



DEPARTMENT OF
ECOLOGY
State of Washington

Standard Operating Procedure NWP002, Version 1.1

Standard Operating Procedure for Shipping Samples to the Nuclear Waste Program Contracted Analytical Laboratories

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Purpose of this document

The Washington State Department of Ecology develops Standard Operating Procedures (SOPs) to document agency practices related to sampling, field and laboratory analysis, and other aspects of the agency's technical operations.

Publication Information

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SIGNATURES AVAILABLE UPON REQUEST

Please note that the Washington State Department of Ecology's Standard Operating Procedures (SOPs) are adapted from published methods, or developed by in-house technical and administrative experts. Their primary purpose is for internal Ecology use, although sampling and administrative SOPs may have a wider utility. Our SOPs do not supplant official published methods. Distribution of these SOPs does not constitute an endorsement of a particular procedure or method.

Any reference to specific equipment, manufacturer, or supplies is for descriptive purposes only and does not constitute an endorsement of a particular product or service by the author or by the Department of Ecology.

Although Ecology follows the SOP in most instances, there may be instances in which the Ecology uses an alternative methodology, procedure, or process.

SOP Revision History

Revision Date	Revision History	Summary of changes	Sections	Reviser(s)
7/5/2006	1.0	Added numbering	all	Bill Kammin
04/17/2019	1.1	Recertification	all	Arati Kaza

1.0 Purpose and Scope

This document is the Nuclear Waste Program Standard Operating Procedure (SOP) for maintaining the integrity of all samples for shipping. "All samples" includes, but is not limited to soil, water, sediment, plant, etc. sampled by NWP staff or contractor sampling staff. The samples could contain low levels of radiochemicals as mixed and/or hazardous waste.

2.0 Applicability

2.1 Program staff must follow this procedure when handling and preparing samples for shipment at the NWP Richland facility.

3.0 Definitions

3.1 Hazardous Waste - Those wastes included in the definitions of RCRA 1004(5) and RCW 70.105.010(15). Hazardous wastes do not contain a radioactive component.

3.2 Matrix - The component or substrate which contains the analytes of interest.

3.3 Chain of custody - A series of procedures designed to document a sample or set of samples from the moment of collection, through transport, analysis, and reporting. Chain of custody requires that each sample be properly identified, and that a record be kept of the names of all persons who handle the sample. The person with custody must have full and verifiable control of the samples at all times.

A sample is considered to be under a person's custody if it is:

- In the individual's physical possession
- In the individual's sight
- Secured in a tamper-proof way by that person, **or**
- Secured by the person in an area that is restricted to authorized personnel

Elements of chain of custody include:

- Sample identification
- Security seals and locks
- Security procedures
- Chain-of-custody record
- Field log book

3.4 Mixed Waste - Waste with both radioactive and hazardous components, as defined by RCRA and the Atomic Energy Act. Mixed wastes are regulated under both laws.

3.5 Reagent - Any substance used in a chemical reaction. It usually implies a chemical that is added in order to bring about the chemical change. For example: Hydrochloric acid is the chemical reagent that would cause calcium carbonate to release carbon dioxide.

Similarly, but less obvious, hydrochloric acid is the chemical reagent that reacts with zinc to produce hydrogen even though in this case the hydrogen comes from the acid and not the metal.

To classify any of the chemicals involved in a chemical reaction as the "reagent" is thus largely a matter of convention or perspective.

In another use of the term, when purchasing or preparing chemicals, "reagent" describes chemical substances of sufficient purity for use in chemical analysis, chemical reactions, or physical testing. Purity standards for reagents are set by organizations such as ASTM International. For instance, reagent-quality water must have very low levels of impurities like sodium and chloride ions, silica, and bacteria, as well as a very high electrical resistivity.

4.0 Personnel Qualifications/Responsibilities

4.1 Experienced senior chemistry staff must train chemistry team members in sample shipping. The chemists typically perform sample shipping, but environmental specialists and other technical staff may be trained.

4.2 Any new staff that will be involved in sampling will be introduced to the sample shipping room and the location of containers, coolers, shipping forms, etc. New staff will attend an actual site sampling event to train in all aspects from sample acquisition to maintaining chain of custody through shipment.

5.0 Equipment, Reagents, and Supplies

5.1 Because the sample storage room does not have a vented hood, no reagents are allowed in the room. Therefore, any preservation must occur in the field prior to shipment to the Nuclear Waste Program office.

5.2 Shipping coolers, ice, plastic bags, tape, and other miscellaneous shipping supplies are stored in the sample storage room.

6.0 Summary of Procedure

6.1 Below is the procedure in checklist form, which outlines the tasks for shipping samples.

	<i>NWP Sample Shipping Checklist</i>	
	Task	COMMENTS
1.	Contact Laboratory	
2.	Complete Contract Form	
3.	Complete Work Assignment	
4.	Ensure Bottle Labels are complete and match chemicals of concern with work assignment and chain of custody	
5.	Use bubble wrap for glass containers and to pad bottom of cooler	
6.	Should there be a step to state something like, "Place sample containers in cooler"?	
7.	Pack with newspaper, not peanuts	
8.	Place blue ice in cooler	
9.	Place chain-of-custody form and work assignment in a plastic bag.	
10.	Tape plastic bag to inside lid of cooler.	
11.	Tape laboratory address label to top of cooler	
12.	Wrap cooler with clear packaging tape	
13.	Place two security tapes on cooler	
14.	Weigh cooler and provide information to receptionist to give to shipper (UPS, FEDEX)	
15.	Place cooler at front desk for shipment	
16.	Place work assignment and contract request form in Section Manager's inbox	

6.2 Before sampling and sample shipping, the checklist below must be completed and approved by the Chemist and Section manager.

