of the TN. Dept. of Public Health for 25 years. He was called a street-level bureaucrat by our daughter..a sociology major. He was pediatrician. and the Director of the Rutherford County Health Dept. - '69 - '91.

There were 150 burning dumps in this county in 1970, and the landfill at Walter Hill was chosen because of the deep soil. It was intended for house hold garbage and was for the public....not for BFI. The county commission got hoodwinked some where along the line. We hope that SWAC has done their homework because we have done ours. WE stands for ENDIT (show signs) Citizens to END NUCLEAR DUMPING IN TENNESSEE.

Many of us attended your July 5th meeting in Nashville and saw you selected a so-called "independent consultant" by the name of Lisa Stetar, a former employee of TDEC, and determined that you would pay her $5,000.00 or $10,000.00. So again, TDEC monitors TDEC. Did you pick the fox to look after the hen house?

This is your meeting tonight and your selected location...holding 230 people. But, this is OUR meeting and our turn to speak. We wonder who appointed you to be

on this advisory committee...to advise TDEC....and what are your qualifications..... Where is a molecular biologist on this committee??? Where is a physician??? My husband was a physician and was a PUBLIC HEALTH physician for 25 years. with the Tennessee Dept. of Health and Environment. Now those departments are separate...TDEC is separate from health....your main concern seems to be looking after the nuclear industry more than the health of Tennesseans.

Your guy, Roger Fenner had his monitor getting rat-a-tat-tat out of glow-in-the-dark toys and watches...while he stood next to a window with the sunshine right on his monitor. What a joke. You all fell for it...and apparently you believe the levels of radiation in the stuff being dumped in or on Middlepoint is safe. Wonder if you have visited the landfill here, or did you all just go play GOLF today??? July 17

only 5 out 18 Committee members came July 17. Whoa!

alpha, beta, or gamma rays!

No one mentioned at the July 5 meeting THAT RADIATION ACCUMULATES in your body...Is there no biologist on your committee???. Part of my homework was talking to a Ph.D. in molecular biology..and you should do the same. You are making a mistake to brush off the effects of radiation and what happens to the human body when radiation alters your DNA and causes mutations, then causes tumors, then causes death. It happened to my husband...leukemia then lymphoma...cancer of the blood. Radiation causes cancer of the blood.

Your consultant , Ronald Price, Ph.D. is not a medical doctor and he stated in The Tennessean July 16, "We really do not have a choice of whether or not we will be exposed to radiation." We certainly should have a choice of whether we ingest radionuclides ..That is a huge concern. These could be in our future drinking water downstream from the landfill.. We do not want to ingest tritium, etc.

The BEIR VII report was disputed by a health physicist...M.A. from Ga. Tech....Bob Applebaum...very audacious to dispute the National Academy of Sciences....BEIR...meaning biological effects of ionizing radiation. It has long been known that there is no safe level of ionizing radiation

study BEIR VII Report

radiation. How can you all be so sure that 1 milirem of radiation does not hurt the human body? Because Eddie Nanney tells you so?????

There are different levels acceptable for different people....especially different ages of humans. Children 's bodies and cells are constantly changing and growing. The high numbers of leukemia cases near high-power electric lines..esp. substations...have caused regulations of building schools and houses to change. away from the high power lines. This is low-level radiation we are talking about. I learned this while fighting the DOE 20 years ago when The SSC , Super Ccnducting Super Collider was being planned for Tennessee.

Phil Bredesen (now TN. Gov.) agreed that the ground water was in jeopardy ! 1988

We think you should consult Dan Hirsch, Ph.D. in Santa Cruz, Univ.. of California re: some water tests that have been done here in Rutherford County. You should consult epidemiologists re: low level radiation. We feel like you are protecting the DOE, the nuclear industry, and BFI. Anyone here tonight from BFI?? Your committee , seems to be window dressing for TDEC,

We understand this a big CASH COW for TN. And we think that is why you are allowing this to happen....We want to know how much MONEY Tennessee has made accepting out-of-state ~~garbage~~ radioactive waste.

If low level radiation is so safe for people, why do the states of Ca., Mich., and Washington want to get it out of their states??????. S.C. is stopping it in 2008...interesting. Study Barnwell, S.C. and you might learn something.

Deputy Commissioner Paul Sloan said July 16...The Tennessean...your "committee is charged with reporting recommendations back to the General Assembly by Sept. 3." We hope you will use every minute of your time to study and do your homework!.

Thank you for listening.

Patricia Pelot Sanders,
Murfreesboro, TN. July 17, 2007



Patricia Sanders Pat
PO Box 1275
Murfreesboro, TN 37133-1275

Joyce Dunlap - Comments to SWAC from Citizens to ENDIT

From: "Kathleen Ferris" <k.r.ferris@comcast.net>
To: <Joyce.Dunlap@state.tn.us>
Date: 7/31/2007 4:29 PM
Subject: Comments to SWAC from Citizens to ENDIT
Attachments: Questions and comments from ENDIT to SWAC.doc

Ms. Dunlap, please find attached our group's input for the Municipal Solid Waste Advisory Committee. I will be sending Appendix B on a separate mailing.

Thank you,
Kathleen Ferris

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INTRODUCTION

To the Members of the Municipal Solid Waste Advisory Committee:

We would like to introduce ourselves. Our organization, Citizens to End Nuclear Dumping in Tennessee (or ENDIT) is based in Murfreesboro. The group organized after we learned that radioactive waste is being dumped in the Middle Point Landfill in Rutherford County, and also in four other landfills in Tennessee. Most of our members are parents, many of us mothers with young children; some of us are old parents with grandchildren. We are educated people, not nuclear scientists, but well enough educated to read and understand the problems associated with nuclear waste.

Our position is not simply one of "NOT IN MY BACKYARD". Because of the location of Middle Point Landfill on the Stones River, and because of the geology of the area, our position is: "Our backyard is one of the worst places in the country that you could have chosen to place hazardous or radioactive materials." Rutherford County is the home of a quarter of a million people and is growing at a rapid pace, and our drinking water supply is threatened. This poses a grave threat to our welfare.

Although our immediate concern is for our own county, we are also very much concerned about citizens throughout the state whose lives and health can be affected by the practice of using Tennessee as the dumping ground for low level radioactive or other hazardous materials. We are in the process of forming alliances with other environmental groups throughout the state, and we are circulating a petition which already has thousands of names and going strong. We plan to be around until this practice has ended.

As you ponder this topic, you should be aware that the Department of Energy is now holding hearings throughout the country in an attempt to raise the level of radioactive materials that can be considered "low-level." If we don't stop accepting this waste now, we will be getting worse waste in the future. It is time for the citizens of this country to realize that with more and more nuclear waste being produced every day, and with no good place to dispose of it, our health is more endangered by our weapons than by our enemies.

We have done extensive research on the topic in the short time that we have had to prepare this document, and we have put a great deal of time and thought into its composition. We hope that you will take the time to read it carefully and to consider our side of this argument, that you will recommend that the moratorium should be extended to the whole state and made permanent, and that the permit to expand Middle Point be rescinded because the people of Rutherford County were not fully briefed on what the expansion entailed

We would appreciate answers to our questions in writing.

Thank you,

Citizens to ENDIT

Kathleen Ferris, Co-founder
Patricia Sanders, Co-founder
David B. Hall, Treasurer

OUR CONCERNS ABOUT THE BSFR PROGRAM

- Why should Tennessee import low-level radioactive waste from throughout the USA? If it is safe, why is it necessary to ship it across country to us?

- TDEC has stated that it is common practice for other states to accept LLRW into municipal landfills. Why then is concrete and soil not deposited somewhere along the way between here and California, or Washington state, or Michigan or Connecticut? Are there no states willing to take it?

- How much economic benefit is there from the BSFR program? Who receives the benefit?

- Is the amount of money taken in by the state and county governments sufficient to put at risk the health and welfare of millions of Tennessee citizens?

- Is the main benefit of this program to the nuclear waste generators, to processors, and to landfill owners and operators? Should their interests take priority over the welfare of the citizens of Tennessee?

- We have learned that Tennessee gives several kinds of "FREE RELEASE" licenses, but only some are BSFR licenses. The other "free release" licenses remove nuclear materials from governmental control but the materials do not go to licensed landfills. Where do they go? To incinerators? To recyclers and then out for public consumption, without the knowledge of the consumer? To unlicensed landfills? Please be specific about the nature of those licenses.

- At the hearing in Murfreesboro on July 17, during the preliminary period for questions, Mike Apple told Kathleen Ferris, in the presence of Betsy Allgood, that no preliminary hearings were conducted in Rutherford County—or elsewhere—before the BSFR program was instituted. If we are mistaken in our understanding of Mr. Apple, we request that TDEC provide evidence of public hearings, their times and places, and evidence of advance notice given to the public.

- Who (by name and position) in the state government (TDEC) was responsible for signing off on the BSFR program? When precisely did the program begin? Who was governor at the time?

- Was any radioactive material dumped into Tennessee municipal landfills *before* the BSFR program was adopted? If so, from where and what and when?

- Is other "special waste" being dumped in Middle Point Landfill? Please give us a complete account of all other hazardous materials or chemicals or bio-hazardous waste that is being dumped there.

- After the BSFR program was adopted, what notification was given, in writing, to state legislators and local government officials in the communities most affected, that the state of Tennessee would be depositing radioactive waste in their municipal landfills? Our officials are telling us that they didn't know anything about it, so if they are not being candid with us, we would like evidence to that effect.

- In 2006, when hearings were held to consider the expansion of Middle Point Landfill, we understand that citizens were told that NO dumping of toxic waste would occur at the facility. Are we mistaken in assuming this to be true? Does TDEC have evidence that citizens <u>were</u> told about

the BSFR program and about low-level radioactive waste being dumped at Middle Point? Or of any other toxic waste being dumped there?

- The name of this program, Bulk Survey for Release, does not contain the word "radioactive" or "nuclear." Were those words purposely omitted so as not to garner public attention?

- Citizens to ENDIT asked TDEC for complete disclosure of the companies involved in generating radioactive waste that was being put in Middle Point Landfill. This included the originating source, the materials involved, and the measurement of radioactivity. In reply, Mr. Paul Sloan cited T.C.A. 68-202-217. This law states that information supplied to TDEC is defined as proprietary and is confidential. Why does Tennessee law protect the polluters instead of the people? Is TDEC helping the nuclear waste generators be excused from liability for the waste they generate?

- From its beginning, the BSFR program has been shrouded in secrecy. Why should information, even about firms long since closed, be considered proprietary? (For example, Quadrex and American Ecology Recycle Center.) The people of Rutherford County want to know what those companies processed and buried in Middle Point. How can we have confidence in our state government when such secrecy is practiced?

- Why does T.C.A. 68-202-217 supersede the Tennessee Open Records Law? What is so secretive that TDEC must protect it from public scrutiny with special laws? When records are marked "for official use only," as was the case when highly activated uranium was spilled in Erwin, TN, last year, the public realizes that something bad is being hidden.

- The first section of Tennessee's Sunshine Law, T.C.A. 8-44-101 (passed through the efforts of Rutherford County's distinguished representative, the late John Bragg) states:

> The general assembly hereby declares it to be the policy of this state that the formation of public policy and decisions is public business and shall not be conducted in secret.

Citizens to ENDIT believe that the entire BSFR program, from its inception until the sun shone on May 14, 2007, has been in violation of that law.

OUR CONCERNS ABOUT RADIATION

- TDEC has given repeated assurances that citizens of Rutherford County (and elsewhere in the state) will not be harmed by a miniscule dose of one millirem of radiation per year, and that we will receive no more than that amount from the BSFR program (even if our descendants become farmers and live on the dump). Because the Citizens to ENDIT have some knowledge about radiation, we reject these simplistic explanations.

- The measurement of a millirem is hypothetical, not measureable and verifiable. Furthermore, the computer formula by which that number was arrived at by the DOE, and paid for with taxpayers' dollars, is kept secret from the public. It has not been verified or validated. Does any person in TDEC or SWAC feel comfortable guaranteeing us that no person will receive more than one millirem of radiation per year? Would you stake your children's and grandchildren's lives on it? Can the state of Tennessee be certain that the private companies that are running this program will not exceed the limits set by the state, or try to evade them?

- The measurement of millirems is based on an estimate of the amount of radiation an adult male can absorb with little risk. The assumption is that each person is the same. Not true. Persons who have already been exposed to high levels of radiation (such as health care workers) might get cancer from just a little more. So might individuals with compromised immune systems. There is no known threshold. Young children, and especially unborn children, are at greater risk from low-level exposure to radiation, both for genetic damage and for cancer. Do you really want to add to this risk for the people of Tennessee? For the children of Tennessee?

- In 1972, a Canadian scientist Dr. Abram Petkau found in his research that the destructive efficiency of low-level radiation causes low-level exposure to result in damage to cells that is 1000 times worse than the damage caused by the same amount of radiation concentrated in a high level burst. From this discovery came what scientists call "the Petkau effect": that the amount of damage done by low-level exposure is dependent on the length of time living tissue spends in the radiation field, not on the relative radiation field strength. Does this fact not damage TDEC's model of the future farmer in Rutherford County living on Mt. Trashmore?

- TDEC would have us believe that naturally occurring radiation is all around us, and therefore it is safe. This is contradictory to what the National Academy of Sciences says in the BEIR VII report (2006) about the effects of ionizing (low-level) radiation:

  > A comprehensive review of the biology data led the committee to conclude that the risk would continue in a linear fashion at lower doses without a threshold and that the smallest dose has the potential to cause a small increase in risk to humans.

  Should SWAC accept the authority of the BEIR VII report, authored and reviewed by many of the nation's most distinguished scientists, who examine all available data objectively before reaching a conclusion, or of TDEC's hired scientists, whose jobs are at stake?

- Radiation from all sources, natural or man-made, ACCUMULATES in a person's body throughout a lifetime. We live in an area of the country where levels of radon gas are very high. Thus, we are already at risk for cancer from the radiation we take in from natural sources and from medical procedures. Why contribute further to the public's exposure to radiation by dumping man-made radioactive materials in our landfills?

- Another fact which TDEC has not taken into account is that radiation which is taken into the body through food or water or inhalation has far more damaging effects on living tissue than does radiation from an external source. Middle Point landfill is located just feet away from the Stones River, which provides the main source of drinking water for Rutherford County and which empties into Percy Priest Lake, also a major source of drinking water. [See Appendix A, photos showing proximity of landfill to river.]

- Who will clean up our water if it becomes contaminated? Will the city of Murfreesboro and the Consolidated Utility District receive monetary assistance from the state to upgrade our water treatment facilities so that radioactivity can be removed from our water?

- Geological studies of land under and around Middle Point show that the sub-strata of the area is limestone, honeycombed with caves and underground streams which will eventually carry the leachate from Middle Point not only into the river but also into ground water. Is it reasonable to add radioactivity to the problems of water pollution that we already face?

- The plastic liner of Middle Point Landfill has documented leaks. Have those leaks been repaired? Can they be repaired if they are buried under tons of garbage?

- Radioactivity has already been detected in leachate from the Middle Point landfill. How is the collected leachate treated? Is it sent to the sewage treatment facility? TCLP samples are not tested for radioactivity; therefore, isn't it possible that radioactive leachate may already have been processed through our water treatment facility without their or our knowledge?

- On the question of our leachate tests, I would like to quote an eminent environmentalist who has seen the results of those tests. Dan Hirsch is President of the Committee to Bridge the Gap, a Los Angeles-based public policy organization focused on nuclear questions, and he is the former Director of the Stevenson Program on Nuclear Policy at the University of California, Santa Cruz. This is his analysis of our tests:

  > Leachate from the Middle Point Landfill—one of those participating in the BSFR disposal program—measured 3395 picoCuries of gross beta radioactivity per liter of leachate, with an error margin of +/-286. . . . The standard Maximum Concentration Limit (MCL) in drinking water is 50pCi/L. By contrast, of fifty landfills sampled in California several years ago, none had gross beta levels in leachate anywhere approaching those levels. 42 of the 50 landfills tested in California had gross beta levels below the MCL. The highest value found for any of the 50 landfills in California was 450 pCi/L, *seven and a half times lower than the Middle Point Landfill leachate*. . . . [Italics mine. KF] (For his complete statement, see Appendix B.)

- One of the tests of Murfreesboro's drinking water has shown an elevated level of tritium, a radioactive isotope of hydrogen, which, if inhaled or ingested, is known to increase risk of cancer, birth defects, miscarriages and genetic abnormalities. According to the EPA website, "Its (tritium's) most significant use is as a component in the triggering mechanism in thermonuclear (fusion) weapons. Very large quantities of tritium are required for the maintenance of our nation's nuclear weapons capabilities."

- A letter from TDEC's laboratory in Lebanon to Murfreesboro's director of Water Quality Control states, "Note that the presence of tritium is becoming an issue of interest on the national level, thought to be due to the apparent disposal of tritium-containing self-luminous exit signs in municipal landfills, the leachate from which is commonly processed at waste water treatment

plants." One of TDEC's scientists at the July 5 meeting also stated that these signs are a source of radioactivity. Can TDEC prove that these signs are responsible for the tritium in our drinking water?

- Because Exit signs contain the radioactive substance tritium, it is a violation of the rules of the Nuclear Regulatory Commission to dispose of them in landfills. We want to know, how many such Exit signs have been disposed of in Middle Point Landfill? If these signs are indeed the source of tritium in our drinking water, why are they being disposed of illegally? If they are not the source, then are we getting debris from the nation's nuclear arms production? Whatever the sources of tritium in Middle Point, we want its dumping to cease.

- Is landfill gas being burned in flares at Middle Point to relieve pressure and prevent the possibility of an explosion? One problem with burning landfill gas is that it contains typically 40-60% methane, but it also includes other organic and inorganic compounds that get released into the atmosphere through combustion. Mercury and tritium are two non-organic substances that are not destroyed when burned. If tritium in the landfill is being burnt off at the landfill site, along with methane, then radioactive particles can become airborne. Possibly we are inhaling as well as ingesting tritium. Has the Green Switch program for collecting gas at Middle Point to produce energy ever been implemented? Has the air quality near Middle Point ever been tested?

- There is another problem of toxicity that could come from burning methane at the landfill. I will quote from a web source on this:

  > When halogenated chemicals (chemicals containing halogens—typically chlorine, fluorine, or bromine) are combusted in the presence of hydrocarbons [such as methane], they can recombine into *highly toxic compounds such as dioxins and furans, the most toxic chemicals ever studied.* [Italics mine.KF] Burning at high temperatures doesn't solve the problem as dioxins are formed at low temperatures and can be formed as the gases are cooling down after the combustion process. (www.energyjustice.net/1fg/)

  The only way to prevent this pollution is to remove toxic substances from the methane before it is burnt. Is this being done at Middle Point and other Tennessee municipal landfills?

- One of the "special waste" items that BSFR tells us is being placed in municipal landfills is called "ash." Is this ash the residue from incinerating radioactive materials in Oak Ridge? Is this ash from Oak Ridge being buried at Middle Point? At other municipal landfills in Tennessee?

- Dan Hirsch offers very good reasons why the BSFR practice--of using municipal landfills to store radioactive materials—should be ended:

  > There are many reasons for the general practice of putting radioactive waste in radioactive waste facilities and regular garbage in regular landfills: municipal landfills are not required to meet the siting, design, monitoring or operational requirements of licensed radioactive waste disposal facilities. . . . To give just two examples of reasons why: (1) The safety of disposal of radioactive materials is strongly influenced by the capacity of soil to retard migration of specific radionuclides. *Municipal garbage contains large amounts of organic complexing compounds that can dramatically increase the migration rates for radionuclides.*(2) Licensed radioactive waste disposal sites are required to conduct fairly extensive monitoring for radioactivity. Municipal landfills are not. [Italics mine. KF]

OUR CONCERNS ABOUT MONITORING

- We have been assured by TDEC that all radioactivity going into Middle Point Landfill is carefully monitored to keep the levels extremely low. Our question is, who does the monitoring?

- Does TDEC have anybody watching the processors, those private corporations bent on making money, as they separate out what is "safe" for us from what is not? Who monitors the processors? How? And how often? Is all monitoring done by reports, or are inspectors physically present?

- The second assurance TDEC has give us about the safety of Middle Point is the monitor placed at the gate of the landfill. Does a TDEC employee man that device, or is it manned by somebody employed by BFI? Who calibrates the monitor, and how often? Is this measuring done by BFI, a corporation with the reputation of being one of the worst polluters in the country?

- Citizens to ENDIT can think of many ways to fool such a monitoring device. The load of radioactive material is hauled in a truck with a metal body. This would block an accurate measurement, especially if it is lined with lead. How the material is placed in the truck, nearer to or further from the monitor, would determine how accurate the reading is. The speed of the truck through the monitoring area would affect the reading. Does TDEC ever physically inspect the trucks?

- What are the operating hours for Middle Point Landfill? When trucks enter the landfill during the middle of the night, as we know they do, who is monitoring? Or is the monitor turned off?

- Likewise for leachate samples, is BFI taking those samples? Where are they being taken? At how many sites? How often? What is being tested for? Are independent laboratories ever used to evaluate those samples? How frequently have these tests been performed over the last 10 years?

- The meters used for publicity (recently on televised news reports and newspapers) do not measure the radioactivity below the surface of the landfill. Furthermore, the meters must be held within inches of the material being tested and for an extended period of time. We question whether this is how the testing is being done at the Tennessee landfills receiving radioactive waste?

- At the July 17 meeting in Murfreesboro, an elderly gentleman who lives across from Middle Point Landfill told how before the May 14 broadcast by Demetria Kalodimos, he could not go out into his yard for more than a few minutes at a time because of the stench from the landfill. But after the news story, BFI covered up the garbage, and now he is able to enjoy going out into his yard. The waste is supposed to be covered immediately upon reception, but obviously this was not being done. Who was doing the inspecting?

CONCLUSION

In its opening section, the Tennessee Constitution states:

> That all power is inherent in the people, and all free governments are founded on their authority, and instituted for their peace, safety and happiness.

We ask that TDEC, the Solid Waste Advisory Committee and all branches of the government of Tennessee observe the state's Constitution.

APPENDIX A

Statement
Regarding Disposal of
Radioactive Wastes
in
Tennessee Municipal Landfills

by
Daniel Hirsch[1]
24 July 2007

A substantial policy issue is raised by the question of whether radioactive wastes should be disposed of in regular landfills neither designed nor licensed as radioactive waste disposal facilities. Radioactive wastes generally are restricted to disposal in special disposal sites constructed for that purpose and operating under nuclear licenses granted by the U.S. Nuclear Regulatory Commission (NRC) or Agreement States. Several times in past decades the NRC and/or the Environmental Protection Agency have proposed changing that policy and adopting a Below Regulatory Concern (BRC) Policy by which certain wastes could be disposed of in regular landfills. These proposals have not been adopted, or, when adopted by NRC, have been overturned by Congress – in part because of safety and environmental concerns. Occasional exceptions are permitted on a case-by-case basis, but the general policy remains in place: radioactive wastes should be disposed of in a radioactive waste disposal facility, not a regular landfill. Tennessee, however, has put in place its own BRC Policy, unbeknownst to much of the public; and controversy has now arisen with the revelation of the practice.

There are many reasons for the general practice of putting radioactive waste in radioactive waste facilities and regular garbage in regular landfills: municipal landfills are not required to meet the siting, design, monitoring or operational requirements of licensed radioactive waste disposal facilities. While one shouldn't overstate the protections afforded in a licensed radioactive site – I for one have been very critical of some of those requirements as insufficiently rigorous – one much prefers radioactive wastes to go to facilities designed to handle them. To give just two examples of reasons why: (1) The safety of disposal of radioactive materials is strongly influenced by the capacity of soil to retard migration of specific radionuclides. Municipal garbage contains large amounts of organic complexing compounds that can dramatically increase the migration rates for radionuclides. (2) Licensed radioactive waste disposal sites are required to conduct fairly extensive monitoring for radioactivity. Municipal landfills are not.

In response to concerns about revelations of disposal of radioactive wastes, some measurements of leachate at landfills have been recently made. These measurements are somewhat diversionary, as one already knows that radioactive wastes have been disposed of in the landfills part of the BSFR program; it is the propriety of that policy that should be the focus of attention.

Nonetheless, the data are interesting. Leachate from the Middle Point Landfill – one of those participating in the BSFR disposal program – measured 3395 picoCuries of gross beta radioactivity per liter of leachate, with an error margin of 286 (3395 +/- 286 pCi/L). The standard Maximum

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[1] Daniel Hirsch is President of the Committee to Bridge the Gap, a Los Angeles-based public policy organization focused on nuclear questions. He is the former Director of the Stevenson Program on Nuclear Policy at the University of California, Santa Cruz, where he will be a Lecturer in the fall teaching Introduction to Nuclear Policy. The views represented here are his own and do not necessarily represent those of either institution.

Concentration Limit (MCL) in drinking water is 50 pCi/L.[2] By contrast, of fifty landfills sampled in California several years ago, none had gross beta levels in leachate anywhere approaching those levels. 42 of the 50 landfills tested in California had gross beta levels below the MCL. The highest value found for any of the 50 landfills in California was 450 pCi/L, seven and a half times lower than the Middle Point Landfill leachate.[3] This is not dispositive, but nonetheless very interesting.

Regulators have pointed to potassium-40 as potentially responsible, given the large amounts of slag from Tennessee aluminum foundries disposed of as a special waste at the facility. And indeed, very high levels of potassium-40 are found at Middle Point, 2480 +/- 31 pCi/L, troubling in its own right. But there still remains about 915 pCi/L of gross beta activity that cannot be accounted for by focus on potassium-40 alone.

I have only briefly perused the additional measurements made of other landfills. The data are spotty, interesting but not fully conclusive. Very high error margins were generally reported, so the central value reported often has little meaning. A single sample is taken per landfill, when multiple samples, from different locations in the landfill, over a significant time period would be required to permit drawing conclusions that are statistically significant. But fundamentally, the idea of comparing some Tennessee landfills with others in the same state may not be all that useful, in that there is no indication that radioactive wastes have been excluded from any of the state's landfills. Some landfills may be part of the BSFR program (which primarily imports radioactive waste from out of state for "treatment" and then disposal in landfills within the state) while others aren't, but given the long presence of Department of Energy nuclear weapons facilities and TVA nuclear power facilities in the state, it is unclear which landfills have ended up over time receiving radioactive wastes.

My recommendation would be to focus on the future and address whether it is appropriate to continue permitting radioactive wastes to be disposed of in Tennessee landfills. In California, a moratorium has been in place for some years barring the disposal in municipal landfills of radioactive wastes from decommissioning nuclear and other radioactive facilities. It is up to those of you who live in Tennessee to determine if such a policy, or one a bit broader, is appropriate for your state.

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[2] If one exceeds the gross alpha or gross beta MCL, one is generally supposed to measure for specific radionuclides, which have their own individual MCLs.

[3] Note that the California landfills are not necessarily free of radioactive waste. The moratorium here is only a few years old. The California measurements were in fact triggered by reports that radioactive wastes had been disposed of in municipal landfills in the state.

Joyce Dunlap - Nuclear Waste in TN Landfills Comment

From: Harold One Feather <igmuskala@yahoo.com>
To: <joyce.dunlap@state.tn.us>
Date: 8/1/2007 2:11 AM
Subject: Nuclear Waste in TN Landfills Comment

Hello:

I like to make some comments about your issue with nuclear wastes being dumped into your landfills. It is wrong in so many ways that it borders on insanity. The communities near these landfills at Middle Point in Rutherford County, North Shelby in Shelby County, South Shelby in Shelby County, Carters Valley in Hawkins County and Chestnut Ridge in Anderson County should be given more time to discuss this issue through more public meetings.

thank you

Harold J. One Feather

Luggage? GPS? Comic books?
Check out fitting gifts for grads at Yahoo! Search.

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Toxco

Toxco Materials Management Center (TMMC)
109 Flint Road, Oak Ridge, TN 37830
Phone: 865-482-553 Fax: 865-482-5605

RECEIVED
AUG 01 2007
TENNESSEE DEPARTMENT OF ENVIRONMENT & CONSERVATION

July 30, 2007

TN Solid Waste Advisory Committee (SWAC)
TN Department of Environment and Conservation
8th Floor, L&C Tower
401 Church Street 37243-1535

Ref: Diane D'Arrigo, NIRS Letter to SWAC dated July 24, 2007

TN Solid Waste Advisory Committee Members:

The SWAC has been provided multiple comments and information from Diane D'Arrigo representing the Nuclear Information and Resource Service (NIRS) headquartered in Maryland. The NIRS states that its purpose is to inform the public about issues related to nuclear activities. Their information they provide to the public clearly projects the NIRS as an antinuclear organization. In Ms. D'Arrigo's letter to the SWAC dated July 24, 2007 she makes statements which are false and are felt to be misleading. Without factual information SWAC committee members could think that what Ms. D'Arrigo is saying is factual. We take this opportunity to address Ms. D'Arrigo's and NIRS's statements with facts that are not vague or misleading like much of the information contained in Ms. D'Arrigo's letter which is attached.

NIRS Statement – The letter begins with the following regard - "RE: Your study of radioactive waste going to unregulated disposal in TN."
FACT – Ms D'Arrigo's statement is false. The BSFR disposal program sends material to processors and disposal sites that are regulated by the Tennessee Department of Environment and Conservation (TDEC) including authority granted by the Nuclear Regulatory Commission (NRC).

NIRS Statements – In the paragraph titled YOUR CHARGE, Ms D'Arrigo presents no factual information. What Ms. D'Arrigo presents are questions without answers. Most questions are grammatically structured to inject fear into the members of the committee.
FACT – Your charge comes from the Tennessee legislature, not the NIRS.

NIRS Statement – In the section titled "WHAT IS SO-CALLED "LOW-LEVEL" RADIOACTIVE WASTE", Ms D'Arrigo presents the classical definition of Low-Level waste which is accurate.
FACT – Ms. D'Arrigo fails to include factual information that this definition she presents does not accurately define the material processed through BSFR. The material processed through BSFR is the lowest level within this very large definition of Low-Level Waste. The BSFR material is referred to in the industry as Very Low-Level waste. All Low-Level radioactive waste can not be eligible for processing through BSFR.

NIRS Statement – **"..** the newly created category of very low level radioactive waste (an effort to deregulate waste without public knowledge) can also have these same long-lasting, biologically active radioactive elements such as plutonium, cesium, strontium and radioiodines, just in lower concentrations.
FACT – The definition of BSFR material and very low-level radioactive waste is not new and has been in the industry for approximately 20 years. The definition of Very Low-Level radioactive waste is not an effort to deregulate waste without public knowledge as it is well known in the industry. **Very Low-Level waste being processed through BSFR is regulated** and will continue to be regardless of the decision of the SWAC. Very low-level radioactive waste will remain regulated until the United States Nuclear Regulatory Commission changes the rules. Ms D'Arrigo is correct that BSFR material can contain specific

radionuclides however she does not include that the BSFR regulations state those radionuclides that are excluded and states the concentrations of the radionuclides that can be included in order to protect the public from excessive and unsafe quantities of material.

NIRS Statement – "The NRC has begun exploiting a loophole in its own regulations for alternative methods of disposal (10CFR20.2002) which TDEC is not using to justify removing control over radioactive waste."
FACT – Ms. D'Arrigo's statement is false. The NRC regulation 10CFR20.2002 is not a loophole. It is an approved regulation of the US NRC. TDEC is now using 10CFR20.2002 to remove control over radioactive waste as all material processed through BSFR is regulated now and will continue to be regulated regardless of the SWAC recommendation.

NIRS Statement – "Over a dozen states passed laws or regulations requiring continued regulatory control over nuclear waste even if the federal government or other states deregulate or declare it below regulatory concern. It is still a regulatory concern in those states."
FACT – Material processed through the BSFR program in the state of Tennessee is regulated even though the levels of radioactivity present in the material are below regulatory concern.

NIRS Statement - "why add to the 100 or 300 or 360 millirems government agencies calculate we receive annually? If the addition is, as TEDEC reported to you at a previous meeting, lost in the fluctuation or natural variation of background levels, how can they be so sure it really as low as they are claiming? Comment – the grammar remains as quoted in order to accurately state what is contained in the letter.
FACT - The BSFR program contains specific controls, analysis, and instrumentation requirements etc. that assure that the material processed through BSFR is as low as they are claiming. The fact is that TDEC can be assured by the monitors that exist at the processors, the monitors that exist at the landfills, and the programs that are routinely inspected by qualified personnel from TDEC.

NIRS Statement – "Tennessee allows nuclear waste processors to bring in large amounts of nuclear waste from .....That amount is likely to increase in the years to come ... This should be considered in planning for future amounts of nuclear waste expected at Middle Point and all of Tennessee landfills."
FACT - The fact is that the quantity of material processed through BSFR in the state of Tennessee by all processors and at all landfills is regulated and controlled by TDEC and can not increase beyond the percentages stated for each landfill. An increase in production of radioactive waste in the world will not have any effect on what is authorized in the regulations of the BSFR program. TDEC has adequately planned for this from the inception of the BSFR program.

NIRS Statement – "A MILLIREM CANNOT BE MEASURED, VERIFIED OR ENFORCED.
FACT – Ms D'Arrigo's statement is false. A millirem is an internationally established standard unit of measurement of radioactivity and is measured, verified and enforced every day of every year. A microrem is a standard unit of measurement that is $1{,}000^{th}$ of a millirem and is also measured, verified and enforced every day of every year. Toxco uses Global Dosimetry Solutions to monitor our employees and dose to the public at our fence line by using thermo luminescent dosimeters (TLDs). The TLDs are sent to a federally accredited laboratory every quarter. Any radiation dose less than 7 mrem/quarter is so low that it is considered 0 mrem. If waste processors, hospitals, laboratories and nuclear power plants all understand the inconsequentiality of a few mrem exposure, how can Ms D'Arrigo has no facts to support her claim 1 mrem/year is harmful.

NIRS Statement – "How can the 5 landfills taking nuclear BSFR waste show that they are only dosing members of the public with one millirem a year? They can't.
FACT – Ms. D'Arrigo's statement is false. The 5 landfills can insure that the dose to be public from the material processors send them is within one millirem a year because of the instrumentation used at the landfill and by the processors, the laboratory analysis conducted on the material by the processors as part of the BSFR certification, and the TDEC inspected and certified processor program for qualifying material. All BSFR material inspection and certification is completed prior to shipping the material to the landfill. Then, at the landfill a final check is made by independent instrumentation located there.

NIRS Statement – "They can run elaborate computer analysis with dozens of questionable assumptions and secret equations underlying those assumptions to claim that a millirem a year is the most anyone will receive, but a millirem cannot be measured-only calculated-and the calculations are being done by those generating the waste and permitting its disposal, both benefiting economically from the practices. .... And we have no way to know the calculations are correct.
FACT - Ms. D'Arrigo's statements are false. As discussed earlier, a millirem can be measured as well as calculated. The assumptions used in the computer analysis are not questionable or secret as they have all received multiple levels of peer review. The computer analysis is a record presented to TDEC for certification and anyone can actually go to school to learn everything that is present in the computer analysis. TDEC has personnel who have attended these classes to read and analyze the calculations. There is no secrecy in any of the BSFR analysis. Ms D'Arrigo and the NIRS may question the equations which is their right.

NIRS Statement – "The RESRAD Computer Code – the code that is used to project the doses from given amounts of radioactivity buried in a landfill – has NOT been verified or validated, despite the assertion made by TDEC staff on July 5, 2007."
FACT – The RESRAD and RESRAD-BUILD codes are part of the RESRAD family of codes developed by the U.S. Department of Energy. For many years, these deterministic codes have been used as dose assessment tools for cleanup of sites contaminated with radioactive materials. The RESRAD code applies to the cleanup of soils, and the RESRAD-BUILD code applies to the cleanup of buildings, structures, and related debris that will be dispositioned. The code has been improved over the years and receives peer review for verification and validation. TDEC has personnel who are certified to read and analyze the calculations from RESRAD.

NIRS Statement – Regarding RESRAD - "The underlying equations used by the code have been kept secret. The public has not been permitted to review them, despite requests from technically independent and competent researchers".
FACT – Anyone can request to go to class to learn about RESRAD and be certified to use it. TDEC has personnel who are certified to read and analyze the calculations from RESRAD.

NIRS Statement – "radioactive waste is being removed from controls and deliberately dispersed to unregulated or controlled destinations...landfills, incinerators, recycling into consumer goods, reuse via sales or donation, without warning."
FACT – This NIRS statement does not apply to BSFR material and is misleading to the committee. Material processed through the BSFR program is regulated and controlled and is not dispersed to uncontrolled destinations. BSFR material does not go to incinerators, nor is it recycled into consumer goods, sold or donated. All recipients of BSFR material hold license to receive the material. All BSFR material recipients are notified (warned) about the BSFR material prior to receiving it and have the authority to decline receipt of the BSFR material if they choose to do so.

NIRS Statement – "In addition, we now understand that there are other "license approved sampling protocols" that may be used to allow radioactive asphalt and concrete to go to a landfill – protocols not listed as BSFR. The question arises then about whether TDEC allows nuclear waste into other landfills not listed as taking BSFR under other mechanisms ... how many and how much?
FACT – All BSFR material shipped to a waste processor must be shipped from a generator under a Tennessee License for Delivery. Generators must also have a Radioactive Materials License. Material processed under BSFR, by regulation, is never received by anyone who does not have a radioactive materials license authorizing the receipt of radioactive materials. By regulation, the BSFR material can only go to one of the 5 landfills authorized and regulated to receive the BSFR material.

NIRS Statement – "Finally we support an extension on the public comment period so members of the affected public just learning about the issue can provide input. The waste generators and waste disposal facilities had time and an extension on their comment period to comment on the BSFR program but the general public was not afforded that opportunity.
FACT – The generators and waste processors have had the same amount of time to comment on the BSFR program and the issues that have been raised as the general public.

NIRS Statement – "The other Free Releases of radioactive wastes and materials must result in their going to places other than landfills…raising interesting questions about their destinations-Incinerators? Recyclers? Reuse? Are the recipients notified? Are they used to make consumer goods or generate other nuclear wastes that end up in landfills?"
FACT - Recycling, Reuse, and Disposal of very low-level radioactively contaminated material from a Radioactive Environment happens every day under approved regulations and controls in virtually every country in the world. Hundreds of processors in the United States and thousands in the world decontaminate these materials for reuse and recycle every day. In the United States it is regulated under Nuclear Regulatory Guide 1.86 which allows release only of material with surface contamination. In the United States there is no authorized level of release for material that is volumetrically contaminated. Most every other country in the world, other than the United States, is regulated by standards of the International Atomic Energy Agency (IAEA). The IAEA does allow releases of very low-level volumetric and surface contaminated materials. Every product that is imported into the United States has the distinct possibility of containing material with very low-levels of radioactive contamination that the IAEA has determined to be safe to the public. When United States residents are finished with these imported materials we, bury them in landfills, resell them to others, burn them in trash, recycle the materials etc. etc. This is a fact of life that every resident of the United States and the world lives with every day of their life and it can not be reversed but it can be controlled in the United States with programs such as BSFR.

Sincerely,



David S. Eaker
Vice President, Metals
Toxco Inc.

Cc: Terry S. Adams, Toxco President
Mike Apple, State of Tennessee
Eddie Nanney, State of Tennessee
Jim Fyke, State of Tennessee
Wayne K. Scharber, Tennessee Chamber of Commerce

Date: July 24, 2007

Memo to: Members of the TDEC Solid Waste Advisory Committee

From: Diane D'Arrigo, Nuclear Information and Resource Service, coauthor of Out of Control – On Purpose: The DOE's Dispersal of Radioactive Waste into Landfills and Consumer Products; dianed@nirs.org; 301-270-6477 x 16.

RE: Your study of radioactive waste going to unregulated disposal in TN

YOUR CHARGE is to advise on whether to continue the moratorium on radioactive materials or resume disposing of them in the Middle Point landfill. It makes sense to consider this same question for all the state's landfills including the other 4- Carters Valley, Chestnut Ridge, North and South Shelby- that have also been receiving radioactive wastes from nuclear power and related industries. How much economic benefit is there and who receives that benefit? The nuclear waste generators and processors? How much do the landfill operators and communities benefit? What if the predictions are wrong and radioactivity mixes with solvents and other hazardous materials leaking from many landfills? Who pays the price? Who is liable if the state has willingly accepted these wastes? Is TDEC helping the nuclear waste generators be excused from liability for the waste they generate? What are the synergistic effects and accelerated migration dangers of radioactive wastes in solid waste landfills where solvents and other special wastes are disposed? Can all of the necessary questions be answered in less than 60 days? Are there members of this panel with pre-existing positions favoring nuclear waste deregulation or free release? What level of objectivity will you require of your contractor?

WHAT IS SO-CALLED "LOW-LEVEL" RADIOACTIVE WASTE?

The definition of "Low-Level" Radioactive Waste essentially includes all radioactive waste generated that is not high level radioactive waste (defined as irradiated fuel, liquid and sludge from reprocessing and the solid to which that is converted). The same radioactive elements are in high level and so-called "low-level" radioactive waste and the newly created category of very low level radioactive waste (an effort to deregulate waste without public knowledge) can also have these same long-lasting, biologically active radioactive elements such as plutonium, cesium, strontium and radioiodines, just in lower concentrations. True there is not legally a lower cutoff but there need not be. In fact federal agencies have tried for decades to choose a lower cutoff level but the public and landfill, metal and nuclear workers, some local and state governments oppose such releases of nuclear waste. Congress revoked the Nuclear Regulatory Commission's (NRC) policies that would have declared some radioactive waste "below regulatory control" and has delayed or cancelled at least two or three rulemakings on setting that level since. The Environmental Protection Agency (EPA) has several times considered and retreated from setting levels for recycling radioactive metal and other materials into commerce and on sending nuclear waste to solid and hazardous waste landfills. At the behest of the nuclear power industry, the NRC has begun exploiting a loophole in its own

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regulations for alternative methods of disposal (10 CFR 20.2002), which TDEC is now using to justify removing control over radioactive wastes. Both NRC and TDEC have been permitting dispersal of radioactive wastes without public knowledge or scrutiny.

Over a dozen states passed laws or regulations requiring continued regulatory control over nuclear waste even if the federal government or other states deregulate or declare it below regulatory concern. It is still a regulatory concern in those states.

The radioactivity generated by nuclear power, weapons and the fuel chain to produce them is not natural—it is industrial and government radioactive waste (some of the radionuclides produced never existed on Earth until splitting of the atom) and needs to be isolated as such. Simply because some ionizing radioactivity already exists in nature or was released from nuclear activities in the past at similar levels or concentrations does not justify *unnecessary* addition of radioactivity into the environment, water or air via landfills or other mechanisms. The radioactivity generated and being dumped in Tennessee landfills includes some very long-lasting radionuclides such as plutonium 239 which will be radiologically dangerous for a quarter to a half million years. Strontium 90 and Cesium 137 remain hazardous for 300 to 600 years, well beyond the life expectancy of any landfill liner. Some of these manmade radionuclides are more biologically active and dangerous than some of the naturally occurring radionuclides.

Naturally occurring radioactive materials can pose health risks thus releasing man-made radioactive materials at equal or portions of those levels are not justified. It only compounds the truly unavoidable risks from naturally occurring radioactivity. According to the risks numbers of the National Academy of Sciences and US EPA 1 in 50 of us will get cancer due to existing background radiation over our lifetimes. So why add to the 100 or 300 or 360 millirems government agencies calculate we receive annually? If the addition is, as TDEC reported to you at a previous meeting, lost in the fluctuation or natural variation of background levels, how can they be so sure it really as low as they are claiming?

Tennessee allows nuclear waste processors to bring in large amounts of nuclear waste from nuclear power and weapons facilities across the country and some from international sources. That amount is likely to increase in the years to come, especially in mid-2008 when the nuclear waste site at Barnwell, South Carolina stops taking radioactive waste from outside its compact (nuclear waste generators in SC, NJ and CT). TDEC-licensed processors could receive even more waste to process and disperse or dilute to facilities without radioactive licenses such as the landfills. This should be considered in planning for future amounts of nuclear waste expected at Middle Point and all of the Tennessee landfills.

A MILLIREM CANNOT BE MEASURED, VERIFIED OR ENFORCED

How do the 5 landfills taking nuclear BSFR waste show that they are only dosing members of the public with one millirem a year? They can't. They can run elaborate computer analysis with dozens of questionable assumptions and secret equations

underlying those assumptions to claim that a millirem a year is the most anyone will receive, but a millirem cannot be measured—only calculated –and the calculations are being done by those generating the waste and permitting its disposal, both benefiting economically from the practice. Furthermore the claim is made that more and more radioactive loads can be disposed and the landfill still will give off only one millirem year. The calculations have been done in the past to permit each contract to give a millirem but then we are told that multiple contracts will not increase in the dose to members of the public now or in the future. Sure some of the assumptions are cautious but others are not. And we have no way to know the calculations are correct.

RESRAD CODE DOES NOT GUARANTEE SET DOSES
NO EVIDENCE IT HAS BEEN VALIDATED OR VERIFIED

Validation means the numbers and calculations in the code are correct or valid. Verification means showing that the projected doses and dose rates are what people really receive.

The RESRAD Computer Code —the code that is used to project the doses from given amounts of radioactivity buried in a landfill– has NOT been verified or validated, despite this assertion made by TDEC staff on July 5, 2007.

This committee should obtain, review and make public the documentation of any and all verification and validation that have been done for the RESRAD code for BURIAL of radioactive waste. Our research and direct request for this information from the developers of the computer code have revealed no verification or validation as of May 2007.

There WERE efforts to verify the RESRAD RECYCLE Computer Code, a different code that is used to allow recycling of radioactive metal into everyday consumer goods but it was not carried out for buried radioactive waste. In addition, its conclusions were highly questionable.

UNDERLYING EQUATIONS ARE SECRET DESPITE TAXPAYER FUNDING

The RESRAD Code was developed using US tax dollars by DOE Argonne Labs specifically to give the impression that calculation of radiation doses was possible at sites where nuclear waste was left in place, where contaminated property was released for reuse or where radioactive waste was disposed in regular landfills. The underlying equations used by the code have been kept secret. The public has not been permitted to review them, despite requests from technically independent and competent researchers.

TENNESSEE GIVES SEVERAL "FREE RELEASE" LICENSES BUT ONLY A FEW ARE BSFR. The other Free Release licenses remove nuclear materials from control but not to landfills. This is a correction on NIRS original description of BSFR in our report.

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A major concern raised in our report, "Out of Control – On Purpose" [http://www.nirs.org/radwaste/outofcontrol/outofcontrolreport.pdf] is that radioactive waste is being removed from controls and deliberately dispersed to unregulated or controlled destinations…landfills, incinerators, recycling into consumer goods, reuse via sales or donation, without warning.

TDEC Division of Radiological Health gives over two dozen kinds of radioactive materials licenses and several of those are for "Free Release" of radioactive materials as if not radioactive. These include:
-Decontamination for Free Release
-Survey for Free Release using Regulatory Guide 1.86 (surface contamination levels)
-Volumetric Free Release
-Free Release of Lead
-Free Release of Soil and Other Bulk Materials
-Free Release of Equipment
-Free Release of Concrete and Asphalt

We inadvertently identified all of these Free Release license types as Bulk Survey for Free Release BSFR in the report but upon later clarification we have been notified by TDEC that NOT ALL FREE RELEASE licenses are in the BSFR category. The other free release licenses are being issued but they are not called BSFR.

BSFR includes only Free Release to Landfills so it includes:

-Volumetric Free Release (to landfills)
-Free Release of Soil and Other Bulk Materials
-Free Release of Concrete and Asphalt

The other Free Releases of radioactive wastes and materials must result in their going to places other than landfills…raising interesting questions about their destinations—Incinerators? Recyclers? Reuse? Are recipients notified? Are they used to make consumer goods or generate other nuclear wastes that end up in landfills?

In addition, we now understand that there are other "license approved sampling protocols" that may be used to allow radioactive asphalt and concrete to go to a landfill – protocols not listed as BSFR. The question arises then about whether TDEC allows nuclear waste into other landfills not listed as taking BSFR under other mechanisms…how many and how much?

We maintain our concerns about Tennessee Department of Environment and Conservation's role in free releasing nuclear waste to unregulated destinations especially those identified as receiving it and encourage the committee to fully evaluate the issue, make the moratorium permanent and expand it to all the landfills and solid waste facilities in the state.

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Finally we support an extension on the public comment period so members of the affected public just learning about the issue can provide input. The waste generators and waste disposal facilities had time and an extension on their comment period to comment on the BSFR program but the general public was not afforded that opportunity.

Nuclear Information and Resource Service would be glad to provide further information, clarification and references upon request of the committee.

