



U.S. DEPARTMENT OF
ENERGY

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

Surface Environmental Surveillance Project Locations Manual

Volume 1 – Air and Water

BG Fritz
JA Stegen

GW Patton
TM Poston

2009



Pacific Northwest
NATIONAL LABORATORY

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Pacific Northwest National Laboratory
Richland, Washington 99352

Summary

Environmental surveillance of the Hanford site and surrounding areas is conducted by the Pacific Northwest National Laboratory (PNNL) 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*, and DOE Order 5400.5, *Radiation Protection of the Public and the Environment*. The environmental surveillance sampling design is described in the Hanford Site *Environmental Monitoring Plan*, *United States Department of Energy, Richland Operation Office* (DOE/RL-91-50). This document contains the locations of sites used to collect samples for the Surface Environmental Surveillance Project (SESP). Each section includes directions, maps, and pictures of the locations. A general knowledge of roads and highways on and around the Hanford Site is necessary to successfully use this manual. Supplemental information (Maps, Gazetteer, etc.) may be necessary if user is unfamiliar with local routes.

Surface Environmental Surveillance Project

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.

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1.0 Air Sampling Locations

1.1 Introduction

The collection and analysis of air samples is important for environmental monitoring because air is a primary pathway of potential radionuclide exposure to the public from the Hanford environs. Air sampling provides a means of assessing the environmental impact of site operations, demonstrating compliance with applicable guidelines, checking the effectiveness of containment and effluent control systems, and evaluating the potential doses to offsite populations from airborne radionuclides.

Air samples are collected continuously at numerous locations, including those onsite, at the site perimeter, and in both nearby and distant communities as shown in Figure 1.1 and listed in Table 1.1.

Because of vandalism in past years, all air sampling hutches located off the site are padlocked. Locks have been installed on the doors on both sides of each hutch. One key opens the locks at all stations and the Sample Collection Task Leader provides this key to all environmental monitoring personnel.

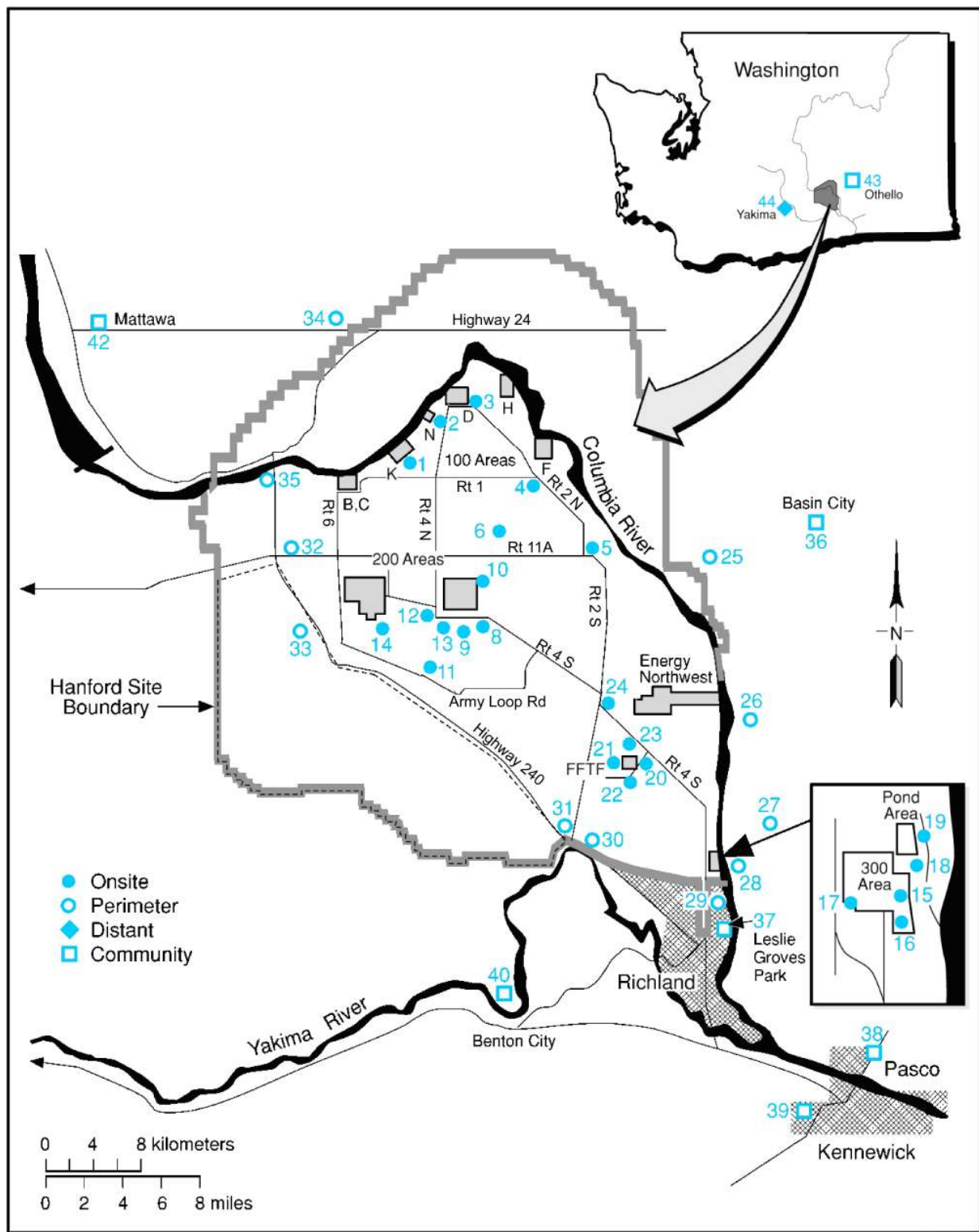


Figure 1.1. Air Sampling Locations Map

Table 1.1. Geographic Positioning System (GPS) Data for SESP Air Sampling Stations

