APPENDIX K
Internal Audits

RADIOLOGICAL CONTROL AND SAFETY AUDIT REPORT

Site:

US Ecology – Washington

Richland, Washington

Period:

1st Semi-Annual 2015

Audit Dates:

May 27-28, 2015

Prepared By: _____ Date: 6/15/15

Tim Jenkins
Corporate Health Physicist

Introduction

The first semi-annual Radiological Control and Safety Audit for calendar year 2015 was performed on May 27 and 28, 2015 at the US Ecology-Washington (USEW) facility by Tim Jenkins, Corporate Health Physicist and Justin Jensen, Radiation Safety Specialist. The audit was performed in accordance with the USEW Facility Standards Manual (FSM, July 2009) and Richland Operations Procedure (ROP) No. 5, Revision 5, "Radiological Controls and Safety Audits".

Audit Performance Areas

ROP 5 Attachment 1 (Rev 5a) contains an audit checklist of radiation protection (RP) program areas for the USEW site that may be used as a guide for reviewing particular program elements. Portions of this checklist were used for the first semi-annual audit, with focus placed in the following areas:

- ALARA Program
- Internal Monitoring
- Posting
- Notification To Individuals
- Instrument Check Sources
- Incoming Vehicle Inspection
- Radiation Safety Committee
- Operational Activities
- Direct Radiation Surveys

A completed copy of the audit checklist is attached to this report.

Observations

General

Following is a summary of each program area that was audited for the 1st semi-annual 2015 audit. With respect to the current check list, there appears to be some areas that need to be updated. While talking with Sean Murphy about this, he indicated that is he currently working on updating the check list.

ALARA Program

No deficiencies were found. The 2014 draft ALARA report was reviewed and met all of the requirements of the audit check list. There were no non-routine preplanned activities to review.

Internal Monitoring

Individual monitoring records were reviewed for multiple site workers for compliance with the checklist. It appears all required monitoring, such as internal and whole body analyses are being performed and properly filed.

Posting

All postings were properly marked. There were no high radiation areas or airborne radioactivity areas at the time of the audit.

Notification to Individuals

An annual dose report is provided to each employee on an NRC form 5. These annual dose reports are delivered to each employee in person rather than mailing them. Annual dose reports of each worker are filed in their individual file.

Instruments Check Sources

All instrument check sources were properly stored in the storage locker. Labeling and Marking of the storage locker met the requirements of 2.13.1 of the FSM. Pertinent information, as per ROP-52, for each source is kept on file.

Incoming Vehicle Inspection

A shipment (Bates # 24635) arrived during the audit and we were able to observe the vehicle inspection. All of the dose measurements, smears and other incoming survey points were performed as required. There were no exceedances of dose rate limits or contamination limits.

While reviewing documents for previous shipments, it was observed that the Vehicle Inspection Form (30-1), for a shipment received on 3/30/2015 (Bates # 24629), did not have the smear results documented. This was brought to the attention of USEW personnel and they indicated that the survey had been completed but that the information had just not be transferred to the survey form. The survey results for that shipment were later found and documented on the survey form.

Radiation Safety Committee (RSC)

From reviewing the RSC meeting minutes, it appears the RSC is functioning as it should.

Operational Activities

One of the containers (15-007-L) on the shipment received during the audit was selected for an inspection. Prior to the inspection, the container was placed in the inspection facility where preparations were made do USEW personnel could safely and properly perform the inspections.

During the inspection it appeared that all of the proper air monitoring and contamination controls were in place and being used. The container was opened and the internal contents were inspected to verify the waste was consistent with the manifest. A small hole was drilled in the lower portion of the container to check for free liquids, which indicated no liquids. The inspection appeared to go as planned and there were no container violations.

Direct Radiation Surveys

Records of the various contamination surveys performed were reviewed along with instrumentation calibration records. There were no deficiencies found in reviewing these records.

USEW personnel pointed out the different instruments on site and specifically the various operations each instrument was used for. It appeared that all of the appropriate instruments were onsite that are needed for site operations

Findings

1. **Incomplete Vehicle Inspection Form (30-1) for Bates # 24629 shipment** – Swipe survey data did not get recorded on the Survey form and the truck was released. USEW personnel were notified of this and were able to find the missing data and complete the form. No further actions required.

Attachments

1. Completed 1S15 Audit Checklist
2. Container 15-007-L Manifest

ATT. NO.	REV.		EFFECTIVE DATE	PAGE
5-1	5a	SAMPLE AUDIT CHECKLIST RICHLAND, WASHINGTON FACILITY	October 8, 2009	1 of 14

REVIEW OF ALARA PROGRAM	SAT	UNSAT	N/A	COMMENT
1. Have all non-routine preplanned activities been reviewed by the RPM/ARPM to ensure adherence to the ALARA policy?			X	None to Report
(a) Are reviews documented?			↓	
2. Do reviews address:				
(a) Description of activity?				
(b) Collection and evaluation of data?				
(c) Evaluation of hazards?				
(d) Establishment of criteria including staffing?				
(e) Protective clothing requirements?				
(f) Training?				
(g) Monitoring?			↓	
3. Has the Radiation Safety Committee made annual ALARA report to manager of operations by June 30 for previous calendar year?	X			
4. Does such report include:	X			
(a) Total exposure and exposure by classification?	X			
(b) Analysis of exposure to personnel during various operations?	X			
(c) Comparison of results to those of previous year?	X			
(d) Identification of trends?	X			
(e) Recommendations for further program improvements?	X			
5. Have radiation exposures to adults been contained to the administrative limits as specified in the FSM?	X			Dosimetry Reports
6. If administrative limits were exceeded, were exposures investigated by the RPM?			X	
7. Were exposures to minors and members of the public limited to 0.1 REM per year?	X			Max 96mRem Per Gov. Man. Report

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PERSONAL AIR MONITORING	SAT	UNSAT	N/A	COMMENT
1. Is a minimum of one air sampler downwind and one air sampler for breathing zone air operated continuously in areas where people work in close proximity to waste?		Did Not review		
2. Does this include:				
(a) Vehicle unloading areas?				
(b) Cask handling operations?				
(c) In-trench operations?				
3. Were levels measured less than as specified in Table 6.1 of				
4. If reporting levels were exceeded, was WDOH notified?				
(a) Were copies of a written report submitted to WDOH within 30 days?				
(b) Did the RPM evaluate most restrictive DAC on the shipment from the manifest?				
(c) If levels exceeded 10% of a DAC, was the need for bioassay evaluated and conducted if appropriate.				

INTERNAL MONITORING	SAT	UNSAT	N/A	COMMENT
1. For new hires, has a whole body scan been conducted within one month?	X			Reviewed Individual
(a) Has a urinalysis been conducted within one month?	X			Worker files
(b) Has an in-vivo thyroid assay been conducted?	X			
2. For employees working in the radiological controlled area, has a whole body count been performed each year?	X			
(a) Has a thyroid scan been performed each calendar year?	X			
(b) Has a urinalysis been performed each calendar year?	X			
(c) Are urinalysis analyzed for tritium, carbon-14, gross alpha and gross beta minus potassium-40?	X			
3. When employees terminate employment, is a whole body gamma scan and bioassay made?			X	None recently To review
(a) If not possible, is an entry made in the individual's record?			X	

EXTERNAL RADIATION MONITORING	SAT	UNSAT	N/A	COMMENT
1. Are whole body dosimeters worn on the frontal area of the chest or waist?				
2. Do all personnel who handle radioactive material wear extremity dosimetry? (ROP-9)				
3. Are all personnel dosimeters, except pocket ionization chambers, processed by an organization accredited by NVLAP?			Did Not Review	
4. Are personnel dosimeters (except pocket ion chambers) and extremity dosimeters processed at least once each quarter?				
5. Are pocket ion chamber dosimeters checked for accuracy and drift at least every six months?				