REV-R



Toxco

Toxco Materials Management Center (TMMC)
109 Flint Road, Oak Ridge, TN 37830
Phone: 865-482-553 Fax: 865-482-5605

July 31, 2007



TN Solid Waste Advisory Committee
c/o Joyce Dunlap
TN Department of Environment and Conservation
8th Floor, L&C Tower
401 Church Street 37243-1535

TN Solid Waste Advisory Committee Members:

Toxco Inc. is a small business in the state of Tennessee that provides waste management services to companies that utilize radioactive materials. Toxco is one of four waste processors authorized to utilize the Bulk Survey For Release (BSFR) program. Toxco Inc. presents the information contained in this letter for use by the Tennessee Solid Waste Advisory Committee concerning the Committee's evaluation of Tennessee's Bulk Survey For Release (BSFR) Program at the Middle Point Landfill. The information provided relate to the BSFR program regardless of which of the five authorized landfills that are being used. Fact and scientific evidence should prevail over perception however; we understand that this is not always the case.

Your recommendation is not an easy one as the United States radioactive material industry, not just the state of Tennessee, will be affected by Tennessee's BSFR decision. What is decided in Tennessee will have national effects. The public, economy, environment and business sectors of many states will be affected by Tennessee's BSFR decision. The national scope of your decision is real and will be briefly explained in this letter.

The committee must decide if the BSFR program will be allowed to continue to provide a much needed service within Tennessee and the United States. There are four specific major issues surrounding the questions and concerns that have suddenly been raised about the BSFR program. One must look at all four of those issues in order to make an informed decision about the overall program. The issues are:

1. Public safety
2. Regulatory Compliance
3. Environment and Conservation
4. Business and Economics

This letter will address each issue below.

Public Safety

Does the material processed through the BSFR program present a risk to the public that is greater than the risk presented by all other materials going to Tennessee's solid waste landfills? Toxco submits that the BSFR material presents no greater risk, likely less risk, to the public than hazardous materials that go to any of the landfills in Tennessee from other industries, processes, and homes.

It is comforting to the public that the Class I landfills receiving BSFR materials are monitored by the state for compliance and have on site detection equipment and programs to prevent non complaint BSFR material from entering the landfill. Each of the 5 BSFR landfills is equipped with radiation detection instrumentation to assure the public that unauthorized material is rejected immediately and not processed at the landfill. Throughout the United States landfills are accepting similar materials without such monitoring instrumentation and licensing control by states. From a Tennessee resident's household one could dispose of radioactive material and not be caught because monitoring is not always present at non BSFR approved landfills.

Information relating to public safety in the nuclear industry has long suffered from a lack of public education. The nuclear industry has not done a good job in educating the public about their operations.

You have received comments from the public, regulatory groups, anti-nuclear groups, special interest groups and others. Toxco simply states that we do not support any information that is presented to your committee that is not based upon factual information related specifically to the type of material processed under the BSFR program. Not all nuclear material is the same and therefore does not present the same hazards. Non-factual statements about radioactive material in general, emotional pleadings, misleading unrelated information etc. should be considered by the committee as nonfactual. General emotional fearful statements presented by people and groups are a concern for the individual or group and serve the individual or group cause however do not normally represent the opinions of what is known as the "Silent Majority". The "Silent Majority" normally do not come to these meetings with pleadings which is not ideal for your committee's evaluation process. Factual information relating to the specific material processed under the BSFR program is what must be considered in making the committee's recommendation.

Toxco totally supports the Tennessee Division of Radiological Health (TDRH) and agrees with the information that has been presented by this organization. The information TDRH presented is factual, educational and supports the fact that this material does not present an unmanageable or significant hazard to the public. The other hazardous materials going to these licensed Class I or lower level landfills can present more hazard to public safety than all of the material disposed of under the BSFR program. Environmental Protection Agency and Nuclear Regulatory Commission reports can confirm this.

Regulatory Compliance

Is the BSFR program compliant with the laws of the United States and the State of Tennessee? Toxco submits that the BSFR Program is legally compliant with the laws of the United States, the Nuclear Regulatory Commission, and the State of Tennessee therefore is authorized to exist and function.

The following statements are provided as proof that the BSFR program is and has operated legally and within the laws of the United States and Tennessee.

- The BSFR program is authorized under United States and State of Tennessee law. The material processed under this program has been handled and disposed of legally in accordance with all federal and state regulatory requirements. **The BSFR program is not a "loophole".**
- TDRH has done a commendable job of regulating the BSFR program in the State of Tennessee with the resources they have been provided.

- The United States Regulatory Commission (NRC) operates a similar very low-level radioactive material disposal program that is project specific rather than specific to a type of material like the BSFR Program. The NRC program allows disposal of radioactive material in Class I landfills where the level of radioactive contamination is significantly higher than what is allowed under the BSFR program.

Environment and Conservation

Does the BSFR program have a negative effect on the Tennessee environment and conservation of Tennessee's resources as well as the environment and conservation of the United States. Toxco submits that the BSFR material presents no greater risk, likely less risk, to the Tennessee and United States environment than hazardous materials that go to any of the landfills in Tennessee or the United States from other industries, processes, and homes.

The following information points are submitted:

- The very low level of radioactivity of material processed through the BSFR program presents no greater negative risk to the Tennessee environment than the other materials disposed of in the states landfills.
- The greatest damage to the Tennessee environment from landfill disposal comes from every Tennessee citizen who disposes of pesticides, lawn chemicals, electronics, batteries, etc. from their homes every day. These materials go to landfills other than a Class I permitted landfills.
- Disposing of the very low level radioactive material in a Class I landfill conserves valuable space for the material with higher radioactive levels in the only active open landfill in the United States who receives this material (Energy Solutions at Clive Utah). The life of the Energy Solutions landfill at Clive Utah can therefore be extended and used for the higher radioactive material differing the time or possibly the need to create another such landfill in the United States.
- Without a BSFR disposal program in Tennessee the illegal disposal of very low level radioactive materials will likely increase causing Tennessee, and other state regulatory agencies to be involved in more cleanup. The cost for this cleanup will be passed on to the taxpayer.
- All or by far the majority of material now processed through BSFR will go to the Energy Solutions facility in Clive Utah. The amount of material produced will not be effected by the Tennessee BSFR decision.
- With the BSFR Program and the State of Tennessee Department of Environment and Conservation has "stepped up" as a leader to establish a conservative and safe program for disposal of very low level radioactive waste. This program should be a model for other states and Compacts who are charged by Congress with the responsibility to dispose of all low-level radioactive materials.
- It is not likely that any new company or state would come along to replace the BSFR program as it takes years for a new company or state to get involved in this business sector. The quickest way to grow in this business sector is through company acquisitions.

Business & Economics

The United States radioactive material industry, not just the state of Tennessee, will be affected by Tennessee's BSFR decision. What is decided in Tennessee will have national effects. One can easily ascertain that it was business that started the BSFR concerns in Tennessee from the start and not public safety or the environment.

The United States radioactive waste industry and business is a fragile marketplace. The business operations and rules are complex, regulated by federal and state agencies, and it takes many years for anyone to enter this industry. Tennessee businesses and the Tennessee economy will be affected by the committee's recommendation and Tennessee's BSFR decision.

Effects In Tennessee:

- Tennessee Revenue:
  - Tennessee will lose hundreds of thousands of dollars in revenue from a tax of $0.015 per pound for BSFR material which passes through one of the four radioactive waste processors
  - Tennessee will loose business taxes from a decline in Tennessee business activities for the four licensed Tennessee processors with the revenue going to Utah
  - Tennessee business revenue would move from Tennessee to Utah.
- Tennessee Jobs
  - The job loss can be estimated to be in the range of fifty to one hundred jobs losses to primarily the state of Utah
  - Tennessee State employees who control and oversee the BSFR program could loose their jobs
- Tennessee Businesses
  - Some Tennessee waste processors will likely go out of business and cease to exist and/or operate in the state of Tennessee
  - Tennessee waste disposal companies operating the landfills will loose revenue from the fees they charge the processors to dispose of the BSFR material
  - Three of the four Tennessee processors would suffer a significant decline in revenue and business. The fourth Tennessee processor, Energy Solutions, would receive a significant increase in their Utah facility revenue through increased volumes at higher disposal costs.

Effects In The United States:

- The public must bear the cost to handle, process, and dispose of very low level radioactive contaminated waste as it is passed on in utility rates, taxes, etc. The cost to the public for handling, processing and disposing of this very low level radioactive waste will increase by more than a factor of ten, based on current rates for BSFR vs. Energy Solutions Clive Utah rates.
- Radioactive waste processors will have to go through expensive and very long lead times to get NRC approval (10CFR20.2002) to dispose of the material anywhere other than Energy Solutions in Utah.
- Illegal disposal of very low level radioactive materials will likely increase causing state and federal regulatory agencies to be involved in more cleanup and this cost will be passed on to the taxpayer.
- The Energy Solutions Clive Utah facility will receive significantly more material which will significantly increase their profits.

Precedent Setting

Decisions set precedents to be carried over into other related activities. The recommendation made by this committee is sure to set such a precedent that would have effects on other Tennessee programs and United States programs. The Tennessee BSFR program is a scientifically valid peer reviewed program providing economic and environmental progress to the state and country. The program is authorized under the laws of the United States and the State of Tennessee. The program is regulatory compliant. If the BSFR program is recommended to be stopped by this committee it will appear to be a decision based upon the minority of people in Tennessee and based upon input from interest groups not located in the state of Tennessee.

One must ask and consider why this disturbance over Tennessee's BSFR program has surfaced in what appears to be an orchestrated manner. The BSFR program has operated in compliance with all laws and regulations in a safe manner for over twenty years. Why did these interest groups descend upon Tennessee? If the BSFR material does not come here it will just go somewhere else.

Toxco hopes that your consideration of the information presented in this letter will result in a recommendation to continue the BSFR program as a fundamentally sound, peer reviewed disposal option allowed under Federal and State statutes. You may consider offering improvements to the BSFR program as no program is perfect. Improvements can likely be made but Toxco does not feel that it is in the best interest of the state of Tennessee or the United States to stop the BSFR program.

You may determine that additional reviews are necessary. If this is your decision, please do not extend the moratorium on shipments to Middle Point or the other landfills. If you extend the moratorium you will in effect be killing the program and putting Tennesseans out of work and companies out of business. Reviews and possible improvements to the BSFR program can be conducted while the BSFR business continues as it has been proven that the BSFR program and material does not have a significant negative effect on the public or the environment.

Thank you for taking your time to read this letter. If there is anything our company can do or additional information or assistance we can provide.

Sincerely,

David S. Eaker
Vice President, Metals
Toxco Inc.

Cc: Terry S. Adams, Toxco President
Mike Apple, State of Tennessee
Eddie Nanney, State of Tennessee
Jim Fyke, State of Tennessee
Wayne K. Scharber, Tennessee Chamber of Commerce

Joyce Dunlap - Nuclear Waste

From: "Bugs" <brawny@twlakes.net>
To: <joyce.dunlap@state.tn.us>
Date: 8/1/2007 8:22 AM
Subject: Nuclear Waste

I Live In Livingston,Tn. between Oak Ridge and Murfreesboro .
I do not want any more Nuclear Waste Dumped anywhere in Tennessee.
I have lost several members of my family to cancer, and many think ,it is in part of the Nuclear waste in our state.

I VOTE NO MORE NUCLEAR WASTE IN TENNESSEE..

B.E.Meadows
Livingston,Tn.38570

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Joyce Dunlap - BSFR Comments

From: "Chuck Jensen" <cjensen@dts9000.com>
To: <Joyce.Dunlap@state.tn.us>
Date: 8/1/2007 12:47 PM
Subject: BSFR Comments
Attachments: 1TN Solid Waste Advisory Committee.doc

Ms. Dunlap,

Attached are comments on the BSFR program and its value to the industry and general public. I would be pleased if you would accept and incorporate my comments in the public recored

Regards,
Chuck Jensen

Diversified Technologies
2680 Westcott Blvd
Knoxville, TN 37931
Phn: 865-539-9000 x100
Cell: 865-406-9001
Fax: 865-539-9001
cjensen@dts9000.com

<<1TN Solid Waste Advisory Committee.doc>>

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DIVERSIFIED TECHNOLOGIES SERVICES
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August 1, 2007

TN Solid Waste Advisory Committee:

As President of Diversified Technologies Services, I have worked in the nuclear industry for over 30 years, particularly in the area of waste management. With this background, I am convinced that the BSFR program has great value, in that it sharply reduces the costs – financial and otherwise -- of disposing of clean materials from healthcare facilities and nuclear power plants.

The outcome of a nearly 20-year development effort, the BSFR program defines an effective pathway for disposal of clean wastes. It establishes safeguards to ensure that only clean, compliant waste materials are disposed of in permitted landfills, while all materials with significant contamination to go licensed radioactive burial sites.

The financial savings from avoiding disposal of clean materials in a radioactive burial site accrue to each consumer, medical patient, stockholder and ratepayer, in the form of lower electrical rates and reduced medical costs.

Less obvious, but no less important, is the favorable impact of the BSFR program on public health and safety. By eliminating multiple long-distance truck shipments of clean materials, we reduce the risks of polluting (and fuel-wasting) traffic, accidents, and deaths. Further, by eliminating clean materials from radioactive waste sites, we can reduce the number and size of such facilities.

In sum, the BSFR program helps us all by reducing our dollar costs, our risks, and the negative impact of waste disposal on our environment. As an aging population and global warming increase our needs for nuclear medicine and nuclear power, so will the BSFR program increase our ability to handle the resulting wastes safety, efficiently and responsibly.

Thank you for the opportunity to voice my opinion on this important topic.

Sincerely,
Diversified Technologies Services, Inc.

Charles E. Jensen, President
2680 Westcott Blvd
Knoxville, TN 37931
865-539-9000
cjensen@dts9000.com

000101

From: <applebaumr@bellsouth.net>
To: <joyce.dunlap@state.tn.us>
Date: 8/1/2007 1:31 PM
Subject: MSWAC Comment
Attachments: RApplebaum to MSWAC.pdf

Ms. Dunlap:

Attached are my comments for submission to MSWAC. Please respond to this email address for any further information or call (901) 487-7897.

Please confirm receipt of this email.

Thanks,

Bob Applebaum

Robert B. Applebaum, CHP
Eads, TN

July 30, 2007

The Municipal Solid Waste Advisory Committee
Tennessee Dept. of Environment and Conservation
Division of Solid Waste Management
8th Floor, L&C Tower
401 Church St.
Nashville, TN 37243-1535

Dear MSWAC:

Thank you for giving this letter your consideration. I am a Tennessee resident and a Certified Health Physicist. I am appalled at the events that have transpired to date. They are incredulous and insulting.

Imagine claiming to a geologist that the earth is flat. The claim seems pretty silly. Well, to a health physicist, investigating whether 1 mrem/year is safe to a hypothetical person is just as silly. You can probably relate to the reaction of the geologist, because you've received sufficient education yourself to know as fact, that the earth is round. You probably received little or no education in health physics, so the issue before you seems more uncertain. But radioactive materials have been studied, used, and regulated in accordance with sound scientific principles for decades. And health physicists, including those working for TDEC, the U.S. NRC, the U.S. EPA, and just about everywhere else know that BSFR disposal is safe.

Unfortunately, this issue has its profiteers and its victims.

The Profiteers:

An anti-nuclear organization, Nuclear Research and Information Service (NIRS), wrote a biased report in the hopes of alarming Tennessee residents. If Tennessee residents respond as NIRS anticipates they will, the BSFR process will be weakened or terminated, and NIRS gains.

A Nashville television station, who receives the report, claims to have undertaken "investigative" journalism, though they acknowledge the BSFR process has been going on for twenty years. Some investigative reporting! However, drama sells, so if citizens' emotions can be stirred, the station gains.

There are local citizens who wanted the Middle Point landfill closed, even before they heard about the BSFR issue. The NIRS report opened the door for resurrection of the issue. And it's been resurrected and those citizens gain.

The Tennessee legislature hears from the Profiteers. Rather than making a few phone calls to TDEC, the U.S. NRC, or anyone else to determine the facts, they "pass the buck" to the MSWAC.

What do these Profiteers have in common? They operate under the guise of being concerned about the health of the citizenry for their own gain. It's pretty reasonable to expect that if one is concerned about public health, one looks at what health issues affect the most people and tackle those issues. .

The leading cause of death in this country is cardiovascular disease; about 50% of men and 40% of women will suffer from it[1]. There is no evidence of increased risk of cardiovascular disease from low dose radiation [2].

Cancer is the second leading cause of death[3]. Roughly 42% of us will get cancer[2]. Cancer of the lung and bronchus are the leading causes of cancer death[4]. Smoking is the leading cause of lung cancer followed by exposure to radon gas[5]. Radon is a naturally occurring radioactive gas, found in most people's homes. Other sources of low dose radiation can lead to cancer. The risk of getting cancer increases with increasing dose.

The background radiation sources that can contribute to one's cancer risk (lung and others) are[6]:

a. radon (200 mrem/year)
b. internal radioactivity (39 mrem/year)
c. cosmic/cosmogenic (28 mrem/year)
d. manmade (60 mrem/year)
e. terrestrial (28 mrem/year)

and, of course there is BSFR[7]:

f. BSFR (0 mrem/year, 1 mrem/year to fictional, hypothetical resident farmer)

If the Profiteers were sincerely concerned about our health they would use their resources to first reduce the incidence of cardiovascular disease. Few of us exercise enough or eat the right foods often enough. Getting people to exercise and eat right would save a lot of lives, but doesn't create a lot of drama.

The next priority should be a focus on cancer prevention. Getting people to stop smoking and having them test their homes for radon makes sense. All of us are exposed to radon and many of us smoke or are exposed to second hand smoke. Yet on these substantive causative factors, the Profiteers are silent. They don't even mention that Rutherford County is one of the counties with the highest potential in the state to exceed the U.S.

EPA's action level for radon[5]. Ironic, considering all the radioactive fear-mongering they're spewing.

We're all exposed to the other radiation sources I've listed above. Measures could be taken to reduce our exposure to those sources, such as radon testing and mitigation. We're also exposed to other non-radioactive carcinogens everyday[8]. But the Profiteers have ignored all of those sources in favor of focusing on BSFR waste, the one source which is only a source of exposure to someone who doesn't exist - the fictional resident farmer.

Clearly this issue isn't about public health, it's about other agendas.

The Victims:

Any Tennessee citizen who has been needlessly frightened of BSFR waste is a victim.

Tennessee taxpayers are victims. My family has spent good tax money funding TDEC as well as the U.S. NRC and EPA. These experts seem to have been excised from the debate. If the state legislature has found that TDEC can't be trusted, they should provide the details of their investigation. But there was no investigation and no basis for not trusting TDEC.

NIRS used taxpayer money to produce their "study", to the tune of $100,000. This funding, through the MTA Fund, established by the U.S. DOE, is supposed to be used for the procurement of technical and scientific assistance to perform technical and scientific reviews[9]. The NIRS report mentions the procurement of these types of services solely from Radioactive Waste Management Associates (RMWA). RMWA services are routinely procured by anti-nuclear groups because they consistently produce results which oppose anything nuclear. RMWA's founder is a former director of the Radioactive Waste Campaign, an anti-nuclear group[10]. RMWA is a frequent beneficiary of funding from the MTA Fund[9].

Now MSWAC found it necessary to spend more of my family's tax money on an independent consultant, another $5,000 squandered.

TDEC is a victim. They have been relegated to some sort of consulting role, yet they are the regulators of the BSFR material. These are hard working, honest Tennessee citizens who do not profit from BSFR or from termination of the BSFR program.

Scientists, educators and students are victims. The current issue suggests that everything we've learned about radiation in the past be revisited for no sound reason. Radiation has been studied, the health effects have been characterized, and regulations have been implemented. The BSFR process hasn't harmed anyone, and yet here we are.

You are victims. This issue is taking your time and perhaps you're feeling unwanted political pressures. You shouldn't be in this predicament and its unfortunate that you are.

The facts regarding BSFR are clear, as clear as the facts concerning the geometry of the earth.

The Facts:

The BSFR process results in a dose of 1 mrem/year to a hypothetical resident farmer. This person doesn't really exist, but if he did, then we assume his entire water and food supply come from his farm which he chooses to place on the landfill. Know of any farmers living off of landfills? Me neither.

If such a farmer existed and he lived off of his farm somewhere else, he would get about 1 mrem/day (from background sources). If he should choose to live and farm at Middle Point, his dose might reach 1.003 mrem/day (background plus BSFR sources). There is no real difference between these two dose rates, anymore than there is any real difference between 75 degrees Fahrenheit and 75.003 degrees Fahrenheit.

The regulatory dose limit to the general public from licensed radioactive material (including BSFR) is 100 mrem/year [11]. The BSFR dose rate to the fictional, hypothetical farmer is within legal limits.

Citizens not living off the landfill will get no dose. Any leakage whether by groundwater or air will be highly dilutive. Concerns regarding liner failure, leakage, etc. are irrelevant for BSFR material.

I don't live in Rutherford County and I have no opinion on whether Middle Point should remain open or not. But I am concerned when my tax dollars are needlessly wasted and the profession that I've devoted my entire adult life to is ignored.

The $100,000 of tax money squandered by NIRS could have been used to purchase radon test kits. These are available for $8.00 each [12]. With about 30,000 Murfreesboro housing units [13], almost half of the city's homes could have been tested. That could lead to reducing real radiation doses to real people.

You don't have to be a rocket scientist (or a health physicist or a geologist) to see what interests are driving the BSFR issue. BSFR waste poses no risk to anyone and should be accepted at Middle Point as long as the landfill remains open. It shouldn't be used to fuel the pre-existing Middle Point or nuclear power debates.

Sincerely,

Robert B. Applebaum, CHP

Attachments: 1. References
2. Brief Response to NIRS July 24, 2007 Memo to MSWAC

References:

1. American Heart Assoc. – www.americanheart.org/presenter.jhtml?identifier=3037324.
2. National Research Council BEIR VII – http://books.nap.edu/openbook.php?record_id=11340&page=1.
3. Centers for Disease Control & Prevention- www.cdc.gov/nchs/fastats/lcod.htm.
4. Centers for Disease Control & Prevention – www.cdc.gov/mmwr/preview/mmwrhtml/ss5303a1.htm
5. U.S. Environmental Protection Agency – www.epa.gov/radon.
6. Idaho State University – www.physics.isu.edu/radinf/natural.htm.
7. State of Tennessee, Division of Radiological Health – http://state.tn.us/environment/rad/bsfr.
8. U.S. Dept. of Health & Human Services, 11th Report on Carcinogens – http://ntp.niehs.nih.gov/index.cfm?objectid=72016262-BDB7-CEBA-FA60E922B18C2540.
9. U.S. Dept. of Energy, MTA Fund – www.mtafund.org/awards/default.htm.
10. Radioactive Waste Management Associates – www.rwma.com/recent_clients.htm & www.rwma.com/mr.htm.
11. State of Tennessee, Department of Environment & Conservation, Rule 1200-2-5-.60 – www.tennessee.gov/sos/rules/1200/1200-02/1200-02-05.pdf.
12. State of Tennessee, Department of Environment & Conservation – http://tennessee.gov/environment/apc/radon/pdf/radonfacts.pdf.
13. U.S. Census Bureau – http://quickfacts.census.gov/qfd/states/47/4751560.html.

Brief Response to NIRS July 24, 2007 Memo to MSWAC

This memo is more anti-nuclear propaganda, and due to the underlying agenda, not worthy of sincere, scientific inquiry or debate. I have included some brief responses here and can provide more detailed, objective, scientific rebuttals to NIRS upon request from MSWAC.

The first paragraph of this memo is nothing but questions. Iterations of questions are a frivolous tactic of debate, when the debater has no facts to offer. NIRS squandered $100,000 of our tax dollars on a "study" and should be an authoritative source of information. But these questions are not sincere and MSWAC should not feel compelled to waste their time providing answers. $100,000 would buy a doctorate level education in Health Physics from many fine universities, but only if the person puts forth the effort to educate him or herself.

The "Low Level Radioactive Waste" section really defines the NIRS position. They feel that there should be no additional radioactivity added to the environment - landfills or no landfills. They fail to acknowledge that all technologies involve some risks. Automobile technology results in highway deaths, deaths from gasoline fires, carcinogenic risks associated with gasoline, the generation of greenhouse gases and other pollutants, the generation of hazardous lead battery and antifreeze wastes, etc. Yet, as a society we accept reasonable risks commensurate with the benefits. Regarding automobiles, we enjoy prompt responses to emergency situations, the ability to haul heavy loads over long distances, the ability to tap larger markets for employment, etc. NIRS fails to acknowledge the benefits of nuclear technologies such as power generation, life-saving nuclear medicine procedures, ongoing medical research, and safety-oriented consumer products (such as smoke detectors and EXIT signs).

The risk/benefit relationship of radioactive materials has been studied, characterized and codified into regulations. Just like the risk/benefit relationships of other technologies. NIRS cannot come to grips with that reality.

The "mrem" section shows a lack of understanding of radiation dosimetry, though many texts are available on the subject. NIRS forgets that members of the public are getting about zero mrem from BSFR waste. Only the fictional, hypothetical farmer could possibly get 1 mrem/year.

The comments associated with the two "RESRAD" sections are outright lies. Chapter 5 of the Resrad User's Manual describes in detail the validation and verification process the code has undergone. The manual is available for free at http://web.ead.anl.gov/resrad/documents. Underlying equations are provided in Chapter 3 of the manual and in the 14 appendices.

The final "Free Release" section, acknowledges that there are several regulatory mechanisms to allow very low levels of radioactive materials to be released into the environment. The releases are regulated and in conformance with international and national standards. The risks have been studied and characterized and deemed as acceptable relative to the benefits derived. As mentioned above, NIRS cannot come to grips with this reality.

Joyce Dunlap - Studsvik Comments for SWAC on BSFR

From: "Harvey C. Farr" <hcfarr@radsafety.com>
To: <joyce.dunlap@state.tn.us>
Date: 8/1/2007 1:50 PM
Subject: Studsvik Comments for SWAC on BSFR
Attachments: Studsvik_BFSR_Comments_for_SWAC[1].pdf

Our comments are provided in the attached file. Thank you for the opportunity to comment on this issue.

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Studsvik

Bulk Survey For Release (BSFR) Comments for the Municipal Solid Waste Advisory Committee

Submitted August 1, 2007

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1.0 Executive Summary

Studsvik is pleased to provide the attached comments related to the BSFR program for consideration by the Municipal Solid Waste Advisory Committee. In consideration of the summarized conclusions below and the more detailed explanations provided within the attached text, we find it absolutely compelling that the BSFR process is safe, efficient and necessary. We urge the Committee to recommend to the Legislature that the BSFR process is safe and should be allowed to continue.

We have framed our submission in a manner that addresses the comments and concerns we have heard at the public meetings and throughout this process to assuage concern, correct misstatements and provide the Committee with technically and scientifically supported material that demonstrates the safety of the BSFR process.

Our comments reflect the current philosophies and practices suggested by such agencies as the U.S. NRC, the U.S. DOE, the U.S. DOT, and organizations such as the National Research Council, the National Academy of Science, the National Council for Radiation Protection, the Health Physics Society, and many more. Our key conclusions are summarized below:

1. The BSFR process is regulated by TDEC under a state equivalent process to the U.S. NRC's 10CFR20.2002 rule. See our Sections 3.1and 3.2 for further details.
2. The public health risk has been regulated by TDEC to a level of 1 mrem/year. This dose only applies to a hypothetical farmer living directly on the landfill post-closure. As shown in Table 1, this is less than the dose thresholds required by NRC for similar scenarios (decommissioning 25 mrem/year, 20.2002 a few mrem/year). The annual dose for people living or farming near the landfill would be much closer to zero mrem. These levels of annual radiation dose are safe and are a miniscule fraction of background doses. See our Section 4.0 for more information.
3. The prescribed dose limit of 1 mrem/year is so low, so as to ensure that public health is not endangered even under an accident scenario, such as a leaking landfill liner or an overturned BSFR waste hauling truck.
4. The U.S. NRC's 10CFR20.2002 rule and its predecessor rules (and TDEC's equivalent rules) are not new and not clouded in secrecy. They have been made publicly available for decades. The BSFR process is just one of several regulated means of disposing of very low level radioactive wastes. Tennessee is not the sole implementer of this rule. See our Appendix B for additional elaboration.

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2.0 BSFR An Important Service for Our Customers and Society

Studsvik operates two radioactive waste processing facilities in Tennessee (one of which processes BSFR), where we employee 200 workers. We paid approximately 2 million dollars in taxes to the state of Tennessee in 2006. Our operations provide a valuable service to our customers and to the citizens of Tennessee. Specifically, our BSFR services are of value to our customers because they provide, safe, environmentally responsible and cost effective alternatives for waste disposal. This removes them from storage and the general environment where they have the potential to migrate and come in contact with the general public and places them in disposal facilities designed to sequester and retain waste materials.

Higher level radioactive wastes are processed and sent to licensed radioactive waste facilities designed to safely retain and segregate radioactive materials from the environment. There are only three such commercial facilities currently in operation in our country. After June of 2008, only one of them is accessible to the businesses and research facilities of Tennessee. The capacity of these facilities is limited and the cost of disposal is very high due to the limited space and the design and operation of the facilities which are geared for radioactive waste that have radioactivity levels, many, many times higher than those released under the BSFR program.

BSFR wastes are very low level radioactive wastes that are screened, monitored, tested and sent to certain Class I municipal landfills as authorized by the Tennessee Department of Environmental and Conservation, Division of Radiological Health. Class I municipal landfills are also designed to segregate wastes from the general environment. To put this in perspective think about the materials in the cabinets under the kitchen sink, or in the bathroom or garage in your own home. Read the labels. What would happen if you drank or ate them? What would happen if there were no municipal landfills where they could be disposed of and they were thrown out in the general environment? What would happen if municipal landfills were not designed to retain those wastes and segregate them from the environment? If you ate BSFR waste as opposed to one of those products in your garage or in your cabinets at home, there would be no immediate harmful effect from the radioactivity in the waste and there would be an immeasurably small risk of a long term health effect.

However, Studsvik believes in being good stewards of our environment and good neighbors to our fellow citizens. We believe it is prudent to capture, segregate and clean up radioactive materials used for industry, medicine and research to maintain a clean, healthy environment that is as free as possible from contamination by industrial and household wastes. Municipal landfills offer a far better alternative for disposal of low level radioactive materials than perpetual storage at facilities across the state waiting for alternatives to the high cost of disposal in a site intended for much higher activity

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radioactive waste. The BSFR service Studsvik provides benefits the citizens of Tennessee by more effectively managing the limited capacity of radioactive disposal sites thereby reducing the pressure on the remaining low level waste storage capacity and reducing the costs to clean up facilities where radioactive materials were used, or disposal of radioactive materials used in basic research at the University of Tennessee, or nuclear medicine at the Thomas Cancer Clinic. Whether or not you believe in the use of nuclear power in producing a balanced supply of electricity in our country, radioactive materials remain an important tool in scientific research and diagnostic and therapeutic medicine and in many other industrial applications. Cost effective safe disposal options will be required to sustain research and medical uses.

Studsvik has carefully monitored the BSFR issue since it came under scrutiny. We have watched the media, we have attended the public meetings, we have heard the concerns of our fellow Tennesseans. There have been misstatements, misrepresentations, misunderstandings and most troubling of all an increase in the unnecessary fear and anxiety of our fellow citizens with regard to radioactive materials generally and BSFR specifically. Therefore, we have framed our comments to the Solid Waste Advisory Committee in a manner that addresses the comments and concerns we have heard at the public meetings and throughout this process to assuage concern, correct misstatements and provide the Committee with technically and scientifically supported material that demonstrate the safety of the BSFR process.

While much was said at the public meetings, our comments are limited to those that related directly to the **Committee's mandate—to make a recommendation to the Legislature on the safety of BSFR**. In addition to these written comments, we respectfully refer to the technical and scientific comments presented at the public meetings by various qualified individuals and experts and to the material presented by TDEC to the Committee, all of which support the position that BSFR is safe to the public and beneficial to Tennessee.

3.0 Out of State vs. TN Waste & the BSFR Process

3.1 Radioactive Material Disposal - Origin not Safety

Low level radioactive waste, originating from other states, has been processed in Tennessee for decades due to the formation of spin-off processing companies from the Oak Ridge site. In the 1980's, the waste was sent to the Barnwell, SC low level waste disposal site. The processing companies developed and enhanced several technologies in their efforts to serve their customers. In the 1990's, some of the commercial low level radioactive waste processors developed the BSFR process for the very lowest levels of radioactive wastes as a safe and cost effective means of disposing of this material.

Low level radioactive waste is transported from other states to Tennessee for disposal as BSFR due to the regulation of licensed radioactive material established by the Nuclear Regulatory Commission and the limited disposal options available to licensees. Whether

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or not a material is considered Low Level Radioactive Waste under the current regulatory frame work depends upon the "origin" of the material and not the "risk" associated with its disposal.

The NRC issues licenses to use, possess, manufacture, or distribute radioactive materials under 10 CFR 50 and 10 CFR 30. Regulations pertaining to the control, monitoring, release and disposal of those "licensed" materials are established in 10 CFR 20 Standards for Protection Against Radiation. It defines byproduct material, source material, and special nuclear material as types of radioactive material that are licensed and controlled by 10 CFR 20. But there is no level of radioactivity below which a material is considered not to be radioactive material for the purpose of regulatory control.

The lowest classification for radioactive waste is Class A waste. The upper limits of Class A waste are set in 10 CFR 61.55. Wastes with concentrations higher than the Class A limits have rigorous disposal requirements. Disposal of very low level wastes, such BSFR material, uses up the limited capacity of our licensed low level waste disposal facilities. There are currently only three such facilities in the United States: Barnwell, South Carolina; Clive, Utah; and Richland, Washington. Only the facility in Clive, Utah is available to licensees from all 50 states. This limited capacity has lead to ever increasing costs for disposal of licensed radioactive material.

The impracticality of this system is the focus of national attention. The National Academy of Sciences, Nuclear and Radiation Studies Board (NRSB) published an extensive report that is relevant to the BSFR issue entitled, "*Improving The Regulation And Management Of Low-Activity Radioactive Wastes - Committee on Improving Practices for Regulating and Managing Low-Activity Radioactive Waste, National Research Council of the National Academies.*" The National Academy of Sciences is a private, nonprofit, self-perpetuating society of distinguished scholars engaged in scientific and engineering research, dedicated to the furtherance of science and technology and to their use for the general welfare. Upon the authority of the charter granted to it by the Congress in 1863, the Academy has a mandate that requires it to advise the federal government on scientific and technical matters. Studies by the National Academies provide scientific and technical advice to assist public decision makers. Studies are typically conducted at the request of a government agency, which funds the study. The above study, however, was self-initiated by the National Academies' Nuclear and Radiation Studies Board (NRSB).

The NRSB states, "***Low-activity wastes are regulated primarily by their origins—the nature of the industry that produced them—rather than the actual radiological hazards they present.*** *Wastes from some origins are tightly controlled, resulting in limited and relatively expensive management and disposal options; while other wastes that present equal or greater risks are less closely controlled.*" For more information on Low Level Radioactive Waste Regulation please refer to Appendix A.

10 CFR 20.2002 "*Method for obtaining approval of proposed disposal procedures*," allows licensees to request alternatives to disposal at a licensed low level waste facility. Additional information relevant to the BSFR issue about 20.2002 is attached as Appendix B for the committee's consideration. The NRC states, "*NRC has received more than one hundred requests in the last 30 years for 10 CFR 20.2002 approvals. Although about 2/3 of these requests were for onsite disposals, the trend in recent years has been for fewer onsite and more offsite disposals. Since 2000, NRC has received twenty requests for 20.2002 alternate disposal authorizations, seventeen of which were for offsite disposal.*" 10 CFR 61 established the requirements for NRC licensed waste disposal facilities. The NRC recognizes that not all material containing "licensed material" is required to be disposed of in such facilities. The NRC states, "*Since some waste that has a low hazard can be safely disposed of in other than a 10 CFR Part 61 low-level waste facility, 10 CFR 20.2002 continues to be available for use by licensees to propose alternative methods of disposal.*" Thus the NRC recognizes that not all disposal options should be driven by the "origin" of the material. A summary of the 20.2002 requests submitted to the NRC since January of 2000 is provided in Appendix C.

However, the 20.2002 process requires approval on a case-by-case basis. This requires the licensee to perform the same type of analyses and detailed modeling as those performed for BSFR waste for a single disposal. This is an expensive, time consuming process for a case by case approval that may or may not be granted in the end. As seen in Appendix C only 20 applications in total have been received since 2000 and only 10 of these are from a few commercial nuclear power licensees. The NRSB states, "*Under 10 CFR 20.2002 the USNRC has the authority to allow the release of very low level radioactive material from licensees, allowing disposal in unlicensed facilities on a case by case basis.* ***The nuclear industry has found the 10 CFR 20.2002 process to be slow and expensive and, as a result, has submitted only about one alternate disposal application per year during the past 10 years (Genoa, 2003).***"

Thus the BSFR program serves as a highly desirable alternative to the 20.2002 process or the high cost of disposal at radioactive waste facilities. BSFR is economical for customers because the BSFR processors that have performed the modeling are required to determine the site specific concentrations for multiple radionuclides that correspond to 1 mrem/year of exposure. It is generally not economical for the customers to implement this process themselves on a case by case basis. The end result is the same as for the 20.2002 process; however the cost of the modeling and program approval is spread over a wider base than case by case approvals by individual licensees.

It should also be noted that the NRC grants 20.2002 disposals at higher levels than BSFR of up to "*a few millirem per year.*" Many of the on-site disposals are not in facilities with liners, clay caps and leachate collection systems like those in a Class I landfill. BSFR is an equivalent, more efficient, application of the 20.2002 principles and should serve as a model for other states in order to preserve our limited disposal capacity for Class A wastes and to control the costs of radioactive material disposal.

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3.2 BSFR Process – Regulatory Oversight, Multiple Checks from Cradle to Grave

The BSFR process is regulated by TDEC with NRC oversight and requires that an application be provided to the TDEC, as the regulatory body, describing the process including procedures, the intended equipment and qualified personnel. Several processors in Tennessee dedicated the necessary resources to carry out the BSFR process and apply for licenses. After lengthy review periods, licenses were granted. Since these companies compete with each other, they typically include in their license application that their process be treated as proprietary information and not shared with the public. Once licensed, the companies immediately advertised their newly approved service, and today such advertisements can be found on the internet.

A BSFR license is granted to a specific processor for disposal at a specific landfill. In the license application, the physical, meteorological, hydrological, and other specific landfill characteristics are described. Also described are the specific radioisotopes and their concentrations, waste volumes, waste physical characteristics, and other specific waste information.

The waste generators shipping BSFR materials are regulated by the NRC or for Agreement States, like Tennessee by a state agency. Generators characterize the radionuclides and the proportions in which they are present in the waste they send for processing. The generators are routinely inspected by regulators to ensure the accuracy of these "waste streams." Regulators not only review the BSFR license applicant's procedures, equipment and personnel prior to granting a license, but they also perform unannounced inspections at the company's facility after the license is granted. They receive ongoing, periodic reports from the company and the landfills. Additionally, customers considering using a particular processing company will perform initial and periodic inspections of the company. They do this to ensure that their material will be handled as required by the processor's license so as not to become a liability attributed to them.

Today, these waste processing companies still compete with each other and continue to implement and refine low level radioactive waste processing technologies, including BSFR. Low level radioactive wastes are still sent to Tennessee for optimal processing, and some of this waste includes BSFR material. Due to the relatively small market and modest profit margins, other companies in other states have not found it prudent to try to compete with the more experienced Tennessee companies. TDEC does tax all low level radioactive waste received by the waste processing companies and uses these funds in support of their regulatory programs. The funds are not available to individual government employees.

Individual waste generators continue to be pleased with the level of service provided to them by Tennessee waste processing companies. Any low level radioactive waste

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generator could amend his license to include waste processing, including BSFR But most have concluded that it is more convenient, less expensive (even considering transportation costs) and performed to higher quality standards when low level waste processing (including BSFR) is done by the companies in Tennessee.

Concerns have been expressed that only the BSFR processors are checking the waste to ensure it is within the limits. In fact BSFR waste is checked multiple times, at multiple locations, to verify it meets BSFR criteria. It starts at the generators' facility where samples are taken of the undiluted pre-demolition waste. These samples show the radionuclides that will be present in the waste and their relative amounts. They are often analyzed by an independent laboratory and the results are checked against measurements made in the generators' laboratory for easily detected nuclides to ensure their accuracy. Because these samples are usually more concentrated than the end state BSFR waste shipped, they provide a much better assay of all the nuclides present than direct sampling of the BSFR waste. Generators use this information to screen the waste prior to shipment to verify the waste is likely to meet BSFR criteria. Generators do not wish to incur the costs of shipping waste that does not meet the criteria required for BSFR and as such, often ensure that their measurements are below the BSFR criteria.

At the BSFR processor's facility shipments are surveyed for radiation levels and monitored to ensure the modeled 1 mrem/year BSFR limits will be met. They also perform surveys on out-going shipments to ensure they will not alarm the radiation monitors at the landfills. The landfills are equipped with monitor(s) that measure the radiation levels on every truck that passes the gate. They are typically set to alarm at levels near background radiation levels. For gamma emitting radionuclides like Co-60 and Cs-137, the set points on these monitors are more restrictive than the 1 mrem/year criteria. Thus in addition to the regulatory oversight and checks, BSFR material is measured and checked by the generator, the processor, and the landfill multiple times to ensure BSFR limits are met.

4.0 Health Risks

The regulated BSFR waste is required to be of such low radioactivity concentration so as to yield a maximum dose to a resident farmer of 1 mrem/year. The resident farmer is a hypothetical person who might live on, drink from, and eat produce and livestock off the landfill after the landfill closes. Anyone not fitting the description of the resident farmer would receive essentially no dose, including anyone currently living around the operating landfill. The Nuclear Regulatory Commission has a useful web page to help place the risk of such an exposure in perspective and to compare it to other radiation doses received by Americans. http://www.nrc.gov/reading-rm/doc-collections/fact-sheets/bio-effects-radiation.html

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The NRC web page states, "The average annual radiation exposure from natural sources to an individual in the United States is about 300 millirem (3 millisieverts). Radon gas accounts for two-thirds of this exposure, while cosmic, terrestrial, and internal radiation account for the remainder. No adverse health effects have been discerned from doses arising from these levels of natural radiation exposure."

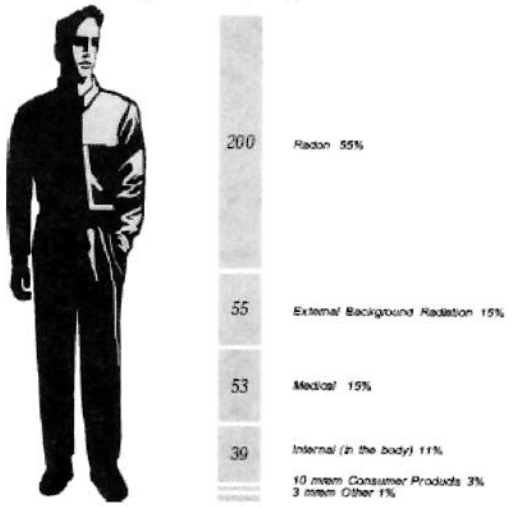


Figure 1 - Average American Annual Radiation Exposure Department of Energy Web Page

"In addition, man-made sources of radiation from medical, commercial, and industrial activities contribute another 60 mrem (0.6 mSv) to our annual radiation exposure. One of the largest of these sources of exposure is medical x-rays. Diagnostic medical procedures account for about 40 mrem (0.4 mSv) each year. In addition, some consumer products such as tobacco, fertilizer, welding rods, gas mantles, luminous watch dials, and smoke detectors contribute another 10 mrem (0.1 mSv) to our annual radiation exposure".

Radioactivity is energy emitted as non-stable atoms undergo auto-disintegration. Over time, the amount of radioactive material decreases compared to an initial amount. This is called decay. It is the absorption of the emitted energy by one's body, which results in a dose. Radioactive decay was discovered in 1898. The study of radiation and its associated risks is not a new field of science or based on recent information. These effects have been studied for well over a half century.

In addition to decay, if radioactive material is disbursed or diluted, it will result in a lower dose. Since the limit is 1 mrem/year for people living on or working on the landfill, leakage from the landfill, by air, water, or dust will result in doses much less than 1 mrem/yr (essentially zero) to anyone who happens to inhale, drink or touch the leaked material. Similarly, the concentrations of radioactive materials are so low that BSFR is not considered hazardous material in U.S. Department of Transportation regulations.

Radiation and radiation health effects have been extensively studied for over half a century. The NRC's and TDEC's dose limits are based on the model that there is a linear, no-threshold dose response relationship between radiation exposure and cancer induction (LNT model). Recently, a National Research Council report, called BEIR VII, confirmed that use of the LNT model is appropriate. Using the most recent risk estimates provided in BEIR VII, at dose levels of 100 mrem/year, the general public is not exposed to any significant risk. The NRC and TDEC have a limit of 100 mrem/year to a member of the public. The NRC and TDEC did not need to revise their existing dose limits upon

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issuance of BEIR VII, because BEIR VII risk estimates were consistent with previous BEIR V risk estimates, which were used in formulating current limits.

It should be noted that both BEIR reports looked at wide cross sections of many populations including the Japanese after WWII, patients exposed to radiation from medical procedures, and workers from the medical, manufacturing, nuclear, research and aviation industries. The diverse characteristics of the people in the study, assures us that the risk estimates can be applied to all the citizens of this country. The scope of the BEIR studies assures us that though cancer risk estimates may be revised in the future, any revision will be minor, as was the case when BEIR VII followed BEIR V.

Consider other limits and standards that represent an acceptable risk for members of the public in Table 1 below. Compare the 1 mrem/year limit and to other regulatory radiation dose limits and standards currently in place. It is also useful to compare the limit on radiation dose from BSFR material to other typical sources of radiation the general public are exposed to as shown in Figure 2. Many of the choices we make on a daily basis result in more radiation exposure than the 1 mrem/year received by a resident farmer living on a BSFR landfill. Like where we choose to live, a difference of 54 mrem a year in Las Vegas versus Beatty, Nevada, or seven to 25 mrem a year from living in stone, concrete or masonry building. These exposures are many times greater than the potential BSFR exposures. Would most people consider the additional risk to be too great to allow these choices?

Examples of possible annual doses from common sources of radiation

Where you live

Location Las Vegas Nevada (natural background)..... **89** millirem or mrem
(Natural background radiation for Beaty, Nevada is 143 mrem)

House Construction: For stone, concrete, or masonry building..... 7-**25** mrem

What you eat, drink, breathe

Food, Water, Air (Potassium 40, K-40**)(U.S. average)..... **25** mrem
World wide weapons test fallout..... **4** mrem

Medical

Chest X-ray..... 10-**39** mrem
(A lowergastrointestinal tract X-ray is 500 mrem. A radiopharmaceutical exam is 300 mrem)

How you live

Jet plane travel: For each 2,500 miles, add 1 mrem; round trip is .. **2**-5 mrem depending on altitude and shielding.

TV viewing 3 hours per day..... **1** mrem
Cooking: With natural gas, add 6 mrem..... **1** mrem

Total annual dose for this example (numbers in bold) is 186 mrem.
U.S. annual average dose is 360 mrem

(Includes U.S. average of 200 mrem for radon***)

Most scientists agree on the internationally recognized guidelines for regulating radiation doses to protect the public and the environment. By using a philosophy that limits exposures to radiation to doses as low as reasonably achievable, doses are kept to levels less than the limits stipulated by regulations. This approach is used by DOE and its contractors when evaluating potential exposures that might be recieved by members of the public and people who work around radioactive materials.

* Doses are expressed in millirem, abbreviated to mrem and are estimates only and vary at any given time.

**The half life of potassium-40 is greater than 1 billion years.

***Radon-222 has a half-life of 3.8 days.

Figure 2 - Department of Energy Examples of Other Radiation Exposures

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Table 1- Other Radiation Dose Limits and Standards for Member of the Public Exposures

mrem/year	Reference	Context
5	NRC I.E. Circular 81-07	Handling materials surveyed and released at the required minimum sensitivities.
25	EPA Regulation 40 CFR 190	Members of the public outside facility property from all exposures associated with nuclear power.
25	NRC 20.1402	License termination with unrestricted property usually includes resident farmer modeling like that used for BSFR.
50	NRC Liquid Effluent Concentration 10 CFR 20 Appendix B	Concentration allowed in liquid release that would result in 50 mrem/year if used as sole drinking water source. Or concentration in gaseous release that would result in 50 mrem/year if inhaled continuously for a year.
100	NRC 10 CFR 20.1301	All sources external and internal from a licensee for on-site and off-site members of the public

5.0 Murfreesboro Specific

After passing Middle Point's radiation monitors, a truck hauling BSFR material is directed to the active portion of the landfill to dump. BSFR material comprises less than 0.1% of the total waste delivered to Middle Point. As such a small waste volume contribution, for operational efficiency and in consideration of the absence of any safety hazard, the landfill operator does not segregate BSFR waste. Active portions of the landfill are covered at the end of each day.