<i>NWP Chemistry team sample collection and analysis checklist – Questions to ask Staff</i>	
1.	PROJECT NAME
2.	MATRIX
3.	COMMENTS
4.	What is the location and type of sample that will be taken? (Soil, Water, etc.)
5.	How many samples will be taken?
6.	Will the data produced be used for laboratory comparison and/or extra Quality Assurance purposes?
7.	What chemicals of concern should be analyzed for? (Review SAP, permit, etc.)
8.	Are there special holding time concerns?
9.	What type and size of containers are needed?
10.	Is there any field screening analyses of historical data to support this effort?
11.	What type of badging, training, and dress-out is required for entry or observance while the samples are being taken?
12.	Who is the point of contact for the contractor doing the sampling?
13.	Is there a pre-sample meeting?
14.	Will the samples need a RAD screen?
15.	What type of a data package will be required? (summary sheets or complete package)
16.	When is the data needed?
17.	Where will the data be stored on-site for pickup?

7.0 Records Management

- 7.1 The chemist must fill out a Nuclear and Mixed Waste Management Program Contract Request Form and submit it to the appropriate section manager for clearance and routing purposes. The form is located on the top north shelf on the west wall of the sample storage room.
- 7.2 A scope of work and price list must be submitted to the section manager along with the contract request form.
- 7.3 Section manager approves the form, then the form and scope of work are sent to the program budget manager.
- 7.4 Keep a copy of all paperwork for files.

8.0 Quality Control and Quality Assurance

- 8.1 A completed chain-of-custody form must accompany the samples. All samples must be in proper containers and labeled with time and date of sampling, analysis required, sample identification, and sample site identification.
- 8.2 Sample containers must be secured with security tape placed across container lids. The security tape must be dated and signed by the sampler. For glass containers bubble wrap is required. Ice must be shipped with the samples to maintain a temperature below four degrees centigrade.
- 8.3 Any field occurrences that could have an effect on the sample should be recorded in the field log book.
- 8.4 Sample integrity must be maintained once the contractor receives the sample. The laboratory should notify Ecology of arrival time and condition of samples. The procedures to ensure sample integrity in the laboratory must be reviewed and approved by the NWP during the laboratory audit.

9.0 Safety

- 9.1 All samples should be brought into the Richland office in sealed coolers with a chain-of-custody form attached. Samples may only be handled within the sample room. Once the packaging is complete the samples may only be moved out of the sample storage room in a sealed cooler.
- 9.2 Each employee dealing with sample handling and shipment must read the most recent version of the *Richland Office Building Safety Plan* and sign the attached review form. Each employee should be up to date on their 40 hour Hazardous Waste Operator and First Aid training.
- 9.3 Lifting and moving coolers with samples for shipment could pose a lifting hazard if not done correctly. Staff should follow proper safe guidance on lifting and use carts for moving samples for shipment. If the Program has a radiation safety plan, it should be cited here.

10.0 **References**

[Richland Office Safety Plan](#)

11.0 **Attachments**

11.1 Appendix A – Work Assignment Scope of Work

11.2 Appendix B – Cost Breakdown

SAMPLE

APPENDIX A

H Spring, H and F aquifer tubes WORK ASSIGNMENT SCOPE OF WORK

BACKGROUND

For regulatory oversight Ecology will take a sample of the 100 H area spring, H aquifer tube, and F aquifer tubes. This work assignment is to authorize Paragon Analytics Incorporated to provide Ecology with analytical laboratory services as outlined in the following tasks:

Task 1 SAMPLE ANALYSIS

Paragon shall conduct analyses on 5

samples. Task 2 DELIVERABLES

Paragon shall submit to Ecology a complete data package for the analysis as listed in Appendix B no later than 11-25-99.

Task 3 PROJECT

MANAGEMENT BUDGET

This work assignment is a cost reimbursement agreement, based on unit prices agreed to in the contract.

SAMPLE

APPENDIX B

Sample	Analysis	Method	Cost per	Cost X
			Method	Samples
64F, 74F,46H,47H	Isotopic Thorium	AS	\$125.00	\$500.00
64F, 74F,46H,47H Hspring	Anions	300	\$15.00	\$75.00
64F, 74F,46H,47H,Hspring	Tc 99	GFP	\$150.00	\$750.00
64F, 74F,46H,47H, Hspring	Sr 89/90	GFP	\$125.00	\$625.00
64F, 74F,46H,47H	Gross Alpha Beta	GFP	\$50.00	\$200.00
64F, 74F,46H,47H Hspring	Gamma Spec	GS	\$65.00	\$325.00
64F; 74F,46H,47H Hspring	Metals	6010 8 RCRA	\$125.00	\$625.00
64F, 74F,46H,47H	VOA	8260	\$160.00	\$640.00
64F, 74F,46H,47H	Semi-VOA	8270	\$275.00	\$1100.00
Total Cost				\$4840.00

Note: Prices provided by Lance Steere 9-15-98