PNNL-17282

Pacific Northwest
National Laboratory
Operated by Battelle for the
U.S. Department of Energy

Hanford Site Environmental Surveillance Master Sampling Schedule for Calendar Year 2008

L. E. Bisping

January 2008

Prepared for the U.S. Department of Energy
under Contract DE-AC05-76RL01830

DISCLAIMER

PACIFIC NORTHWEST NATIONAL LABORATORY
operated by
BATTELLE
for the
UNITED STATES DEPARTMENT OF ENERGY
under Contract DE-AC05-76RL01830

Printed in the United States of America

May be available to DOE and DOE contractors from the
Office of Scientific and Technical Information,
P.O. Box 62, Oak Ridge, TN 37831-0062;
ph: (865) 576-8401
fax: (865) 576-5728
email: reports@adonis.osti.gov

May be available to the public from the National Technical Information Service,
U.S. Department of Commerce, 5285 Port Royal Rd., Springfield, VA 22161
ph: (800) 553-6847
fax: (703) 605-6900
email: orders@ntis.fedworld.gov
online ordering: http://www.ntis.gov/ordering.htm

PNNL-17282

Hanford Site Environmental Surveillance Master Sampling Schedule for Calendar Year 2008

L. E. Bisping

January 2008

Prepared for
the U.S. Department of Energy
under Contract DE-AC05-76RL01830

Pacific Northwest National Laboratory
Richland, Washington

Summary

Environmental surveillance of the Hanford Site and surrounding areas is conducted by the Pacific Northwest National Laboratory (PNNL)[a] for the U.S. Department of Energy (DOE). Sampling is conducted to evaluate levels of radioactive and nonradioactive pollutants in the Hanford environs, as required in DOE Order 450.1, *Environmental Protection Program*[b], and DOE Order 5400.5, *Radiation Protection of the Public and the Environment*[c]. The environmental surveillance sampling design is described in the Hanford Site *Environmental Monitoring Plan, United States Department of Energy, Richland Operations Office* (DOE/RL-91-50[d]).

This document contains the calendar year 2008 schedule for the routine collection of samples for the Surface Environmental Surveillance Project (SESP) and Drinking Water Monitoring Project (DWMP). Each section includes sampling locations, sampling frequencies, sample types, and analyses to be performed. In some cases, samples are scheduled on a rotating basis. If a sample will not be collected in 2008, the anticipated year for collection is provided. Maps showing approximate sampling locations are included for media scheduled for collection in 2008.

Surface Environmental Surveillance Project Sampling

The SESP is a multimedia environmental surveillance effort to measure the concentrations of radionuclides and chemicals in environmental media to demonstrate compliance with applicable environmental quality standards and public exposure limits, and assessing environmental impacts. Project personnel annually collect selected samples of ambient air, surface water, agricultural products, fish, wildlife, and sediments. Soil and vegetation samples are collected approximately every 5 years. Analytical capabilities include the measurement of radionuclides at very low environmental concentrations and, in selected media, nonradiological chemicals including metals, anions, volatile organic compounds, and total organic carbon.

Drinking Water Monitoring Project Sampling

Fluor Hanford, Inc. is responsible for monitoring the quality of drinking water supplied by DOE to its onsite facilities in accordance with federal and state regulations. PNNL conducts radiological monitoring of onsite drinking water for Fluor Hanford, Inc. concurrent with SESP activities to promote sampling efficiency and consistency, utilize expertise developed over the years, and reduce costs associated with management, sample collection, procedure development, analytical contracting, data management, quality control, and reporting.

[a]Pacific Northwest National Laboratory is operated by Battelle for the U.S. Department of Energy.
[b]DOE Order 450.1. 2003. "Environmental Protection Program." U.S. Department of Energy, Washington, D.C.
[c]DOE Order 5400.5. 1990. "Radiation Protection of the Public and the Environment." U.S. Department of Energy, Washington, D.C.
[d] DOE/RL-91-50, Rev. 3. 2000. *Environmental Monitoring Plan, United States Department of Energy Richland Operations Office.* U.S. Department of Energy, Richland, Washington.

Data Management

The Hanford Environmental Information System (HEIS) database is used as a repository for data gathered during environmental surveillance activities at the Hanford Site. For ease in retrieving SESP or drinking water data from the HEIS database (HEIS 1989), the majority of the location names in this document are the location names used in the database.

Schedule Changes

This schedule is subject to modification during the year in response to changes in site operations, program requirements, and the nature of the observed results. Operational limitations such as weather, mechanical failures, sample availability, and other factors may also impact scheduled sampling. Therefore, this document may not be an accurate record of samples collected during the year.

Multi-Agency Samples

By joint agreement, some samples are collected by SESP personnel and provided to the Washington State Department of Health (DOH) and the U.S. Food and Drug Administration (FDA). All planned cooperative sampling efforts are indicated in this schedule.

Additional Information

Questions relating to the content of this document can be directed to T. M. (Ted) Poston, Manager, SESP, (509) 372-6900 or G. W. (Greg) Patton, Manager, DWMP, (509) 371-7071.

Acronyms and Symbols

Acronyms

ALE	Fitzner/Eberhardt Arid Lands Ecology Reserve
DOH	Washington State Department of Health
DR	Downriver (from noted location)
FDA	U.S. Food and Drug Administration
FFTF	Fast Flux Test Facility
HRM	Hanford river markers
ICP-MS	Inductively coupled plasma mass spectrometry
NSQAN	National Stream Quality Accounting Network
USGS	U.S. Geological Survey
UR	Upriver (from noted location)

Frequency Symbols Used

A	annually
BE	biennially (every 2 years)
BW	biweekly (every 2 weeks)
M	monthly
M Comp.	monthly composite
Q	quarterly
Q Comp.	quarterly composite
SA	semiannually (twice each year)
TE	triennially (every 3 years)

Analytical Symbols Used

Generally, standard element, chemical, and isotope designations are used to indicate the analyses performed. Other analytical designations used include the following:

Alpha	gross alpha activity of sample
Anions	major anions – generally chloride, fluoride, nitrate, nitrite, sulfate
Beta	gross beta activity of sample
Gamma Scan	analysis of photon energy spectrum for individual photon-emitting radionuclides
HTO	tritiated water ($^{3}H^{1}H^{16}O$)
Hg-CVAA	mercury by cold vapor atomic absorbance spectrometry
Hg-CVAF	total mercury in water by cold vapor atomic fluorescence
ICP-MS	major metals by inductively coupled plasma mass spectrometry – samples unfiltered unless otherwise noted
Lo ^{3}H	analytical procedure includes electrolytic enrichment
Pu	isotopic plutonium (^{238}Pu, $^{239/240}Pu$)

TOC	total organic carbon
U	isotopic uranium (^{234}U, ^{235}U, ^{238}U)
VOA	volatile organic compounds

Contents

Figures

1.0 Air Surveillance

1.1 Particulate Filter

	Individual Samples			Composited Samples		
Location	Location Number[a]	Frequency	Analyses	Composite Group	Frequency	Analyses
Onsite						
100 K Area	1	BW	Beta, Alpha	100 Areas	Q	^{90}Sr, Pu, Gamma Scan
100 N-1325 Crib	2	BW	Beta, Alpha			
100 D Area	3	BW	Beta, Alpha			
100 F Met Tower	4	BW	Beta, Alpha	Hanford Townsite	Q	^{90}Sr, Pu, Gamma Scan
Hanford Townsite	5	BW	Beta, Alpha			
Gable Mountain	6	BW	Beta, Alpha	Gable Mountain	Q	Gamma Scan
200 ESE	7	BW	Beta, Alpha	200 E Area	Q	^{90}Sr, Pu, U, Gamma Scan
S of 200 E	8	BW	Beta, Alpha			
B Pond	9	BW	Beta, Alpha	B Pond	Q	Pu, U, Gamma Scan
Army Loop Camp	10	BW	Beta, Alpha	200 W South East	Q	^{90}Sr, Pu, U, Gamma Scan
200 Tel. Exchange	11	BW	Beta, Alpha			
SW of B/C Cribs	12	BW	Beta, Alpha			
200 W SE	13	BW	Beta, Alpha	200 West Area	Q	Pu, U, Gamma Scan
300 Water Intake	14	BW	Beta, Alpha	300 Area	Q	^{90}Sr, Pu, U, Gamma Scan
300 South Gate	15	BW	Beta, Alpha			
300 South West	16	BW	Beta, Alpha			
300 Trench	17	BW	Beta, Alpha	300 NE	Q	^{90}Sr, Pu, U, Gamma Scan
300 NE	18	BW	Beta, Alpha			
400 E	19	BW	Beta, Alpha	400 Area	Q	^{90}Sr, Pu, Gamma Scan
400 W	20	BW	Beta, Alpha			
400 S	21	BW	Beta, Alpha			
400 N	22	BW	Beta, Alpha			
Wye Barricade[b]	23	BW	Beta, Alpha	Wye Barricade	Q	^{90}Sr, Pu, U, Gamma Scan
Perimeter						
Ringold Met Tower	24	BW	Beta, Alpha	Ringold Met Tower	Q	^{90}Sr, Pu, Gamma Scan
W End of Fir Road[b]	25	BW	Beta, Alpha	W End of Fir Road	Q	^{90}Sr, Pu, U, Gamma Scan

Particulate Filter (contd)

Location	Individual Samples: Location Number[a]	Individual Samples: Frequency	Individual Samples: Analyses	Composited Samples: Composite Group	Composited Samples: Frequency	Composited Samples: Analyses
Perimeter						
Dogwood Met Tower	26	BW	Beta, Alpha	Dogwood Met Tower	Q	^{90}Sr, U, Gamma Scan
Byers Landing	27	BW	Beta, Alpha	Byers Landing	Q	^{90}Sr, Pu, U, Gamma Scan
Battelle Complex[b]	28	BW	Beta, Alpha	Battelle Complex	Q	U, Gamma Scan
Horn Rapids Substa	29	BW	Beta, Alpha	Prosser Barricade	Q	^{90}Sr, Pu, Gamma Scan
Prosser Barricade[b]	30	BW	Beta, Alpha			
Yakima Barricade[b]	31	BW	Beta, Alpha	Yakima Barricade	Q	^{90}Sr, Pu, Gamma Scan
Rattlesnake Springs	32	BW	Beta, Alpha			
Wahluke Slope	33	BW	Beta, Alpha	Wahluke Slope	Q	^{90}Sr, Pu, Gamma Scan
S End Vernita Bridge	34	BW	Beta, Alpha			
Community						
Basin City School	35	BW	Beta, Alpha	Basin City School	Q	^{90}Sr, Pu, U, Gamma Scan
Leslie Groves-Rchlnd	36	BW	Beta, Alpha	Leslie Groves-Rchlnd	Q	^{90}Sr, Pu, U, Gamma Scan
Pasco	37	BW	Beta	Tri Cities	Q	^{90}Sr, Pu, U, Gamma Scan
Kennewick-Ely Street	38	BW	Beta, Alpha			
Benton City	39	BW	Beta	Benton City	Q	Gamma Scan
Mattawa	40	BW	Beta	Mattawa	Q	Gamma Scan
Othello	41	BW	Beta	Othello	Q	Gamma Scan
Distant						
Yakima	42	BW	Beta, Alpha	Yakima	Q	^{90}Sr, Pu, U, Gamma Scan

(a) Refer to Figure 1.1, "2008 Air Sampling Locations."
(b) Washington State Department of Health (DOH) air sampler also at this location.

