

Meeting of the Northwest Interstate Compact on Low-Level Radioactive Waste Management

June 12, 2014

Courtyard Marriot
Richland, Washington

Present

Mike Garner, Executive Director/Acting Chair
Marlene Brewer, Alaska
Jeffery Eckerd, Hawaii
Roy Kemp, Montana
Ken Niles, Oregon
Rusty Lundberg, Utah
Kristin Mitchell, Compact Council
Lois Dahmen, Compact Staff

Mr. Mike Garner, Executive Director/Acting Chair, convened the meeting at 9:00 am. Mr. Garner stated he would be filling the role of Chair as Mr. Larry Goldstein, previous Chair, retired on May 30, 2014. The committee then unanimously approved the minutes from its June 18, 2013 meeting held in Boise, Idaho.

Mr. Garner reported he was recently contacted by Mr. Luke Esch with Wyoming's Department of Environmental Quality. Mr. Esch stated he had been selected to fill Mr. Carl Anderson's position following his retirement. Mr. Garner stated examples of appointment letters were provided to Mr. Esch and is hopeful Wyoming will appoint its new member to the committee shortly.

Mr. Garner thanked US Ecology representatives for arranging a tour of its Richland commercial low-level radioactive waste disposal facility for committee members yesterday.

Party State Reports

Alaska

Ms. Marlena Brewer reported the Alaska Department of Conservation entered into a joint regulations update with Alaska's Division of Public Health for radiation protection standards. The current regulations predate when Alaska became a non-agreement state with the U.S. Nuclear Regulatory Commission (NRC). A copy was provided to the committee members for review. The only remaining waste issue involves Naturally Occurring Radioactive Material (NORM) and the Department of Conservation's Solid Waste Program plans to incorporate this material into its solid waste regulations. Ms. Brewer stated she will provide updates on the status of these actions as they progress.

Montana

Mr. Roy Kemp reported high levels of oil field activities continue in northeastern Montana, North Dakota, and Canada. Discussions are ongoing between Montana's Department of Environmental Quality and North Dakota about how to best manage NORM wastes being

generated by oil field activities. Mr. Kemp stated that although the states have different regulatory thresholds, it is hoped the two states can reach agreement on this issue.

Hawaii

Mr. Jeff Eckerd stated Hawaii has nothing new to report.

Oregon

Mr. Ken Niles reported representatives of the U.S. Department of Energy (Energy) conducted a site assessment visit at the decommissioned Trojan facility during July 2013 to discuss and evaluate transportation infrastructure at the facility. Energy representatives were taken on a tour of the railroad spur and barge slip. This is part of an effort to examine all of the shut down reactors and the possibility Energy might open an interim storage facility for spent fuel. Trojan has rail access but would have to replace about 100 yards of the railroad spur that was previously removed. Although the facility has a barge slip, Mr. Niles stated he told Trojan representatives that barging the spent fuel would not seem to be feasible due to public perception. Plus, there is no logical destination to send the spent fuel via a barge.

Utah

Mr. Rusty Lundberg stated he would defer to his scheduled presentation on Utah activities.

Washington

Mr. Mike Garner stated he would also defer to his scheduled presentation.

US Ecology Activities Overview

Mr. Mike Ault, General Manager - US Ecology Washington (USEW), stated US Ecology is a publically traded company under NASDAQ (ECOL) headquartered in Boise, ID and has approximately 450 employees. US Ecology recently entered into an agreement to purchase The Environmental Quality Company (EQ). US Ecology's mission is to provide safe, compliant, cost-effective hazardous waste and radioactive materials management solutions to industry and government.

Mr. Ault stated US Ecology's Richland, WA, facility is located within Energy's Hanford Reservation on 100 acres that is subleased to the company by the Washington State Department of Ecology (Ecology). Mr. Ault stated the Richland facility provides access for disposal of low-level radioactive waste (LLRW) generated in the eleven member states of the Northwest and Rocky Mountain Compacts. The facility also accepts NARM and Exempt waste from states throughout the country.

Mr. Ault reported US Ecology also operates a facility in Grandview, ID, that receives Resource Conservation and Recovery Act (RCRA), Toxics Substance Control Act (TSCA), Low-Activity Radioactive Material (LARM), and low-level Naturally Occurring Radioactive Material (NORM) wastes. The company also operates a facility in Nevada which accepts significantly lower concentrations of RCRA, TSCA, and NORM wastes than its Grandview, ID facility. The company has a facility in Corpus Christi, TX, and operates a RCRA treatment and disposal

facility located near Montreal, Canada. Two years ago, US Ecology purchased a water treatment facility in Detroit, Michigan.

Mr. Ault reported USEW has maintained its status as a Voluntary Protection Programs site for five years. Employees have strongly embraced this safety culture.

Mr. Ault stated LLRW disposal fees at the Richland facility are regulated by the Washington Utility & Transportation Commission (WUTC) who must approve annual disposal fees. Under rate regulation the company is afforded an annual revenue requirement which provides for reimbursement of the company's cost to operate the facility and a reasonable profit margin.

Mr. Ault reported the facility has ample disposal capacity available through 2056, the year when installation of the final cover begins. The company anticipates it will take approximately 24 months to install the final cover. Once the final cover is installed, the facility will be turned over to the state for a five-year observation period. Following the observation period the state will turn the facility over to Energy.

