

**2009 Report to the Legislature**

on the

**State Nuclear Safety Inspector's Oversight Activities**

of the

**Independent Spent Fuel Storage Installation (ISFSI)**

at the

**Maine Yankee Site in Wiscasset, Maine**

*Prepared for*  
**Joint Standing Committee on  
Utilities and Energy**  
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## Executive Summary

The following report details the State Nuclear Safety Inspector's oversight activities performed at the Maine Yankee site and the Independent Spent Fuel Storage Installation (ISFSI) in Wiscasset.

The Maine Yankee plant was decommissioned over an eight year period from 1997 to 2005. Since the Department of Energy was unable to fulfill its contractual obligations to take the spent nuclear fuel, Maine Yankee was compelled to construct an Independent Spent Fuel Storage Installation (ISFSI) in Wiscasset to store the high level waste in casks until a national repository is available to dispose of the nuclear waste.

As part of the his oversight role of the high level waste stored at the ISFSI, the State Inspector performs the following

- Daily reviews of the operational and security reports from the on-site security staff,
- Environmental surveillance of the Maine Yankee environs to include fresh and saltwater monitoring, seaweed and air sampling, and field measurements of the local radiation levels,
- Participates in the annual Nuclear Regulatory Commission inspection of the facility,
- Participates in the ISFSI's annual emergency plan exercise,
- Radiological groundwater assessments of the old industrial complex and yearly quality assurance checks of Maine Yankee's analysis of the groundwater,
- Monthly reports to the legislature of his activities,
- Interfaces with various state agencies also performing oversight functions at the ISFSI,
- Participates in regional and national organizations involved in the Yucca Mountain project in Nevada,
- Researches websites to keep abreast of national developments on spent nuclear waste management.

The storage of the high level waste in Wiscasset is an important issue. With the Administration's recent position to withdraw the Department of Energy's license application before the Nuclear Regulatory Commission, effectively terminating the Yucca Mountain repository, the high level waste stored in Wiscasset may be there for 100 years, as per the Nuclear Regulatory Commission's 2009 proposed waste confidence rule, or, as some fear, potentially indefinitely.

## **1.0 Introduction**

### **1.1 Historical Perspective**

The State had one nuclear power plant, called the Maine Yankee Atomic Power plant, and it was located in Wiscasset, Maine. It operated from the fall of 1972 to December 1996. The Maine Yankee Plant was initially rated at about 825 megawatts electric or 2440 megawatts thermal and by the end of its life Maine Yankee plant was producing slightly over 900 megawatts electric.

At the time of its last shutdown in December 1996 the plant owners were facing some major issues, principally cable separation and the aftermath of the Nuclear Regulatory Commission's (NRC) Independent Safety Assessment Team (ISAT) findings pertaining to plant safety systems. The State was a participant in the ISAT process. In 1997 the plant owners decided that the likelihood of the nuclear plant operating at a profit was non-existent in light of Maine's electric restructuring act passed that same year. With the availability of cheaper power from Canada, the plant was no longer considered economically viable. In May 1997 Maine Yankee announced that it would either sell or close the plant if there were no buyers. Even though there was a serious assessment performed by Philadelphia Electric Company to purchase the Maine Yankee plant, in July 1997 both parties could not come to an agreement and in August 1997 the Board of Directors voted to shutdown the plant permanently and commence the immediate dismantlement of the nuclear facility. The planning process for the site's decommissioning began shortly after the official closure and the decommissioning lasted eight years.

When the Nuclear Waste Policy Act (NWPA) was enacted in 1982, Congress assumed that a national repository would be available by 1998 for the disposal of the spent fuel. The NWPA mandated the Department of Energy (DOE) to take title and possession of the nation's spent nuclear fuel in 1998. Since the high level waste repository at Yucca Mountain in Nevada had experienced significant licensing and construction delays, DOE was unable to take title and possession of the nation's spent fuel and consequently breached its legal contracts with all the nation's nuclear power plants.

Early during the decommissioning it became evident that at DOE's current pace the Yucca Mountain repository would not open at its then projected start date of 2010. DOE's inaction prompted Maine Yankee to construct an Independent Spent Fuel Storage Installation (ISFSI) during decommissioning to store the 1434 spent fuel assemblies that were previously housed in the spent fuel pool in the plant, into 60 storage casks on-site. Another four casks contain some of the more radioactive components of the reactor internals that were cut up during decommissioning, since their radioactive concentrations were too high to dispose at a low level radioactive waste facility. These are expected to be shipped along with the spent fuel to the Yucca Mountain site should the repository open.

Although President Bush recommended to Congress and Congress approved the Yucca facility as the nation's federal repository for spent nuclear fuel in 2002, the DOE did not submit a license application until June of 2008, which was accepted for review by the NRC in September of 2008. Since then, the Obama Administration and the new Energy Secretary, Dr. Chu, have advocated for the termination of the Yucca Mountain site as it was no longer considered a viable option for disposing of the nation's high level waste and spent nuclear fuel. Energy Secretary Chu has assembled a Blue Ribbon Commission of experts to review alternative strategies for managing these waste forms. In the meantime all the spent fuel will remain at their present storage locations until a new management strategy is devised and implemented.

## 1.2 Law

With the spent fuel at Maine Yankee likely to be stored in Wiscasset for decades to come, in March of 2008, in the second regular session of the 123<sup>rd</sup> Legislature, the Legislature enacted and the Governor signed into law the establishment of the State Nuclear Safety Inspector Office within the Department of Health and Human Services to provide independent oversight of the Maine Yankee ISFSI. The law also mandated that an Oversight Group, comprised of various state agencies, Maine Yankee and an independent expert in radiological and nuclear engineering, meet on a quarterly basis to discuss the protection of public health and safety at the ISFSI site and be involved in national activities that would hasten the timely removal of the spent nuclear fuel from the site. The law went into effect June 29, 2008.

The following sections contain the State Nuclear Safety Inspector's activities for the 2009 calendar year under certain broad categories covering the ISFSI, environmental surveillance around the Maine Yankee site, remaining pieces of the State's decommissioning efforts, on-going groundwater monitoring program, regional and national activities, and newsworthy items on the national repository situation.

## 2.0 State Nuclear Safety Inspector Activities

### 2.1 Independent Spent Fuel Storage Installation (ISFSI)

#### 2.1.1 Annual Inspection

On May 18<sup>th</sup> the Nuclear Regulatory Commission (NRC) performed a security inspection of the ISFSI. Since the NRC inspection also involved two other decommissioned plants in New England, Connecticut Yankee and Yankee Rowe in Massachusetts, an exit briefing would be conducted at some later date. The NRC had a four person team of security specialists from headquarters in Rockville, Maryland perform security inspections at the three decommissioned Yankee plants in New England that have an ISFSI. On June 23<sup>rd</sup> the NRC conducted a conference call on the security debriefing of the three stand alone Yankee plants. On August 4<sup>th</sup> the NRC issued their inspection report which related there were no findings or violations.

#### 2.1.2 Annual Emergency Plan Drill

On an annual basis Maine Yankee is required to perform an emergency plan drill, a radiological drill, a medical drill and a fire drill.

On June 10<sup>th</sup> Maine Yankee conducted its annual fire and medical drill. Since this was a mutual aid drill, it included the Wiscasset fire and ambulance crews and the departments of Westport and Woolwich. The drill involved a structure fire in the ISFSI building which required evacuation of the building. There was a simulated injury to a firefighter during the drill. A post drill critique indicated that all participants performed extremely well, and all drill objectives were achieved. After completion of the drill and critique, participants took a familiarization tour of the facility.

On October 14<sup>th</sup> Maine Yankee conducted its annual emergency plan training to state officials at the Maine Emergency Management Agency in preparation for its annual emergency exercise. The overview consisted of the site's status and spent fuel considerations, emergency classifications, activation of the Maine Yankee emergency response organization, functions performed at the ISFSI control center, and the offsite interface with appropriate local, state and federal organizations.

On October 28<sup>th</sup> Maine Yankee conducted its annual mandated emergency exercise. The Maine State Police and the State Nuclear Safety Inspector participated in the exercise. The exercise scenario focused on an earthquake moving and causing hairline crack on one of the concrete casks that resulted in a very slight increase in background radiation levels towards the Back River. The drill lasted two hours.

### 2.1.3 Daily ISFSI Operations Pass-Ons

The on-shift Security Supervisor forwards the ISFSI Pass-On, essentially three times daily, to the State Inspector. The Pass-On provides an overview per shift of the ISFSI status, the cask monitoring status, procedures/surveillances/work in progress, equipment out of service, alarm issues, and team information. It is from these daily reports that the information on condition reports, fire or security related impairments, security event logs and spurious alarms are disclosed in the State Inspector's monthly reports to the Legislature.

### 2.1.4 Maine Yankee Reports to the NRC

In January Maine Yankee submitted its revised Defueling Safety Analysis Report (DSAR) to the NRC. The DSAR is the principal licensing document describing the applicable equipment, structures, systems, operational constraints and practices, and accident analyses important to the ISFSI.

In February Maine Yankee submitted Revision 5 to their License Termination Plan (LTP) to the NRC. Of the nine chapters in the LTP two had revisions. Chapter 1 had changes related to previous correspondence and provided a listing of the revision history for all the chapters and Attachments within the LTP. Chapter 4 revisions were made according to 10 CFR 50.59 process. The NRC 50.59 process allows a licensee to make certain changes to their license without prior NRC approval provided the changes do not result in an un-reviewed safety question, a reduction in safety margin or an increase in the frequency of a previously evaluated accident. The revisions under Chapter 4 deleted Attachment 4C on "Remediation Survey – Gamma Scan" and their associated references.

In March Maine Yankee submitted to the NRC its 2008 Annual Radiological Environmental Operating and Radioactive Release Effluent Release Reports, its annual Decommissioning Fund Assurance Status Report, and its Individual Monitoring Report. The Environmental Operating Report summarizes the direct radiation results of nine thermoluminescent dosimeters (TLDs) locations situated within a 288 meter (about 945 feet) ring from the center of the ISFSI. The maximum calculated dose from the ISFSI was 1.7 mrem. This compares to an average background within the United States of about 300 mrems. Since the mud flats in Bailey Cove are the closest region used by the public and that region is further away than the highest TLD location, then the dose to a member of the public would be much lower than the calculated 1.7. The Effluent Release Report summarizes the radioactive gaseous and liquid effluents for each calendar quarter. There were no gaseous or liquid releases in 2008. In addition, the report also mentioned that there were no radioactive waste shipments in 2008. The Decommissioning Fund Report noted that the Site-Specific Cost Estimate would be \$123.9 million with \$110.6 million projected for long term operations of the ISFSI through 2023. The market value of the trust fund at the end of 2008 was \$90.8 million. The Individual Monitoring Report provides information on the radiation doses for each individual monitored at the ISFSI.

In September Maine Yankee submitted its annual Special Nuclear Material (SNM) Report to the NRC for the period ending July 28, 2009. The report represents the material accountability for fissionable material, such as Uranium-235 and Plutonium-239 on US Government owned or non-US owned nuclear fuel between beginning and ending inventories, radioactive decay differences,

if any, and receipts of or removals of SNM. The report also includes source material such as natural Uranium and Thorium.