Datum:	NAD-83			
Ellipsoid:	GRS80			
Map Location	Feature Name	Latitude (°N)	Longitude (°W)	Elevation (m)
1	100 K Area	46.643987	119.595720	136
2	100 N-1325 Crib	46.67536	119.558807	124
3	100 D Area	46.689479	119.526817	119
4	100 F Met Tower	46.635037	119.452439	105
5	Hanford Townsite	46.586571	119.401002	100
6	Gabel Mountain	46.597950	119.460780	332
8	200 ESE	46.539818	119.505258	196
9	S of 200 E	46.514644	119.519424	191
10	B Pond	46.560766	119.496462	174
11	Army Loop Camp	46.518475	119.606980	174
12	200 Tel. Exchange	46.551264	119.572352	206
13	SW of B/C Crib	46.507384	119.555184	179
14	200 W SE	46.538615	119.608723	197
15	300 Water Intake	46.368538	119.271092	93
16	300 South Gate	46.363033	119.273789	105
17	300 South West	46.363463	119.281981	98
18	300 Trench	46.374382	119.277357	95
19	300 NE	46.373174	119.273003	114
20	400 E	46.435010	119.357245	157
21	400 W	46.434979	119.368594	145
22	400 S	46.429568	119.359207	156
23	400 N	46.439072	119.363928	147
24	Wye Barricade	46.481581	119.391564	148

Table 1.2. (contd)

Map Location	Feature Name	Latitude (°N)	Longitude (°W)	Elevation (m)
25	Ringold Met Tower	46.544968	119.237245	174
26	W End of Fir Road	46.445888	119.249979	176
27	Dogwood Met Tower	46.416885	119.237452	247
28	Byers Landing	46.358582	119.247650	140
29	Battelle Complex	46.340423	119.282326	105
30	Horn Rapids Substation	46.361621	119.361406	136
31	Prosser Barricade	46.392328	119.412032	125
32	Yakima Barricade	46.577978	119.726094	227
33	Rattlesnake Springs	46.512378	119.681845	180
34	Wahluke Slope	46.736887	119.640927	189
35	S End Vernita Bridge	46.639018	119.732095	112
36	Basin City Elementary School	46.594756	119.153921	200
37	Leslie Groves-Richland	46.314659	119.261279	93
38	Pasco	46.251686	119.119466	113
39	Kennewick-Ely Street	46.193120	119.158894	160
40	Benton City	46.275718	119.499132	190
42	Mattawa	46.736233	119.896931	221
43	Othello	46.827833	119.163280	318
44	Yakima	46.570557	120.541992	306

1.1.1 On Site Locations

100 K

1. From Route 1, head toward the main gate at 100 K Area.
2. Cross the railroad track and travel about 100 yards.
3. The air sampler is located on the right (east) side of the road on the concrete pad where a portable building used to be located.
4. The sampler is located roughly half the distance between the railroad crossing and the 100 K main gate.

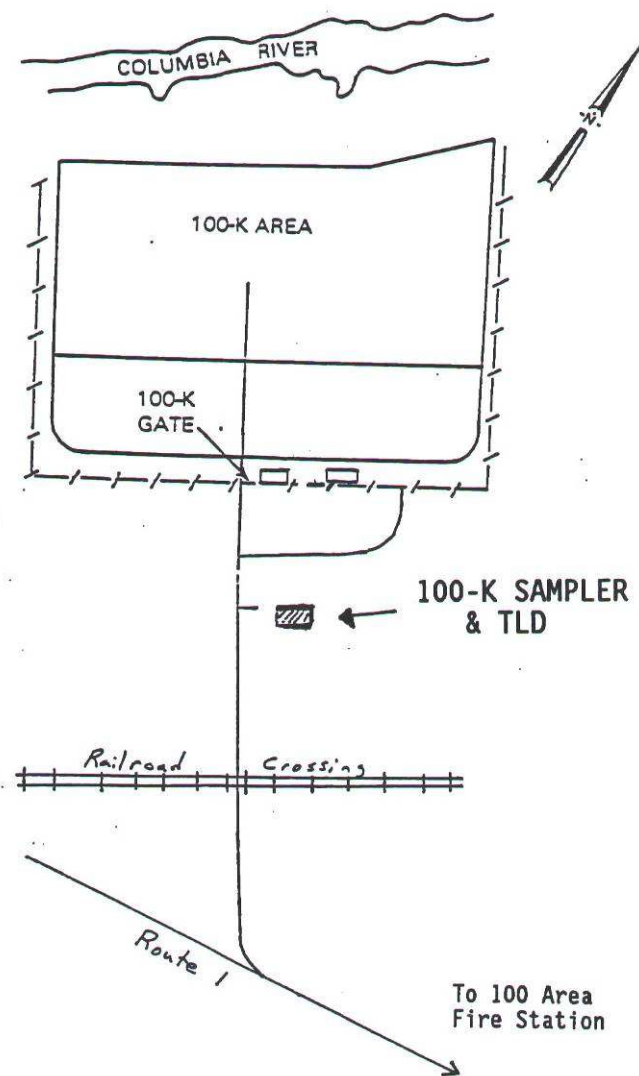


Figure 1.2. Air Sampling Location at 100 K Area



Figure 1.3. 100 K Area Air Sampler. Note: Building may not be there now.

100 N-1325 CRIB

NOTE: This area is under the ERC clean-up effort. The following directions may not be accurate and change depending on the clean-up activities. You may have to undergo specific training and check in procedures to this location.

1. Head toward the main 100 N Gate. Turn right (northeast) onto a gravel road that runs on the northwest side of Building 1120.
2. Proceed approximately 0.1 mile on this dirt road. The air sampler is on the right.



Figure 1.4. Air Sampling Location at 100 N-1325 Crib



Figure 1.5. 100 N Air Sampler

100 D

NOTE: This area is under the ERC clean-up effort. The following directions may not be accurate and change depending on the clean-up activities. You may have to undergo specific training and check in procedures to access this location.