Mr. Ault reported there are two active trenches at the facility. Trench 18 receives unstable waste and Trench 19 receives stable waste. In 2013 the facility received 23,238.24 cubic feet of LLRW; 1,603.46 cubic feet of NARM waste; and 117.70 cubic feet of Exempt waste for a total of 24,959.40 cubic feet. To date in 2014, the Richland facility has received 5,853.30 cubic feet of LLRW; 2,645.50 cubic feet of NARM waste; and 24.00 cubic feet of Exempt waste for a total of 8,522.80 cubic feet. Mr. Ault stated Exempt wastes are primarily disposed in RCRA landfills as disposal fees are much lower than the Richland facility.

Status of 2014 Revenue Requirement through April 2014

Component	Site Avail	Volume	Shipment
Requirement	\$620,004	\$2,063,366	\$727,969
Collected	\$615,280	\$853,225	\$193,260
Remaining	\$4,724	\$1,228,141	\$534,709

Component	Container	Exposure	Total
Requirement	\$1,403,872	\$927,209	\$5,742,420
Collected	\$417,040	\$239,126	\$2,299,931
Remaining	\$986,832	\$688,083	\$3,442,489

Mr. Ault commented that Energy Northwest didn't ship much LLRW through the first quarter of 2014, but it is anticipated shipments will increase through the remainder of the year. In addition, the company anticipates receiving LLRW from Dawn Mining Co. which was not included in the company's annual projection.

Mr. Ault stated the Richland facility's waste acceptance criteria allow the facility to accept radium sealed sources, NARM waste, containing up to 1.2 curies. Other commercial disposal

facilities cannot accept radium sources with this level of activity. As a result, many of the radium sources throughout the nation are shipped to the Richland facility for disposal.

Mr. Ault stated the company does a visual inspection of each incoming waste shipment. In addition, the Washington State Department of Health (Health) selects a container from one shipment each week. The container is then opened and the contents are visually inspected to ensure the waste is free of liquids and meets the license requirements.

Mr. Ault reported USEW submitted its radioactive materials license renewal application to Health in 2010. Health approved the license renewal application in February 2014 (Amendment 40) and its term will expire on December 31, 2018. A requirement of the new license is the installation of three new groundwater wells, one up-gradient and two down-gradient. The facility's location in the middle of Energy's cleanup at the Hanford Reservation makes the up-gradient wells very important as samples are used to identify the level of groundwater contamination coming onto the site from off-site locations. This information allows the company to identify their contribution to the groundwater pathway. The installation of the new groundwater wells was completed in January 2014, and the first samples were collected on March 10, 2014.

Mr. Ault reported efforts continue with the Model Toxics Control Act (MTCA) investigation. Prior to 1985 there was no mixed waste, as waste containing both a hazardous and radioactive component was simply considered to be radioactive waste. Following initiation of the MTCA investigation, the company began to examine its historical waste receipts and determined scintillation vials containing toluene and benzene were the primary contributor to the hazardous waste disposed in the facility. The use of absorbents was discontinued in 2000 and was replaced by solidification requirements.

The company began looking at the impact of the hazardous materials and a conceptual-type model was completed on September 4, 2013. The company submitted its draft Focused Feasibility Study (FFS) to Ecology on February 5, 2014. Ecology provided additional comments to the company on May 14, 2014. The company asked Ecology for clarification on its comments, primarily technical issues, in a request submitted on May 30, 2014. The company anticipates submitting a revised draft approximately five weeks after receiving Ecology's responses to its clarification request.

Mr. Ault reported the company is working with Health on transferring approximately 500,000 cubic yards of soil from Energy's Environmental Restoration Disposal Facility (ERDF) to its facility. The soils are available as a result of excavation that took place during the development of disposal capacity at the ERDF facility. The soils will be used to install the first phase of the cover over the closed trenches at the facility.

Utah – Activities Overview

Mr. Lundberg stated Utah's Department of Environmental Quality believes it is important to gain the confidence of the public as the agency engages in programs throughout its departments. The

primary services offered by Utah's Division of Radiation Control (UDRC) are associated with licensing and permitting in the following areas:

- Low-level radioactive waste management facilities
- Uranium mill tailings operations
- Generator Site Access Program
- Radioactive materials (industrial, medical, institutional, and commercial uses)

Mr. Lundberg stated the priorities of UDRC include:

- Assure that LLW management within Utah is protective of public health and safety and the environment.
- Foster and work within a regulatory framework that is transparent and predictable
- Institute agency/program efficiencies.
- Build public and regulated community confidence.
- Enhance information sharing, ensuring documents are available in a timely manner and are easily accessible.
- Assure that adequate planning and resources are in place for long-term stewardship at EnergySolutions' Clive, UT, disposal facility.

Mr. Lundberg reported when EnergySolutions' initial license was issued, an exemption was granted regarding the requirement for government ownership of the land on which a LLRW disposal facility is located. A few years ago, the Legislature implemented a requirement for UDRC and Utah's Hazardous and Solid Waste Program to evaluate and report on long-term stewardship and funding for facilities these departments regulate every five years. The initial report was issued in 2006 and the next update is due in 2016.

Mr. Lundberg reported on a number of program activities that UDRC has undertaken:

- Initiated actions to attempt to engage external stakeholders earlier in the process rather than waiting for a draft decision being distributed for comment. This is consistent with the commitment of Utah's Department of Environmental Quality to place documents and information online in real time for stakeholders.
- Two listservs have been developed: one covers UDRC general activities and the other is specific to EnergySolutions. Both are able to provide automatic email notices to interested parties.
- The UDRC website is developing a search engine where interested parties can search documents geographically or with a specific focus; e.g., EnergySolutions can be found under EnergySolutions or Tooele County (location of the EnergySolutions' Clive facility).
- Agency budget creates more performance accountability per the Legislature's request
- Currently moving away from a trial-type administrative procedure to an administrative records process. This places more emphasis on research and documentation of information underlying licensing and permitting actions.