The Middle Point landfill was permitted and designed as a Class I sanitary landfill for the safe disposal of household, commercial and approved special wastes. The landfill has a liner with two parts: the lower portion is composed of two feet of compacted clay and above that is a layer of high-density plastic. Clay has a very high affinity for most radionuclides and strongly retains them. Landfill operators are also required by the state to monitor groundwater quality on a quarterly basis, according to Tennessee Department of Environment and Conservation (TDEC). With radioactivity levels limited to 1 mrem/year for a resident farmer occupying a landfill after closure it is not feasible that radioactive materials from BSFR could migrate through the liner in levels sufficient to contaminate surrounding groundwater without other indications of leakage from the groundwater monitoring system to be detected.

6.0 List of Appendices

Appendix A - Information on Low-Level Waste Disposal In the U.S.

Appendix B – Facts About 10 CFR 20.2002.

Appendix C – NRC SECY-06-0056 March 9, 2006 Enclosure 4 , Summary of 10 CFR 20.2002 Requests Received Since January 1, 2000.

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7.0 References

1. Nuclear Regulatory Commission Health Physics Position Paper 221 – "*Lower Limit of Detection (LLD) for Potentially Contaminated Oil*", January, 1985.
2. National Academy of Sciences, Nuclear and Radiation Studies Board (NRSB) "*Improving The Regulation And Management Of Low-Activity Radioactive Wastes - Committee on Improving Practices for Regulating and Managing Low-Activity Radioactive Waste*", National Research Council Of The National Academies.
3. U.S.N.R.C Policy Issue Notation Vote SECY-06-0056 March 9, 2006 FOR: The Commissioners FROM: Luis A. Reyes Executive Director For Operations SUBJECT: Improving Transparency In The 10 CFR 20.2002 Process.
4. PS009-2 - *Low-Level Radioactive Waste Management Needs A Complete And Coordinated Overhaul* Position Statement Of The Health Physics Society Health Physics Society, Adopted: May 1995 Revised: September 2005.
5. BI009-0 Information on "*Low-Level Radioactive Waste Management Needs A Complete And Coordinated Overhaul*" Position Statement of the Health Physics Society* Adopted: October 1993, Revised: May 1995, Updated: July 1998, Revised: July 1999, Revised: September 2005.
6. NCRP Report No. 139, "Risk-Based Classification of Radioactive and Hazardous Chemical Wastes", 2002, 433 pp. National Council on Radiation Protection and Measurements, 7910 Woodmont Avenue, Suite 400, Bethesda, MD 20814; ISBN: 0-929600-72-X, http//www.ncrp.com.
7. EPA 402-R-99-004A Environmental Protection August 1999 Agency *Understanding Variation In Partition Coefficient, Kd, Values Volume I: The Kd Model, Methods of Measurement, and Application of Chemical Reaction Codes.*
8. ANL/EAD/TM-93, *Assessing the Impact of Hazardous Constituents on the Mobilization, Transport, and Fate of Radionuclides in RCRA Waste Disposal Units*, Environmental Assessment Division Argonne National Laboratory Operated by The University of Chicago, under Contract W-31-109-Eng-38, for the United States Department of Energy Assessing the Impact of Hazardous Constituents on the Mobilization, Transport, and Fate of Radionuclides in RCRA Waste Disposal Units.

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APPENDIX A

Information on Low-Level Waste Disposal in the U.S.

Many comments have been made to SWAC asking why waste is trucked across the country for disposal in Tennessee under BSFR if the material is so safe. Why isn't the provision of 20.2002 used to dispose of the material at their landfills? The short answer is that the cost effective risk based approach taken by Tennessee for BSFR is ahead of the curve on this issue.

The Health Physics Society's position statement on low level waste states, "*Low-level radioactive waste (LLRW) is an inevitable byproduct of beneficial uses of radioactive materials in the United States. It arises from medical research, diagnosis and treatment of diseases, industrial processes, national defense, and electric power generation—all vital to our national interests. LLRW will continue to be generated, requiring the availability of disposal methods and sites so that society can continue to enjoy the full benefits of the use of radioactive materials. Safe and effective methods and standards for processing, transport, and disposal of LLRW are well established.*"

There is no level of radioactivity below which a licensed material is considered not to be radioactive material for the purpose of regulatory control. Therefore, technically, if a licensee has "process knowledge" that the material contains licensed radioactive material or detects that one atom of byproduct, source or special nuclear material in a truck load of material, it renders that truck load radioactive under NRC regulations.

10 CFR 20.2001 contains limitations on disposal of licensed radioactive material. Essentially it requires that the material is decayed in storage, released as an effluent or transferred to another licensee. The "other licensees" includes NRC licensed waste disposal and treatment facilities. Thus materials containing detectable atoms of licensed radioactive material are captured in a system of perpetual custody, unless they are released as an effluent or decayed.

The NRC does offer some methods for relief from the perpetual custody dilemma for licensed material. These additional methods are as follows:

- Licensed material may remain upon termination of the license if the dose to an individual will not exceed 25 mrem per year.
- A license may survey or sample material and demonstrate that no licensed material was detectable. The NRC establishes standards for the minimum sensitivities that must be met. These correspond to 5 mrem per year for an individual handling or using the item (NRC Circular 81-07).
- A licensee may dispose of some liquid materials through the sanitary sewage system. This is often used by hospitals, research facilities, etc. The NRC set limits on the concentrations that can be disposed of in this manner in 10 CFR 20, Appendix B. These limits assume a 10:1 dilution ratio and equate to 50 mrem/year for someone consuming the water at the outfall of the waste treatment facility as their sole source of potable water.

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- A licensee may request an alternate disposal path under 20.2002. The NRC usually approves those requests where doses of under a few millirem a year can be demonstrated.

With the exception of 20.2002, these alternatives are limited in their applicability to licensees, those terminating their license or those disposing of low level liquid waste. The 20.2002 process is on a case by case basis and requires considerable resources to model and request each individual disposal. It is therefore not widely used.

There are only three facilities where low level waste can be disposed of: Clive, Utah, Richland, Washington and Barnwell, South Carolina. The limited capacity of low level waste facilities has lead to ever increasing costs of disposal. This impacts all licensees who use radioactive materials, not just nuclear reactor owners. Nuclear medicine users, who use radium needle implants to cure prostate cancer, researchers who use tritium to find cures for diseases and study genetics, radiographers who X-ray welds on oil pipelines, all bear the brunt of increased costs. These costs limit the amount of research that can be done and increase the price for services to consumers and taxpayers in every state. Thus there is a great incentive and need for progressive disposal alternatives for these wastes, such as the Tennessee BSFR process.

BI-009-0 of the Health Physics Society Position on Low Level Waste provides a good summary of the low level waste disposal issues and impacts, "*Position 2 – The Health Physics Society believes that lack of competition in LLRW disposal options results in excessively high costs to waste generators, which impede the use of nuclear technologies that provide significant benefits to society.*"

"Although long-term disposal options for Class A wastes are available, lack of competition results in excessively high costs to waste generators. These excessive costs have impeded the use of nuclear technologies that provide significant benefits to society. Such technologies are used to diagnose medical illnesses, treat cancers, conduct research, develop new pharmaceuticals, preserve our food supply, and generate over 20% of our nation's electricity from commercial nuclear power plants. We believe that reducing the price of waste disposal would stimulate more research, leading to more innovative/efficient technologies that could significantly improve the quality of life of our society. However, these beneficial technologies (such as those discovered by biomedical research) continue to be impeded due to the high cost of radioactive waste disposal."

"We base our position on the following: Waste-disposal costs for government contracts held by the Department of Energy (DOE) and the Army Corps of Engineers are approximately \$5 per ft^3 for disposal of Class A LLRW at the Clive, Utah, disposal facility. For waste generators that do not have access to these government contracts, waste-disposal costs often exceed \$200 per ft^3 for Class A LLRW."

"In addition, there are high costs for disposal of mixed waste (i.e., waste that is regulated for both its radioactive and hazardous chemical content) and radioactively contaminated biological waste. The cost for treatment and disposal of mixed waste from

biomedical research activities typically ranges from $150 to $1,500 per gallon and can be greater than $10,000 per gallon. In comparison, the cost for treatment and disposal of biological waste from biomedical research without radioactive contamination typically ranges from $1 to $20 per pound. Recognizing that much of biological waste is aqueous (about eight pounds per gallon), this converts to $8 - $160 per gallon, typically 10% of the cost of biomedical mixed waste. A National Research Council (NRC) report published in 2001 (NRC 2001) strongly supports HPS' concern regarding the costs of waste disposal. The HPS acknowledges that the report from the NRC (NRC 2001) concluded that the disposal capacity at sites regulated by the NRC were sufficient for biomedical needs for the next several decades. However, this report also concluded that the central issue in biomedical research is the cost of managing LLRW. While it noted the impacts of LLRW management varied depending on the local demographics and size of the research institution, the NRC further concluded that cost was an important issue to virtually all research institutions."

Chapter 2 of the NRSB report included in the references the states, "*A previous National Academies' committee* ***reviewed disposition options for slightly radioactive solid wastes from decommissioning the nation's existing power reactors. That committee estimated costs of $4.5 billion to $11.7 billion for disposing of 10 million tons of concrete and metal debris in Nuclear Regulatory Commission (USNRC)-licensed LLW facilities (NRC, 2002, p. 6).*** *For smaller enterprises with limited funds for waste disposal, finding a safe and economical disposal alternative can mean the difference between cleaning up a site and releasing it for unrestricted use, and leaving the waste in place or storing it until an affordable option becomes available (Federline, 2004)."* This directly impacts the electric rates paid by consumers, including those in Tennessee due to the NRC requirements for operators of nuclear power plants to maintain a decommissioning fund to cover the costs of decommissioning. These funds are derived as part of the rate base paid by consumers. The decommissioning cost estimates are evaluated periodically and baseline rates are adjusted accordingly.

Thus diversion of BSFR material to low level waste facilities such as Clive, Utah further diminishes competition, depletes the exiting low-level waste capacity in the U.S. more rapidly and increases costs that will affect Tennessee's citizens.

The NRSB, NCRP and the Health Physics Society all advocate a risk based approach to management of these materials. The nation is in fact moving toward risked based disposal options such as BSFR and not away from them. The NRSB states, "*This committee, along with the Environmental Protection Agency (EPA) and the USNRC as shown by their initiatives described below, considered whether other disposal methods may be able to provide protection for slightly radioactive wastes, given their low potential for posing radiological risks."* In Chapter 2 of the report an entire section is entitled "***Low-Activity Waste Disposal in Landfills".***

The Health Physics Society Position BI-009-0 states, "*The EPA acknowledged that some wastes regulated under the AEA are excluded from regulations as "unimportant*

quantities" (i.e., source materials containing less than 0.05% uranium or thorium), while others are regulated down to the last atom. Additionally, the EPA acknowledged that the current practice of LLRW disposal resulted in costly waste-management practices and appeared to have an adverse impact on the health care industry to levels that were less than optimal. To address these issues, EPA solicited stakeholder input to find solutions needed to minimize the current practice of imposing dual regulatory authority for controlling disposal of these types of regulated wastes."

This NRSB section states, "***There are a few instances where states have permitted the use of RCRA Subtitle D municipal waste landfills for disposal of radioactive waste that contains very small concentrations of radioactive material. The committee noted in its interim report that very low activity wastes from the decommissioning of the Big Rock Point nuclear power plant were sent to a municipal landfill in Michigan. Other states, such as Texas, have determined that municipal landfills offer sufficient protection for certain types of radioactive material, for example, materials with very short half-lives, and have defined in their state regulations the kinds and amounts of radioactive wastes that may be so disposed.***"

The National Council on Radiation Protection (NCRP) has addressed the issue in Report No. 139 "*Risk-Based Classification of Radioactive and Hazardous Chemical Wastes*." The Report claims that current radioactive material and hazardous waste classification schemes are either qualitative or source-based and, in many cases, are unrelated to risk. In contrast, NCRP proposes a broadly applicable quantitative risk-based classification scheme where as shown in Figure 3, the lowest risk wastes, would be disposed of in ***municipal landfills***.

Waste class	Risk Index (RI)	Disposal method
Exempt	RI $\ll$ 1	Municipal landfill
Low hazard	RI ~ <1	Regulated near-surface burial site
High hazard	RI $\gg$ 1	Geological repository

Figure 3 - NCRP Report 139 Risk Based Disposal Options

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APPENDIX B

Facts About 10 CFR 20.2002

Why 10 CFR 20.2002 authorizations are needed

10 CFR 20.2002 is available for use by licensees for wastes that typically are a small fraction of the Class A limits contained in Part 61, and for which the extensive controls in Part 61 are not needed to ensure protection of public health and safety and the environment. Thus,10 CFR 20.2002 provides an alternative, safe, risk-informed disposal method for these materials, which are frequently called "low-activity waste." Although these materials could be disposed of in a licensed low-level radioactive waste facility, if a licensee chose to do so, disposal at another type of facility under 10 CFR 20.2002 may significantly reduce transportation distances (often on the order of one to two thousand miles), provide for more disposal options, and lower disposal costs, while still providing for protection of public health and safety and the environment.

The history of 10 CFR 20.2002 in NRC regulations

10 CFR 20.2002 and its predecessors in earlier versions of 10 CFR Part 20, 10 CFR 20.304 and 20.302, have been in NRC's regulations and available for use by licensees since 1959. 10 CFR 20.302 was used to license the early low-level radioactive waste disposal sites before NRC's Part 61 for LLW disposal facilities was promulgated in 1982. Part 61 disposal facilities are designed for the disposal of all but the most highly radioactive low-level radioactive waste. To ensure safety and the protection of the environment, Part 61 provides detailed requirements for the performance of low-level waste disposal facilities, along with specific site selection, design, operations, and closure requirements. Since some waste that has a low hazard can be safely disposed of in other than a 10 CFR Part 61 low-level waste facility,10 CFR 20.2002 continues to be available for use by licensees to propose alternative methods of disposal.

NRC has received more than one hundred requests in the last 30 years for 10 CFR 20.2002 approvals. Although about 2/3 of these requests were for onsite disposals, the trend in recent years has been for fewer onsite and more offsite disposals. Since 2000, NRC has received twenty requests for 20.2002 alternate disposal authorizations, seventeen of which were for offsite disposal.

Materials typically disposed of under 10 CFR 20.2002 and their relative hazards

In practice, 10 CFR 20.2002 is most often used for disposal of low-activity radioactive waste in hazardous or local solid waste landfills that are permitted under the Resource Conservation and Recovery Act (RCRA), but it can be used for any type of disposal not already defined in the regulations, such as disposal on a licensee's site or on offsite private property. The term "low-activity waste" (LAW) does not have a statutory or regulatory definition, but generally means wastes that contain some residual radioactivity, including naturally occurring radionuclides, which can be safely disposed of in hazardous or municipal solid waste landfills. Such waste possesses a small fraction of the hazard of

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waste at the Class A limits in 10 CFR Part 61. NRC may authorize its licensees to dispose of waste under 10 CFR 20.2002, but other low-activity waste, not regulated by NRC is also disposed of in landfills and hazardous waste sites.

Past NRC 20.2002 disposal authorizations have included the offsite disposal of large quantities (hundreds of thousands of cubic feet) of very low levels of radioactivity in permitted landfills, disposals on the licensees' property, disposal of short-lived waste in oil wells, disposal of incinerator ash from universities and research laboratories in landfills, and use of filtercake with source material as feedstock for a cement kiln. Concentrations are typically below those that would cause a dose in excess of 1 mrem/yr if released for any use and without any controls, i.e. if the materials had been cleared for unrestricted use.

In addition to waste authorized for disposal under 10 CFR 20.2002, a wide variety of radioactive materials are disposed of in hazardous and solid waste landfills that are regulated under the Resource Conservation and Recovery Act (RCRA). RCRA is implemented by the U.S. EPA and States authorized by EPA.

Many materials with naturally occurring radioactivity are disposed of in landfills. Other sources of radioactivity in landfills are man-made items. Some of the radioactive materials that may be disposed of in landfills include the following:

- Short-lived nuclear medicine radioisotopes with a half life of less than 65 days, from hospitals, medical clinics, or from patients' homes. These may include paper towels, dishes, tableware, bedding and anything else touched by a patient.

- Items containing naturally occurring radioactivity, such as:

  Fertilizer
  Gypsum
  Sheet rock
  Ion exchange resins from water purification
  Coal ash
  Oil and gas production sludges

- Consumer products:

  Timepieces (tritium, radium, promethium)
  Smoke detectors
  Pottery
  Gas lantern mantles (Coleman lanterns, e.g.)
  Optical lenses for cameras, glasses, binoculars, telescopes, etc.
  Road salt

APPENDIX C

NRC SECY-06-0056 March 9, 2006

Enclosure 4 , Summary of 10 CFR 20.2002 Requests Received Since January 1, 2000

Licensee	Date Submitted	Date Approved	Disposal Method	Materials Involved	Comments
US Army Corps of Engineers, Stepan Chemical Co. site in Maywood, N.J.	December 16, 2005	Pending	RCRA hazardous waste landfill (U.S. Ecology Idaho	Processing residuals with uranium, thorium and radium (11e.(2) byproduct material)	Army Corps is not an NRC licensee. NRC response to this request is being developed.
Yankee Atomic	October 31, 2005	Pending	Retaining wall at an offsite property	Approx. 500 cubic feet, 90 pCi/g of H-3, and up to 162 pCi/g avg. of C-14.	
U.S. Army, Aberdeen Test Center	September 13, 2005	Pending	RCRA hazardous waste landfillI (U.S. Ecology Idaho)	Two M2A2 Bradley fighting vehicles with depleted uranium contamination	
Tennessee Valley Authority, Watts Bar Nuclear Plant	August 26, 2005	Pending	Onsite disposal	In-situ disposal of liquid effluent line until decommissioning	
UCAR	May 13, 2005	Pending	RCRA hazardous waste cell (WCS)	15 intermodal containers of LAW	On hold, proposed disposal facility not currently authorized to accept these materials
Connecticut Yankee	January 4, 2005	Pending	Waste Control Specialists RCRA facility	1 million cubic feet of demolition debris containing misc. byproduct materials	On hold, proposed disposal facility not currently authorized to accept these materials.
Yankee Atomic	December 22, 2004	May 6, 2005	Waste Control Specialists RCRA facility	60 million pounds of demolition debris (approximately 600,000 cubic feet) containing up to 20 pCi/g of Co-60 and 100 pCi/g of Cs- 137 and up to 198 pCi/g of H-3	Licensee decided against this disposal option
Cabot Supermetals	November 24, 2004	July 15, 2005	Cement kiln	Wastewater filtercake containing up to 10 pCi/gram uranium, and 3 pCi/gram of thorium, 20,000 tons	

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APPENDIX C

NRC SECY-06-0056 March 9, 2006

Enclosure 4 , Summary of 10 CFR 20.2002 Requests Received Since January 1, 2000

Licensee	Date Submitted	Date Approved	Disposal Method	Materials Involved	Comments
				annually	
Vermont Yankee	October 4, 2004	July 19, 2005	Onsite disposal	Soil/sand from misc. activities onsite–silt from cooling towers, sand for ice/snow on roads, etc. Previously approved limit was 28 cubic meters/yr (approx. 1000 cubic feet/yr). This request was to increase that amount for 150 cubic meters/yr (5300 cubic feet/yr). Less than 1 pCi/gram Cs-137 and Co-60.	
Connecticut Yankee	September 16, 2004	April 19, 2005	US Ecology Idaho RCRA facility	Approx. 1 million cubic feet of demolition debris. Cs-137, Co-60, C-14, and H-3 concentrations are very small. Other radionuclides also present.	US Ecology Idaho decided not to pursue this disposal
Consumers Energy, Big Rock Point Plant	September 15, 2004	January 19, 2005	Landfills in Michigan	500,000 cubic feet of demolition debris, Cs-137, Co-60, and H-3, at low concentrations	This was an amendment to a 2001 request, requesting approval of the use of another landfill in Michigan.
Department of the Air Force	June 23, 2004	October 25, 2005	US Ecology Idaho RCRA facility	Four M 47 tanks, less than 0.05% uranium average concentration	
Merck Research Laboratories	February 23, 2004	June 13, 2005	Landfill in New York State	80 cubic yards of soil containing 756 microcuries of tritium (16.7 pCi/gram)	
Michigan State University	February 28, 2002	June 12, 2002	Landfill	Incinerator ash	
Core Laboratories	August 31, 2001	November 4, 2003	Class II disposal wells (from oil and gas production)	Well-logging "sandouts" (well returns) with less than 1000 pCi/g total radioactivity concentration, and	

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APPENDIX C

NRC SECY-06-0056 March 9, 2006

Enclosure 4 , Summary of 10 CFR 20.2002 Requests Received Since January 1, 2000

Licensee	Date Submitted	Date Approved	Disposal Method	Materials Involved	Comments
				120 day half-life.	
Lionville Laboratory	May 17, 2001	October 4, 2001	Landfill	11e.(1) byproduct materials at and below Appendix B, Part 20, Table II, Col. 2, concentrations	
Big Rock Point Nuclear Power Plant	May 14, 2001	February 5, 2002	Landfill	Approximately 350,000 cubic feet of demolition debris. Cs-137 = 0.17 pCi/g Co-60 = 0.83 pCi/g H-3 = 7.86 pCi/g	
Oyster Creek	December 29, 2000	December 14, 2001	Offsite disposal on property owned by licensee next to plant site	Approximately 5 million cubic feet. 0.088 pCi/g of Co-60, and 0.270 pCi/g of Cs-137.	
University of Michigan	September 27, 2000	March 23, 2001	Landfill	Incinerator ash	
Vermont Yankee	September 11, 2000	June 26, 2001	Onsite disposal	Adds slightly contaminated soil from construction-related activities to list of previously approved materials for onsite disposal [up to 980 cubic feet per year]	

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Joyce Dunlap - Re: Studsvik Comments for SWAC on BSFR

From: Joyce Dunlap
To: Farr, Harvey C.
Subject: Re: Studsvik Comments for SWAC on BSFR

Dear Mr. Farr:

This is to acknowledge receipt of your comments for consideration by the Municipal Solid Waste Advisory Committee in their deliberations regarding the Bulk Survey for Release Program.

Thank you for your concern for Tennessee's environment and its citizens.

Sincerely,

Joyce Dunlap, Manager
Solid Waste Assistance Programs
Division of Solid Waste Management
401 Church Street
L & C Tower, 8th Floor
Nashville, TN 37243

>>> "Harvey C. Farr" <hcfarr@radsafety.com> 8/1/2007 1:49 PM >>>
Our comments are provided in the attached file. Thank you for the opportunity to comment on this issue.

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Joyce Dunlap - BSFR - Comments

From: James East <eastje@hotmail.com>
To: Joyce Dunlap <joyce.dunlap@state.tn.us>
Date: 8/1/2007 3:05 PM
Subject: BSFR - Comments

Dear Committee,

As a matter of introduction, I am a radiation safety professional. I am Certified by the American Board of Health Physics. I hold the Quality Auditor Certification from the American Society for Quality. I'm familiar with the BSFR program, having been RSO at one of the licensees processing BSFR wastes. I no longer have any financial interest in the program. I'm trained in RESRAD and understand its principles.

The following comments and perspective are mine as a citizen of this great state.

I wish to see the state handle hazardous material responsibility. Our modern life style that has given us longer life expectancy depends on the safe use of hazardous material.

Just think about our cars. When we go to start our cars, we depend on enough lead to poison everyone in our neighbor hood. We carry in our gas tanks enough explosive liquid to start an inferno. There's enough oil in the crank case to pollute a lake. Yet we strap our kids in the same container and off to the pre-school we go.

The point is, there is risk in what we do and most people don't even think about it. Risk should be reconized and has to be handled responsibility. Risk without due caution results in unnecessary loss. Being too cautious is wasteful and often prevents us from managing other risks that may have greater impact.

As was mentioned in the July meeting, risk from radiation exposure is proportional to the dose. The dose is measured in REM, which takes into the quantity of energy, type of energy entering living cells and the damage that will be left behind.

The limit of 1 millirem for the BSFR is of little risk, very little energy. There is such a small amount of energy that no instrumentation would be able to detect radioactivity from the BSFR land fill. It could not be detected 10 miles away, 10 feet away, even or against the fence. Its in the noise as Roger said. It's like trying to listen to a radio station a long way off and all you hear is static, no music. There is not physically possible to see this amount of radiation with the best of equipment.

Following along with the energy idea, consider walking through a swarm of small flies. These little guys are flying at you with all their might. They may be a little annoying and you can tell they are there, but can you even be bruised by one? Will the impact square on the noggin kill you? Not likely. They don't pack a lot of energy.

Consider walking across several lanes of high speed interstate traffic. Now, we're talking about some energy! Can we get across? Maybe. I don't have to explain the damage done to the human body when it encounters an 18-Wheeler at 70 mph. Fortunately, the state has seen fit to comply with the regulations line the interstate with fences, post signs, and patrol the interstates to address these hazards.

The flies represent 1 millirem, the 18-Wheelers represent 1,000,000 or more millirem.

The hazardous material just in our household waste represent a speeding vehicle. Consider the used disposable batteries, lead from our electronics, and the biological hazards in the disposable diapers. We throw it in the trash, and think nothing of it. Fortunately, the state has overseen the landfills to manage these hazards and keep them out of the environment. I thank you for that.

What the committee is considering the BSFR program is dealing with the small flies. The state has complied with the laws, rules, and regulations to ensure the processors have ensured that there are no 18 wheelers in the BSFR. Or for that mater, not even a Bigwheel Trike or a high speed bee.

I hope my down home analogies have helped provide prospective to the technical aspect of this discussion. I mean no disrespect, but I understand this is a difficult subject and offer this to aid in understanding the risk management under discussion. I ask that the handling of radioactive risk be no more restrictive than the risk management of other hazardous material.

The federal regulations used in the BSFR program are appropriate for the hazard. The state has demonstrated it has managed the program well. As a Quality Auditor, I understand and accept the audit results of this program by the NRC. The committee should conclude that the program is important to the welfare of the state and the industry, health care, and power generation we all depend on.

The responsible thing to do is restart the BSFR program without delay.

Sincerely,
James East, CHP, CQA
eastje@hotmail.com
Knoxville, TN

Joyce Dunlap - Please find in attached file BURNT comments on Middle Point

From: <Activnshvll@aol.com>
To: <joyce.dunlap@state.tn.us>, <paul.sloan@state.tn.us>, <lewisb@williamson-tn.org>, <rep.david.shepard@legislature.state.tn.us>, <rep.donna.rowland@legislature.tn.us>, <rep.brenda.gilmore@legislature.state.tn.us>, <rep.gary.odum@legislature.state.tn.us>, <rep.william.coleman@legislature.state.tn.us>, <sen.beverly.maprero@legislature.state.tn.us>, <sen.doug.jackson@legislature.state.tn.us>, <sen.bill.ketron@legislature.state.tn.us>, <sen.jim.tracy@legislature.state.tn.us>, <chuck.head@state.tn.us>, <alan.leiserson@state.tn.us>, <mike.apple@state.tn.us>
Date: 8/1/2007 3:10 PM
Subject: Please find in attached file BURNT comments on Middle Point
Attachments: middle point comments aug2007.pdf

BURNT

1 August

Please find in attached file BURNT comments on Middle Point radioactive waste

We very much appreciate the opportunity to participate in our government.

Thank you

Bruce Wood

Get a sneak peek of the all-new AOL.com.

BURNT

IMPROVING THE ENVIRONMENT THROUGH
CITIZEN INVOLVEMENT WITH GOVERNMENT
BUSINESS, AND ACADEMIA

1 August 2007

Mr. Lewis Bumpus, Chair
Tennessee Solid Waste Advisory Committee
Williamson County Solid Waste Director
5750 Pinewood Road
Franklin, Tennessee 37064

via e-mail and surface mail

RE: Landfilling 'low level' radioactive waste in Middle Point Municipal Solid Waste Landfill

Dear Chairman Bumpus:

BURNT appreciates the opportunity to participate in the hearings and deliberations involving our government. As a citizen activist group, we believe one of the reasons Tennessee consistently ranks near the bottom of all states [and below many 3rd world countries] in social indexes such as infant mortality, obesity, literacy, distribution of income, health insurance, and many environmental standards is the nature of our government. For example, Middle Point was recently permitted to expand yet citizens and elected officials who opposed this expansion did not know about the secret landfilling of radioactive waste in Middle Point.

Our recommendation for the Solid Waste Advisory Committee to make to the Governor

1. Solid waste and landfills have seriously degraded groundwater in Tennessee

2. The Committee is very concerned that Middle Point accepted 'low level' radioactive waste without notice to public officials and local citizens even as the permit to expand was granted. Based on our limited review, we believe the permit to expand Middle Point should be reopened because the operator did not reveal that 'low level' nuclear waste was landfilled.

3. The Tennessee Solid Waste Board will develop new regulations for the disposal of solid waste in Tennessee (*HB 2289/SB 2267*) with advice from this Committee *(1345/SB 1779)*.

4. The Committee recommends the moratorium on landfilling 'low level' radioactive waste at Middle Point should continue until the State Solid Waste Board completes the rule making process on solid waste regulations including 'low level' radioactive waste.

5. We recommend full consideration of a statewide moratorium on 'low level' nuclear waste at all Tennessee landfills until the solid waste rule making process is completed.

Middle Point and radioactive landfilling is part of a state wide landfill issue

1. Citizens from Dickson County including the president of the Dickson County NAACP

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A Member Of Community Shares

testified twice about the notorious Dickson County landfill which has permanently polluted ground water three (3) miles from the landfill. Yet, TDEC officials state nothing illegal was dumped at Dickson County. Where will we be in 20 years–or two hundred years or two thousand years–if Murfreesboro becomes the same type man made environmental slum as Eno Road in Dickson County? *Solid waste is very much a matter of environmental injustice.*

2. Why is 17.5% of all solid waste in the State landfilled in Middle Pont–apparently 9 million tons in the last eight years? Why is solid waste transported 12 million [12,000,000 miles] annually between Transfer Stations and landfills? Middle Point is within 50 feet of the Stones River a source for public drinking water for many cities. Karst geology with caves and fissures allows migration of pollution. The landfill liner has leaks and holes and is nearing the end of its effective life. We as a State and society will have a day of reckoning–Tennessee will require billions to rehabilitate damaged landfills and water. Businesses, haulers, and local governments are subsidized because they do not pay the true cost of polluting groundwater.

Jobs, Jobs, Jobs

A nuclear processor testified about the importance of nuclear processing jobs in Tennessee. Tennessee has a long history of selling its environment, water, and air in return for jobs. In the 1960's a Tennessee Governor from Dickson County won acclaim for recruiting business to his home county which left behind an environmental slum, health problems, and declining property values. Those companies have since migrated. BURNT volunteers have participated in solid waste for nineteen years and this is the most substantial matter this committee has faced. *We ask you to address the fundamental fact that solid waste–and radioactive waste–are water problems and the State must no longer give a free ride to businesses and local governments.* We can develop cost efficient methods to divert solid waste from landfills by using them as compost and raw materials in business.

We Ask All TDEC Employees to Recuse Themselves From This Process

No TDEC employee should participate in the decision or deliberations of this panel. One TDEC employee who is a member of the Solid Waste Advisory Committee wrote a strong defense of this program to an area U.S. Congressman. TDEC employees should not participate in any way in a review of policy which they create and administer. *This is a matter of independence for this committee, not a matter of integrity or trust of TDEC employees.*

Expansion of Middle Point Should Be Reopened Due to Secrecy

Apparently, Middle Point was permitted to expand within the last 18 months despite citizen opposition. Yet, the operator failed to divulge that radioactive waste was landfilled. The Middle Point expansion decision should be reopened. There is a precedent–a landfill in New Johnsonville, Tennessee did not divulge dioxins were landfilled and a landfill permit close to being issued was reopened.

We Request, AGAIN, a Complete List From TDEC of All Landfills in All States Which Accept This Waste and Quantities Landfilled at Each Site

1. TDEC employees have repeatedly portrayed landfilling this 'low level' radioactive waste as routine and allowed by many states. If this is true, why is this waste routinely shipped from

California and Washington State to Tennessee? We request an accounting of all waste shipped to different states and quantity landfilled at each site.

2. Apparently, according to DOE eight (8) sites accept this waste: **Tennessee has five (5) sites**-- BFI/Allied Middle Point, Rutherford County (Tn.), BFI Carter Valley, Hawkinss County, (Tn.), BFI North Shelby, Shelby County (Tn.), BFI South Shelby, Shelby County, (Tn.), Chestnut Ridge Landfill & Recycling Center, Anderson County (Tn.), **Three (3) other sites**: BFI Pine Avenue (NY), BFI Conestoga Landfill, (Pa), and Grows Landfill, (Pa).

Shipping & Tracking Procedures Create Huge Loopholes in Safety

Tennessee shipping protocols should require waste to arrive in Murfreesboro packaged by the generating source in sealed containers which only contain the same type of waste–construction waste, clothing, metal, and so on to prevent mixing of waste to camouflage more contaminated material. Present shipping and tracking radioactive waste is apparently the responsibility of for profit corporations who dispose of large quantities of radioactive waste of varying degrees of contamination. Higher contaminated radioactive waste may be buried within larger shipments of more benign waste to escape measurements which are taken only outside of the shipping container.

Middle Point Leachate Apparently Exceeded EPA standards

1. Despite twenty years landfilling 'low level' radioactive waste in Tennessee, there were no tests of radioactive accumulation in leachate, water, or ground until recent tests at Middle Point and Crossville, which has never accepted radioactive waste.

2. Apparently Middle Point leachate tested Gross Alpha radiation more than five times the EPA drinking water level and Gross Beta radiation as 66 times higher than EPA allows. Middle Point results far exceeded results from a Crossville landfill which does not accept radioactive materials. Tennessee must not allow any landfill which exceeds any radiation limit set by EPA to accept this 'low level' radioactive waste.

3. Once again, TDEC provides a facile explanation of dangerous facts–radioactive watches and exit signs from movie houses caused Middle Point elevated results. Does the Crossville landfill have an aggressive, effective program to keep out watches and exit signs?

4. What is the exposure threats to humans of such test results which exceed EPA standards?

California Researcher Disputes Tennessee Interpretation of Test Results

Dan Hirsch, a California educator termed the Alpha B radiation readings from leachate at Middle Point as '...just astronomical..." [transcript, Channel 4 News story] A State of Tennessee Health Physicist said results were not a problem. Middle Point results far exceeded results from a Crossville landfill which does not accept radioactive materials.

Methane Gas Is Burned or Released at Middle Point–Nuclear Particulates Released?

Apparently, methane gas is burned or released at Middle Point. However,

1. landfill gas is NOT only methane--it is a brew of methane, propane, ethane, and butane. *Is it safe to burn this mix of gasses when methane is the target?*

2. Is there any reason nuclear particulates will not be released with the landfill gasses?

3. Middle Point should be treated as a nuclear waste incinerator.

What Amount and Type of Radioactive Waste Is Good for Tennessee?

Tennessee needs a public statement of the amount and type of radioactive waste we want dumped in solid waste landfills. Why should Tennessee import this waste in the first place? Why should this be dumped with regular trash? Some radioactive waste materials can not be measured or detected through truck walls and containers, as is done at the landfill. We are dealing with private, for-profit corporations and at least six (6) of the nine (9) landfills which accept this waste are owned by a single company [see above]. Human and corporate error is not impossible. *We have repeatedly asked for the tip fee for this material and the amount given to the host government including the State.*

Regulations governing reopening landfill permits and review of radioactive waste

1. We have asked for the regulations governing reopening landfill permits due to operator failure to make public germane information and regulations review of low level radioactive materials. These have not been provided.

Conclusion

We appreciate the opportunity to participate in this review. We believe for too long TDEC has not recognized the significant but unnecessary risks of landfills, including recycling, incinerating, and landfilling nuclear waste and solid waste. Our water, environment, and state are at risk. By law, the Solid Waste Advisory Committee and the State Solid Waste Board will develop new regulations governing solid waste in Tennessee. We ask this Committee to recommend to the Governor a moratorium at Middle Point, if not throughout the State, on the continued burning and landfilling of long-lasting, man-made nuclear power and weapons waste. There should be public comment all the "Free Release" licenses that TDEC gives including the BSFR and any others that allow radioactive "Free Release" to landfills.

Thank you

Bruce Wood
president

Sharon Force
treasurer

R C Bartlett
board member

Cc: BURNT Board
Legislative Sponsors
enc. research for General Assembly

Joyce Dunlap - BSFR

From: "Jeff Grzymajlo" <jgrzymajlo@studsvikrace.com>
To: <joyce.dunlap@state.tn.us>
Date: 8/1/2007 1:59 PM
Subject: BSFR
Attachments: BSFR Letter.pdf

Jeff Grzymajlo
Shipper

Studsvik Processing Facility Memphis, LLC
2550 Channel Ave.
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Memphis, TN 38113
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Studsvik

July 30, 2007

Tennessee Department of Environment and Conservation
Division of Solid Waste Management
8th Floor, L&C Tower
401 Church Street
Nashville, TN 37243-1535

To Whom It May Concern:

It has come to my attention that the Solid Waste Advisory Committee (SWAC) will soon be determining whether or not the Bulk Survey for Release Program (BSFR) process is safe.

As an employee of Studsvik Processing Facility, LLC in Memphis, Tenn., I am concerned about the recent hysteria created regarding the state's BSFR program.

I have never had any concerns, nor have I ever feared for my safety working with BSFR material. Truth be told, the scientific facts show more risk to radiation exposure from a cross-country airplane flight or a routine chest x-ray at the doctor's office.

I encourage the Solid Waste Advisory Committee to continue to act responsibly in dealing with this current hysteria regarding your decision on the safety of the BSFR process and its continued safe disposal at the Middle Point Landfill. I sincerely hope that you will continue to make decisions based on scientific facts and not the misinformation that so many have tried to stir up.

Thank you for listening. I appreciate your leadership on this issue.

Sincerely,

Jeff Grzymajlo

Joyce Dunlap - BSFR letter

From: "William Doolittle" <wdoolittle@studsvikrace.com>
To: <joyce.dunlap@state.tn.us>
Date: 8/1/2007 2:14 PM
Subject: BSFR letter
Attachments: BSFR letter.pdf

Please see the attached letter. Thank you.

William Doolittle
Compliance Manager

Studsvik Processing Facility Memphis, LLC
2550 Channel Ave.
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Memphis, TN 38113
Phone: (901) 507-8104
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Studsvik

July 30, 2007

Tennessee Department of Environment and Conservation
Division of Solid Waste Management
8th Floor, L&C Tower
401 Church Street
Nashville, TN 37243-1535

To Whom It May Concern:

It has come to my attention that the State of Tennessee is evaluating the "safety of the Bulk Survey for Release (BSFR) program."

As an employee of Studsvik, our BSFR services are of value to our customers and the community because they provide safe, cost effective, environmentally responsible alternatives for waste disposal.

I have been a Studsvik employee for 2 years and there has never been a day when I have gone to work concerned about the safety of the BSFR process or the impact that it may have on my health or on the health of other Tennesseans.

I have a wife and two kids and would not do anything to jeopardize my health, my family or of my community and state.

I respectfully request that the State and the Solid Waste Advisory Committee carefully assess the scientific evidence and appreciate the role that the BSFR process plays in safely handling this waste stream. Moreover, I hope that you will recognize that there are businesses and folks like me here in Tennessee who depend on the continuation of a safe BSFR process.

Thank you for your time and consideration.

Sincerely,

William Doolittle

Studsvik Processing Facility Memphis, LLC: 2550 Channel Ave PO Box 13143 Memphis, TN 38113
Phone: 901-775-0690 Fax: 901-775-0629 www.studsvik.com

Joyce Dunlap - Response to the BSFR Program

From: "Gary Benda" <gbenda@studsvikrace.com>
To: <joyce.dunlap@state.tn.us>
Date: 8/1/2007 2:16 PM
Subject: Response to the BSFR Program
Attachments: State of TN.JPG

Please submit for public record

Gary A. Benda
Government Programs and Commercial Facilities

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Studsvik

July 30, 2007

Tennessee Department of Environment and Conservation
Division of Solid Waste Management
8th Floor, L&C Tower
401 Church Street
Nashville, TN 37243-1535

To Whom It May Concern:

As an employee of Studsvik, one of the four licensed companies under the Tennessee Bulk Survey for Release (BSFR) program, I am interested in the state's current evaluation of the program.

I have over 30 years of radioactive waste management experience and been an employee at Studsvik for three years. During that time, I have worked on our BSFR program. I am proud of the role that I along with my co-workers play in safely processing and disposing of this waste stream.

When the question of safety arises, I simply reflect on my knowledge as a Certified Health Physicist and know that the scientific evidence clearly shows that this process is safe. As such, I have no concerns working with the BSFR material. Quite frankly, from a health perspective, there is more radiation exposure from a trip to the dentist for dental x-rays than there is from the waste processed through BSFR.

I respectfully encourage the State and the Solid Waste Advisory Committee to recognize the viable economic role that Studsvik and others are playing. I assure you that my employment at Studsvik is very important to me, my family and the community.

In addition, I hope that the State and the Committee will stay focused on one main issue "is the BSFR process safe for Tennesseans." If you do, I am confident that you will assess that the scientific evidence totally supports the safety of this process.

Sincerely,

Gary Benda

Studsvik, Inc. 100 Nelishusky Erwin, TN 37650 Phone 423-735-6300 Fax 423-743-4143 www.studsvik.com

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From: Judith Johnsrud <johnsrud@uplink.net>
To: Joyce Dunlap <joyce.dunlap@state.tn.us>, Judith Johnsrud <johnsrud@uplin...
Date: 8/1/2007 8:57 PM
Subject: [Fwd: [Fwd: Tennessee Solid Waste Advisory Committee]]

Dear Ms. Dunlap:
I have just discovered that the TDEC SWAC comments
I sent to you apparently failed to arrive. There may
be an error in the e-mail address that I had received for you.
Trying again.
Judith Johnsrud
Sierra Club; ECNP

-------- Original Message --------
Subject: [Fwd: Tennessee Solid Waste Advisory Committee]
Date: Wed, 01 Aug 2007 21:38:15 -0400
From: Judith Johnsrud <johnsrud@uplink.net>
To: Judith Johnsrud <johnsrud@uplink.net>, Joyce Dunlap
<joyce.dDunlap@state.tn.us>

Dear Ms. Dunlap:
Please accept the comments below concerning
the Proposed SWAC Recommendation with respect
to low-level radioactive waste municipal
landfill disposal.

Thank you.
Judith H. Johnsrud, Ph.D.

Subject: Tennessee Solid Waste Advisory Committee
Date: Wed, 01 Aug 2007 11:05:42 -0400
From: Judith Johnsrud <johnsrud@uplink.net>
To: Joyce Dunlap <joyce.dunlap@state.tn.us>

###

Tennessee Solid Waste Advisory Committee
TDEC Division of Solid Waste Management
8th Floor, L&C Tower
401 Church Street
Nashville, TN 37243-1535

RE: Proposed TDEC Solid Waste Advisory Committee (SWAC) Recommendation
with respect to low-level radioactive waste municipal landfill disposal

The following comments on the pending TDEC SWAC recommendation are
submitted on behalf of the Pennsylvania Chapter of Sierra Club and the
Pennsylvania-based Environmental Coalition on Nuclear Power.**

1. Having only belatedly learned of the opportunity for comments on this
proposal, we urge that notice concerning this action and the opportunity
for public comment both be extended for a minimum of sixty additional
days, in order for more of the affected public to learn more about the
potential consequences of the SWAC recommendation. It is important to
recognize that not only the residents near the immediately affected
landfills have an interest in the decision.

2. Since 1990, the National Academies of Science Committee on the Biological Effects of Ionizing Radiation (BEIR V, 1990, and BEIR VII, 2005,Reports) have concluded that there is no "safe" radiation dose level. The linear dose/response relationship means that biologic damage may occur at any level of additive exposures. In the last twenty years, basic research in radiation microbiology has identified unanticipated and greater damages and types of injury than had previously been identified.

3. Among these findings:
-- "bystander effect" (an irradiated cell adversely affects nearby but not necessarily contiguous cells);
-- "delayed cell damage" (an irradiated cell appears to reproduce accurately for a number of cell lives before defective reproduction appears);
-- "adaptive response" (cell changes may result in cell's future ability to survive or flourish, or fail in altered conditions);
-- "imperfect cellular repair capability"; and
-- "genomic instability".

Such biologic alterations now appear to be of substantially greater genetic significance than had in past decades been observed or understood.

3. The truth of the matter is that we still have no way to "dispose" of anything, much less of radioactive wastes. We merely alter the forms of these contaminated materials and/or change their locations, and try to maintain control of them for the duration of their hazardous life. We may or may not be successful. The radiation hazard remains. Surveillance may fail.

4. The waste disposal at issue is radioactive but it may have been redefined or designated as "low-level" or "low-activity" waste. By using the now-widely discredited "reference" or "standard man" dose definitions to determine permissible exposures for both workers and members of the public, those who are seeking to rid themselves or their companies of the high costs and trouble of requiring safest attainable waste isolation will claim that the doses received from THEIR LLRW or "LAW" have not been proven to be hazardous to a recipient. The adversely affected individual will have no way to prove his/her injury.

5. Radwastes reaching a disposal site, it should be noted, will have also potentially adversely affected members of the public at numerous steps of the nuclear fuel chain

6. Another basic consideration is that, from a medical perspective, radiation protection is based on the expectation that an individual should receive a benefit greater than or at least equal to the added risk incurred. Primum non nocere. How does the recipient measure all sources of additive exposures once the radioactive wastes have been deregulated, released from control and/or from measurement?

7. A dose recipient cannot effectively protect him/her self from harm in part simply because of the longevity of latency periods between exposure and appearance of a tumor, or of damage to a fetus. (Deaths that are

medically attributed to the Hiroshima and Nagasaki bombs that were dropped sixty years ago, are still occurring in Japan.) How can a dose recipient ever even know how large the doses received may be? How many exposures occur? What is the total collective dose? What isotopes? Which and how large were the internal exposures?

8. When low-level or low-activity radioactive waste is declared "safe enough" for disposal in an ordinary municipal solid waste landfill, only the dose level at the point of entry need be checked, but increasing unidentifiable sources of exposure occur as the nuclear industry is allowed to relax regulatory controls. There now are far more sources of additive contamination than in the past, yet these multiple sources cannot be readily identified or measured or avoided by the dose recipient.

9. The international bodies charged with dose standards reviews and determination are, in large measure, composed of persons with ties to the industry and sources of exposures that need to be guarded against. Some bodies are charged with aiding the international trade in nuclear materials and radioactive wastes. The pressures to allow traffic with minimal control and costs are exceedingly high.

10. Moreover, municipal landfill disposal of radwaste will be followed sooner or later with a loss of control: seepage of contaminated liquids in the effluent; additions to the original amounts and composition accepted; minimal record-keeping. In the recent past in this commenter's experience, radioactive tritium in amounts far in excess of EPA limits was identified in numerous landfills. The contaminated liquid wastes moved offsite and into streams that fed into the river providing potable water for the major cities and suburbs downstream.

11. It is important to remember that municipal solid waste landfills are not required to be designed to maintain control of the radioactive wastes that may, over time, be dumped without any consideration of previous amounts and composition of radioactive wastes accepted. This is a situation of multiple, additive, cumulative -- and in combinations with other toxics -- synergistic wastes destined to move out of control, as has occurred at even disposal sites designed for more protection.

12. Despite the pressures exerted by the nuclear industry for cheap disposal, despite the political and economic power of the waste generators, the Tennessee SWAC can exercise its oversight authority, and insist that all LLRW, even those that are redefined as "very low" or "low-activity wastes" must be contained with as much rigor and for long time into the future at facilities designed to maximize control and minimize release, as well as minimizing all recycle of radiologically contaminated materials and wastes.

**The commenter, Dr. Johnsrud, serves as Energy Committee Co-Chair of the Pennsylvania Chapter of Sierra Club, and directs the Environmental Coalition on Nuclear Power (ECNP), which she has represented on the Pennsylvania State Low-Level Radioactive Waste Advisory Committee since LLWAC's inception in 1988. She had also served on a DOE Advisory Group for the Department of Energy's Low-Dose Radiation Research Program.