POSTING	SAT	UNSAT	N/A	COMMENT
1. Are all radiation areas properly posted?	X			
(a) Are all high radiation areas properly posted?			X	None
(b) Are all airborne radioactivity area properly posted?			X	None
(c) Are Radioactive Material Storage areas properly posted?	X			
(d) Are Radioactive Material Containers (for onsite waste) properly labeled?	X			
2. Are the following posted:	X			
(a) WDOH Notice to Employees?	X			
(b) Notice as to location of license and operating procedures?	X			
(c) Emergency procedures?	X			
(d) Notice of violation from WDOH?	X			

NOTIFICATION TO INDIVIDUALS	SAT	UNSAT	N/A	COMMENT
1. Are notifications of radiation exposure furnished on written request annually?	X			Form 5
(a) At request of employee formerly employed?			X	No requests recently
(b) Within 30 days from request or 30 days after exposure determined?			X	
(c) Is notification in writing issued by RPM?			X	
(d) Does notification include name of facility?			X	
(e) Name of individual?			X	

NOTIFICATION TO INDIVIDUALS (continued)	SAT	UNSAT	N/A	COMMENT
(f) Social security number?			X	
(g) Exposure information?			X	
(h) Statement regarding NRC/WDOH?			X	
2. Is notification to individual made in the event a report is required to NRC/WDOH?			X	No Events that Required

INSTRUMENT CHECK SOURCES	SAT	UNSAT	N/A	COMMENT
1. When not in use are instrument check sources located in source storage locker?	X			
(a) Is locker locked when unattended?	X			
(b) Is locker posted with current list of personnel authorized to have access?	X			
2. Are radiation levels maintained at less than two mrem per hour?	X			
(a) Is a quarterly radiation survey of the storage locker performed?	X			
(b) Is a survey performed immediately after receipt of additional check sources?	X			
3. Were sources disposed of as radioactive waste? (ROP-35)			X	No Disposal/Transfers
(a) Were sources transferred to another licensee?			↓	
(b) Was written verification of authorization maintained?			↓	
4. Has a physical inventory of sources been conducted	X			
5. Procurement history of each source including copies of purchase orders and seller certification. (ROP-52)	X			

EXTERNAL CONTAMINATION	SAT	UNSAT	N/A	COMMENT
1. Do personnel survey themselves before leaving radiologically controlled area?				
(a) If levels exceeding 10,000 dpm per 100 square centimeter beta gamma or 1000 dpm per 100 square centimeter alpha detected was non-routine monitoring conducted? (FSM 2.15)			Did not Review	
(b) If so, was bioassay conducted?				

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RESPIRATORY PROTECTION	SAT	UNSAT	N/A	COMMENT
1. Is only NIOSH approved respiratory protection equipment furnished? (ROP's 14, 15 & 16).				
2. Is respiratory protection equipment furnished if:				
(a) Unconfined material handled?				
(b) Contamination levels greater than 10,000 dpm per 100 square centimeters beta gamma or 1,000 dpm per 100 square centimeters alpha?				
(c) Any sample within 50 feet indicates greater than 10 percent of weekly maximum allowable concentration?				
(d) Respiratory protection is a specific requirement of an operational procedure?				
3. Have all personnel required to use respiratory protection equipment received training on an annual basis?				
(a) Is training by RPM or individual approved by RPM?				
(b) Are personnel advised they may leave work area for relief from physical or psychological distress?				
(c) Communication failure?				
(d) Significant deterioration of operational conditions?				
4. Is work being performed using respiratory protection always done under supervision of an individual qualified to wear respiratory protection and is such equipment readily available?				
5. Have all personnel qualified to wear respiratory equipment received an annual quantitative fit test? (ROP-16)				
6. Are personnel instructed in proper procedure for positive and negative fit tests?				
(a) Are tests performed immediately after donning respirators?				
(b) If user of respirator requires glasses, are respiratory prescription lenses available and worn?				
7. Is respiratory protection equipment issued only by RPM or designee?				
(a) Are outside contractors and other non-facility personnel required to adhere to the respiratory protection procedure?				

Did not Review

RESPIRATORY PROTECTION (continued)	**SAT**	**UNSAT**	**N/A**	**COMMENT**
(b) Are decontamination, sanitization, inspection noted in Respiratory Monthly Inspection Record Log?				
8. Is respiratory protection equipment inspected prior to each use?				
(a) Is respiratory protection equipment cleaned after each use?				
9. Are all respiratory protection devices subjected to detailed inspection program?				
(a) Are emergency use respirators inspected by ARPM or designee once a month?				
10. Are medical evaluations performed on personnel each year as part of or prior to fit testing? Medical evaluation documentation in individual dosimetry file? (ROP-14)				
11. Respiratory protection issuance maintained in log with name, date of issue, reason, initials of person issuing, and date bioassay kit issued if needed?				
AUDITING PROGRAM	**SAT**	**UNSAT**	**N/A**	**COMMENT**
1. Management audits conducted at least twice a year?				
(a) Do audits cover two working days?				
(b) Has the facility manager responded to any item requiring corrective actions within 14 days of receipt of				
2. Has the facility manager or assistant facility manager conducted and documented a weekly inspection of the				
(a) Does inspection include tour of restricted area and inspection of random selection of documents?				
3. Have radiological control and Safety audits been performed once each calendar quarter?				

Did not review

PERSONNEL TRAINING	SAT	UNSAT	N/A	COMMENT
1. Do escorted visitors receive the following orientation:				
(a) Restricted area location?				
(b) Methods of working and posting?				
(c) Requirements for dosimetry?				
(d) Escort requirements?				
(e) Completion of exposure authorization form?				
(f) Review of USNRC Regulatory Guide 8.13?				
2. Do unescorted visitors also receive orientation in the above plus:				
(a) Facility security?				
(b) US Ecology notice to personnel?				
(c) Radiation and risk?				
3. Are non-occupationally exposed facility personnel provided with general orientation and:				
(a) Facility security?				
(b) US Ecology notice to personnel?				
(c) Radiation and risk?				
(d) Is this training re-administered biennially?				
4. Have radiological workers received training as specified in FSM 4.3.4?				
(a) Completion of Occupational Radiation Exposure Questionnaire?				
(b) Is training repeated every two years?				
(c) Does qualification require passing a written test with a score of 75 percent or better?				
(d) Does training consist of 12 hours of classroom work and four hours of practical work?				
5. Is specialized radiological worker training conducted in the event a worker is required to work on a special project?				
6. Is RC&ST training as described in FSM 4.3.6?				
(a) Does training include 40 hours of classroom study?				
(b) Are RC & ST re-qualified and tested every two years?				
7. Is a weekly safety meeting conducted? (ROP's 20 & 21)				

Did Not Review

PERSONNEL TRAINING (continued)	**SAT**	**UNSAT**	**N/A**	**COMMENT**
8. Is a list of qualified instructors and areas of expertise maintained at the facility?				
9. Does the Management training meet the requirements of the FSM and ROP 25				
INCOMING VEHICLE INSPECTION	**SAT**	**UNSAT**	**N/A**	**COMMENT**
1. Are incoming vehicles surveyed as minimum at the following points:	X			
(a) Two smears each on right, left, rear and inside?	X			
(b) Three smears of cargo?	X			
(c) 200 mR/hr contact at sides and underneath?	X			
(d) 10 mR/hr at 2 meters from sides?	X			
(e) 2 mR/hr in cab?	X			
2. Are following documents available:	X			
(a) Waste shipment and disposal manifest?	X			
(b) LLRW shipment certification form RHF-31?	X			
(c) Certificate of Compliance required by 10 CFR 71?	X			
(d) DOE/NCR 741 if required?	X			
(e) Exclusive use instruction?	X			
(f) Certification of limited quantity or instruments if required?			X	
(g) WSP Vehicle inspection form?	X			
3. In the event of hazard to personnel safety or the environment are operations ceased until approval granted by WDOH?	X			
(a) Are administratively correctable violations corrected, documented and brought to attention of WDOH on site inspector?	X			
4. Does the Facility Manager or designee ensure the wastes:	X			
(a) Meets packaging and wastes form requirements?	X			
(b) Per FSM, are at least 33% of containers inspected for physical integrity and compliance with marking?	X			
(c) Are all waste packages checked to ensure correlation to the manifest?	X			
5. Are current HIC procedures on file for HIC waste received?	X			

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INCOMING VEHICLE INSPECTION (continued)	**SAT**	**UNSAT**	**N/A**	**COMMENT**
6. Are current C of C and cask handling procedures on file for casks?	X			
7. Are vehicles and items for unconditioned release surveyed and decontaminated in accordance with ROP 44 & 45?				
(a) Do they meet the release limits of Table 6.2 of FSM?		X		Missing Smear results for 3/30/15 Shipment Form 30-1
(b) 220 dpm/100 cm^2 beta-gamma?		↓		
(c) 22 dpm/100 cm^2 alpha?				
(d) Is waste generated from decontamination processed, packaged and manifested in accordance with the			X	
8. Are instruments calibrated in accordance with ROP 54?	X			
9. Is a person qualified as a RC & ST present during receipt and disposal operations?	X			

PACKAGE CONFIRMATION AND STORAGE	**SAT**	**UNSAT**	**N/A**	**COMMENT**
1. Are the contents of a package confirmed once per week or one out of every 10 shipments?				
(a) Is this based on a random sampling procedure				
(b) If possible, are package contents confirmed in package inspection facility? (ROP 40)				
(c) Is any violation reported to WDOH by the Facility Manager or designee?				
(d) Are records available for the inspection room survey after the confirmation?				
(e) Are records of bioassays available for personnel participating in confirmation?				
2. Are all packages stored above ground been disposed of 60 days from date of receipt?				
(a) Is storage within license possession limits?				
(b) Is storage in accordance with ROP's 36 & 37?				
(c) Are accumulations of packages containing SNM stored at least 4 meters from other accumulations of packages containing SNM?				
3. Is ROP 39 followed for over packaging containers?				