### 2.1.5 Security Plan

In February Maine Yankee submitted to the NRC modifications to its ISFSI Security Plan. Since the submittal is Safeguards Information, the information is classified and, therefore, not available for public disclosure. Later in the month Maine Yankee submitted as part of its ISFSI Security Plan, its Memorandum of Understanding (MOU) with three local law enforcement agencies (State Police, Lincoln County Sheriff Department, and Wiscasset Police Department). Since the MOU's contain Safeguards Information, their contents can not be disclosed to the public.

In April the U.S. Nuclear Regulatory Commission (NRC) forwarded a letter to Maine Yankee stating that they had reviewed their "proposed revision to the physical security plan, and determined that no physical security changes were made, and, therefore, the proposed changes would not decrease the effectiveness of the plan." Furthermore, Maine Yankee was required to submit a report to the NRC of the security changes within two months of their implementation. In September Maine Yankee submitted in response to the NRC's April directive, its physical security plan for the ISFSI. The submittal was in response to a complete reformatting of the Plan.

In December Maine Yankee submitted a proposed amendment to their Physical Security Plan and an exemption request from NRC Regulations. Since the proposed amendment contains safeguards information, disclosure of its contents to the public is not permitted. The exemption request is to remove the central alarm station from within the protected area. The exemption would be comparable to those already approved for stand alone ISFSI's, such as Yankee Rowe in Massachusetts and Connecticut Yankee.

### 2.1.6 Interface with Other State Agencies

As part of the legislation's mandate, on a quarterly basis, the State Inspector and the Manager of the Radiation Control Program, met with State Police, the Public Advocate and the Department of Environmental Protection to discuss oversight activities at the ISFSI. Maine Yankee also participated in this process. The quarterly meeting dates were January 3<sup>rd</sup>, April 14<sup>th</sup>, July 8<sup>th</sup> and October 13<sup>th</sup>. At the meetings Maine Yankee provided a status of their activities followed by the State Inspector's update of his past, current and planned near term activities. Discussions have also centered on the Group's annual and financial reports to the Legislature, national and congressional efforts on spent fuel waste management, especially centralized interim storage at some away facility outside of New England as opposed to on-site storage, groundwater monitoring and its costs, the Federal Energy Regulatory Commission rate case settlement cases pending before the federal Appeals Courts, and environmental surveillance.

### 2.1.7 ISFSI Topics

#### 2.1.7.1 ISFSI Status

The status of the ISFSI from January to December was normal, except for the snowstorms on January 17<sup>th</sup>, January 28<sup>th</sup>, February 22<sup>nd</sup>, March 2<sup>nd</sup>, December 9<sup>th</sup>, and December 19<sup>th</sup>. The December 9<sup>th</sup> snowstorm also included high winds. Additional measures were put in place for each snowstorm and were terminated once the storms passed. As part of its operational constraints after a snow event, the vent screens for the concrete casks need to be inspected daily for blockage. The venting is necessary to ensure that the cooling of the cask internals is maintained.

#### 2.1.7.2 Security Related Events/Impairments

There were no security related impairments for 2009. There were 51 spurious alarms during this time frame due to environmental conditions. In all instances the alarms were investigated and no further actions were warranted. There were 108 security events logged over the course of the year of which 90 were related to environmental conditions. Of the 18, eight included on-going maintenance activities with the remaining issues involving incomplete testing of security alarms, personnel error, momentary power loss, a failed sensor, a momentary computer problem, and hardware issues.

There were a couple of instances that prompted follow-up action from the Local Law Enforcement Agency. On May 6<sup>th</sup> two suspicious vehicles stopped at the site gate. The Wiscasset police were called, but the vehicles departed before the police arrived. On July 29<sup>th</sup> a suspicious vehicle was observed. An individual approached the site gate, spoke remotely with a security officer and then departed. The local law enforcement agency responded, but was not able to locate the vehicle.

#### 2.1.7.3 Fire Related Events/Impairments

There were two fire related impairments reported in 2009. The first occurred on May 19<sup>th</sup> and was due to an inner door of the ISFSI document vault not fully closing and latching properly. Security checks were performed each shift until the impairment was resolved on May 21<sup>st</sup>. The second was due to 60 boxes of paper records being returned to Maine Yankee from a records storage facility. The impairment had no impact on the Site's Security Plan. Fire safety checks were performed twice per shift. The fire impairment was discontinued on July 29<sup>th</sup> after all the records were scanned, shredded and disposed of.

#### 2.1.7.4 Condition Reports

There were 59 condition reports written in 2009. A condition report (CR) is a report that promptly alerts management to potential conditions that may be adverse to quality or safety. The report is generally initiated by a worker at the ISFSI facility. The report prompts management to activate a process to identify causal factors and document corrective and preventative measures stemming from the initial report. The majority of the CR's are administrative in nature. Examples of some CR's written ranged from a supervisor not signing the log sheet in the right place to using a regular bolt instead of a shear bolt for a snow blower to a bucket loader hitting a fence post to errors in documentation to damage of a tail light on a pickup truck to personnel error causing a power supply to be turned off to minor spills of a few ounces to a few cups of diesel oil to problems with a computer server to tracking open items from the review of the fire protection system to e-mail information inappropriately sent to the State Inspector to a disconnected sewer alarm light to a new fire extinguisher missing its surveillance to a transposition error in recording temperature logs to a vendor security firm not following their own protocols.

#### 2.1.7.5 Other ISFSI Related Activities

As part of the NRC's regulations, in September the State Inspector received his annual site access and security training, including safeguards training, to maintain his security badge and personal radiation monitoring status. Also in September Maine Yankee provided comments to the Riverbank Power Corporation from Toronto, Canada, on its proposed underground riverbank project, north of the ISFSI. Maine Yankee's comments focused on the potential effects that blasting and excavation could have on the ISFSI, the electrical grid, the groundwater flow and sampling program, and potential security issues.

## 2.2 Environmental

### 2.2.1 Radiological Environmental Monitoring Program (REMP) Description and Historical Perspective

Since 1970 the State has maintained an independent, radiological environmental monitoring program of the environs around Maine Yankee. Over the years there was an extensive quarterly sampling and analysis program that included such media as salt and fresh water, milk, crabs, lobsters, fish, fruits, vegetables, and air. Since the decommissioning the State's program has been reduced twice to accommodate decreased revenues for sample analyses at the State's Health and Environmental Testing Laboratory (HETL). Besides the media sampling, over the years the State has maintained a robust thermoluminescent dosimeter<sup>1</sup> (TLD) program to measure the radiation environment. The TLDs were placed within a 10 to 20 mile radius of the plant to measure the background radiation levels and later, when the plant was operating, any potential increases in background levels due to plant operations. Over time the number of TLDs nearly doubled to address public concerns over the clam flats in Bailey Cove and the construction of the ISFSI. After the plant's decommissioning the State reduced the number of TLDs around Bailey Cove, but maintained the same number for the environmental surveillance of the ISFSI. A further evaluation of whether or not to reduce the scope of the State's radiological environmental monitoring program was planned for the fall of 2009, but was later deferred until the spring of 2010.

### 2.2.2 REMP Media Results

Presently, the State monitors one freshwater location, one saltwater and seaweed location, and one air sample location. The State maintains a quarterly sampling regimen, except for the air sample, which is performed bi-weekly near the old Bailey Farm House. Table 1 on the next page shows the quarterly sampling results for the year.

The Health and Environmental Testing Laboratory (HETL) analyzes the samples and employs various analytical methods to measure particular radioactive elements. Except for Iodine-131 (I-131), all the positive results reported highlight naturally occurring background levels and ranges. There are some seasonal variations, but these would be difficult to point out with only four data points. When additional surveillance results become available the data will be plotted in next year's annual report to illustrate the trends.

The Iodine-131 that was found does not originate from Maine Yankee. With a half life of about 8 days, any I-131 with an inventory of one billion curies would have decayed or disappeared in about a year and a half after the plant shutdown, or about July of 1998. The source is most likely from the Wiscasset Municipal Waste Treatment System. Patients at nearby hospitals are sometimes injected with radioactive Iodine for thyroid scans or uptakes. When the patients return home and eliminate wastes, the waste water containing the I-131 is channeled to their local wastewater treatment plant. The treated water is then discharged into the bay and the I-131 is eventually picked up by the seaweed. Seaweed is a very efficient bio-accumulator for numerous elements and therefore, a good indicator of environmental contaminants.

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<sup>1</sup> Thermoluminescent dosimeters (TLD) are very small plastic-like phosphors or crystals that are placed in a small plastic cage and mounted on trees, posts, etc. to absorb any radiation that impinges on the material. Special readers are then used to heat the plastic to release the energy that was stored when the radiation was absorbed by the plastic. The energy released is in the form of invisible light and that light is counted by the TLD reader. The intensity of the light emitted from the crystals is directly proportional to the amount of radiation that the TLD phosphor was exposed to.

Table 1 – REMP Media Results

Media Type	Positive Results	Quarterly Sampling Period			
		1 <sup>st</sup> Quarter	2 <sup>nd</sup> Quarter	3 <sup>rd</sup> Quarter	4 <sup>th</sup> Quarter
<u>Freshwater*</u>	Gross Beta <sup>(2)</sup>	1.09	1.06	2.46	0.71
	Tritium (or H-3)	BIDC**	BIDC	BIDC	158
<u>Seawater</u>	Tritium (H-3)	BIDC	149	90.0	187
	Potassium-40 (K-40)	90.2	159	194	172
<u>Seaweed***</u>	Beryllium-7 (Be-7)	136	69.6	52.5	195
	Potassium-40 (K-40)	4,150	5,230	5,030	4,470
	Iodine-131 (I-131)	BIDC	46.1	BIDC	BIDC

\* The concentration units for fresh or sea water is pCi/L<sup>(3)</sup>

\*\* BIDC = Below Instrument's Detection Capability

\*\*\* The concentration units for seaweed is pCi/kg<sup>(4)</sup>

Tritium (Hydrogen-3 or H-3) and Beryllium-7 (Be-7) are both naturally occurring “cosmogenic” radioactive elements, which mean they are continuously being produced by cosmic-ray interactions in the atmosphere. Be-7 is produced from the high-energy cosmic rays bombarding the oxygen, carbon and nitrogen molecules in the atmosphere. Besides being naturally produced, Tritium is also a man-made element as it is a by product of the fission and neutron activation processes in nuclear power plants.

Since Potassium-40 (K-40) has such a long half life, approximately 1.3 billion years, it is a “primordial” radioactive element, which means it has survived in detectable quantities in the earth's crust since the formation of the earth. Generally speaking K-40 is not normally found in freshwater, but it is readily detected in saltwater due to minerals being washed into streams and rivers and ultimately emptying into the ocean.

<sup>2</sup> Gross Beta is a simple screening technique employed to measure the total number of beta particles emanating from a potentially radioactive sample, with higher values usually indicating that the sample contains natural and/or man-made radioactive elements. High values would prompt further analyses to identify the radioactive species. A beta is a negatively charged particle that is emitted from the nucleus of an atom with a mass equal to that of an orbiting electron.

<sup>3</sup> A pCi/L is an acronym for a pico-curie per liter, which is a concentration unit that defines how much radioactivity is present in a unit volume, such as a liter. A curie, named after its discoverers Pierre and Marie Curie, is defined as the rate at which a radioactive element transforms itself into another element that is most often another radioactive element. It is mathematically equivalent to 37 billion disintegrations or transformations per second. A “pico” is a scientific prefix for an exponential term that is equivalent to one trillionth (1/1,000,000,000,000). Consequently, a picocurie is a very small unit of radioactivity that equates to only 2.22 disintegrations or transformations per minute.