1.2 Tritium

Location	Location Number[a]	Frequency	Analysis[b]
Onsite			
100 K Area	1	M	^{3}H
100 N-1325 Crib	2	M	^{3}H
200 ESE	7	M	^{3}H
200 Tel. Exchange	11	M	^{3}H
300 Water Intake[c]	14	M	^{3}H
300 South Gate[d]	15	M	^{3}H
300 South West	16	M	^{3}H
300 Trench	17	M	^{3}H
300 NE	18	M	^{3}H
400 E	19	M	^{3}H
Perimeter			
Ringold Met Tower	24	M	^{3}H
W End of Fir Road	25	M	^{3}H
Dogwood Met Tower	26	M	^{3}H
Byers Landing	27	M	^{3}H
Battelle Complex[c]	28	M	^{3}H
Prosser Barricade	30	M	^{3}H
Wahluke Slope	33	M	^{3}H
Community			
Basin City School	35	M	^{3}H
Leslie Groves-Rchlnd	36	M	^{3}H
Distant			
Yakima	42	M	^{3}H

(a) Refer to Figure 1.1, "2008 Air Sampling Locations."
(b) As tritiated water (HTO).
(c) DOH air sampler also at this location.
(d) Two tritium samples are collected from this location.

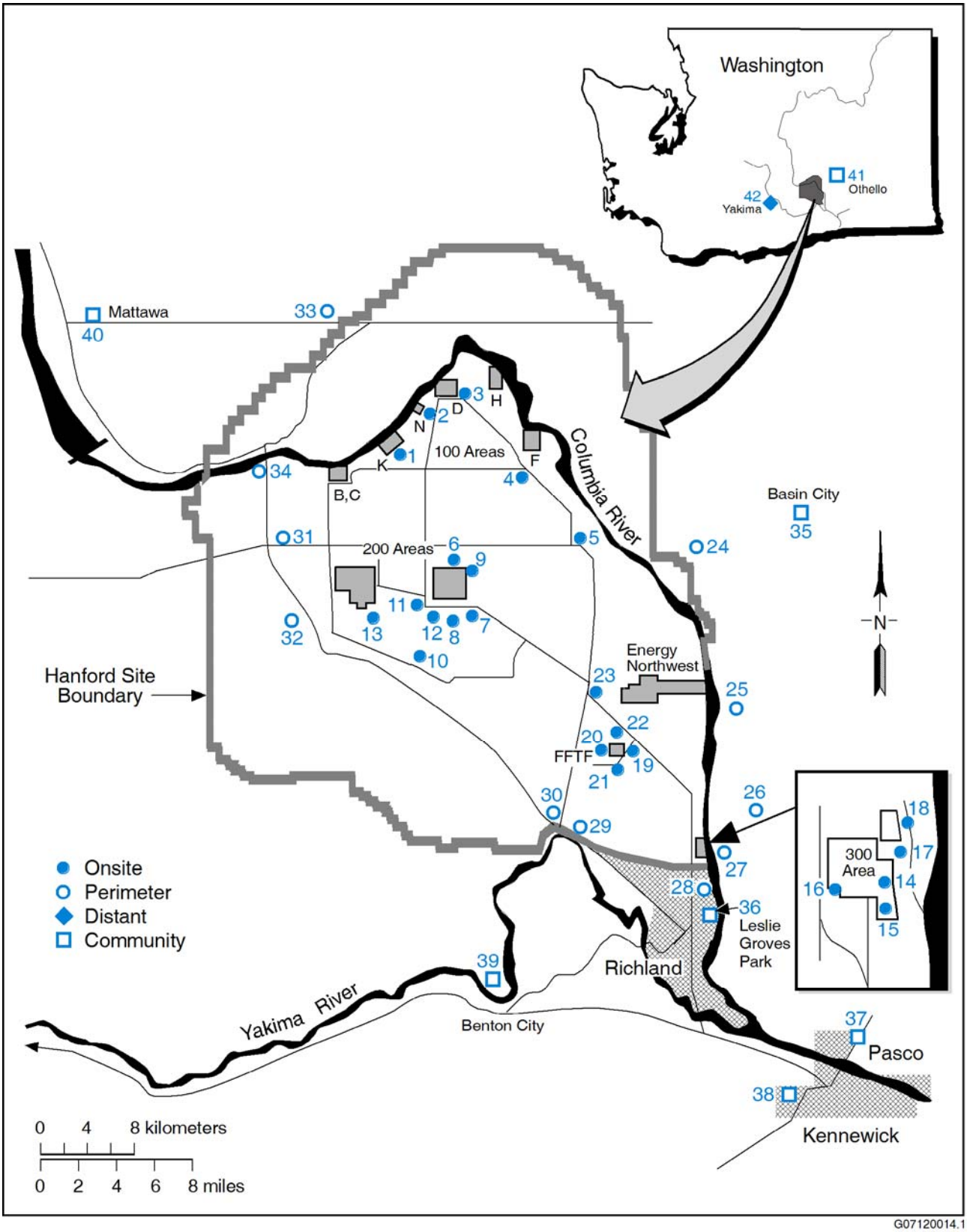

Figure 1.1. 2008 Air Sampling Locations

2.0 Surface Water Surveillance

2.1 Columbia River

Location[a]	Sample Type	Frequency	Analyses/Agency
Priest Rapids-River	Cumulative	M Comp.[b]	Alpha, Beta, Lo ^{3}H, ^{90}Sr, ^{99}Tc, U/DOH[c]
	Particulate (filter)	M Comp.[d]	Gamma Scan
		Q Comp.[d]	Pu
	Soluble (resin)	M Comp.[d]	Gamma Scan
		Q Comp.[d]	Pu
Rich.Pmphs HRM 46.4	Cumulative	M Comp.[b]	Alpha, Beta, Lo ^{3}H, ^{90}Sr, ^{99}Tc, U
	Particulate (filter)	M Comp.[d]	Gamma Scan
		Q Comp.[d]	Pu
	Soluble (resin)	M Comp.[d]	Gamma Scan
		Q Comp.[d]	Pu
	Grab	3/Yr	USGS-NASQAN[e]
Rich.Pmphs-1 HRM46.4[f]	Transect	Q	Lo ^{3}H, ^{90}Sr, U, Anions
		A	ICP-MS, Hg-CVAF, ICP-MS Filtered, VOA
Rich.Pmphs-2 HRM46.4	Transect	Q	Lo ^{3}H, ^{90}Sr, U, Anions
		A	ICP-MS, Hg-CVAF, ICP-MS Filtered, VOA
Rich.Pmphs-3 HRM46.4	Transect	Q	Lo ^{3}H, ^{90}Sr, U, Anions
		A	ICP-MS, Hg-CVAF, ICP-MS Filtered, VOA
Rich.Pmphs-5 HRM46.4	Transect	Q	Lo ^{3}H, ^{90}Sr, U, Anions
		A	ICP-MS, Hg-CVAF, ICP-MS Filtered, VOA
Rich.Pmphs-7 HRM46.4	Transect	Q	Lo ^{3}H, ^{90}Sr, U, Anions
		A	ICP-MS, Hg-CVAF, ICP-MS Filtered, VOA
Rich.Pmphs-10 HRM46.4	Transect	Q	Lo ^{3}H, ^{90}Sr, U, Anions
		A	ICP-MS, Hg-CVAF, ICP-MS Filtered, VOA
Rich.Pmphs HRM 43.5	Transect	Q	Lo ^{3}H, ^{90}Sr, U, Anions
		A	ICP-MS, Hg-CVAF, ICP-MS Filtered
Rich.Pmphs HRM 43.9	Transect	Q	Lo ^{3}H, ^{90}Sr, U, Anions
		A	ICP-MS, Hg-CVAF, ICP-MS Filtered
Rich.Pmphs HRM 45.0	Transect	Q	Lo ^{3}H, ^{90}Sr, U, Anions
		A	ICP-MS, Hg-CVAF, ICP-MS Filtered
Rich.Pmphs HRM 45.8	Transect	Q	Lo ^{3}H, ^{90}Sr, U, Anions
		A	ICP-MS, Hg-CVAF, ICP-MS Filtered
Vernita	Grab	3/Yr	USGS-NASQAN[e]
Vernita-1 HRM 0.3	Transect	Q	Lo ^{3}H, ^{90}Sr, U, Anions
		A	ICP-MS, Hg-CVAF, ICP-MS Filtered, VOA
Vernita-2 HRM 0.3	Transect	Q	Lo ^{3}H, ^{90}Sr, U, Anions
		A	ICP-MS, Hg-CVAF, ICP-MS Filtered, VOA
Vernita-3 HRM 0.3	Transect	Q	Lo 3H, 90Sr, U, Anions
		A	ICP-MS, Hg-CVAF, ICP-MS Filtered, VOA
Vernita-4 HRM 0.3	Transect	Q	Lo 3H, 90Sr, U, Anions
		A	ICP-MS, Hg-CVAF, ICP-MS Filtered, VOA

Columbia River (contd)