1. Turn right (north) from Rt. 2 North at the 100 D Area sign and travel 0.3 miles.
2. The air sampler is located north of the cement block building (1614-D).

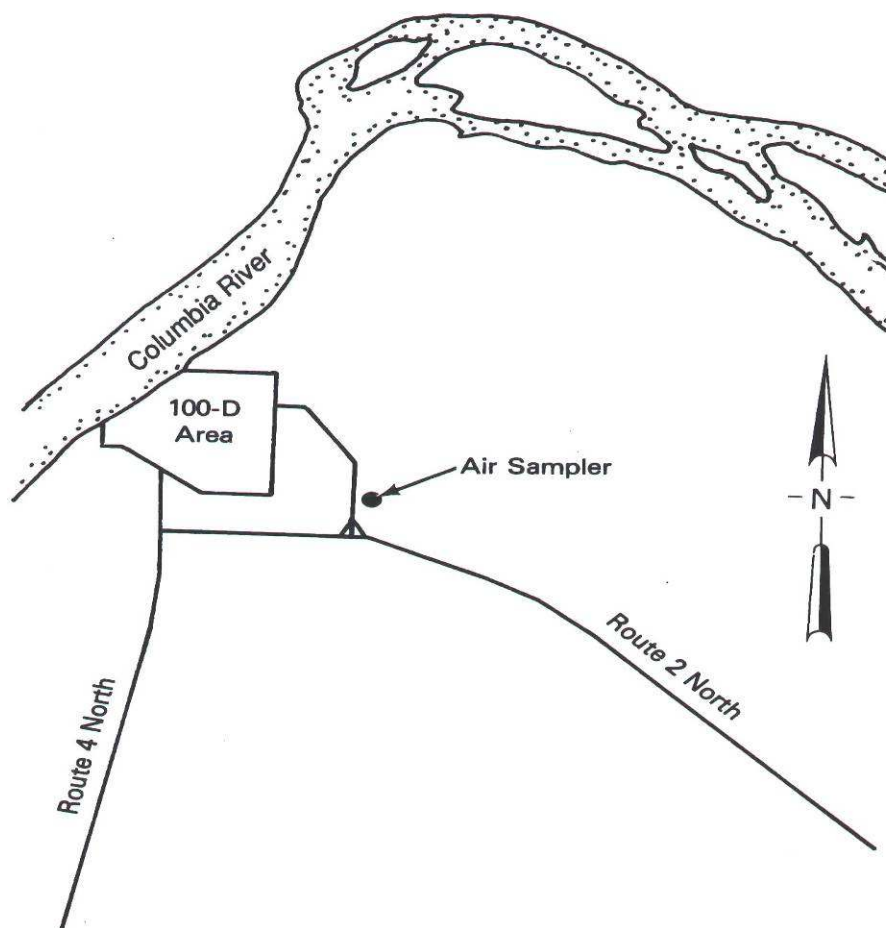


Figure 1.6. Air Sampling Location at 100 D Area



Figure 1.7. 100 D Area Air Sampler

100 F MET TOWER

1. Take Route 2 North from the Wye Barricade.
2. The 100-F air sampler is located near the 100 F meteorology tower on the southwest corner of Route 2 North and Route 1. This is approximately 12.4 miles north of the Wye Barricade following Route 2 North.