Mr. Lundberg stated the Legislature requires the Utah's Department of Health and UDRC to develop a statewide electronic awareness campaign to educate the public on radon gas, its health risks, testing options, and remediation.

Mr. Lundberg reported Utah's Legislative Auditor General's Office audited UDRC's association and oversight of the EnergySolutions' Clive facility and issued its report in September 2012. The primary focus of the audit was on predisposal activities rather than the activities auditors felt UDRC is currently dedicating its resources to. In response to the audit, UDRC has put together a guidance document to assist staff in conducting inspections of out-of-state site generators that ship LLRW to the Clive facility. UDRC is very aware of the jurisdictional boundaries this entails, but is taking this action to ensure LLRW received at the Clive facility does not exceed Class A limits. In addition, UDRC is now running each SempraSafe shipment through a software package to ensure it does not exceed Class A limits.

Mr. Lundberg stated UDRC current activities include:

1. Utah Radiation Control Board (URCB) rulemaking actions
 - URCB implemented a rule change that increases civil penalties from \$5,000 to \$10,000 per violation for EnergySolutions Clive facility.
 - URCB approved a rule that extends the term of a radioactive materials license from five years to ten years unless there are compliance issues requiring a more frequent or thorough review. However, new licenses will continue to have a term of five years.
 - URCB is developing rules that categorize and establish time frames for LLW licensing and permitting actions performed by UDRC.
 - URCB is adopting rules to revise the generator site access requirements.
2. EnergySolutions Activities
 - A one-year variance for the acceptance of sealed sources was issued and is scheduled to expire on September 30, 2014. To date, the Clive facility has received one drum of sealed sources from the Source Recovery and Threat Reduction (SCATR) program operated by the Conference of Radiation Program Directors (CRCPD). The facility expects to receive one or two more drums by the September 30th deadline.
 - Evaluation of the SempraSafe LLRW stream continues. Originally SempraSafe was a joint venture between Studsvik and EnergySolutions, but EnergySolutions subsequently purchased the Studsvik facility. Under its current license, EnergySolutions' Clive facility is allowed to accept restricted volumes of the SempraSafe waste annually until UDRC completes its evaluation.
 - Technical contractor SC&A was hired to help evaluate the depleted uranium performance assessment. A second set of questions and requests for information has been submitted to EnergySolutions. UDRC hopes to complete its review of the performance assessment by August 2014 and anticipates making a decision by October 2014.
 - Radioactive materials license and ground water permit renewals were issued.
 - Authorization was granted to combine disposal embankments Class A South and Class A North to create a Class A West aggregated disposal embankment.
 - Work continues on the 11e.(2) byproduct material license renewal.
 - Discussions continue with Energy regarding long-term stewardship at the Clive facility.

Energy Solutions – Activities Overview

Mr. Sean McCandless, Manager of Compliance and Permitting, stated EnergySolutions provides all aspects of complex planning and transportation services for waste disposal, including a fleet of tractor-trailers, railcars, and containers. The company owns and operates processing facilities located in South Carolina, Tennessee, and Utah. It also operates two LLRW disposal facilities located in South Carolina and Utah.

Mr. McCandless stated EnergySolutions' Bear Creek processing facility (formerly Duratek) was built in 1985. The facility has 250,000 square feet of bonded radioactive waste storage space and the capability to process over 30 million pounds of waste annually. The facility has a metal melt furnace, two waste incinerators, lead recycling capabilities, and the largest waste compactor in the U.S.

Mr. McCandless reported as of February 2014, EnergySolutions' metal melt furnace has recycled over 128 million pounds of contaminated metals for beneficial use. One of the resulting products includes 10 ton shielding blocks for use in high energy physics labs. The two incinerators provide a throughput of approximately 7 million pounds per year of radioactive waste including solids, liquids, and sludge materials. The compactor is used to compact waste boxes and drums.

Mr. McCandless reported the on-site lead recycle facility is able to extract lead for reuse in various types of shielding containers and components such as DOT Type A packages, process shields for liners, specialty shields for accelerators, and transfer bells. These products are then made available for sale to the nuclear industry.

Mr. McCandless stated the Bear Creek facility also has an RCRA permit to perform a variety of relatively standard treatment activities to include macro encapsulation, waste sorting and segregation, size reduction, amalgamation, and chemical reduction.

Mr. McCandless stated as the Bear Creek facility has grown and matured, EnergySolutions has acquired neighboring facilities:

- The Bear Creek Radioactive Material Solutions operation provides advanced characterization, storage, and staging for enhanced industry optimization of high activity wastes.
- The Erwin, TN Resin Solutions processing facility, formerly Studsvik, uses Thermal Organic Reduction (THOR) technology for processing ion exchange resins generated by nuclear utilities. This facility has been in operation since 1999 and 52 waste shipments have been received at the Clive facility. This represents a small fraction of the limit currently authorized by UDRC.
- The Memphis, TN Operations includes barge access that enables the facility to receive large items.

Mr. McCandless stated Hittman is EnergySolutions' transportation/trucking company. The company has provided approximately 40 years of safe nuclear transportation with a good fleet of containers, tankers, casks, and trailers.

Mr. McCandless reported safety is a high priority at the Clive facility. The last lost-time injury was almost four years ago (1,152,681 work hours), and there have only been two recordable events during this period.

Mr. McCandless stated EnergySolutions owns a half section south and a full section north of the section used for waste disposal. This area provides support to the facility as sand and clay are mined for use at the disposal facility.