Location[a]	Sample Type	Frequency	Analyses/Agency
100 N -1 HRM 9.5[g]	Transect	A	Lo ^{3}H, ^{90}Sr, U, ICP-MS, ICP-MS Filtered, Anions
100 N -2 HRM 9.5	Transect	A	Lo ^{3}H, ^{90}Sr, U, ICP-MS, ICP-MS Filtered, Anions
100 N -3 HRM 9.5	Transect	A	Lo ^{3}H, ^{90}Sr, U, ICP-MS, ICP-MS Filtered, Anions
100 N -5 HRM 9.5	Transect	A	Lo ^{3}H, ^{90}Sr, U, ICP-MS, ICP-MS Filtered, Anions
100 N -7 HRM 9.5	Transect	A	Lo ^{3}H, ^{90}Sr, U, ICP-MS, ICP-MS Filtered, Anions
100 N -10 HRM 9.5	Transect	A	Lo ^{3}H, ^{90}Sr, U, ICP-MS, ICP-MS Filtered, Anions
100 N Shore HRM 8.4	Transect	A	Lo ^{3}H, ^{90}Sr, U, ICP-MS, ICP-MS Filtered, Anions/DOH[h]
100 N Shore HRM 8.9	Transect	A	Lo ^{3}H, ^{90}Sr, U, ICP-MS, ICP-MS Filtered, Anions/DOH[h]
100 N Shore HRM 9.2	Transect	A	Lo ^{3}H, ^{90}Sr, U, ICP-MS, ICP-MS Filtered, Anions/DOH[h]
100 N Shore HRM 9.8	Transect	A	Lo ^{3}H, ^{90}Sr, U, ICP-MS, ICP-MS Filtered, Anions/DOH[h]
Hanfrd TS-1 HRM 28.7	Transect	A	Lo ^{3}H, ^{90}Sr, ^{99}Tc, U, ICP-MS, ICP-MS Filtered, Anions
Hanfrd TS-2 HRM 28.7	Transect	A	Lo ^{3}H, ^{90}Sr, U, ICP-MS, ICP-MS Filtered, Anions
Hanfrd TS-3 HRM 28.7	Transect	A	Lo ^{3}H, ^{90}Sr, U, ICP-MS, ICP-MS Filtered, Anions
Hanfrd TS-5 HRM 28.7	Transect	A	Lo ^{3}H, ^{90}Sr, U, ICP-MS, ICP-MS Filtered, Anions
Hanfrd TS-7 HRM 28.7	Transect	A	Lo ^{3}H, ^{90}Sr, U, ICP-MS, ICP-MS Filtered, Anions
Hanfrd TS-10 HRM 28.7	Transect	A	Lo ^{3}H, ^{90}Sr, U, ICP-MS, ICP-MS Filtered, Anions
Hanfrd Twnsite HRM26	Transect	A	Lo ^{3}H, ^{90}Sr, ^{99}Tc, U, ICP-MS, ICP-MS Filtered, Anions/DOH[h]
Hanfrd Twnsite HRM27	Transect	A	Lo ^{3}H, ^{90}Sr, ^{99}Tc, U, ICP-MS, ICP-MS Filtered, Anions/DOH[h]
Hanfrd Twnsite HRM28	Transect	A	Lo ^{3}H, ^{90}Sr, ^{99}Tc, U, ICP-MS, ICP-MS Filtered, Anions/DOH[h]
Hanfrd Twnsite HRM30	Transect	A	Lo ^{3}H, ^{90}Sr, ^{99}Tc, U, ICP-MS, ICP-MS Filtered, Anions/DOH[h]
300 Area -1 HRM 43.1	Transect	A	Lo ^{3}H, ^{90}Sr, U, ICP-MS, ICP-MS Filtered, Anions
300 Area -2 HRM 43.1	Transect	A	Lo ^{3}H, ^{90}Sr, U, ICP-MS, ICP-MS Filtered, Anions
300 Area -3 HRM 43.1	Transect	A	Lo ^{3}H, ^{90}Sr, U, ICP-MS, ICP-MS Filtered, Anions
300 Area -5 HRM 43.1	Transect	A	Lo ^{3}H, ^{90}Sr, U, ICP-MS, ICP-MS Filtered, Anions
300 Area -7 HRM 43.1	Transect	A	Lo ^{3}H, ^{90}Sr, U, ICP-MS, ICP-MS Filtered, Anions
300 Area -10 HRM 43.1	Transect	A	Lo ^{3}H, ^{90}Sr, U, ICP-MS, ICP-MS Filtered, Anions
300 Area Shr HRM41.5	Transect	A	Lo ^{3}H, ^{90}Sr, U, ICP-MS, ICP-MS Filtered, Anions/DOH[h]
300 Area Spring 42-2	Transect	A	Lo ^{3}H, ^{90}Sr, U, ICP-MS, ICP-MS Filtered, Anions/DOH[h]
300 Area Spr DR 42-2	Transect	A	Lo ^{3}H, ^{90}Sr, U, ICP-MS, ICP-MS Filtered, Anions/DOH[h]
300 Area Shr HRM42.9	Transect	A	Lo ^{3}H, ^{90}Sr, U, ICP-MS, ICP-MS Filtered, Anions/DOH[h]
300 Area Outfl13	Grab	Q	Lo ^{3}H, ^{90}Sr, U, Anions
		A	ICP-MS, ICP-MS Filtered

ICP-MS = Inductively coupled plasma mass spectrometry.
VOA = Volatile organic analysis.

(a) Refer to Figure 2.1, "2008 Surface Water and Drinking Water Sampling Locations." Hanford river markers (HRM) are a series of signposts along the Hanford Site shoreline of the Columbia River that are roughly 1.6 kilometer (1 mile) apart. The Vernita Bridge is HRM #0 and Ferry Street in Richland is HRM #46. Samples collected between HRMs are assigned a decimal.
(b) Sample is collected weekly and composited monthly for analysis.
(c) Additional sample provided to the DOH (January and June only).
(d) Sample is collected biweekly and composited for analysis.
(e) Analyses are performed by the U.S. Geological Survey (USGS) in conjunction with the National Stream Quality Accounting Network (NASQAN) Program, and include conductance, pH, temperature, turbidity, dissolved oxygen, hardness, Ca, Mg, alkalinity, carbonates, sulfate, Cl, F, solids, NH_4-N, NO_3+NO_2, N-Kjeldahl, P, Cr, Fe, and dissolved organic carbon.
(f) Quality assurance sample submitted for analyses twice per year.
(g) Quality assurance sample submitted for analyses once per year.
(h) Additional sample provided to the DOH.

2.2 River Shoreline Springs

Location[a]	HRM[b]	Sample Type	Frequency	Analyses/Agency
100-B Spring 38-3	3.8	Grab	A	Alpha, Beta, ^{3}H, ^{90}Sr, ^{99}Tc, Gamma Scan, ICP-MS, Hg-CVAF, ICP-MS Filtered, Anions, VOA/DOH[c]
100-B Spring 39-2	3.9	Grab	A	Alpha, Beta, ^{3}H, ^{90}Sr, ^{99}Tc, Gamma Scan, ICP-MS, Hg-CVAF, ICP-MS Filtered, Anions, VOA/DOH[c]
100-K Spring 63-1	6.3	Grab	A	Alpha, Beta, ^{3}H, ^{90}Sr, Gamma Scan, ICP-MS, Hg-CVAF, ICP-MS Filtered, Anions, VOA
100-K Spring 77-1	7.6	Grab	A	Alpha, Beta, ^{3}H, ^{90}Sr, Gamma Scan, ICP-MS, Hg-CVAF, ICP-MS Filtered, Anions, VOA
100-N Spring 8-13	9.3	Grab	A	Alpha, Beta, ^{3}H, ^{90}Sr, Gamma Scan, ICP-MS, Hg-CVAF, ICP-MS Filtered, Anions/DOH[c]
100-D Spring 102-1	10.2	Grab	A	Alpha, Beta, ^{3}H, ^{90}Sr, Gamma Scan, ICP-MS, Hg-CVAF, ICP-MS Filtered, Anions/DOH[c]
100-D Spring 110-1	11.0	Grab	A	Alpha, Beta, ^{3}H, ^{90}Sr, Gamma Scan, ICP-MS, Hg-CVAF, ICP-MS Filtered, Anions/DOH[c]
100-H Spring 145-1	14.4	Grab	A	Alpha, Beta, ^{3}H, ^{90}Sr, ^{99}Tc, U, Gamma Scan, ICP-MS, Hg-CVAF, ICP-MS Filtered, Anions
100-H Spring 153-1	15.3	Grab	A	Alpha, Beta, ^{3}H, ^{90}Sr, ^{99}Tc, U, Gamma Scan, ICP-MS, Hg-CVAF, ICP-MS Filtered, Anions
100-F Spring 207-1	21.3	Grab	A	Alpha, Beta, ^{3}H, ^{90}Sr, U, Gamma Scan, ICP-MS, Hg-CVAF, ICP-MS Filtered, Anions, VOA
Hanford Spr UR 28-2[d]	27.8	Grab	A	Alpha, Beta, ^{3}H, ^{99}Tc, U, ^{129}I, Gamma Scan, ICP-MS, Hg-CVAF, ICP-MS Filtered, Anions/DOH[c]
Hanford Spring 28-2	28.1	Grab	A	Alpha, Beta, ^{3}H, ^{99}Tc, U, ^{129}I, Gamma Scan, ICP-MS, Hg-CVAF, ICP-MS Filtered, Anions/DOH[c]
Hanford Spr DR 28-2[e]	28.3	Grab	A	Alpha, Beta, ^{3}H, ^{99}Tc, U, ^{129}I, Gamma Scan, ICP-MS, Hg-CVAF, ICP-MS Filtered, Anions/DOH[c]
300 Area Spring 41-9	41.9	Grab	A	Alpha, Beta, ^{3}H, ^{90}Sr, U, Gamma Scan, ICP-MS, Hg-CVAF, ICP-MS Filtered, Anions
300 Area Spring 42-2	42.1	Grab	A	Alpha, Beta, ^{3}H, ^{90}Sr, U, ^{129}I, Gamma Scan, ICP-MS, Hg-CVAF, ICP-MS Filtered, Anions, VOA/ DOH[c]
300 Area Spr DR 42-2[e]	42.4	Grab	A	Alpha, Beta, ^{3}H, ^{90}Sr, U, ^{129}I, Gamma Scan, ICP-MS, Hg-CVAF, ICP-MS Filtered, Anions, VOA/ DOH[c]
300 Area Spring 42-7	42.7	Grab	A	Alpha, Beta, ^{3}H, ^{90}Sr, U, Gamma Scan, Anions
Richland Spr(SRL 437-1)	43.7	Grab	A	Alpha, Beta, ^{3}H, ^{90}Sr, U, Gamma Scan, ICP-MS, Hg-CVAF, ICP-MS Filtered, Anions

(a) Refer to Figure 2.1, "2008 Surface Water and Drinking Water Sampling Locations."
(b) Hanford river markers (HRM) are a series of signposts along the Hanford Site shoreline of the Columbia River that are roughly 1.6 kilometers (1 mile) apart. The Vernita Bridge is HRM #0 and Ferry Street in Richland is HRM #46. Samples collected between HRMs are assigned a decimal.
(c) Additional sample provided to the DOH.
(d) UR = Upriver from noted location.
(e) DR = Downriver from noted location.