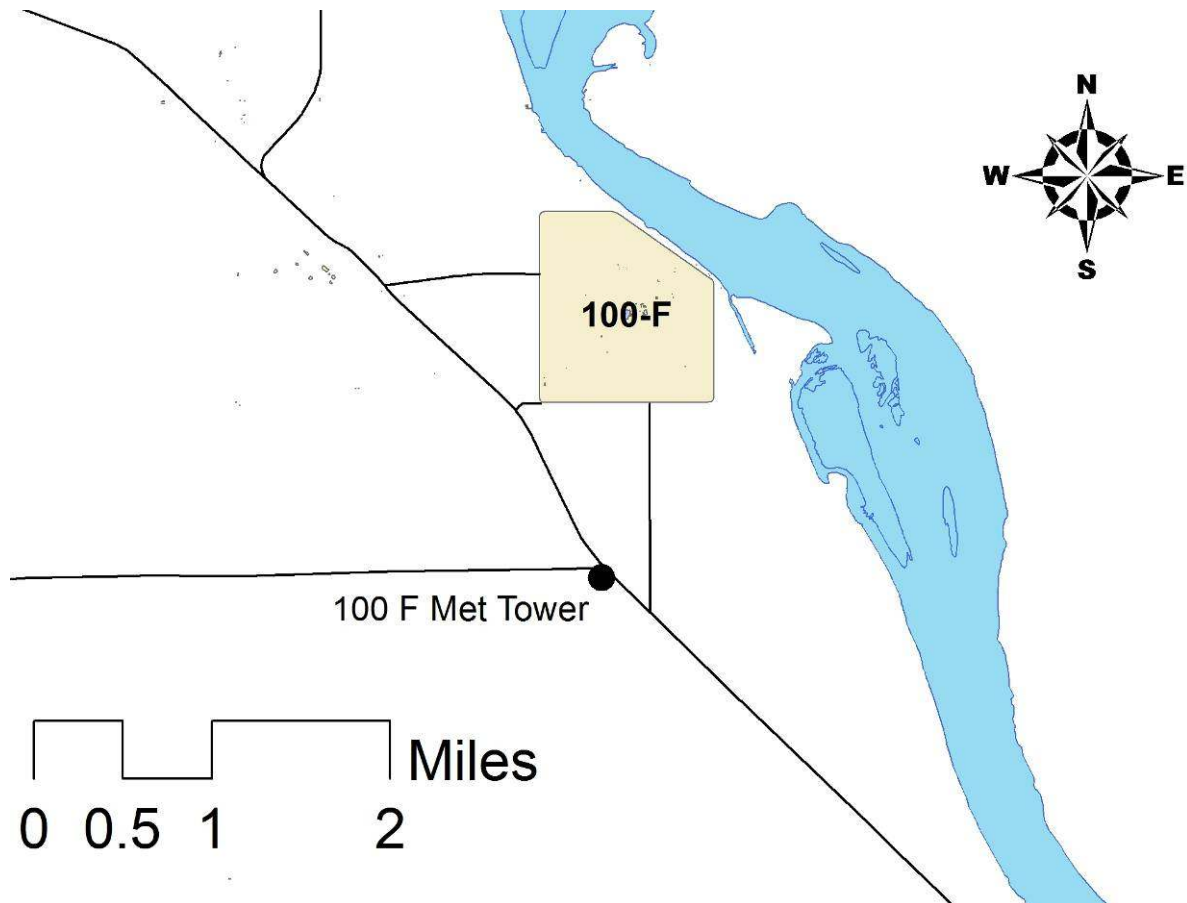


Figure 1.8. Air Sampling Location at 100 F Met Tower

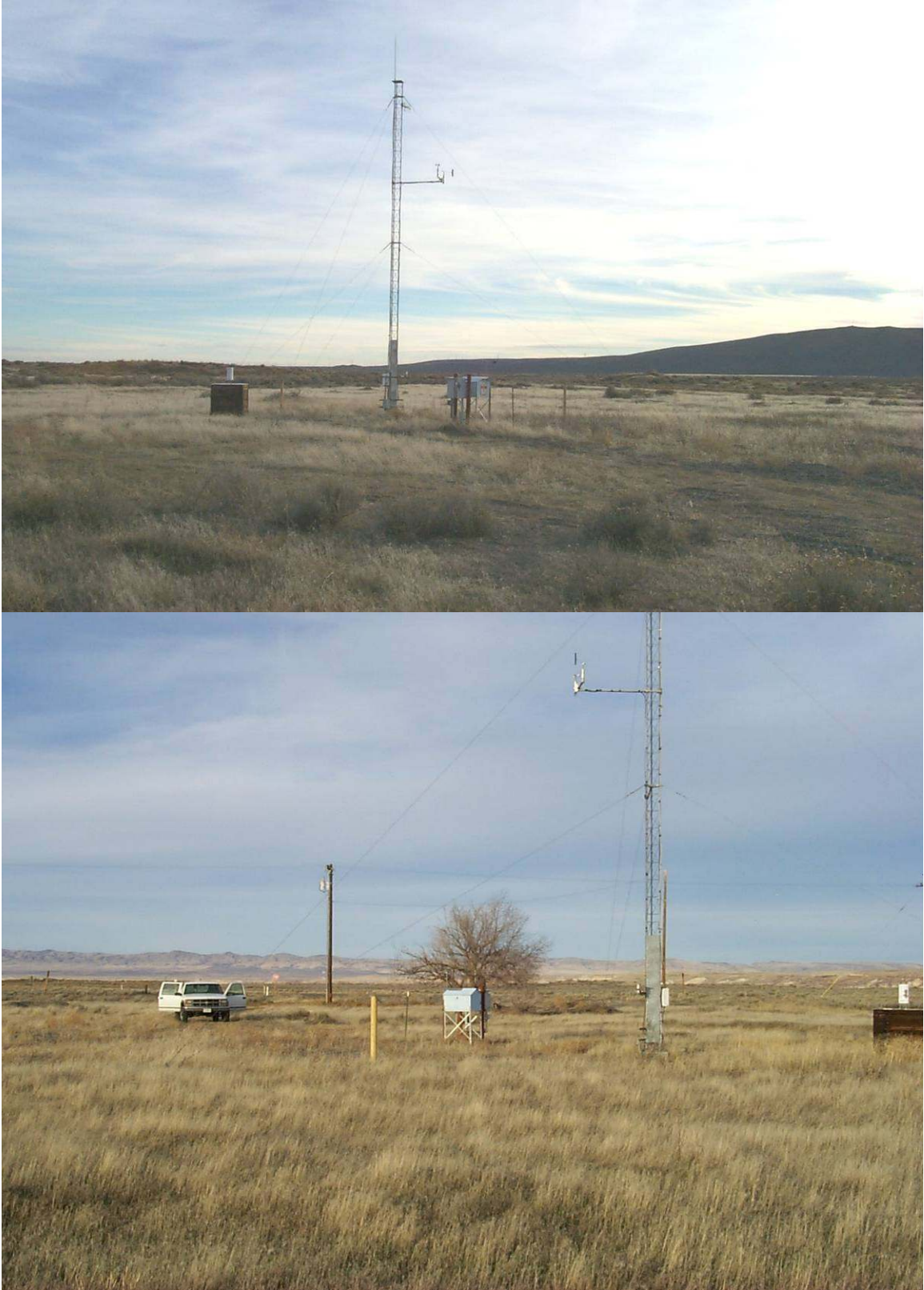


Figure 1.9. 100 F Met Tower Air Sampler

HANFORD TOWNSITE

1. Take Route 2S north from the Wye Barricade.
2. The Hanford Townsite air sampler is located on Route 2 North, 0.8 miles north of the Rt. 11-A and Route 2 South intersection, about 100 yards east of Route 2 North at the base of a power pole. This is approximately 7.2 miles north of the Wye Barricade.