Mr. McCandless stated the Clive, UT facility has a full suite of licenses and over 26 years of experience treating and disposing of Class A LLRW. The facility provides for the disposal of bulk wastes, containerized waste, and large components. The facility also provides mixed waste treatments to include macro encapsulation, stabilization, liquid solidification, thermal desorption, and PCBs. Current projects include the mixed waste cover, Class A cover, facility consolidation, radioactive materials license renewal, groundwater permit renewal, and renewal of its RCRA Part B permit.

Mr. McCandless reported the current approved cover is a rock armor mulch design, but the company is now examining an evapotranspiration cover. Once the design is completed it will need to be approved by URDC. Mr. Niles asked how a fire or deep-rooted vegetation would impact an evapotranspiration cover. Mr. McCandless indicated a fire event has not been evaluated but thinks it would be similar to an un-vegetated cover, which has been examined. The deep rooted vegetation has been examined and the roots appear to only go down a couple of feet and then spread horizontally when they hit a dense, tightly packed layer.

Mr. McCandless reported the Clive facility received over two million cubic feet of LLRW in 2013. Annual volumes for commercial LLRW have stayed fairly stable over the past five years, approximately 1.5 to 2 million cubic feet. Energy's LLRW volumes declined to less than 1 million cubic feet during the past two years and tends to fluctuate much more than commercial LLRW annual volumes.

US Ecology MTCA Investigation

Ms. Robin Varljen, Site Manager, stated at the last committee meeting releases at the site were reviewed. Since then, Ecology has finished the Conceptual Site Model and is working with US Ecology on a Focused Feasibility Study (FFS) to evaluate remedial action alternatives.

Ms. Varljen reported the steps remaining in the cleanup process include: 1) completion of the FFS; 2) selection of a Cleanup Action Plan; and 3) site cleanup. The purpose of the FFS is to develop and evaluate cleanup action alternatives to enable cleanup at the facility.

Ms. Varljen stated the steps in the remedy selection process include:

1. Identify remedial action goals.
2. Identify a reasonable number and type of alternatives. For example, the US Ecology facility has both groundwater and vapor contamination, so some remedial alternatives have been identified to address these issues.

3. Conduct an initial screening of alternatives. Alternatives that don't meet the minimum requirements will be eliminated as well as those where the cost is disproportionate to the benefit.
4. Conduct a detailed evaluation of the alternatives. Evaluate according to the regulations; is there a reasonable restoration timeframe; determine cost and benefits and; identify the degree of permanence via the disproportionate cost analysis outlined in the regulations.
5. Select a preferred remedy on the basis of the detailed evaluation in Step 4; distribute it for public comment; evaluate the public comments; and draft a cleanup action plan.

Ms. Varljen reported the following Threshold Minimum Requirements for cleanup actions include:

- Protecting human health and the environment.
- Complying with cleanup standards.
- Complying with applicable state and federal laws.
- Providing for compliance monitoring.

Additional minimum requirements for cleanup actions include:

- Use permanent solutions to the maximum extent practicable.
- Provide for a reasonable restoration time frame.
- Consider public concerns.

Ms. Varljen stated certain facilities may have site-specific requirements. For example, US Ecology has site-specific requirements for groundwater cleanup actions and institutional control.

Ms. Varljen reported there are various ways to determine if a remedy is protective of human health and the environment:

- Cleanup actions that achieve cleanup levels at the point of compliance and comply with applicable state and federal laws are presumed to be protective of human health and the environment.
- A quantitative site specific risk assessment may be conducted to help determine whether a cleanup action that doesn't achieve cleanup levels is protective of human health and the environment.
- A qualitative evaluation may also be used.

Ms. Varljen stated to determine if an alternative is "permanent to the maximum extent practicable," a "disproportionate cost analysis" is conducted. Costs are disproportionate to the benefits if the incremental costs of a "higher cost" alternative over that of a "lower cost" alternative substantially exceed the incremental degree of benefits achieved by the "higher cost" alternative over that of the "lower cost" alternative. The term "disproportionate" means the degree to which incremental costs exceed incremental benefits must be substantial.

Ms. Varljen reported the next step involves Ecology working with US Ecology to draft the FFS. Once completed, Ecology will prepare a draft cleanup action plan (CAP). Then the remedial investigation, focused feasibility study, and the draft CAP will be distributed for public comment. After considering public comment to see if any remedy decisions need to be re-evaluated, the CAP will be finalized. Once issued, the CAP locks in the cleanup standards; the values that need to be met at the point of compliance.

Ms. Varljen stated during the administrative approval process, Ecology will work with US Ecology to get approval through a consent decree, agreed order, or an enforcement order.

Ms. Varljen reported the schedule for MTCA actions is as follows:

- Period of developing the draft FFS – 8/23/2013-8/15/2014
- Period of developing the draft CAP – 8/18/2014-3/15/2015
- 30-day comment period – 3/19/2015-4/29/2015
- CAP finalized – 9/2/2015
- Implement cleanup action – 3/1/2016-11/7/2016

Mr. Niles asked if the process has progressed to the point where some of the possible cleanup alternatives can be described. Ms. Varljen indicated that before this can be done, parties need to reach a consensus on the alternatives. Mr. Niles then asked what consideration is given to the neighbor, Energy, as they will leave significant waste volumes on-site. Ms. Varljen indicated neighbors are not taken into consideration, but both Energy and the Environmental Protection Agency have been kept informed of investigation activities.