2.3 Onsite Pond

Location[(a)]	Sample Type	Frequency	Analyses
West Lake	Grab	Q	^{3}H
FFTF Pond[(b)]	Grab	Q	Alpha, Beta, ^{3}H, Gamma Scan

FFTF = Fast Flux Test Facility.
(a) Refer to Figure 2.1, "2008 Surface Water and Drinking Water Sampling Locations."
(b) Quality assurance sample submitted for analyses once per year.

2.4 Offsite Irrigation

Location[(a)]	Sample Type	Frequency	Analyses/Agency
Riverview Canal	Grab	3 (May-Sept)	Alpha, Beta, Lo ^{3}H, ^{90}Sr, U, Gamma Scan/DOH[(b)]
Horn Rapids Area	Grab	3 (May-Sept)	Alpha, Beta, Lo ^{3}H, ^{90}Sr, U, Gamma Scan/DOH[(b)]

(a) Refer to Figure 2.1, "2008 Surface Water and Drinking Water Sampling Locations."
(b) Additional sample provided to the DOH.

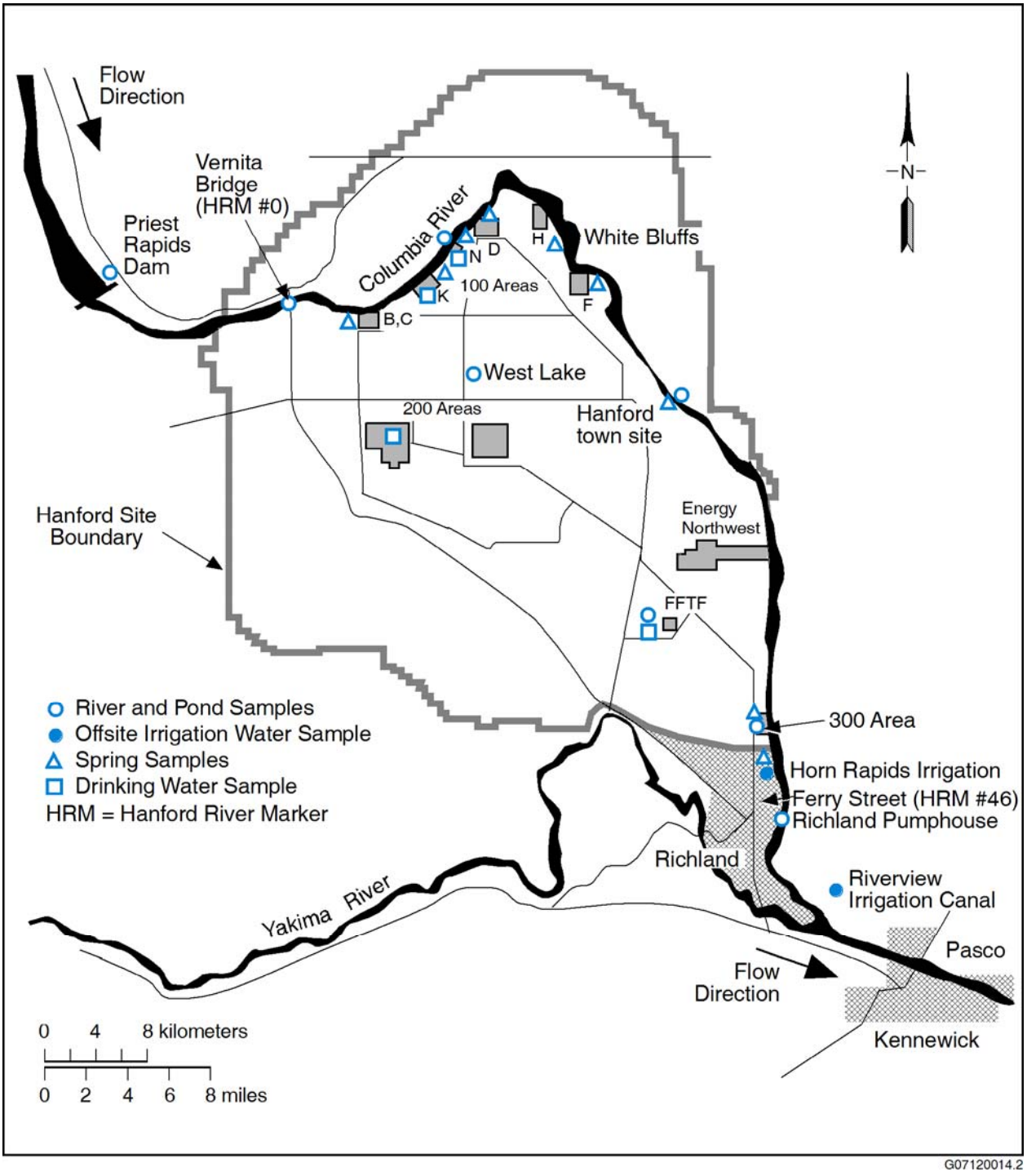

Figure 2.1. 2008 Surface Water and Drinking Water Sampling Locations

3.0 Drinking Water Surveillance

3.1 Onsite Drinking

		Individual Samples		Composited Samples		
Location[a]	Sample Type	Frequency	Analyses/Agency	Composite Group	Frequency	Analyses/Agency
100 N Area	Grab	M[b]	}	100 N Area	Q	Beta
100 N Area	Grab	Q[c]	Alpha }	100 N Area	A	^{90}Sr, ^{3}H
200 W Area	Grab	M[b]	}	200 W Area	Q	Beta
200 W Area	Grab	Q[c]	Alpha }	200 W Area	A	^{90}Sr, ^{3}H
100 K Area	Grab	M[b]	}	100 K Area	Q	Beta
100 K Area	Grab	Q[c]	Alpha }	100 K Area	A	^{90}Sr, ^{3}H
400 Area Well P-14	Grab	M[b]	}	400 Area Well P-14	Q	Beta
400 Area Well P-14	Grab	Q[c]	Alpha }	400 Area Well P-14	A	^{90}Sr, ^{3}H/DOH[d]
400 Area	Grab	M[b]	}	400 Area	Q	Beta
400 Area	Grab	Q[c]	Alpha, ^{3}H/DOH[e] }	400 Area	A	^{90}Sr

(a) Refer to Figure 2.1, "2008 Surface Water and Drinking Water Sampling Locations."
(b) Sample is collected monthly and composited for quarterly analysis.
(c) Sample is collected and analyzed quarterly and then composited for annual analysis.
(d) Additional sample provided quarterly to the DOH and then composited for annual analysis.
(e) Additional sample provided quarterly to the DOH for ^{3}H analysis (January only).

4.0 Biota

4.1 Food and Farm Products

4.1.1 Milk

Location[a]	Frequency	Analyses
East Wahluke Area[b]	Q	Lo ^{3}H, ^{90}Sr, Gamma Scan
Sagemoor Composite[b,c]	Q	Lo ^{3}H, ^{90}Sr, Gamma Scan
Sunnyside Area	Q	Lo ^{3}H, ^{90}Sr, Gamma Scan

(a) Refer to Figure 4.1, "2008 Food and Farm Products Sampling Locations."
(b) Sample composited from multiple dairies in each area.
(c) Quality assurance sample submitted for analyses once per year.

4.1.2 Leafy Vegetables

Location[a,b]	Frequency[c]	Analyses/Agency
Riverview Area	A	^{90}Sr, Gamma Scan/FDA[d]
Sunnyside Area	A	^{90}Sr, Gamma Scan/FDA[d]
East Wahluke Area	BE (2008)	^{90}Sr, Gamma Scan/DOH[e]
Sagemoor Area	BE (2009)	^{90}Sr, Gamma Scan/DOH[e]

(a) Refer to Figure 4.1, "2008 Food and Farm Products Sampling Locations."
(b) Two samples collected for PNNL within each area; one sample is analyzed and one is archived.
(c) Samples are collected in 2008 according to their specified frequency unless otherwise noted.
(d) Two additional samples sent to the U.S. Food and Drug Administration (FDA).
(e) Additional sample provided to the DOH.

4.1.3 Vegetables

Location[a,b]	Sample Type	Frequency[c]	Analyses/Agency
Riverview Area[d]	Potatoes	A	^{90}Sr, Gamma Scan/DOH[e]
Sunnyside Area	Potatoes	A	^{90}Sr, Gamma Scan/FDA[f]
East Wahluke Area	Potatoes	A	^{90}Sr, Gamma Scan/DOH[e]
Horn Rapids Area	Potatoes	BE (2009)	^{90}Sr, Gamma Scan/DOH,[e] FDA[f]
Sagemoor Area	Potatoes	TE (2009)	^{90}Sr, Gamma Scan/DOH,[e] FDA[f]

(a) Refer to Figure 4.1, "2008 Food and Farm Products Sampling Locations."
(b) Two samples collected for PNNL within each area; one sample is analyzed and one is archived.
(c) Samples are collected in 2008 according to their specified frequency unless otherwise noted.
(d) Other vegetables may be substituted if potatoes are not available.
(e) Additional sample provided to the DOH.
(f) Two additional samples sent to the FDA.