Did Not Review

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DIRECT GAMMA MONITORING	**SAT**	**UNSAT**	**N/A**	**COMMENT**
1. Was direct gamma monitoring conducted in accordance with ROP 50?				
(a) Were results reported in mrem/day?				
(b) Were TLD's posted and exchanged quarterly at N, S, E & W fence lines?		Did not Review		
2. Were monthly TLD's posted at N, S, E & W fence lines and fence line nearest active disposal trench?				
(a) Were results less than 30 mrem/month?				
3. If TLD reporting limits were exceeded, was WDOH verbally notified within 24 hours?				
(a) Written notification within 30 days?				
ENVIRONMENTAL MONITORING	**SAT**	**UNSAT**	**N/A**	**COMMENT**
1. Is a scaled map showing all environmental monitoring locations available?				
2. Is a record of all routine and special calibration of airflow or volume metering devices available?				
(a) Are primary and secondary standards specified?				
(b) Are methods employed available?		Did Not Review		
(c) Are estimates of accuracy available?				
3. Have monthly burial reports been forwarded to WDOH?				
4. Have interim trench markers been installed at each end of the disposal trenches?				
(a) Do monuments consist of durable material with exposed dimensions of 20" (h) X 12" (w) X 14" (l)?				
(b) Is a corrosive resistant metal plate affixed with the total activity of by product material?				
(c) Source material (kilograms)				
(d) SNM (grams)?				
(e) Trench number?				
(f) Date of opening and closing trench?				
(g) Volume of waste in the trench?				
(h) Coordinates of disposal unit.				
5. Are continuous air monitoring stations located along the fence line in the predominant wind direction?				

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ENVIRONMENTAL MONITORING (continued)	**SAT**	**UNSAT**	**N/A**	**COMMENT**
(a) Is this in accordance with the scaled map?				
(b) Are airflows set at 1.5 CFM? (ROP 46)				
(c) Are tritium samplers at least 100-150cc per minute?				
(d) Are gross alpha, gross beta counted weekly?				
(e) Is the gamma counted by monthly composite?				
(f) Is I-125 counted weekly?				
(g) Is tritium in upwind and two downwind stations counted monthly?				
(h) Environmental Air Sampling Daily Check Form filled out properly?				
6. Are results within action levels?				
(a) Gross alpha 1 E-14 uCi/cc				
(b) Gross beta 1-E-13 uCi/cc				
(c) Gamma 5 X MDC uCi/cc				
(d) I-125 3.5 E-14 uCI/cc				
(e) H-3 2 E-11 uCi/cc				
7. If reporting levels exceeded, was immediate verbal notification made to WDOH?				
(a) Was letter sent to WDOH within 30 days?				
8. Is air sampling equipment calibrated so that the cumulative error in the determination of the total volume is less than 20%?				
(a) Is a linear change in flow rate assumed?				

Did not review

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	OPERATIONAL ACTIVITIES	SAT	UNSAT	N/A	COMMENT
1.	Observation of operating and maintenance activities. List activities observed: Inspection of Containers from Shipment recieved.	X			Inspected Container, Entered contents, checks for liquids.
2.	Interviews with Radiation Protection personnel List personnel interviewed:				
3.	Interviews with Operations/Maintenance personnel List personnel interviewed:				
4.	Compliance and effectiveness of rules and procedures				

	RADIATION SAFETY COMMITTEE (RSC)	SAT	UNSAT	N/A	COMMENT
1.	Are minutes on file for current year RSC meetings?	X			
2.	Does the RSC review safety evaluations for new/revised procedures?	X			
3.	Does the RSC review draft license and FSM changes?			X	No changes were made
4.	Does the RSC review events that lead to unplanned exposures to individuals?	X			
5.	Does the RSC consist of at least:	X			
	(a) The RPM, Facility Manager, ARPM, Quality Assurance Coordinator and an employee representative?	X			
6.	Have items of noncompliance (audit findings, NCR's, WDOH inspection findings, etc.) been reviewed by the RSC?	X			

DIRECT RADIATION SURVEYS	SAT	UNSAT	N/A	COMMENT
1. Were direct surveys conducted:	X			
(a) Controlled facilities, weekly (100 cpm above BKG)?	X			
(b) Operational trench, daily (5 mR/hr)?	X			
(c) Normal traffic areas, weekly (0.5 mR/hr)?	X			
(d) Site equipment outside area, weekly (0.5 mR.hr)?	X			
(e) Site equipment outside area, weekly (0.1 mR/hr)?	X			
(f) Non-rad buildings, monthly (0.1 mR/hr)?	X			
2. Were surveys documented at end of workday after detecting contamination?			X	No Contamination
3. Was at least one of each type of instrument in use in the area in which receipt, handling and disposal operations were conducted:	X			
(a) Portable instruments for measuring high levels (0-500 R/hr) beta-gamma?	X			
(b) Portable instrument for measuring low levels (0-2000 mR/hr) beta-gamma?	X			
(c) Did these instruments meet 10% full-scale linearity and 10% calibration stability?	X			
(d) Portable instruments for measuring beta-gamma contamination?	X			
(e) Do beta-gamma contamination instruments meet 10% calibration stability and window of 1.2 - 2.0 mg/cm^2?	X			
4. Was calibration of instruments at one-third and two-thirds of each scale?	X			
5. Were portable instruments source checked prior to use?	X			
(a) Were contamination instruments checked for response every other day and other instruments checked once each week (documentation required)?	X			
(b) Is a battery check performed each time instrument is turned on?	X			
(c) Is any instrument found to respond improperly taken out of use until repaired?	X			

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QUARTERLY INSPECTION AND SECURITY	SAT	UNSAT	N/A	COMMENT
1. Are a visual inspection and radiation survey performed on completed disposal units each calendar Quarter?				
(a) Does this include condition of trench cap?				
(b) Changes in radiation levels?				
(c) General condition of disposal facility?				
(d) Status of security measures? (ROP's 60 & 61)				
2. Is the perimeter of the operation area of the facility surrounded with a continuous eight-foot high chain link fence topped with barbed wire?				
(a) Is the entrance gate kept locked or under surveillance during working hours and locked during non-working hours?				
(b) Is distribution of keys to personnel controlled by the Facility Manager?				
(c) Are keys distributed per ROP-62?				
(d) Are vehicles secured at the end of each workday? (ROP-31)				

Additional Comments:

024635

FORM 541A

UNIFORM LOW-LEVEL RADIOACTIVE WASTE MANIFEST

CONTAINER AND WASTE DESCRIPTION (CONTINUATION)