<sup>4</sup> A pCi/kg is an acronym for a pico-curie per kilogram, which is a concentration unit that defines how much radioactivity is present in a unit mass, such as a kilogram.

### 2.2.3 Air Sample Results

The State has had an environmental air sampler at the old Bailey Point Farm House since 1970. It is one of the few state environmental locations that are still in existence at its original location. The sampler has operated on a weekly basis from the days before Maine Yankee through its operating days through the decommissioning and then biweekly thereafter until recently. On December 30<sup>th</sup> the State's air sampler at the Old Bailey Farm House at the Maine Yankee site was permanently discontinued. Power to the air sampler required an underground electrical conduit to meet OSHA standards to eliminate a safety hazard. In reviewing the historical air data information and taking into account the leak tightness of the spent fuel casks, it was determined that there was no technical basis to continue the air monitoring location. The air sampling location was in operation for 39 years.

Besides the bi-weekly gross beta analysis a quarterly composite of the air filters is evaluated for the gamma energy fingerprints of most radioactive elements. The bi-weekly and quarterly analyses and their results are listed in Table 2 below.

Table 2 – Air Sample Results

Media Type	Positive Results	Quarterly Sampling Period			
		1 <sup>st</sup> Quarter	2 <sup>nd</sup> Quarter	3 <sup>rd</sup> Quarter	4 <sup>th</sup> Quarter
Air Filters*	Gross Beta (range)	17.8 - 40.2	8.6 - 26.2	11.7 – 39.7	17.4 - 29.1
	Quarterly Composite (Be-7)	93.5	95.7	92.1	64.4
Air Filters (Control)	Gross Beta (range)	OOS**	10.3 - 29.3	11.9 – 38.0	15.3 - 26.1
	Quarterly Composite (Be-7)	OOS	88.7	81.2	64.1

\* The concentration for the air filters is fCi/m<sup>3</sup> <sup>(5)</sup>.  
 \*\* OOS = out of service

The gross beta values reported are comparable to the historical values seen at Maine Yankee and at the control station on the roof of the Health and Environmental Testing Laboratory (HETL). Except for the first quarter when the air sampling unit on the roof of HETL was shut down for repairs, the values between the control station and the Maine Yankee site are very comparable. As previously mentioned the Be-7 identified is a cosmogenic element that is naturally radioactive.

### 2.2.4 Thermoluminescent Dosimeters (TLDs)

As outlined in the historical context and as part of its independent oversight, the State had a TLD program to measure the quarterly ambient radiation levels over the years at Maine Yankee, both in the proximity of the power plant and at various locations within a 10 to 20 mile radius from the plant. At present the State's TLD program is focused on two areas - the ISFSI and Bailey Cove.

<sup>5</sup> A fCi/m<sup>3</sup> is an acronym for a femto-curie per cubic meter, which is a concentration unit that defines how much radioactivity is present in a particular air volume, such as a cubic meter. A "femto" is a scientific prefix for an exponential term that is equivalent to one trillionth (1/1,000,000,000,000,000). A femto-curie is an extremely small quantity of radioactivity that is equivalent to about 3.2 disintegrations or transformations per day.

#### 2.2.4.1 Bailey Cove TLDs

The Bailey Cove surveillance is a remnant of the operating days when the public had raised questions over the radiation levels in the Cove and its impact on clam and worm diggers from the extended shutdown due to the steam generator sleeving project in 1995. The number of TLD locations was reduced in January of 2008 from the initial 40 that covered both sides of Bailey Cove down to 14. The TLD results for Bailey Cove for 2009 are illustrated in Table 3. To acquire statistical weighting for each location two TLDs are placed at each location. Each TLD has three plastic-like phosphors. The average represents the mean of the six element phosphors that capture the radiation and the range depicts the low and high values of the six crystals.

There is good agreement with the individual elements of the TLDs for all four quarters with a noticeable increase in variability in the spring and summer, as evidenced by the larger spreads in some of the ranges. With the advent of fall and winter there was, as expected, a slight decrease in the results due to frozen and/or snow cover conditions inhibiting the out gassing of the natural Radon gas. Normally the background values on the coast of Maine range from 13 to 25, with the lower values indicative of their proximity to the water, especially at high tide.

Table 3 – Bailey Cove TLD Results

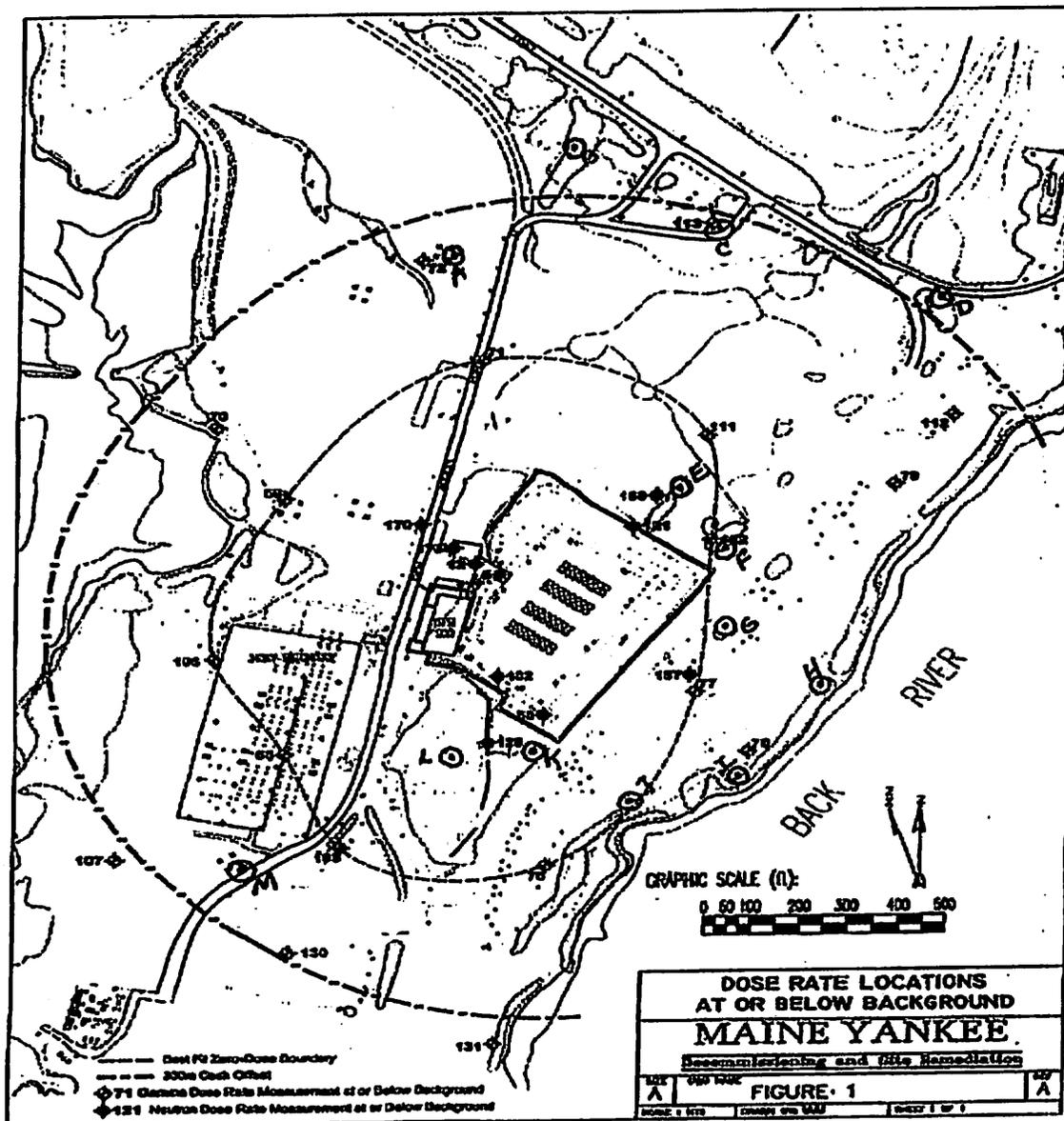
TLD Stations	Quarterly Exposure Period			
	1 <sup>st</sup> Quarter (Winter) Average (Range) (mrem) <sup>6</sup>	2 <sup>nd</sup> Quarter (Spring) Average (Range) (mrem)	3 <sup>rd</sup> Quarter (Summer) Average (Range) (mrem)	4 <sup>th</sup> Quarter (Fall) Average (Range) (mrem)
1	22.8 (22-24)	28.7 (28-30)	29.8 (28-31)	24.7 (22-28)
2	20.3 (20-21)	27.2 (25-30)	27.0 (25-29)	23.7 (23-25)
3	20.5 (19-21)	30.2 (26-37)	29.2 (28-30)	22.7 (22-24)
4	21.3 (20-23)	27.2 (27-28)	26.3 (22-30)	23.7 (23-24)
5	23.2 (22-24)	31.2 (30-34)	28.7 (25-33)	25.3 (23-27)
6	20.3 (19-22)	26.7 (25-28)	26.0 (25-29)	22.3 (21-23)
7	19.3 (18-21)	26.3 (25-27)	24.5 (24-25)	21.8 (20-24)
8	23.8 (22-25)	28.2 (27-29)	29.5 (27-32)	25.7 (25-27)
9	23.2 (23-24)	30.0 (27-33)	28.0 (26-30)	25.8 (25-26)
10	21.3 (20-23)	26.8 (25-30)	28.8 (27-31)	26.2 (25-28)
11	17.8 (16-19)	24.8 (24-26)	25.0 (23-27)	23.0 (21-24)
12	22.2 (21-24)	28.2 (26-29)	28.8 (27-30)	24.5 (23-26)
13	23.0 (22-24)	29.0 (26-33)	27.3 (26-30)	25.3 (24-27)
14	20.0 (19-21)	25.2 (24-27)	24.0 (22-25)	20.7 (20-21)

<sup>6</sup> A mrem or millirem is one thousandth, (1/1000), of a rem. A rem is an acronym for roentgen equivalent man and is based on how much of the radiation energy is absorbed by the body multiplied by a hazard factor that depends on the type of radiation.

### 2.2.4.2 ISFSI TLDs

In October of 2000, in preparation for the spent nuclear fuel to be moved from the fuel pool and stored in concrete casks at the ISFSI, the State Inspector, as part of his independent oversight, established 13 TLD locations to monitor the local radiation levels from the ISFSI. The thirteen locations are identified by the letters A through M in Figure 1 below.

Figure 1 – State TLD Locations at ISFSI



Since the spent fuel was projected to be moved in the fall of 2001, it was necessary to perform monthly TLD field replacements as opposed to quarterly in order to gather enough field data to establish a pre-operational database. The monthly regimen was maintained until the fall of 2004 when it was converted to a quarterly frequency.

Initially, some of the state TLD locations were co-located with some of Maine Yankee's TLDs for future comparative purposes. However, Maine Yankee reconfigured its TLD locations in 2008 and only 2 remain co-located. Table 4 lists the State results for the year.