4.1.4 Fruits

Location[a,b]	Sample Type	Frequency[c]	Collection Period	Analyses/Agency
Sagemoor Area	Cherries	TE (2008)	June	^{90}Sr, Gamma Scan/DOH,[d] FDA[e]
	Apples	TE (2009)	September	^{90}Sr, Gamma Scan/DOH,[d] FDA[e]
	Grapes[f]	TE (2010)	September	^{90}Sr, Gamma Scan/DOH[d]
Sunnyside Area	Tomatoes	A	July	^{90}Sr, ^{3}H, Gamma Scan
	Cherries	TE (2008)	June	^{90}Sr, Gamma Scan/DOH[d]
	Apples	TE (2009)	September	^{90}Sr, Gamma Scan/DOH[d]
	Grapes[f]	TE (2010)	September	^{90}Sr, Gamma Scan
Riverview Area[g]	Tomatoes	A	July	^{90}Sr, ^{3}H, Gamma Scan
	Cherries	TE (2008)	June	^{90}Sr, Gamma Scan
	Apples	TE (2009)	September	^{90}Sr, Gamma Scan/DOH,[d] FDA[e]
	Grapes[f]	TE (2010)	September	^{90}Sr, Gamma Scan/DOH,[d] FDA[e]
Ringold Area	Cherries	TE (2008)	June	^{90}Sr, Gamma Scan/DOH[d]
East Wahluke Area	Cherries	TE (2008)	June	^{90}Sr, Gamma Scan/DOH[d]
Mattawa Area	Apples	TE (2009)	September	^{90}Sr, Gamma Scan/DOH[d]
Cold Creek Area	Grapes[f]	TE (2010)	September	^{90}Sr, Gamma Scan

(a) Refer to Figure 4.1, "2008 Food and Farm Products Sampling Locations."
(b) Two samples collected for the PNNL within each area; one sample is analyzed and one is archived.
(c) Samples are collected in 2008 according to their specified frequency unless otherwise noted.
(d) Additional sample provided to the DOH.
(e) Two additional samples sent to the FDA.
(f) Concord grapes preferred; table grapes acceptable if concord grapes are unavailable.
(g) Other fruits may be substituted due to availability.

4.1.5 Wines

Location[a]	Sample Type	Frequency	Collection Period	Analyses/Agency
Columbia Basin[b]	White	BE (2009)	December	Lo ^{3}H, Gamma Scan/DOH[c]
	Red	BE (2009)	December	Lo ^{3}H, Gamma Scan/DOH[c]
Yakima Valley	White	BE (2009)	December	Lo ^{3}H, Gamma Scan/DOH[c]
	Red	BE (2009)	December	Lo ^{3}H, Gamma Scan/DOH[c]
Mattawa Area	White	BE (2009)	December	Lo ^{3}H, Gamma Scan/DOH[c]
	Red	BE (2009)	December	Lo ^{3}H, Gamma Scan/DOH[c]

(a) Two samples of each type collected for PNNL within each area.
(b) Location refers to Benton and Franklin Counties.
(c) Additional sample provided to the DOH.

4.1.6 Alfalfa

Location[a]	Sample Type	Frequency	Collection Period	Analyses/Agency
Sagemoor Area	Alfalfa	BE (2009)	May	^{90}Sr, Gamma Scan
Riverview Area	Alfalfa	BE (2009)	May	^{90}Sr, Gamma Scan/DOH,[b] FDA[c]
Sunnyside Area	Alfalfa	BE (2009)	May	^{90}Sr, Gamma Scan/FDA[c]
Horn Rapids Area	Alfalfa	BE (2009)	May	^{90}Sr, Gamma Scan/DOH[b]

(a) Two samples collected for PNNL within each area; one sample is analyzed and one is archived.
(b) Additional sample provided to the DOH.
(c) Two additional samples sent to the FDA.

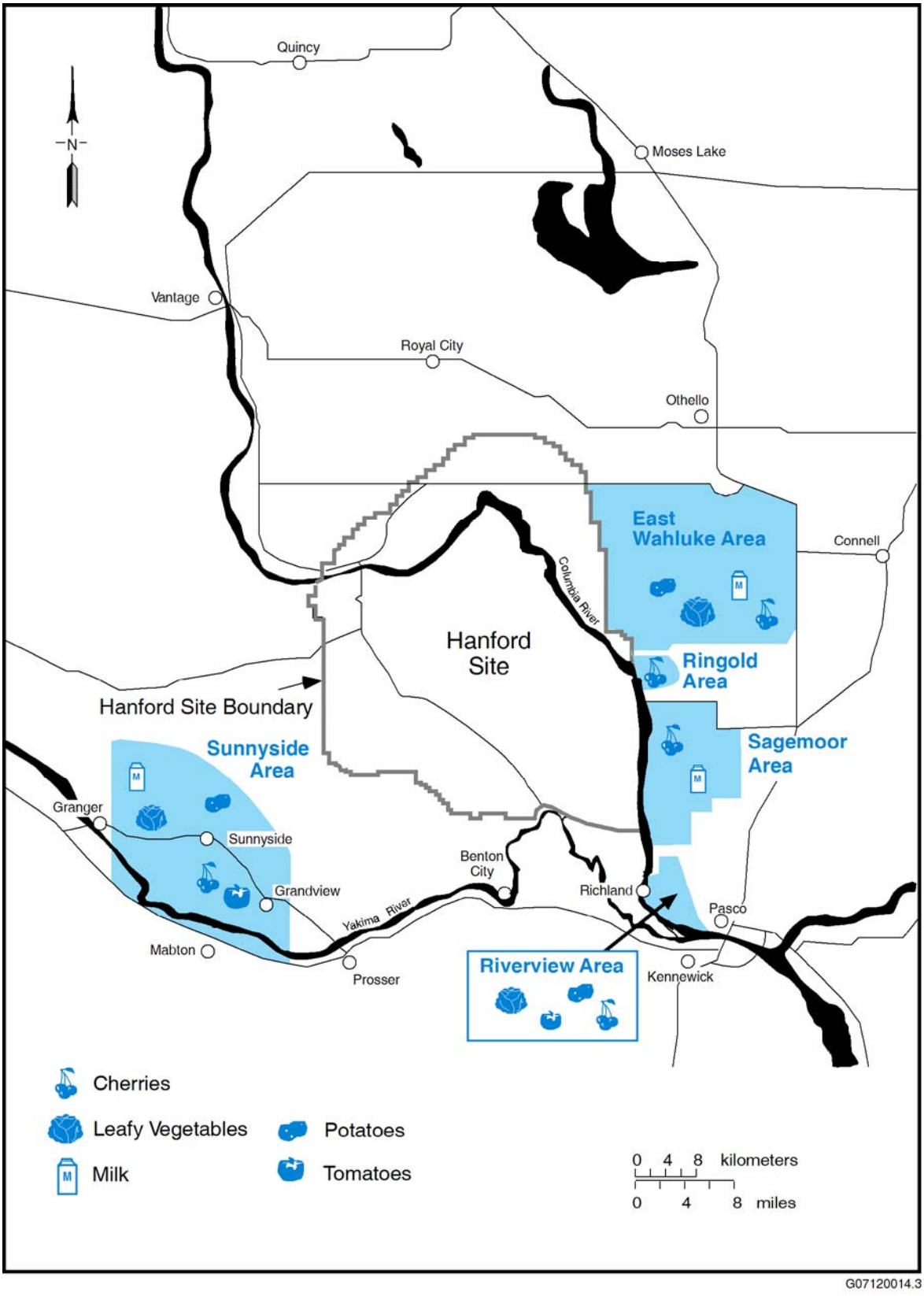

Figure 4.1. 2008 Food and Farm Products Sampling Locations

4.2 Wildlife

4.2.1 Fish

Location[a]	Species/Sample	Number of Samples	Frequency[b]	Collection Period	Analyses/Agency
100-N to 100-D	Carp				
	Fillet	5	BE (2008)	April-July	Gamma Scan/DOH[c]
	Carcass	5	BE (2008)	April-July	^{90}Sr/DOH[c]
	Liver[d]	5	BE (2008)	April-July	ICP-MS
	Whitefish				
	Fillet	5	BE (2009)	Oct-Nov	Gamma Scan/DOH[c]
	Carcass	5	BE (2009)	Oct-Nov	^{90}Sr/DOH[c]
	Liver[d]	5	BE (2009)	Oct-Nov	ICP-MS
300 Area	Carp				
	Fillet	5	BE (2008)	April-July	Gamma Scan, U/DOH[c]
	Carcass	5	BE (2008)	April-July	^{90}Sr/DOH[c]
	Liver[d]	5	BE (2008)	April-July	ICP-MS, Hg-CVAA
	Bass				
	Fillet	5	TE (2008)	April-June	Gamma Scan, U/DOH[c]
	Carcass	5	TE (2008)	April-June	^{90}Sr/DOH[c]
	Liver[d]	5	TE (2008)	April-June	ICP-MS, Hg-CVAA
Background - Desert Aire/Vantage	Carp				
	Fillet	5	BE (2008)	April-July	Gamma Scan, U/DOH[c]
	Carcass	5	BE (2008)	April-July	^{90}Sr/DOH[c]
	Liver[d]	5	BE (2008)	April-July	ICP-MS, Hg-CVAA
	Bass				
	Fillet	5	TE (2008)	April-June	Gamma Scan, U
	Carcass	5	TE (2008)	April-June	^{90}Sr
	Liver[d]	5	TE (2008)	April-June	ICP-MS, Hg-CVAA
100 F Slough	Bass				
	Fillet	5	TE (2008)	April-June	Gamma Scan/DOH[c]
	Carcass	5	TE (2008)	April-June	^{90}Sr/DOH[c]
	Liver[d]	5	TE (2008)	April-June	ICP-MS, Hg-CVAA
Hanford Slough	Bass				
	Fillet	5	TE (2008)	April-June	Gamma Scan/DOH[c]
	Carcass	5	TE (2008)	April-June	^{90}Sr/DOH[c]
	Liver[d]	5	TE (2008)	April-June	ICP-MS, Hg-CVAA
Background - Priest Rapids/Wanapum Pools	Whitefish				
	Fillet	5	BE (2009)	November	Gamma Scan
	Carcass	5	BE (2009)	November	^{90}Sr
	Liver[d]	5	BE (2009)	November	ICP-MS, Hg-CVAA

(a) Refer to Figure 4.2, "2008 Wildlife Sampling Locations."
(b) Samples are collected in 2008 according to their specified frequency unless otherwise noted.
(c) Additional whole fish sample provided to the DOH.
(d) Ecological assessment sample.