###

Joyce Dunlap - SWAC information

From: <MMOBLEY@aol.com>
To: <Joyce.Dunlap@state.tn.us>
Date: 8/1/2007 10:28 PM
Subject: SWAC information
Attachments: Comments on NIRS ltr of 7-24-07.doc

Joyce, attached is some additional comments I would like to share with the committee.

Mike

Get a sneak peek of the all-new AOL.com.

Joyce, please provide this to the committee.

To members of SWAC:

As one of Tennessee's representatives on the Southeast Low-Level Radioactive Waste Commission I am aware of many of the issues that the committee must face. Especially one issue in particular. The problem is one of "instant experts" who proclaim to know all, but actually only have an anti-nuclear agenda. They will make any claim in order to create problems for the nuclear power industry. I have commented on the report generated by Diane D'Arrigo and I will comment on her July 24, 2007 letter here. I will just highlight some issues but there numerous misleading statements therein.

At the bottom of page one she states "At the behest of the nuclear power industry, the NRC has begun exploring a loophole in its own regulations for alternative methods of disposal". She states this in this manner to make is appear that this activity is a "loophole" and that it is something that has not been utilized previously when in reality it has been used for many, many years. While it is true that some states have passed laws requiring continued control over nuclear wastes it is also true that some states have passed laws outlawing the disposal of any radioactivity, notwithstanding the fact that everything is radioactive. In reality these laws are totally unenforceable and actually from my perspective, ridiculous. They also could cause the states to lose Agreement State status (if they had it) and may very well divert much needed radiation protection expertise from the many real radiation problems. I also believe she errs in her assertion that some of the radionuclides produced never existed on Earth until splitting of the atom, as we now know that there were naturally occurring reactors on earth. The byproducts of those reactors existed in nature. She also brings up the life expectancy of the landfill liner which as has been noted numerous times is immaterial to the issue of the impact of the radionuclides as the assessment to approve their disposal did not assume a liner was present therefore any period of time in which the liner is present provides <u>additional</u> protection beyond what is calculated in the assessment.

The only reason that the dose (in millirem) cannot be measured at these landfills is because there is no one living, farming and drinking the water from the landfill. If and when that happens then the dose could be measured if any radionuclides above background were present. Actually their dose from naturally occurring radionuclides could be measured also. Personnel at nuclear facilities, dentist offices, medical facilities all have their doses (in millirem) measured every day. I actually do not understand what their issue here is.

She notes that the "calculations have been done in the past to permit each contract to give a millirem" which is not true. The state has licensed a processor to process a certain amount of material (limited by the amount of radioactivity contained therein and limited by a certain volume or weight) and dispose of the material that meets the criteria in the selected landfill. As noted by TDEC representatives it even accounts for the possibility that several processors may use the same disposal facility.

The RESRAD code has had so much review and acceptance that her statements do not deserve further comment.

As I believe I noted in Murfreesboro, much of this material is so low in radioactivity that it could be released under Reg Guide 1.86 which would allow it to be free released for any purpose, usually recycling. I am glad to see her correction in their report.

In conclusion, I would ask the committee to assess the qualifications and agenda of those that are making claims to the committee. Determine what their real qualifications to assess radiation impacts are. Determine what my qualifications are. I am certain that in the area of radiation protection mine are well beyond any possessed by NIRS representatives.

One point of interest for the committee and the public who have asked: why do this. Information from the decommissioning of Big Rock Point Nuclear power plant in Michigan shows there they disposed of 53 million pounds of low-level radioactive waste (to LLW facilities) and 59 million pounds of non-radioactive waste (most of this went through a BSFR type process and was sent to a local landfill). Under the NIRS concept all the waste would go to a LLW disposal site and within a short period of time there would be no access to any LLW site as they would all be full. This would result in either the curtailment of all uses of radioactive material or the storage of radioactive material in numerous facilities that are not designed to store such wastes over the long term.

I would be happy to assist the committee in any way I can in their discussions and determinations.

Michael H. Mobley

344 Mobley Road
Clarksville, TN 37043-7627

Joyce Dunlap - RE: Comments to the TN SWAC regarding BSFR

From: "Troy Eshleman" <ESHLEMAN@energysolutions.com>
To: <Joyce.Dunlap@state.tn.us>
Date: 8/1/2007 4:09 PM
Subject: RE: Comments to the TN SWAC regarding BSFR
CC: "Phil Gianutsos" <PGIANUTSOS@energysolutions.com>
Attachments: FINAL REV BSFT Comments to SWAC.pdf

Joyce,

EnergySolutions would like to recall our comment memo dated July 31, 2007 and replace it with the attached memorandum dated August 1, 2007. Thank you for your consideration.

Troy

From: Troy Eshleman
Sent: Wednesday, August 01, 2007 8:40 AM
To: Joyce.Dunlap@state.tn.us
Cc: Phil Gianutsos
Subject: Comments to the TN SWAC regarding BSFR

Joyce,

EnergySolutions respectfully submits comments via the attached memo by the August 1, 2007 deadline.

Please respond to confirm receipt.

Troy Eshleman

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ENERGYSOLUTIONS

August 1, 2007

Tennessee Municipal Solid Waste Advisory Committee
Attention: Ms. Joyce Dunlap
8th Floor L&C Tower
401 Church Street
Nashville, TN 37273

Subject: Comments on the Bulk Survey for Release Program

Dear Committee Members:

EnergySolutions, LLC and its predecessor companies Duratek Services, Inc., and Scientific Ecology Group have been licensed to implement BSFR since 1993 at our facilities in Oak Ridge, TN. Since late 2005, EnergySolutions has been working with the Tennessee Department of Environment and Conservation, Division of Radiological Heath (TDEC-RH) to establish more performance based and detailed program requirements for BSFR processors. In March 2007, TDEC-RH issued a "white paper" entitled "Draft Licensing Requirements for Evaluation and Acceptance of License Requests for the Disposal of Material with Extremely Low Levels of Contamination in Class D Landfills." EnergySolutions strongly supports expeditious implementation of the TDEC-RH white paper requirements and to examine funding options to buttress TDEC-RH inspection and oversight personnel for this program.

Evolution of the EnergySolutions BSFR Licensing

The EnergySolutions original BSFR program licensing basis in 1993 under the "Green-is-Clean" trade name was intended to provide a means for conventional landfill disposal of commercial nuclear power wastes demonstrated to be "free" of detectable radioactive materials.

In 2000, EnergySolutions requested and was granted a license amendment to add the dose-based release of materials containing known but low concentrations of radionuclides under the trade name of "Safecheck." Such disposal of detectable quantities of radioactivity with resultant doses less than 1 millirem per year is consistent with the recommendation by the National Council on Radiation Protection and Measurements (NRCP) in report 116, Limitation of Exposure to Ionizing Radiation, that doses below 1 millirem "....can be dismissed from consideration". To expand process throughput, a license was also requested and granted to expand the geometry of the package size from a 55-gallon drum in one measurement to a 100 cubic foot box, and later in 2004 approved for a 675 cubic foot Intermodel containers.

Recommendations/Comments

EnergySolutions believes that with the correct level of technical program development and operational rigor the BSFR program can be safely implemented in Tennessee. We further hope that we have clearly demonstrated how the BSFR Program has evolved from a "contamination free" validation program to a sophisticated low concentrations monitoring program that requires

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significant technical skills and resources to implement. As such EnergySolutions recommends a clear set of regulatory guidelines in the form of expanded license requirements, processing record documentation, and supporting analytical data from waste generators, processors, and landfill operation parameters to ensure that all companies take the same care and rigor when implementing BSFR.

To contact me or for any questions I can be reached at (865) 220-5814.

Respectfully,

Troy L. Eshleman
Vice-President
Commercial Processing Division Leader

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Joyce Dunlap - Comments of Impact Services, Inc. on Bulk Survey for Release Program

From:	"Ed Callaway" <Ed.Callaway@wallerlaw.com>
To:	<joyce.dunlap@state.tn.us>
Date:	8/1/2007 3:43 PM
Subject:	Comments of Impact Services, Inc. on Bulk Survey for Release Program
CC:	<tracy.carter@state.tn.us>, "Mike Apple" <Mike.Apple@state.tn.us>, <sammyjones@impactservicesinc.net>, <leeyoung@impactservicesinc.net>
Attachments:	Cover Letter.pdf; Comments.pdf; Attachments.pdf

Ms. Dunlap,

On behalf of Impact Services, Inc., please accept these comments on the Bulk Survey for Release program. These comments are intended for the Municipal Solid Waste Advisory Committee to consider in formulating its recommendations on the BSFR program.

Impact Services believes the BSFR program is fully protective of human health and the environment, and should be continued with no changes.

Ed

Edward M. Callaway
Waller Lansden Dortch & Davis, LLP
511 Union Street, Suite 2700
Nashville, TN 37219
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Facsimile: 615-244-6804
Email: ecallaway@wallerlaw.com

Please visit our Web Site at http://www.wallerlaw.com



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TENNESSEE DEPARTMENT
OF ENVIRONMENT &
CONSERVATION

IMPACT SERVICES, INC.

August 1, 2007

To the members of the Solid Waste Advisory Committee:

Attached you will find our company's detailed response to issues raised during recent public discussions of the BSFR disposal practices in Tennessee. IMPACT Services had numerous representatives at each of the public hearings, offered testimony at each of them and made our experts available both in person and online to field citizens' questions afterward.

We are, in fact, the only Tennessee company to make itself available in such a public way throughout the proceedings. The reason we decided to do so is because we believe there is merit to a public discussion and better understanding of BSFR regulations and practices, and because we believe public scrutiny will show that what we do is safe, lawful and responsible.

Here are some points we hope you will consider as you ponder the future of this program. Each of these points is backed up with more detailed information in the attached document:

1.) Tennessee's BSFR regulations are many times more strict than federal guidelines for the same materials. It would make no sense whatsoever to scrap these tougher regulations and leave Tennesseans guarded by only the more lax federal standards.
2.) Everything – from human beings to household items, to natural food, contains some amount of naturally occurring radiation. It is impossible to place a zero tolerance policy on radiation in landfills because virtually everything contained there emits some level of radiation. In spite of what people may want, the "zero radiation" limit is an unattainable level.
3.) The BSFR materials being disposed of at Middle Point Landfill in Rutherford County have been shown to be lower in radiation than even the soil that naturally covers the ground in that county. Every shipment of that material is analyzed at the construction site, analyzed again at our facility, and monitored one last time at the landfill with reliable, calibrated measuring devices to ensure that none of the materials exceed the extremely low levels cleared for disposal in Tennessee.
4.) Though the public hearings were intended to limit discussion to the safety of BSFR materials at Middle Point, some of the fringe anti-nuclear extremists used the hearings as a podium for discussing everything from their anti-war sentiments to the presence of tritium from building exit signs, which don't even fall under

BSFR guidelines. Please set aside the anti-landfill and general anti-nuclear arguments from your consideration of BSFR regulations.

5.) Tennessee has a worldwide model for BSFR disposal – one that countries like Japan are trying to emulate and one that other states envy due to its effectiveness without layers of bureaucracy. Please don't let a great program get swept under by unfounded and emotional allegations.

Thank you for allowing us to submit the attached report for your consideration. We hope you will find it helpful as you weigh your decision.

We firmly believe that the BSFR program is protective of human health and the environment as it is currently constituted, and ask that you recommend no changes. Please feel free to contact us if you need further information or clarification.

Sincerely,

Kenneth Griffin

Ken Griffin
President
IMPACT Services, Inc.

Attachment

IMPACT SERVICES, INC.

Comments for Tennessee Solid Waste Advisory Committee

Bulk Survey for Release (BSFR) program

Submitted August 1, 2007

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IMPACT SERVICES, INC.

Introduction

IMPACT Services, Inc., is a radioactive materials management company located in Oak Ridge. IMPACT is one of the licensees which processes BSFR materials as governed by the Tennessee Department of Environment and Conservation regulations. We are one of several such firms licensed to process low-level radioactive materials in Tennessee. Our business includes several processes for managing low-level radioactive waste that requires special disposal, and a separate business line for processing material of such low radioactivity that its disposal in landfills is allowed by the Tennessee Division of Radiological Health (TDRH).

We ask that the Solid Waste Advisory Committee (SWAC) recommend no change to the BSFR program when it makes its report on September 3, 2007.

IMPACT takes pride in the fact that we have operated within the confines of all applicable state and federal regulations and laws. IMPACT Services files all required reports with state and/or federal authorities as required by law and regulation, and has been inspected to these standards on numerous occasions by state, federal, and commercial entities. While the company is relatively young, our management team has more than 40 years of waste processing experience, and our Quality Program meets strict requirements in accordance with national and international standards.

We take great pride in operating safely and responsibly. Our commitment to safety includes our employees, our clients, the materials we handle, and the landfills where these processed materials eventually are disposed of.

IMPACT offers the following comments for the SWAC's consideration:

I. Radiation Generally

Everything is made of atoms, which are in turn made of a nucleus of protons and neutrons, orbited by electrons. The number of protons in an atom determines what chemical element it is (e.g., oxygen, nitrogen, carbon, etc.). The number of protons and neutrons it has determines what isotope of an atom it is (e.g., K-39, K-40, K-41). Radioactivity occurs when the atom's proto- to-neutron ratio is not quite right – as if the

atom is not happy being what it is. It wants to change into something stable (e.g., with a stable proton to neutron ratio). It does this by giving off some energy in the form of a charged particle (e.g., an electron or some protons and neutrons) and perhaps some gamma radiation. By doing this, it changes into a different isotope, until it reaches one with the proper neutron to proton ratio (i.e., one that is stable). Each one of these transitions is called a radioactive decay. The radiation (i.e., charged particles or gamma rays) given off during these transitions deposits its energy by ionizing (i.e., freeing electrons) atoms in nearby material.

Radioactive half-life is simply a measurement of how unhappy the atom is being itself. Isotopes with a very long half-life, such as the naturally occurring Thorium, Uranium, and Radium in your front yard have very long half-lives, because they'd like to change eventually but aren't in any real hurry. Whereas, many man-made isotopes have a very short half-life because they are so unstable that they want to change as soon as possible. The "half-life" is the amount of time it takes half of the atoms present in a particular isotopic form to decay to a stable state.

Is ANY radiation safe?

While it is theoretically true that any radiation-related ionization event could eventually lead to health problems, it is equally true that each of us is exposed to millions of these radiation-related ionization events each day as a natural part of life. Being afraid of any amount of radiation because it could cause cancer is similar to being afraid of any amount of bacteria because too many can cause a fatal bacterial infection. We are all naturally exposed to millions of bacteria each day, just as we are all naturally exposed to millions of radiation ionization events each day: but there is no medical evidence that extreme germaphobic behavior has a positive effect on personal health, and there is no scientific evidence that less than 5,000 mrem per year or 10,000 mrem per lifetime has any adverse effect on personal health.

In fact, the Health Physics Society, a nonprofit scientific professional organization of 6,000 scientists, physicians, engineers, lawyers, and other professionals whose mission is excellence in the science and practice of radiation safety, has issued a position statement on "Radiation Risk in Perspective," in which its membership concludes, "Below 5-10 rem (which includes occupational and environmental exposures), risks of health effects are either too small to be observed or are nonexistent."[i] The Society recommends that numerical estimates not be made of risk posed by radiation doses below that level – that only a range be used, "emphasizing the inability to detect any increased health detriment (that is, zero health effects is a probable outcome)."

A separate report by the National Research Council (called BEIR VII) takes the position that the relationship between dose and risk is linear, even at levels below 5-10 rem.[ii] Contrary to certain comments in the record, BEIR VII does not state that there is no safe dose of radiation. In fact, when using the risk estimates included in BEIR VII, the public is not exposed to any significant risk, even at a dose level of 100 millirem/year.

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Some have asked why Tennessee should allow the "release" of any level of man-made radiation, given the significant levels of naturally occurring radiation already present. Radioactive materials are present in our everyday lives in many forms. These materials provide very useful functions for our safety, health, and well-being. They are a part of countless material that we consider very normal and ordinary, including food waste and construction debris. BSFR materials, when discarded, must be disposed of in a safe and environmentally sound manner, the same as all the waste generated in our everyday lives. The fact that BSFR material comes from a licensed facility does not make its radioactivity different from the radioactivity of other materials disposed of in a landfill routinely.

What is a millirem, and what does it mean? Is it hypothetical?

A rad (radiation absorbed dose) is that amount of radiation that deposits 100 ergs of energy in one gram of material. It is an easily measured quantity. A rem (roentgen equivalent man) is a unit of measurement that weights the energy deposition (in rads) by a Quality Factor, since some types of radiation (e.g., alpha) create a larger number of ionization events in tissue per amount of energy deposited than other types of radiation (beta and gamma). Scientists have been studying this for decades, and it is a measurable quantity -- not a hypothetical, mathematically modeled construct. A millirem is simply one one-thousandth of a rem. Since we all receive an average of about 300 millirem (mrem) per year from natural sources, one millirem is considered a negligible dose. As noted above, the Health Physics Society has concluded that no medical effects have been determined from doses below 5-10 rem (that is, 5,000 to10,000 millirem).

Examples of other radiation exposures in everyday life

All stars, including the sun, are huge uncontained fusion reactors, undergoing an uncontained nuclear reaction. Therefore, solar power is actually nuclear power; it is just generated far away. Because of this, the radiation given off from these uncontained nuclear reactors is constantly bombarding us and our planet with substantial radiation levels (i.e., cosmic radiation).

In addition, we are all routinely exposed to the radiation from the Potassium in our food, Radium, Thorium, and Uranium in our soil and building materials, and Radon in our air and drinking water. A certain percentage of each of these elements is always present in the form of unstable isotopes, which decay and give off ionizing radiation. Even all Carbon -- the basic element of all organic life -- contains the radioactive isotope Carbon-14. (This is how carbon dating is performed.) These sources result in the average person's receiving an annual dose of about 300 millirem per year considering both external exposure and internal exposure from ingestion.

Radioactivity over time (does it 'accumulate')?

While very specific mechanisms can cause things to accumulate (e.g., a trap of some kind), all things in nature, including radioactivity, tend to disperse. Radioactivity does

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not accumulate in ground or surface water, even over long periods of time. By the nature of how water moves in the ground, it disperses. Very specific mechanisms – like the chemical bonding properties of some elements, plant life absorption, and physical traps in the soil -- can cause temporary accumulations of radioactive material, but these mechanisms are well-understood and are accounted for in dose assessment models.

II. Regulatory Context

Regulation of radioactive material begins with the Nuclear Regulatory Commission (NRC) and the federal Atomic Energy Act (AEA). The NRC has overarching authority over the licensing and regulation of radiation and radioactive materials nationwide.

Tennessee is one of 34 "Agreement States" that have been delegated authority to regulate on behalf of the NRC. These Agreement States have entered into an effective regulatory discontinuance agreement with the NRC under subsection 274b. of the AEA. The role of the Agreement States is to regulate most types of radioactive material in accordance with the compatibility requirements of the AEA. These types of radioactive materials include source material (Uranium and Thorium), reactor fission byproducts, and limited quantities of special nuclear materials (SNM) not sufficient to form a critical mass. The NRC periodically reviews the performance of each Agreement State to assure compatibility with NRC's regulatory standards. Tennessee's Division of Radiological Health is subject to a periodic NRC review, including a review culminating in an approval letter dated July 11, 2007.[iii] At the present time, 34 states are currently Agreement States and three others have petitions pending with the NRC.[iv]

Agreement States issue radioactive materials licenses, promulgate regulations, and enforce those regulations under the authority of each individual state's laws. The Agreement States exercise their licensing and enforcement actions under direction of the governors in a manner that is compatible with the licensing and enforcement programs of the NRC.

Facilities that use radiation or radioactive materials are required to obtain a license for that activity from the NRC or the applicable Agreement State. These licenses contain detailed requirements for the management of radioactivity, and for the protection of workers and the public at large. Termination of a license (for instance, after shutdown of a licensed laboratory) requires that all radioactive materials be accounted for, and that the residual radioactivity at the site be surveyed and determined to be below certain established levels (typically 25 mrem/year for "unrestricted release," or higher for sites with future use restrictions).[v]

Waste materials generated at licensed facilities are treated differently than similar wastes generated at nonlicensed facilities based on their origin, not necessarily on their radioactivity or the level of risk posed. The National Academy of Sciences has noted, "Regulations focused on [low-level radioactive] waste's origins have led to inconsistencies relative to their likely radiological risks."[vi] In many cases, for instance, demolition debris from a residential or commercial setting, including widely used

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building materials such as granite, may exhibit higher levels of radioactivity than demolition waste from a licensed facility undergoing decommissioning. (This type of demolition waste is the most common material approved under the BSFR process.) Recognizing this incongruity, the Health Physics Society has taken the position that "Risk-informed waste-disposal requirements for radioactive materials should be consistent and integrated with waste disposal for nonradioactive hazardous waste."

Licensees that generate waste with radioactivity that does not meet the federal or state definition of high-level radioactive waste (either through a process, or through demolition during decommissioning) are faced with few and dwindling options for disposal. Only three disposal facilities exist for this material, located in Barnwell, S.C.; Grand View, Idaho; and Clive, Utah. Of these three, the Barnwell site in 2008 is imposing a prohibition on waste from outside of the few states in its "compact," and the Idaho site is limited to naturally occurring radioactive materials waste. Effectively, one facility, operated for profit by EnergySolutions, is available for most of the nation's low-level radioactive waste. This lack of competition has led to monopolistic pricing practices, as documented by the Health Physics Society[vii] and as currently under investigation by the U.S. Department of Justice.[viii]

Regulatory Basis of the BSFR Program

One of the areas that the Agreement States have regulatory control over is the disposal of radioactive materials. In the federal regulations, the regulation that BSFR is based on is in Title 10 Part 20.2002, which authorizes a licensee to apply to the NRC for approval of alternative methods of disposal not specifically set out in the federal regulations. This regulation and its predecessors in earlier versions of 10 CFR Part 20, 10 CFR 20.304 and 20.302, have been in NRC's regulations and have been used since 1959. According to the NRC, the agency has received more than 100 requests in the last 30 years for 10 CFR 20.2002 approvals. Although about two-thirds of these requests were for onsite disposals, the trend in recent years has been for fewer onsite and more offsite disposals.[ix] Since 2000, NRC has received 20 requests for 20.2002 alternate disposal authorizations, 17 of which were for offsite disposal.[x]

The NRC bases its approval of the information contained in a 20.2002 request from a licensee to determine whether the proposed disposal will be safe. For offsite disposals, the NRC's standard practice is to assess three scenarios that potentially expose people to radiation to determine the exposure levels: 1) a transportation worker (e.g., truck driver), 2) a worker at the disposal facility, and 3) a resident farmer at the site, for which long-term impacts are examined. The request is typically authorized by NRC if the projected radiation dose is less than "a few millirem per year," which they have determined is no more than five millirem. Under the Tennessee BSFR program, the most restrictive resident farmer scenario and a dose limit of one millirem are used for the assessment.

Most Agreement States have incorporated language analogous to the federal 10 CFR 20.2002 in their state regulations, and thus have authority to approve alternative methods

of disposal. Our review of Agreement States' regulations determined that 30 states have such authority.[xi]

BSFR and 10 CFR 20.2002 disposals are similar to other disposals of other radioactive materials in landfills and hazardous waste facilities that occur routinely in the U.S. Among the authorized disposal facilities of radioactive materials in the U.S. are hazardous waste facilities, in California and Colorado, which accept radioactive wastes in concentrations up to 2,000 pCi/gram total radioactivity, and Michigan solid waste landfills which are allowed to accept waste containing up to 50 pCi/gram of Radium-226. In addition, Louisiana allows for oilfield waste containing up to 30 pCi/gram Radium-226 to be disposed of in non-hazardous oilfield disposal facilities. The U.S. Ecology Idaho facility and the Waste Control Specialists facility in Texas, in addition to accepting Atomic Energy Act materials, also accept naturally occurring radioactive materials. In addition to waste authorized for disposal under these programs, a wide variety of radioactive materials are disposed of in hazardous and solid waste landfills that are regulated under the Resource Conservation and Recovery Act (RCRA). RCRA is implemented by the U.S. EPA and States authorized by EPA. Many materials with naturally occurring radioactivity are disposed of in landfills. Other sources of radioactivity in landfills are man-made items.

Some of the radioactive materials that may be disposed of in landfills include the following:

- Short-lived nuclear medicine radioisotopes with a half-life of less than 65 days, from hospitals, medical clinics, or from patients' homes. These may include paper towels, dishes, tableware, bedding and anything else touched by a patient. Because the half-life is so short, the hazard quickly disappears.

- Tritium Exits signs (the primary source of leachate contamination)[xii]

- Items containing naturally occurring radioactivity, such as:

  Fertilizer
  Gypsum
  Dry wall
  Ion exchange resins from water purification
  Coal ash
  Oil and gas production sludges
  Consumer products:
  Timepieces (Tritium, Radium, Promethium)
  Smoke detectors
  Pottery
  Gas lantern mantles (e.g., Coleman lanterns)
  Optical lenses for cameras, glasses, binoculars, telescopes, etc.
  Road salt

III. BSFR

BSFR Program Licensing

IMPACT's BSFR process is a comprehensive program licensed by the state in accordance with the governing regulations. This is done by specific amendments to IMPACT's Radioactive Material License which is the governing document by which we operate our facilities.

The BSFR amendment(s) are granted after a comprehensive landfill-specific request is generated and submitted to the state for evaluation and approval. These requests take into consideration the specific characteristics of each landfill such as terrain, construction, hydrology, and disposal operations, but takes no credit for the liners typically installed at these locations. A significant portion of the request is the scientific modeling done using the internationally recognized and NRC-accepted RESRAD program. The BSFR modeling is based on the most conservative scenario, commonly referred to as the "resident farmer" scenario. This scenario assumes an individual lives and farms the land after the landfill is closed, thereby being exposed to radiation from the affected area continuously. The Tennessee BSFR program stipulates a dose limit of one millirem as a limit to this farmer, as opposed to the five millirem standard used by the NRC in the 10 CFR 20.2002 process.

Information on the RESRAD program can be found at the Argonne National Laboratory website, http://web.ead.anl.gov/resrad/home2/. A very good description and explanation of this modeling can be found in the NRC publication, NUREG 1757, Consolidated Decommissioning Guidance, Volume 2, Appendix I. Contrary to the statements of the Nuclear Information Resource Services in comments made on the record, RESRAD is indeed a verified model.[xiii]

It is very important to note:

- The one millirem maximum exposure is to the resident farmer. The exposure to persons living near the landfill would be significantly less.
- The one millirem maximum exposure is based on disposal of materials at a maximum concentration of radioactive materials and at maximum tonnage per day. The history of the program has shown that these disposal rates are extremely conservative and that none of the licensees have disposed of materials near these rates.

This license amendment process is very comprehensive in terms of the level of effort and detail involved. The license application and supporting scientific study and documentation is a grueling and lengthy process with several hundred man-hours of effort involved. Additionally, the licensee must have a comprehensive program in place

to administer the BSFR process including areas of operations, quality, safety, and administration. The licensee must also demonstrate these assurances to state, federal, and local jurisdictions, and not at all insignificantly, to insurers who provide financial surety and bonding for these operations. The licensee is inspected and audited on a regular basis by these agencies to ensure compliance.

BSFR Program Operations

The BSFR program operations are strictly regulated by the previously described licensing process. The limits which are scientifically derived from this process restrict the level of radioactivity in the materials being considered for disposal. When a request is received to evaluate a particular waste stream for applicability, the licensee must follow a careful step-by-step approach to determine the acceptability.

These steps include:

- Historical review of the site to determine the types of materials which would be expected
- Review and analysis of sample data from the site to determine relative concentrations and discrete individual concentrations of contaminants
- Review of other potential hazards such as chemical contaminants
- Physical characteristics such as size, soil content, metal content, etc.

The licensee will then require that the generator provide independent analysis of the candidate materials and provide documentation that the materials will meet the requirements for disposal.[xiv] The licensee reviews the materials' characteristics by analysis, and determines if the strict requirements are indeed met. If all these requirements are met, the licensee will authorize the generator to send the candidate materials to the licensee.

Upon receipt at the licensee's facility, the materials are then subjected to a comprehensive sampling and analysis program to again determine that they in fact do or do not meet the requirements.[xv] This includes physical sampling, direct radiation measurements, and inspections of containers of actual material. This sampling and analysis is performed using state-of-the-art measurement technology under approved procedures and calibrated instrumentation. The sensitivity of assay instrumentation is several orders of magnitude greater than one would see with field handheld instrumentation or drive-by portal detectors typically installed at landfills. If any material is determined not to meet BSFR's strict criteria, IMPACT returns the material to the generator at the generator's expense.

The material is tracked by weight, concentrations of radionuclides, and total amounts of materials going to a particular disposal facility. This process is meticulously documented to ensure all BSFR materials are properly disposed of, as required by the processor's license. The licensee also reports to the state on a routine basis as required by the

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governing regulations and specifically committed to in the license. The licensee is routinely audited and inspected against these rigorous regulations to ensure verbatim compliance.

BSFR Program Proprietary Information

IMPACT Services does not and has never claimed proprietary rights on any of the documentation provided to the state on any submittals involving the BSFR process. The basis of our approved program, the license, and all reporting to the state is available to the public at the state offices governing this process.

IV. Landfill-related Issues

No Impacts to Environment by Dispersal of Radioactivity from Landfill

Commenters at the public meetings on the BSFR process have expressed concern about the potential for radioactivity from BSFR materials to be dispersed into the environment or the community by various routes, including migration to groundwater; migration to surface water, and the drinking water supply; dispersal of contamination by vectors (such as rats or raccoons); or dust from landfill operations. Each of these potential dispersal mechanisms is accounted for in the RESRAD modeling for each BSFR site. Specifically, the potential for migration to ground water and surface water, and future exposure to those waters, as well as the impact of animals on the site, is included in the 'resident farmer' exposure scenario. The exposure to on-site workers to dust from landfill operations (which would necessarily be higher than others in the community, but not on-site) is accounted for in the industrial use scenario. Considering all of these approaches, BSFR material still adds less than one millirem of dose to the most exposed individuals.

Leachate Radioactivity Analysis

The recent reporting of results of leachate sampling at some of the landfills in Tennessee has focused on elevated levels of radioactive tritium. Tritium is a mildly radioactive type of Hydrogen (H-3) with a modest 25-year half-life that occurs both naturally and from man-made sources. Both the NRC and USEPA have identified a growing problem with Tritium disposal at municipal and industrial landfills across the nation. The source of this contamination has been determined to be the improper disposal of self-illuminating exit signs from buildings. The data obtained from the Tennessee landfills is not inconsistent with that seen in other parts of the country.[xvi] This is a national phenomenon, but is unrelated to the current issue of licensed disposal in the state of Tennessee. These materials are not allowed or part of the BSFR process, and are specifically screened in the processor's analysis. No elevated levels of Tritium can be attributed to the BSFR program, as the processors are required to screen for this radionuclide.

Additional information on Tritium is available at the USNRC and USEPA web sites along with several state and institutional pages. A good starting point is the USEPA site

on exit signs, http://www.epa.gov/radtown/exit-signs.htm, which gives a good overview of the problem and provides several informative links to other locations.

Daniel Hirsch, the President of the Committee to Bridge the Gap, a California-based anti-nuclear advocacy group, has stated in published press reports that leachate data from Tennessee landfills is significantly higher in radioactivity than data from a 2003 survey of landfills in California. IMPACT Services points out that this data comparison is disingenuous, because the studies used wildly different methodologies.[xvii] California's studies used leachate samples passed through a sub-micron filter, which would remove nearly all solids in the sample. Most radioactivity is part of the suspended solids in liquid samples, and such aggressive filtering would have the effect of eliminating most radioactivity that otherwise would have been detected. Tennessee's samples were unfiltered. Furthermore, California's geology is significantly different than Tennessee's, which has significant levels of uranium in the background. For these reasons, Impact believes comparison of Tennessee leachate sampling results with California sample results is not scientifically defensible.

Landfill Liner Compatibility

As described above, the RESRAD modeling completed as part of a BSFR licensing amendment takes no credit for the synthetic liner that is part of the design at every BSFR landfill, including Middlepoint. Nevertheless, IMPACT Services brings to the SWAC's attention the existence of a scientific study of the effects of radionuclides on synthetic landfill liners commissioned by the U.S. Department of Energy at its Fernald, Ohio, facility.[xviii] The DOE study examined the effects of the chemical and radiological properties of leachate from a proposed onsite radioactive waste disposal cell on HDPE liner systems, and concluded, "There is no indication that the [landfill] in-service conditions will cause degradation to commercially available HDPE geomembrane products." The design life of the Fernald radioactive waste landfill is 500 years, according to Dr. Robert Bachus, one of the authors of the study, and a standard landfill liner was determined to be suitable for the design. The liner of the Middlepoint landfill should likewise be unaffected by the relatively insignificant radioactivity in the BSFR materials disposed of there.

V. Other Issues Raised in Public Comment Period

Legislative Intent and 60-day Deadline

Certain statements have been made on the record at the SWAC's July 24, 2007, meeting about the intent of the General Assembly in passing the legislation that became Public Chapter No. 584, that should be clarified. Specifically, the SWAC was told that because the 60-day deadline for the SWAC's recommendations was the result of a late compromise between the two bodies of the General Assembly, it would be acceptable for the SWAC to report back that more time for study is needed, rather than with substantive recommendations. The legislative history contradicts this statement.

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The official summary of the bill from the General Assembly's web site, detailing the legislative history of the bill, is attached.[xix] Contrary to the assertions to the SWAC on July 24, the legislative history shows the legislature's concern that the SWAC complete its review of the BSFR process expeditiously. Specifically, after the House of Representatives passed an amended version of HB 1345 on June 12, 2007 – which included a moratorium on the disposal of BSFR materials in Rutherford County, pending the SWAC's recommendations due December 31, 2009 -- the Senate refused to concur. That version of the bill could not and did not become law because of objections in the Senate. After reconsideration of the bill in the House, a new Amendment 4 to HB 1345 was devised, which required the SWAC to report its recommendations within 60 days after its next scheduled meeting on July 5, 2007. Only after the House passed the revised bill did the Senate concur, and the bill get transmitted to the governor for signature.

This history clearly indicates that the General Assembly rejected an extended period of review, and specifically limited the SWAC's time for action to 60 days. The SWAC would be in violation of the law if it were not to make its recommendations in the required time frame.

Proprietary Information

Recent media reports on the BSFR program have focused on its history as a "secret" program, hidden from public view. In the case of IMPACT Services, this could not be further from the truth. IMPACT Services submitted its license amendment materials for review with no claim of confidentiality. All of IMPACT's periodic reports to the TDRH have been submitted without claims against disclosure. The records of IMPACT's process are an "open book" at TDEC.

In addition, Mark McHugh, the Certified Health Physicist who assisted IMPACT Services in preparing its licensing documentation, offered from the podium at the June 17 public meeting, in front of hundreds of Murfreesboro residents, to stay as late needed after the meeting to answer every question that the citizenry had about the BSFR program, its scientific background, and its potential to impact the community. Only one person spoke to Mr. McHugh after the meeting.

Did TDEC and Middlepoint Promise Not to Accept any Special Wastes?

BSFR materials are classified as "special waste" by the Division of Solid Waste Management, which requires specific approval for disposal. Several commenters have alleged that officials from TDEC or the Middlepoint Landfill promised that the landfill would accept only household garbage, when questioned by the participants in the public comment process for that permit. One commenter at the June 17 public meeting stated that as an official and a citizen in that process, he asked whether any hazardous waste or special wastes would be accepted at the landfill, and that TDEC and Middlepoint officials "lied" when they said that no, only household garbage would be accepted. IMPACT Services is unaware of specific conversations that took place during the landfill's

expansion permitting process, but points out that the public notice from that time states that the permit is "for the disposal of domestic wastes, commercial wastes, institutional wastes, municipal solid wastes, bulky wastes, landscaping and land clearing wastes, industrial wastes, construction/demolition wastes, farming wastes, shredded automotive tires, dead animals, and special wastes."[xx]

How Does the BSFR Process Help Tennessee?

Disposing of BSFR materials in solid waste landfills preserves scarce disposal space that is licensed for low-level radioactive waste disposal. As described above, the lack of competition in the disposal market has led to pricing practices that have triggered an antitrust investigation by the U.S. Department of Justice. In addition, high disposal prices have adversely affected health care practices and life sciences research activities, according to a number of leading institutions and organizations that expressed their concerns in response to a 2003 USEPA request for comment on potential revisions to the disposal regulations for low-level radioactive waste.[xxi] Maximizing the space available for disposal of materials that requires isolation in a licensed facility because of its radioactivity may help reduce these detrimental effects on the health sciences.

In addition, the BSFR process was devised by Tennessee businesses with expertise in managing radioactive materials because of the state's historic and cutting-edge role in nuclear science. Frankly, the BSFR "business" exists in Tennessee because entrepreneurial Tennesseans with years of experience with this extremely low-activity waste devised a business model based on an efficient, pre-approved, but extremely conservative process for its safe disposal. Four companies in the state now provide this service to licensed facilities, and employ hundreds of Tennesseans in skilled jobs. To discontinue the BSFR process based on unfounded hysteria would be the death-knell of a homegrown, highly skilled industry.

Conclusion

In conclusion, IMPACT Services believes the scientific evidence shows that the BSFR program is protective of human health and the environment. It is beneficial to science as a whole, and is a homegrown Tennessee industry. There is no environmental reason to reduce or eliminate the disposal of BSFR materials in Tennessee landfills, and therefore IMPACT Services respectfully requests that the SWAC recommend no change in the program.

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[i] Health Physics Society position statement, "Radiation Risk in Perspective" (Revised August 2004). See Attachment 1.

[ii] National Research Council, Health Risks from Exposure to Low Levels of Ionizing Radiation: BEIR VII, Phase 2 (June 29, 2005).

[iii] See letter from Scott W. Moore, NRC, to Lawrence E. Nanney, Director, TDRH (July 11, 2007), available at http://nrc-stp.ornl.gov/special/regs/tnregs070711.pdf.

[iv] See http://www.hsrd.ornl.gov/nrc/rulemaking.htm

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[v] See the voluminous NRC guidance on license termination requirements in NUREG-1757 at http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1757/

[vi] National Research Council Report, "The Impact of Low-Level Radioactive Waste Management Policy on Biomedical Research in the United States," National Academies Press, 2001.

[vii] Background information document for Health Physics Society position statement, "Low-Level Radioactive Waste Management Needs A Complete and Coordinated Overhaul" (Revised September 2005). See Attachment 3.

[viii] "Antitrust Claims: EnergySolutions' Competitors Being Interviewed by Justice," Salt Lake Tribune, July 13, 2007. See Attachment 4. See also, "Justice Department Launches Antitrust Investigation of EnergySolutions," Weapons Complex Monitor, Vol. 18 No. 30, July 9, 2007. See Attachment 5.

[ix] See http://www.nrc.gov/waste/llw-disposal/10cfr20-2002-info.html

[x] See Attachment 4 to Memorandum to NRC Commissioners from Luis A. Reyes, NRC Executive Director for Operations, "Improving Transparency in the 10 CFR 20.2002 Process" (March 9, 2006). See Attachment 6.

[xi] See spreadsheet compilation at Attachment 7. This spreadsheet examines only whether the Agreement States have regulations analogous to 10 CFR 20.2002 in their programs, not the degree to which they have exercised the authority to approve alternative disposal methods.

[xii] This conclusion is supported by numerous studies of radionuclides in landfill leachate. Robert D. Mutch, Jr. et al, "A Study of Tritium in Municipal Solid Waste Leachate and Gas," presented at Water Environment Federation 2007 Specialty Conference (2007); Civil & Environmental Consultants, Inc., "Radiological Investigation Results for Pennsylvania Landfill Leachate" conducted for Pennsylvania Department of Environmental Protection (Oct. 3, 2005) (available at http://www.dep.state.pa.us/brp/Radiation_Control_Division/SolidWasteMonitoring/LF%20Leachate%20Final%2010_03_051_web.pdf); Civil & Environmental Consultants, Inc., "Radiological Investigation Results for Pennsylvania Landfill Leachate Fall 2005 Tritium Update" conducted for Pennsylvania Department of Environmental Protection (April 7, 2006) (available at http://www.dep.state.pa.us/brp/Radiation_Control_Division/SolidWasteMonitoring/Fall%2005%20LF%20Leachate%20Tritium%20PRE%20FINAL_slw032906_8.pdf).

[xiii] Haliburton NUS Corporation, "Verification of RESRAD A Code for Implementing Residual radioactive Material Guidelines Version 5.03," June 1994. Minor changes to the RESRAD code since the last full verification have been the subject of two more limited validation papers using the most recent real-world dose data.

[xiv] See typical form for reporting generator analysis at Attachment 8.

[xv] See redacted but typical processor analysis at Attachment 9.

[xvi] See Attachment 11.

[xvii] Impact believes the California sampling program was conducted through several studies, including the GeoChem Applications study, "Results and Evaluation of Radiochemical Sampling at Six Waste Management, Inc. California Landfills" (January 2003) (available at http://apps.em.doe.gov/etec/Cleanup/Documents/WasteManagement/RadiochemistryFinal.pdf). It is noteworthy that this study includes sample results more than double the maximum levels reported by Mr. Hirsch in his July 24, 2007 statement.

[xviii] GeoSyntec Consultants, "Leachate/Liner Compatibility Study Final Report," June 1997. See Attachment 12.

[xix] See Attachment 13, which was printed from the Tennessee General Assembly's website at http://www.legislature.state.tn.us/bills/currentga/asp/WebBillInfo/Summary.aspx?BillNumber=SB1779

[xx] TDEC Division of Solid Waste Management, "Public Notice of Public Hearing and Intent to Issue Permit for a Solid Waste Disposal Facility," issued December 20, 2005. See Attachment 14.

[xxi] USEPA, "Approaches to an Integrated Framework for Management and Disposal of Low-Activity Radioactive Waste: Request for Comment; Proposed Rule," 68 Fed. Reg. 65120 (Nov. 18, 2003). Relevant responsive comments are summarized in the background information document for Health Physics Society position statement, "Low-Level Radioactive Waste Management Needs A Complete and Coordinated Overhaul" (Revised September 2005).

Attachment 1

HEALTH PHYSICS SOCIETY

RADIATION RISK IN PERSPECTIVE

POSITION STATEMENT OF THE HEALTH PHYSICS SOCIETY*

Adopted: January 1996
Revised: August 2004

Contact: Richard J. Burk, Jr.
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In accordance with current knowledge of radiation health risks, the Health Physics Society recommends against quantitative estimation of health risks below an individual dose of 5 rem[1] in one year or a lifetime dose of 10 rem above that received from natural sources. Doses from natural background radiation in the United States average about 0.3 rem per year. A dose of 5 rem will be accumulated in the first 17 years of life and about 25 rem in a lifetime of 80 years. Estimation of health risk associated with radiation doses that are of similar magnitude as those received from natural sources should be strictly qualitative and encompass a range of hypothetical health outcomes, including the possibility of no adverse health effects at such low levels.

There is substantial and convincing scientific evidence for health risks following high-dose exposures. However, below 5–10 rem (which includes occupational and environmental exposures), risks of health effects are either too small to be observed or are nonexistent.

In part because of the insurmountable intrinsic and methodological difficulties in determining if the health effects that are demonstrated at high radiation doses are also present at low doses, current radiation protection standards and practices are based on the premise that any radiation dose, no matter how small, may result in detrimental health effects, such as cancer and hereditary genetic damage. Further, it is assumed that these effects are produced in direct proportion to the dose received, that is, doubling the radiation dose results in a doubling of the effect. These two assumptions lead to a dose-response relationship, often referred to as the linear, no-threshold model, for estimating health effects at radiation dose levels of interest. There is, however, substantial scientific evidence that this model is an oversimplification. It can be rejected for a number of specific cancers, such as bone cancer and chronic lymphocytic leukemia, and heritable genetic damage has not been observed in human studies. However, the effect of biological mechanisms such as DNA repair, bystander effect, and adaptive response on the induction of cancers and genetic mutations are not well understood and are not accounted for by the linear, no-threshold model.

Radiogenic Health Effects Have Not Been Consistently Demonstrated Below 10 Rem

Radiogenic health effects (primarily cancer) have been demonstrated in humans through epidemiological studies only at doses exceeding 5–10 rem delivered at high dose rates. Below this dose, estimation of adverse health effect remains speculative. Risk estimates that are used to predict health effects in exposed individuals or populations are based on epidemiological studies of well-defined populations (for example, the Japanese survivors of the atomic bombings in 1945 and medical patients) exposed to relatively high doses delivered at high dose rates. Epidemiological studies have not demonstrated adverse health effects in individuals exposed to small doses (less than 10 rem) delivered in a period of many years.

Limit Quantitative Risk Assessment to Doses at or Above 5 Rem per Year or 10 Rem Lifetime

In view of the above, the Society has concluded that estimates of risk should be limited to individuals receiving a dose of 5 rem in one year or a lifetime dose of 10 rem in addition to natural background. In making risk estimates, specific organ doses and age-adjusted and gender-adjusted organ risk factors should be used. Below these doses, risk estimates should not be used. Expressions of risk should only be qualitative, that is, a range based on the uncertainties in estimating risk (NCRP 1997) emphasizing the inability to detect any increased health detriment (that is, zero health effects is a probable outcome).

Impact on Radiation Protection

Limiting the use of quantitative risk assessment, as described above, has the following implications for radiation protection:

(a) The possibility that health effects might occur at small doses should not be entirely discounted. The Health Physics Society also recognizes the practical advantages of the linear, no-threshold hypothesis to the practice of radiation protection. Nonetheless, risk assessment at low doses should focus on establishing a range of health outcomes in the dose range of interest and acknowledge the possibility of zero health effects. These assessments can be used to inform decision making with respect to cleanup of sites contaminated with radioactive material, disposition of slightly radioactive material, transport of radioactive material, etc.

(b) Collective dose (the sum of individual doses in a defined exposed population expressed as person-rem) has been a useful index for quantifying dose in large populations and in comparing the magnitude of exposures from different radiation sources. However, collective dose may aggregate information excessively, for example, a large dose to a small number of people is not equivalent to a small dose to many people, even if the collective doses are the same. Thus, for populations in which almost all individuals are estimated to receive a lifetime dose of less than 10 rem above background, collective dose is a highly speculative and uncertain measure of risk and should not be used for the purpose of estimating population health risks.

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Footnotes

[1]The rem is the unit of effective dose. In international units, 1 rem=0.01 sievert (Sv)=10 mSv.

References

National Council on Radiation Protection and Measurements. Uncertainties in fatal cancer risk estimates used in radiation protection. Bethesda, MD: NCRP; NCRP Report No. 126; 1997.

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* The Health Physics Society is a nonprofit scientific professional organization whose mission is excellence in the science and practice of radiation safety. Since its formation in 1956, the Society has grown to approximately 6,000 scientists, physicians, engineers, lawyers, and other professionals representing academia, industry, government, national laboratories, the Department of Defense, and other organizations. Society activities include encouraging research in radiation science, developing standards, and disseminating radiation safety information. Society members are involved in understanding, evaluating, and controlling the potential risks from radiation relative to the benefits. Official position statements are prepared and adopted in accordance with standard policies and procedures of the Society. The Society may be contacted at 1313 Dolley Madison Blvd., Suite 402, McLean, VA 22101; phone: 703-790-1745; fax: 703-790-2672; email: HPS@BurkInc.com.

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Attachment 2

HEALTH PHYSICS SOCIETY

LOW-LEVEL RADIOACTIVE WASTE MANAGEMENT NEEDS A COMPLETE AND COORDINATED OVERHAUL

POSITION STATEMENT OF THE
HEALTH PHYSICS SOCIETY*

Adopted: May 1995
Revised: September 2005

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Low-level radioactive waste (LLRW) is an inevitable byproduct of beneficial uses of radioactive materials in the United States. It arises from medical research, diagnosis and treatment of diseases, industrial processes, national defense, and electric power generation—all vital to our national interests. LLRW will continue to be generated, requiring the availability of disposal methods and sites so that society can continue to enjoy the full benefits of the use of radioactive materials. Safe and effective methods and standards for processing, transport, and disposal of LLRW are well established.