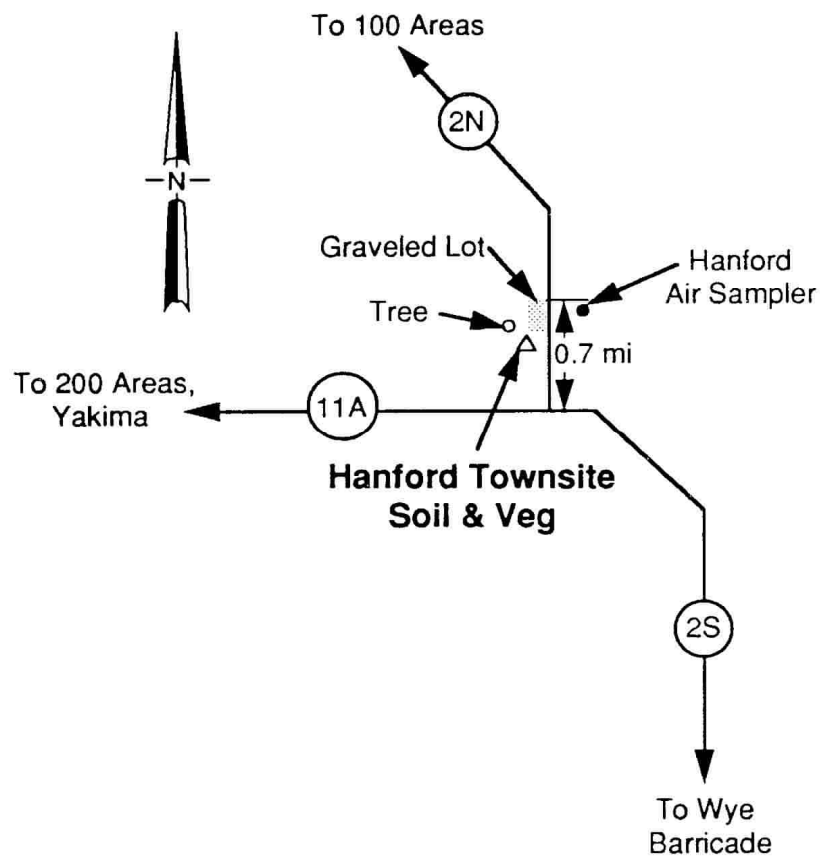


Figure 1.10. Air Sampling Location at the Hanford Townsite



Figure 1.11. Hanford Townsite Air Sampler

200 ESE

1. The 200 ESE air sampler is located at the old army camp on top of the 200 East hill. There are several trees at the location.
2. Take the gravel road turning off Rt. 4S into the old army camp, 0.6 mile east of the southeast corner of the 200 East area.
3. Keep to the right as the gravel road approaches the trees.

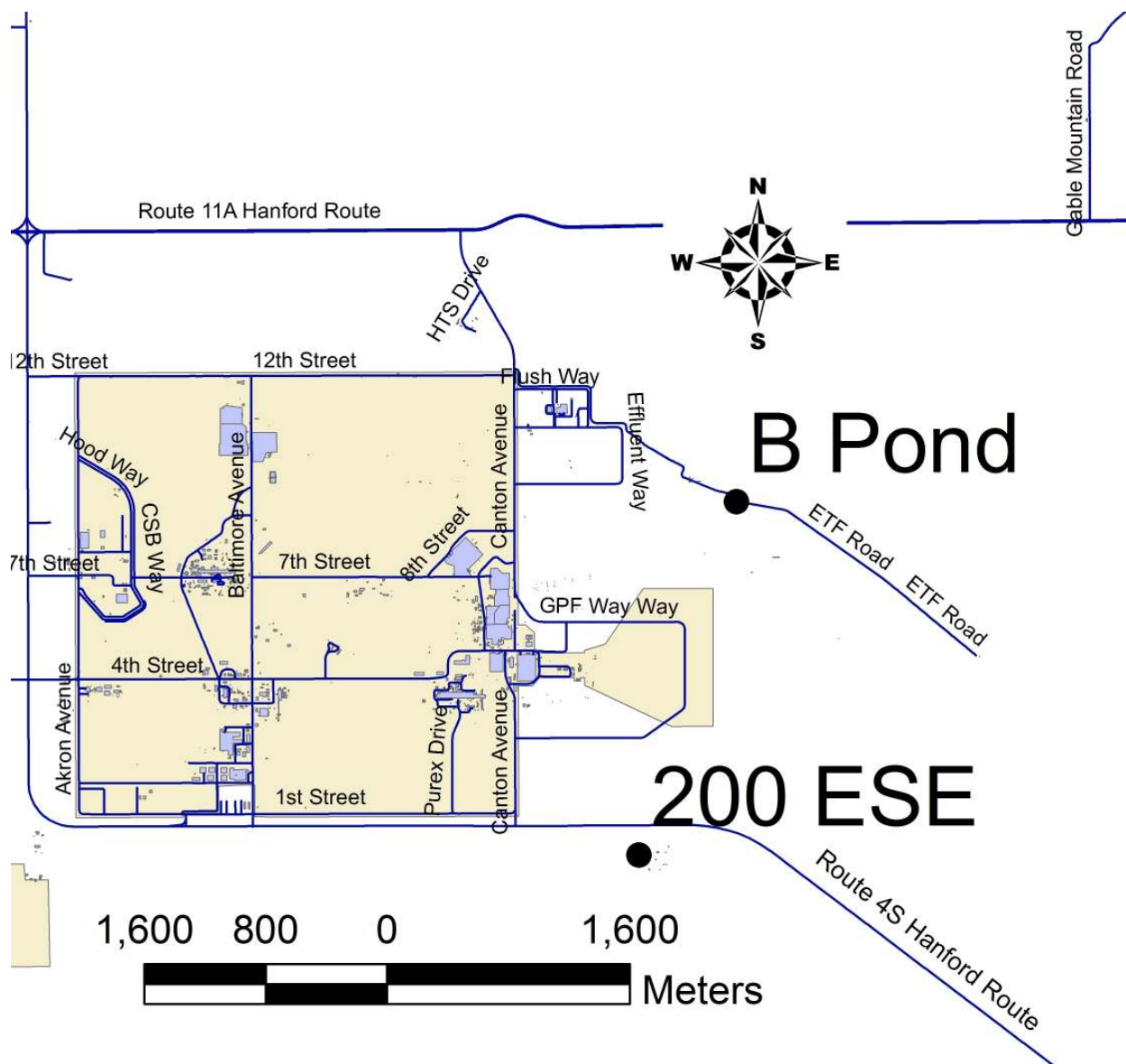


Figure 1.12. Air Sampling Location at 200 ESE



Figure 1.13. 200 ESE Air Sampler

S OF 200 E

1. From the Wye Barricade travel 4.1 miles northwest on Rt. 4S to the Central Landfill Road (Army Loop Camp Road).
2. Turn left (southwest onto the Central Landfill Road and continue 2.4 miles to a gravel road on the right side of the road).
3. Turn right (north on to the gravel road and travel 2.7 miles).
4. The air sampler is located on the right side of the road at the top of a hill.