Table 4 – ISFSI TLD Results

TLD Stations	Quarterly Exposure Period							
	1 <sup>st</sup> Quarter (Winter) Average (Range) (mrem)		2 <sup>nd</sup> Quarter (Spring) Average (Range) (mrem)		3 <sup>rd</sup> Quarter (Summer) Average (Range) (mrem)		4 <sup>th</sup> Quarter (Fall) Average (Range) (mrem)	
A	19.2	(17-21)	23.3	(23-24)	29.7	(27-32)	24	(22-25)
B	20.2	(18-22)	26.7	(25-28)	27.3	(26-28)	22.5	(21-23)
C	21.2	(18-23)	26.5	(25-28)	31.8	(28-35)	24.3	(24-25)
D	21.3	(21-22)	24.7	(23-26)	27.8	(25-31)	24.2	(23-26)
E	24.2	(23-26)	28.7	(27-30)	32.8	(31-35)	25.8	(24-28)
F	26.7	(26-27)	30.5	(29-33)	32.2	(30-36)	27.5	(26-29)
G	33.0	(28-39)	34.3	(32-37)	34.7	(34-37)	30.2	(28-32)
H	21.2	(19-22)	27.3	(26-29)	29.2	(26-32)	23.2	(21-25)
I	20.7	(20-21)	27.5	(25-30)	30.5	(28-33)	24.8	(24-26)
J	21.7	(21-23)	28.5	(26-31)	31.8	(28-39)	26.5	(24-28)
K	28.3	(26-30)	33.0	(32-34)	35.8	(34-38)	31.0	(29-33)
L	23.8	(21-26)	28.8	(27-31)	32.5	(30-35)	27.8	(25-30)
M	22.0	(20-24)	29.0	(28-30)	29.3	(27-31)	25.3	(24-26)

Stations G and K continued to be high due to their proximity to the ISFSI. Stations E, F and L also showed signs of influence from the ISFSI as noted by their proximity to the ISFSI in Figure 1. As with the Bailey Cove TLDs there were some stations that had higher variability as noted by their ranges. Even though the ISFSI TLD data had higher values, the Bailey Cove data's overall range of about 18 to 37 compared well to the ISFSI's range of about 19 to 39. It should be noted that some of the Bailey Cove TLDs can serve as both a Bailey Cove TLD and an ISFSI TLD, since their location would fulfill one of the 16 points of the compass.

## 2.3 Maine Yankee Decommissioning

### 2.3.1 Background

Maine Yankee's decommissioning was completed in the fall of 2005. At that time the State Inspector also commenced his final walk down survey of the site. Certain areas such as the transportation routes exiting the plant site were surveyed after the plant industrial area was decommissioned. It took a considerable amount of time to complete both half-mile east and west access routes and the two thirds of a mile of the railroad track. In addition, nine specific areas, including the dirt road, were also examined as part of the final site walk down survey. The State's survey of the dirt road leading to the old softball field was extended in the fall of 2007 when the State discovered three localized, elevated contaminated areas on the road. Over the next couple months extensive bounding samples were taken to determine the extent of the contamination. Based on the findings a specialized survey, keying on the radioactive element Cesium-137, was performed in June of 2008. The survey did not find any new areas of elevated

contamination. The State closed the issue in October of 2008 after 18 soil samples from the Dirt Road did not reveal any increased levels of Cesium-137 beyond normal background levels. Even though some residual radioactivity remains, due to the localized nature of the contaminant and the restricted security access to the site, the contamination found does not present a public health hazard.

### 2.3.2 East Access Road Survey

With the closure of the Dirt Road, the only remaining walk down survey left to be performed on-site is the portion of the East Access Road adjacent to the ISFSI bermed area as depicted in Figure 2. This area remains as the background radiation levels from the ISFSI were initially found to be high, (greater than 30,000 counts per minute (cpm)), and could mask potential elevated areas. Since then the State Inspector has been monitoring the levels every spring and has observed a steady decrease in the ambient radiation levels down to 25,000 cpm.

In June the State Inspector surveyed a 560 foot section of the East Access Road near the ISFSI. The road abutting the ISFSI was marked off at 50 foot intervals with fixed, one minute measurements taken at the centerline of the road and approximately 10 feet on each side of the centerline to see if there were any gradients across the road. The results indicate that the radiation levels across the road were fairly uniform and mostly within plus or minus 500 cpm of the average. The measurements also revealed a 250 foot section of the road with less than optimum conditions for re-surveying as the readings were still high, (more than 22,000 cpm). The results also indicated that the elevated readings tended more toward the southern portion of the ISFSI, which correlates well with the lower height of the bermed area near the ISFSI. The highest fixed reading was about 25,100 cpm with the highest scan (walking) reading at 27,000 cpm. The State will perform one more survey in 2010 and decide at that time how best to disposition this section of the road.

Figure 2 - East Access Road Survey near ISFSI



### 2.3.3 Confirmatory Reports

The State will publish its decommissioning findings in a confirmatory summary that is expected in 2010. As part of that process the State will condense over 40 major survey areas into eleven confirmatory reports that were worked on by an outside consultant. In 2000 the State contracted with a nationally recognized decommissioning expert with nearly 35 years of experience to ensure proper reviews of Maine Yankee's License Termination Plan and technical submittals to the U.S. Nuclear Regulatory Commission. The independent consultant collected all the State's findings and summarized them in technical reports that the State Inspector will use to complete the State's confirmatory summary.

The technical reviews of the independent consultant's reports were performed by the State Inspector. The State Inspector provided final comments on the Spray Building, Yard West, Yard East, and the Final Site Walk Down Survey Reports for further revision. Additional documentation and photos were compiled on the final site walk down survey and forwarded to the consultant for the final report. Due to all the major revisions that had to be made to the confirmatory reports and the additional complexity of the final site walk down report containing 12 distinct survey areas on the 150 acre Maine Yankee site, it was necessary in February to amend the consultant's contract to allow more time to complete the final site survey report. After eight months the report was ultimately finalized and received in July.

## 2.4 Groundwater Monitoring Program

### 2.4.1 Background

In June of 2004, the State, through the Department of Environmental Protection's (DEP) authority under 38 MRSA §1455, signed an Agreement with Maine Yankee for a five year, post decommissioning radiological groundwater monitoring program at the site. The details of how the Agreement would be carried out relative to the quality assurance facets of the monitoring, sampling and analyses would be captured in Maine Yankee's Radiological Groundwater Monitoring Work Plan. It should also be noted that Maine Yankee, as part of its hazardous materials closure of the site for the DEP, is conducting a concurrent 30-year chemical monitoring program to perform sampling of 23 wells from selected past industrialized activities on the Bailey Point Peninsula.

The Agreement between the State and Maine Yankee set an administrative limit of 2 mrem per year per well as a demonstration that it had met the State's groundwater decommissioning standards of a 4 mrem dose per year above background values. If a well exceeded the 2 mrem value after the five year monitoring program ended, Maine Yankee would allow the State to continue monitoring that well. To-date fifteen of the sixteen wells sampled have not exceeded one tenth of the limit, or 0.2 mrem per year. Only well number MW-502 has come close to exceeding the 2 mrem administrative limit and that was back in March of 2006 when the dose was 1.96 mrem.

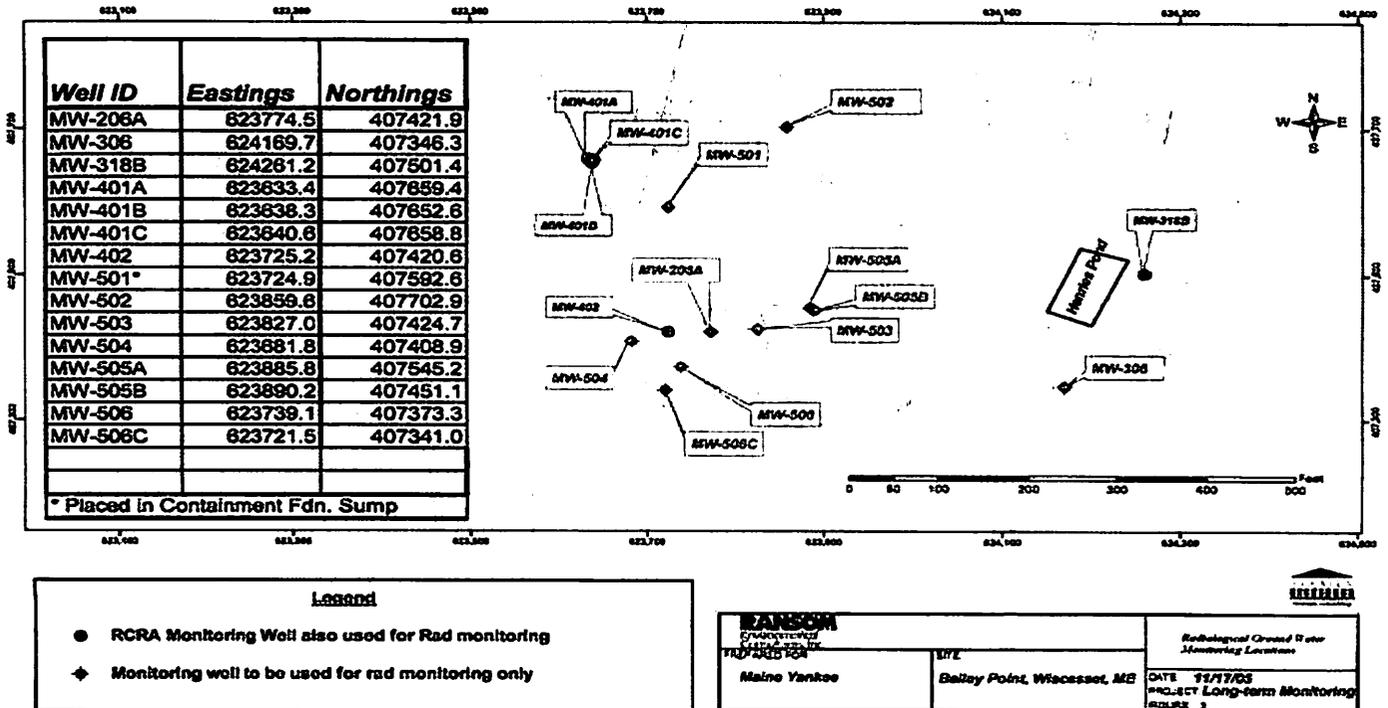
### 2.4.2 Sampling

The normal sampling regimen for the groundwater monitoring program is three times a year. However, since the first sampling took place in September of 2005, the annual sampling constitutes the September sampling of the current calendar year and finishes with the June sampling of the following year. As of September the groundwater monitoring program had started its fifth and final radiological sampling year.

According to Maine Yankee's Rad Work Plan Rev 3, their environmental consultant, Ransom Environmental from Portland, samples 16 individual wells on a tri-annual basis and ships the well water samples to the AREVA environmental laboratory in Westborough, Massachusetts for analysis.

Figure 3 below, courtesy of Maine Yankee, illustrates the locations of the 16 sampling wells. Some wells also double as chemical sampling wells. It should be noted that the well ID list inadvertently omitted well MW-318A, which is at the same well location as MW-318B. The letter 'A' signifies that it is a bedrock well, whereas the 'B' denotes a surficial or surface well.

Figure 3 - Monitoring Well Locations



The well water is analyzed for radioactive elements that emit gamma ray radiation, such as Cesium-137 and Cobalt-60, and for tritium, a form of heavy hydrogen that is naturally radioactive and a pure beta particle emitter. In addition to Maine Yankee's vendor laboratory, AREVA, the State Inspector also collects annually from Maine Yankee's consultant, Ransom Environmental, groundwater samples from seven wells to conduct independent quality assurance checks on Maine Yankee's AREVA laboratory by having the State's Health and Environmental Testing Laboratory perform the same types of analyses on gamma emitting radioactive elements and the beta emitter tritium.