The 1980 LLRW Policy Act, as amended in 1985, established a framework for the states to provide for safe disposal of LLRW and encouraged the creation of regional compacts to develop an appropriate network of disposal sites. The deadlines established for the development of new sites have passed, with no new sites being opened. Political, judicial, and administrative obstacles have blocked the development of sites and have limited the disposal options for higher-activity classes of waste within existing sites. Disposal options for the highest-activity classes of waste are limited and may no longer exist for a majority of the states after 2008. In addition, the current regulatory framework results in excessive and overly restrictive requirements for disposal of the lowest-activity class of waste. The effect of these obstacles and restrictions is to interfere with optimal use of radioactive materials in medicine, research, energy production, and technology. The use

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of all available options, including private, commercial, and federal facilities, can facilitate the orderly, safe, and efficient disposal of radioactive waste.

The current state of affairs for LLRW disposal has led the Health Physics Society to take the following **positions.**

1. **The goal of managing LLRW is to ensure the safety of workers and the public and to protect the environment. To achieve this goal, disposal, not long-term storage, is the best and safest long-term approach.**

2. **The Health Physics Society believes that lack of competition in LLRW disposal options results in excessively high costs to waste generators, which impede the use of nuclear technologies that provide significant benefits to society.**

3. **The Health Physics Society believes that the regulatory framework for management and disposal of LLRW needs a complete and coordinated overhaul.**

   The **fundamental changes** needed to LLRW management include the following:

   a. **Waste classification and disposal requirements for any type of radioactive waste should be based on its potential risk to public health and safety, not on its origin or legislative stature.**

   b. **Risk-informed waste-disposal requirements for radioactive materials should be consistent and integrated with waste disposal for nonradioactive hazardous waste.**

   c. **The LLRW Policy Act should be amended or replaced to:**

      i. **allow non-Department of Energy (DOE) waste generators access to all existing licensed and permitted disposal facilities.**

      ii. **allow non-DOE waste generators access to disposal facilities owned and operated by the DOE.**

      iii. **provide a new waste-disposal capacity for all LLRW at a facility currently operated by DOE or by private industry on land owned by the federal government.**

Based on these positions, the Health Physics Society makes the following **recommendations**. Although some of these recommendations are available with no significant change in the regulatory framework, they are all consistent with the regulatory framework changes given above.

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1. Based on Positions 3.a and 3.b, we endorse the approach for a waste-disposal classification system proposed by the National Council on Radiation Protection and Measurements (NCRP 2002).

2. Based on Position 3.b, we strongly support the Environmental Protection Agency efforts to move forward with a rulemaking to promulgate regulations allowing disposal of low-activity radioactive waste (LARW) and low-activity mixed waste (LAMW) at Resource Conservation and Recovery Act (RCRA) Subtitle C sites.

3. Based on Position 3.b, we support the use of uranium mill-tailings sites regulated under the Uranium Mill Tailings Radiation Control Act (UMTRCA) for disposal of radioactive materials that are appropriate for these sites. Examples of potentially appropriate materials are certain non-11e.(2) byproduct material such as the LARW and LAMW noted in 2 above; technologically enhanced naturally occurring radioactive materials (TENORM); high-volume, low-activity waste from reactor decommissioning; and certain low-activity resins from operating reactors.

4. Based on Position 3.c, we strongly support DOE efforts to prepare an Environmental Impact Statement under the National Environmental Policy Act to evaluate additional alternatives for disposal of greater-than-Class C wastes. These include deep geological disposal facilities, existing LLRW disposal facilities (both commercial and federal), and new facilities (both commercial and federal) at federal sites or on private land.

5. Based on Position 3.c, we urge Congress to direct federal action to ensure that disposal options and capacity for Class B and Class C waste will exist for all states in the future. This can be achieved by use of commercial or private facilities on federal or private lands to mitigate significant adverse consequences to generators of these wastes.

Reference:

National Council on Radiation Protection and Measurements. Report 139, Risk-Based Classification of Radioactive and Hazardous Chemical Wastes, Bethesda, Maryland. Issued 31 December 2002.

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* The Health Physics Society is a nonprofit scientific professional organization whose mission is to promote the practice of radiation safety. Since its formation in 1956, the Society has grown to approximately 6,000 scientists, physicians, engineers, lawyers, and other professionals representing academia, industry, government, national laboratories, the Department of Defense, and other organizations. Society activities include encouraging research in radiation science, developing standards, and disseminating radiation safety information. Society members are involved in understanding, evaluating, and controlling the potential risks from radiation relative to the benefits. Official position statements are prepared and adopted in accordance with standard policies and procedures of the Society. The Society may be contacted at 1313 Dolley Madison Blvd., Suite 402, McLean, VA 22101; phone: 703-790-1745; fax: 703-790-2672; email: HPS@BurkInc.com.

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Attachment 3

HEALTH PHYSICS SOCIETY

Specialists in Radiation Safety

Background Information on
"LOW-LEVEL RADIOACTIVE WASTE MANAGEMENT NEEDS A COMPLETE AND COORDINATED OVERHAUL"
Position Statement of the Health Physics Society*
Adopted: October 1993, Revised: May 1995, Updated: July 1998, Revised: July 1999, Revised: September 2005

Approved by the Scientific and Public Issues Committee
Drafted with the assistance of the Legislation and Regulation Committee

Introduction

The Health Physics Society (HPS) initially issued a position statement in October 1993 titled "Low-Level Radioactive Waste." In that statement the HPS expressed concern over the way in which the Low-Level Radioactive Waste (LLRW) Policy Act of 1980, as amended in 1985, was being implemented. The position statement was then revised in May 1995 to focus on the issue that disposal facilities were not being developed, resulting in waste being stored at the sites where it was generated. This revision established the Society position that disposal, not temporary storage, is the safest approach. In July 1998 the position statement was updated to reflect obstacles encountered in California and Texas in trying to site a disposal facility. In July 1999, the Society revised the position statement once again. In that revision the Society took the position that the LLRW Policy Act unnecessarily restricts access to available disposal sites and impedes open commercial development of additional facilities. In 2005 the Society revised the position statement again, giving it a different title.

This document provides background supporting information for the revised position statement issued in September 2005 titled "Low-Level Radioactive Waste Management Needs a Complete and Coordinated Overhaul." It should be considered an adjunct to the position statement and is not a stand-alone document.

Rationale for the September 2005 Revision

The 1980 LLRW Policy Act, as amended in 1985, established a framework for the states to provide for safe disposal of LLRW and encouraged the creation of regional compacts to develop an appropriate network of disposal sites. However, 20 years after the last amendments to the act, disposal facilities and options for LLRW remain limited, do not provide options for disposal of all classes of LLRW, and are expensive. Since 9/11/2001, concern for the security of radioactive

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material, including radioactive waste, has been greatly heightened. During this same period the availability of disposal facilities for the wastes having the highest radioactivity content, i.e., Class B, Class C, and greater-than-Class C (GTCC) waste, became uncertain. The disposal facility in Barnwell, South Carolina, announced it would no longer take Class B and Class C waste from other than its compact states after 2008. The disposal facility in Clive, Utah, ceased actions to try to obtain a license to dispose of Class B and Class C waste, and the projected disposal facility for GTCC waste, i.e., Yucca Mountain, continues to be delayed by a court ruling regarding the environmental performance standards. These issues and others have increased interest and concern within Congress. For example, the Senate Energy and Natural Resources Committee, which commissioned a report by the Government Accountability Office (GAO) on the disposal capacity projections for LLRW (GAO 2004), held a hearing in September 2004 on Low-Level Radioactive Waste Oversight. The committee subsequently commissioned a study by the National Academy of Sciences' Board of Radioactive Waste Management and commissioned another report by the GAO, which is to be completed in the fall of 2005 in anticipation of another hearing on waste issues.

In other radioactive waste-related activity, the Environmental Protection Agency (EPA) issued an Advanced Notice of Proposed Rulemaking (ANPR) for management of low-activity radioactive waste mixed with chemical hazardous waste (EPA 2003). The Nuclear Regulatory Commission (NRC) did work on rulemaking for disposition of solid materials. Further, Congress enacted legislation that classified certain naturally occurring or accelerator-produced radioactive materials (NARM) as byproduct material under the Atomic Energy Act (AEA). All these actions had implications for radioactive waste disposal.

The HPS provided public comments for these recent initiatives and activities. These included public comment on the EPA ANPR (HPS 2004a), public written testimony to the Senate Energy and Natural Resources Committee for its hearing (HPS 2004b), a joint position statement with the Organization of Agreement States on the need to reclassify NARM under the AEA (HPS 2005a), and responses to questions from the GAO regarding our written testimony to the Senate (HPS 2005b).

Each of these HPS documents contained positions and recommendations related to some aspect or aspects of LLRW disposal. The Scientific and Public Issues Committee decided to consolidate these positions and recommendations into a single document in the form of a revised position statement. Although the previously cited documents discussed issues concerning orphan sources and disposition of radioactive material, these topics are not incorporated in this position statement.

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Position 1 – The goal of managing LLRW is to ensure the safety of workers and the public and to protect the environment. To achieve this goal, disposal, not long-term storage, is the best and safest long-term approach.

This position is carried forward from previous versions of the position statement. The continuing concern is that the lack of disposal options results in temporary storage of waste at or near the generator sources, which comprise thousands of sites nationwide. Clearly, the final disposal of waste in centralized, properly designed and secured disposal facilities is safer and presents a higher level of security than thousands of temporary, widely distributed storage facilities. In addition, temporary storage facilities impose an unnecessary cost on the generators and increase the likelihood of loss of control if facilities close and go out of business without transferring the waste to another facility.

Position 2 – The Health Physics Society believes that lack of competition in LLRW disposal options results in excessively high costs to waste generators, which impede the use of nuclear technologies that provide significant benefits to society.

Although long-term disposal options for Class A wastes are available, lack of competition results in excessively high costs to waste generators. These excessive costs have impeded the use of nuclear technologies that provide significant benefits to society. Such technologies are used to diagnose medical illnesses, treat cancers, conduct research, develop new pharmaceuticals, preserve our food supply, and generate over 20% of our nation's electricity from commercial nuclear power plants. We believe that reducing the price of waste disposal would stimulate more research, leading to more innovative/efficient technologies that could significantly improve the quality of life of our society. However, these beneficial technologies (such as those discovered by biomedical research) continue to be impeded due to the high cost of radioactive waste disposal.

We base our position on the following:

Waste-disposal costs for government contracts held by the Department of Energy (DOE) and the Army Corps of Engineers are approximately \$5 per ft^3 for disposal of Class A LLRW at the Clive, Utah, disposal facility. For waste generators that do not have access to these government contracts, waste-disposal costs often exceed \$200 per ft^3 for Class A LLRW. In addition, there are high costs for disposal of mixed waste (i.e., waste that is regulated for both its radioactive and hazardous chemical content) and radioactively contaminated biological waste. The cost for treatment and disposal of mixed waste from biomedical research activities typically ranges from \$150 to \$1,500 per gallon and can be greater than \$10,000 per gallon. In comparison, the cost for treatment and disposal of biological waste from biomedical research without radioactive contamination typically ranges from \$1 to \$20 per pound. Recognizing that much of biological waste is aqueous (about eight pounds per gallon), this converts to \$8 - \$160 per gallon, typically 10% of the cost of biomedical mixed waste.

A National Research Council (NRC) report published in 2001 (NRC 2001) strongly supports HPS' concern regarding the costs of waste disposal. The HPS acknowledges that the report from the NRC (NRC 2001) concluded that the disposal capacity at sites regulated by the NRC were

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sufficient for biomedical needs for the next several decades. However, this report also concluded that the central issue in biomedical research is the cost of managing LLRW. While it noted the impacts of LLRW management varied depending on the local demographics and size of the research institution, the NRC further concluded that cost was an important issue to virtually all research institutions.

In the public comments submitted to the EPA in response to its Advance Notice of Proposed Rulemaking (ANPR) titled *Approaches to an Integrated Framework for Management and Disposal of Low-Activity Radioactive Waste: Request for Comment; Proposed Rule* (EPA 2003) several stakeholders, including the University of California (UC), the National Institutes of Health, the University of Nebraska, the University of Michigan, the Council on Radionuclides and Radiopharmaceuticals (CORAR), the HPS, and the state of Nebraska, underscored the economic impacts due to the high costs of waste disposal. In fact, CORAR agreed with EPA's concern that the high cost of waste disposal resulted in less than optimal health care practices. Moreover, CORAR noted that the referenced report by the NRC published in 2001 indicated that EPA regulations of mixed waste have already caused the elimination of some biomedical research and have increased the cost of research and health care (CORAR 2004).

Following are some examples of this concern from the letters to the EPA:

UC, commenting on behalf of the three DOE National Laboratories it manages, attested that the high cost and difficulty of disposing of low-activity mixed waste (LAMW) discourages some types of research conducted at its facilities. Therefore, UC adopted a general policy that no research be carried out that generates waste for which there is no disposal route. UC also supported EPA's efforts to allow more disposal options as a means to alleviate constraints on its research (UC 2004). Similarly, several UC campuses and private biomedical research centers are no longer conducting research using large animals or long-lived radioactive materials due to the unavailability of licensed treatment/disposal facilities and/or the high costs for disposal of radioactively contaminated biological waste and mixed waste.

The following specific examples were previously provided to the GAO by Cedars-Sinai Medical Center:

Animal studies at our institution are required to pay the expense of disposal out of their own grant funds. The institution does not cover the cost of this type of disposal.

1. *Historically our institution's Cardiology research programs have used large animals such as dogs, pigs, etc. These programs have been suspended for years. Experiments utilizing radioactive compounds have proven to be too expensive for grants to pay for the disposal. One animal fills an entire 30-gallon drum.*

   Cardiology research at our institution has generated breakthrough technology such as the Swan-Ganz Catheter. Drs. Swan and Ganz developed this catheter using large animals and radioactive tracers at our institution.

The use of sealed sources to treat the placque on cardiac vessels was also research that was carried out with members of our cardiology staff. Over the years, sealed sources from iodine-125, to vanadium, strontium and phosphorous were all explored.

2. *Currently our Neuroscience Institute is conducting research on blood brain barrier utilizing rats. For a 200 gm rat, only 20 microcuries of tritium or carbon 14 are utilized. The program has had to slow their research production of animals due to the costs of disposal. Each group of 60 rats requires disposal in a 30-gallon drum. Each drum costs approximately $5,000 for 1.2 millicuries of radioactive waste. Typically, this research generates approximately 60 drums per month.*

   This research on blood brain barrier is to discover a way to directly target and treat life-altering and life-ending brain tumors. These tumors are very resilient and most often recur after surgical resection. When they recur, they are more aggressive than initially presented and a treatment like Radiation Therapy or Gamma knife, etc. has even less efficacy. The life-span of these patients in usually measured in months.

   Recently the research program was brought back on track due to the implementation of some very expensive imaging technology. This technology has assisted the program with the reduction of the amount of radioactive materials used per animal experiment.

A colleague at Harbor-UCLA Medical Center added to this point: "Research using C-14 and H-3 labeled materials is nearly dead. People are using mass spectrometry techniques with C-13 and H-2 (stable nuclides) instead, even though they are less sensitive and more expensive."

The Pharmaceutical Research and Manufacturers of America (PhRMA) stated the pharmaceutical and biotechnology industry invests over $32 billion annually in discovering and developing new medicines. It also offered strong support encouraging EPA and the Nuclear Regulatory Commission to work together to allow disposal of LAMW and low-activity radioactive waste (LARW) at Resource Conservation and Recovery Act (RCRA) Subtitle C and RCRA Subtitle D sites. They provided a comparison of waste-disposal costs, which concluded that disposal of radioactive materials at sites other than an LLRW facility was 100-fold less expensive (PhRMA 2004).

The University of Nebraska cited similar observations on the high cost of waste disposal, stating that the disposal costs for a 30-gallon drum of nonscintillation LAMW at an NRC-licensed facility was 4,450% higher than managing a similar nonradioactive waste stream at an RCRA Subtitle C facility.

The state of Nebraska, Nebraska Health and Human Services, submitted comments to EPA regarding the economic impacts associated with disposal of waste generated by treatment of drinking water wastes at local municipalities. These wastes, which contain low levels of NORM, are generated by a large number of water treatment facilities across the United States. The state of Nebraska supported the EPA's proposed approach to allow use of RCRA facilities for disposal of LAMW and LLRW as a means for reducing the economic burden of waste disposal (NE 2004).

Since the promulgation of 10 CFR 61, *Licensing Requirements for Land Disposal of Radioactive Waste* (>20 years ago), untreated radioactively contaminated biological waste has not been disposed of at shallow land burial facilities. Such waste containing either low concentrations of carbon-14 and hydrogen-3 or short-lived radionuclides stored for decay to background radiation levels has been incinerated. Biomedical research using radioactive materials that generated biological waste containing higher concentrations of carbon-14 and hydrogen-3, or many other long-lived radionuclides, is no longer being conducted. The loss of value of this research tool is difficult to quantify, but is estimated to be substantial.

Position 3 – The Health Physics Society believes that the regulatory framework for management and disposal of LLRW needs a complete and coordinated overhaul.

The **fundamental changes** needed to LLRW management include the following:

Position 3.a – Waste classification and disposal requirements for any type of radioactive waste should be based on its potential risk to public health and safety, not on its origin or legislative stature.

The use of a risk-informed approach for evaluating options for land disposal of LLRW should be applied independently of the origin of the radioactive materials. As stated by the National Academy of Sciences, "*Regulations focused on [low-level radioactive] waste's origins have led to inconsistencies relative to their likely radiological risks*" (NRC 2003). These inconsistencies in regulation result in a fractionated, complicated, and inefficient regulatory framework that has contributed to the high cost of waste disposal without increasing the protection of public health and safety.

A risk-informed approach should be applied to NORM, technologically enhanced NORM (TENORM), NARM, and all other radioactive materials. For example, uranium mill tailings produced prior to the Uranium Mill Tailings Radiation Control Act of 1978 (UMTRCA) may not be disposed of in existing Title II uranium tailings sites without further acts of Congress. Likewise, other ore tailings containing similar radionuclides and posing a similar level of risk may not be disposed of in mill-tailings impoundments.

Position 3.b – Risk-informed waste-disposal requirements for radioactive materials should be consistent and integrated with waste disposal for nonradioactive hazardous waste.

As noted above, the current system of regulatory control of radioactive materials is severely fractionated with EPA, NRC, and individual states having authority under various laws. This fractionated control leads to inconsistency, inefficiency, and unnecessarily expensive public health protection policies, as discussed in the HPS Position Statement "Compatibility in Radiation-Safety Regulations" (HPS 2000).

The HPS believes that appropriate rulemaking by the EPA and NRC applying a classification framework based on the potential risk to public health and safety will achieve equitable

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protection from the hazards of radioactive and chemical waste, while at the same time moving toward a more efficient framework of regulatory control over radiation exposure in this country.

Although the EPA ANPR (EPA 2003) requested comments on the most effective use of RCRA Subtitle C facilities for disposal of LAMW, it also requested comment on a variety of wastes regulated under the AEA. These wastes include certain wastes governed by the AEA, certain wastes generated by the extraction of uranium and thorium, a variety of wastes characterized as TENORM, and certain types of decommissioning wastes.

The EPA acknowledged that some wastes regulated under the AEA are excluded from regulations as "unimportant quantities" (i.e., source materials containing less than 0.05% uranium or thorium), while others are regulated down to the last atom. Additionally, the EPA acknowledged that the current practice of LLRW disposal resulted in costly waste-management practices and appeared to have an adverse impact on the health care industry to levels that were less than optimal. To address these issues, EPA solicited stakeholder input to find solutions needed to minimize the current practice of imposing dual regulatory authority for controlling disposal of these types of regulated wastes.

Although the EPA requested comments on a variety of issues as specified in the ANPR, the following three questions appeared most important:

1. How can the disposal of LAMW be simplified?
2. Is it feasible to dispose of other LARW in hazardous waste sites?
3. What nonregulatory approaches might be effective in managing LAMW and other LARW?

To minimize dual regulatory authority, the EPA acknowledged that such an integrated framework would also require changes to regulations established by the NRC and Agreement States under the AEA. In fact, the EPA noted a similar regulatory approach that was successful previously in eliminating dual regulations (FR 2001). This approach required deferral of EPA's authority under RCRA, thus allowing disposal of mixed wastes at sites regulated by the NRC, under Title 10 Code of Federal Regulations, Part 61. The EPA believed that such a rulemaking was justifiable since adequate protection of human health and the environment was ensured under the existing NRC standards. The EPA also stated that both agencies could pursue a similar and compatible rulemaking to further harmonize the management of certain regulated waste streams outlined in the proposed rulemaking. Such a rulemaking would afford the same level of protection. The EPA stated that this approach would also reduce the regulatory burdens imposed by two separate regulatory regimes. To support this objective, the EPA would consider proceeding with a rulemaking that would allow disposal of waste streams that contain certain concentrations of radioactive materials at one of the 20 existing RCRA-regulated facilities. However, for this approach to succeed, the NRC must defer its authority under the AEA to allow disposal of licensed materials at sites regulated under RCRA, Subtitle C.

In April 2004, the HPS submitted comments on this rulemaking initiative, commending the EPA for its leadership in embarking on this important task (HPS 2004a). In addition to addressing the necessary radiation standards successfully employed to protect human health and safety, our

comments addressed technical issues regarding the movement and fate of radioactive and hazardous materials in the environment. We noted that the movement of radioactive materials in the environment would generally share the same parameters as the chemical compounds of which they are a part, except to the extent that radioactive decay hastens their degradation. We included reference to a report by the California Office of Environmental Health Hazard Assessment that concluded that biodegradation times of many RCRA hazardous wastes containing heavy metals are on the order of over 200,000 years and, thus, comparable to many of the long-lived radionuclides. As such, we suggested a concept based on the half-lives of chemicals and radionuclides should be considered to better shape the definition of LAMW and LARW.

Position 3.c – The LLRW Policy Act should be amended or replaced to:

i. **allow non-Department of Energy (DOE) waste generators access to all existing licensed and permitted disposal facilities.**

ii. **allow non-DOE waste generators access to disposal facilities owned and operated by the DOE.**

iii. **provide a new waste-disposal capacity for all LLRW at a facility currently operated by DOE or by private industry on land owned by the federal government.**

This position was first adopted by the HPS in the 1999 revision of this position statement.

The 1980 LLRW Policy Act, as amended in 1985, established a framework for the states to provide for safe disposal of LLRW and encouraged the creation of regional compacts to develop an appropriate network of disposal sites. The deadlines established for the development of new sites have passed with no new sites being opened. Political, judicial, and administrative obstacles have blocked sites from development and have limited the disposal options for higher-activity classes of waste in existing sites. Disposal options for the highest-activity classes of waste are limited and may no longer exist for a majority of the states after 2008. Complex regulatory obstacles have thwarted other sites in North Carolina, Pennsylvania, Illinois, and Nebraska. The LLRW Policy Act now unnecessarily restricts access to available disposal sites and impedes open commercial development of additional facilities.

Present knowledge and technology are sufficient to allow safe disposal of radioactive waste. Comprehensive regulations and practices are in place for the design, operation, and closure of LLRW disposal sites. The use of all available options, including federal and private commercial facilities on federal or private land, can facilitate the orderly, safe, and efficient disposal of radioactive waste.

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Recommendation 1 – Based on Positions 3.a and 3.b, we endorse the approach for a waste-disposal classification system proposed by the National Council on Radiation Protection and Measurements (NCRP 2002).

National Council on Radiation Protection and Measurements (NCRP) Report No. 139, *Risk-Based Classification of Radioactive and Hazardous Chemical Wastes*, issued 31 December 2002, provides a risk-based framework for revising the manner in which radioactive and hazardous materials are classified. We believe that the framework laid out in NCRP Report 139 is an appropriate basis for implementing Positions 3.a and 3.b of this position statement.

This report incorporates the following principles:

1. The classification system is generally applicable to any waste that contains radionuclides, hazardous chemicals, or mixtures of the two.

2. Wastes that contain hazardous substances are classified based on consideration of health risks to the public that arise from waste disposal.

3. The waste classification system includes an exempt class of waste.

Recommendation 2 – Based on Position 3.b, we strongly support Environmental Protection Agency efforts to move forward with a rulemaking to promulgate regulations allowing disposal of low-activity radioactive waste (LARW) and low-activity mixed waste (LAMW) at Resource and Conservation Recovery Act (RCRA) Subtitle C sites.

We strongly support EPA efforts to move forward with a rulemaking to promulgate regulations that would allow disposal of LARW and LAMW at RCRA Subtitle C sites. The regulatory control required under RCRA is expected to provide adequate levels of protection, subject to an appropriate environmental impact analysis. We strongly encourage EPA, NRC, and state agencies to work closely together to move this rulemaking forward in a coordinated manner.

Recommendation 3 – Based on Position 3.b, we support the use of uranium mill-tailings sites regulated under the Uranium Mill Tailings Radiation Control Act (UMTRCA) for disposal of radioactive materials that are appropriate for these sites. Examples of potentially appropriate materials are certain non-11e.(2) byproduct material such as the LARW and LAMW noted in 2 above; TENORM materials; high-volume, low-activity waste from reactor decommissioning; and certain low-activity resins from operating reactors.

We support a nonregulatory approach that would allow disposal of low levels of candidate materials at uranium mill-tailings sites regulated under the UMTRCA. Efforts have been made by the National Mining Association (NMA) and the Fuel Cycle Facility Forum (FCFF) to explore an option that should be considered to ease the nation's low-level waste disposal capacity problem. NRC has existing policy guidance (NRC 1999) regarding the direct disposal of certain radioactive materials at uranium mill-tailings facilities. These facilities normally

contain "11e.(2)" byproduct material[1] (also known as "mill tailings"), which are wastes generated from the processing of ores principally for their source material content. NMA and FCFF believe that the existing policy that severely restricts non-11e.(2) material from being disposed of in mill-tailings piles needs amending. These two groups are proposing that NRC liberalize its criteria for determining what types of non-11e.(2) materials could be appropriately disposed in licensed uranium mill-tailings impoundments by developing generic waste acceptance criteria for such materials. These generic waste acceptance criteria would be based on the same safety acceptance criteria as used to demonstrate that 11e.(2) materials (tailings) could be safely disposed in a mill-tailings impoundment and would serve as the basis for disposal of non-11e.(2) candidate waste streams that are chemically, physically, and radiologically similar to 11e.(2) materials, which are covered under UMTRCA.

The current restrictions on disposal of non-11e.(2) byproduct in UMTRCA-licensed facilities is another manifestation of waste management based on the origin of the waste and not the relative risk it presents to human health, the environment, or national security. Uranium mill tailings, for example, possess many chemical, physical, and radiological similarities to LARW and LAMW and NORM waste generated by a variety of non-uranium-milling processes. Yet, despite being virtually identical to 11(e).2 byproduct, differences in origin of LARW and LAMW result in denial of a vast, underutilized disposal resource that could otherwise be available to many licensees throughout the United States for non-11(e).2 byproduct materials.

Another advantage of liberalizing 11(e).2 disposal in UMTRCA facilities would be creating an alternative disposal outlet for vast quantities of Class A LLRW. In decommissioning uranium fuel-cycle facilities to levels that will allow unrestricted release under 10 CFR 20, Subpart E, Radiological Criteria for License Termination (LTR), large volumes of LLRW, typically containing low levels of uranium/thorium-bearing materials, are generated. The large volumes of wastes generated at these facilities are the result of efforts to comply with the LTR that leads to remediation at levels that are approximately the same concentrations as measured in the natural environment. Since the uranium/thorium-bearing waste streams generated at uranium fuel-cycle facilities and many DOE sites are less hazardous than those present in the tailings impoundment, these solid materials would be ideally suited for disposal in UMTRCA facilities.

There are significant advantages to disposing of additional types of waste at UMTRCA facilities. First, by statute, these facilities must be turned over to the government (DOE) for long-term custodial care in perpetuity. In addition, NRC regulations require that all mill tailings must be protected for a period of 200 to 1,000 years with no active maintenance and only passive controls. This will provide greater protection than that offered by RCRA or at disposal sites regulated under 10 CFR Part 61. We believe that this alternative fits well within the context of a nonregulatory alternative[2] for disposal of potentially large volumes of decommissioning wastes that are similar in nature and pose less hazard than those wastes presently contained in uranium mill-tailings facilities.

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[1] So called because it is defined in Section 11(e).2 of the AEA.

[2] Nonregulatory approaches should be viewed as statutory actions that exist within the scope of an existing framework. Nonregulatory approaches should not be viewed as removal of such wastes from regulatory control or deregulation of LLRW. Moreover, this term was used to specifically address information requested by EPA under its ANPR (EPA 2003).

A fundamental concern associated with the direct disposal of non-11e.(2) byproduct material in uranium mill-tailings impoundments is that, if such material contains RCRA hazardous wastes, it could then subject the entire impoundment to regulation by EPA or delegated states under RCRA. Similar jurisdictional overlap might occur if any non-11e.(2) byproduct material containing NORM subject to state regulation is disposed of in a mill-tailings impoundment. This potential for dual or overlapping jurisdiction raises questions about the eventual transfer of custody of mill tailings to DOE, the long-term custodian. UMTRCA requires Title II licensees to transfer custody of their uranium mill-tailings facilities to DOE upon license termination, and DOE is required by Section 83 of the AEA to take the mill tailings and other property necessary for the proper disposal of 11e.(2) byproduct material. Since UMTRCA contains no provision requiring that DOE take custody of, or title to, materials other than 11e.(2) byproduct material, disposal of other materials could, without congressional action, pose an impediment to license termination and transfer of custody to DOE as the long-term steward.

Although DOE is only required to take title to and custody of 11e.(2) byproduct material under UMTRCA, the department has the authority under 42 USC § 10171(b) to accept custody of AEA wastes other than 11e.(2) byproduct material under the Nuclear Waste Policy Act of 1980, including non-11e.(2) byproduct material, provided that:

1. NRC requirements for site closure are satisfied.
2. transfer of title and custody to DOE is without cost to the federal government.
3. federal ownership and management of the site is necessary or desirable to protect public health and safety and the environment.

Several categories of wastes have already been proposed for disposal in uranium mill-tailings impoundments, including secondary process wastes generated during the capture of uranium in side-stream recovery operations, sludge and residues generated during treatment of mine water containing suspended or dissolved source material, NORM, and TENORM. Some fuel-cycle facilities have expressed an interest in seeking NRC approval to dispose of special nuclear materials in existing tailings impoundments. To address these and other issues, the NRC began its inquiry into this matter approximately 10 years ago.

The existing disposal capacity at a single uranium mill-tailings site can easily exceed 20-40 million metric tons. We further recommend that the committee seek additional information regarding the level of funding that may be required in the development of generic waste-disposal criteria in order to expedite the classification and disposal of these radioactive wastes based on their risk and not their origin. Existing mill-tailings sites have sufficient capacity to accept most, if not all, of the fuel-cycle industry's low-activity, high-volume waste well into the foreseeable future.

Recommendation 4 – Based on Position 3.c, we strongly support DOE efforts to prepare an Environmental Impact Statement under the National Environmental Policy Act to evaluate additional alternatives for disposal of greater-than-Class C (GTCC) wastes. These include deep geological disposal facilities, existing LLRW disposal facilities (both commercial and federal), and new facilities (both commercial and federal) at federal sites or on private land.

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Given the political uncertainty of licensing the federal repository at Yucca Mountain, which has been considered the most likely disposal alternative for GTCC waste, all alternatives for GTCC disposal should be fully explored.

In May 2005, the DOE issued in the *Federal Register* an Advanced Notice of Intent to prepare an Environmental Impact Statement (EIS) on waste disposal alternatives for GTCC LLRW (FR 2005). DOE intends that this EIS will enable DOE to select any new or existing disposal locations, facilities, and methods for disposal of GTCC LLRW as well as DOE waste with similar characteristics.

The LLRW Policy Act assigned to the federal government responsibility for the disposal of GTCC radioactive waste. This EIS will evaluate alternative locations and methods for disposal of these wastes. Potential disposal locations include deep geologic disposal facilities; existing LLRW disposal facilities, both commercial and DOE; and new facilities at DOE or other government sites or on private land. Methods to be considered include deep geologic disposal, greater confinement disposal configurations, and enhanced near-surface disposal facilities.

While we strongly support the evaluation of all alternatives to GTCC disposal, we suggest that use of the Waste Isolation Pilot Project (WIPP) in Carlsbad, New Mexico, be considered as part of this evaluation because extensive environmental reviews for disposal of candidate chemical hazardous and transuranic waste streams have already been conducted for this facility in support of rulemakings. We believe the geologic features and regulatory controls currently governing the use of this facility would adequately protect public health and safety for disposal of GTCC sources. We are very sensitive to the fact that the WIPP was initially approved with a clear understanding it would not be made available for non-defense-related waste and that a reversal of that promise to the people of New Mexico should not be done lightly. However, the great national need for a safe and timely disposal option for this most highly radioactive category of LLRW calls for an evaluation of all options. Therefore, we recommend stakeholder involvement in the decision-making process to consider allowing disposal of waste streams not originally destined for WIPP under the National Environmental Policy Act of 1969.

Recommendation 5 – Based on Position 3.c, we urge Congress to direct federal action to ensure that disposal options and capacity for Class B and Class C waste will exist for all states in the future. This can be achieved by use of commercial or private facilities on federal or private lands to mitigate significant adverse consequences to generators of these wastes.

While disposal options for Class A radioactive waste are expensive, inconsistent and, in some cases, unnecessarily overly restrictive, disposal options for Class B and Class C wastes are of particular concern because they may become nonexistent for a majority of the states in 2008. Currently Class B and Class C waste disposal is available in Washington State to the 11 member states of the Northwest and Rocky Mountain Compacts and in South Carolina for all other states. However, South Carolina has passed legislation requiring the disposal facility to stop accepting Class B and Class C waste from states other than the three members of the Atlantic Compact in 2008. This would leave 36 states without a disposal option for the highest radioactive classes of LLRW.

We believe that use of the Waste Control Specialist (WCS) site in Texas offers the potential for disposal of Class B and C LLRW should South Carolina continue to prohibit access to its site to nonmember states after 2008. It is our understanding that the Texas legislature has the political resolve to assist state government agencies responsible for licensing this facility to completion. Moreover, the local community in areas surrounding Andrews, Texas, is firmly supportive of opening this site, in large part due the economic benefits that this facility will bring forward. However, use of WCS by noncompact members is contingent upon the Texas Compact shouldering the burden of allowing access to the WCS site for disposal of Class B and C LLRW. For this approach to be successful, bilateral agreements between Texas (as the host state of the Compact) and any one or more of the remaining states, District of Columbia, and Puerto Rico may be needed. Should Texas opt to prohibit access to the WCS site to any nonmember state as allowed under the LLRW Policy Act, then congressional action in changing the LLRW Policy Act may be necessary to prevent significant adverse consequences to generators of Class B and C wastes, as well as the biomedical community for disposal of tissue wastes containing radioactive material.

Other alternatives that warrant consideration are to authorize:

1. Access to both compact and noncompact states for disposal of LLRW at a facility operated by the DOE, or

2. Commercial construction and operation of an LLRW disposal facility, including construction on land owned by the federal government if privately owned sites cannot be identified or approved by the states. Under this approach, congressional action may be necessary to construct a facility that could be operated by private industry[3] and licensed by the NRC.

Under either of these approaches, congressional action may be needed to remove statutory impediments prohibiting access for disposal of LLRW to compact and noncompact states alike.

[3] Such a concept is currently being implemented for disposition of surplus weapons-grade plutonium at the Savannah River Site located near Aiken, South Carolina.

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* The Health Physics Society is a nonprofit scientific professional organization whose mission is to promote the practice of radiation safety. Since its formation in 1956, the Society has grown to approximately 6,000 scientists, physicians, engineers, lawyers, and other professionals representing academia, industry, government, national laboratories, the Department of Defense, and other organizations. Society activities include encouraging research in radiation science, developing standards, and disseminating radiation safety information. Society members are involved in understanding, evaluating, and controlling the potential risks from radiation relative to the benefits. Official position statements are prepared and adopted in accordance with standard policies and procedures of the Society. The Society may be contacted at 1313 Dolley Madison Blvd., Suite 402, McLean, VA 22101; phone: 703-790-1745; fax: 703-790-2672; email: HPS@BurkInc.com.

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Attachment 4

The Salt Lake Tribune http://www.sltrib.com

Antitrust claims: EnergySolutions' competitors being interviewed by Justice

By Judy Fahys
The Salt Lake Tribune
Salt Lake Tribune
Article Last Updated:07/13/2007 07:14:45 AM MDT

Competitors of EnergySolutions are being interviewed by the U.S. Justice Department about antitrust allegations being raised against the Salt Lake City-based company.

The *Weapons Complex Monitor*, a newsletter of the nuclear cleanup industry, said federal investigators have spoken with at least two competing companies in the waste-treatment business. Perma-fix Environmental Services Inc. is an Atlanta-based nuclear-waste processing company, and Studsvik Corp. is a Swedish company with two low-level waste processing facilities in Tennessee.

The industry newsletter says that officials from both companies and EnergySolutions were questioned last month about the Utah company's possible involvement in anticompetitive practices.

"The Department of Justice contacted us, inquiring about the nature of our structure and the contract arrangements in our industry," EnergySolutions spokesman Mark Walker told the newsletter, "and we provided information in response to those questions."

The company did not return calls Thursday seeking comment, and the Department of Justice has a policy of neither confirming nor denying questions about its inquiries.

But Studsvik General Counsel Joseph DiCamillo confirmed that his company met with the Justice Department.

"Yes, we have had an interview with the department with respect to the low-level waste market," he said, "and the department had questions about EnergySolutions' role in the market."

The investors who own EnergySolutions, including President and Chief Executive Officer Steve Creamer, are in the midst of trying to take the company public. The owners, who also face an antitrust review as part of the U.S. Securities and Exchange Commission review, have asked the SEC to allow issuance of $500 million in stock so the money can be used to help pay off money owed to employees and to repay outstanding debt of more than $764 million.

EnergySolutions is best-known in Utah for owning and operating a mile-square radioactive and hazardous waste landfill about 80 miles west of Salt Lake City. The landfill gives the Utah company enormous leverage over commercial radioactive waste disposal throughout the United States. Of the two other radioactive landfills, only one is open to the majority of states and that one is also owned by EnergySolutions.

In its push to load the U.S. market in all aspects of nuclear waste, the company has expanded into new business lines, including cleanup and nuclear decontamination and decommissioning.

Three weeks ago, the U.S. Energy Department handed the Utah company a $98.4 million, four-year contract for removing 16 million tons of uranium tailings and contaminated soil from the banks of the Colorado River near Moab and disposing it at a soon-to-be-created disposal site at Crescent Junction.

fahys@sltrib.com

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Attachment 5

MONITOR
WEAPONS COMPLEX

Waste Management ◆ Clean Up

Volume 18 No. 30 July 9, 2007

— *INSIDE HIGHLIGHTS* —

The House and Senate are expected over the next several weeks to complete work on two major pieces of annual legislation that fund most DOE work 2

With a number of major cleanup procurements underway and more in the offing, contractors are bracing for what they expect will be a trainwreck at DOE 2

The Department of Justice has launched an antitrust investigation of EnergySolutions in recent weeks, specifically looking into allegations of anti-competitive business practices, *WC Monitor* has learned 3

DOE issued the final Request for Proposals for the cleanup of Hanford's tank farms last week 4

The lengthy process to award a new contract for interim cleanup of the West Valley Demonstration Project could stretch on even longer, as losing bidders are considering filing a protest 5

Dissatisfaction among the losing bidders on the recently awarded Moab cleanup contract has prompted some to examine potential options for challenging the "unprotestable" award, according to industry officials 5

A proposal to accelerate the decommissioning of excess facilities at Oak Ridge took a small step forward late last month, with the Department of Energy's Energy Systems Acquisition Advisory Board signing off on Critical Decision-0 for the plan June 29 6

At the DOE Operations Offices/Facilities 7

At River Protection

Workers Inhale Low Levels of Rad Material 7

At Los Alamos

Cleanup of Pu-Contaminated Room Completed 7

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— June 6 for the Savannah River M&O contract;
— July 16 for the Hanford Mission Support contract;
— Sept. 21 for the Hanford Plateau Remediation contract; and
— Sept. 17 for the Hanford Tank Farms contract.

Such tight schedules have prompted criticism from the DOE contracting community. "The feedback from the beginning on all this work coming out was to stagger it. A week apart? During Fourth of July week? With the tanks having a shorter turnaround than PRC? It's just absolutely illogical," a second industry official said of the Hanford contracts. "Wait until you see the schedule. I guarantee you it won't be MSC awarded and then six weeks later PRC awarded and tanks a week after that. It won't track that way because they don't have the resources to do it. Yet they put the RFPs out with no consideration of contractor resources at all." Added a third industry official: "No matter who is on the [Source Evaluation Board], there's the same reviewers at headquarters. It makes no sense to put the contracts out almost simultaneously when you know that when they get them, they can only do one at a time. They automatically get staggered anyway so why not stagger the release of the RFPs and the due dates?"

A Lingering Issue

DOE is no stranger to criticism over its procurement processes and resultant delays. Most recently, the Department awarded earlier this month the West Valley Demonstration Project interim completion contract, worth approximately $160 million, to a team led by the site incumbent contractor approximately two years after first announcing plans to recompete the contract. In response to such concerns, Assistant Energy Secretary for Environmental Management James Rispoli has focused on improving the cleanup program's procurement practices through the creation of an "acquisition machine" comprised of revised procedures and increased amounts of contracting personnel. DOE officials have acknowledged, though, that such reforms would not be in place in time to fully affect the Hanford and Savannah River procurements (*WC Monitor*, Vol. 18 No. 20).

DOE Has Been Preparing for Workload

At the 2007 Waste Management conference in February, Ed Simpson, director of DOE's Office of Procurement, acknowledged both the pending flood of procurements and the Department's own limited resources (*WC Monitor*, Vol. 18 No. 10). "One of the issues facing the Department really is we've got contracts in place that have to be administered. There's work that oversight has to occur," Simpson said. "At the same time, we're running one of the heaviest competition schedules in the Department's history. So there is a balancing of resources that has to occur at each of the field sites, and at headquarters, to ensure that we strike the proper balance to not only sustain the work that's being done there but also put us in a position to affect the competition schedule over the near-term." DOE officials last week, though, defended the Department's ambitious procurement schedule. "We feel like we've staged these well," a senior Department official told *WC Monitor*. "We're confident that we have the resources to do this and do it in a timely fashion."

Capitol Hill Concerned

Even so, concerns over DOE's ability to effectively manage so many complex procurements at once are not limited to industry. "It's insanity. How can they award all of these? They can barely award one," said a Congressional staffer last week. "Does DOE think that issuing these RFPs shows progress? That's the easy part. They have no capacity to make timely, well-considered awards and trying to do this all at once will just make things worse."

The staffer noted the potential impact of a change in Administration in approximately 18 months, with the November 2008 presidential election. "There's going to be a new president and a new DOE," the staffer said. "If something is going to be hanging around, do you think they are going to award it quickly or are they going to want to put their mark on it, make sure everything is OK? Of course they're not going to put it out quickly."■

JUSTICE DEPT. LAUNCHES ANTITRUST INVESTIGATION OF ENERGYSOLUTIONS

The Department of Justice has launched an antitrust investigation of EnergySolutions in recent weeks, specifically looking into allegations of anti-competitive business practices, *WC Monitor* has learned. Though DOJ officials would not confirm the investigation last week, the Department's investigators in June questioned EnergySolutions and officials from its radioactive waste treatment competitors Perma-Fix and Studsvik. "The Department of Justice contacted us, inquiring about the nature of our structure and the contract arrangements in our industry and we provided information in response to those questions," EnergySolutions spokesman Mark Walker told *WC Monitor* last week, declining to comment further.

'Bundling' of Services a Concern

It remains unclear exactly what caused the Department of Justice to initiate the investigation and the specific portions of EnergySolutions business that are facing scrutiny, though the inquiry is likely related to a recent string of acquisitions that have allowed the company to 'bundle' certain nuclear services. In the last year, EnergySolutions has acquired Duratek and NUKEM, two companies whose waste treatment, processing and logistics capabilities augment the Utah firm's existing waste disposal capabilities to allow EnergySolutions to offer what it calls Logistics, Processing and Disposal (LP&D) services to commercial nuclear customers.

EnergySolutions has been signing life-of-plant contracts for LP&D services with commercial nuclear reactor operators, a practice that some competitors say makes it nearly impossible to compete. "Life-of-plant contracts provide our customers with LLRW and MLLW processing and disposal services for the remaining lives of their nuclear power plants, as well as D&D waste disposal services when the plants are shut down," EnergySolutions said in its March filing with the Securities and Exchange Commission in preparation for its initial public offering. "We have signed life-of-plant contracts with commercial customers representing 44 of the 103 operating nuclear reactors in the United States." Life-of-plant contracts have been signed with Dominion Resources, Inc., Duke Energy Corporation, Exelon Corporation, Florida Power & Light Company and Progress Energy.■

FINAL HANFORD TANK FARMS RFP YIELDS FEW SURPRISES

The Department of Energy issued the final Request for Proposals for the cleanup of Hanford's tank farms last week—the third of three RFPs issued over the past two months, along with Mission Support and Central Plateau Remediation, to replace the existing cleanup contracts held by CH2M HILL Hanford Group and Fluor Hanford. Among the significant changes in the final Tank Farms RFP from the draft issued last fall are workscope modifications and the removal of conflict-of-interest provisions that would have prevented companies involved on the Waste Treatment Plant project from bidding. The planned Tank Farms contract, set to be worth more than $8 billion, covers operations of the tank farms, which store 53 million gallons of radioactive waste in 177 underground tanks, including emptying leak-prone single-shell tanks and work to prepare and send waste to the Waste Treatment Plant once completed. The contract will also cover the testing of bulk vitrification technology and the possible operation of a bulk vitrification plant as a supplemental treatment for low-activity radioactive tank waste.

DOE anticipates the contract to run for five years beginning in Fiscal Year 2008, with a five-year option period. Bidders are required to propose a fee ranging between 5 and 10 percent of the value of the work, although certain costs would be excluded from the total before the fee is calculated. At least two teams are believed to have formed to go after the work—incumbent CH2M HILL and team consisting of Washington Group, EnergySolutions and AREVA (*WC Monitor*, Vol. 18 No. 27).

Early WTP Low-Activity Facility Startup Considered

The most notable change in the final RFP is the possible early operation of the Waste Treatment Plant's Low-Activity Waste Facility. The vitrification plant, which has experienced design and technical issues, is not expected to begin addressing high-level waste until 2019, eight years behind legal deadlines. The Dept. of Energy, though, is considering beginning use of the WTP's Low-Activity Waste Facility, Analytical Laboratory and other support facilities as early as mid-2014. Among the benefits of an early start to the LAW facility, according to a study commissioned by CH2M HILL and released this spring, is the creation of approximately 5 million gallons of space in the double-shell tanks (*WC Monitor*, Vol. 18 No. 18). The final RFP also includes a new requirement for a continuing in-process evaluation of vit plant operational readiness to allow the contractor to understand and plan for future plant operations.

Small Business Use Emphasized

In addition, the Tank Farms RFP requires that 15 percent of the contract work be performed by small businesses. That compares to 17 percent of the work in the Plateau Remediation Contract and 25 percent in the Mission Support Contract. As in the earlier two RFPs, current Hanford employees who transfer to the winning Tank Farms contractor would continue to receive the traditional Hanford pension. However, new employees would receive what DOE calls "market-based" pension and health insurance plans—likely a 401(k)-style retirement plan that would require workers to manage investments from contributions they and the contractor make. The health care plan is required to provide benefits worth more no more than 5 percent more than comparable businesses. A community commitment clause has been added to the RFP after a request by the Tri-City Development Council. The winning contractor will be required to discuss issues of concern with the public and interested groups and recognize that giving back to the Tri-City area community is a worthwhile business practice.

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Attachment 6

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POLICY ISSUE
NOTATION VOTE

SECY-0

March 9, 2006

FOR: The Commissioners

FROM: Luis A. Reyes
Executive Director for Operations

SUBJECT: IMPROVING TRANSPARENCY IN THE 10 CFR 20.2002 PROCESS

- PURPOSE
- BACKGROUND
- DISCUSSION
- COMMITMENTS
- RECOMMENDATION
- RESOURCES
- COORDINATION

PURPOSE:

In Staff Requirements Memorandum (SRM) COMGBJ-05-001, "Improving Transparency in the 10 CFR Sec. 20.2002 Process," the Commission directed the staff, working with the Office of the General Counsel (OGC), to develop option enhance public understanding and awareness of 10 CFR 20.2002 approvals and to provide recommendations to the Commission. The recommendations were to identify potential adverse impacts on the U.S. Nuclear Regulatory Commi (NRC's) well-established regulatory framework. The Commission also directed the staff to ". . . encourage stakeholde by individuals who may be directly affected by an NRC decision." This paper responds to these requests.