Mr. Richard Grondin, Perma-Fix NW, asked if the cost of remediation is already included in the fees. Ms. Varljen indicated the Closure Fund will likely be used for remediation. Mr. Garner stated there is currently \$24-25 million in the Closure Fund, and payback for the \$13.8 million borrowed from the Closure Fund about 10 years ago started in 2008 and will continue through 2033.

Mr. Zittle, University of Washington, asked if licensees will be approached to contribute funds for the remediation. Ms. Varljen stated it was uncertain but didn't believe licensees would be approached in the near future.

Mr. Lundberg asked how stakeholders might respond to a disproportionate cost to benefits analysis because in many cases stakeholders are not concerned about the cost; they just want the contamination cleaned up. Ms. Deborah Singleton, Ecology, stated it is likely similar comments will be received once documents are distributed for public comment.

Low-Level Radioactive Waste Forum's Disused Sources Working Group

Mr. Slosky, Executive Director of the Rocky Mountain Compact and Chair of the Disused Sources Working Group (DSWG), stated in September 2011, at the request of the Energy's National Nuclear Security Administration (NNSA), the LLW Forum formed the DSWG. The mission of the DSWG was to develop recommendations for improving the management and disposition of disused sealed sources that pose a potential threat to national security.

Mr. Slosky stated over a 31-month period, the DSWG solicited input from a broad range of stakeholders. The final report, which includes findings and recommendations of the DSWG, was issued in March 2014 and is available at www.llwforum.org.

Mr. Slosky reported the DSWG has begun its second phase which involves building stakeholder support and to pursue implementation of its recommendations. The primary purpose of the project is to reduce the opportunity of a radioactive dispersal device (dirty bomb) event occurring

in the country. There are 2 million licensed sealed sources in the country and the vast majorities are handled responsibly by licensees. The sources provide many beneficial uses to our society, but tens of thousands of these sources are viewed as a national security risk by NNSA. NNSA wants to improve the control of these sources through the disposition of sources that have been stored indefinitely to ensure they are less susceptible to being misappropriated or lost.

Mr. Slosky stated that it is pretty easy to obtain a radioactive sealed source. A couple of years ago, the U.S. Government Accountability Office (GAO) submitted a scam license application to NRC and was able to obtain a radioactive materials license. However, when GAO attempted a similar scam in an agreement state, it withdrew its license request when the agreement state indicated it would have to visit the business address before issuing a radioactive materials license.

Mr. Slosky reported NRC has not implemented financial assurance requirements on licensees to date. Financial assurance would provide significant incentive for licensees to dispose of disused sources that are no longer needed in a timely manner; thereby reducing storage terms.

Mr. Slosky stated certain higher activity sources require special transport containers such as a Type B container. The rental of a Type B container to transport sources for disposition can cost up to \$100,000. The current system makes it easier and cheaper to store a disused source rather than disposing of it.

Mr. Slosky stated that licensees who purchase sources and profit from their use should be responsible for the cost of disposing of them. In many cases, life-cycle costs are not internalized and don't include the eventual cost of disposition. Unfortunately, the opening of the Texas Compact facility to out-of-region LLRW has not resulted in a rush to dispose of disused sources. Programs like SCATR operated by CRCPD currently subsidize the cost of disposal for the vast inventory of lower activity sources. NNSA's Off-Site Recovery Program (OSRP) subsidizes the disposal of large, high activity sources that pose the greatest threat to national security. The program provides for pickup and disposal of these sources. In these cases, the licensee profiting from use of the source ends up not being responsible for the entire cost of disposition. These programs may provide disincentive for licensees to promptly disposition disused sources as the licensee may instead choose to wait for the next subsidized roundup to come through its area. Eventually the SCATR and OSRP programs will need to be re-evaluated so that licensees understand they are responsible for the disposition of a source when it is no longer needed.

Mr. Slosky reported several states have gone above the federal requirements. Illinois and Florida have implemented financial assurance requirements for certain licensees. In Oregon, licensees have to pay an annual possession fee for each source in their possession. In other states, one fee is paid whether a licensee has one source or 10,000 sources. The individual source possession fee creates incentive for licensees to promptly dispose of sources that are no longer needed. Mr. Slosky stated the report recommends a limit on how long a source may be stored without use. If a source hasn't been used for two years and has no prospect of being used in the foreseeable future, the regulator could then require the licensee to dispose of it within a year. A source exchange is also being considered so licensees that have sources they no longer need, can identify if another licensee may need such a source.

Mr. Slosky reported one area of the report has gotten significant pushback from stakeholders. This is DSWG's concern that greater attention needs to be paid to the threat posed by Category 3 sources. In certain cases, two aggregated Category 3 sources can pose a threat similar to or greater than one Category 2 source; which is considered a threat to national security. The NRC has previously considered this issue but has not taken any action to date. NNSA considers Category 3 sources to be a national security risk. The DSWG report recommends that any source considered to be a threat to national security should be specifically licensed instead of generally licensed; as is presently the case with Category 3 sources. The DSWG recommends NRC reconsider including higher activity Category 3 sources in its National Source Tracking System (NSTS). Currently, only Category 1 and 2 sources are required to be entered in the NSTS. In addition, the DSWG recommends validating the information on sources contained within NSTS during on-site inspections conducted by NRC representatives. The NSTS contains an optional field that shows if a source is currently in use or if it is disused. The DSWG recommended it be changed from an optional to a mandatory field. The NRC has not done this, but did issue an information summary recommending that licensees who use the NSTS complete this field.