### 2.4.3 Analytical Results for Tritium

The State, as part of its oversight functions, analyzed seven well water samples from the March sampling event. The results from the State and Maine Yankee analyses are provided in Table 5 below.

The comparisons between the two laboratories appear to be in fairly good agreement with each other. Four of the seven wells tested by the State, (MW-401B, MW-401C, MW-502, and MW-505B), had positive indications for Tritium, whereas Maine Yankee had three wells, (MW-501, -502, and -505A), with positive indications. (A positive indication is one where the result is greater than its statistical radiological counting uncertainty at the 95% confidence level.) However, three of the State's four positives and two of the three Maine Yankee positive indications were less than 600 pCi/L. Although Tritium is naturally occurring, it is also a by-product of fission and neutron activation in an operating nuclear plant. Therefore, the State set the natural background limit of Tritium in a well sample to 600 pCi/L. Hence, as per the Agreement, only a well with a Tritium concentration in excess of 600 pCi/L would be included in the radiological dose assessment.

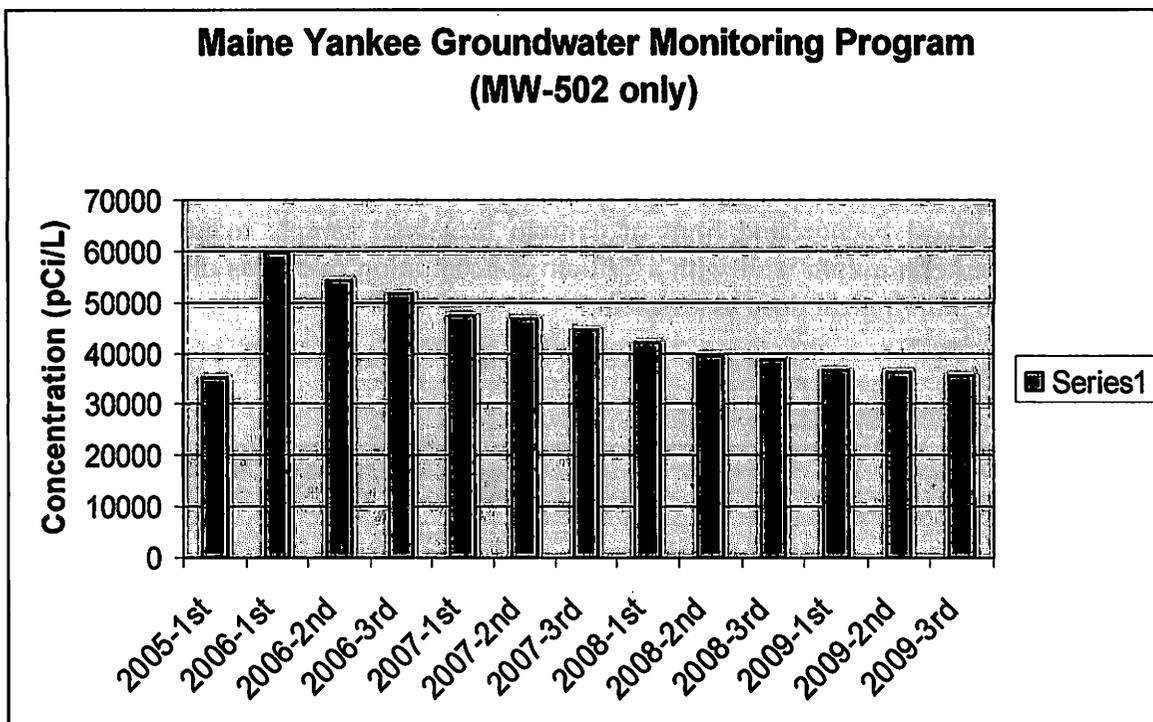
Table 5 – Tritium Results

<u>Well Numbers</u>	<u>Maine Yankee Results</u> (pCi/L)	<u>State Results</u> (pCi/L)
MW-206A	-60	101
MW-306	-210	
MW-318A	0	
MW-318B	0	
MW-401A	-90	69
MW-401B	-90	124
MW-401C	-100	178
MW-402	20	
MW-501	440	
MW-502	36,480	34,700
MW-503	180	
MW-504	80	
MW-505A	370	
MW-505B	-130	229
MW-506A	40	
MW-506C	-110	49

The elevated Tritium in well MW-502 has been steadily decreasing since its peak value of 59,570 pCi/L in March of 2006 as exemplified by the illustration in Figure 3 on page 16. It is expected that this well will remain elevated for some time as the water infiltration rates are very low. Consequently, the decrease will be slow and steady.

The highest Tritium well is currently calculated to give a projected annual radiation dose of 1.1 mrem above naturally occurring concentrations. In comparison the average natural background radiation dose equivalent to the United States population is estimated to be 292 millirems per year, or 0.8 millirem per day, with 68 % of that dose coming from Radon and its subsequent decay products.

Figure 3 – Monitoring Well MW-502 With Elevated Tritium



#### 2.4.4 Positive Indications

Besides Tritium as being a recurrent detection in some of the wells, there are other radioactive elements that have had positive indications. The following radioactive elements were identified in trace quantities in nine of the sixteen wells through gamma spectroscopy, which is a technique that identifies the radioactive elements by their energy fingerprints. They were Cobalt-57, Cobalt-58, Cobalt-60, Zinc-65, Silver-110m, Antimony-125, Cesium-137, Cerium-141, Cerium-144, and Europium-152. All the radioactive elements are normally found in a nuclear power plant environment. However, due to their short radioactive half lives Cobalt-58 and Cerium-141 can not physically originate from the plant's operational days. As for the Cobalt-57, Cobalt-60, Zinc-65, Silver-100m, Antimony-125, Cerium-144, and Europium-152, their radioactive half lives are longer and, therefore, the likelihood of their existence is much more probable. In both cases however, except for Antimony-125 and Cesium-137, since the AREVA laboratory reported only trace amounts of the radioactive elements, which were barely detectable, it is very possible that the results are false positives and probably not really there. The highest projected dose for either the Antimony-125 or Cesium-137 was only 0.038 mrem per year as compared to the average U.S. population of 292 mrem per year.

The gamma energy technique also identified Americium-241 in trace quantities in six wells. This is important as Americium is heavier than Uranium, is a potential indicator of other heavier elements such as Plutonium, and is an alpha emitter with higher dose implications. Since the trace values were so low and the gamma technique at these low levels is not very accurate, then another technique, called alpha spectroscopy, was used as it is much more sensitive than the gamma ray detection technique. All six well samples were re-analyzed and none were found to have positive indications of Americium-241.

## 2.4.5 Tri-annual Sampling Events and Reports

After each sampling event Maine Yankee submits to the State Inspector a summary report of their findings. The State Inspector reviews the report, comments on the findings and forwards his comments to Maine Yankee for their response. The State Inspector also forwards his comments to the Department of Environmental Protection (DEP) to apprise them of the radiological findings. At the end of the three sampling events an annual report is generated that covers the sampling year's findings with an independent third party validation of the data from an outside vendor. All the raw data is submitted to the DEP and the State Inspector for review. The annual report is reviewed by several staff persons at DEP, whose primary focus is on the chemical sampling program and they defer to the State's Radiation Program, or the State Inspector in this case, for their expertise in radiological matters.

The State Inspector provided his comments on the third annual groundwater report to the DEP in June, which were later compiled with DEP's chemical comments and forwarded to Maine Yankee in November for their response. Maine Yankee replied to the State's comments in December. The complete fourth annual report was received by the State in December.

## 2.4.6 Quality Assurance Criteria (Maine Yankee Rad Work Plan)

At the onset of the groundwater monitoring program the DEP requested that Maine Yankee provide a guidance document on how they will carry out the various facets of the Post Decommissioning Radiological Groundwater Agreement. A Work Plan was devised and it describes the well and geoprobe locations, the geologic characterization, field screening for contamination, drilling depth, screen length, sampling dates and collection, analysis, internal laboratory review, data validation, usability and reporting. The development of the Work Plan commenced in 2005 and was finalized in September 2008. The reason for the lengthy delay was due to protracted discussions and clarifications involving a number of iterations on laboratory acceptance criteria for analyses, data validation and data reporting to the DEP's Environmental and Geographic Analysis Database.

## 2.5 Other Noteworthy Activities

### 2.5.1 Reports to the Legislature

#### 2.5.1.1 Monthly

As mandated by legislation passed in the spring of 2008, the State Inspector is required to submit monthly reports to the Legislature on his oversight activities of Maine Yankee's Independent Spent Fuel storage Installation (ISFSI) located in Wiscasset. Since the law went into effect on June 29, 2008, the State Inspector has been providing monthly reports to a distribution that includes the President of the Senate, the Speaker of the House, the U.S. Nuclear Regulatory Commission (NRC) at NRC Headquarters in Rockville, Maryland and Region I in King of Prussia, Pennsylvania, Maine Yankee, the Governor's Office, the Department of Health and Human Services, the Department of Environmental Protection, the Public Advocate and the State Police's Special Services Unit. The topics covered in the monthly reports are highlighted in sections 2.1.7, 2.2, 2.3, 2.4 and 2.6 of this report.

#### 2.5.1.2 Annual

Under 22 MRSA §668, as enacted under Public Law, Chapter 539 the State Inspector prepares an annual accounting report of all the funds received into and all disbursements out of the Interim Spent Fuel Storage Facility Oversight Fund. The report is due the first Monday of February. In addition, the State Inspector must annually report his activities

to the Department of Health and Human Services Manager of the Radiation Control Program for inclusion in the Manager's Annual Report of Oversight Activities and Funding to the Legislature. In addition to the above annual reports the Inspector also prepares an annual report by July first of every year to the Legislature of his oversight activities. This report fulfills that obligation.'

#### **2.5.2 Northeast High Level Radioactive Waste Transportation Task Force (NEHLRWTF)**

As the State's representative the State Inspector has participated in periodic conference calls on the status of Yucca Mountain and transportation issues that could impact Maine. No Task Force meeting was held this year due to federal cutbacks to the Yucca Mountain Project. The Inspector did provide comments to the NEHLRWT on the Department of Energy's National Transportation Plan for shipping spent fuel. In addition, the Inspector also provided feedback on the DOE's proposed allocation of grants for training state, local and tribal communities on emergency response and logistical coordination of spent fuel shipments. The Task Force is an affiliate of the Eastern Regional Conference of the Council of State Governments. The purpose of the Task Force is to not only develop the safest and most efficient transportation route to ship spent nuclear fuel from the Northeast, but also to provide the State with direct involvement in formulating and establishing national policy in the design of the national transportation system and development of a proposed repository at Yucca Mountain in Nevada.

#### **2.5.3 Yankee Federal Energy Regulatory Commission (FERC) Rate Case Settlement**

The State participated in the quarterly conference call briefings relevant to Yankee Rowe, Connecticut Yankee and Maine Yankee. The briefings provide updates to both state and private officials affected by the FERC settlements over the Department of Energy's (DOE) breach of contract to take possession of the spent fuel at Maine Yankee as mandated by the Nuclear Waste Policy Act of 1982, as amended. In September 2006 Maine Yankee won a \$75.8 million judgment for monetary damages through 2002 in its lawsuit with the DOE in the U.S. Court of Federal Claims. In December 2007 the three Yankee companies filed a second round of damage claims.