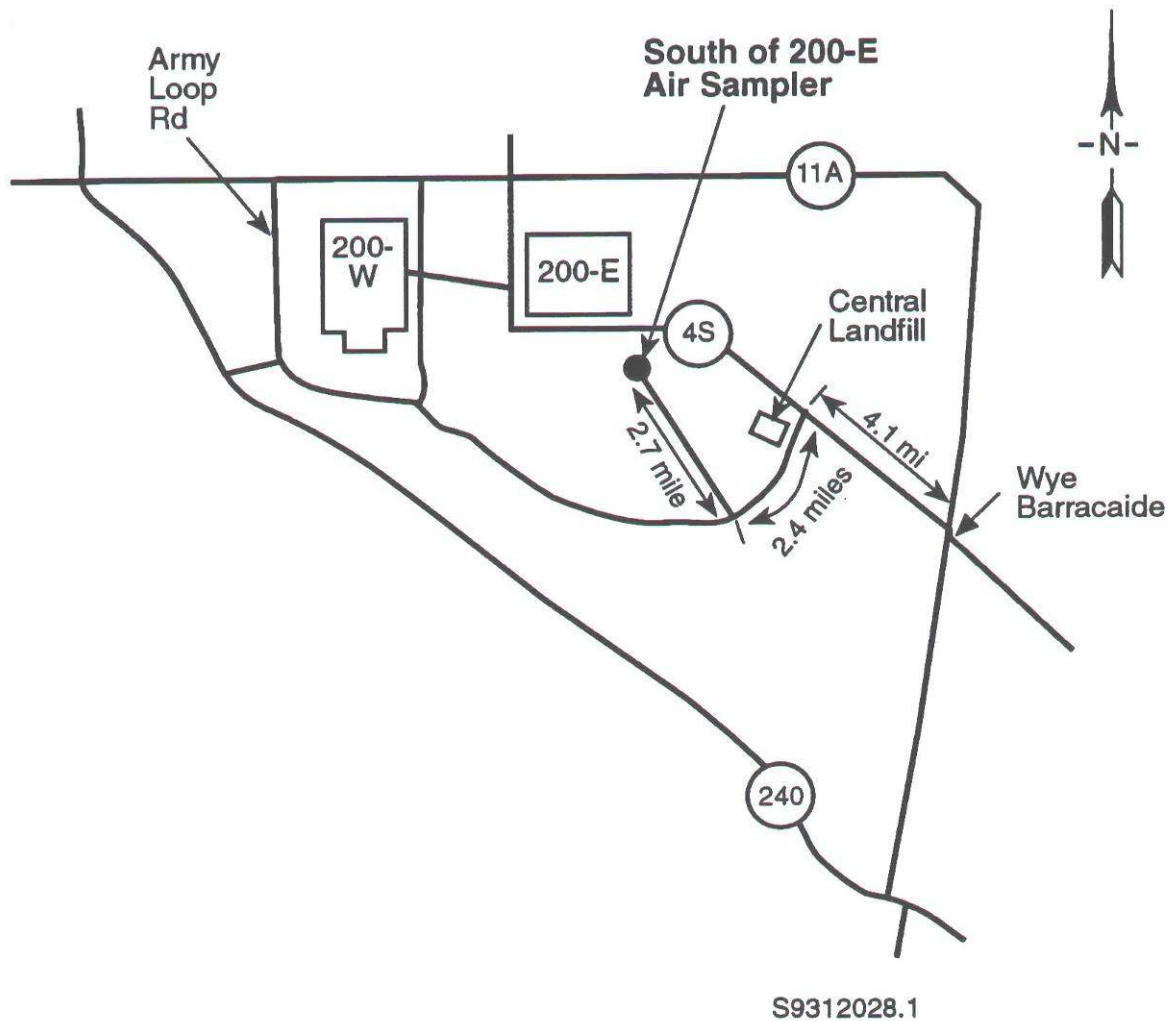


Figure 1.14. Air Sampling Location S of 200 E



Figure 1.15. S of 200 E Air Sampler

B POND

1. From Route 11A, turn south towards the 200-East Area on the access road 1.9 miles east of the 11A/4S intersection. This is the access road that leads to the submarine reactor storage area.
2. Before entering the 200-East Area fence, turn east onto a gravel road.
3. Follow the gravel road to the southwest to a concrete building (6653A). The air sampler is located 20 meters south of the building.