2. MANIFEST NUMBER: 02366

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DISPOSAL CONTAINER DESCRIPTION							WASTE DESCRIPTION FOR EACH WASTE TYPE IN CONTAINER							16. WASTE CLASSIFICATION AS-Class A Stable AU-Class A Unstable B-ClassB C-Class C
							PHYSICAL DESCRIPTION			14 CHEMICAL DESCRIPTION		15. RADIOLOGICAL DESCRIPTION		
5 CONTAINER IDENTIFICATION NUMBER/ TRANSPORT PERMIT NUMBER(S)	6 CONTAINER DESCRIPTION (See Note 1)	7 VOLUME m³ / ft³	8 WASTE AND CONTAINER WEIGHT kg / lb	9 SURFACE RADIATION LEVEL mSv/hr / mrem/hr	10 SURFACE CONTAMINATION MBq/100 cm² / dpm/100 cm² ALPHA	BETA-GAMMA	11 WASTE DESCRIP-TOR (See Note 2	12 APPROXIMATE WASTE VOLUME(S) IN CONTAINER m³/ft³	13 SORBENT SOLIDIFICATION, STABILIZATION MEDIA (See Note 3)	CHEMICAL FORM/ CHELATING AGENT	WEIGHT % CHELATING AGENT IF > 0.1%	INDIVIDUAL RADIONUCLIDES AND ACTIVITY AND CONTAINER TOTAL OR CONTAINER TOTAL ACTIVITY AND RADIONUCLIDE PERCENT RADIONUCLIDES	MBq	mCi	
15-007-L	5	4.82E+00	4.26E+03	1.40E-01	<3.33E-07	<1.67E-05	32 Mixed Bed Ion-exchange M <1% 39	4.32E+00	100	Metal Oxides	NP	Co-60	7.14E+02	1.93E+01	AU
G1018		1.70E+02	9.40E+03	1.40E+01	<2.00E+01	<1.00E+03		1.52E+02		NP		Ba-140	8.78E+01	2.37E+00	
												Zn-65	3.69E+02	9.97E+00	
												C-14	4.51E+02	1.22E+01	
												Co-58	1.27E+02	3.44E+00	
												I-131	8.24E+01	2.23E+00	
												Ag-110m	3.81E+01	1.03E+00	
												Mn-54	7.14E+01	1.93E+00	
												Pu-241 [4.71E-07g]	1.79E+00	4.83E-02	
												Pu-238 [2.93E-08g]	1.85E-02	4.99E-04	
												Pu-239 [6.43E-06g]	1.48E-02	4.00E-04	
												Am-241	1.23E-02	3.34E-04	
												Ce-141	5.60E+00	1.51E-01	
												Fe-55	3.41E+02	9.21E+00	
												Cm-243	6.49E-03	1.75E-04	
												Cm-242	2.57E-02	6.93E-04	
												Sr-90	2.20E-01	5.94E-03	
												H-3	2.41E+01	6.50E-01	
												Ni-63	1.69E+01	4.56E-01	
												Tc-99	7.93E-04	2.14E-05	
												I-129	2.16E-05	5.85E-07	
												SubTtl SNM[6.93E-06g]	2.33E+03	6.30E+01	
10618	2	2.72E+00	1.32E+03	7.00E-02	<3.33E-07	<1.67E-05	39 Compactible Trash (100.0%)	2.55E+00	100	Metal Oxides	NP	Co-60	5.65E+01	1.53E+00	AU
G1018		9.60E+01	2.91E+03	7.00E+00	<2.00E+01	<1.00E+03		9.00E+01		NP		Co-58	6.89E+01	1.86E+00	
												Zn-65	3.56E+01	9.62E-01	
												Mn-54	1.57E+01	4.24E-01	
												Pu-241 [3.73E-08g]	1.42E-01	3.83E-03	
												Pu-238 [2.32E-09g]	1.46E-03	3.95E-05	
												H-3	5.25E+01	1.42E+00	
												Pu-239 [5.09E-07g]	1.17E-03	3.16E-05	
												Am-241	9.77E-04	2.64E-05	
												Cm-243	5.14E-04	1.39E-05	
												Cm-242	2.03E-03	5.49E-05	
												Fe-55	4.83E+00	1.30E-01	

024635

RADIOLOGICAL CONTROL AND SAFETY AUDIT REPORT

Site:

US Ecology – Washington

Richland, Washington

Period:

2nd Semi-Annual 2015

Audit Dates:

December 8-9, 2015

Prepared By: _____ Date: 15 December 2015

Joseph J. Weismann, CHP
VP, Radiological Programs

Introduction

The second semi-annual Radiological Control and Safety Audit for calendar year 2015 was performed on December 8 and 9, 2015 at the US Ecology-Washington (USEW) facility by Joseph J. Weismann, CHP, US Ecology's Vice President of Radiological Programs. The audit was performed in accordance with the USEW Facility Standards Manual (FSM, July 2009) and Richland Operations Procedure (ROP) No. 5, Revision 5, "Radiological Controls and Safety Audits".

Audit Performance Areas

ROP 5 Attachment 1 (Rev 5a) contains an audit checklist of radiation protection (RP) program areas for the USEW site that may be used as a guide for reviewing particular program elements. Portions of this checklist were used for the second 2015 semi-annual audit, with focus placed in the following areas:

- External Contamination
- Respiratory Protection
- Audit Program
- Personnel Training
- Package Confirmation and Storage
- Direct Gamma Monitoring
- Environmental Monitoring
- Operational Activities
- Quarterly Inspection and Security

A completed copy of the audit checklist is attached to this report. Also attached is a RC&S Program Area Focus Matrix that shows the portions of USEW's program that have been audited on a semi-annual basis since the focused subject area approach was implemented (1S2011).

Major site activities observed during the audit period included waste receipt and unloading, a waste package inspection, and a weekly safety meeting. The Radiation Protection Manager (Sean Murphy) and the Quality Assurance Manager (Parrish Jones) were not present during day 2 of the audit due to a scheduled offsite vendor audit.

Observations

<u>General</u>

All audited portions of the ROP-5 checklist were found to be compliant with the facility license and Facility Standards Manual (FSM). The USEW staff members who supported this audit were all very helpful and professional during the inspection period.

USEW's Program Administration and Recordkeeping processes were observed to excellent, making audit of site paperwork and records straightforward. The staff appear to understand their work areas and responsibilities extremely well and were prepared to answer all questions directed to them by the auditor.

Procedure Errors

During the course of the audit, several checklist items in Procedure ROP-5-1 were found to be out of date or requiring revision which made auditing more difficult. This finding has been noted during previous audits as well. I was told that all site ROP's have undergone update and re-numbering as part of the USEW License Renewal but these new procedures are still under review by WDOH and have not yet been implemented. Unfortunately, the existing version of ROP-5 had to be used and thus the Audit Checklist attached to this report will show numerous corrections made during the course of the two audit days.

Once the new procedure set is approved by WDOH, it would be appreciated if a copy of the replacement procedure for ROP-5 be forwarded to the auditor for verification that the typographical and reference errors observed during this period have been appropriately corrected.

Waste Package Inspection

A Package Inspection (PI) of a waste box was performed at the request of WDOH during the audit period. The shipment consisted of animal carcasses from research activities. The PI was performed to verify the inner package and sorbent requirements of License Condition 35 were being met by the generator. Upon inspection, the USEW staff verified that the waste in question was packaged, marked, and labeled correctly. The information was submitted to WDOH for final release to allow disposal.

During observation of the PI, I was impressed by the communication and teamwork between the Operations and Radiation Protection (RP) personnel performing the inspection. The inspection was performed quickly and efficiently with attention paid to ALARA and good contamination control practices.

It is recommended that USEW consider installing a digital camera on the roof of the PI tent near the crane to assist with capturing information internal to the waste packages. I was told by RP staff that the WDOH was specifically asking for proof that the inner packaging met "DOT 7A" requirements per License Condition 35. Staff attempted to take photographs of the inner package markings but it was observed to be very difficult due to the sight angle inherent to standing outside of the PI tent. An overhead camera with remote zoom capability would overcome these obstacles and allow staff to quickly and efficiently capture photographs and/or video as required.

Environmental Monitoring

Several air samplings stations were visually inspected within (and outside) of the Restricted Area to verify operating condition, calibration markings, and flow rate settings. Station 1 was inspected outside of the Restricted Area (near the Administrative Buildings) while Stations 2 and 3 were inspected within the Restricted Area fence along the eastern edge of the site. All air sampling stations were observed to be operating as per Procedure ROP-46 (@1.5 cfm flow rates) and had appropriate calibration and daily inspection indications provided. Scott Courneya of the RC&S technician staff accompanied me during

the tour and answered all of my questions regarding air sampling, closed trench inspections and monuments, and overall site conditions.

Findings

None.

Recommendations / Follow-up Items

1. Please forward a copy of the replacement procedure and checklist for ROP-5 after it has been approved for use by WDOH. Corrections of the noted errors in the audit checklist should be verified.
2. It is recommended that an overhead camera be installed in the PI tent to simplify collection of video evidence for shipments being inspected.