BACKGROUND:

10 CFR 20.2001 (Enclosure 1) identifies the mechanisms by which a licensee may lawfully dispose of its licensed radioactive waste. It contains seven different disposal paths, including 10 CFR 20.2002, a provision for "alternative disposal" authorizations. Section 20.2002 is a general provision that allows for other disposal methods, different from already defined in the regulations, provided that doses are maintained ALARA and within the dose limits in Part 20. Ir practice, 10 CFR 20.2002 is most often used for disposal of radioactive waste in hazardous or solid waste landfills tha permitted under the Resource Conservation and Recovery Act, but it can be used for any type of disposal not already defined in the regulations, such as disposal on a licensee's site or on offsite private property. With the exception of th initial licensing of a Part 61 disposal site, none of the disposal mechanisms in Subpart K has special public involvemer requirements. Additional background on the history of 10 CFR 20.2002 in NRC's regulations and on licensee use of thi provision is contained in Enclosure 2.

With a few exceptions, public interest in both onsite and offsite 10 CFR 20.2002 approvals has been limited. However have been two authorizations that did generate significant public interest in the recent past. In 2001, Consumers Pow licensee for the Big Rock Point Nuclear Power Plant, proposed the disposal of large quantities of demolition debris fror

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decommissioning in a nearby landfill. Before obtaining NRC approval under 10 CFR 20.2002, the licensee conducted a number of town meetings with stakeholders and members of the public on the proposed disposal. NRC participated in licensee's meetings, and held its own public meeting as well. The authorization was granted in 2002. In 2005, NRC re a number of letters from members of Congress and others expressing concerns with a proposed disposal of large amc of demolition debris from the Connecticut Yankee power plant at a hazardous waste disposal facility in Idaho. Althoug disposal facility that was proposed routinely accepts large amounts of radioactive material, this would have been the such disposal at this facility from a nuclear power plant undergoing decommissioning. One factor that affected the lev interest in the Connecticut Yankee proposal was NRC's proposed rulemaking on the disposition of solid material. The staff's proposed rule package was released to the public one day before NRC's approval of the 10 CFR 20.2002 dispos and letters to NRC expressed concern that NRC was implementing the rule before it had been promulgated. Neither th disposal facility operator nor the generator decided to pursue the waste's acceptance at the facility. Since then, NRC approved five 10 CFR 20.2002 requests from licensees without any significant public interest.

DISCUSSION:

The staff has developed three options for addressing how NRC can: a) enhance public understanding and awareness CFR 20.2002 disposals; and b) encourage stakeholder input by those "directly affected" by an NRC 10 CFR 20.2002 approval, as directed by the SRM. Potential adverse impacts on NRC's regulatory program are also identified. Enclosu contains a detailed description of the options and advantages and disadvantages of each. A summary of each opti provided below.

The first option is a "no-action" alternative that reflects current practice. Information on specific 10 CFR 20.200 reque from licensees is available to the public in the Agencywide Documents Access Management System (ADAMS) and in th public document room. Generic information is very limited, however, and none is available on the NRC public web site respect to staff receiving input from those directly affected by a 10 CFR 20.2002 request, there may be several opportunities, depending upon the type of request:

- Affected States are provided a copy of a draft environmental assessment (EA) for review and comment before final EA is published.
- In certain cases, where there is significant interest in a proposed disposal and unique circumstances, the staff hold a public meeting to solicit input from the public.
- Materials and fuel cycle 10 CFR 20.2002 requests are approved with a license amendment, thus affording an opportunity for a hearing. (Reactor approvals are generally granted with a letter, and there is no opportunity fc hearing).
- Depending on the specific request, the staff may obtain information from the State permitting agency and disp facility operator related to the request during the review.

The primary advantage of the current approach is that it can be viewed as appropriate because 1) the number of 10 20.2002 requests received each year is small (an average of twenty in the last six years), 2) the risk-significance of t CFR 20.2002 authorizations is low, and 3) with the exception of a few cases in the last several years, the level of pub interest has been small. The primary disadvantage of this option is that there would continue to be no basic informati 10 CFR 20.2002 authorizations available to the public, and whatever misunderstandings exist today would likely conti

The second option recognizes that there are significant differences in the types of 10 CFR 20.2002 disposals that are requested by licensees, and that a graded approach for transparency may be appropriate. This option would both pro basic, generic information on 10 CFR 20.2002 disposals on the NRC's public web site, as well as define and document more systematic approach for interacting with the public and obtaining input on particular requests than current pract The primary advantage of this approach is that it would increase public understanding and awareness and provide for from stakeholders, without a large expenditure in staff resources. At the same time, a disadvantage is that these resc would be expended for a small number of requests for such disposals (twenty in the last six years).

The third option treats 10 CFR 20.2002 requests in a manner similar to high-visibility NRC activities, such as the rene a power reactor license. "Real-time" information would be posted on the NRC's public web page regarding the status reviews, along with links to documents in ADAMS. In addition, reactor 10 CFR 20.2002 requests would be approved w license amendment, thus affording an opportunity for a hearing. The advantage of this option is that it would provide

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stakeholders to determine quickly and efficiently the status of individual reviews, obtain important documents related request, and understand what opportunities there might be for public input. The disadvantage is that the level of effo implement the option would be significant compared to the first two options. In addition, if a reactor hearing were necessary, significantly more resources might be needed. A hearing could also cause a significant delay in NRC's deci a request.

COMMITMENTS:

The staff will provide the Commission with the results of its analysis of how 10 CFR 20.2002 approvals are granted (b license amendment in the Office of Nuclear Material Safety and Safeguards and by letter approval in the Office of Nuc Reactor Regulation) and whether any changes may be appropriate, as discussed in Option 1, Enclosure 3.

RECOMMENDATION:

The staff recommends Option 2 for improving transparency in NRC's 10 CFR 20.2002 process. This option would incre the background information available to the public on 10 CFR 20.2002 disposals, and apply resources for additional pu outreach to case-specific requests based on defined criteria. It would also: (1) minimize the resource impacts on the l level waste (LLW) budget, which is currently 5.0 full-time equivalent (FTEs) in FY 07; (2) appropriately weigh, in the s view, NRC's strategic goal of openness with its safety, security, and effectiveness goals for this particular type of regu action; and (3) enable NRC to have flexibility in addressing the wide variety of 10 CFR 20.2002 disposals.

It should be noted that the staff intends to formalize and document the procedure for reviewing 10 CFR 20.2002 requ independent of the transparency measures identified in this paper. The Commission's decision on which measures the should implement to improve transparency would be included when this procedure is developed.

RESOURCES:

For planning purposes, the staff has assumed six 10 CFR 20.2002 requests per year, with one that meets the propose criteria for additional outreach measures, based on the history of requests received over the last 6 years (see Enclosu). Two of these six requests would be from nuclear power reactor licensees and, for Option 3, would require some additional resources to issue a license amendment. Implementing Option 2 would require a one-time investment of 0. to develop generic communications tools and 0.2 FTE/yr to maintain them and conduct public meetings. Option 3 wou require 0.6 FTE to develop both the communication tools and a web page that provides "real-time" information on 10 20.2002 requests under review. It would also require 0.4 FTE each year to implement, assuming there were no reacto hearings. If a hearing were requested, the resources could range from a few staff weeks to several FTEs, depending u the case. Enclosure 5 summarizes these resource estimates, and includes a column identifying the time added to th review for each, as well.

10 CFR 20.2002 authorizations are currently performed as part of routine casework and resources are not specifically budgeted for these reviews. Most of the annual resources for reviewing specific requests would come from the materi fuel cycle and reactor licensing programs. If Option 2 or 3 were to be implemented, however, the one-time resources needed for the communication tools would come from the LLW program budget for Fiscal Year (FY) 2007. Staff would the planning, budgeting, and performance management process, as resources for this activity are not included in the budget. Projects whose schedule could be affected include updating the LLW storage guidance, developing a staff pro for processing 10 CFR 20.2002 requests, or staff's response to the Commission's request to consider the potential reclassification of depleted uranium.[1] The Office of Nuclear Material Safety and Safeguards LLW budget for FY '07 is 5 FTEs and $57,000.

COORDINATION:

The Office of the General Counsel has reviewed this paper and has no legal objections. The Office of the Chief Financi Officer has also reviewed the paper and concurs.

/RA/

Luis A. Reyes
Executive Director for Operations

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Enclosures:

1. 10 CFR Part 20, Subpart K, and 10 CFR 20.2002 Waste Disposal Provisions
2. History of 10 CFR 20.2002 in NRC's Regulations and Its Use by Licensees
3. Options for Improving Transparency in the 10 CFR 20.2002 Process.
4. Summary of 20.2002 Requests Received Since January 1, 2000
5. Resources for Options Presented in Commission Paper
6. Specific Activities and Associated Resources to Increase 10 CFR 20.2002 Transparency
7. Agency Communication Tools

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[1] See Memorandum and Order CLI-05-20 in connection with the Louisiana Energy Services hearing.

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Thursday, February 22, 2007

000207

SUMMARY OF 10 CFR 20.2002 REQUESTS RECEIVED SINCE JANUARY 1, 2000

Licensee	Date Submitted	Date Approved	Disposal Method	Materials Involved	Comments
US Army Corps of Engineers, Stepan Chemical Co. site in Maywood, N.J.	December 16, 2005	Pending	RCRA hazardous waste landfill (U.S. Ecology Idaho)	Processing residuals with uranium, thorium and radium (11e.(2) byproduct material)	Army Corps is not an NRC licensee. NRC response to this request is being developed.
Yankee Atomic	October 31, 2005	Pending	Retaining wall at an offsite property	Approx. 500 cubic feet, 90 pCi/g of H-3, and up to 162 pCi/g avg. of C-14.	
U.S. Army, Aberdeen Test Center	September 13, 2005	Pending	RCRA hazardous waste landfillll (U.S. Ecology Idaho)	Two M2A2 Bradley fighting vehicles with depleted uranium contamination	
Tennessee Valley Authority, Watts Bar Nuclear Plant	August 26, 2005	Pending	Onsite disposal	In-situ disposal of liquid effluent line until decommissioning	
UCAR	May 13, 2005	Pending	RCRA hazardous waste cell (WCS)	15 intermodal containers of LAW.	On hold, proposed disposal facility not currently authorized to accept these materials.

Enclosure 4

802000

Licensee	Date Submitted	Date Approved	Disposal Method	Materials Involved	Comments
Connecticut Yankee	January 4, 2005	Pending	Waste Control Specialists RCRA facility	1 million cubic feet of demolition debris containing misc. byproduct materials.	On hold, proposed disposal facility not currently authorized to accept these materials.
Yankee Atomic	December 22, 2004	May 6, 2005	Waste Control Specialists RCRA facility	60 million pounds of demolition debris (approximately 600,000 cubic feet) containing up to 20 pCi/g of Co-60 and 100 pCi/g of Cs-137 and up to 198 pCi/g of H-3	Licensee decided against this disposal option.
Cabot Supermetals	November 24, 2004	July 15, 2005	Cement kiln	Wastewater filtercake containing up to 10 pCi/gram uranium, and 3 pCi/gram of thorium, 20,000 tons annually	
Vermont Yankee	October 4, 2004	July 19, 2005	Onsite disposal	Soil/sand from misc. activities onsite–silt from cooling towers, sand for ice/snow on roads, etc. Previously approved limit was 28 cubic meters/yr (approx. 1000 cubic feet/yr. This request was to increase that amount for 150 cubic meters/yr (5300 cubic feet/yr). Less than 1 pCi/gram Cs-137 and Co-60.	

002009

Licensee	Date Submitted	Date Approved	Disposal Method	Materials Involved	Comments
Connecticut Yankee	September 16, 2004	April 19, 2005	US Ecology Idaho RCRA facility	Approx. 1 million cubic feet of demolition debris. Cs-137, Co-60, C-14, and H-3 concentrations are very small. Other radionuclides also present.	US Ecology Idaho decided not to pursue this disposal.
Consumers Energy, Big Rock Point Plant	September 15, 2004	January 19, 2005	Landfills in Michigan	500,000 cubic feet of demolition debris, Cs-137, Co-60, and H-3, at low concentrations	This was an amendment to a 2001 request, requesting approval of the use of another landfill in Michigan.
Department of the Air Force	June 23, 2004	October 25, 2005	US Ecology Idaho RCRA facility	Four M 47 tanks, less than 0.05% uranium average concentration	
Merck Research Laboratories	February 23, 2004	June 13, 2005	Landfill in New York State	80 cubic yards of soil containing 756 microcuries of tritium (16.7 pCi/gram)	
Michigan State University	February 28, 2002	June 12, 2002	Landfill	Incinerator ash	
Core Laboratories	August 31, 2001	November 4, 2003	Class II disposal wells (from oil and gas production)	Well-logging "sandouts" (well returns) with less than 1000 pCi/g total radioactivity concentration, and 120 day half-life.	

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Licensee	Date Submitted	Date Approved	Disposal Method	Materials Involved	Comments
Lionville Laboratory	May 17, 2001	October 4, 2001	Landfill	11e.(1) byproduct materials at and below Appendix B, Part 20, Table II, Col. 2, concentrations	
Big Rock Point Nuclear Power Plant	May 14, 2001	February 5, 2002	Landfill	Approximately 350,000 cubic feet of demolition debris. Cs-137 = 0.17 pCi/g Co-60 = 0.83 pCi/g H-3 = 7.86 pCi/g	
Oyster Creek	December 29, 2000	December 14, 2001	Offsite disposal on property owned by licensee next to plant site.	Approximately 5 million cubic feet. 0.088 pCi/g of Co-60, and 0.270 pCi/g of Cs-137.	
University of Michigan	September 27, 2000	March 23, 2001	Landfill	Incinerator ash	
Vermont Yankee	September 11, 2000	June 26, 2001	Onsite disposal	Adds slightly contaminated soil from construction-related activities to list of previously approved materials for onsite disposal [up to 980 cubic feet per year]	

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Attachment 7

		10 CFR 20.2002 authority
AL	N	
AK	Y	18 AAC 85.280
AR	Y	RH-1401
CA	N	
CO	CO	GCCR 1007-1 part 4.34
FL	Y	64E-5.329
GA	Y	391-3-17-.03(13)(b)
IL	Y	32 IL Admin Code 340.1020
IA	Y	641—40.71
KS	Y	KAR 28-35-223a(c)
KY	y	
LA	Y	LAV33:XV:461
ME	Y	CMR 220 Part D 34
MD	Y	D:1002
MA	N	105CMR120.252
MN	Y	4731.241
MS	Y	15-III-78-400.35
NB	Y	Title 180 4-040
NV	Y	NAC 459.3595
NH		No Reference
NJ	Y	SubChptr 11 7:28-11.7
NM	Y	NMAC 20.3.4.434
NY		
NC	Y	15ANCAC11.1629
ND	Y	33-10-04.1-14.2
OH	Y	OAC 3701:38-19©
OK	Y	10CFR20 Adopted by Rule
OR	Y	120.333-120-0510
PA		
RI	Y	R23-1.3-A.4.2
SC	Y	61-63:RHA3.28
TN	Y	
TX	Y	
UT	Y	
VA		
WA	Y	
WI	Y	HFS 157.30(2)

Attachment 8

Appendix B
Generator Profile

Generator Name (Company/Facility): [redacted]

Waste Stream: ☐ Resin ☐ Trash ☐ Soil and Gravel ☒ Concrete, Rubble, and Debris

☐ Sludges ☒ Scrap Metals ☒ Grit ☐ Absorbed, Stabilized, and Solidified Liquids

☒ Other (describe): Lab Trash, floor dry, concrete pieces, paper, plastic, glass, sharps, dirt, metal, wood

Process Generating Waste: Facility cleanup, sorted generator waste

Printed Name & Title of Person Completing Form: [redacted], Low Level Materials Control / Shipper

Waste Properties

1. Physical State: ☒ Solid ☐ Semi-Solid ☒ Powder/Dust ☐ Other:
2. Flash Point, °F: ☐ ≤ 72 ☐ 73 - 100 ☐ 101-140 ☐ 141-200 ☐ ≥ 201 ☒ N/A ☐ N/D
3. Reactivity: ☐ Water Reactive ☐ Acid Reactive ☐ Alkaline Reactive ☐ Oxidizer
   ☐ Pyrophoric ☐ Explosive ☐ Shock Sensitive ☐ Thermally Sensitive ☐ Auto-polymerizable
4. Odor - describe: ☒ None ☐ Mild ☐ Strong
5. pH: ☐ ≤ 2 ☐ 2.1 - 5.0 ☐ 5.1 - 9.0 ☐ 9.1 - 12.4 ☐ ≥ 12.5 ☒ N/A

Does the waste contain, or is it suspected to contain any of the following:

☐ Free Cyanide ☐ Free Sulfide ☐ Organic Compounds ☐ OSHA Substances ☐ Infectious Agents
☐ Virgin Oils ☐ Used Oils ☐ PCBs ☐ Oxidizing Agents ☐ Solvents
☐ Reducing Agents ☐ Volatile Organics ☐ Pesticides ☐ Herbicides ☒ None of the Above

Is this waste a characteristic hazardous waste per 40 CFR 261.21 - 24? ☐ Yes ☒ No

Is this waste an F, K, P, or U Listed hazardous waste per 40 CFR 261.31-33? ☐ Yes ☒ No

Is this waste derived from the treatment, storage or disposal of hazardous waste as described in 40 CFR 261?

☐ Yes ☒ No If yes, explain:

What process was used to treat/neutralize the waste?

Is this a "Hazardous Waste" as defined by State, Provincial, or Local Regulations? ☐ Yes ☒ No

If yes, enter the waste identification number, if one has been assigned:

If the waste is a sewer sludge, have analyses been performed in accordance with 40 CFR 503.8? ☐ Yes ☒ No

If yes, attach a copy of the analysis results.

Generator's certification of non-hazardous waste: As the generator of this waste, I certify all information to be complete and accurate to the best of my knowledge and ability.

Print Name: [redacted] Signature: [redacted] Title: Low Level Facility Manager

Date: 4-13-07 Telephone: [redacted]

In order to expedite our review of your material, please attach any results for laboratory analyses, material safety data sheets and any additional information regarding this material.

Activity Table for [redacted]

Isotope	Sampled activity in pCi/gram	Ratio to Cs-137
H-3	1.278	0.00018 : 1
C-14	1.703	0.00025 : 1
K-40	2224	0.32 : 1
Fe-55	361	0.052 : 1
Ni-59	No detectable	0 : 1
Co60	356	0.052 : 1
Ni-63	423	0.061 : 1
Sr-90	26.4	0.0038 : 1
Nb-94	No detectable	0 : 1
Tc-99	32.4	0.0047 : 1
I-129	No detectable	0 : 1
Cs-134	346.8	0.050 : 1
Cs-137	6900	1 : 1
Pb-214	878.4	0.13 : 1
Th-228	0.86	0.00012 : 1
Th-230	1.19	0.00017 : 1
Th-232	0.26	0.000038 : 1
U-234	6.3	0.00091 : 1
U-235/236	0.36	0.000052 : 1
Np-237	No detectable	0 : 1
U-238	1.52	0.00022 : 1
Pu-238	1.19	0.00017 : 1
Pu-239/240	2.66	0.00039 : 1
Pu-241	36.2	0.0052 : 1
Am-241	1.73	0.00025 : 1
Cm-242	No detectable	0 : 1
Cm-243/244	0.45	0.000065 : 1

(1)

****
***** GAMMA SPECTRUM ANALYSIS *****
****

Filename: DET01

Report Generated On	:	9/27/2006 1:19:15 PM
Sample Title	:	BSFR [redacted]
Spectrum Description	:	
Sample Identification	:	06s0084
Sample Type	:	
Sample Geometry	:	500ML
Peak Locate Threshold	:	5.00
Peak Locate Range (in channels)	:	1 - 65535
Peak Area Range (in channels)	:	1 - 8192
Identification Energy Tolerance	:	1.000 keV
Sample Size	:	1.000E+000 GRAMS
Sample Taken On	:	9/27/2006 6:00:00 AM
Acquisition Started	:	9/27/2006 12:23:02 PM
Live Time	:	1800.0 seconds
Real Time	:	1801.2 seconds
Dead Time	:	0.07 %

Energy Calibration Used Done On	:	9/16/2004
Efficiency Calibration Used Done On	:	10/25/2005
Efficiency ID	:	500ml

COPY

****
***** NUCLIDE IDENTIFICATION REPORT *****
****

Sample Title: BSFR [redacted]
Nuclide Library Used: C:\GENIE2K\CAMFILES\STDLIB.NLB

IDENTIFIED NUCLIDES

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (pCi/GRAM)	Activity Uncertainty
K-40	0.998	1460.81*	10.67	2.065E+003	3.574E+002
CO-60	0.992	1173.22*	100.00	1.960E+003	1.012E+002
		1332.49*	100.00	1.951E+003	1.022E+002
CS-134	0.707	475.35	1.46		
		563.23	8.38		
		569.32	15.43		
		604.70*	97.60	2.475E+002	4.167E+001
		795.84*	85.40	2.945E+002	4.035E+001
		801.93	8.73		
		1038.57	1.00		
		1167.94	1.80		
		1365.15	3.04		
CS-137	0.991	661.65*	85.12	3.283E+004	1.441E+003

* = Energy line found in the spectrum.
Energy Tolerance : 1.000 keV
Nuclide confidence index threshold = 0.30
Errors quoted at 1.000 sigma

********** UNIDENTIFIED PEAKS **********

Peak Locate Performed on: 9/27/2006 1:19:15 PM
Peak Locate From Channel: 1
Peak Locate To Channel: 8192

Peak No.	Energy (keV)	Peak Size in Counts per Second	Peak CPS % Uncertainty
1	147.58	4.6307E-002	77.89

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet

Errors quoted at 1.000 sigma

(2)

****
***** GAMMA SPECTRUM ANALYSIS *****
****

Filename: DET01

Report Generated On	: 9/27/2006 2:05:04 PM
Sample Title	: BSFR [redacted]
Spectrum Description	:
Sample Identification	: 06s0085
Sample Type	:
Sample Geometry	: 500ML
Peak Locate Threshold	: 5.00
Peak Locate Range (in channels)	: 1 - 65535
Peak Area Range (in channels)	: 1 - 8192
Identification Energy Tolerance	: 1.000 keV
Sample Size	: 1.000E+000 GRAMS
Sample Taken On	: 9/27/2006 6:00:00 AM
Acquisition Started	: 9/27/2006 1:21:06 PM
Live Time	: 1800.0 seconds
Real Time	: 1801.2 seconds
Dead Time	: 0.06 %

Energy Calibration Used Done On	: 9/16/2004
Efficiency Calibration Used Done On	: 10/25/2005
Efficiency ID	: 500ml

COPY

****
***** NUCLIDE IDENTIFICATION REPORT *****
****

Sample Title: BSFR [redacted]
Nuclide Library Used: C:\GENIE2K\CAMFILES\STDLIB.NLB

IDENTIFIED NUCLIDES

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (pCi/GRAM)	Activity Uncertainty
K-40	0.983	1460.81*	10.67	1.257E+003	3.414E+002
CO-60	0.998	1173.22*	100.00	1.327E+003	8.018E+001
		1332.49*	100.00	1.514E+003	8.491E+001
CS-134	0.709	475.35	1.46		
		563.23	8.38		
		569.32	15.43		
		604.70*	97.60	2.691E+002	4.648E+001
		795.84*	85.40	2.219E+002	4.052E+001
		801.93	8.73		
		1038.57	1.00		
		1167.94	1.80		
		1365.15	3.04		
CS-137	0.993	661.65*	85.12	3.213E+004	1.411E+003

* = Energy line found in the spectrum.
Energy Tolerance : 1.000 keV
Nuclide confidence index threshold = 0.30
Errors quoted at 1.000 sigma

********** UNIDENTIFIED PEAKS **********

Peak Locate Performed on: 9/27/2006 2:05:04 PM
Peak Locate From Channel: 1
Peak Locate To Channel: 8192

Peak No.	Energy (keV)	Peak Size in Counts per Second	Peak CPS % Uncertainty
1	17.96	1.2409E-001	19.34
2	147.50	-6.5115E-002	-51.54

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet

Errors quoted at 1.000 sigma

(3)

****
***** GAMMA SPECTRUM ANALYSIS *****
****

Filename: DET01

Report Generated On : 9/28/2006 9:33:12 AM

Sample Title : BSFR [redacted]
Spectrum Description :
Sample Identification : 06s0086
Sample Type :
Sample Geometry : 500ML

Peak Locate Threshold : 5.00
Peak Locate Range (in channels) : 1 - 65535
Peak Area Range (in channels) : 1 - 8192
Identification Energy Tolerance : 1.000 keV

Sample Size : 1.000E+000 GRAMS

Sample Taken On : 9/27/2006 6:00:00 AM
Acquisition Started : 9/27/2006 2:09:14 PM

Live Time : 1800.0 seconds
Real Time : 1801.4 seconds

Dead Time : 0.08 %

Energy Calibration Used Done On : 9/16/2004
Efficiency Calibration Used Done On : 10/25/2005
Efficiency ID : 500ml

COPY

****
***** NUCLIDE IDENTIFICATION REPORT *****
****

Sample Title: BSFR [redacted]
Nuclide Library Used: C:\GENIE2K\CAMFILES\STDLIB.NLB

IDENTIFIED NUCLIDES

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (pCi/GRAM)	Activity Uncertainty
K-40	0.992	1460.81*	10.67	2.224E+003	3.833E+002
CO-60	0.996	1173.22*	100.00	2.403E+003	1.160E+002
		1332.49*	100.00	2.496E+003	1.216E+002
CS-134	0.710	475.35	1.46		
		563.23	8.38		
		569.32	15.43		
		604.70*	97.60	2.711E+002	4.345E+001
		795.84*	85.40	3.468E+002	4.452E+001
		801.93	8.73		
		1038.57	1.00		
		1167.94	1.80		
		1365.15	3.04		
CS-137	0.994	661.65*	85.12	3.847E+004	1.684E+003

* = Energy line found in the spectrum.
Energy Tolerance : 1.000 keV
Nuclide confidence index threshold = 0.30
Errors quoted at 1.000 sigma

********** UNIDENTIFIED PEAKS **********

Peak Locate Performed on: 9/28/2006 9:33:12 AM
Peak Locate From Channel: 1
Peak Locate To Channel: 8192

Peak No.	Energy (keV)	Peak Size in Counts per Second	Peak CPS % Uncertainty
1	17.87	1.4079E-001	15.85
2	147.54	-3.6073E-002	-85.50

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet

Errors quoted at 1.000 sigma

(4)

****
***** GAMMA SPECTRUM ANALYSIS *****
****

Filename: DET01

Report Generated On : 9/28/2006 11:55:04 AM

Sample Title : BSFR [redacted]
Spectrum Description :
Sample Identification : 06s0087
Sample Type :
Sample Geometry : 500ml

Peak Locate Threshold : 5.00
Peak Locate Range (in channels) : 1 - 65535
Peak Area Range (in channels) : 1 - 8192
Identification Energy Tolerance : 1.000 keV

Sample Size : 1.000E+000 gram

Sample Taken On : 9/27/2006 6:00:00 AM
Acquisition Started : 9/28/2006 10:07:41 AM

Live Time : 1800.0 seconds
Real Time : 1801.2 seconds

Dead Time : 0.07 %

Energy Calibration Used Done On : 9/16/2004
Efficiency Calibration Used Done On : 10/25/2005
Efficiency ID : 500ml

COPY

****
***** NUCLIDE IDENTIFICATION REPORT *****
****

Sample Title: BSFR [redacted]
Nuclide Library Used: C:\GENIE2K\CAMFILES\STDLIB.NLB

IDENTIFIED NUCLIDES

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (pCi/gram)	Activity Uncertainty
K-40	0.985	1460.81*	10.67	1.325E+003	3.289E+002
CO-60	0.989	1173.22*	100.00	1.483E+003	8.675E+001
		1332.49*	100.00	1.257E+003	8.071E+001
CS-134	0.695	475.35	1.46		
		563.23	8.38		
		569.32	15.43		
		604.70*	97.60	2.457E+002	2.767E+001
		795.84*	85.40	2.306E+002	3.864E+001
		801.93	8.73		
		1038.57	1.00		
		1167.94	1.80		
		1365.15	3.04		
CS-137	0.992	661.65*	85.12	3.273E+004	1.437E+003
PB-214	0.457	74.81	6.33		
		77.11	10.70		
		87.20	3.70		
		89.80	1.03		
		241.98	7.49		
		295.21*	19.20	8.708E+002	2.330E+002
		351.92*	37.20	8.784E+002	1.353E+002
		785.91	1.10		

* = Energy line found in the spectrum.
Energy Tolerance : 1.000 keV
Nuclide confidence index threshold = 0.30
Errors quoted at 1.000 sigma

********** U N I D E N T I F I E D P E A K S **********

Peak Locate Performed on: 9/28/2006 11:55:04 AM
Peak Locate From Channel: 1
Peak Locate To Channel: 8192

	Peak No.	Energy (keV)	Peak Size in Counts per Second	Peak CPS % Uncertainty
	1	18.01	9.9068E-002	19.82
	2	147.35	-6.6252E-002	-44.70
m	6	609.03	1.1534E-001	9.00

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet

Errors quoted at 1.000 sigma

(5)

****
***** GAMMA SPECTRUM ANALYSIS *****
****

Filename: DET01

Report Generated On : 9/28/2006 12:32:17 PM

Sample Title : BSFR[redacted]
Spectrum Description :
Sample Identification : 06s0088
Sample Type :
Sample Geometry : 500ml

Peak Locate Threshold : 5.00
Peak Locate Range (in channels) : 1 - 65535
Peak Area Range (in channels) : 1 - 8192
Identification Energy Tolerance : 1.000 keV

Sample Size : 1.000E+000 gram

Sample Taken On : 9/27/2006 6:00:00 AM
Acquisition Started : 9/28/2006 11:56:25 AM

Live Time : 1800.0 seconds
Real Time : 1801.4 seconds

Dead Time : 0.08 %

Energy Calibration Used Done On : 9/16/2004
Efficiency Calibration Used Done On : 10/25/2005
Efficiency ID : 500ml

COPY

****
***** NUCLIDE IDENTIFICATION REPORT *****
****

Sample Title: BSFR [redacted]
Nuclide Library Used: C:\GENIE2K\CAMFILES\STDLIB.NLB

IDENTIFIED NUCLIDES

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (pCi/gram)	Activity Uncertainty
K-40	0.966	1460.81*	10.67	1.266E+003	3.206E+002
CO-60	0.989	1173.22*	100.00	1.784E+003	9.437E+001
		1332.49*	100.00	1.953E+003	1.014E+002
CS-134	0.705	475.35	1.46		
		563.23	8.38		
		569.32	15.43		
		604.70*	97.60	2.779E+002	4.959E+001
		795.84*	85.40	3.385E+002	4.422E+001
		801.93	8.73		
		1038.57	1.00		
		1167.94	1.80		
		1365.15	3.04		
CS-137	0.991	661.65*	85.12	4.113E+004	1.799E+003

* = Energy line found in the spectrum.
Energy Tolerance : 1.000 keV
Nuclide confidence index threshold = 0.30
Errors quoted at 1.000 sigma

********** UNIDENTIFIED PEAKS **********

Peak Locate Performed on: 9/28/2006 12:32:17 PM
Peak Locate From Channel: 1
Peak Locate To Channel: 8192

Peak No.	Energy (keV)	Peak Size in Counts per Second	Peak CPS % Uncertainty
1	18.01	7.6192E-002	23.49
2	147.44	-5.0818E-002	-69.52

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet

Errors quoted at 1.000 sigma

(6)

****
***** GAMMA SPECTRUM ANALYSIS *****
****

Filename: DET01

Report Generated On : 9/28/2006 1:05:24 PM

Sample Title : BSFR [redacted]
Spectrum Description :
Sample Identification : 06s0089
Sample Type :
Sample Geometry : 500ml

Peak Locate Threshold : 5.00
Peak Locate Range (in channels) : 1 - 65535
Peak Area Range (in channels) : 1 - 8192
Identification Energy Tolerance : 1.000 keV

Sample Size : 1.000E+000 gram

Sample Taken On : 9/27/2006 6:00:00 AM
Acquisition Started : 9/28/2006 12:32:55 PM

Live Time : 1800.0 seconds
Real Time : 1801.0 seconds

Dead Time : 0.06 %

Energy Calibration Used Done On : 9/16/2004
Efficiency Calibration Used Done On : 10/25/2005
Efficiency ID : 500ml

COPY

****
***** NUCLIDE IDENTIFICATION REPORT *****
****

Sample Title: BSFR [redacted]
Nuclide Library Used: C:\GENIE2K\CAMFILES\STDLIB.NLB

IDENTIFIED NUCLIDES

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (pCi/gram)	Activity Uncertainty
K-40	0.981	1460.81*	10.67	2.025E+003	3.344E+002
CO-60	0.996	1173.22*	100.00	7.931E+002	5.699E+001
		1332.49*	100.00	6.256E+002	5.601E+001
CS-134	0.705	475.35	1.46		
		563.23	8.38		
		569.32	15.43		
		604.70*	97.60	1.548E+002	3.792E+001
		795.84*	85.40	2.473E+002	3.219E+001
		801.93	8.73		
		1038.57	1.00		
		1167.94	1.80		
		1365.15	3.04		
CS-137	0.993	661.65*	85.12	2.597E+004	1.145E+003

* = Energy line found in the spectrum.
Energy Tolerance : 1.000 keV
Nuclide confidence index threshold = 0.30
Errors quoted at 1.000 sigma

********** UNIDENTIFIED PEAKS **********

Peak Locate Performed on: 9/28/2006 1:05:24 PM
Peak Locate From Channel: 1
Peak Locate To Channel: 8192

Peak No.	Energy (keV)	Peak Size in Counts per Second	Peak CPS % Uncertainty
1	17.86	3.2656E-002	55.04
2	147.40	-1.1564E-002	-296.21

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet

Errors quoted at 1.000 sigma

COPY

ID:BSFR 27 SEP 2006 11:16

USER: 8 COMMENT:TH

PRESET TIME :	1.00						
DATA CALC :	DL DPM	H#	:YES	SAMPLE REPEATS:	1	PRINTER	: STD
COUNT BLANK :	NO	IC#	: NO	REPLICATES :	1	RS232	: OFF
TWO PHASE :	NO	AQC	:YES	CYCLE REPEATS :	1		
SCINTILLATOR:	LIQUID	LUMEX	:YES	LOW SAMPLE REJ:	0		
LOW LEVEL :	NO	HALF LIFE CORRECTION DATE:				none	

ISOTOPE 1:	3H	%ERROR:	2.00	FACTOR:	1.000000	BKG. SUB:	0
ISOTOPE 2:	14C	%ERROR:	2.00	FACTOR:	1.000000	BKG. SUB:	0
WIDE OPEN WINDOW		%ERROR:	0.00	FACTOR:	1.000000	BKG. SUB:	0

BACKGROUND QUENCH CURVE: Off COLOR QUENCH CORRECTION: Off

Quench Limits Low:15.387 High:310.94

SAM NO	POS	TIME MIN	H#	ISO	CORRECTED CPM	%ERROR	DPM	EFF-1	EFF-2	RATIO	LUMEX %	ELAPSED TIME
1	**-1	1.00	130.4	3H	182.00	14.87	**184.88**	25.92	1.30	0.220	0.28	1.49
				14C	608.00	8.11	**839.40**	15.97	72.15			
				WIDE	1076.00	6.10						
2	**-2	1.00	118.4	3H	248.00	12.70	**422.71**	28.55	1.26	0.539	0.16	3.04
				14C	577.00	8.33	**784.85**	16.22	72.84			
				WIDE	1071.00	6.11						
3	**-3	1.00	114.1	3H	1453.00	5.25	**2837.63**	29.49	1.25	0.751	0.04	4.61
				14C	2798.00	3.78	**3780.76**	16.29	73.07			
				WIDE	5655.00	2.66						
4	**-4	1.00	139.0	3H	321.00	11.22	**995.03**	24.08	1.32	1.927	0.80	6.16
				14C	383.00	10.22	**516.41**	15.76	71.61			
				WIDE	750.00	7.32						
5	**-5	1.00	184.7	3H	19.00	45.88	**70.73**	15.03	1.50	1.176	1.81	7.72
				14C	42.00	30.86	**60.16**	13.91	68.05			
				WIDE	124.00	17.96						

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ANALYTICAL REPORT

PROJECT NO. 10CFR61

BSFR

Lot #: F6J030296

[redacted]

SEVERN TRENT LABORATORIES, INC.

pp Brian O'Donnell
Project Manager

October 25, 2006

Case Narrative
LOT NUMBER: **F6J030296**

This report contains the analytical results for the six samples received under chain of custody by STL St. Louis on October 3, 2006. These samples are associated with your BSFR project.

The analytical results included in this report meet all applicable quality control procedure requirements except as noted on the following page.

The test results in this report meet all NELAP requirements for parameters in which accreditations are held by STL St. Louis. Any exceptions to NELAP requirements are noted in the case narrative. The case narrative is an integral part of this report.

All chemical analysis results are based upon sample as received, wet weight, unless noted otherwise. All radiochemistry results are based upon sample as dried and ground with the exception of tritium, unless requested wet weight by the client.

Observations/Nonconformances
Reference the chain of custody and condition upon receipt report for any variations on receipt conditions and temperature of samples on receipt.

Isotopic Neptunium by A-01-R MOD

The Neptunium LCS tracer recovery is outside acceptance limits. LCS spike recoveries are within QC limits demonstrating acceptable sample preparation and instrument performance. There is an apparent anomaly in the sample preparation, isolated to the LCS and not indicative of the batch. No further action is required.
Affected Samples:
F6J030296 (2): 06S0085 (#2)

Ni-59/Ni-63 by DOE STL-RC-0055

During the preparation of these Nickel-59,63 samples the carrier spike added was the parent standard not the working standard. The samples were subsequently diluted 1 to 5 to allow for ICP determination of carrier recovery. The data is reported with the MDA achieved.
Affected Samples:
F6J030296 (6): 06S0089 (#6)

Iron-55 by DOE STL-RC-0055

During the preparation of these Iron-55 samples the carrier spike added was the parent standard not the working standard. The samples were subsequently diluted 1 to 5 to allow for ICP determination of carrier recovery. The data is reported with the MDA achieved.
Affected Samples:
F6J030296 (6): 06S0089 (#6)

Iodine by GA-01-R

The LCS recovery for Iodine-129 analyzed by gamma spectroscopy is outside the upper QC limit, indicating a potential positive bias for sample results. Iodine-129 was not observed above the reporting

limit in the associated samples; therefore the sample data was not adversely affected by this excursion. The original sample results are provided.

The reporting limit for Iodine-129 analyzed by gamma spectroscopy was not met due to interferences from Cesium-137 which was present in the sample. The data is reported with the MDA achieved.
Affected Samples:
F6J030296 (4): 06S0087 (#4)

TC-99 by TC-02-RC MOD

Reporting limit for Technesium-99 not met due to insufficient sample volume available for analysis. Analytical results are reported with the MDC achieved.
Affected Samples:
F6J030296 (5): 06S0088 (#5)

METHODS SUMMARY

F6J030296

PARAMETER	ANALYTICAL METHOD	PREPARATION METHOD
Gamma Spectroscopy - Cesium-137 & Hits	EML GA-01-R MOD	
Iodine by Gamma Spectrosc opy	EML Iodine GA-0	
Iron-55 by Liquid Scint. Spectrometry	DOE STL-RC-0055	
Iso Am241, Cm243/244 by Alpha Spectroscopy	EML A-01-R MOD	
Isotopic Neptunium by Alpha Spectroscopy	EML A-01-R MOD	
Isotopic Plutonium by Alpha Spectroscopy	EML A-01-R	
Isotopic Thorium by Alpha Spectroscopy	EML A-01-R MOD	
Isotopic Uranium by Alpha Spectroscopy	EML A-01-R MOD	
Ni-59/Ni-63 by Liquid Scint. Spectrometry	DOE STL-RC-0055	
Pu-241 By Liquid Scint.	STL STL-RC-0245	
Total Strontium By GFPC	EML SR-03-RC MO	
TC-99 by LSC	EML TC-02-RC MO	

References:

DOE "DOE METHODS FOR EVALUATING ENVIRONMENTAL AND WASTE MANAGEMENT SAMPLES" OCTOBER 1994 US DEPARTMENT OF ENERGY

EML "ENVIRONMENTAL MEASUREMENTS LABORATORY PROCEDURES MANUAL" HASL-300 28TH EDITION, VOLUME I and II DEPARTMENT OF ENERGY

STL Severn Trent Laboraties at St. Louis Facility Standard Operating Procedure.

SAMPLE SUMMARY

F6J030296

WO #	SAMPLE#	CLIENT SAMPLE ID	SAMPLED DATE	SAMP TIME
JFKW8	001	06S0084 (#1)	09/27/06	09:00
JFKXT	002	06S0085 (#2)	09/27/06	09:00
JFKXX	003	06S0086 (#3)	09/27/06	09:00
JFKX1	004	06S0087 (#4)	09/27/06	09:00
JFKX3	005	06S0088 (#5)	09/27/06	09:00
JFKX5	006	06S0089 (#6)	09/27/06	09:00

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

[redacted]

Client Sample ID: 06S0084 (#1)

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F6J030296-001
Work Order: JFKW8
Matrix: SOLID

Date Collected: 09/27/06 0900
Date Received: 10/03/06 0900

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Plutonium-241 by Liquid Scintillation				**pCi/sample**	**Batch # 6282381**		**Yld % 88**
Plutonium 241	**36.2**		**9.1**	20.0	**8.1**	**10/06/06**	**10/17/06**
Iso URANIUM (SHORT CT) DOE A-01-R MOD				**pCi/sample**	**Batch # 6282378**		**Yld % 77**
Uranium 234	**6.3**		**1.4**	4.0	**0.3**	**10/06/06**	**10/11/06**
Uranium 235/236	0.15	U	0.21	4.00	0.28	10/06/06	10/11/06
Uranium 238	**1.21**	**J**	**0.50**	4.00	**0.19**	**10/06/06**	**10/11/06**
Iso PLUTONIUM (SHORT CT) DOE A-01-R MOD				**pCi/sample**	**Batch # 6282372**		**Yld % 88**
Plutonium 238	**1.19**	**J**	**0.55**	4.00	**0.46**	**10/06/06**	**10/11/06**
Plutonium 239/40	**2.66**	**J**	**0.76**	4.00	**0.21**	**10/06/06**	**10/11/06**
Am241, Cm243/244 (SHORT CT) DOE A-01-R MOD				**pCi/sample**	**Batch # 6282369**		**Yld % 109**
Americium 241	**1.03**	**J**	**0.43**	4.00	**0.19**	**10/06/06**	**10/11/06**
Curium 243/244	0.16	U	0.21	4.00	0.28	10/06/06	10/11/06
Curium 242	0.0	U	0.0	4.0	0.1	10/06/06	10/11/06

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

J **Result is greater than sample detection limit but less than stated reporting limit.**
U **Result is less than the sample detection limit.**

[redacted]

Client Sample ID: 06S0084 (#1) DUP

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F6J030296-001X
Work Order: JFKW8
Matrix: SOLID

Date Collected: 09/27/06 0900
Date Received: 10/03/06 0900

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Am241, Cm243/244 (SHORT CT) DOE A-01-R MOD				**pCi/sample**	**Batch # 6282369**		**Yld % 90**
Americium 241	**1.73**	**J**	**0.61**	4.00	**0.22**	**10/06/06**	**10/11/06**
Curium 243/244	**0.45**	**J**	**0.33**	4.00	**0.32**	**10/06/06**	**10/11/06**
Curium 242	-0.02	U	0.11	4.00	0.24	10/06/06	10/11/06
Iso PLUTONIUM (SHORT CT) DOE A-01-R MOD				**pCi/sample**	**Batch # 6282372**		**Yld % 101**
Plutonium 238	**1.09**	**J**	**0.44**	4.00	**0.26**	**10/06/06**	**10/11/06**
Plutonium 239/40	**2.57**	**J**	**0.70**	4.00	**0.20**	**10/06/06**	**10/11/06**
Iso URANIUM (SHORT CT) DOE A-01-R MOD				**pCi/sample**	**Batch # 6282378**		**Yld % 78**
Uranium 234	**5.7**		**1.3**	4.0	**0.3**	**10/06/06**	**10/11/06**
Uranium 235/236	**0.36**	**J**	**0.31**	4.00	**0.26**	**10/06/06**	**10/11/06**
Uranium 238	**1.52**	**J**	**0.59**	4.00	**0.13**	**10/06/06**	**10/11/06**
Plutonium-241 by Liquid Scintillation				**pCi/sample**	**Batch # 6282381**		**Yld % 101**
Plutonium 241	**22.8**		**5.8**	20.0	**5.5**	**10/06/06**	**10/17/06**

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

J **Result is greater than sample detection limit but less than stated reporting limit.**
U **Result is less than the sample detection limit.**

LOT# F6J030296

[redacted]

Client Sample ID: 06S0085 (#2)

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F6J030296-002
Work Order: JFKXT
Matrix: SOLID

Date Collected: 09/27/06 0900
Date Received: 10/03/06 0900

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Iso THORIUM (SHORT CT) DOE A-01-R MOD				**pCi/sample**	**Batch # 6282376**		**Yld % 44**
Thorium 228	0.43	U	0.52	4.00	0.68	10/06/06	10/15/06
Thorium 230	**1.19**	**J**	**0.68**	4.00	**0.37**	**10/06/06**	**10/15/06**
Thorium 232	0.21	U	0.33	4.00	0.46	10/06/06	10/15/06
ISO NEPTUNIUM (SHORT CT) DOE A-01-R MOD				**pCi/sample**	**Batch # 6282370**		**Yld % 101**
Neptunium 237	-0.04	U	0.11	4.00	0.25	10/06/06	10/15/06

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

J Result is greater than sample detection limit but less than stated reporting limit.
U Result is less than the sample detection limit.

[redacted]

Client Sample ID: 06S0085 (#2) DUP

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F6J030296-002X
Work Order: JFKXT
Matrix: SOLID

Date Collected: 09/27/06 0900
Date Received: 10/03/06 0900

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
ISO NEPTUNIUM (SHORT CT) DOE A-01-R MOD				**pCi/sample**	**Batch # 6282370**		**Yld % 87**
Neptunium 237	-0.008	U	0.099	4.00	0.19	10/06/06	10/15/06
Iso THORIUM (SHORT CT) DOE A-01-R MOD				**pCi/sample**	**Batch # 6282376**		**Yld % 44**
Thorium 228	**0.86**	**J**	**0.58**	4.00	**0.23**	**10/06/06**	**10/15/06**
Thorium 230	**0.77**	**J**	**0.55**	4.00	**0.23**	**10/06/06**	**10/15/06**
Thorium 232	**0.26**	**J**	**0.34**	4.00	**0.23**	**10/06/06**	**10/15/06**

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

J Result is greater than sample detection limit but less than stated reporting limit.
U Result is less than the sample detection limit.

[redacted]

Client Sample ID: 06S0086 (#3)

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F6J030296-003
Work Order: JFKXX
Matrix: SOLID

Date Collected: 09/27/06 0900
Date Received: 10/03/06 0900

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Total SR BY GFPC DOE SR-03-RC MOD				**pCi/sample**	**Batch # 6277092**		**Yld % 79**
Strontium Total	**26.4**		**3.3**	3.0	**1.5**	**10/04/06**	**10/11/06**

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

[redacted]

Client Sample ID: 06S0086 (#3) DUP

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: P6J030296-003X
Work Order: JFKXX
Matrix: SOLID

Date Collected: 09/27/06 0900
Date Received: 10/03/06 0900

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Total SR BY GFPC DOE SR-03-RC MOD				pCi/sample	Batch # 6277092		Yld % 80
Strontium Total	22.5		2.9	3.0	1.3	10/04/06	10/11/06

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

[redacted]

Client Sample ID: 06S0087 (#4)

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F6J030296-004
Work Order: JFKX1
Matrix: SOLID

Date Collected: 09/27/06 0900
Date Received: 10/03/06 0900

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Gamma Iodine by GA-01-R MOD				**pCi/sample**	**Batch # 6283327**		**Yld %**
Iodine 129	-120	U	110	30	130	10/10/06	10/17/06
Gamma Cs-137 & Hits by DOE GA-01-R MOD.				**pCi/sample**	**Batch # 6277382**		**Yld %**
Cesium 137	**6430**		**870**	20	**20**	**10/04/06**	**10/15/06**
Cobalt 60	**338**		**48**		**15**	**10/04/06**	**10/15/06**
Niobium 94	2.7	U	8.7		17	10/04/06	10/15/06

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

U Result is less than the sample detection limit.