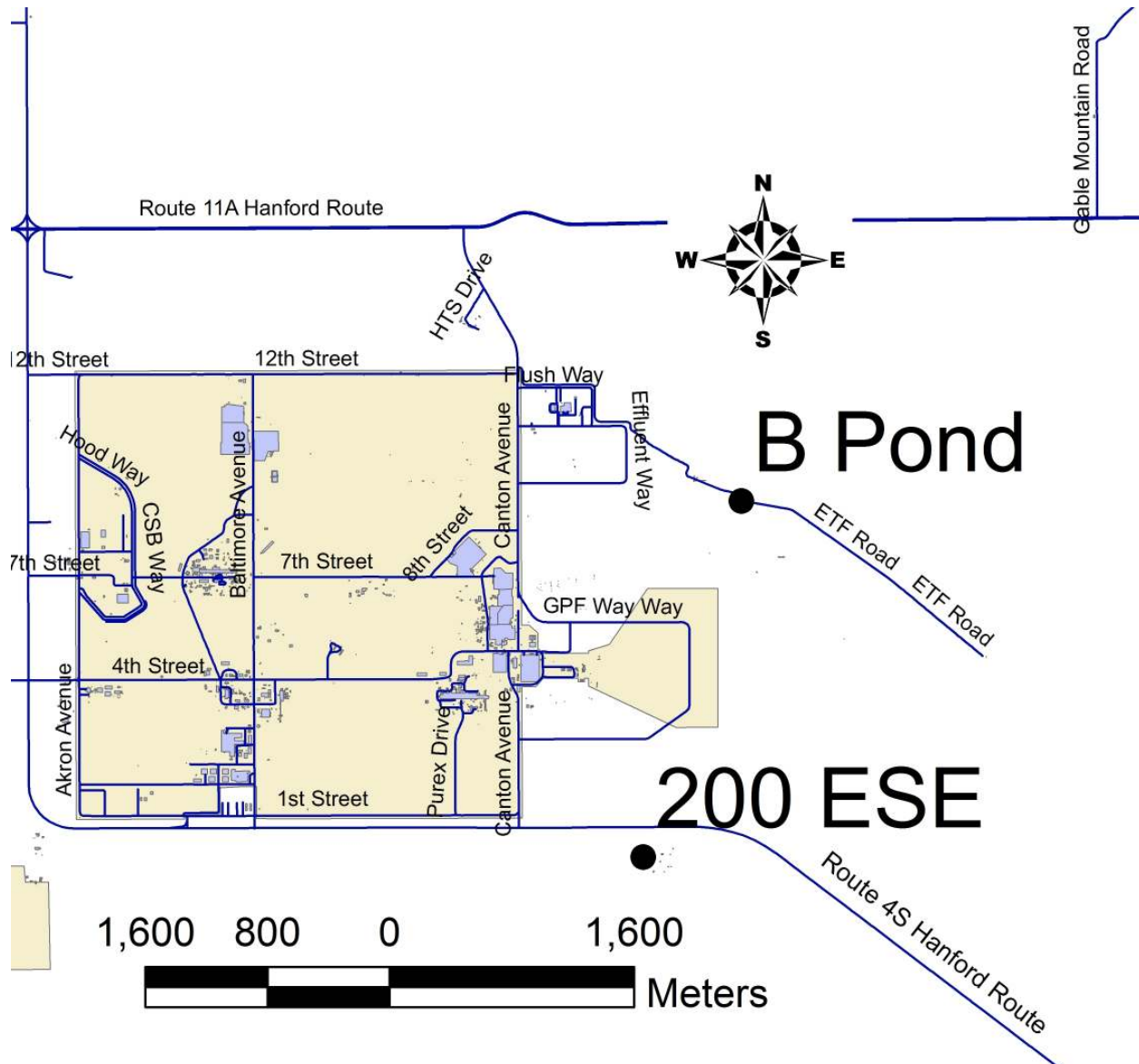


Figure 1.16. Air Sampling Location at B Pond



Figure 1.17. B Pond Air Sampler

ARMY LOOP CAMP

1. From the Wye Barricade travel 4.1 miles northwest on Rt. 4S to the Central Landfill Road (Army Loop Camp Road).
2. Turn left (southwest) and continue 9.0 miles to Army Loop Camp (look for a group of trees), which is on the left (south) side of the road.
3. Turn right (north) onto the gravel road heading towards 200 West.
4. Travel 0.6 miles north and turn right (east) a gravel pad. The air sampler is located beside the power pole located on top of a small hill.