Attachments

1. Completed 2S15 Audit Checklist
2. USEW Semi-Annual RC&S Audit Program Focus Area Matrix

ATT. NO.	REV.		EFFECTIVE DATE	PAGE
5-1	5a	SAMPLE AUDIT CHECKLIST RICHLAND, WASHINGTON FACILITY	October 8, 2009	1 of 14

REVIEW OF ALARA PROGRAM	SAT	UNSAT	N/A	COMMENT
1. Have all non-routine preplanned activities been reviewed by the RPM/ARPM to ensure adherence to the ALARA policy?			X	Not audited this period.
(a) Are reviews documented?				
2. Do reviews address:				
(a) Description of activity?				
(b) Collection and evaluation of data?				
(c) Evaluation of hazards?				
(d) Establishment of criteria including staffing?				
(e) Protective clothing requirements?				
(f) Training?				
(g) Monitoring?				
3. Has the Radiation Safety Committee made annual ALARA report to manager of operations by June 30 for previous calendar year?				
4. Does such report include:				
(a) Total exposure and exposure by classification?				
(b) Analysis of exposure to personnel during various operations?				
(c) Comparison of results to those of previous year?				
(d) Identification of trends?				
(e) Recommendations for further program improvements?				
5. Have radiation exposures to adults been contained to the administrative limits as specified in the FSM?				
6. If administrative limits were exceeded, were exposures investigated by the RPM?				
7. Were exposures to minors and members of the public limited to 0.1 REM per year?				

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5-1	5a	SAMPLE AUDIT CHECKLIST RICHLAND, WASHINGTON FACILITY	October 8, 2009	2 of 14

PERSONAL AIR MONITORING	SAT	UNSAT	N/A	COMMENT
1. Is a minimum of one air sampler downwind and one air sampler for breathing zone air operated continuously in areas where people work in close proximity to waste?			X	Not audited this period.
2. Does this include:				
(a) Vehicle unloading areas?				
(b) Cask handling operations?				
(c) In-trench operations?				
3. Were levels measured less than as specified in Table 6.1 of				
4. If reporting levels were exceeded, was WDOH notified?				
(a) Were copies of a written report submitted to WDOH within 30 days?				
(b) Did the RPM evaluate most restrictive DAC on the shipment from the manifest?				
(c) If levels exceeded 10% of a DAC, was the need for bioassay evaluated and conducted if appropriate.				

INTERNAL MONITORING	SAT	UNSAT	N/A	COMMENT
1. For new hires, has a whole body scan been conducted within one month?			X	Not audited this period
(a) Has a urinalysis been conducted within one month?				
(b) Has an in-vivo thyroid assay been conducted?				
2. For employees working in the radiological controlled area, has a whole body count been performed each year?				
(a) Has a thyroid scan been performed each calendar year?				
(b) Has a urinalysis been performed each calendar year?				
(c) Are urinalysis analyzed for tritium, carbon-14, gross alpha and gross beta minus potassium-40?				
3. When employees terminate employment, is a whole body gamma scan and bioassay made?				
(a) If not possible, is an entry made in the individual's record?				

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5-1	5a		October 8, 2009	3 of 14

EXTERNAL RADIATION MONITORING	**SAT**	**UNSAT**	**N/A**	**COMMENT**
1. Are whole body dosimeters worn on the frontal area of the chest or waist?			X	Not Audited This period
2. Do all personnel who handle radioactive material wear extremity dosimetry? (ROP-9)			↓	↓
3. Are all personnel dosimeters, except pocket ionization chambers, processed by an organization accredited by NVLAP?			↓	↓
4. Are personnel dosimeters (except pocket ion chambers) and extremity dosimeters processed at least once each quarter?			↓	↓
5. Are pocket ion chamber dosimeters checked for accuracy and drift at least every six months?			↓	↓
POSTING	**SAT**	**UNSAT**	**N/A**	**COMMENT**
1. Are all radiation areas properly posted?			X	Not Audited This Period.
(a) Are all high radiation areas properly posted?			↓	↓
(b) Are all airborne radioactivity area properly posted?			↓	↓
(c) Are Radioactive Material Storage areas properly posted?			↓	↓
(d) Are Radioactive Material Containers (for onsite waste) properly labeled?			↓	↓
2. Are the following posted:			↓	↓
(a) WDOH Notice to Employees?			↓	↓
(b) Notice as to location of license and operating procedures?			↓	↓
(c) Emergency procedures?			↓	↓
(d) Notice of violation from WDOH?			↓	↓
NOTIFICATION TO INDIVIDUALS	**SAT**	**UNSAT**	**N/A**	**COMMENT**
1. Are notifications of radiation exposure furnished on written request annually?			X	Not Audited This period
(a) At request of employee formerly employed?			↓	↓
(b) Within 30 days from request or 30 days after exposure determined?			↓	↓
(c) Is notification in writing issued by RPM?			↓	↓
(d) Does notification include name of facility?			↓	↓
(e) Name of individual?			↓	↓

NOTIFICATION TO INDIVIDUALS (continued)	SAT	UNSAT	N/A	COMMENT
(f) Social security number?			X	not Audited This period
(g) Exposure information?			↓	
(h) Statement regarding NRC/WDOH?				
2. Is notification to individual made in the event a report is required to NRC/WDOH?			↓	↓
INSTRUMENT CHECK SOURCES	**SAT**	**UNSAT**	**N/A**	**COMMENT**
1. When not in use are instrument check sources located in source storage locker?			X	Not Audited This period
(a) Is locker locked when unattended?			↓	↓
(b) Is locker posted with current list of personnel authorized to have access?				
2. Are radiation levels maintained at less than two mrem per hour?				
(a) Is a quarterly radiation survey of the storage locker performed?				
(b) Is a survey performed immediately after receipt of additional check sources?				
3. Were sources disposed of as radioactive waste? (ROP-35)				
(a) Were sources transferred to another licensee?				
(b) Was written verification of authorization maintained?				
4. Has a physical inventory of sources been conducted				
5. Procurement history of each source including copies of purchase orders and seller certification. (ROP-52)			↓	↓
EXTERNAL CONTAMINATION	**SAT**	**UNSAT**	**N/A**	**COMMENT**
1. Do personnel survey themselves before leaving radiologically controlled area?	✓			
(a) If levels exceeding 10,000 dpm per 100 square centimeter beta gamma or 1000 dpm per 100 square centimeter alpha detected was non-routine monitoring conducted? (FSM 2.15)			✓	
(b) If so, was bioassay conducted?			✓	

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5-1	5a	SAMPLE AUDIT CHECKLIST RICHLAND, WASHINGTON FACILITY	October 8, 2009	5 of 14

RESPIRATORY PROTECTION	SAT	UNSAT	N/A	COMMENT
1. Is only NIOSH approved respiratory protection equipment furnished? (ROP's 14, ~~15~~ & ~~16~~).	✓			ROP's 15 & 16 have been deleted.
2. Is respiratory protection equipment furnished if:	✓			
(a) Unconfined material handled?	✓			
(b) Contamination levels greater than 10,000 dpm per 100 square centimeters beta gamma or 1,000 dpm per 100 square centimeters alpha?	✓			
(c) Any sample within 50 feet indicates greater than 10 percent of weekly maximum allowable concentration?	✓			
(d) Respiratory protection is a specific requirement of an operational procedure?	✓			
3. Have all personnel required to use respiratory protection equipment received training on an annual basis?	✓			
(a) Is training by RPM or individual approved by RPM?	✓			
(b) Are personnel advised they may leave work area for relief from physical or psychological distress?	✓			
(c) Communication failure?	✓			
(d) Significant deterioration of operational conditions?	✓			
4. Is work being performed using respiratory protection always done under supervision of an individual qualified to wear respiratory protection and is such equipment readily available?	✓			
5. Have all personnel qualified to wear respiratory equipment received an annual quantitative fit test? ~~(ROP-16)~~	✓			ROP-16 retired.
6. Are personnel instructed in proper procedure for positive and negative fit tests?	✓			
(a) Are tests performed immediately after donning respirators?	✓			
(b) If user of respirator requires glasses, are respiratory prescription lenses available and worn?	✓			
7. Is respiratory protection equipment issued only by RPM or designee?	✓			
(a) Are outside contractors and other non-facility personnel required to adhere to the respiratory protection procedure?	✓			

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RESPIRATORY PROTECTION (continued)	**SAT**	**UNSAT**	**N/A**	**COMMENT**
(b) Are decontamination, sanitization, inspection noted in Respiratory Monthly Inspection Record Log?	✓			
8. Is respiratory protection equipment inspected prior to each use?	✓			
(a) Is respiratory protection equipment cleaned after each use?	✓			
9. Are all respiratory protection devices subjected to detailed inspection program?	✓			
(a) Are emergency use respirators inspected by ARPM or designee once a month?	✓			
10. Are medical evaluations performed on personnel each year as part of or prior to fit testing? Medical evaluation documentation in individual dosimetry file? (ROP-14)	✓			
11. Respiratory protection issuance maintained in log with name, date of issue, reason, initials of person issuing, and date bioassay kit issued if needed?	✓			
AUDITING PROGRAM	**SAT**	**UNSAT**	**N/A**	**COMMENT**
1. Management audits conducted at least ~~twice~~ once a year?	✓			Checklist needs update per FSM.
(a) Do audits cover two working days?	✓			
(b) Has the facility manager responded to any item requiring corrective actions within 14 days of receipt of			✓	No responses necessary from previous 2 audits
2. Has the facility manager or assistant facility manager conducted and documented a weekly inspection of the	✓			4th Qtr inspections reviewed SAT.
(a) Does inspection include tour of restricted area and inspection of random selection of documents?	✓			
3. Have radiological control and Safety audits been performed ~~once each calendar quarter?~~ twice per year?	✓			Checklist needs update per FSM.