4.2.2 Geese

Location	Species/Sample	Number of Samples	Frequency	Collection Period	Analyses
100 Areas	Canada Goose				
	Muscle	5	BE (2009)	May-July	Gamma Scan
	Bone	5	BE (2009)	May-July	^{90}Sr
	Liver[(a)]	5	BE (2009)	May-July	ICP-MS, Hg-CVAA
Hanf Townsite to 300 Area	Canada Goose				
	Muscle	5	BE (2009)	May-July	Gamma Scan
	Bone	5	BE (2009)	May-July	^{90}Sr
	Liver[(a)]	5	BE (2009)	May-July	ICP-MS, Hg-CVAA
Background - Desert Aire/Vantage	Canada Goose				
	Muscle	5	BE (2009)	May-July	Gamma Scan
	Bone	5	BE (2009)	May-July	^{90}Sr
	Liver[(a)]	5	BE (2009)	May-July	ICP-MS, Hg-CVAA

(a) Ecological assessment sample.

4.2.3 Upland Game Birds

Location[(a)]	Species/Sample[(b)]	Number of Samples	Frequency	Collection Period	Analyses/Agency
100-D to 100-H	Pheasant				
	Muscle	4	BE (2008)	September	Gamma Scan
	Bone	4	BE (2008)	September	^{90}Sr
	Liver[(c)]	4	BE (2008)	September	ICP-MS
100-H to 100-F	Pheasant				
	Muscle	6	BE (2008)	September	Gamma Scan/DOH[(d)]
	Bone	6	BE (2008)	September	^{90}Sr/DOH[(d)]
	Liver[(c)]	6	BE (2008)	September	ICP-MS
Background	Pheasant				
	Muscle	5	BE (2008)	September	Gamma Scan/DOH[(d)]
	Bone	5	BE (2008)	September	^{90}Sr/DOH[(d)]
	Liver[(c)]	5	BE (2008)	September	ICP-MS

(a) Refer to Figure 4.2, "2008 Wildlife Sampling Locations."
(b) Pheasants preferred; chukars or quail acceptable if pheasants are unavailable.
(c) Ecological assessment sample.
(d) Additional whole bird sample provided to the DOH.

4.2.4 Rabbits

Location	Species/Sample	Number of Samples	Frequency	Collection Period	Analyses/Agency
100 N Area	Cottontail				
	Muscle	4	BE (2009)	Jan-Dec	Gamma Scan/DOH[a]
	Bone	4	BE (2009)	Jan-Dec	^{90}Sr/DOH[a]
	Liver[b]	4	BE (2009)	Jan-Dec	ICP-MS
200 E Area	Cottontail				
	Muscle	4	BE (2009)	Jan-Dec	Gamma Scan/DOH[a]
	Bone	4	BE (2009)	Jan-Dec	^{90}Sr/DOH[a]
	Liver[b]	4	BE (2009)	Jan-Dec	Pu, ICP-MS
200 West	Cottontail				
	Muscle	4	BE (2009)	Jan-Dec	Gamma Scan/DOH[a]
	Bone	4	BE (2009)	Jan-Dec	^{90}Sr/DOH[a]
	Liver[b]	4	BE (2009)	Jan-Dec	Pu, ICP-MS
Background	Cottontail				
	Muscle	5	BE (2009)	Jan-Dec	Gamma Scan
	Bone	5	BE (2009)	Jan-Dec	^{90}Sr
	Liver[b]	5	BE (2009)	Jan-Dec	Pu, ICP-MS

(a) Additional whole rabbit sample provided to the DOH.
(b) Ecological assessment sample.

4.2.5 Deer/Elk

Location[a]	Species/Sample	Number of Samples	Frequency	Collection Period	Analyses/Agency
100 N Area	Mule Deer				
	Muscle	2	BE (2008)	Nov-Dec	Gamma Scan/DOH[b]
	Bone	2	BE (2008)	Nov-Dec	^{90}Sr/DOH[b]
	Liver[c]	2	BE (2008)	Nov-Dec	ICP-MS
200 Areas	Mule Deer				
	Muscle	2	BE (2008)	Nov-Dec	Gamma Scan/DOH[b]
	Bone	2	BE (2008)	Nov-Dec	^{90}Sr/DOH[b]
	Liver[c]	2	BE (2008)	Nov-Dec	Pu, ICP-MS
Road Kill at Onsite Locations[d]	Mule Deer or Elk				
	Muscle	10	BE (2008)	As Available	Gamma Scan
	Bone	10	BE (2008)	As Available	^{90}Sr
Background[e]	Mule Deer				
	Muscle	2	BE (2008)	October	Gamma Scan/DOH[b]
	Bone	2	BE (2008)	October	^{90}Sr/DOH[b]
	Liver[c]	2	BE (2008)	October	Pu, ICP-MS

(a) Refer to Figure 4.2, "2008 Wildlife Sampling Locations."
(b) Additional sample provided to the DOH.
(c) Ecological assessment sample.
(d) As available, according to location.
(e) One of the two background samples obtained from the DOH.