Besides the lawsuits updates are also provided of other organizational activities, both on the regional and national levels, on spent fuel issues, whether it be the Yucca Mountain repository or focusing attention on local or centralized storage. These organizations include the Administration, the Department of Energy, the Nuclear Regulatory Commission, the Blue Ribbon Commission, Congress, the National Conference of State Legislatures, the Nuclear Waste Strategy Coalition, the Decommissioning Plant Coalition, the National Association of Regulatory Utility Regulators, the Council of State Governments, the New England Governor's Conference, the New England Council, the Coalition of Northeastern Governors, and the New England Conference of Public Utility Commissioners.

#### **2.5.4 Nuclear Waste Strategy Coalition (NWSC)**

The State participated in the periodic status briefings of the NWSC. The NWSC is an ad hoc group of state utility regulators, state attorneys general, electric utilities and associate members representing 47 stakeholders in 31 states, committed to reforming and adequately funding the U.S. civilian high-level nuclear waste transportation, storage, and disposal program.

#### **2.6 Some Newsworthy Items**

On June 3, 2008, as mandated by Nuclear Waste Policy Act (NWPA), as amended, the Department of Energy's (DOE) submitted its license application for the construction of a high-level waste repository at Yucca Mountain in Nevada. On September 8, 2008, the Nuclear Regulatory Commission (NRC)

accepted DOE's license application for technical review. Shortly after the presidential election President-Elect Obama vowed to terminate the Yucca Mountain Project in Nevada, thereby setting the stage for the ensuing conflict. To provide a picture and a timeline on the unfolding highlights on this controversial subject, the newsworthy items were segregated into four main categories to better illustrate the on-going nature of the Yucca licensing process, the Congressional response to the Administration's posture, the response from other stakeholders and interested parties, and finally the significant reports that were published during the year that impacted the on-going discussions.

### *2.6.1 Yucca Mountain Activities*

1. On January 16<sup>th</sup> the U.S. Nuclear Regulatory Commission (NRC) created three boards to consider the admissibility of 318 proposed contentions filed by 12 petitioners for adjudicatory hearing over the geologic repository at Yucca Mountain in Nevada. Each board will consist of three judges, two with legal expertise and one with technical expertise. These boards will consider only the standing of the petitioners and the admissibility of their contentions.
2. On February 17<sup>th</sup> the NRC approved a final rule that incorporates the Environmental Protection Agency's (EPA) radiation protection standards for the proposed high-level waste repository at Yucca Mountain in Nevada. The final rule retains EPA's dose limits of 15 millirems<sup>7</sup> for the first 10,000 years and 100 millirems thereafter up to one million years.
3. On February 24<sup>th</sup> Senator Majority Leader Harry Reid from Nevada announced that he was successful in cutting an additional \$100 million from the Yucca Mountain Project reducing the initial request made by the previous administration from \$494.7 million down to a final \$288.4 million. The omnibus bill, when signed by President Obama, would finalize spending through September 2009.
4. On February 26<sup>th</sup> President Obama revealed his proposed federal budget for FY 2010 that reflected his apparent opposition to the Yucca Mountain Project. The language in the proposed budget stated that the "the Yucca Mountain program will be scaled back to those costs necessary to answer inquiries from the Nuclear Regulatory Commission", (on DOE's Yucca Mountain license application pending before the NRC), "while the administration devises a new strategy toward nuclear waste disposal".
5. On March 5<sup>th</sup> Energy Secretary Chu told the Senate Energy and Natural Resources Committee that he plans to carry out the President Obama's wishes to find an alternative to the Yucca Mountain repository in Nevada.
6. On March 11<sup>th</sup> Energy Secretary Chu revealed to the Senate budget Committee that he will convene a blue-ribbon panel of experts to develop a long term strategy for waste disposal and to report back to him by the end of this year.
7. On March 12<sup>th</sup> President Obama signed the FY2009 Omnibus Appropriation Act that made a mid-year 25%, \$100 million cut in the funding for the Yucca Mountain Project.
8. On March 13<sup>th</sup> the US Nuclear Regulatory Commission (NRC) published in the Federal Register its final regulatory requirements for a high-level nuclear waste repository at Yucca Mountain, Nevada, bringing the agency's rule in line with the radiation dose standards the US Environmental Protection Agency issued last year. The NRC rule will go into effect April 13<sup>th</sup>.

9. On March 18<sup>th</sup> the NRC's Chairman, Dale Klein, stated at a Senate hearing that the NRC is revising its estimates as to how long nuclear waste can be stored at nuclear facilities. The agency could decide this summer that spent nuclear fuel could be stored securely in above-ground concrete and steel casks for at least 120 years. This is 20 years longer than the current policy that was adopted by the NRC on October 9, 2008. Previous to that storage at facilities ranged from 20 to 40 years based on the anticipated availability of the geologic repository at Yucca Mountain in Nevada.
10. On March 31<sup>st</sup>-April 2<sup>nd</sup> judges from three boards from the Nuclear Regulatory Commission's Atomic and Safety Licensing Panel started a three day hearing to listen to arguments on the Department of Energy's license application to construct a repository at Yucca Mountain. The board hearings will assess the legal standings of the 12 petitioners who filed 318 contentions on the license application.
11. On May 11<sup>th</sup> the Nuclear Regulatory Commission's Atomic Safety and Licensing Boards issued an order that allows eight petitioners and 299 contentions on safety and environmental issues to be admitted to the licensing proceedings. Initially, the Boards held hearings from March 31<sup>st</sup> through April 2<sup>nd</sup> on the 12 petitions to intervene and 318 proposed contentions on the Department of Energy's license application to construct a repository at Yucca Mountain in Nevada. Besides the eight, one petition was denied, two Nevada counties were granted status as interested governmental participants and three tribal organizations were not admitted as interveners until they can demonstrate compliance with the NRC's licensing support network.
12. On May 13<sup>th</sup> President Obama designated Dr. Gregory Jaczko, a former aide to Senator Majority Leader Harry Reid of Nevada and a member of the Nuclear Regulatory Commission (NRC), as Chairman of the federal nuclear safety agency. "Jaczko, who has a doctorate in physics, was a science advisor to Senate Reid and managed the Nevadan's opposition to the Yucca Mountain project before he was appointed to the NRC in 2005".
13. On May 13<sup>th</sup> President Obama designated Dr. Gregory Jaczko, a former aide to Senator Majority Leader Harry Reid of Nevada and a member of the Nuclear Regulatory Commission (NRC), as Chairman of the federal nuclear safety agency. "Jaczko, who has a doctorate in physics, was a science advisor to Senate Reid and managed the Nevadan's opposition to the Yucca Mountain project before he was appointed to the NRC in 2005".
14. On June 3<sup>rd</sup> Energy Secretary Chu reaffirmed the Administration's position that the Yucca Mountain repository is dead to the House Committee on Appropriations' Subcommittee on Energy and Water Development, and Related Agencies. Dr. Chu also stated that if the nuclear waste material is to be permanently isolated, then other geological sites become more desirable. Dr. Chu did not specify what types of geologic media, such as granite formations or salt beds, he was referring to.
15. On June 30<sup>th</sup> the Nuclear Regulatory Commission unanimously upheld the three Atomic Safety and Licensing Boards decisions on the Department of Energy's application to build and operate a high level waste repository at Yucca Mountain. The Commission's decisions included the rejection of most of the NRC's staff appeal of several admitted contentions as well as the rejection of two Nevada contentions challenging DOE's managerial competence and institutional integrity.

16. On July 2<sup>nd</sup> the Nuclear Regulatory Commission's (NRC) Atomic Safety and Licensing Board governing the license application contentions issued an order to the NRC staff to advise the Board within 10 days whether the NRC staff's entire Safety Evaluation Report (SER) will be issued by April 23, 2010 as required, or, if not, the NRC staff's best estimate of when the SER will be issued. The order was issued due to concerns about realistic expectations in light of fiscal realities.
17. On July 16<sup>th</sup> Christopher Kouts, Acting Director of the Office of Civilian Radioactive Waste Management for the Department of Energy (DOE), told the House Budget Committee that taxpayers will have to pay \$12.3 billion by 2020 for not accepting the spent fuel waste. That will be \$2 billion more than the \$10 billion the DOE has spent over the last 25 years in studying the Yucca Mountain site. As of May this year 71 lawsuits have been filed to recover damages against the federal government for breaching its contracts with utilities.
18. On August 20<sup>th</sup> the Attorney General from Nevada sent a letter to the Commissioners of the U.S. Nuclear Regulatory Commission (NRC) requesting that the NRC staff's Safety Evaluation Report on the Yucca Mountain license application include a performance assessment of the "post-closure radiation standards without the titanium alloy drip shields the Department of Energy proposes to install after the wastes are emplaced" in the repository. Nevada's contention is that the assessment will demonstrate that the radiation standards established by the U.S. Environmental Protection Agency for Yucca Mountain will not be met without the drip shields.
19. On September 10<sup>th</sup> the NRC's Atomic Safety Licensing Board Panel Construction Authorization Board recognized the councils of the Shoshone and Paiutes as having legal standing for the purpose of being a party to the Yucca Mountain case. Initially, the panel had declined them status, but on appeal the Tribes were able to demonstrate that they would be directly affected by the proposed waste repository.
20. On September 14<sup>th</sup> the State of Nevada filed five new challenges to the Department of Energy's license application to build a geologic repository at Yucca Mountain. The contentions involved how fast a special alloy for waste containers will corrode, the logic of waiting 75 years to install titanium drip shields for water intrusion, and the amount of water infiltrating the repository and eroding the waste containers sooner than expected. The remaining two challenges were related to future volcanic activity at the Yucca Mountain site.
21. On September 23<sup>rd</sup>, after 20 years of providing technical overviews of a proposed repository at Yucca Mountain, the Nuclear Waste Technical Review Board, established in 1987 by Congress under the Nuclear Waste Policy Act, departed from the proposed repository and started discussing ways of reusing the spent fuel. Discussions focused on different ways to sort out the components of nuclear waste, on burying some, recycling others for use as fuel, and by putting some in reactors to transform the waste into materials easier to handle.
22. On October 8<sup>th</sup> the Department of Energy (DOE) responded to the July 8<sup>th</sup> letter from the National Association of Regulatory Utility Commissioners (NARUC), of which the Maine Public Utilities Commission is a member. NARUC's letter requested suspension of the payments to the Nuclear Waste Fund (NWF). With a balance in the NWF exceeding \$23 billion and interest amounting to over \$1 billion annually, DOE's response was that the Obama Administration issued a policy directive stating the fee was necessary. The DOE issued the same response to the Nuclear Energy institute's July 8<sup>th</sup> letter requesting suspension of payments to the NWF.

23. On October 27<sup>th</sup> the U.S. Nuclear Waste Technical Review Board sent a letter to Speaker of the House Nancy Pelosi, Senate President Pro Tempore Robert Byrd and Secretary Energy Chu outlining the Board's mission under the Nuclear Waste Policy Act as amended in 1987, its continuing role and, in light of the Administration's position on Yucca Mountain, a realigning of the Board's priority goals to be of service to Congress, to the Secretary of Energy and the proposed Blue Ribbon Commission in evaluating alternatives to the nation's nuclear waste management program. A copy of the letter is attached at the end of the report.
24. During the week of December 7<sup>th</sup> the Department of Energy (DOE) met a filing deadline for briefs with the Nuclear Regulatory Commission's Atomic and Safety Licensing Board on the DOE's Yucca Mountain license application. The filing signaled that the DOE lawyers are moving forward in their defense of the license application. Nevada also met the deadline by submitting their brief covering about ten legal questions, one of which addressed the postponement for 100 years the installation of drip shields. The parties have 30 days to file responses with the court with a hearing for oral arguments scheduled for late January in Las Vegas.