[redacted]

Client Sample ID: 06S0087 (#4) DUP

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F6J030296-004X
Work Order: JFKX1
Matrix: SOLID

Date Collected: 09/27/06 0900
Date Received: 10/03/06 0900

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Gamma Cs-137 & Hits by DOE GA-01-R MOD.				**pCi/sample**	**Batch # 6277382**		**Yld %**
Cesium 137	**6900**		**860**	20	**30**	**10/04/06**	**10/15/06**
Cobalt 60	**356**		**50**		**14**	**10/04/06**	**10/15/06**
Niobium 94	-6	U	11		19	10/04/06	10/15/06
Gamma Iodine by GA-01-R MOD				**pCi/sample**	**Batch # 6283327**		**Yld %**
Iodine 129	-20	U	30000	30	100	10/10/06	10/17/06

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

U Result is less than the sample detection limit.

[redacted]

Client Sample ID: 06S0088 (#5)

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F6J030296-005
Work Order: JFKX3
Matrix: SOLID

Date Collected: 09/27/06 0900
Date Received: 10/03/06 0900

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
TC-99 by LSC by DOE TC-02-RC Mod.				pCi/sample	Batch # 6290475		Yld % 93
Technetium 99	32.4		5.4	1.0	5.6	10/17/06	10/24/06

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

[redacted]

Client Sample ID: 06S0088 (#5) DUP

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F6J030296-005X
Work Order: JFKX3
Matrix: SOLID

Date Collected: 09/27/06 0900
Date Received: 10/03/06 0900

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
TC-99 by LSC by DOE TC-02-RC Mod.				pCi/sample	Batch # 6290475		Yld % 95
Technetium 99	30.9		5.3	1.0	5.5	10/17/06	10/24/06

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

[redacted]

Client Sample ID: 06S0089 (#6)

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F6J030296-006
Work Order: JFKX5
Matrix: SOLID

Date Collected: 09/27/06 0900
Date Received: 10/03/06 0900

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Iron-55 by Liquid Scint. Spectrometry				**pCi/sample**	**Batch # 6284457**		**Yld % 90**
Iron 55	**330**		**42**	25	**22**	**10/11/06**	**10/16/06**
Ni-59 & Ni-63 by Liquid Scint. Spec.				**pCi/sample**	**Batch # 6284456**		**Yld % 92**
Nickel 59	0.0	U	0.0	25.0	9.3	10/11/06	10/16/06
Nickel 63	**369**		**42**	25	**14**	**10/11/06**	**10/16/06**

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

U Result is less than the sample detection limit.

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[redacted]

Client Sample ID: 06S0089 (#6) DUP

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F6J030296-006X
Work Order: JFKX5
Matrix: SOLID

Date Collected: 09/27/06 0900
Date Received: 10/03/06 0900

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Ni-59 & Ni-63 by Liquid Scint. Spec.				**pCi/sample**		**Batch # 6284456**	**Yld % 87**
Nickel 59	0.0	U	0.0	25.0	10	10/11/06	10/16/06
Nickel 63	**423**		**48**	25	**15**	**10/11/06**	**10/16/06**
Iron-55 by Liquid Scint. Spectrometry				**pCi/sample**		**Batch # 6284457**	**Yld % 88**
Iron 55	**361**		**45**	25	**23**	**10/11/06**	**10/16/06**

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

U Result is less than the sample detection limit.

METHOD BLANK REPORT

Severn Trent Laboratories - Radiochemistry

Client Lot ID: F6J030296
Matrix: SOLID

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date	Lab Sample ID
Iso URANIUM (SHORT CT) DOE A-01-R MOD			**pCi/sample**	**Batch # 6282378**		**Yld % 70**		**F6J090000-378B**
Uranium 234	0.025	U	0.040	1.00	0.058		10/06/06	10/11/06
Uranium 235/236	0.034	U	0.059	1.00	0.046		10/06/06	10/11/06
Uranium 238	0.008	U	0.032	1.00	0.067		10/06/06	10/11/06
Plutonium-241 by Liquid Scintillation			**pCi/sample**	**Batch # 6282381**		**Yld % 96**		**F6J090000-381B**
Plutonium 241	0.7	U	4.6	5.0	1.8		10/06/06	10/16/06
Am241, Cm243/244 (SHORT CT) DOE A-01-R MOD			**pCi/sample**	**Batch # 6282369**		**Yld % 96**		**F6J090000-369B**
Americium 241	0.010	U	0.029	1.00	0.028		10/06/06	10/11/06
Curium 243/244	0.0	U	0.0	1.0	0.03		10/06/06	10/11/06
Curium 242	0.0	U	0.0	1.0	0.03		10/06/06	10/11/06
ISO NEPTUNIUM (SHORT CT) DOE A-01-R MOD			**pCi/sample**	**Batch # 6282370**		**Yld % 109**		**F6J090000-370B**
Neptunium 237	-0.017	U	0.046	1.00	0.093		10/06/06	10/15/06
Iso PLUTONIUM (SHORT CT) DOE A-01-R MOD			**pCi/sample**	**Batch # 6282372**		**Yld % 96**		**F6J090000-372B**
Plutonium 238	0.018	U	0.029	1.00	0.042		10/06/06	10/11/06
Plutonium 239/40	**0.158**	**J**	**0.084**	1.00	**0.027**		**10/06/06**	**10/11/06**
Iso THORIUM (SHORT CT) DOE A-01-R MOD			**pCi/sample**	**Batch # 6282376**		**Yld % 59**		**F6J090000-376B**
Thorium 228	**0.047**	**J**	**0.064**	1.00	**0.043**		**10/06/06**	**10/15/06**
Thorium 230	0.039	U	0.087	1.00	0.20		10/06/06	10/15/06
Thorium 232	0.0	U	0.0	1.0	0.04		10/06/06	10/15/06
Gamma Iodine by GA-01-R MOD			**pCi/sample**	**Batch # 6283327**		**Yld %**		**F6J100000-327B**
Iodine 129	2	U	32	30	58		10/10/06	10/17/06
Ni-59 & Ni-63 by Liquid Scint. Spec.			**pCi/sample**	**Batch # 6284456**		**Yld % 73**		**F6J110000-456B**
Nickel 59	0.0	U	0.0	5.0	5.8		10/11/06	10/16/06
Nickel 63	-0.7	U	6.7	5.0	9.0		10/11/06	10/16/06
Iron-55 by Liquid Scint. Spectrometry			**pCi/sample**	**Batch # 6284457**		**Yld % 69**		**F6J110000-457B**
Iron 55	6.3	U	5.4	5.0	16		10/11/06	10/16/06

METHOD BLANK REPORT

Severn Trent Laboratories - Radiochemistry

Client Lot ID: F6J030296
Matrix: SOLID

Parameter	Result	Qual	Total Uncert. (2 σ+/-)		RL	MDC	Prep Date	Lab Sample ID / Analysis Date
Total SR BY GFPC DOE SR-03-RC MOD				**pCi/sample**	**Batch # 6277092**	**Yld % 84**		**F6J040000-092B**
Strontium Total	-0.02	U	0.19		3.00	0.34	10/04/06	10/11/06
Gamma Cs-137 & Hits by DOE GA-01-R MOD.				**pCi/sample**	**Batch # 6277382**	**Yld %**		**F6J040000-382B**
Cesium 137	1.7	U	8.4		20.0	18	10/04/06	10/15/06
Cobalt 60	-2.6	U	7.1			13	10/04/06	10/15/06
Niobium 94	-0.7	U	5.4			11	10/04/06	10/15/06
TC-99 by LSC by DOE TC-02-RC Mod.				**pCi/sample**	**Batch # 6290475**	**Yld % 96**		**F6J170000-475B**
Technetium 99	-1.39	U	0.81		1.00	1.4	10/17/06	10/24/06

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined using instrument performance only
Bold results are greater than the MDC

J Result is greater than sample detection limit but less than stated reporting limit.
U Result is less than the sample detection limit.

L@T# F6J030296

Laboratory Control Sample Report

Severn Trent Laboratories - Radiochemistry

Client Lot ID: F6J030296
Matrix: SOLID

Parameter	Spike Amount	Result	Total Uncert. (2 σ +/-)	MDC	% Yld	% Rec	Lab Sample ID QC Control Limits
Total SR BY GFPC DOE SR-03-RC MOD			**pCi/samp**	**SR-03-RC MOD**			**F6J040000-092C**
Strontium Total	9.21	9.0	1.1	0.4	80	98	(63 - 127)
	Batch #:	6277092		**Analysis Date:**	10/11/06		
Gamma Cs-137 & Hits by DOE GA-01-R MOD.			**pCi/samp**	**GA-01-R MOD**			**F6J040000-382C**
Americium 241	51000	53700	6500	100		105	(89 - 118)
Cesium 137	21600	22900	2700	100		106	(90 - 119)
Cobalt 60	33200	34500	3800	100		104	(90 - 112)
	Batch #:	6277382		**Analysis Date:**	10/15/06		
Am241, Cm243/244 (SHORT CT) DOE A-01-R MOD			**pCi/samp**	**A-01-R MOD**			**F6J090000-369C**
Americium 241	3.86	3.90	0.65	0.05	91	101	(80 - 121)
	Batch #:	6282369		**Analysis Date:**	10/11/06		
ISO NEPTUNIUM (SHORT CT) DOE A-01-R MOD			**pCi/samp**	**A-01-R MOD**			**F6J090000-370C**
Neptunium 237	13.3	13.5	0.74	0.08	118	102	(77 - 114)
	Batch #:	6282370		**Analysis Date:**	10/15/06		
Iso PLUTONIUM (SHORT CT) DOE A-01-R MOD			**pCi/samp**	**A-01-R**			**F6J090000-372C**
Plutonium 238	6.13	6.11	0.95	0.10	93	100	(69 - 120)
Plutonium 239/40	5.77	5.79	0.91	0.05	93	100	(78 - 118)
	Batch #:	6282372		**Analysis Date:**	10/11/06		
Iso THORIUM (SHORT CT) DOE A-01-R MOD			**pCi/samp**	**A-01-R MOD**			**F6J090000-376C**
Thorium 230	4.12	4.52	0.89	0.05	48	110	(68 - 128)
	Batch #:	6282376		**Analysis Date:**	10/15/06		
Iso URANIUM (SHORT CT) DOE A-01-R MOD			**pCi/samp**	**A-01-R MOD**			**F6J090000-378C**
Uranium 234	6.56	6.6	1.0	0.06	77	101	(75 - 125)
Uranium 238	6.82	7.2	1.1	0.07	77	106	(75 - 122)
	Batch #:	6282378		**Analysis Date:**	10/11/06		
Plutonium-241 by Liquid Scintillation			**pCi/samp**	**STL-RC-0245**			**F6J090000-381C**
Plutonium 241	17.6	18.3	3.1	1.8	107	104	(52 - 126)
	Batch #:	6282381		**Analysis Date:**	10/17/06		
Gamma Iodine by GA-01-R MOD			**pCi/samp**	**Iodine GA-01**			**F6J100000-327C**
Iodine 129	70.5	97	a 36	46		138 a	(85 - 123)
	Batch #:	6283327		**Analysis Date:**	10/18/06		
Ni-59 & Ni-63 by Liquid Scint. Spec.			**pCi/samp**	**STL-RC-0055**			**F6J110000-456C**
Nickel 59	205	165	17	4	97	81	(70 - 123)
Nickel 63	190	186	21	7	97	98	(72 - 134)
	Batch #:	6284456		**Analysis Date:**	10/16/06		
Iron-55 by Liquid Scint. Spectrometry			**pCi/samp**	**STL-RC-0055**			**F6J110000-457C**
Iron 55	90.4	80	20	17	77	89	(60 - 122)
	Batch #:	6284457		**Analysis Date:**	10/16/06		

Laboratory Control Sample Report

Severn Trent Laboratories - Radiochemistry

Client Lot ID: F6J030296
Matrix: SOLID

Parameter	Spike Amount	Result	Total Uncert. (2 σ+/-)	MDC	% Yld	% Rec	Lab Sample ID QC Control Limits
TC-99 by LSC by DOE TC-02-RC Mod.			**pCi/samp**	**TC-02-RC MOD**			**F6J170000-475C**
Technetium 99	25.0	20.0	2.5	1.6	84	80	(78 - 102)
	Batch #:	5290475		**Analysis Date:**	10/24/06		

NOTE(S)

MDC is determined by instrument performance only
Calculations are performed before rounding to avoid round-off error in calculated results
a Spiked analyte outside of stated QC limits.

DUPLICATE EVALUATION REPORT

Severn Trent Laboratories - Radiochemistry

Client Lot ID: F6J030296
Matrix: SOLID

Date Sampled: 09/27/06
Date Received: 10/03/06

Parameter	SAMPLE Result		Total Uncert. (2σ+/-)	% Yld	DUPLICATE Result		Total Uncert. (2 σ+/-)	% Yld	QC Sample ID Precision	
Am241, Cm243/244 (SHORT CT) DOE A-01-R M	**pCi/samp**		**A-01-R MOD**						**F6J030296-001**	
Americium 241	**1.03**	J	**0.43**	109	**1.73**	J	**0.61**	90	51	%RPD
Curium 242	0.0	U	0.0	109	-0.02	U	0.11	90	200	%RPD
Curium 243/244	0.16	U	0.21	109	**0.45**	J	**0.33**	90	94	%RPD
	Batch #:		6282369 (Sample)		6282369 (Duplicate)					
Iso PLUTONIUM (SHORT CT) DOE A-01-R MOD	**pCi/samp**		**A-01-R**						**F6J030296-001**	
Plutonium 238	**1.19**	J	**0.55**	88	**1.09**	J	**0.44**	101	9	%RPD
Plutonium 239/40	**2.66**	J	**0.76**	88	**2.57**	J	**0.70**	101	4	%RPD
	Batch #:		6282372 (Sample)		6282372 (Duplicate)					
Iso URANIUM (SHORT CT) DOE A-01-R MOD	**pCi/samp**		**A-01-R MOD**						**F6J030296-001**	
Uranium 234	**6.3**		**1.4**	77	**5.7**		**1.3**	78	10	%RPD
Uranium 235/236	0.15	U	0.21	77	**0.36**	J	**0.31**	78	82	%RPD
Uranium 238	**1.21**	J	**0.50**	77	**1.52**	J	**0.59**	78	22	%RPD
	Batch #:		6282378 (Sample)		6282378 (Duplicate)					
Plutonium-241 by Liquid Scintillation	**pCi/samp**		**STL-RC-0245**						**F6J030296-001**	
Plutonium 241	36.2		9.1	88	22.8		5.8	101	46	%RPD
	Batch #:		6282381 (Sample)		6282381 (Duplicate)					
Gamma Cs-137 & Hits by DOE GA-01-R MOD.	**pCi/samp**		**GA-01-R MOD**						**F6J030296-004**	
Cesium 137	**6430**		**870**		**6900**		**860**		7	%RPD
Cobalt 60	**338**		**48**		**356**		**50**		5	%RPD
Niobium 94	**2.7**	U	**8.7**		**-6**	U	**11**		592	%RPD
	Batch #:		6277382 (Sample)		6277382 (Duplicate)					
Gamma Iodine by GA-01-R MOD	**pCi/samp**		**Iodine GA-01**						**F6J030296-004**	
Iodine 129	-120	U	110		**-20**	U	**30000**		143	%RPD
	Batch #:		6283327 (Sample)		6283327 (Duplicate)					
TC-99 by LSC by DOE TC-02-RC Mod.	**pCi/samp**		**TC-02-RC MOD**						**F6J030296-005**	
Technetium 99	32.4		5.4	93	30.9		5.3	95	5	%RPD
	Batch #:		6290475 (Sample)		6290475 (Duplicate)					
Ni-59 & Ni-63 by Liquid Scint. Spec.	**pCi/samp**		**STL-RC-0055**						**F6J030296-006**	
Nickel 59	0.0	U	0.0	92	0.0	U	0.0	87	0	%RPD
Nickel 63	**369**		**42**	92	**423**		**48**	87	14	%RPD
	Batch #:		6284456 (Sample)		6284456 (Duplicate)					
Iron-55 by Liquid Scint. Spectrometry	**pCi/samp**		**STL-RC-0055**						**F6J030296-006**	
Iron 55	**330**		**42**	90	**361**		**45**	88	9	%RPD
	Batch #:		6284457 (Sample)		6284457 (Duplicate)					
ISO NEPTUNIUM (SHORT CT) DOE A-01-R MOD	**pCi/samp**		**A-01-R MOD**						**F6J030296-002**	
Neptunium 237	-0.04	U	0.11	101	-0.008	U	0.099	87	126	%RPD
	Batch #:		6282370 (Sample)		6282370 (Duplicate)					

DUPLICATE EVALUATION REPORT

Severn Trent Laboratories - Radiochemistry

Client Lot ID: F6J030296
Matrix: SOLID

Date Sampled: 09/27/06
Date Received: 10/03/06

Parameter	SAMPLE Result		Total Uncert. (2σ +/-)	% Yld	DUPLICATE Result		Total Uncert. (2 σ +/-)	% Yld	QC Sample ID Precision	
Iso THORIUM (SHORT CT) DOE A-01-R MOD				**pCi/samp**	**A-01-R MOD**				**F6J030296-002**	
Thorium 228	0.43	U	0.52	44	**0.86**	J	**0.58**	44	67	%RPD
Thorium 230	**1.19**	J	**0.68**	44	**0.77**	J	**0.55**	44	43	%RPD
Thorium 232	0.21	U	0.33	44	**0.26**	J	**0.34**	44	20	%RPD
	Batch #:		6282376 (Sample)		6282376 (Duplicate)					
Total SR BY GFPC DOE SR-03-RC MOD				**pCi/samp**	**SR-03-RC MOD**				**F6J030296-003**	
Strontium Total	**26.4**		**3.3**	79	**22.5**		**2.9**	80	16	%RPD
	Batch #:		6277092 (Sample)		6277092 (Duplicate)					

NOTE(S)

Data are incomplete without the case narrative.
Calculations are performed before rounding to avoid round-off error in calculated results

J Result is greater than sample detection limit but less than stated reporting limit.
U Result is less than the sample detection limit.

LOT# F6J030296

STL ST. LOUIS

Chain of Custody Record

SEVERN TRENT STL

Severn Trent Laboratories, Inc.

CLK4474

STL-4124 (0901)

Client	Project Manager	Date	Chain of Custody Number
[redacted] Pacific Eco Solutions	[redacted]	10/2/06	320389
Address	**Telephone Number (Area Code)/Fax Number**	**Lab Number**	**Page** 1 of 1
2025 Battelle Blvd	[redacted]		
City / **State** / **Zip Code**	**Site Contact**	**Lab Contact**	
Richland / WA / 99354			
Project Name and Location (State)	**Carrier/Waybill Number**		
BSFR			
Contract/Purchase Order/Quote No.			
B0907060-1			

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed.	Soil	Containers & Preservatives: Unpres.	H_2SO_4	HNO_3	HCl	NaOH	ZnAc/NaOH
0650084(#1), 0650085(#2), 0650086(#3), 0650087(#4), 0650088(#5), 0650089(#6) (Smear swipes)	10/2/06	1400			X							
0650084 (#1) 9.27.06 0900												
85 (#2)												
86 (#3)												
87 (#4)												
88 (#5)												
89 (#6) QC 10.03.06												

Analysis (Attach list if more space is needed)

Special Instructions/ Conditions of Receipt

See Attached for Analysis required.
120g/w ~~wipe~~ Hs.
QC 10.03.06

Possible Hazard Identification	Sample Disposal	Turn Around Time Required	QC Requirements (Specify)
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown	☒ Return To Client ☐ Disposal By Lab ☐ Archive For ____ Months (A fee may be assessed if samples are retained longer than 1 month)	☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☒ 14 Days ☐ 21 Days ☐ Other ____	

	Relinquished By	Date	Time	Received By	Date	Time
1.	[redacted]	10/2/06	1400	Gil Clarke	10-03-06	0900
2.						
3.						

Comments: See the attached price quote for sampling Requirements.

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

STL St Louis
13715 Rider Trail North
Earth City , MO 63045
Phone: 314-298-8566
Fax: 314-298-8757

SEVERN TRENT STL

PRICE QUOTATION B090706-1

Requested By: [redacted]
Prepared For: [redacted]
[redacted]
0 0

[redacted]
Phone: [redacted]
Email: [redacted]

Quote Number: B090706-1
Prepared by Brian O'Donnell
Date: 7-Sep-06
Lab Contact: 0

Project Ref: 10CFR61
Est Start Date: 9/11/2006
Est Duration: unknown

Method	Description	Matrix	Estimated Number of Samples	Unit Price	Extended Price
DOE A-01-R	Pu-241(In conjunction w/Iso.Pu)	Wipe	1	$ 100.00	$ 100.00
DOE A-01-R	Isotopic Plutonium	Wipe	1	$ 100.00	$ 100.00
DOE A-01-R	Am-241	Wipe	1	$ 100.00	$ 100.00
DOE A-01-R	Cm-242,Cm-244	Wipe	1	$ 100.00	$ 100.00
DOE A-01-R	U-238,U-234,U-235	Wipe	1	$ 100.00	$ 100.00
DOE A-01-R	Th-232,230,228	Wipe	1	$ 100.00	$ 100.00
DOE A-01-R	Np-237	Wipe	1	$ 100.00	$ 100.00
HASL 300 TC-02	Tc-99	Wipe	1	$ 90.00	$ 90.00
STL-RC-0055	Fe-55	Wipe	1	$ 125.00	$ 125.00
STL-RC-0055	Ni-59,Ni-63	Wipe	1	$ 125.00	$ 125.00
GA-01-R	I-129	Wipe	1	$ 80.00	$ 80.00
SR-03-C	Strontium, Total	Wipe	1	$ 90.00	$ 90.00
GA-01-R	Gamma Cs-137,Co-60,Nb-94	Wipe	1	$ 80.00	$ 80.00
					$ -
					$ 1,290.00

Quick TAT samples received after 12:00 noon will be considered "received" on the next business day, for the purposes of calculating TAT.

Client Service Options	Charge
Extended Sample Storage (>30 Days)	$5.00/sample/month
Sample Disposal	Return to client if mixed waste or if radioactive; otherwise disposal by lab
Electronic Data Deliverables (STL St. Louis Excel format)	
Extended Data Package (Level IV)	
Rush Turn Arounds - call lab for availability	See Below
Difficult Matrices, e.g. concrete, oily sludge	Unit Charge for each analytical run needed

Turnaround Time: 14 Business Days **Terms Effective:** 30 Days

NOTE: The TAT will start when all issues associated with samples received are resolved.

[redacted]

P. O. **P-0244604**

QA REQUIRED? (See QP 7.1)	Yes (X)	No ( )

Requestor: [redacted] SIGNATURE _____ Date: 10/2/2006

Charge To: ( ) Non-Thermal LL ( ) Thermal LL ( ) Maintenance ( ) Ship/Rec (X) Safety/Quality ( ) MW
( ) Reg. Compliance ( ) Sales ( ) Warehouse Stock ( ) Admin ( ) Other _____

Vendor:	STL (St Louis)		
NAME:	13715 Rider Trail North	CONTACT:	Brian O'Donnell
ADDRESS:	Earth City, MO 63045	PHONE:	1-314-298-8566
		FAX:	1-314-298-8757

DATE REQ.	TERMS	SHIP VIA	FOB	TAXABLE
				YES

Quantity	UOM	Prod. Code	Description	Unit Price	Ext. Price
1	ea	B090706-1	Isotopic Sampling (BSFR Swipes)	$1,290.00	$1,290.00
				Subtotal	$1,290.00
				Tax	
Comments: Swipes are for the BSFR campaign.				Freight	
				Total	$1,290.00

Receiving Instructions / QA / QC Instructions: Severn Trent is on the approved vendor list
Perform Analysis IAW STL QA Program

JOB CODE	COST CODE	GL CODE	VENDOR

APPROVALS:	SIGNATURE	DATE
Ordered By:		10/2/06
Purchasing:		
Quality Assurance:		10/2/06
Supervisor / Dept. Manager:		10/2/06
Controller:	M. Garcia	10/2/06
Chief Operating Officer:		

ST. LOUIS STL St. Louis

Lot #(s): F6J030296

- 4474 -

Condition Upon Receipt Form

Client: [redacted] COC/RFA No: 320389 Date 10.03.06

Quote No: Initiated By: Time: 0900

Shipping Information

Shipper Name: Fed Ex Multiple Packages Y (N) N/A

Shipping # (s):* Sample Temperature (s):**

1.	8517 6264652	6.		1.	Ambient	6.	
2.		7.		2.		7.	
3.		8.		3.		8.	
4.		9.		4.		9.	
5.		10.		5.		10.	

*Numbered shipping lines correspond to Numbered Sample Temp lines

**Sample must be received at 4°C ± 2°C- If not, note contents below. Temperature variance does NOT affect the following: Metals-Liquid or Rad tests- Liquid or Solids

Condition (Circle "Y" for yes, "N" for no and "N/A" for not applicable):

1.	Y (N)	Was sample received broken?	8.	(Y) N	Sample received with Chain of Custody?
2.	Y N (N/A)	Was sample received with proper pH[1] ? (If not, make note below)	9.	(Y) N	Chain of Custody matches sample ID's on container(s)?
3.	Y N	If N/A-Was pH taken by original STL Lab?	10.	Y (N)	Are there custody seals present on cooler?
4.	(Y) N	Sample received in proper containers?	11.	Y N (N/A)	Do custody seals on cooler appear to be tampered with?
5.	(Y) N	Sample volume sufficient for analysis?	12.	Y (N)	Are there custody seals present on bottles?
6.	Y N (N/A)	Headspace in VOA or TOX liquid samples? (If Yes, note sample ID's below)	13.	Y N (N/A)	Do custody seals on bottles appear to be tampered with?
7.	(Y) N	Were contents of the cooler frisked after opening	14.	Y N	Was Internal COC/Workshare received?

[1] For DOE-AL (Pantex, LANL, Sandia) sites, pH of ALL containers received must be verified, EXCEPT VOA, TOX and soils.

Notes:

Corrective Action:

☐ Client Contact Name: Informed by:

☐ Sample(s) processed "as is"

☐ Sample(s) on hold until: If released, notify:

Project Management Review: Date: 10-4-06

THIS FORM MUST BE COMPLETED AT THE TIME THE ITEMS ARE BEING CHECKED IN. IF ANY ITEM IS COMPLETED BY SOMEONE OTHER THAN THE INITIATOR, THEN THAT PERSON IS REQUIRED TO APPLY THEIR INITIAL AND THE DATE NEXT TO THAT ITEM.

F6J030296 CLIENT ANALYSIS SUMMARY

Storage Loc: RAD

Project Manager: BTO Quote #: 72591 SDG:

Project: 10CFR61 BSFR

PO#: P-0244604 Report to: Curt Cannon

Client: [redacted]

Date Received: 2006-10-03

Analytical Due Date: 2006-10-16

Report Due Date: 2006-10-17

Report Type: B Standard Report

#SMPS in LOT: 6 EDD Code: 00

Each sample consists of five wipes. Composite them prior to analysis. Report as pCi/sample.

SAMPLE #	CLIENT SAMPLE ID	Site ID	Client Matrix	DATE/TIME SAMPLED	WORKORDER	A
1	06S0084 (#1)			2006-09-27 / 900	JFKW8	SOLID

SAMPLE COMMENTS: **COMPOSITE PRIOR TO ANALYSIS**

XX	2H	EML	A-01-R	Iso PLUTONIUM (SHORT CT) DOE A-01-R MOD	J2	Extraction Chromatography - Sequential Actinides	01	STANDARD TEST SET	PROT: A	WRK LOC	06
XX	2I	EML	A-01-R MOD	Iso URANIUM (SHORT CT) DOE A-01-R MOD	J2	Extraction Chromatography - Sequential Actinides	01	STANDARD TEST SET	PROT: A	WRK LOC	06
XX	2J	EML	A-01-R MOD	Am241, Cm243/244 (SHORT CT) DOE A-01-R MOD	J2	Extraction Chromatography - Sequential Actinides	01	STANDARD TEST SET	PROT: A	WRK LOC	06
XX	3O	STL	STL-RC-0245	Plutonium-241 by Liquid Scintillation	JA	Extraction Chromatography -> LSC PREP	01	STANDARD TEST SET	PROT: A	WRK LOC	06

SAMPLE #	CLIENT SAMPLE ID	Site ID	Client Matrix	DATE/TIME SAMPLED	WORKORDER	A
2	06S0085 (#2)			2006-09-27 / 900	JFKXT	SOLID

SAMPLE COMMENTS: **COMPOSITE PRIOR TO ANALYSIS**

XX	2K	EML	A-01-R MOD	Iso THORIUM (SHORT CT) DOE A-01-R MOD	J2	Extraction Chromatography - Sequential Actinides	01	STANDARD TEST SET	PROT: A	WRK LOC	06
XX	3K	EML	A-01-R MOD	ISO NEPTUNIUM (SHORT CT) DOE A-01-R MOD	J2	Extraction Chromatography - Sequential Actinides	01	STANDARD TEST SET	PROT: A	WRK LOC	06

SAMPLE #	CLIENT SAMPLE ID	Site ID	Client Matrix	DATE/TIME SAMPLED	WORKORDER	A
3	06S0086 (#3)			2006-09-27 / 900	JFKXX	SOLID

SAMPLE COMMENTS: **COMPOSITE PRIOR TO ANALYSIS**

XX	ZJ	EML	SR-03-RC MOD	Total SR BY GFPC DOE SR-03-RC MOD	FW	Dry, Grind, Digest, Precipitate, Separation	01	STANDARD TEST SET	PROT: A	WRK LOC	06

SAMPLE #	CLIENT SAMPLE ID	Site ID	Client Matrix	DATE/TIME SAMPLED	WORKORDER	A
4	06S0087 (#4)			2006-09-27 / 900	JFKX1	SOLID

SAMPLE COMMENTS: **COMPOSITE PRIOR TO ANALYSIS**

XX	0A	EML	GA-01-R MOD	Gamma Cs-137 & Hits by DOE GA-01-R MOD.	K1	As Received, Fill Geometry	01	STANDARD TEST SET	PROT: A	WRK LOC	06
XX	4F	EML	Iodine GA-01-R	Gamma Iodine by GA-01-R MOD	K5	As Received, Direct Addition of Sample	01	STANDARD TEST SET	PROT: A	WRK LOC	06

SAMPLE #	CLIENT SAMPLE ID	Site ID	Client Matrix	DATE/TIME SAMPLED	WORKORDER	A
5	06S0088 (#5)			2006-09-27 / 900	JFKX3	SOLID

SAMPLE COMMENTS: **COMPOSITE PRIOR TO ANALYSIS**

XX	2Q	EML	TC-02-RC MOD	TC-99 by LSC by DOE TC-02-RC Mod.	IM	TC-99 by Extraction Chromatography Resin	01	STANDARD TEST SET	PROT: A	WRK LOC	06

SAMPLE #	CLIENT SAMPLE ID	Site ID	Client Matrix	DATE/TIME SAMPLED	WORKORDER	A
6	06S0089 (#6)			2006-09-27 / 900	JFKX5	SOLID

SAMPLE COMMENTS: **COMPOSITE PRIOR TO ANALYSIS**

XX	3V	DOE	STL-RC-0055	Iron-55 by Liquid Scint. Spectrometry	J3	Ion Exchange Resin preconcentration and	01	STANDARD TEST SET	PROT: A	WRK LOC	06
XX	3W	DOE	STL-RC-0055	Ni-59 & Ni-63 by Liquid Scint. Spec.	J3	Ion Exchange Resin preconcentration and	01	STANDARD TEST SET	PROT: A	WRK LOC	06

F6J030296

CLIENT COMMENTS SUMMARY

Storage Loc: RAD
Date Received: 2006-10-03
Analytical Due Date: 2006-10-16
Report Due Date: 2006-10-17
Report Type: B Standard Report
EDD Code: 00

Project Manager: BTO
Project: 10CFR61
PO#: P-0244604
Client: [redacted]

Quote #: 72591 SDG:
BSFR
Report to: Curt Cannon
#SMPS in LOT: 6

Each sample consists of five wipes. Composite them prior to analysis.
Report as pCi/sample.

STL - St Louis Logged in by: ODONNELB 2006-10-04 8:14:02 printed on: Wednesday, October 04, 2006 01:2 Page 1 of 1

Attachment 9

Assay Results (SoF)

IMPACt Services, Inc.

[redacted]

Volumetric Clearance for alternative Disposal

Project Number 5800-303
Purchase Order Number 334225
IMPACt Project Number 0402059

Shipment WA-05-1069-W
Container Type Intermodal MHFU001751
Container ID MBNBC5186
Content JN-1B Demolition Debris
Process Date 6/16/2005
Status Passed
Manifest BFI 1326
Disposal Date 6/20/2005

Isotope	Enter Indicated Activity Concentration pCi/g	Activity in Waste Stream mCi	Scaling Factor	Dose Fraction Limit pCi/gm	Activity Concentration pCi/gm	Unity Fraction Contribution
Ac-227	HTD	7.36E-13	1.11E-10	0.44	1.07E-10	2.4347E-10
Am-241	0	3.34E-04	NA	0.15	0	0
Am-243	0	2.49E-06	NA	0.13	0	0
Ba-133	0	4.14E-32	NA	49	0	0
C-14	HTD	1.25E-07	1.88E-05	2000	1.82E-05	9.0972E-09
Cl-36	HTD	1.24E-09	1.86E-07	2.7	1.80E-07	6.6848E-08
Cm-243	0	1.75E-06	NA	32	0	0
Cm-244	HTD	2.69E-04	4.04E-02	94	3.92E-02	0.00041654
Cm-245	0	4.27E-08	NA	0.37	0	0
Cm-246	HTD	1.46E-08	2.19E-06	20	2.13E-06	1.0626E-07
Cm-247	0	6.81E-14	NA	2.6	0	0
Cm-248	HTD	2.80E-13	4.20E-11	2.4	4.08E-11	1.6981E-11
Co-60	0.0194	2.06E-03	NA	22	0.0194	0.00088182
Cs-134	0	2.74E-05	NA	1200	0	0
Cs-137	0.9694	6.66E-03	NA	8.5	0.9694	0.11404706
Eu-152	0	2.50E-07	NA	10	0	0
Eu-154	0	1.03E-04	NA	17	0	0
Gd-152	HTD	3.92E-20	5.89E-18	60	5.71E-18	9.5096E-20
I-129	HTD	3.17E-09	4.76E-07	0.23	4.61E-07	2.0061E-06
Nb-94	0	1.51E-11	NA	26	0	0
Ni-59	HTD	4.88E-08	7.33E-06	3900	7.10E-06	1.8213E-09
Ni-63	HTD	6.02E-06	9.04E-04	1600	8.76E-04	5.4765E-07
Np-237	0	3.01E-08	NA	0.6	0	0
Pa-231	0	1.91E-12	NA	0.026	0	0
Pb-210	HTD	2.14E-14	3.21E-12	2.7	3.11E-12	1.1537E-12
Pu-238	HTD	3.21E-04	4.82E-02	31	4.67E-02	0.0015072
Pu-239	HTD	4.13E-05	6.20E-03	16	6.01E-03	0.00037572
Pu-240	HTD	6.73E-05	1.01E-02	24	9.80E-03	0.00040816
Pu-241	HTD	5.41E-03	8.12E-01	5	7.87E-01	0.15749111
Pu-242	HTD	2.01E-07	3.02E-05	12	2.93E-05	2.4381E-06
Pu-244	HTD	8.60E-14	1.29E-11	2.5	1.25E-11	5.0071E-12

Sb-125	0	3.05E-05	NA	2000	0	0
Se-79	HTD	3.95E-08	5.93E-06	5.7	5.75E-06	1.0087E-06
Sm-147	HTD	4.35E-13	6.53E-11	74	6.33E-11	8.5563E-13
Sm-151	HTD	3.15E-05	4.73E-03	2000	4.59E-03	2.2925E-06
Sr-90	HTD	4.37E-03	6.56E-01	2.7	6.36E-01	0.23558436
Tc-99	HTD	1.25E-06	1.88E-04	12	1.82E-04	1.5162E-05
Th-228	0	3.06E-09	NA	4.70E+02	0	0
Th-229	0	1.99E-14	NA	7.8	0	0
U-232	0	3.07E-09	NA	2.7	0	0
U-233	HTD	3.58E-12	5.38E-10	4.6	5.21E-10	1.1328E-10
U-234	HTD	1.15E-07	1.73E-05	4.7	0.00E+00	0
U-235	0	1.68E-09	NA	1.9	0	0
U-236	HTD	2.23E-08	3.35E-06	4.9	3.25E-06	6.6243E-07
U-238	0	3.26E-08	NA	4.8	0	0
Zr-93	HTD	1.85E-07	2.78E-05	46	2.69E-05	5.8539E-07

Total Unity Fraction = 0.51073686

Analyst Signature and Date: 6/23/05

RSO Signature and Date: 7/13/05

VCD Container Form

Eng. Eval. Number: 04-003R1 File Ref.: MBNBC5186 Date: 06/23/05

A, B, C

Analyst (Printed Name): Bobby Parrott

Material (Unique Identifier): MBNBC5186 Net Wt.: 3,438,230.16g

Isotope Identified	Peak Energy (keV)	Indicated Activity (μCi)	Corrected Activity (pCi)	Specific Activity (pCi/g)	Unity Fraction
Co60	**1332.5**	**.0008**	**6.6608E04**	**.0194**	**.0009**
Cs137	**661.66**	**.0326**	**3.3331E06**	**.9694**	**.1141**
				SoF	**.1149**

Clearance Approved: ☒ Yes ☐ No ☐ NA

Analyst Signature and Date: Robert J. Parrott 6/23/05

RSO Signature and Date: [signature] 7/13/05

000263

MBNBC5186

IMPACT Services, Inc. Volumtric Clearance for Alternative Disposal SoF Worksheet

	µCi A	µCi B	µCi C	µCi TTL		Weight #	Weight g
Cs137	0.0112	0.011	0.0104	0.0326		7580.0000	3,438,230.16

	µCi A	µCi B	µCi C	µCi TTL
Co60	0.0005	0	0.0003	0.0008

	µCi	pCi	pCi x corr	pCi/g	Unity Frac
Cs137	0.0326	3.2600E+04	3.3331E+06	0.9694	0.1141

	µCi	pCi	pCi x corr	pCi/g	Unity Frac
Co60	0.0008	8.0000E+02	6.6608E+04	0.0194	0.0009

SoF
0.1149

Attachment 10

Leachate Data

Maximum Tritium in Landfill Leachate

		H-3	
	Blount County	330	
*	Carter Valley	14341	
*	Chestnut Ridge	19451	
	Clarksville Bi-County	45966	
	Iris Glen	36595	
	Jackson Landfill	24067	
*	Middle Point	38472	
*	North Shelby County	12528	
*	South Shelby County	15660	
**	California Landfills	304000	(maximum observed value)
**	New Jersey/New York Landfills	192000	(maximum observed value)
***	Pennsylvania Landfills	181700	(Maximum observed value)

Note: **Results from samples collected June 2007 by staff from the Tennessee Division of Radiological Health**

* Indicates landfills that accept BSFR material
** Data from "A STUDY OF TRITIUM IN MUNICIPAL SOLID WASTE LEACHATE AND GAS", see reference in endnote xiii
*** Pennsylvania Department of Environmental Protection, Bureau of Radiation Protection

9920096

Attachment 11

No. 28

LEACHATE/LINER COMPATIBILITY STUDY FINAL REPORT

ON-SITE DISPOSAL FACILITY

Revision 0
June 1997

United States Department of Energy

Fluor Daniel Fernald
Fernald, Ohio

Prepared by

GeoSyntec Consultants
1100 Lake Hearn Drive, NE, Suite 200
Atlanta, Georgia 30342

Under

Fluor Daniel Fernald
Subcontract 95PS005028

000268

1. INTRODUCTION

1.1 Purpose of Report

This report presents the results of a study designed to evaluate the leachate compatibility characteristics of high-density polyethylene (HDPE) geomembrane materials that are candidates for use as components of both the liner and final cover systems for the On-Site Disposal Facility (OSDF) at the Fernald Environmental Management Project (FEMP), located in Fernald, Ohio. The FEMP is undergoing remediation pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). In order to address applicable or relevant and appropriate requirements (ARARs) derived from the Ohio Administrative Code (OAC) Chapter 3745-27 (Ohio Environmental Protection Agency (OEPA) Solid Waste Disposal Regulations), and identified in the *Final Record of Decision for Remedial Actions at Operable Unit 2* (OU2 ROD) [DOE, 1995a], a leachate/liner compatibility work plan (LLCWP) [GeoSyntec, 1996a] was developed. This report documents results of testing performed by the Fluor Daniel Fernald (FDF) and GeoSyntec Consultants (GeoSyntec) in accordance with the LLCWP and presents conclusions based upon those results.

The LLCWP comprised two main parts. Part I described the activities that were undertaken to compile available data and develop findings on the likely performance of HDPE geomembranes when exposed to OSDF leachate. The main elements of Part I included:

- developing a rationale for focusing the LLCWP on HDPE geomembranes;
- evaluating the likely chemical and radiological characteristics of leachate produced by the OSDF;
- discussing the results of a review of available information on the impacts of radiation and chemicals on HDPE geomembranes; and

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- deriving conclusions and recommendations from the results of the information review.

Part II of the LLCWP described a testing program developed to provide adequate information for design of the OSDF and to satisfy the ARARs. Part II established the key components of the testing program, which included:

- collecting perched ground water from an on-site source at the FEMP;
- using this perched ground water as test leachate in the geomembrane immersion testing;
- fabricating geomembrane immersion cells;
- immersing candidate geomembrane specimens in the test leachate;
- testing the geomembrane specimens under pre-immersion and post-immersion conditions;
- analyzing the laboratory test results; and
- summarizing the results and developing the conclusions.

This report presents the results and findings from the testing program described in the LLCWP.

1.2 Organization of Report

This leachate/liner compatibility final report (LLCFR) is organized as follows:

- a summary of key points from the LLCWP regarding the selection of HDPE geomembranes for evaluation, the selection of an appropriate test leachate, the review of available information relevant to the chemical compatibility of

000270

HDPE geomembranes, and quality assurance/quality control requirements of the testing program is presented in Section 2;

- a summary of the chemical compatibility test results, including a brief description of the candidate geomembranes, study participants, experimental details, test methodologies, and characteristics of the properties tested is presented in Section 3; this section also includes a discussion of the results of environmental stress crack resistance testing of the candidate geomembrane materials; and

- conclusions based upon the results of the testing program are given in Section 4.

000271

4. CONCLUSIONS

The principal findings of this leachate/liner compatibility test program regarding the radiological/chemical compatibility of the HDPE geomembranes and test leachate are as follows:

- All five candidate geomembranes performed similarly in the USEPA Method 9090 tests. There were no measurable or discernable effects to the physical and mechanical properties of the geomembranes as the result of 120 days of immersion in the test leachate.

- The surface molecular structure of the geomembranes was not modified, as determined by infrared surface spectroscopy, by 120 days of immersion in the test leachate.

- Based on the environmental NCTL test results presented in this report, a minimum recommended time-to-rupture at a tensile stress of 900 psi (6.2 MPa), when tested in accordance with ASTM D 3597, of 500 hours is recommended as a requirement for HDPE geomembranes used in the OSDF liner or final cover systems.

In conclusion, the HDPE geomembranes proposed for use in the OSDF liner and final cover systems exhibit a high degree of compatibility with the test leachate. There is no indication that the OSDF in-service conditions will cause degradation to commercially-available HDPE geomembrane products. The NCTL test results provide data to allow development of a HDPE geomembrane specification that will result in the use of geomembrane materials having a high level of resistance to environmental stress crack.

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Attachment 12

Information on this page is generally current to within an hour.

***SB1779 by *Jackson, *Harper, *Marrero B, *Finney R., *Tracy. (HB1345 by *Shepard, *Gilmore, *Pruitt, *Rowland.)**

Solid Waste Disposal - Continues the joint study currently being performed by TSU and MTSU of solid waste in Tennessee; requires a report to be made to the general assembly by February 15, 2008. - Amends TCA Title 68, Chapter 211.

Fiscal Summary for *SB1779 / HB1345

Increase State Expenditures - $149,000/One-Time

Bill Summary for *SB1779 / HB1345

Tennessee State University (TSU) and Middle Tennessee State University (MTSU) recently conducted a state-funded solid waste study to determine how to divert solid waste from landfills.

This bill requires TSU and MTSU to continue the joint solid waste study and report the findings to the senate environment, conservation, and tourism committee and the house conservation and environment committee by February 15, 2008. This bill specifies particular subjects concerning solid waste that the study must address.

ON JUNE 7, 2007, THE SENATE ADOPTED AMENDMENT #1 AND PASSED SENATE BILL 1779, AS AMENDED.

AMENDMENT #1 rewrites this bill to require the municipal solid waste committee to develop by December 31, 2008, recommendations, using input from TSU and other stakeholders, in regard to as many of the following issues as possible:

(1) Finding a higher value use for materials in the waste stream than landfilling; and
(2) Reducing or eliminating from the landfills food waste, yard waste, household hazardous waste, chemicals, or other materials which decompose into a liquid or gas or which may increase the environmental hazards potentially created by landfills or leachate.
This amendment also authorizes the department to make a grant to TSU for this work.
The recommendations must:
(1) Determine how class IV construction and demolition waste can be ground, mulched, crushed, or disposed of on the construction site;
(2) Determine the nature, amount, and source of hazardous waste in the solid waste stream and the construction and demolition waste stream;
(3) Illustrate how to use the materials in the waste stream for business, as compost, or in other ways;
(4) Identify states which have clear and concise regulations implementing such practices;
(5) Determine the components of the municipal waste stream and the construction and demolition waste stream in Tennessee which can be composted, reused, recycled, or otherwise diverted from the landfills; and
(6) Determine methods by which waste can be diverted from landfills using transfer stations, drop-off points, composting facilities, or other means.

The recommendations of the advisory committee must be made available to the public, municipalities, counties, and businesses in the state and must be considered by the solid waste

000274

disposal control board for incorporation into the rules.

ON JUNE 12, 2007, THE HOUSE SUBSTITUTED SENATE BILL 1779 FOR HOUSE BILL 1345, ADOPTED AMENDMENTS #2 AND #3, AS AMENDED, AND PASSED SENATE BILL 1779, AS AMENDED.

AMENDMENT #2 rewrites this bill to require the municipal solid waste committee to develop by December 31, 2009, recommendations, using input from TSU and other stakeholders, in regard to as many of the following issues as possible:
(1) Finding a higher value use for materials in the waste stream than landfilling; and
(2) Reducing or eliminating from the landfills food waste, yard waste, household hazardous waste, chemicals, or other materials which decompose into a liquid or gas or which may increase the environmental hazards potentially created by landfills or leachate.
This amendment also authorizes the department to make a grant to TSU for this work.
The recommendations must:
(1) Determine how class IV construction and demolition waste can be ground, mulched, crushed, or disposed of on the construction site;
(2) Determine the nature, amount, and source of hazardous waste in the solid waste stream and the construction and demolition waste stream;
(3) Illustrate how to use the materials in the waste stream for business, as compost, or in other ways;
(4) Identify states which have clear and concise regulations implementing such practices;
(5) Determine the components of the municipal waste stream and the construction and demolition waste stream in Tennessee which can be composted, reused, recycled, or otherwise diverted from the landfills; and
(6) Determine methods by which waste can be diverted from landfills using transfer stations, drop-off points, composting facilities, or other means.
The recommendations of the advisory committee must be made available to the public, municipalities, counties, and businesses in the state and must be considered by the solid waste disposal control board for incorporation into the rules.

AMENDMENT #3, AS AMENDED, includes elimination or reduction of radioactive waste in the issues for which recommendations will be issued. This amendment also imposes a moratorium on waste from the bulk survey for release program being disposed in landfills in Rutherford County pending the results of the municipal solid waste advisory committee's recommendations.

ON JUNE 12, 2007, THE SENATE NON-CONCURRED IN HOUSE AMENDMENT #3.

ON JUNE 12, 2007, THE HOUSE LIFTED THE TABLING MOTION, RECONSIDERED ITS ACTION IN PASSING SENATE BILL 1779, WITHDREW AMENDMENT #3, ADOPTED AMENDMENT #4 AND REPASSED SENATE BILL 1779, AS AMENDED.

AMENDMENT #4 makes the same changes as those described for House Amendment #3, as amended, and requires that the advisory committee's recommendations be submitted no later than 60 days after July 5, 2007.

ON JUNE 12, 2007, THE SENATE CONCURRED IN HOUSE AMENDMENT #4.