PERSONNEL TRAINING	SAT	UNSAT	N/A	COMMENT
1. Do escorted visitors receive the following orientation:				
(a) Restricted area location?	✓			
(b) Methods of working and posting?	✓			
(c) Requirements for dosimetry?	✓			
(d) Escort requirements?	✓			
(e) Completion of exposure authorization form?	✓			
(f) Review of USNRC Regulatory Guide 8.13?	✓			
2. Do unescorted visitors also receive orientation in the above plus:				Reviewed T. Hankey training - 9/2/15
(a) Facility security?	✓			
(b) US Ecology notice to personnel?	✓			
(c) Radiation and risk?	✓			
3. Are non-occupationally exposed facility personnel provided with general orientation and:				
(a) Facility security?	✓			Confirmed via C. Watson file
(b) US Ecology notice to personnel?	✓			
(c) Radiation and risk?	✓			
(d) Is this training re-administered biennially?	✓			
4. Have radiological workers received training as specified in FSM 4.3.4?	✓			
(a) Completion of Occupational Radiation Exposure Questionnaire?	✓			Confirmed via S. Baumgarten file.
(b) Is training repeated every two years?	✓			
(c) Does qualification require passing a written test with a score of 75 percent or better?	✓			
(d) Does training consist of 12 hours of classroom work and four hours of practical work?	✓			
5. Is specialized radiological worker training conducted in the event a worker is required to work on a special project?	✓			No specific special projects noted during period
6. Is RC&ST training as described in FSM ~~4.3.6~~? 4.8.7	✓			Checklist needs revision
(a) Does training include 40 hours of classroom study?	✓			
(b) Are RC & ST re-qualified and tested every two years?	✓			
7. Is a weekly safety meeting conducted? (ROP's 20 & 21)	✓			

PERSONNEL TRAINING (continued)	**SAT**	**UNSAT**	**N/A**	**COMMENT**
8. Is a list of qualified instructors and areas of expertise maintained at the facility?	✓			
9. Does the Management training meet the requirements of the FSM and ROP 25	✓			
INCOMING VEHICLE INSPECTION	**SAT**	**UNSAT**	**N/A**	**COMMENT**
1. Are incoming vehicles surveyed as minimum at the following points:			X	Not Audited This period
(a) Two smears each on right, left, rear and inside?				
(b) Three smears of cargo?				
(c) 200 mR/hr contact at sides and underneath?				
(d) 10 mR/hr at 2 meters from sides?				
(e) 2 mR/hr in cab?				
2. Are following documents available:				
(a) Waste shipment and disposal manifest?				
(b) LLRW shipment certification form RHF-31?				
(c) Certificate of Compliance required by 10 CFR 71?				
(d) DOE/NCR 741 if required?				
(e) Exclusive use instruction?				
(f) Certification of limited quantity or instruments if required?				
(g) WSP Vehicle inspection form?				
3. In the event of hazard to personnel safety or the environment are operations ceased until approval granted by WDOH?				
(a) Are administratively correctable violations corrected, documented and brought to attention of WDOH on site inspector?				
4. Does the Facility Manager or designee ensure the wastes:				
(a) Meets packaging and wastes form requirements?				
(b) Per FSM, are at least 33% of containers inspected for physical integrity and compliance with marking?				
(c) Are all waste packages checked to ensure correlation to the manifest?				
5. Are current HIC procedures on file for HIC waste received?			↓	✓

INCOMING VEHICLE INSPECTION (continued)	SAT	UNSAT	N/A	COMMENT
6. Are current C of C and cask handling procedures on file for casks?			X	Not Applicable This period
7. Are vehicles and items for unconditioned release surveyed and decontaminated in accordance with ROP 44 & 45?			↓	↓
(a) Do they meet the release limits of Table 6.2 of FSM?				
(b) 220 dpm/100 cm^2 beta-gamma?				
(c) 22 dpm/100 cm^2 alpha?				
(d) Is waste generated from decontamination processed, packaged and manifested in accordance with the				
8. Are instruments calibrated in accordance with ROP 54?				
9. Is a person qualified as a RC & ST present during receipt and disposal operations?			↓	↓

PACKAGE CONFIRMATION AND STORAGE	SAT	UNSAT	N/A	COMMENT
1. Are the contents of a package confirmed once per week or one out of every 10 shipments?	✓			
(a) Is this based on a random sampling procedure	✓			per WA DOH
(b) If possible, are package contents confirmed in package inspection facility? (ROP 40)	✓			
(c) Is any violation reported to WDOH by the Facility Manager or designee?			✓	
(d) Are records available for the inspection room survey after the confirmation?	✓		✓	
(e) Are records of bioassays available for personnel participating in confirmation?	✓			
2. Are all packages stored above ground been disposed of 60 90 days from ~~date of receipt?~~ DOH Release of Pkg.	✓			90 days per Lic. Cond. 52. Chk lst requires update.
(a) Is storage within license possession limits?	✓			
(b) Is storage in accordance with ROP's 36 & 37?	✓			ROP-36 deleted.
(c) Are accumulations of packages containing SNM stored at least 4 meters from other accumulations of packages containing SNM?			✓	Only 1 pkg currently above ground.
3. Is ROP 39 followed for over packaging containers?	✓			

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DIRECT GAMMA MONITORING	**SAT**	**UNSAT**	**N/A**	**COMMENT**
1. Was direct gamma monitoring conducted in accordance with ROP 50?	✓			
(a) Were results reported in mrem/day?			✓	
(b) Were TLD's posted and exchanged quarterly at N, S, E & W fence lines?	✓			FSM Table 6.1 all Qtrly now.
2. Were ~~monthly~~ TLD's posted at N, S, E & W fence lines and fence line nearest active disposal trench?			✓	
(a) Were results less than 30 mrem/month?	✓			
3. If TLD reporting limits were exceeded, was WDOH verbally notified within 24 hours?			✓	No exceedances
(a) Written notification within 30 days?			✓	

ENVIRONMENTAL MONITORING	**SAT**	**UNSAT**	**N/A**	**COMMENT**
1. Is a scaled map showing all environmental monitoring locations available?	✓			
2. Is a record of all routine and special calibration of airflow or volume metering devices available?	✓			
(a) Are primary and secondary standards specified?	✓			
(b) Are methods employed available?	✓			
(c) Are estimates of accuracy available?	✓			
3. Have monthly burial reports been forwarded to WDOH?	✓			Records available on Server.
4. Have interim trench markers been installed at each end of the disposal trenches?	✓			
(a) Do monuments consist of durable material with exposed dimensions of 20" (h) X 12" (w) X 14" (l)?	✓			
(b) Is a corrosive resistant metal plate affixed with the total activity of by product material?	✓			
(c) Source material (kilograms)	✓			
(d) SNM (grams)?	✓			
(e) Trench number?	✓			
(f) Date of opening and closing trench?	✓			
(g) Volume of waste in the trench?	✓			
(h) Coordinates of disposal unit.	✓			
5. Are continuous air monitoring stations located along the fence line in the predominant wind direction?	✓			