Mr. Slosky stated the limited availability of proper transportation containers, such as the Type B containers, impacts the expediency of disposal. Foreign transport containers, approved by the International Atomic Energy Association (IAEA), can be shipped to the US fully loaded. These fully loaded containers can then be shipped by truck across the country. However, this same container cannot be used to ship a source to a commercial disposal facility. DSWG has suggested that NNSA select a couple of the international transport containers that would have versatile application in this country and pay the NRC to conduct the tests needed to certify these foreign containers for domestic use.

Mr. Slosky reported the DSWG has gotten some positive response to its report. NNSA presented the report to the IAEA who intends to use it as part of its input in developing guidance to its Code of Conduct.

Mr. Slosky reiterated the DSWG is moving into its second phase which involves a continued dialogue with stakeholders while pursuing implementation of its recommendations.

Mr. Niles stated a couple of years ago it appeared there was a crisis as a number of states had no disposal access for Class B and C LLRW. Has this crisis been eliminated now that Waste Control Specialists has opened? Mr. Slosky stated originally it appeared NNSA wanted operating sites to provide exemptions for the disposal of radioactive sealed sources posing a national security threat. With the opening of the Texas facility and the willingness of the Texas Compact to provide access to out-of-region LLRW, this is no longer the case.

Mr. Zittle stated that during his employment at Oregon State University it took five years to dispose of thirty-two radioactive sealed sources. It was a very difficult process. Mr. Slosky replied one of the DSWG's recommendations includes the development of a technical assistance program to assist licensees with this process.

Closure Activities at the Richland, WA, Commercial LLRW Disposal Facility

Mr. Earl Fordham, Deputy Director, Washington State Office of Radiation Protection, stated the Richland commercial LLRW disposal facility is located in Benton County, approximately 23 miles northwest of Richland, WA. It is near the center of Energy's Hanford Reservation on 100 acres of land. Access to the facility is restricted, and there are no permanent residents on or adjacent to the site. The Columbia River is the nearest significant body of surface water and is located approximately six miles east of the facility. Groundwater depth is over 300 feet, and the average annual precipitation is approximately 6.5 inches. There are no domestic or municipal wells within several miles of the site. Energy has a number of monitoring wells nearby, and monitoring wells are located on-site at the facility.

Mr. Fordham stated in 1964, Washington State and the Atomic Energy Commission (now Energy) entered into a 99-year lease agreement for 1000 acres on the Hanford Reservation. In 1965, the state of Washington subleased 100 acres of land to California Nuclear Inc. (US Ecology, Inc.), for the operation of a commercial LLRW disposal facility. In the middle of the 90's Energy withdrew the undeveloped 900 acres, as provided for under the terms of the Prime Lease, for development of ERDF.

Mr. Fordham reported Health regulates the USEW operation through a radioactive materials license that authorizes the facility to receive, transfer, repackage and dispose of radioactive waste. If incoming LLRW is non-compliant, it is Health's policy to first allow USEW to attempt to bring the waste into compliance prior to putting it back on the road. During previous periods when the facility received significantly higher annual LLRW volumes, Health maintained a resident on-site inspector.

Mr. Fordham stated ninety-five percent of the LLRW received at the facility is Class A LLRW. This typically includes items such as contaminated protective clothing, wiping rags, filters, reactor water treatment residues, equipment and tools, etc. Class B and Class C LLRW have a higher activity than Class A LLRW and generally consists of water treatment residues, discarded nuclear reactor parts, and gauges containing radioactive material. NARM wastes include pipe scale from oil and gas pipelines, soils from cleanup of mineral processing sites, and sealed radioactive sources containing radium.

Mr. Fordham reported LLRW is packaged in containers appropriate to its hazard level. Some higher activity LLRW requires shielding with lead, concrete, or other material to protect workers and members of the public. LLRW is disposed in unlined trenches that are approximately 1,000 feet long, 150 feet wide, and 50 feet deep. There are 22 closed trenches and two active trenches (18 and 19). Trench 19 is an active trench and is characterized as a "dig as you go" trench. Mr. Fordham stated closed trenches are covered with a minimum of eight feet of soil and then six inches of rock is placed on the soil to reduce erosion. Monument markers with plaques are positioned at the trench ends.

Mr. Fordham stated five steel tanks were buried at the US Ecology site in the 1960's for the treatment of liquid LLRW. In 1985, snow runoff collected above the tanks, entering one and it was estimated 100-120 gallons of liquids was released from this tank. From 1985 through 1986,

the five tanks were pumped to remove their contents. Liquids from the tanks were solidified and disposed of in Trench 11-A. In 1986, two of the tanks were removed and the remaining three tanks were solidified in place. The tank farm was permanently closed in 1987.

Mr. Fordham reported US Ecology's license requires regular monitoring of soil, groundwater, vegetation, and ambient air for radionuclide analysis. This information is then compiled into reports.

Mr. Fordham stated vadose zone and groundwater contamination from past Energy activities on the Central Plateau has been well-documented. Radioisotopes contaminating the groundwater include tritium, cobalt 60, strontium 90, technetium 99, iodine 129, cesium 137, and plutonium and uranium isotopes. Several plumes are either moving slowly towards the US Ecology site or have already passed under the site.

Mr. Fordham reported that 2056 is the last possible year for disposal operations to cease and closure to begin (lease expires in 2063). This provides two years for USEW to install the final phase of the cover and five years of institutional monitoring by the state prior to turning the site over to Energy.

The radioactive materials license limits the total site activity for specific radioisotopes. For example, tritium has an annual limit of 100 Ci which is far in excess of what is normally received.