Attachment 13

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION
Division of Solid Waste Management
5th Floor, L & C Tower
401 Church Street
Nashville, Tennessee 37243-1535
(615) 532-0780

PUBLIC NOTICE
OF
PUBLIC HEARING AND INTENT TO ISSUE PERMIT
FOR A SOLID WASTE DISPOSAL FACILITY

The Tennessee Department of Environment and Conservation, Division of Solid Waste Management (DSWM), will conduct a public hearing to receive comments on its tentative decision to issue a solid waste disposal facility major permit modification to BFI Waste Systems of Tennessee, LLC for construction, operation, closure, and post-closure care of a lateral expansion of the existing Middle Point Class I Landfill for the disposal of domestic wastes, commercial wastes, institutional wastes, municipal solid wastes, bulky wastes, landscaping and land clearing wastes, industrial wastes, construction/demolition wastes, farming wastes, shredded automotive tires, dead animals, and special wastes.

The hearing, which is being scheduled at the request of the applicant, will be held on **Thursday, January 5, 2006**, in the Auditorium of the Walter Hill Elementary School, 6309 Lebanon Road, Murfreesboro, TN 37219; telephone 615-893-8046. From 6:30 p.m. to 7:00 p.m. CST, citizens are invited to inspect and discuss the permit application, draft permit, fact sheet, plans, and other materials with the DSWM and with representatives of the applicant. There will be an opportunity for public comments to be recorded or written and submitted from 6:30 p.m. to 7:00 p.m. The formal hearing will begin at 7:00 p.m. The DSWM will explain its tentative decision to issue the permit, after which the applicant's representative will describe the proposed facility action/expansion. DSWM will then receive oral comments on the draft permit from the public. Please note that **in the event the school is closed due to inclement weather**, the hearing will be re-scheduled, and a public notice published fifteen (15) days prior to the re-scheduled date.

The facility, identified as SNL 75-0219, is located in Rutherford County at 750 East Jefferson Pike, Murfreesboro, Tennessee (latitude N 35°55'57" /longitude W 86°22'10"). The proposed expansion would result in 69.5 to be used for waste disposal. No hazardous wastes, as regulated by the Tennessee Hazardous Waste Management Act (Tennessee Code Annotated, Section 68-212-101, et. seq.) and the Rules adopted pursuant to the Act, shall be accepted for disposal at this facility. The official responsible for operation of the facility is Mr. Allen Phillips, General Manager, BFI Waste Systems of Tennessee LLC, dba Middle Point Landfill, 750 East Jefferson Pike, Murfreesboro, TN 37130; telephone: 615-896-2075.

Following an in-depth review of the application, DSWM has made a preliminary determination that this proposal meets the applicable requirements of Tennessee Rule Chapter 1200-1-7, Solid Waste Processing and Disposal. It is the present intent of DSWM, pending consideration of any contrary technical information received during the public comment period ending on **February 2, 2006**, that this permit be issued.

The public is also invited to submit comments in writing to: Mr. Mike Apple, Director, Division of Solid Waste Management, 5th Floor, L&C Tower, 401 Church Street, Nashville, TN 37243-1535; telephone: 615-532-0780. Comments must be received by 4:30 p.m. CST on **Thursday, February 2, 2006,** to assure consideration. If you wish to review the data for this proposal or obtain further information prior to the hearing, please contact the DSWM at the TDEC Nashville Environmental Field Office, 711 R.S. Gass Boulevard, Nashville, TN 37243; telephone: 615-687-7000. A copy of the data on this proposal may also be viewed at the Linebaugh Public Library, 105 West Vine Street, Murfreesboro, TN 37130-3673; telephone: 615-893-4131. After considering all public comments, the DSWM Director will issue a final permit decision and a Response to Comments, which can be viewed at the Linebaugh Public Library or at the DSWM Environmental Field Office in Nashville, Tennessee.

The Tennessee Department of Environment and Conservation is committed to the principles of equal opportunity, equal access, and affirmative action. Individuals with disabilities who wish to participate in these proceedings (or to review these filings) should contact the Tennessee Department of Environment and Conservation to discuss any auxiliary aids or services needed to facilitate such participation. Such contact may be in person, by writing, telephone, or other means, and should be made no less than ten days prior to the scheduled meeting date, or date such party intends to review such filings, to allow time to provide such aid or service. Contact the ADA Coordinator at 1-866-253-5827 for further information. Hearing impaired callers may use the Tennessee Relay Service, telephone: 1-800-848-0298.

Persons who wish to be on the Division of Solid Waste Management's mailing list should obtain a Mailing List Request form by calling or writing the Public Participation Officer, Division of Solid Waste Management, Tennessee Department of Environment and Conservation, 5th Floor, L & C Tower, 401 Church Street, Nashville TN 37243-1535, telephone: (615) 532-0798, email: solid.waste@state.tn.us.

NOTICE ISSUED December 20, 2005

0002772

From: Retha Ferrell <rethaearthheart@yahoo.com>
To: <joyce.dunlap@state.tn.us>
Date: 8/1/2007 9:00 AM
Subject: concerned resident of Hawkins County

Hi Joyce
The garbage business is BIG. Most people do not realize that the most precious real estate lies in the most contaminated area, the landfill.
Radioactive waste requires more secure handling and storage, (since there is no getting rid of it in the foreseeable future), than in ordinary household waste landfills. Our groundwater and food chains are contaminated from it, and since we are at the top, we humans get the most concentrated amounts.
Is no science allowed in government? That is how it seems to me. I am also disillusioned with the process of protest, but I still am writing to remind you that some people are still thinking for themselves and resisting the nonsense that is fed to them by government officials, garbage businesss, and the media.
Thank you
Retha Ferrell

From: "Classic, Kelly L." <classic.kelly@mayo.edu>
To: <joyce.dunlap@state.tn.us>
Date: 8/1/2007 9:31 AM
Subject: Tennessee BSFR Letter.doc
Attachments: Tennessee Landfill Issue Letter.doc

<<Tennessee Landfill Issue Letter.doc>> Ms. Dunlap,

Dr. Kevin Nelson, President of the Health Physics Society, would appreciate your assistance in providing this letter to the Municipal Solid Waste Advisory Committee as it relates to the BSFR issue.

If you have any questions, please feel free to contact me.

Kelly Classic
Media Liaison
Health Physics Society
507-284-4407

HEALTH PHYSICS SOCIETY

"Specialists in Radiation Safety"

July 31, 2007

Kevin Nelson, Ph.D.,
President

The State of Tennessee
Tennessee Department of Environment and Conservation
Muncipal Solid Waste Advisory Committee

Dear Committee Members:

The media in your area has reported several times on the issue of the Bulk Survey for Release program in Tennessee. As a non-profit, scientific, professional society dedicated to the promotion of radiation safety, the Health Physics Society[1] feels a need to respond to information that may mislead the public on issues that are a part of our organization's primary mission.

The media state such things as "pounds of radioactive wastes," "no amount is harmless," "low-level radioactive waste," and "Gross Alpha radiation in the leachate measured 82. The EPA standard for drinking water is 15. Gross Beta, the leachate, measures 3,395. This is 68 times higher than the maximum allowed in drinking water."

While we appreciate the need to get information out to the public quickly, the Health Physics Society is concerned with statements such as those listed that are misleading. Let me clarify:

> "Pounds of radioactive wastes": While the waste material overall may have weighed tons or millions of pounds, radiation is not measured that way and the amount of radioactivity cannot be assessed using terms such as this. This is a misleading statement such that the public may believe there is a million pounds of radiation (a statement that is nonsensical) rather than understanding that there is some radioactivity in the millions of pounds of waste.
>
> "No amount is harmless": If this were the case, with radiation in our bodies and in our environment, we would all be harmed whether or not there were other additional exposures. This statement stems from the linear no-threshold hypothesis that regulators use to set standards; it is not a statement of known fact. The Health Physics Society has stated that an acceptable level of exposure to a member of the public from all man made sources is 100 mrem/y (http://hps.org/documents/publicdose_ps005-3.pdf).
>
> "Low-level radioactive waste": There actually is a regulatory definition for low-level radioactive waste and it is waste that cannot be disposed into a landfill. Any wastes going to a landfill that might be contaminated with radioactive material must have levels of radiation below "low-level" criteria (a level at which the radioactivity is barely detectable, if at all). The Health Physics Society is in favor of a radiation level, below which, materials can be released from control; this level is 1 mrem/y (http://hps.org/documents/clearance_ps012-0.pdf). This is the level Tennessee uses for BSFR wastes.
>
> "Gross Alpha radiation in the leachate measured 82. The EPA standard for drinking water is 15. Gross Beta, the leachate, measures 3,395. This is 68 times higher than the maximum allowed in drinking water": We cannot tell whether these statements, with no radiation units, have merit. It is correct that

the gross alpha limit for water is 15 *pCi/L* and the gross beta limit for water is 4 millirem/y. The measurement of 82 and 3,395 (with no units) is confusing and really cannot be compared to the standard without some units on the numbers. The Tennessee Division of Radiological Health reports that, in their testings, there have been no readings above drinking water limits.

It is speculative, at best, to predict that health effects will occur or to predict the number of cancers from such low doses of radiation. The BSFR policy is such that a person, even if living on the site and growing food on the site, cannot receive more than 1 millirem in a year (roughly the equivalent of an hour's worth of natural background radiation dose). The risk of a harmful effect from this dose level is roughly equivalent to the risk of having a traffic accident driving 40 miles or getting cancer from smoking 1.4 cigarettes in your lifetime.

The Health Physics Society is in favor of waste disposal of radioactive materials that carry an extremely low, or no public risk in a manner consistent with nonradioactive chemical/biological waste that is based on its potential risk to public health and safety, not on its origin or legislative stature (http://hps.org/documents/lowlevelwaste_ps009-2.pdf).

It is important to assure that you and the public are provided with factual information. The committee and public should be aware of the potentially misleading statements in the media. The Health Physics Society is willing to assist you to ensure a balanced view of radiation protection issues and the potential health consequences of radiation exposure. Please contact me regarding this issue, or any issue involving radiological public health and safety.

Sincerely,



Kevin Nelson, Ph.D., President
Health Physics Society

[1]The Health Physics Society is a nonprofit scientific professional organization whose mission is excellence in the science and practice of radiation safety. Since its formation in 1956, the Society has grown to approximately 5,500 scientists, physicians, engineers, lawyers, and other professionals. Society activities include encouraging research in radiation science, developing standards, and disseminating radiation safety information. Society members are involved in understanding, evaluating, and controlling the potential risks from radiation relative to the benefits. The Society may be contacted at 1313 Dolley Madison Blvd., Suite 402, McLean, VA 22101; phone: 703-790-1745; fax: 703-790-2672; email: HPS@BurkInc.com. The Society's Media Liaison can be contacted at 507-284-4407 (office) or 507-254-8444 (cell); email: media@hps.org.

RECEIVED
AUG 15 2007
TENNESSEE DEPARTMENT OF ENVIRONMENT CONSERVATION

RESOLUTION 07-R-26 concerning landfill safety and Tennessee's Bulk Survey For Release Program.

WHEREAS, the City of Murfreesboro has become aware that waste regulated under Tennessee's Bulk Survey For Release ("BSFR") program has been placed in the Middle Point Landfill in Rutherford County; and,

WHEREAS, this information is of great concern to the City because the Middle Point Landfill is located upstream and in the vicinity of the raw water intake for the City's water treatment plant and because the leachate for the Middle Point Landfill is piped to, and treated in, the City's wastewater treatment plant; and,

WHEREAS, the short and long term implications of the BSFR program for the health and well-being of the City's residents and the City's water and wastewater systems is of high importance to the City Council; and,

WHEREAS, the adequacy and wisdom of the State's BSFR program and regulations are currently being reviewed by the Municipal Solid Waste Advisory Committee pursuant to Chapter 584 of the Public Acts of 2007 and may be the subject of rulemaking by the Solid Waste Disposal Control Board.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF MURFREESBORO, TENNESSEE, AS FOLLOWS:

SECTION 1. The State of Tennessee should continue the moratorium on placing BSFR waste in the Middle Point Landfill beyond the legislatively mandated date to ensure that all aspects of such program are thoroughly reviewed, analyzed, and explained to the residents of the City, County and State.

SECTION 2. The State of Tennessee should carefully review the existing BSFR regulations and if necessary modify them to ensure the long-term health of both persons and the waters and lands of the State. Health should be the paramount goal of such review. In the absence of clear, scientific evidence that the BSFR program, with or without modification, does not endanger public health, the placement of such waste in the Middle Point Landfill should cease.

SECTION 3. The City Recorder shall send copies of this Resolution to the Governor, the Commissioner for the Tennessee Department of Environment and Conservation, the Solid Waste Disposal Control Board, the Municipal Solid Waste Advisory Committee, the Rutherford County Delegation of the Tennessee General Assembly, the Rutherford County Mayor and Allied Waste Services.

SECTION 4. This Resolution shall be effective immediately upon its passage and adoption, the public welfare and the welfare of the City requiring it.

RECEIVED
AUG 08 2007
ENVIRONMENT AND CONSERVATION
COMMISSIONER'S OFFICE

Passed: August 2, 2007

Tommy Bragg, Mayor

ATTEST:

James B. Penner
City Recorder

APPROVED AS TO FORM:

Susan Emery McGannon
City Attorney

State of Tennessee)
: SS
Rutherford County)

I, the undersigned, **James B. Penner**, do hereby certify that I as the duly appointed City Recorder of the City of Murfreesboro, Rutherford County, Tennessee, and as such official I further certify that attached hereto is a true and correct copy of RESOLUTION 07-R-26 adopted by the City Council of said City at its meeting held on August 2, 2007.

IN WITNESS WHEREOF, I have hereunto subscribed by official signature and affixed the Corporate Seal of said City this 6th day of August, 2007.

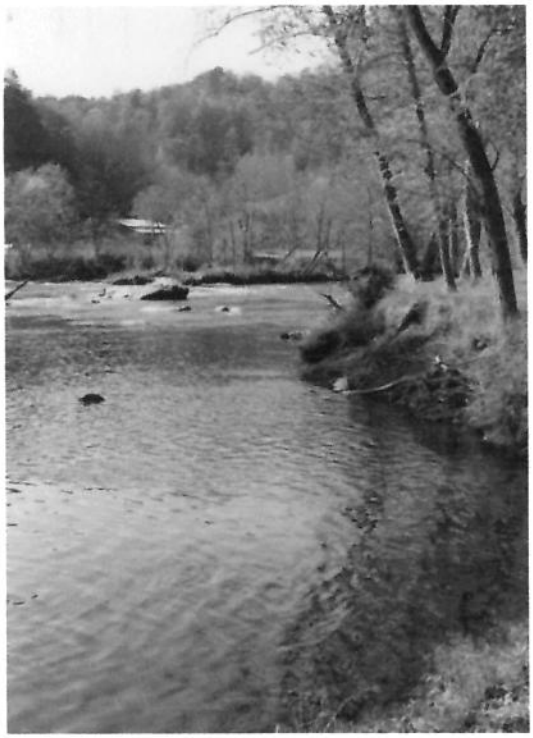
James B. Penner
City Recorder

(S E A L)

000284

RECEIVED
AUG 07 2007
TENNESSEE DEPARTMENT
OF ENVIRONMENT &
CONSERVATION

Questions and Comments To the Solid Waste Advisory Committee From Citizens to End Nuclear Dumping in TN



Without water, there is no life. Unlike garbage, chemicals and radioactivity are not easily seen in our waterways. Nevertheless, they kill fish, wildlife, and humans. Please help us to keep our state a beautiful, clean and healthy place to rear our children.

INTRODUCTION

To the Members of the Municipal Solid Waste Advisory Committee:

We would like to introduce ourselves. Our organization, Citizens to End Nuclear Dumping in Tennessee (or ENDIT) is based in Murfreesboro. The group organized after we learned that radioactive waste is being dumped in the Middle Point Landfill in Rutherford County, and also in four other landfills in Tennessee. Most of our members are parents, many of us mothers with young children; some of us are old parents with grandchildren. We are educated people, not nuclear scientists, but well enough educated to read and understand the problems associated with nuclear waste.

Our position is not simply one of "NOT IN MY BACKYARD". Because of the location of Middle Point Landfill on the Stones River, and because of the geology of the area, our position is: "Our backyard is one of the worst places in the country that you could have chosen to place hazardous or radioactive materials." Rutherford County is the home of a quarter of a million people and is growing at a rapid pace, and our drinking water supply is threatened. This poses a grave threat to our welfare.

Although our immediate concern is for our own county, we are also very much concerned about citizens throughout the state whose lives and health can be affected by the practice of using Tennessee as the dumping ground for low level radioactive or other hazardous materials. We are in the process of forming alliances with other environmental groups throughout the state, and we are circulating a petition which already has thousands of names and going strong. We plan to be around until this practice has ended.

As you ponder this topic, you should be aware that the Department of Energy is now holding hearings throughout the country in an attempt to raise the level of radioactive materials that can be considered "low-level." If we don't stop accepting this waste now, we will be getting worse waste in the future. It is time for the citizens of this country to realize that with more and more nuclear waste being produced every day, and with no good place to dispose of it, our health is more endangered by our weapons than by our enemies.

We have done extensive research on the topic in the short time that we have had to prepare this document, and we have put a great deal of time and thought into its composition. We hope that you will take the time to read it carefully and to consider our side of this argument, that you will recommend that the moratorium should be extended to the whole state and made permanent, and that the permit to expand Middle Point be rescinded because the people of Rutherford County were not fully briefed on what the expansion entailed

We would appreciate answers to our questions in writing.

Thank you,

Citizens to ENDIT

Kathleen Ferris, Co-founder
Patricia Sanders, Co-founder
David B. Hall, Treasurer

Attached to Ltr. from Dr. Marion Wells, biology professor, MTSU, to Judge James Threet & Dr. Robert Sanders, 18 April 1973.

000287

The limits of the Central Basin might best be defined as the base of the Chattanooga Shale along its periphery. In most places this rock unit marks a distinct topographic break, the slope of the Rim being noticeably steeper above its base.

From the standpoint of potential landfill sites, the Central Basin can be classified into several geologic-topographic areas—(1) rocks of the Stones River Group, which are the predominant units of the Inner Basin, (2) the Nashville-Maysville Groups and younger rocks of the Outer Basin, and (3) hills and ridges capped by the Fort Payne Formation.

Inner Basin

Rutherford County comprises the largest part of the Inner Basin, with Murfreesboro essentially at its center. The Inner Basin is less distinct to the southwest, but does extend into Bedford and Marshall Counties. It also extends northward to include a part of Wilson County. Most of the rocks in this area are classified in the Stones River Group, but there are some outliers of younger Ordovician rocks, mostly Nashville Group. The formation that underlies the largest area of the Inner Basin is the Ridley Limestone, which forms nearly level areas referred to as "Ridley flats." Other formations with wide areal extent are the Lebanon, which forms low hills, and the Carters Limestone, which underlies slightly steeper hilly terrain.

Areas underlain by rocks of the Stones River Group are probably the poorest in the State for landfill use. Upon weathering they typically develop a thin, clayey residuum. The Lebanon Limestone forms the thinnest soils; some areas of several acres have almost no soil cover. The thickly bedded Ridley, which immediately underlies the Lebanon, may develop as much as 10 feet of residuum, but the residuum is highly irregular in thickness and may contain large pinnacles of unweathered rock. Joint widening is also common in the Ridley, and sinkholes are prevalent throughout its outcrop area. Karst features are present in other Stones River rocks, and the Inner Basin area is generally characterized by a notable lack of surface drainage.

The Pierce and Murfreesboro Limestones, which underlie the Ridley, are restricted in outcrop to the river valleys and smaller stream beds.

The youngest unit of the Stones River Group, the Carters Limestone, consists of a thick-bedded Lower Member and a thin-bedded Upper Member. The Carters also weathers differentially, with cutter-pinnacle development common, and its residuum is characterized by a high clay content. The major outcrop areas of the Carters are along the outer edge of the Inner Basin and in inliers throughout much of the Outer Basin.

The only units of the Stones River Group that form significant thicknesses of residuum are the Carters and Ridley Limestones. However, the bedrock surface configuration of these formations is highly irregular and unpredictable. In many places there is no soil preserved, and bare rock covers large areas. Even the minimum of 5 feet of underlying residuum suggested for a landfill base would be difficult to find over any sizable area. Also, when wet, these soils are difficult to work because of their clay content. In addition, the water table in the Inner Basin is quite shallow in much of the Ridley belt, in some places only 25 to 30 feet. With the high degree of joint-plane enlargement and cavern development, such thin residuum is inadequate to filter leachate which can quickly move to the zone of saturation.

These factors lead to the conclusion that all Stones River rock units should be avoided for sanitary landfill sites, except for the construction of "fills" above Stones River residuum by the use of cover material brought into the area. This is discussed under the section *Transportation of Cover Material.*

Outer Basin

This area is predominantly underlain by rocks of the Nashville Group, and, to a lesser extent, the Maysville Group. Above these in some areas are thin units of the Richmond Group (Upper Ordovician) and Silurian and Devonian rocks. These younger units are preserved mostly along the northern and western periphery of the Basin, in some outliers within the Basin, and in inliers on the Western Rim; in general, they are not acceptable for landfill sites.

The formations of the Nashville Group, from oldest to youngest, are the Hermitage Formation, the Bigby-Cannon Limestone, and the Catheys Formation. In general, the Hermitage and Bigby-Cannon Formations crop out in large rolling and hilly areas within the Basin, and the Catheys Formation is restricted to the peripheral areas and to the higher outliers and hillier sections within the Basin. The Leipers Formation (Maysville Group), which overlies the Catheys is lithologically similar to it, and for convenience will be considered with it in this discussion. The Leipers is even more restricted to the edges of the Basin than the Catheys.

The Hermitage Formation is moderately well suited for landfill use. The Laminated Argillaceous Member, which comprises the majority of the formation, characteristically weathers to moderately deep, sandy, silty, clayey residuum which is fairly permeable. Some of the problems associated with use of the Hermitage are (1) the prevalence of cavern development in the underlying Carters and the subsequent collapse of Hermitage into sinkholes, and (2) the presence of enlarged joints which may contain cavities.

The overlying Bigby-Cannon Limestone is subdivided into three facies. The predominant lithology on the east side of the Basin is the dense, dark, medium- to thick-bedded Cannon limestone facies, which weathers to a relatively thin, clayey residuum. Also present is the Dove-colored limestone facies, which is also dense but much lighter in color. Areas underlain by these members generally are unacceptable for landfill sites because of thin residuum. Farther west in the Basin the predominant lithology is the medium- to thick-bedded, crossbedded phosphatic Bigby limestone facies, which comprises the entire formation on the western periphery of the Basin, the lowermost and uppermost zone of the formation slightly farther toward the axis of the dome, and an even smaller percentage of the formation near the axis. It is mined for phosphate at several localities in the Central

OUR CONCERNS ABOUT THE BSFR PROGRAM

- Why should Tennessee import low-level radioactive waste from throughout the USA? If it is safe, why is it necessary to ship it across country to us?

- TDEC has stated that it is common practice for other states to accept LLRW into municipal landfills. Why then is concrete and soil not deposited somewhere along the way between here and California, or Washington state, or Michigan or Connecticut? Are there no states willing to take it?

- How much economic benefit is there from the BSFR program? Who receives the benefit?

- Is the amount of money taken in by the state and county governments sufficient to put at risk the health and welfare of millions of Tennessee citizens?

- Is the main benefit of this program to the nuclear waste generators, to processors, and to landfill owners and operators? Should their interests take priority over the welfare of the citizens of Tennessee?

- We have learned that Tennessee gives several kinds of "FREE RELEASE" licenses, but only some are BSFR licenses. The other "free release" licenses remove nuclear materials from governmental control but the materials do not go to licensed landfills. Where do they go? To incinerators? To recyclers and then out for public consumption, without the knowledge of the consumer? To unlicensed landfills? Please be specific about the nature of those licenses.

- At the hearing in Murfreesboro on July 17, during the preliminary period for questions, Mike Apple told Kathleen Ferris, in the presence of Betsy Allgood, that no preliminary hearings were conducted in Rutherford County—or elsewhere—before the BSFR program was instituted. If we are mistaken in our understanding of Mr. Apple, we request that TDEC provide evidence of public hearings, their times and places, and evidence of advance notice given to the public.

- Who (by name and position) in the state government (TDEC) was responsible for signing off on the BSFR program? When precisely did the program begin? Who was governor at the time?

- Was any radioactive material dumped into Tennessee municipal landfills *before* the BSFR program was adopted? If so, from where and what and when?

- Is other "special waste" being dumped in Middle Point Landfill? Please give us a complete account of all other hazardous materials or chemicals or bio-hazardous waste that is being dumped there.

- After the BSFR program was adopted, what notification was given, in writing, to state legislators and local government officials in the communities most affected, that the state of Tennessee would be depositing radioactive waste in their municipal landfills? Our officials are telling us that they didn't know anything about it, so if they are not being candid with us, we would like evidence to that effect.

- In 2006, when hearings were held to consider the expansion of Middle Point Landfill, we understand that citizens were told that NO dumping of toxic waste would occur at the facility. Are we mistaken in assuming this to be true? Does TDEC have evidence that citizens <u>were</u> told about

the BSFR program and about low-level radioactive waste being dumped at Middle Point? Or of any other toxic waste being dumped there?

- The name of this program, Bulk Survey for Release, does not contain the word "radioactive" or "nuclear." Were those words purposely omitted so as not to garner public attention?

- Citizens to ENDIT asked TDEC for complete disclosure of the companies involved in generating radioactive waste that was being put in Middle Point Landfill. This included the originating source, the materials involved, and the measurement of radioactivity. In reply, Mr. Paul Sloan cited T.C.A. 68-202-217. This law states that information supplied to TDEC is defined as proprietary and is confidential. Why does Tennessee law protect the polluters instead of the people? Is TDEC helping the nuclear waste generators be excused from liability for the waste they generate?

- From its beginning, the BSFR program has been shrouded in secrecy. Why should information, even about firms long since closed, be considered proprietary? (For example, Quadrex and American Ecology Recycle Center.) The people of Rutherford County want to know what those companies processed and buried in Middle Point. How can we have confidence in our state government when such secrecy is practiced?

- Why does T.C.A. 68-202-217 supersede the Tennessee Open Records Law? What is so secretive that TDEC must protect it from public scrutiny with special laws? When records are marked "for official use only," as was the case when highly activated uranium was spilled in Erwin, TN, last year, the public realizes that something bad is being hidden.

- The first section of Tennessee's Sunshine Law, T.C.A. 8-44-101 (passed through the efforts of Rutherford County's distinguished representative, the late John Bragg) states:

> The general assembly hereby declares it to be the policy of this state that the formation of public policy and decisions is public business and shall not be conducted in secret.

Citizens to ENDIT believe that the entire BSFR program, from its inception until the sun shone on May 14, 2007, has been in violation of that law.

OUR CONCERNS ABOUT RADIATION

- TDEC has given repeated assurances that citizens of Rutherford County (and elsewhere in the state) will not be harmed by a miniscule dose of one millirem of radiation per year, and that we will receive no more than that amount from the BSFR program (even if our descendants become farmers and live on the dump). Because the Citizens to ENDIT have some knowledge about radiation, we reject these simplistic explanations.

- The measurement of a millirem is hypothetical, not measureable and verifiable. Furthermore, the computer formula by which that number was arrived at by the DOE, and paid for with taxpayers' dollars, is kept secret from the public. It has not been verified or validated. Does any person in TDEC or SWAC feel comfortable guaranteeing us that no person will receive more than one millirem of radiation per year? Would you stake your children's and grandchildren's lives on it? Can the state of Tennessee be certain that the private companies that are running this program will not exceed the limits set by the state, or try to evade them?

- The measurement of millirems is based on an estimate of the amount of radiation an adult male can absorb with little risk. The assumption is that each person is the same. Not true. Persons who have already been exposed to high levels of radiation (such as health care workers) might get cancer from just a little more. So might individuals with compromised immune systems. There is no known threshold. Young children, and especially unborn children, are at greater risk from low-level exposure to radiation, both for genetic damage and for cancer. Do you really want to add to this risk for the people of Tennessee? For the children of Tennessee?

- In 1972, a Canadian scientist Dr. Abram Petkau found in his research that the destructive efficiency of low-level radiation causes low-level exposure to result in damage to cells that is 1000 times worse than the damage caused by the same amount of radiation concentrated in a high level burst. From this discovery came what scientists call "the Petkau effect": that the amount of damage done by low-level exposure is dependent on the length of time living tissue spends in the radiation field, not on the relative radiation field strength. Does this fact not damage TDEC's model of the future farmer in Rutherford County living on Mt. Trashmore?

- TDEC would have us believe that naturally occurring radiation is all around us, and therefore it is safe. This is contradictory to what the National Academy of Sciences says in the BEIR VII report (2006) about the effects of ionizing (low-level) radiation:

  > A comprehensive review of the biology data led the committee to conclude that the risk would continue in a linear fashion at lower doses without a threshold and that the smallest dose has the potential to cause a small increase in risk to humans.

  Should SWAC accept the authority of the BEIR VII report, authored and reviewed by many of the nation's most distinguished scientists, who examine all available data objectively before reaching a conclusion, or of TDEC's hired scientists, whose jobs are at stake?

- Radiation from all sources, natural or man-made, ACCUMULATES in a person's body throughout a lifetime. We live in an area of the country where levels of radon gas are very high. Thus, we are already at risk for cancer from the radiation we take in from natural sources and from medical procedures. Why contribute further to the public's exposure to radiation by dumping man-made radioactive materials in our landfills?

- Another fact which TDEC has not taken into account is that radiation which is taken into the body through food or water or inhalation has far more damaging effects on living tissue than does radiation from an external source. Middle Point landfill is located just feet away from the Stones River, which provides the main source of drinking water for Rutherford County and which empties into Percy Priest Lake, also a major source of drinking water. [See Appendix A, photos showing proximity of landfill to river.]

- Who will clean up our water if it becomes contaminated? Will the city of Murfreesboro and the Consolidated Utility District receive monetary assistance from the state to upgrade our water treatment facilities so that radioactivity can be removed from our water?

- Geological studies of land under and around Middle Point show that the sub-strata of the area is limestone, honeycombed with caves and underground streams which will eventually carry the leachate from Middle Point not only into the river but also into ground water. Is it reasonable to add radioactivity to the problems of water pollution that we already face?

- The plastic liner of Middle Point Landfill has documented leaks. Have those leaks been repaired? Can they be repaired if they are buried under tons of garbage?

- Radioactivity has already been detected in leachate from the Middle Point landfill. How is the collected leachate treated? Is it sent to the sewage treatment facility? TCLP samples are not tested for radioactivity; therefore, isn't it possible that radioactive leachate may already have been processed through our water treatment facility without their or our knowledge?

- On the question of our leachate tests, I would like to quote an eminent environmentalist who has seen the results of those tests. Dan Hirsch is President of the Committee to Bridge the Gap, a Los Angeles-based public policy organization focused on nuclear questions, and he is the former Director of the Stevenson Program on Nuclear Policy at the University of California, Santa Cruz. This is his analysis of our tests:

  > Leachate from the Middle Point Landfill—one of those participating in the BSFR disposal program—measured 3395 picoCuries of gross beta radioactivity per liter of leachate, with an error margin of +/-286. . . . The standard Maximum Concentration Limit (MCL) in drinking water is 50pCi/L. By contrast, of fifty landfills sampled in California several years ago, none had gross beta levels in leachate anywhere approaching those levels. 42 of the 50 landfills tested in California had gross beta levels below the MCL. The highest value found for any of the 50 landfills in California was 450 pCi/L, *seven and a half times lower than the Middle Point Landfill leachate*. . . . [Italics mine. KF] (For his complete statement, see Appendix B.)

- One of the tests of Murfreesboro's drinking water has shown an elevated level of tritium, a radioactive isotope of hydrogen, which, if inhaled or ingested, is known to increase risk of cancer, birth defects, miscarriages and genetic abnormalities. According to the EPA website, "Its (tritium's) most significant use is as a component in the triggering mechanism in thermonuclear (fusion) weapons. Very large quantities of tritium are required for the maintenance of our nation's nuclear weapons capabilities."

- A letter from TDEC's laboratory in Lebanon to Murfreesboro's director of Water Quality Control states, "Note that the presence of tritium is becoming an issue of interest on the national level, thought to be due to the apparent disposal of tritium-containing self-luminous exit signs in municipal landfills, the leachate from which is commonly processed at waste water treatment

plants." One of TDEC's scientists at the July 5 meeting also stated that these signs are a source of radioactivity. Can TDEC prove that these signs are responsible for the tritium in our drinking water?

- Because Exit signs contain the radioactive substance tritium, it is a violation of the rules of the Nuclear Regulatory Commission to dispose of them in landfills. We want to know, how many such Exit signs have been disposed of in Middle Point Landfill? If these signs are indeed the source of tritium in our drinking water, why are they being disposed of illegally? If they are not the source, then are we getting debris from the nation's nuclear arms production? Whatever the sources of tritium in Middle Point, we want its dumping to cease.

- Is landfill gas being burned in flares at Middle Point to relieve pressure and prevent the possibility of an explosion? One problem with burning landfill gas is that it contains typically 40-60% methane, but it also includes other organic and inorganic compounds that get released into the atmosphere through combustion. Mercury and tritium are two non-organic substances that are not destroyed when burned. If tritium in the landfill is being burnt off at the landfill site, along with methane, then radioactive particles can become airborne. Possibly we are inhaling as well as ingesting tritium. Has the Green Switch program for collecting gas at Middle Point to produce energy ever been implemented? Has the air quality near Middle Point ever been tested?

- There is another problem of toxicity that could come from burning methane at the landfill. I will quote from a web source on this:

  > When halogenated chemicals (chemicals containing halogens—typically chlorine, fluorine, or bromine) are combusted in the presence of hydrocarbons [such as methane], they can recombine into *highly toxic compounds such as dioxins and furans, the most toxic chemicals ever studied.* [Italics mine.KF] Burning at high temperatures doesn't solve the problem as dioxins are formed at low temperatures and can be formed as the gases are cooling down after the combustion process. (www.energyjustice.net/1fg/)

  The only way to prevent this pollution is to remove toxic substances from the methane before it is burnt. Is this being done at Middle Point and other Tennessee municipal landfills?

- One of the "special waste" items that BSFR tells us is being placed in municipal landfills is called "ash." Is this ash the residue from incinerating radioactive materials in Oak Ridge? Is this ash from Oak Ridge being buried at Middle Point? At other municipal landfills in Tennessee?

- Dan Hirsch offers very good reasons why the BSFR practice--of using municipal landfills to store radioactive materials—should be ended:

  > There are many reasons for the general practice of putting radioactive waste in radioactive waste facilities and regular garbage in regular landfills: municipal landfills are not required to meet the siting, design, monitoring or operational requirements of licensed radioactive waste disposal facilities. . . . To give just two examples of reasons why: (1) The safety of disposal of radioactive materials is strongly influenced by the capacity of soil to retard migration of specific radionuclides. *Municipal garbage contains large amounts of organic complexing compounds that can dramatically increase the migration rates for radionuclides.*(2) Licensed radioactive waste disposal sites are required to conduct fairly extensive monitoring for radioactivity. Municipal landfills are not. [Italics mine. KF]

OUR CONCERNS ABOUT MONITORING

- We have been assured by TDEC that all radioactivity going into Middle Point Landfill is carefully monitored to keep the levels extremely low. Our question is, who does the monitoring?

- Does TDEC have anybody watching the processors, those private corporations bent on making money, as they separate out what is "safe" for us from what is not? Who monitors the processors? How? And how often? Is all monitoring done by reports, or are inspectors physically present?

- The second assurance TDEC has give us about the safety of Middle Point is the monitor placed at the gate of the landfill. Does a TDEC employee man that device, or is it manned by somebody employed by BFI? Who calibrates the monitor, and how often? Is this measuring done by BFI, a corporation with the reputation of being one of the worst polluters in the country?

- Citizens to ENDIT can think of many ways to fool such a monitoring device. The load of radioactive material is hauled in a truck with a metal body. This would block an accurate measurement, especially if it is lined with lead. How the material is placed in the truck, nearer to or further from the monitor, would determine how accurate the reading is. The speed of the truck through the monitoring area would affect the reading. Does TDEC ever physically inspect the trucks?

- What are the operating hours for Middle Point Landfill? When trucks enter the landfill during the middle of the night, as we know they do, who is monitoring? Or is the monitor turned off?

- Likewise for leachate samples, is BFI taking those samples? Where are they being taken? At how many sites? How often? What is being tested for? Are independent laboratories ever used to evaluate those samples? How frequently have these tests been performed over the last 10 years?

- The meters used for publicity (recently on televised news reports and newspapers) do not measure the radioactivity below the surface of the landfill. Furthermore, the meters must be held within inches of the material being tested and for an extended period of time. We question whether this is how the testing is being done at the Tennessee landfills receiving radioactive waste?

- At the July 17 meeting in Murfreesboro, an elderly gentleman who lives across from Middle Point Landfill told how before the May 14 broadcast by Demetria Kalodimos, he could not go out into his yard for more than a few minutes at a time because of the stench from the landfill. But after the news story, BFI covered up the garbage, and now he is able to enjoy going out into his yard. The waste is supposed to be covered immediately upon reception, but obviously this was not being done. Who was doing the inspecting?

CONCLUSION

In its opening section, the Tennessee Constitution states:

> That all power is inherent in the people, and all free governments are founded on their authority, and instituted for their peace, safety and happiness.

We ask that TDEC, the Solid Waste Advisory Committee and all branches of the government of Tennessee observe the state's Constitution.

APPENDIX A

Statement Regarding Disposal of Radioactive Wastes in Tennessee Municipal Landfills

by
Daniel Hirsch[1]
24 July 2007

A substantial policy issue is raised by the question of whether radioactive wastes should be disposed of in regular landfills neither designed nor licensed as radioactive waste disposal facilities. Radioactive wastes generally are restricted to disposal in special disposal sites constructed for that purpose and operating under nuclear licenses granted by the U.S. Nuclear Regulatory Commission (NRC) or Agreement States. Several times in past decades the NRC and/or the Environmental Protection Agency have proposed changing that policy and adopting a Below Regulatory Concern (BRC) Policy by which certain wastes could be disposed of in regular landfills. These proposals have not been adopted, or, when adopted by NRC, have been overturned by Congress – in part because of safety and environmental concerns. Occasional exceptions are permitted on a case-by-case basis, but the general policy remains in place: radioactive wastes should be disposed of in a radioactive waste disposal facility, not a regular landfill. Tennessee, however, has put in place its own BRC Policy, unbeknownst to much of the public; and controversy has now arisen with the revelation of the practice.

There are many reasons for the general practice of putting radioactive waste in radioactive waste facilities and regular garbage in regular landfills: municipal landfills are not required to meet the siting, design, monitoring or operational requirements of licensed radioactive waste disposal facilities. While one shouldn't overstate the protections afforded in a licensed radioactive site – I for one have been very critical of some of those requirements as insufficiently rigorous – one much prefers radioactive wastes to go to facilities designed to handle them. To give just two examples of reasons why: (1) The safety of disposal of radioactive materials is strongly influenced by the capacity of soil to retard migration of specific radionuclides. Municipal garbage contains large amounts of organic complexing compounds that can dramatically increase the migration rates for radionuclides. (2) Licensed radioactive waste disposal sites are required to conduct fairly extensive monitoring for radioactivity. Municipal landfills are not.

In response to concerns about revelations of disposal of radioactive wastes, some measurements of leachate at landfills have been recently made. These measurements are somewhat diversionary, as one already knows that radioactive wastes have been disposed of in the landfills part of the BSFR program; it is the propriety of that policy that should be the focus of attention.

Nonetheless, the data are interesting. Leachate from the Middle Point Landfill – one of those participating in the BSFR disposal program – measured 3395 picoCuries of gross beta radioactivity per liter of leachate, with an error margin of 286 (3395 +/- 286 pCi/L). The standard Maximum

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[1] Daniel Hirsch is President of the Committee to Bridge the Gap, a Los Angeles-based public policy organization focused on nuclear questions. He is the former Director of the Stevenson Program on Nuclear Policy at the University of California, Santa Cruz, where he will be a Lecturer in the fall teaching Introduction to Nuclear Policy. The views represented here are his own and do not necessarily represent those of either institution.

Concentration Limit (MCL) in drinking water is 50 pCi/L.[2] By contrast, of fifty landfills sampled in California several years ago, none had gross beta levels in leachate anywhere approaching those levels. 42 of the 50 landfills tested in California had gross beta levels below the MCL. The highest value found for any of the 50 landfills in California was 450 pCi/L, seven and a half times lower than the Middle Point Landfill leachate.[3] This is not dispositive, but nonetheless very interesting.

Regulators have pointed to potassium-40 as potentially responsible, given the large amounts of slag from Tennessee aluminum foundries disposed of as a special waste at the facility. And indeed, very high levels of potassium-40 are found at Middle Point, 2480 +/- 31 pCi/L, troubling in its own right. But there still remains about 915 pCi/L of gross beta activity that cannot be accounted for by focus on potassium-40 alone.

I have only briefly perused the additional measurements made of other landfills. The data are spotty, interesting but not fully conclusive. Very high error margins were generally reported, so the central value reported often has little meaning. A single sample is taken per landfill, when multiple samples, from different locations in the landfill, over a significant time period would be required to permit drawing conclusions that are statistically significant. But fundamentally, the idea of comparing some Tennessee landfills with others in the same state may not be all that useful, in that there is no indication that radioactive wastes have been excluded from any of the state's landfills. Some landfills may be part of the BSFR program (which primarily imports radioactive waste from out of state for "treatment" and then disposal in landfills within the state) while others aren't, but given the long presence of Department of Energy nuclear weapons facilities and TVA nuclear power facilities in the state, it is unclear which landfills have ended up over time receiving radioactive wastes.

My recommendation would be to focus on the future and address whether it is appropriate to continue permitting radioactive wastes to be disposed of in Tennessee landfills. In California, a moratorium has been in place for some years barring the disposal in municipal landfills of radioactive wastes from decommissioning nuclear and other radioactive facilities. It is up to those of you who live in Tennessee to determine if such a policy, or one a bit broader, is appropriate for your state.

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[2] If one exceeds the gross alpha or gross beta MCL, one is generally supposed to measure for specific radionuclides, which have their own individual MCLs.

[3] Note that the California landfills are not necessarily free of radioactive waste. The moratorium here is only a few years old. The California measurements were in fact triggered by reports that radioactive wastes had been disposed of in municipal landfills in the state.

Appendix B-- Middle Point Landfill



size & proximity to river



water treatment plant at bottom
edge of landfill on top



proximity of landfill (dark red in background)
to water treatment plant (foreground)
river snaking through trees in between

County to consider moratorium extension

DNJ staff reports 9/15/07 DNJ

The Rutherford County Commission will consider a resolution Thursday to extend a moratorium on the dumping of low-level radioactive materials at the Middle Point Landfill.

The moratorium, which was established by the General Assembly this summer to allow the Tennessee Solid Waste Advisory Committee time to study the state's Bulk Survey For Release program, is set to expire Sept. 3 — the same day the committee's report on the program is due.

The committee has been charged by the state Legislature to review the program.

The commission meets at 6 p.m. in the Rutherford County Courthouse.

Under the BSFR program, low-level radioactive materials have been dumped at the landfill since the 1990s. The landfill is on Jefferson Pike in the Walter Hill community.

Opposing the dumping would be nothing new for the commission. In early June, the commission unanimously passed a resolution calling for an end to all radioactive dumping at Middle Point.

The dumping of the materials was brought to the public's attention in May when the nuclear-watchdog organization Nuclear Information and Resource Service published a report critical of the Tennessee standards for the disposal of such waste. State officials have maintained the materials being disposed of under the program are safe for the public.

Some commissioners have expressed outrage they were not informed of the dumping earlier.

— Turner Hutchens, (615) 278-5161

Inside

■ TDEC meeting on dumping tomorrow, A4

RESOLUTION 07-R-26 concerning landfill safety and Tennessee's Bulk Survey For Release Program.

WHEREAS, the City of Murfreesboro has become aware that waste regulated under Tennessee's Bulk Survey For Release ("BSFR") program has been placed in the Middle Point Landfill in Rutherford County; and,

WHEREAS, this information is of great concern to the City because the Middle Point Landfill is located upstream and in the vicinity of the raw water intake for the City's water treatment plant and because the leachate for the Middle Point Landfill is piped to, and treated in, the City's wastewater treatment plant; and,

WHEREAS, the short and long term implications of the BSFR program for the health and well-being of the City's residents and the City's water and wastewater systems is of high importance to the City Council; and,

WHEREAS, the adequacy and wisdom of the State's BSFR program and regulations are currently being reviewed by the Municipal Solid Waste Advisory Committee pursuant to Chapter 584 of the Public Acts of 2007 and may be the subject of rulemaking by the Solid Waste Disposal Control Board.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF MURFREESBORO, TENNESSEE, AS FOLLOWS:

SECTION 1. The State of Tennessee should continue the moratorium on placing BSFR waste in the Middle Point Landfill beyond the legislatively mandated date to ensure that all aspects of such program are thoroughly reviewed, analyzed, and explained to the residents of the City, County and State.

SECTION 2. The State of Tennessee should carefully review the existing BSFR regulations and if necessary modify them to ensure the long-term health of both persons and the waters and lands of the State. Health should be the paramount goal of such review. In the absence of clear, scientific evidence that the BSFR program, with or without modification, does not endanger public health, the placement of such waste in the Middle Point Landfill should cease.

SECTION 3. The City Recorder shall send copies of this Resolution to the Governor, the Commissioner for the Tennessee Department of Environment and Conservation, the Solid Waste Disposal Control Board, the Municipal Solid Waste Advisory Committee, the Rutherford County Delegation of the Tennessee General Assembly, the Rutherford County Mayor and Allied Waste Services.

SECTION 4. This Resolution shall be effective immediately upon its passage and adoption, the public welfare and the welfare of the City requiring it.

Passed: August 2, 2007

Tommy Bragg, Mayor

ATTEST:

James B. Penner
City Recorder

APPROVED AS TO FORM:

Susan Emery McGannon
City Attorney

State of Tennessee)
: SS
Rutherford County)

I, the undersigned, **James B. Penner**, do hereby certify that I as the duly appointed City Recorder of the City of Murfreesboro, Rutherford County, Tennessee, and as such official I further certify that attached hereto is a true and correct copy of RESOLUTION 07-R-26 adopted by the City Council of said City at its meeting held on August 2, 2007.

IN WITNESS WHEREOF, I have hereunto subscribed by official signature and affixed the Corporate Seal of said City this 6th day of August, 2007.

James B. Penner
City Recorder

(SEAL)

TENNESSEE CHAMBER of Commerce & Industry

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Nashville, TN 37203-3742
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615-256-6726 Fax
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August 16, 2007

Chairman Graham and members
Solid Waste Advisory Committee

RE: Bulk Survey for Release Program at Middle Point Landfill in Rutherford County

I am Wayne Scharber, Vice President for Environmental Affairs, Tennessee Chamber of Commerce & Industry, Nashville, Tennessee. The Chamber is a trade organization, established in 1912 to represent manufacturers, industry, and businesses in this state. Most of our members have operations subject to environmental regulations and all are committed to compliance for the public's safety and protection of our environment. You were charged to review the BSRF program at the Middle Point Landfill in Rutherford County and make recommendations to the Commissioner and to the Legislature.

The Chamber, having attended the public hearings and reviewing the comments offered, would offer that the **"scientific based standards", as modified by the state to be more conservative in protection of the public's health and the environment, need to be upheld as there has been no basis of technical justification to change the standards.** Further, at most some administrative processes of more frequent and consistent reporting to the regulators could be considered and the regulatory agency could make such information available to interested public on the department's website. It is further my understanding that the Division of Radiological Health did propose some such changes earlier in the year and such have not been concluded at this time. There has been no documentation submitted to show that the protection standards for environment, workers, or the water supplies have been violated. Based upon the Department's staff efforts to show the relative safety and interpretations for the standards, the existing standards should prevail and the scheduled legislatively imposed moratorium included in Section 2(c) of Public Chapter 584 should be allowed to expire. I would also suggest to the Committee that consistent and prompt enforcement should be continued or modified as required by any administrative recommendations of the Committee to the Commissioner.

The Tennessee Divisions of Solid/Hazardous Waste Management and Radiological Health have implemented a most responsible program to assure regulation of this special waste (BSFR) in Tennessee and also to assure that Low Level Radiological Waste and any Mixed Waste (Radiological & Hazardous) is properly sent to legal disposal or treatment.

I appreciate the opportunity to present these comments in behalf of stakeholders operating and using services of landfills in this state. Thank you.