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ENVIRONMENTAL MONITORING (continued)	**SAT**	**UNSAT**	**N/A**	**COMMENT**
(a) Is this in accordance with the scaled map?	✓			
(b) Are airflows set at 1.5 CFM? (ROP 46)	✓			
(c) Are tritium samplers at least 100-150cc per minute?	✓			
(d) Are gross alpha, gross beta counted weekly?	✓			
(e) Is the gamma counted by monthly composite?	✓			
~~(f) Is I-125 counted weekly~~? JN			✓	Not done anymore
(g) Is tritium in upwind and two downwind stations counted ~~monthly~~? quarterly JN	✓			
(h) Environmental Air Sampling Daily Check Form filled out properly?	✓			
6. Are results within action levels?				
(a) Gross alpha 1 E-14 uCi/cc	✓			
(b) Gross beta 1-E-13 uCi/cc	✓			
(c) Gamma 5 X MDC uCi/cc	✓			
~~(d) I-125 3.5 E-14 uCi/cc~~ JN			✓	? Not Env.
(e) H-3 2 E-11 uCi/cc	✓			
7. If reporting levels exceeded, was immediate verbal notification made to WDOH?			✓	
(a) Was letter sent to WDOH within 30 days?			✓	
8. Is air sampling equipment calibrated so that the cumulative error in the determination of the total volume is less than 20%?	✓			
(a) Is a linear change in flow rate assumed?	✓			

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OPERATIONAL ACTIVITIES		SAT	UNSAT	N/A	COMMENT
1.	Observation of operating and maintenance activities. List activities observed: Waste Offload, waste movement, Package Inspection	✓			
2.	Interviews with Radiation Protection personnel List personnel interviewed: Sean Murphy, Terry Herman, Scott Courneyea, John Wrstleigh	✓			
3.	Interviews with Operations/Maintenance personnel List personnel interviewed: Charlie Walton, Ed Boggs, Ernie Thompson	✓			
4.	Compliance and effectiveness of rules and procedures	✓			

RADIATION SAFETY COMMITTEE (RSC)		SAT	UNSAT	N/A	COMMENT
1.	Are minutes on file for current year RSC meetings?			X	
2.	Does the RSC review safety evaluations for new/revised procedures?			↓	
3.	Does the RSC review draft license and FSM changes?				
4.	Does the RSC review events that lead to unplanned exposures to individuals?				
5.	Does the RSC consist of at least:				
	(a) The RPM, Facility Manager, ARPM, Quality Assurance Coordinator and an employee representative?				
6.	Have items of noncompliance (audit findings, NCR's, WDOH inspection findings, etc.) been reviewed by the RSC?				

DIRECT RADIATION SURVEYS	SAT	UNSAT	N/A	COMMENT
1. Were direct surveys conducted:			X	Not Audited This Period
(a) Controlled facilities, weekly (100 cpm above BKG)?				
(b) Operational trench, daily (5 mR/hr)?				
(c) Normal traffic areas, weekly (0.5 mR/hr)?				
(d) Site equipment outside area, weekly (0.5 mR.hr)?				
(e) Site equipment outside area, weekly (0.1 mR/hr)?				
(f) Non-rad buildings, monthly (0.1 mR/hr)?				
2. Were surveys documented at end of workday after detecting contamination?				
3. Was at least one of each type of instrument in use in the area in which receipt, handling and disposal operations were conducted:				
(a) Portable instruments for measuring high levels (0-500 R/hr) beta-gamma?				
(b) Portable instrument for measuring low levels (0-2000 mR/hr) beta-gamma?				
(c) Did these instruments meet 10% full-scale linearity and 10% calibration stability?				
(d) Portable instruments for measuring beta-gamma contamination?				
(e) Do beta-gamma contamination instruments meet 10% calibration stability and window of 1.2 - 2.0 mg/cm^2?				
4. Was calibration of instruments at one-third and two-thirds of each scale?				
5. Were portable instruments source checked prior to use?				
(a) Were contamination instruments checked for response every other day and other instruments checked once each week (documentation required)?				
(b) Is a battery check performed each time instrument is turned on?				
(c) Is any instrument found to respond improperly taken out of use until repaired?				

ATT. NO.	REV.		EFFECTIVE DATE	PAGE
5-1	5a	SAMPLE AUDIT CHECKLIST RICHLAND, WASHINGTON FACILITY	October 8, 2009	14 of 14

QUARTERLY INSPECTION AND SECURITY	SAT	UNSAT	N/A	COMMENT
1. Are a visual inspection and radiation survey performed on completed disposal units each calendar Quarter?	✓			Logs & Surveys reviewed.
(a) Does this include condition of trench cap?	✓			
(b) Changes in radiation levels?	✓			
(c) General condition of disposal facility?	✓			
(d) Status of security measures? (ROP's 60 & 61)	✓			
2. Is the perimeter of the operation area of the facility surrounded with a continuous eight-foot high chain link fence topped with barbed wire?	✓			
(a) Is the entrance gate kept locked or under surveillance during working hours and locked during non-working hours?	✓			
(b) Is distribution of keys to personnel controlled by the Facility Manager?	✓			
(c) Are keys distributed per ROP-62?	✓			
(d) Are vehicles secured at the end of each workday? (ROP-31)	✓			

Additional Comments:

1. Observed package inspection of box containing biological waste from ENEC. Box appeared to be appropriately packaged per license. Ops & RC&S worked closely together to complete inspection safely.
2. Toured Restricted Area with Scott C. Observed waste offload, active stable & unstable trenches, & closed trench caps.
3. Verified several air sampling stations (1, 2, & 3). All SAT.

USEW Semi-Annual RC&S Audit Program Focus Areas

Audit Performance Areas	1st 2011	2nd 2011	1st 2012	2nd 2012	1st 2013	2nd 2013	1st 2014	2nd 2014	1st 2015	2nd 2015
ALARA Program		x		x	x				x	
Personal Air Monitoring					x		x	x		
Internal Montoring				x		x			x	
External Monitoring				x		x	x	x		
Posting		x			x		x		x	
Notification to Indiv.				x		x			x	
Instrument Check Sources		x			x		x		x	
External Contamination				x			x			x
Respiratory Protection		x			x		x			x
Audit Program				x			x			x
Personnel Training	x			x	x			x		x
Incoming Vehicle Inspection	x					x	x		x	
Package Confirmation and Storage	x					x	x			x
Direct Gamma Monitoring	x	x		x				x		x
Environemental Monitoring		x	x					x		x
Operational Activities	x	x	x	x	x			x		x
Radiation Safety Committee	x	x		x			x		x	
Direct Radiation Surveys	x	x				x	x		x	
Quarterly Inspection and Security					x		x			x

INTEROFFICE MEMORANDUM

TO: MIKE AULT, USEW GENERAL MANAGER

FROM: JOE WEISMANN, VP RADIOLOGICAL PROGRAMS /

SUBJECT: 2015 USEW MANAGEMENT AUDIT REPORT (ROP-004)

DATE: 11/23/2015

CC: SIMON BELL, EVP OPERATIONS - ES

The Annual US Ecology Washington (USEW) Management Audit was completed on November 17 and 18, 2015 as prescribed in Section 3.1.3 of the USEW Facility Standards Manual (FSM). A copy of the Completed Audit Checklist from ROP-4 "Management Audits" is attached for your review.

During the course of the audit, personnel from site Management, Operations, and Radiation Safety and Control departments were interviewed or contacted for information. Overall, the facility staff demonstrated a strong understanding of the requirements of the License, FSM, and Quality Assurance program. All staff members consulted during the audit provided information in a timely and professional manner. No major findings were documented during this audit.

A high dose rate cask shipment from the Navy was received during the period of this Management Audit. The portions of the shipment inspection and offload that were observed during the audit were all done safely and in accordance with site procedures. I was briefed of the radiological hazards and provided with appropriate PPE prior to being escorted into the Restricted Area to observe offload activities. I also observed the partial construction of a polyethylene secondary containment structure by the Operations staff in order to comply with a USEW License Condition involving shipments containing Carbon-14 (C-14).

On Nov. 17th, the Hanford area experienced a rather severe windstorm that contributed to excessive airborne dust and tumbleweed accumulation along site fences. The strong winds caused damage to the Restricted Area fence gate at the NE entry point that will need to be repaired. Site Operations informed me that fence maintenance and repairs are an ongoing challenge at the site due to strong winds and that the recent damage will be repaired as soon as practicable. All other markings and signage on the Restricted Area Fence were in good condition.

A Site Safety Meeting was held on Wed, Nov. 18th on Source Security. Since I did not have the proper clearance for the chosen subject matter, I was asked to leave the briefing. This confirmed proper adherence to the Site Security Plan and procedures. Sean Murphy, the USEW RPM/Health & Safety Manager confirmed that the Safety Meeting was documented as required.

I was also informed that the USEW Fourth Quarter (4Q) groundwater sampling event was slightly delayed due to a delay to delivery of the 3Q results from the analytical laboratory. The sampling has been rescheduled for early December. Groundwater well MW-8 also had a bladder pump failure, which will prevent its sampling until the pump can be replaced with an electric pump. The site has already instituted a replacement protocol for all well bladder pumps as they fail with the electric style.