### **2.6.2 Congressional Responses**

1. On January 15<sup>th</sup> five Senators, Senators Snowe and Collins from Maine, Senators Kohl and Feingold from Wisconsin, Senator Feinstein from California, signed and forwarded a letter to then President-Elect Barack Obama urging him and his new Administration to give priority to the removal of spent nuclear fuel from their decommissioned reactor sites in the Administration's consideration of alternatives for the storage of spent fuel. Maine, Wisconsin, California, Michigan, Massachusetts and Connecticut are part of a consortium, called the Decommissioned Plant Coalition, which seeks the removal of spent fuel from shut-down reactors to a more centralized interim storage facility.
2. On March 5<sup>th</sup> Idaho's Congressional delegation signed and forwarded a letter to Dr. Chu questioning the Obama Administration's plans to scale back the Yucca Mountain Project when the Department of Energy is under a 1995 court settlement to remove the high level nuclear waste from the state by 2035.
3. On March 12<sup>th</sup> Senators Bingaman and Murkowski co-authored a letter to the Senate Energy and Natural Resources Committee stating that the US Government could be liable for \$30 billion or more in damages if the Yucca Mountain Project is abandoned. The Senators reminded the Committee members that federal courts have already found the government in partial breach of contracts with electric utilities costing taxpayers hundreds of million of dollars. Senator Jeff Bingaman is the Democratic Chairman of the Committee and Senator Lisa Murkowski is the leading Republican on the Committee.
4. On March 24<sup>th</sup> Representatives Michael Michaud and Chellie Pingree of Maine along with five other Representatives serving six states, expressed their concerns in a letter, (a copy of which is attached at the end of the report), to President Obama on the suspension of Yucca Mountain as a repository for spent fuel. Each of the signatories has a distinct "stand alone, permanently shut down nuclear reactor site" in their respective states.
5. On April 22<sup>nd</sup> Senator Lindsey Graham from South Carolina introduced a bill in the Senate, S.861, that would refund the unused portion of the Nuclear Waste Fund back to the electric consumers should the Yucca Mountain Project be terminated. The legislation would refund 75% of the \$22.6 billion balance to ratepayers with the remaining funds being distributed to

nuclear power facilities for security and storage upgrades. Senator Susan Collins from Maine and seven other Senators, representing seven states, were co-sponsors of the proposed legislation.

6. On April 29<sup>th</sup> Senators James Inhofe from Oklahoma and Olympia Snowe from Maine along with 15 other U.S. Senators, representing 13 states, sent a letter, (a copy of which is attached at the end of the report), to Dr. Steven Chu, Energy Secretary, requesting a response to a number of questions and to provide information supporting the scientific basis for the decision that Yucca Mountain is “not an option”.
7. On May 7<sup>th</sup> four ranking members of the Committees of Energy and Commerce, and Science and Technology forwarded a letter to Energy Secretary Chu requesting a response to a number of questions and to provide information supporting the scientific basis for the decision that Yucca Mountain is “not an option”. The House letter is very similar in scope to the Senate letter issued on April 29<sup>th</sup>.
8. On May 14<sup>th</sup> Senators Olympia Snowe and Susan Collins coauthored a letter to Energy Secretary Chu urging him to appoint a representative from an affected community that currently stores spent fuel. Both Senators advocated that a member of Maine Yankee’s Community Advisory Panel on Spent Nuclear Fuel Storage and Removal, could provide representation on the proposed Blue Ribbon Panel to evaluate the nation’s alternatives to nuclear waste management. A copy of the letter is attached to the report.
9. On May 29<sup>th</sup> the Acting Director of Department of Energy’s (DOE) Yucca Mountain Project responded to the March 24<sup>th</sup> House of Representatives letter that included the signatures of Maine’s two Congressional Representatives, Michael Michaud and Chellie Pingree. His letter stated that they consider the issue of permanently shutdown plants seriously and that he expects the Blue Ribbon Panel being formed will address this issue.
10. On June 17<sup>th</sup> twenty-five bipartisan members of the U.S. House of Representatives, representing 13 states, signed and sent a letter to Energy Secretary Chu expressing their support for the continuation of the Yucca Mountain project, their concerns of Department of Energy’s abandonment of Yucca Mountain and finding another suitable repository, and their support for increased funding to ensure the licensing review of Yucca Mountain is kept on track.
11. On July 10<sup>th</sup> the Senate Committee on Energy and Natural resources was reviewing Senate Bill, S. 861, Rebating America’s Deposits Act. The Act requires the President to certify Yucca Mountain as the nation’s geologic repository for spent nuclear fuel and high level waste. If the President fails to certify Yucca Mountain, then utilities would cease making payments to the Nuclear Waste Fund and they would receive from the Secretary of the Treasury their pro-rated share of their payments into the Nuclear Waste Fund including interest. 75% of the monies returned will be rebated to the ratepayers with the remaining 25% used by the utilities to upgrade storage and security of their nuclear materials.
12. On July 16<sup>th</sup> Kim Cawley from the Congressional Budget Office testified before the U.S. House of Representatives’ Committee on the Budget on the Federal Government’s Responsibilities and Liabilities Under the Nuclear Waste Policy Act. Ms. Cawley stated that, since 1983 to the end of 2008, \$16.3 billion had been collected from electric utilities that generate civilian nuclear waste through a disposal assessment fee of 0.1 cents per kilowatt-hour. The interest credited over the same time period to the Nuclear Waste Fund established

by Congress in 1983 amounted to \$12.8 billion for a total of \$29.1 billion. As of the end of 2008 \$7.1 billion had been disbursed from the Fund, which left a balance of \$22 billion. The Congressional Budget Office estimates that in 2009 nearly \$800 million will be collected from fees with about \$1.2 billion in interest being credited to the Fund for a total of \$2 billion. The projected expenditures for 2009 will total \$200 million. On defense related wastes \$3.6 billion has been appropriated by Congress from 1983 through 2008 with \$100 million being appropriated in 2009. The remainder of the testimony focused on the liabilities that the federal government is accruing due to damage claims filed by electric utilities on the federal government's 1998 breach of its contracts to take the spent fuel. The claims against the federal government are paid out of a taxpayer subsidized Judgment Fund. It is estimated that if a repository were to open and accept waste in 2020 the taxpayers' liabilities from the lawsuits would amount to \$12.3 billion in today's dollars and that further payments would be expected from the Judgment Fund for a number of decades beyond 2020. If no repository is available to receive wastes, then federal liabilities will remain substantial for decades to come.

13. On July 29<sup>th</sup> the Senate passed by a vote of 85-9 its version of a \$34.3 billion energy and water projects bill. The bill effectively cuts an additional \$27 million from the Administration's budget of \$56 million for the Nuclear Regulatory Commission's review of the Department of Energy's license application for Yucca Mountain. Earlier in the month the House passed its own \$33.3 billion version. The House bill does contain a provision that the \$5 million earmarked for the Blue Ribbon Commission must consider Yucca Mountain as part of the Commission's review.
14. On August 4<sup>th</sup> Energy Secretary Chu wrote a letter to Senators Kennedy and Kerry from Massachusetts agreeing to include "a member with expertise in spent fuel management at decommissioned plants" to the blue ribbon panel that the Administration plans to convene for spent fuel waste management.
15. On September 14<sup>th</sup> Senators Lieberman and Dodd from Connecticut co-signed a letter to the Chairman and Ranking Member of the Senate's Committee on Appropriations Subcommittee on Energy and Water Development requesting special consideration of the single unit decommissioned reactor sites by including representation on the proposed Blue Ribbon Panel.
16. On October 1<sup>st</sup> the House of Representatives passed the Conference Report on the Energy and Water Development and Related Agencies Appropriations Act for FY 2010. The Conference Report states that \$197 million was approved to continue current activities on nuclear waste disposal with \$5 million of that amount to establish a Blue Ribbon Commission to consider all alternatives for nuclear waste disposal.
17. On October 20<sup>th</sup> Washington State Representative Doc Hastings sent a letter to President Obama specifically requesting a response to six questions ranging from the scientific basis for rejecting Yucca Mountain to the membership of the Blue Ribbon Commission. Representative Hastings also asked for "a complete explanation of the federal government's legal liabilities and obligations regarding both defense and commercial nuclear spent fuel".
18. On November 18<sup>th</sup> Ranking Members of the House of Representatives forwarded a letter to Energy Secretary Chu expressing their reservations relevant to the recent DOE's draft Program Decision Memorandum (PDM) of October 23<sup>rd</sup> statement that "all license activities will be terminated in December 2009". The statement means that the DOE would stop

responding to Nuclear Regulatory Commission (NRC) inquiries on the technical aspects of DOE's Yucca Mountain license application, essentially ensuring that the NRC would not approve it. The October 23<sup>rd</sup> PDM also summarizes DOE's FY 2011 funding request at \$46.2 million and zero funding for fiscal years thereafter. The FY 2011 funding breakdown is for \$21.2 million for site remediation and worker transition, and \$25 million for archiving the Yucca Mountain program data, fundamentally shutting down the Yucca Mountain Project. The House letter lists a number of questions and requests for the DOE to respond to.

19. On November 19<sup>th</sup> Representative Mike Simpson from Idaho wrote a letter to Energy Secretary Chu on the Department of Energy's (DOE) draft internal memorandum indicating that the DOE will terminate in December the licensing support for the Yucca Mountain application currently under review by the Nuclear Regulatory Commission. The letter reiterated Congresses' mandate for the DOE to continue its support of the licensing process. Representative Simpson requested a response on the intent of the draft memorandum and for Secretary Chu to share with him the DOE's FY 2010 spending plan for Yucca Mountain.

### *2.6.3 Other Stakeholder and Interested Party Responses*

1. On February 6<sup>th</sup> the Decommissioning Plant Coalition (DPC) commented on the Nuclear Regulatory Commission's (NRC) waste confidence rule. The NRC's rule states that the Commission is confident that spent fuel waste could be effectively managed and safely stored at power reactor sites for up to 60 years beyond the design life of a nuclear power plant when disposal is expected to be available. The DPC is a consortium of stakeholders from Maine, Wisconsin, Massachusetts, Connecticut, California, and Michigan, which seek the removal of spent fuel from shut-down reactors to a more centralized interim storage facility. The DPC was instrumental in Senators Snowe and Collins January 15<sup>th</sup> letter to President-Elect Obama.
2. On April 7<sup>th</sup> the Maine Legislature approved and issued a joint resolution requesting the United States Government to immediately reduce the Nuclear Waste Fund fee to cover only those costs incurred by the Department of Energy, the Nuclear Regulatory Commission (NRC) and local governments in Nevada overseeing the Yucca Mountain project. The joint resolution also advocated the immediate enactment of legislation to expedite the creation of two NRC licensed interim storage facilities to accept spent fuel with priority given to decommissioned plants. State Senator Deborah Simpson sponsored the resolution.
3. On May 4<sup>th</sup> the National Conference of State Legislatures (NCSL) forwarded letters to Energy Secretary Chu and the Senate. Both letters espouse the need to establish private interim storage facilities for spent nuclear fuel and that this need is imperative in light of the opposition by the Administration to the Yucca Mountain repository in Nevada. Both letters also recommend the appointment of one state legislator familiar with the nuclear waste issues to be on the proposed Blue Ribbon Panel.
4. On May 19<sup>th</sup> the Council of State Governments (CSG) issued a resolution on federal policy on nuclear waste management. The resolution "urges the federal government to honor its obligations under the Nuclear Waste Policy Act (NWPA), to provide the Department of Energy and the Nuclear Regulatory Commission sufficient funding to carry out their obligations under the NWPA, including the full funding for state regional transportation projects and other state activities."
5. On May 31<sup>st</sup> the Northeast High-Level Radioactive Waste Transportation Task Force, a consortium of 10 northeast states, recommended Dr. Max Power to Energy Secretary, Dr.

