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	WASHINGTON PUBLIC POWER SUPPLY SYSTEM
	NCONTROLLED PLANT PROCEDURES MANUAL WNP-2
U	WNP-2
	PROCEDURE NUMBER APPROVED
	*12.10.2 · ( / artin · 06/21/83
1	VOLUME NAME
	12 CHEMISTRY PROCEDURES
	SECTION
	12.10 POST ACCIDENT SAMPLING AND ANALYSIS
	TITLE
	*12.10.2 SMALL VOLUME LIQUID ANALYSIS

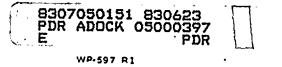
## 12.10.2.1 Purpose

This procedure describes the analysis of a small volume liquid sample for gamma energy analysis.

- 12.10.2.2 Precautions/Prerequisites
  - A. Lab personnel shall be issued extremity monitoring devices per Health Physics policy.
  - B. Lead shielding must be setup prior to removing the sample from the cask.
  - C. Appropriate dose rate meter must be available and in calibration. Use continuously to assure personnel exposure is ALARA.
  - D. The gamma spectrometer system must be operable.
  - E. Appropriate remote handling tools must be available and used during handling of highly radioactive sample.
  - F. Follow PPM 12.10.1 to obtain sample using the Post Accident Sampling System.

## 12.10.2.3 Equipment

- A. Syringes capable of accurately measuring desired aliquiot (100 $\lambda$ ; 200 $\lambda$ ; 500 $\lambda$ )
- B. Needles capable of reaching the bottom of the 15 ml vial (2.5" to 3" long)
- C. 125 ml Serum Vials



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PROCEDURE NUMBER	REVISION NUMBER	PAGE NUMBER
12.10.2	0	12.10.2-1 of 4

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- D. 15 ml Serum Vials
- E. Solution of 0.1N<sup>•</sup> HNO<sub>3</sub> for dilution

## 12.10.2.4 Procedure

- A. Prior to removing sample from transfer cask into the shielded handling arrangement, complete the following:
  - 1. Prepare the dilution vials (125 ml) as follows:
    - a. Add 50 ml of 0.1N HNO<sub>3</sub> to the 125 ml vial.
    - b. Evacuate vial for approximately 30 seconds being careful not to remove any liquid.
    - c. Prepare the counting vials (15 ml) as follows:
      - 1) Add 10 ml of 0.1N HNO3 to 15 ml vial.
      - Evacuate vial for approximately 30 seconds being careful not to remove any liquid.
- B. While monitoring radiation exposure raise sample vial up in transfer cask to enable removable and transfer from cask into shield work area. Use remote handling tool only.
- C. Monitor radiation exposure while vial is in position to determine dilution and adjust lead to minimize personnel exposure.
- D. Using the appropriate syringe withdraw an aliquot of sample and transfer into dilution vial prepared in Step A above. Record dilution on Attachment A.

NOTE: Liquid will be quickly sucked into the vial.

- E. Depending on radiation levels of vial more sample dilution(s) may be necessary. If so, repeat Step D by transferring sample from last dilution vial into another prepared 125 ml vial.
- F. 'Final counting vial will be 15 ml with 10 ml final volume in 0.1N
  HNO3.
- G. Survey counting vial for contamination, radiation and transport to counting room for analysis only when vial is less than 1000 dpm/100cm<sup>2</sup> external contamination and radiation levels are low enough to count on gamma spectrometer.

NOTE: Containing vial in plastic wrap is required prior to placing vial in shielded cave.

PROCEDURE NUMBER	REVISION NUMBER	PAGE NUMBER
12.10.2	0	12.10.2-2.of 4

WP-598

Count sample just long enough to obtain a spectrum that can be used to identify the following nuclides in microcuries per ml: н.

- I-131 1.
- 2. 3.
- I-133 Cs-134 Cs-137 4.

PROCEDURE NUMBER	REVISION NUMBER	PAGENUMBER
12.10.2	0	12.10.2-3 of 4

I. Sample from PASS contains: <u>10.0 ml</u> of dilution plus (a) <u>0.1 ml</u> of sample solution (b) II. Sample dilution #1 ml of dilution (c) (0.1N)

\_\_\_\_\_ml of dilution (c) (0.1N HNO3)

\_\_\_\_\_\_ ml of sample (d)

III. Sample dilution #2

\_\_\_\_ ml dilution (e) 0.1N HNO3

ml sample (f)

IV. Sample dilution #3

\_\_\_\_\_ ml dilution (g) (0.1N HNO3)

\_\_\_\_\_ ml sample (h)

Pass dilution ratio:

 $(a/b) \times (c/d) \times (e/f) \dots = dilution factor$ 

Isotope	uCi/ml Concentration	Dilution Factor	Final Conc uCl/ml
I-131			·
I-133	·		
Cs-134			
Cs-137	د 	A	

## Attachment A

PASS

1	PROCEDURE NUMBER	REVISION NUMBER	PAGE NUMBER	Í.
	12,10,2	0	' 12.10.2-4 of 4	

WP-598