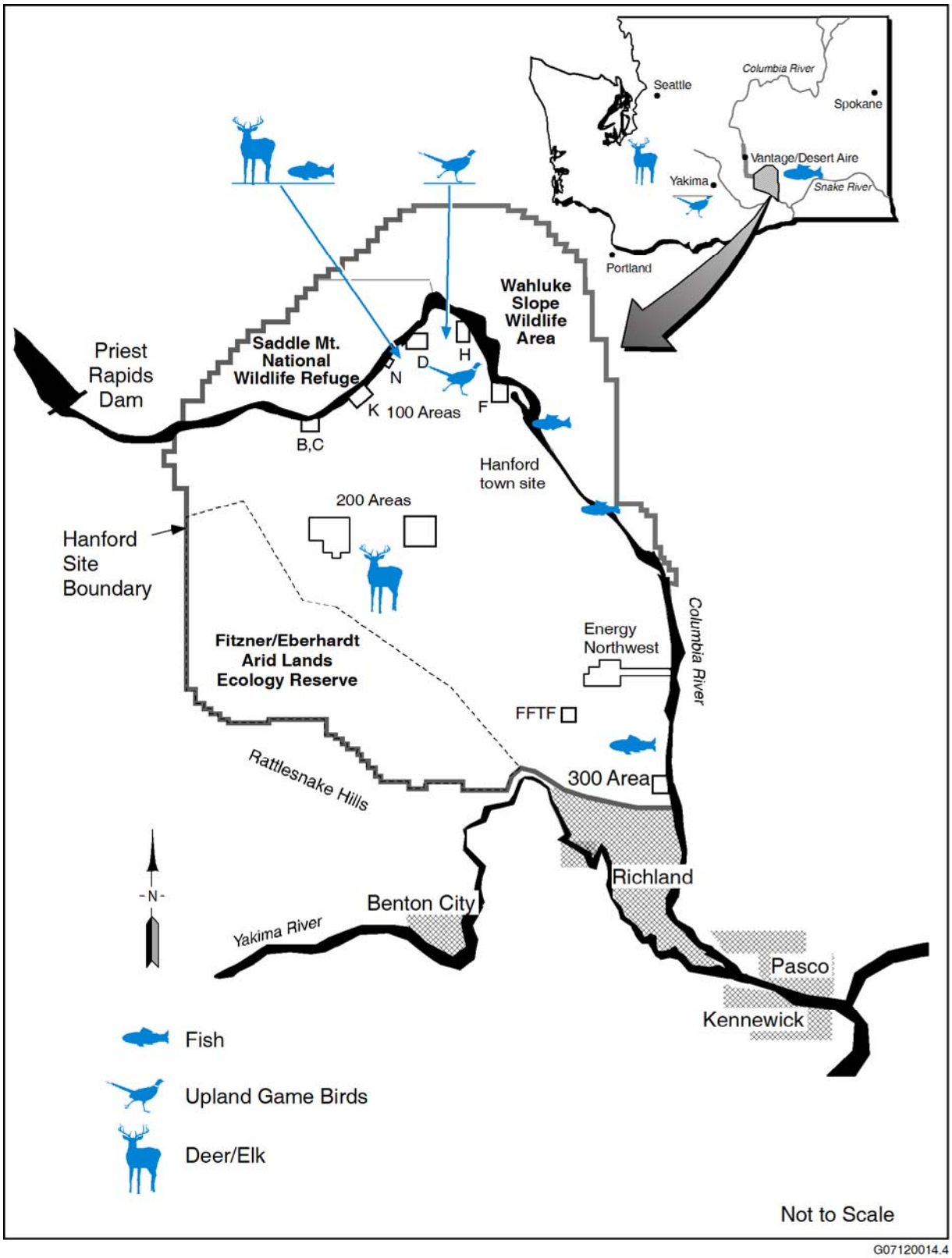

Figure 4.2. 2008 Wildlife Sampling Locations

5.0 Soil and Vegetation

5.1 Soil

Location	Frequency[a]	Collection Period	Analyses/Agency
100 K Area	3 to 5 yrs	June-Sept	Gamma Scan, ^{90}Sr, U, Pu/DOH[b]
NE of 100 N Area	3 to 5 yrs	June-Sept	Gamma Scan, ^{90}Sr, U, Pu
E of 100 N Area	3 to 5 yrs	June-Sept	Gamma Scan, ^{90}Sr, U, Pu/DOH[b]
100N Shore Above HGP	3 to 5 yrs	June-Sept	Gamma Scan, ^{90}Sr, U, Pu
100N Spring Shoreline	3 to 5 yrs	June-Sept	Gamma Scan, ^{90}Sr, U, Pu
Above 100D Pumphouse	3 to 5 yrs	June-Sept	Gamma Scan, ^{90}Sr, U, Pu
100 Area Fire Stat	3 to 5 yrs	June-Sept	Gamma Scan, ^{90}Sr, U, Pu
200 ENC	3 to 5 yrs	June-Sept	Gamma Scan, ^{90}Sr, U, Pu
E of 200 E	3 to 5 yrs	June-Sept	Gamma Scan, ^{90}Sr, U, Pu/DOH[b]
200 ESE	3 to 5 yrs	June-Sept	Gamma Scan, ^{90}Sr, U, Pu, ^{241}Am
S of 200 E	3 to 5 yrs	June-Sept	Gamma Scan, ^{90}Sr, U, Pu
SW of B/C Cribs	3 to 5 yrs	June-Sept	Gamma Scan, ^{90}Sr, U, Pu, ^{241}Am/DOH[b]
E of 200 W Gate	3 to 5 yrs	June-Sept	Gamma Scan, ^{90}Sr, U, Pu ,^{241}Am/DOH[b]
S of 200 W	3 to 5 yrs	June-Sept	Gamma Scan, ^{90}Sr, U, Pu/DOH[b]
Rattlesnake Springs	3 to 5 yrs	June-Sept	Gamma Scan, ^{90}Sr, U, Pu/DOH[b]
Yakima Barricade	3 to 5 yrs	June-Sept	Gamma Scan, ^{90}Sr, U, Pu
400 E	3 to 5 yrs	June-Sept	Gamma Scan, ^{90}Sr, U, Pu
SE Side of FFTF	3 to 5 yrs	June-Sept	Gamma Scan, ^{90}Sr, U, Pu/DOH[b]
North of 300 Area	3 to 5 yrs	June-Sept	Gamma Scan, ^{90}Sr, U, Pu/DOH[b]
South of 300 Area	3 to 5 yrs	June-Sept	Gamma Scan, ^{90}Sr, U, Pu/DOH[b]
Hanford Townsite	3 to 5 yrs	June-Sept	Gamma Scan, ^{90}Sr, U, Pu
Wye Barricade[c]	3 to 5 yrs	June-Sept	Gamma Scan, ^{90}Sr, U, Pu
Prosser Barricade	3 to 5 yrs	June-Sept	Gamma Scan, ^{90}Sr, U, Pu
ALE Field Lab	3 to 5 yrs	June-Sept	Gamma Scan, ^{90}Sr, U, Pu
N End Vernita Bridge	3 to 5 yrs	June-Sept	Gamma Scan, ^{90}Sr, U, Pu
Wahluke Slope	3 to 5 yrs	June-Sept	Gamma Scan, ^{90}Sr, U, Pu
Berg Ranch	3 to 5 yrs	June-Sept	Gamma Scan, ^{90}Sr, U, Pu
Ringold Area	3 to 5 yrs	June-Sept	Gamma Scan, ^{90}Sr, U, Pu
W End of Fir Road	3 to 5 yrs	June-Sept	Gamma Scan, ^{90}Sr, U, Pu
Taylor Flats No. 2	3 to 5 yrs	June-Sept	Gamma Scan, ^{90}Sr, U, Pu
Sagemoor Farm[c]	3 to 5 yrs	June-Sept	Gamma Scan, ^{90}Sr, U, Pu, ^{241}Am
Byers Landing	3 to 5 yrs	June-Sept	Gamma Scan, ^{90}Sr, U, Pu
Riverview-Harris	3 to 5 yrs	June-Sept	Gamma Scan, ^{90}Sr, U, Pu
Benton City	3 to 5 yrs	June-Sept	Gamma Scan, ^{90}Sr, U, Pu
Sunnyside	3 to 5 yrs	June-Sept	Gamma Scan, ^{90}Sr, U, Pu, ^{241}Am
McNary Dam	3 to 5 yrs	June-Sept	Gamma Scan, ^{90}Sr, U, Pu
Walla Walla	3 to 5 yrs	June-Sept	Gamma Scan, ^{90}Sr, U, Pu
Washtucna	3 to 5 yrs	June-Sept	Gamma Scan, ^{90}Sr, U, Pu
Toppenish	3 to 5 yrs	June-Sept	Gamma Scan, ^{90}Sr, U, Pu
George	3 to 5 yrs	June-Sept	Gamma Scan, ^{90}Sr, U, Pu/DOH[b]
Othello	3 to 5 yrs	June-Sept	Gamma Scan, ^{90}Sr, U, Pu/DOH[b]
Wanapum	3 to 5 yrs	June-Sept	Gamma Scan, ^{90}Sr, U, Pu/DOH[b]

ALE = Fitzner/Eberhardt Arid Lands Ecology Reserve.
(a) Samples are collected once every 3 to 5 years and should be collected in 2009.
(b) Additional sample provided to the DOH.
(c) Quality assurance samples submitted for analyses.

5.2 Vegetation

Location	Frequency[a]	Collection Period	Analyses/Agency
100 K Area	3 to 5 yrs	June-Sept	Gamma Scan, ^{90}Sr, U, Pu/DOH[b]
NE of 100 N Area	3 to 5 yrs	June-Sept	Gamma Scan, ^{90}Sr, U, Pu/DOH[b]
E of 100 N Area	3 to 5 yrs	June-Sept	Gamma Scan, ^{90}Sr, U, Pu
100N Spring Shoreline	3 to 5 yrs	June-Sept	Gamma Scan, ^{90}Sr, U, Pu
E of 200 W Gate	3 to 5 yrs	June-Sept	Gamma Scan, ^{90}Sr, U, Pu
300 Area Shoreline	3 to 5 yrs	June-Sept	Gamma Scan, ^{90}Sr, U, Pu/DOH[b]
Hanford Townsite	3 to 5 yrs	June-Sept	Gamma Scan, ^{90}Sr, U, Pu
Hanford Twnsite HRM28	3 to 5 yrs	June-Sept	Gamma Scan, ^{90}Sr, U, Pu/DOH[b]
Ringold Area	3 to 5 yrs	June-Sept	Gamma Scan, ^{90}Sr, U, Pu
Sagemoor Farm	3 to 5 yrs	June-Sept	Gamma Scan, ^{90}Sr, U, Pu
Byers Landing	3 to 5 yrs	June-Sept	Gamma Scan, ^{90}Sr, U, Pu
Riverview-Harris	3 to 5 yrs	June-Sept	Gamma Scan, ^{90}Sr, U, Pu
Sunnyside	3 to 5 yrs	June-Sept	Gamma Scan, ^{90}Sr, U, Pu
Toppenish	3 to 5 yrs	June-Sept	Gamma Scan, ^{90}Sr, U, Pu
George	3 to 5 yrs	June-Sept	Gamma Scan, ^{90}Sr, U, Pu/DOH[b]
Othello	3 to 5 yrs	June-Sept	Gamma Scan, ^{90}Sr, U, Pu/DOH[b]
Wanapum	3 to 5 yrs	June-Sept	Gamma Scan, ^{90}Sr, U, Pu/DOH[b]

(a) Samples are collected once every 3 to 5 years and should be collected in 2009.
(b) Additional sample provided to the DOH.

6.0 Sediment

6.1 Columbia River

Location[a]	Frequency	Analyses/Agency
McNary Dam		
McNary-OR. Side Near Dam	A	Gamma Scan, ^{90}Sr, U, Pu, ICP-MS, Hg-CVAA, TOC/DOH[b]
McNary-Wash. Side Near Dam	A	Gamma Scan, ^{90}Sr, U, Pu, ICP-MS, Hg-CVAA, TOC/DOH[b]
Priest Rapids Dam (PRD)		
PRD-Grant Side Near Dam	A	Gamma Scan, ^{90}Sr, U, Pu, ICP-MS, Hg-CVAA, TOC/DOH[b]
PRD-Yakima Side Near Dam	A	Gamma Scan, ^{90}Sr, U, Pu, ICP-MS, Hg-CVAA, TOC/DOH[b]
White Bluffs Slough	A	Gamma Scan, ^{90}Sr, U, Pu, ICP-MS, Hg-CVAA, TOC
100 F Slough	A	Gamma Scan, ^{90}Sr, U, Pu, ICP-MS, Hg-CVAA, TOC
Hanford Slough	A	Gamma Scan, ^{90}Sr, U, Pu, ICP-MS, Hg-CVAA, TOC/DOH[b]
Richland	A	Gamma Scan, ^{90}Sr, U, Pu, ICP-MS, Hg-CVAA, TOC

(a) Refer to Figure 6.1, "2008 Sediment Sampling Locations."
(b) Additional sample provided to the DOH.

6.2 River Shoreline Springs

Location[a]	HRM[b]	Frequency	Analyses/Agency
100-B Spring 38-3	3.8	A	Gamma Scan, ^{90}Sr, U, ICP-MS, Hg-CVAA/DOH[c]
100-K Spring 63-1	6.3	A	Gamma Scan, ^{90}Sr, U, ICP-MS, Hg-CVAA
100-H Spring 145-1	14.4	A	Gamma Scan, ^{90}Sr, U, ICP-MS, Hg-CVAA
100-F Spring 207-1	21.3	A	Gamma Scan, ^{90}Sr, U, ICP-MS, Hg-CVAA
Hanford Spr UR 28-2[d]	27.8	A	Gamma Scan, ^{90}Sr, U, ICP-MS, Hg-CVAA/DOH[c]
Hanford Spr DR 28-2[e]	28.3	A	Gamma Scan, ^{90}Sr, U, ICP-MS, Hg-CVAA/DOH[c]
300 Area Spring 41-9	41.9	A	Gamma Scan, U
300 Area Spring 42-2	42.1	A	Gamma Scan, ^{90}Sr, U, ICP-MS, Hg-CVAA/DOH[c]
300 Area Spr DR 42-2[e]	42.4	A	Gamma Scan, ^{90}Sr, U, ICP-MS, Hg-CVAA/DOH[c]
300 Area Spring 42-7	42.7	A	Gamma Scan, U
Richland Spr(SRL 437-1)	43.7	A	Gamma Scan, U

(a) Refer to Figure 6.1, "2008 Sediment Sampling Locations."
(b) Hanford river markers (HRM) are a series of signposts along the Hanford Site shoreline of the Columbia River that are roughly 1.6 kilometers (1 mile) apart. The Vernita Bridge is HRM #0 and Ferry Street in Richland is HRM #46. Samples collected between HRMs are assigned a decimal.
(c) Additional sample provided to the DOH.
(d) UR = Upriver from noted location.
(e) DR = Downriver from noted location.