Steven Chu, as an appointment by the President to the Blue Ribbon Panel on nuclear waste that will evaluate alternatives to the Yucca Mountain repository in Nevada. The Northeast Task Force is a subsidiary of the Council of State Governments Eastern Regional Conference.

6. On June 14<sup>th</sup> nineteen Governors, under the auspices of the Western Governors' Association, adopted a resolution that would deter the Obama administration and private energy companies from constructing any interim, spent fuel storage facilities in the Western US. Citing growing uncertainties about US nuclear waste policy, such as the abandonment by the Administration and Energy Secretary Chu of the Yucca Mountain repository in Nevada, the Governors expressed their concern that any interim storage site could become a permanent nuclear waste site.
7. On July 8<sup>th</sup> the Nuclear Energy Institute (NEI), the lobbying arm of the nuclear industry, forwarded a letter to Secretary of Energy Chu calling for the suspension of payments to the Nuclear Waste Fund. Each nuclear utility is required to pay one tenth of one cent per kilowatt-hour of electricity it produces into the Nuclear Waste Fund to develop a national geologic repository for spent nuclear fuel and high level waste, including defense related wastes.
8. On July 8<sup>th</sup> the National Association of Regulatory Utility Commissioners (NARUC) sent a letter to Secretary of Energy Chu supporting the Nuclear Energy Institute's request to discontinue payments by nuclear utilities to the Nuclear Waste Fund. NARUC expressed their position by stating that "if we are going to pause to reconsider disposal options, we feel it is also appropriate to pause the fee payments".
9. On August 31<sup>st</sup> local leaders and lawmakers from the States of Washington, Idaho and South Carolina expressed their concerns that the highly radioactive waste from the building of the nation's nuclear weapons arsenal will remain in their states indefinitely as de facto nuclear dumps due to the Administration's shutdown of the Yucca Mountain Project. The States have legal binding agreements with the federal government that require the Department of Energy to take their waste to Yucca Mountain.
10. On October 7<sup>th</sup> nineteen organizations, representing various interests, sent a letter to Energy Secretary Chu expressing their concern that "the Department of Energy will decline to seek funding in FY 2011 for continuation of the Yucca Mountain license application now pending before the Nuclear Regulatory Commission." The letter highlights 11 disadvantages from the potential defunding.
11. On October 15<sup>th</sup> the Prairie Island Indian Community issued a press release calling "on President Obama to follow the law and deliver on the federal government's decades-old mandate and promise to establish a permanent repository for the nation's commercial nuclear waste." The Prairie Island Indian Community in Red Wing, Minnesota is among the closest communities in the nation, located less than 600 yards from twin nuclear reactors and a temporary spent fuel storage site.
12. On November 18<sup>th</sup> the Sustainable Fuel Cycle Task Force Science Panel sent a letter to Secretary of Energy Chu questioning the technical merits of the DOE response to the Task Force's October 7<sup>th</sup> letter. The letter takes issue with the DOE comment that Yucca Mountain is not a workable option.

13. On November 19<sup>th</sup> the Nuclear Waste Strategy Coalition (NWSC) sent a letter to the Chairmen of both the Senate and House Appropriations Committees and its respective Ranking Members expressing their concern over an October 23<sup>rd</sup> DOE memorandum from the DOE's Chief Financial Officer's directing that "all license defense activities will be terminated in December 2009". The NWSC letter raises questions as to the intent of the recently passed Appropriations Act for FY 2010, which clearly supported the continuation of the DOE Yucca Mountain license application before the Nuclear Regulatory Commission for the entire fiscal year 2010. The NWSC is an ad hoc group of state utility regulators, state attorneys general, electric utilities and associate members representing 47 stakeholders in 31 states, committed to reforming and adequately funding the U.S. civilian high-level nuclear waste transportation, storage, and disposal program.
14. On December 16<sup>th</sup> the New England Governor's Conference forwarded their letter to Secretary of Energy Chu advocating the expedited removal of spent nuclear fuel from decommissioned and operating sites. The letter also expressed concerns over the long term storage of canisters and "the potential for significant safety and environmental issues" should the canisters not receive their periodic 20 year relicensing from the NRC. Governor Baldacci is the current Chairman of the New England Governor's Conference.
15. On December 17<sup>th</sup> the Energy Community Alliance (ECA) sent a letter to Secretary Energy Chu questioning the Department of Energy's (DOE) plans for defense high level waste (HLW) stored at sites across the country. The letter was sent in response to the Administration's position that Yucca Mountain was no longer a viable disposal option. Local communities that hosted DOE sites accepted the defense HLW from other states and sites on the presumption that the storage was temporary until the Yucca Mountain repository opened. The ECA letter is calling on the DOE to a) "engage local communities and governments on high-level waste decisions and impacts, b) analyze the impact of DOE's decision to leave defense high-level waste in communities, and c) appoint a local government official to the Blue Ribbon Panel". The ECA is a non-profit organization of local governments adjacent to and impacted by DOE sites. A copy of the letter is attached at the end of the report.

#### *2.6.4 Notable Reports and Documents*

1. On February 6<sup>th</sup> the Congressional Research Service published a report, entitled "Nuclear Waste Disposal: An Alternative to Yucca Mountain". The report outlined consequences of a Yucca Mountain policy shift that included federal liabilities for disposal delays, licensing complications for new power reactors, environmental cleanup penalties, and long term risks. The report also probed into nuclear waste policy options, such as institutional changes, extended on-site storage, federal central interim storage, private central storage, spent fuel reprocessing and recycling, non-repository options, and a new repository site. The purpose of the Congressional Research Service is to provide Congress with analysis and research services that are authoritative, objective, nonpartisan, and confidential.
2. In May the Institute for 21<sup>st</sup> Century Energy, an affiliate of the U.S. Chamber of Commerce, issued a report, entitled "Revising America's Nuclear Waste Policy". The report "recounts the history of the country's nuclear waste policy, discusses the mechanics of the issue, and offers specific recommendations to the Obama Administration and the U.S. Congress." Six recommendations were offered in such areas as restructuring government's nuclear waste management to a government corporation, establishing interim storage facilities, creating a clear path for constructing a permanent nuclear waste repository, evaluating the retrievability

requirement of the Nuclear Waste Policy Act, consider recycling the used fuel, and assessing whether the nuclear waste fee should continue or deposit it into a private escrow account.

3. In mid-August a group of experts in nuclear waste policy from three mid-western universities published a report from a March 16, 2009 workshop on Arms Control, Disarmament and International Security held at the University of Illinois at Urbana-Champaign. The report documents the recent success achieved in reaching a consensus on how to revise the nation's management of spent nuclear fuel. Although the report lists five Plans (A-E), the experts advocate a Plan D – holding spent fuel in dry cask storage until it becomes clearer whether reprocessing will precede permanent disposal. The experts proposed seven recommendations that would require US Congressional action to manage this situation efficiently and lay the groundwork for a useful transition to long term spent fuel management. They are: 1) set up regulated escrow accounts for utilities to draw on for on-site management of dry cask storage, 2) allow shipments of spent fuel from one utility to another utility in the same state, 3) provide a financial incentive for states to agree to accept spent fuel from an inoperative site in a neighboring state to a reactor site in their own state, 4) require any licensed reprocessing facility to be licensed for on-site storage of any spent fuel and reprocessing waste streams, 5) set up a tightly regulated corporation to license long term spent fuel facilities should the federal government fail to do so, 6) allow states to receive very large financial incentives for hosting long term spent nuclear fuel facilities, and 7) consider licensing long term management facilities for taking spent fuel from many different reactor sites, but not using such facilities until it is clear that it is more economical to do so than to store in dry casks at operating reactor sites.
4. On October 30<sup>th</sup> the U.S. Nuclear Waste Technical Review Board issued a report to Congress and the Secretary of Energy, entitled “Survey of National Programs for Managing High Level Radioactive Waste and Spent Nuclear Fuel”. The report surveys and describes 30 technical and institutional attributes of nuclear waste programs in 13 countries which account for 83% of the worldwide nuclear power generating capacity. The Board did not evaluate or make judgments about any of the programs but rather provided an overview of lessons learned for Congress and Secretary Chu to consider and incorporate in evaluating options for managing the nation's nuclear waste stockpile.
5. On November 4<sup>th</sup> the Government Accountability Office issued GAO 10-48 Report, entitled “NUCLEAR WASTE MANAGEMENT - Key Attributes, Challenges, and Costs for the Yucca Mountain Repository and Two Potential Alternatives”. The Report was issued in response to three Congressional requesters, Senator Majority Leader Harry Reid, Senator John Ensign, both from Nevada, and Senator Barbara Boxer from California. The GAO cost projections found a) “that a repository to dispose of 153,000 metric tons (of nuclear waste) would cost \$41 billion to \$67 billion (in 2009 dollars) over a 143 year period until the repository is closed.” Nuclear power electric rate payers would pay about 80% of these costs and taxpayers would pay about 20%. b) “GAO estimated (in 2009 dollars) the cost of centralized storage of 153,000 metric tons at the end of 100 years to range from \$15 billion to \$29 billion but increasing to between \$23 billion and \$81 billion (with disposal in a permanent geological repository after 100 years).” The GAO assumed that two locations for centralized storage could be realized within 10 to 30 years. c) “GAO estimated the cost of on-site storage (in 2009 dollars) of 153,000 metric tons at the end of 100 years to range from \$13 billion to \$34 billion but increasing to between \$20 billion to \$97 billion (with disposal in a permanent repository after 100 years).” Options ‘b’ and ‘c’ cover a period of 232 years. The GAO Report also assessed on-site storage costs for 500 years with repackaging every

100 years for safety purposes from \$34 billion up to \$225 billion. The GAO Report acknowledged large uncertainties in their cost projections.

6. On December 4<sup>th</sup> the Sustainable Fuel Cycle Task Force (SFCTF) issued a statement in response to the Government Accountability Office Report (GAO-10-48) on nuclear waste management. The SFCTF took issue with the GAO's methodology to discount future costs for storing and disposing of nuclear wastes. According to the SFCTF the discounting technique is appropriate in comparing choices in the near term. Since nuclear waste management is a multi-decade, if not a multi-century undertaking, discounting costs beyond a decade masks the costs that will be paid by taxpayers and ratepayers. The SFCTF estimates the cost for storing spent fuel for over 100 years will more likely total over \$100 billion as compared to the GAO costs of \$13 to \$34 billion. The approach advocates paying the higher up front capital costs for Yucca Mountain now as oppose to paying on-going storage costs for 100 years and then paying the construction and operating costs for a geologic repository.
7. On December 22<sup>nd</sup> the Congressional Research Service issued a report, entitled "The Yucca Mountain Litigation: Breach of Contract Under the Nuclear Waste Policy Act of 1982". The report addresses key issues that have surfaced due to protracted waste storage litigation, explains the jurisdictional conflict between the U.S. Court of Appeals for the Federal Circuit and the U.S. Court of Appeals for the District of Columbia Circuit, and reflects on the potential for future liability from storage and disposal delays.