The Final Environmental Impact Statement (FEIS) dated May 28, 2004, identifies a GeoSynthetic Cover as the preferred cover alternative. The cover design must meet or exceed the GeoSynthetic performance criteria as follows:

- Water infiltration rate through the cover less than or equal to 0.5 mm/year
- Radon 222 emanation rate through the cover less than or equal to 0.62 pCi/m²
- Cover depth equal to or greater than five meters
- Off-site resident dose less than or equal to 22 millirem (mrem) per year
- On-site resident dose less than or equal to 107 mrem per year
- Compliant with Minimum Technical Requirements for RCRA landfills as defined in RCRA guidance document

The cover will be constructed in two "phases" as identified in the FEIS. Modeling indicates the first phase of the cover should be installed by 2020, plus or minus four years, to meet the 22 mrem standard. The first phase of closure would include six inches of soil, a sheeted layer of high density polyethylene (HDPE - 80 ml.), and an additional twenty-two inches of soil on the HDPE plastic sheet. Health was very close to putting out a bid to move soils onto the facility from ERDF when Ecology and Health were sued by Heart of America and Yakamas. Phase 1 cover construction over all closed trenches is now proposed for the 2015-16 time period.

National and Regional Issues

Mr. Garner reported during the past year one import/export license (IW032and XW021) application was received. It was from Eastern Technologies, Inc., in Ashford, AL and would

provide for the import of contaminated polyvinyl alcohol waste from Canadian utilities for volume reduction. The export license provides for the return of waste residuals and non-conforming items (zippers, elastic, and hook and loop closure materials) resulting from processing to the Canadian utilities. None of the LLRW resulting from processing would be shipped to the Clive facility for disposal. The response provided to the NRC stated the NWIC has no issue with these license applications.

Mr. Garner stated NRC's Branch Technical Position (BTP) on concentration averaging and encapsulation is scheduled to be completed in 2014. The revised BTP increases the Class C limit for Ce-137 from 30 to 130 curies; provides guidance on "Alternate Approaches"; and allows for the large-scale blending of homogenous LLRW. The NRC has stated it will hold implementation meetings regarding changes incorporated into the BTP.

Mr. Garner reported the NRC continues to pursue its 10 CFR Part 61 rulemaking. Amendments included in staff's proposed rule (SECY-13-0075) include:

- Performance Assessment (Compliance Period) – 10,000 years and 25 mrem
- Intruder Assessment – 10,000 years and 500 mrem
- Long-term analysis to assess how the disposal facility and site characteristics limit the potential long-term radiological impacts
 - This analysis only applies to disposal sites containing significant volumes of long-lived radioisotopes, such as depleted uranium, exceeding concentration limits listed in Table A of 10 CFR 61.13(3) or, if necessitated, by site-specific conditions

Mr. Garner stated it currently appears only two commercial disposal operations, EnergySolutions' Clive, UT, and WCS's Andrews County, TX, are interested in receiving large volumes of depleted uranium for disposal. Some believe NRC's primary purpose in revising 10 CFR 61 is to address the disposal of large volumes of depleted uranium. The amendments currently under consideration requires that a site-specific performance assessment be developed for each operating disposal facility, even if the facility has no intention of accepting large quantities of long-lived radioisotopes.

Mr. Garner stated NRC Commissioner's released a Staff Requirements Memorandum (SRM) at the beginning of the 2014 directing staff to:

- Change the performance assessment from 10,000 to 1,000 years.
- Require compatibility "B," not "C," to apply to the most significant provisions such as the performance assessment, protective assurance analysis period, and waste acceptance criteria.
- Approved the staff's proposal to require a 10,000 year intruder assessment at 500 mrem, with the expectation that scenarios used should be realistic and consistent with expected activities in and around the site at closure.
- There should be a protective assurance analysis performed for the period from the end of the performance assessment period (1,000 years) through 10,000 years, with a goal to keep the dose below 500 mrem.
- Approved staff's recommendation that applicants provide a qualitative analysis covering a performance period of 10,000 years or more after site closure to evaluate the ability of a

disposal system to mitigate long-term risks associated with the disposal of long-lived radioisotopes.

Mr. Garner stated the SRM instructed staff to develop the “safety case” in the proposed rule for licensing, with decisions based on defense in depth such as engineered features, natural geologic features of disposal site, and the performance assessment goals. The SRM asked staff to develop a question regarding compatibility so that comments will include reasons for varying from compatibility “B” as recommended by the Commissioners. The Commissioners also stated the comment period for the final rule should be extended to 120 days.

Mr. Garner reported NRC is reviewing its LLRW manifest requirements, giving primary focus to the over-reporting of the “Phantom 4” radionuclides—H-3, C-14, Tc-99, and I-129. In many cases detection equipment isn’t sensitive enough to measure the actual level of these radioisotopes and generators/processors end up defaulting to the lowest detectable limit instead of the actual value of the radioisotope. This could result in the premature closure of disposal facilities. NRC is looking at options to address this issue to include:

- Improve sampling and detection capabilities
- Consider use of generic scaling factors
- Revise NUREG/BR-0204 which addresses reporting requirements

Mr. Garner reported in 2007, the NRC conducted a LLRW Strategic Assessment to identify and prioritize projects of importance to the nuclear industry and regulatory community to work on during the next five to seven years. NRC is in the process of updating its Strategic Assessment and is taking comments on projects that stakeholders believe NRC should focus on.