6.3 Onsite Pond

Location[(a)]	Frequency	Analyses/Agency
West Lake	SA (Feb & June)	Gamma Scan, ^{90}Sr, U, ^{99}Tc, Alpha, Beta/DOH[(b)]

(a) Refer to Figure 6.1, "2008 Sediment Sampling Locations."
(b) Additional sample provided to the DOH (February only).

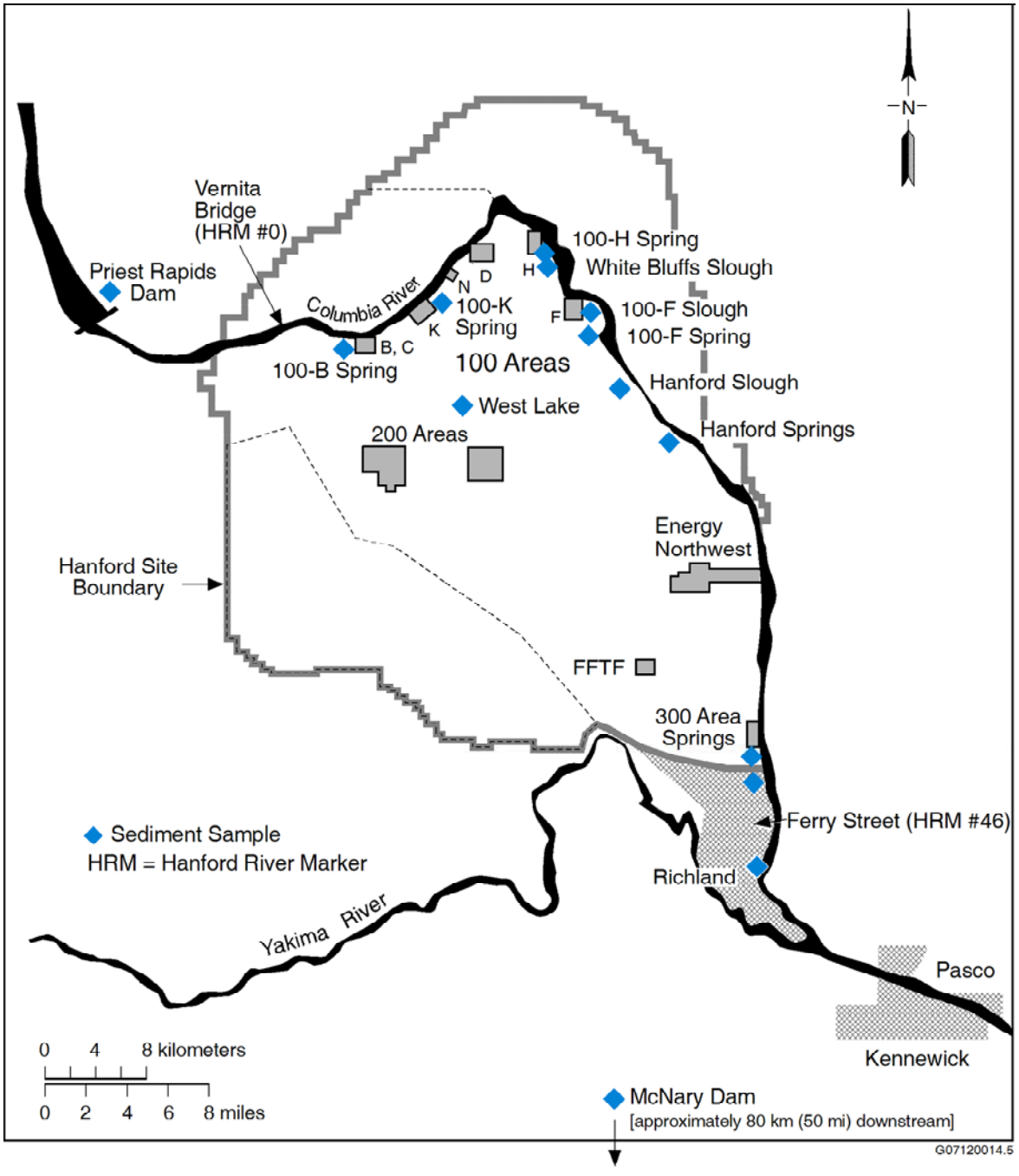

Figure 6.1. 2008 Sediment Sampling Locations

7.0 References

DOE/RL-91-50, Rev. 3. 2000. *Environmental Monitoring Plan, United States Department of Energy, Richland Operations Office*. U.S. Department of Energy, Richland, Washington.

DOE Order 450.1. 2003. "Environmental Protection Program." U.S. Department of Energy, Washington, D.C.

DOE Order 5400.5. 1990. "Radiation Protection of the Public and the Environment." U.S. Department of Energy, Washington, D.C.

HEIS. 1989. *Hanford Environmental Information System*. Environmental Information Systems Department, Fluor Hanford, Inc., Richland, Washington

Distribution

No. of Copies

OFFSITE (32)

2 L. Albin
Division of Radiation Protection
Washington State Department of Health
P.O. Box 47827
Olympia, WA 98504-7827

C. Andrade
Washington Department of Fish and Wildlife
600 Capitol Way
1111 Washington Street NE
Olympia, WA 98501-1091

G. Bohnee
Nez Perce Tribe
P.O. Box 365
Lapwai, ID 83540

R. Brunoe, GW Natural Resource
Confederated Tribes of Warm Springs Reservation
P.O. Box 1299
Warm Springs, OR 97761

L. Buck
Wanapum
P.O. Box 878
Ephrata, WA 98823

R. Buck, Jr.
Wanapum
P.O. Box 878
Ephrata, WA 98823

L. Buelow
U.S. Environmental Protection Agency,
309 Bradley, Suite 115, MS B1-46
Richland, WA 99352

2 N. Ceto
U.S. Environmental Protection Agency
309 Bradley, Suite 115, MS B1-46
Richland, WA 99352

No. of Copies

L. Gadbois
U.S. Environmental Protection Agency
309 Bradley, Suite 115, MS B1-46
Richland, WA 99352

J. Gear
Oregon Department of Energy
625 Marion Street NE
Salem, OR 97301-3737

L. Goldstein
Washington State Department of Ecology
P.O. Box 47600
Olympia, WA 98504

J. Hansen
U.S. Fish and Wildlife Service
11103 E. Montgomery Drive
Spokane Valley, WA 99206

B. Harper
Confederated Tribes of the Umatilla Indian Reservation
750 Swift, Suite 14
Richland, WA 99352

S. Harris
Confederated Tribes of the Umatilla Indian Reservation
P.O. Box 638
Pendleton, OR 97801

G. Hughes
U.S. Fish and Wildlife Service
3250 Port of Benton Boulevard
Richland, WA 99354-1670

R. Jim, Manager
Yakama Nation
2808 Main Street
Union Gap, WA 98903

No. of Copies

E. Kramer
Division of Radiation Protection
Washington State Department of Health
P.O. Box 47827
Olympia, WA 98504-7827

D. Landeen
Hanford Natural Resources Trustee Council
Nez Perce Tribe
P.O. Box 365
Lapwai, ID 83540

D. McBaugh
Division of Radiation Protection
Washington State Department of Health
P.O. Box 47827
Olympia, WA 98504-7827

J. McConnaughey
Yakama Nation
P.O. Box 6066
Kennewick, WA 99336-0066

A. Nomee
Department of Natural Resources
Coeur d'Alene Tribe
P.O. Box 408
Plummer, ID 83851-9703

Office of Environmental Cleanup
Director - Hanford Project Office
1200 6th Avenue
Seattle, WA 98101

C. Pleasants
Confederated Tribes of the Colville Indian Reservation
P.O. Box 150
Nespelem, WA 99155

M. Priddy
Washington State Department of Health
309 Bradley, Suite 201
Richland, WA 99352

No. of Copies

P. Rigdon
Yakama Nation
P.O. Box 151
Toppenish, WA 98948

M. Ritter
U.S. Fish and Wildlife Service
3250 Port of Benton Boulevard
Richland, WA 99354

B. Ruben
Washington State Department of Health
309 Bradley, Suite 201
Richland, WA 99352

P. Shaffer
Oregon Department of Energy
625 Marion Street NE
Salem, OR 97301-3737

T. Southworth
Energy Northwest
P.O. Box 968
Richland, WA 99354

S.P. Van Verst
Division of Radiation Protection
Washington State Department of Health
P.O. Box 47827
Olympia, WA 98504-7827

ONSITE (69)

DOE Pacific Northwest Site Office

	J. Erickson	K9-42

DOE Richland Operations Office

15	D.A. Brockman	A7-50
	B. L. Foley	A6-38
	J.R. Franco	A3-04
	A.R. Hawkins	A7-50
	J.P. Sands	A3-04
	K.M. Thompson	A6-38
	A.C. Tortoso	A6-38
	D.C. Ward (5)	A3-04
	J. Zeisloft	A3-04
	DOE Public Reading Room (2)	H2-53

No. of Copies

DOE Office of River Protection

W. Russell	H6-60

3 **Energy*Solutions***

J.J. Dorian	G1-62
S.M. McKinney	G1-62
C.J. Perkins	G1-62

4 **Fluor Hanford, Inc.**

D.L. Dyekman	H8-13
A.R. Johnson	H8-26
L.M. Kelly	R3-15
K.A. Peterson	H8-13

4 **Washington Closure Hanford, LLC**

K.A. Gano	H4-21
L.C. Hulstrom	H4-22
R.W. Ovink	H4-21
J.E. Thomson	H4-22

No. of Copies

41 **Pacific Northwest National Laboratory**

E.J. Antonio	K3-54
L.E. Bisping (20)	K6-75
J.M. Brandenberger	Sequim
R.L. Dirkes (2)	K6-75
J.L. Downs	K6-85
R.E. Durham	K6-85
J.M. Ferritto	K6-75
B.G. Fritz	K6-75
R.W. Fulton	K6-75
K. D. Hand	K6-85
B.K. Lasorsa	Sequim
E.A. Lepel	P8-01
R. P. Mueller	K6-85
B.E. Opitz	K6-75
G.W. Patton	K6-75
R.E. Peterson	K6-75
T.M. Poston	K6-75
J.A. Stegen	K3-66
Hanford Technical Library (2)	P8-55
Historical File—T.M. Poston	K6-75