I appreciate the time and cooperation provided by the USEW staff during my visit. If you have any questions, please do not hesitate to contact me.

ATTACHMENT

Transmitted via e-mail

ROP	REV.	LOW-LEVEL RADIOACTIVE WASTE DISPOSAL FACILITY MANAGEMENT CHECKLIST	EFFECTIVE DATE	PAGE
4-1	3		04/12/06	1 of 3

FACILITY: US Ecology Washington, Inc.
DATE OF INSPECTION: 11/17/15 - 11/18/15 NUMBER: N/A
DATE OF LAST INSPECTION: 11/18/14 - 11/19/14 NUMBER: N/A
NAME OF INSPECTOR: Joe Weismann
FACILITY REPRESENTATIVE: David Kanin, Asst GM

FACILITY MANAGEMENT AUDIT CHECKLIST 4-1				
A. SAFETY	**YES**	**NO**	**N/A**	**COMMENTS**
1. Is facility safety equipment inspected and readily available, including fire control?	✓			
2. Are all personnel trained in the use of safety equipment and procedures?	✓			
3. Are regular safety meetings conducted? Indicate date of last meeting.	✓			11/18/15
4. Are safety meetings documented?	✓			
5. Were any violations of good safety practices observed?		✓		
6. Was proper protective clothing worn by personnel during disposal operations?	✓			
7. Have previous safety and management audits been reviewed for outstanding items?	✓			
8. Is an emergency plan for meeting potentially dangerous situations by evacuating the site posted on the bulletin board?	✓			
9. Is all monitoring equipment properly used at entrance to disposal area?	✓			
10. Are proper surveys conducted of facility equipment and personnel leaving the controlled area?	✓			
B. EQUIPMENT AND TOOLS				
1. Is maintenance area orderly and free of safety hazards?	✓			Constructing sec. Containment
C. SECURITY				
1. Is security fence in good repair?		✓		Minor damage from wind storm.
2. Are keys properly controlled?	✓			
D. RECEIPT AND DISPOSAL OF WASTE				
1. Was State Inspector present during inspection?		✓		
2. Were all waste shipments accompanied by properly executed shipment records certifications and permits including a Washington State Patrol or Washington State Utilities and Transportation Commission vehicle inspection certificate or a visible Washington State 90-day vehicle inspection seal?	✓			
3. Was each shipment accompanied by a properly executed materials and certification properly executed by a representative of the shipper / generator of the waste?	✓			
4. Was a survey of incoming vehicles conducted?	✓			
5. Was a survey conducted during off-loading and handling operations to assess radiation and contamination levels and to identify problem situations?	✓			
6. Were surveys conducted of the vehicles before release?			✓	Didn't observe
7. Were survey results documented?			✓	" "
8. Were open burial trenches surrounded by a chain link fence, 8 feet high, topped with barbed wire?	✓			See Comments
9. Was waste off-loaded and placed in trench in accordance with procedures?	✓			

ROP	REV.	LOW-LEVEL RADIOACTIVE WASTE DISPOSAL FACILITY MANAGEMENT CHECKLIST	EFFECTIVE DATE	PAGE
4-1	3		04/12/06	2 of 3

D. RECEIPT AND DISPOSAL OF WASTE (Cont.)	YES	NO	N/A	COMMENTS
10. Were any damaged packages observed during off-loading or disposal procedures?	☐	☑	☐	
11. Were any damaged packages observed in the active trench?	☐	☑	☐	
12. Was all waste stored above ground in accordance with the license?	☐	☐	☑	No waste above ground
13. Is capability maintained for safely opening and inspecting contents of packages and for preparing damaged or leaking packages for disposal or return to shipper?	☑	☐	☐	
14. Were proper notifications made regarding damaged packages?	☐	☐	☑	
15. Were proper personnel and radiation detection equipment available during receipt, handling, packaging, repackaging and disposal operations?	☑	☐	☐	
16. Was specified waste segregated as required by the License?	☐	☐	☑	
E. INSPECTION OF CLOSED TRENCHES				
1. Are all capped trenches surrounded by fence in good repair?	☑	☐	☐	Slight soil erosion from wind storm.
2. Are all capped trenches completely covered with at least six inches of large gravel and rock, extending at least 10 feet beyond the edges of the trenches?	☑	☐	☐	
3. Is a monument with prescribed information in place on each capped trench?	☑	☐	☐	
4. Does a minimum of eight feet of earth (compacted where possible) separate the wastes and natural grade level of trench opening? (Trenches 1 through 6 excluded)	☑	☐	☐	
5. Is a permanent record of each trench or other waste disposal area boundaries maintained?	☑	☐	☐	
6. Was any erosion, shrinkage or settlement noted in trench caps?	☐	☑	☐	Very minor. Subsidence observed in Trench 5.
F. ENVIRONMENTAL MONITORING AND SURVEILLANCE CONDITIONS				
1. Has environmental monitoring been conducted as required?	☑	☐	☐	4Q GW delayed.
2. Have results of sample analyses been forwarded to the State as required?	☑	☐	☐	
3. In the event action levels are exceeded, have the proper notifications been made?	☐	☐	☑	
4. Have the personnel surveys been conducted as required?	☑	☐	☐	
5. Has the quarterly facility inspection maintenance program been completed and documented?	☑	☐	☐	
6. Are passive monitoring devices in place?	☑	☐	☐	
7. Have passive monitoring devices been replaced and analyzed as required with results recorded for inspection by the WDOH?	☑	☐	☐	
G. TRENCH CONSTRUCTION				
1. Is immediate area surrounding perimeter of trench under construction graded level	☑	☐	☐	
2. Has the State of Washington been notified prior to use of all new trenches?	☐	☐	☑	No new trenches in past year.
H. GENERAL				
1. Has the WDOH been notified within 30 days of any changes in the disposal facility?	☐	☐	☑	No changes documented.
2. Has the Facility Manager conducted and documented the weekly inspection of operating checklists and facility operations?	☑	☐	☐	
I. QUALITY ASSURANCE PROGRAM				
1. A documented quality assurance program has been established.	☑	☐	☐	
2. Is the QA matrix out of date?	☐	☑	☐	Matrix updated to new format.
3. Items and services covered by the quality assurance program have been identified.	☑	☐	☐	
4. Program provides for the indoctrination and training of personnel performing activities affecting quality.	☑	☐	☐	
5. Management regularly reviews the status and adequacy of the quality assurance	☑	☐	☐	

program.				
J. DOCUMENT CONTROL	**YES**	**NO**	**N/A**	COMMENTS
1. Measures are established to control the issuance of documents that prescribe activities affecting quality. (Training)	☑	☐	☐	
2. Measures are established to assure that documents, including changes, are reviewed for adequacy and approved for release by authorized personnel.	☑	☐	☐	
3. Provisions for the appropriate document to be distributed to and used at the location where the prescribed activity is performed are established.	☑	☐	☐	
4. Changes to documents are reviewed and approved by the same organizations that performed the original review and approved, unless other organizations are designated	☑	☐	☐	
K. QA RECORDS				
1. Records are maintained to furnish documentary evidence of the quality of items and of activities affecting quality.	☑	☐	☐	
2. Records include, as appropriate, results of reviews, inspections, tests, audits, material analysis, and data, such as qualification of personnel procedures and equipment.	☑	☐	☐	
3. Measures are established to assure that records are identifiable and retrievable	☑	☐	☐	
4. Measures include requirements and responsibilities for record transmittal, retention and maintenance subsequent to completion of work.	☑	☐	☐	
L. AUDITS, SURVEILLANCE, AND MANAGERIAL CONTROLS				
1. Provisions are established for a system of planned and periodic audits to verify the implementation and effectiveness of the implementation of quality assurance programs (internal and external).	☑	☐	☐	
2. External audits of quality related vendors are performed as appropriate.	☑	☐	☐	AVL Reviewed
3. Audits are performed in accordance with written procedures, plans, and checklists.	☑	☐	☐	
4. Do trained personnel not having direct responsibility in the area being audited perform audits?	☐	☑	☐	
5. Audit results are documented and reviewed by management having responsibility in the area audited.	☑	☐	☐	
6. Follow-up action, including re-audit of deficient areas is performed as necessary.	☐	☐	☑	None required during period.

I. SUMMARY:

No major findings. Site requires some minor maintenance resulting from recent windstorm & tumbleweed build up. Waste offload and inspection activities observed to be safe & compliant.