The 2007 Strategic Assessment list included twenty items and, to date, the NRC has completed three of the high-priority items:

- Review/updated guidance on extended storage of LLRW
- Develop guidance on 10 CFR 20.2002 Alternate Disposal Requests
- Determine if depleted uranium waste streams from enrichments plants warrant amending the waste classification tables

Work continues on other high priorities that have been started to include:

- Updating the BTP—Concentration Averaging and Encapsulation
- Revising 10 CFR 61.58 regarding alternate waste classification requirements

Other high priorities that have not been started include:

- Prepare a review procedure for import/export reviews, which will make NRC’s review of the applications more efficient
- Perform a scoping study on the need to revise/expand byproduct material financial assurance to account for life-cycle

Mr. Garner stated he moderated a panel at the 2013 RadWaste Summit meeting that included the following sited state representatives: Mr. Rusty Lundberg (Utah); Mr. Earl Fordham (Washington) and; Ms. Susan Jenkins (South Carolina). The purpose of the panel was to provide comments on NRC’s proposed 10 CFR Part 61 rulemaking. Mr. Lundberg commented the draft NRC rule should include a Ra-226 waste standard as in-growth in buried depleted uranium creates the potential for Greater Than Class C waste at approximately 50,000 years. Mr.

Fordham agreed with a 25 mrem dose for the 10,000 year compliance period and Ms. Jenkins questioned if the new rule would apply to the Barnwell site where 86 percent of the facility is in the five-year post-closure observation period.

Mr. Garner reported from April 27, 2012 through February 28, 2014, the Texas compact facility operated by Waste Control Specialists (WCS) received 8,399.8 cubic feet of in-region LLRW containing 1,398.3 curies, 18,609.55 cubic feet of out-of-region LLRW containing 176,184.6 curies for a total of 27,009.35 cubic feet and 177,582.9 curies. The state of Texas receives 25 percent of the gross revenues associated with disposal of out-of-region LLRW. The majority of Texas and Vermont generators ship their Class A LLRW waste to Energy Solutions' Clive facility for disposal as it is more cost effective.

Mr. Garner stated at the October 2013 Low-Level Radioactive Waste Forum meeting, the Chair of the Texas Compact said very little in-region Class A LLRW is being disposed at the Texas compact facility. Mr. Garner stated that prior to receiving this information; the possibility of an arrangement with the Texas Compact to ensure import requests that included LLRW from Northwest Compact generators were not approved by the Texas Compact had been considered. However, after further consideration, Mr. Garner concluded the best approach at this time is to continue to monitor this situation and maintain a dialogue with the Executive Director of the Texas Compact who is also monitoring this issue.

Mr. Garner reported that WCS opened its Federal Facility which is licensed to accept 26 million cubic feet of waste. WCS has submitted an amendment request to accept 400,000 cubic meters (over 14 million cubic feet) of depleted uranium waste to the Texas Commission on Environmental Quality (TCEQ). The Compact facility is currently licensed to accept 2.31 million cubic feet and 3.89 million curies of LLRW.

Mr. Garner stated WCS has submitted an amendment to TCEQ that, if approved, would allow the company to accept LLRW and then determine if the LLRW can be designated as Exempt waste. Designation as an Exempt waste would allow the waste to be disposed in WCS's RCRA disposal cell instead of the Texas compact facility. This is similar to NRC's 10 CFR 20.2002, and it pertains to very low activity LLRW. A question arises about how this may impact revenues for the State of Texas as the state receives 25 percent of the gross revenues for out-of-region LLRW disposed at the Texas compact facility.

Mr. Garner reported in 2014 US Ecology's sublease payment increased from \$71,655 to \$75,885. The sublease payment is subject to change every three years based on the change in the Consumer Price Index. Ecology retains \$600 for the Prime Lease payment to Energy and under an agreement with Benton County the remainder is transferred to the Benton County Treasurer. A new contract that runs through June 30, 2017, was recently sent to Benton County for approval by its Commissioners.

Mr. Garner stated the issuance of site use permits for generators using the Richland commercial disposal facility has historically generated \$225,000 - 260,000 in annual revenue. For example annual revenue amounted to \$277,592 for 2010; \$232,528 for 2011; \$267,808 for 2012; and then dropped to \$199,720 for 2013. It appears revenue for 2014 (\$196,448 through 5/15) will

increase but will still be considerably lower than the revenue generated during the period of 2010 through 2012. This revenue funds administration of the Site Use Permit system as well as the activities of the Northwest Compact.

Mr. Garner reported Site Use Permit fees were last increased in 2003 and Health and Ecology will meet to evaluate whether fees need to be increased in 2015. If an increase is sought, it will likely be in the range of 15-20 percent (base fee increased from \$424 to \$488-\$509). A 20 percent increase would reflect an annual increase of 1.82 percent when averaged over the years since the last increase.

Mr. Garner stated he plans to develop a handbook for those tasks that are dealt with on a routine basis as a reference for his eventual replacement. This would include items such as import/export license applications; summary of wastes provided access to the Richland, WA facility; LLRW provided access to the region under the compact's Third Amended Resolution and Order; overview of rate regulation; etc.

Mr. Garner stated compact activities are currently 100 percent funded by revenue generated by the issuance of Site Use Permits required for the Richland facility. An option that may be worth considering is the imposition of an access fee on those states that chose to rely on another state/compact for access for disposal of LLRW generated in their state/compact. These states/compacts have not incurred the out-of-pocket expense associated with the development of disposal capacity as originally envisioned under the LLRW Policy Amendments Act.

Legal Activities

Ms. Kristen Mitchell reported there are no pending legal issues for the compact. Ms. Mitchell stated she is monitoring actions associated with the suit filed against Ecology and Health regarding MTCA actions.

Public Comment

There was no public comment.

The committee determined its next meeting would be held in Salt Lake City, Utah, and would include a tour of EnergySolutions' Clive, UT facility for committee members.