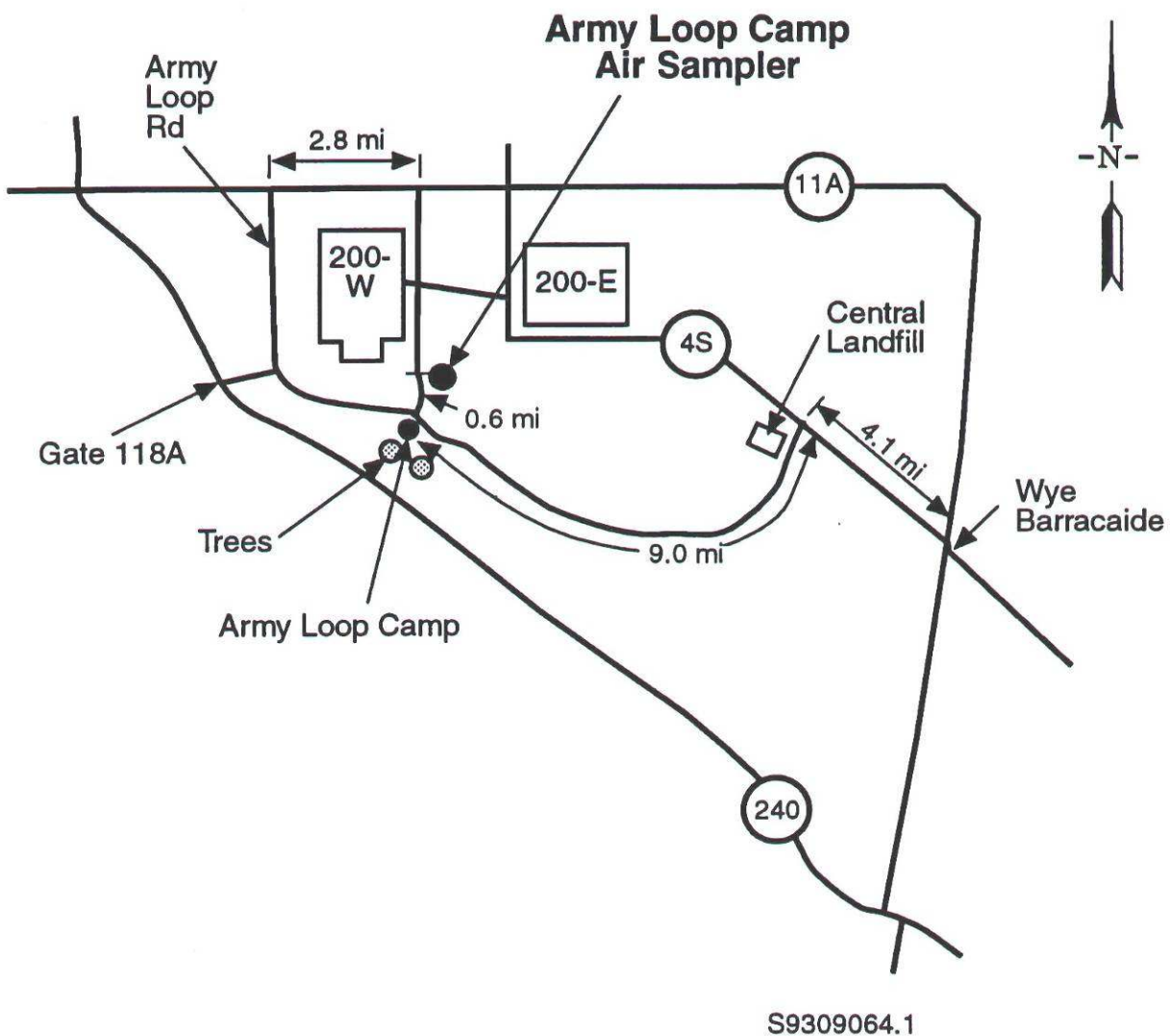


Figure 1.18. Air Sampling Location at the Army Loop Camp



Figure 1.19. Army Loop Camp Air Sampler

**200 TEL.
EXCHANGE**

1. The 200 Tel. Exchange air sampler is located on Rt. 3 between the 200 East Area and the 200 West Area, 0.5 mile from the intersection of Rt. 3 and Rt. 4S.
2. On the south side of Rt.3 is a brick building with brown trim and an adjacent fenced area. The air sampler is at the northwest corner of the fenced area.

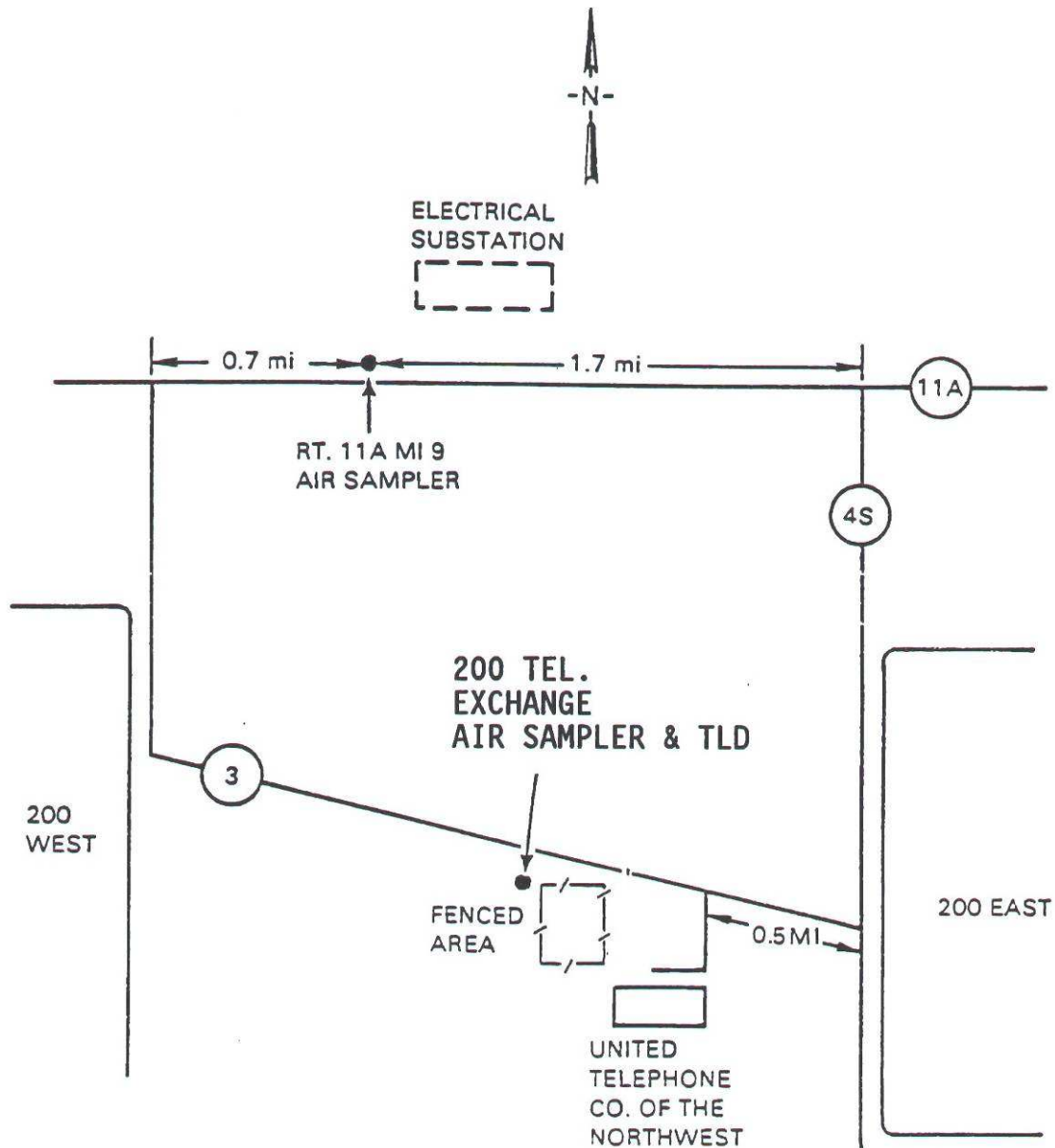


Figure 1.20. Air Sampling Location at the 200 Tel. Exchange



Figure 1.21. 200 Tel. Exchange Air Sampler

SW of B/C CRIBS

Directions from Rt. 4 and US Ecology Turn-off

1. Turn off Rt. 4S at the “US Ecology Burial Ground” sign located near the southwest corner of the 200-E area.
2. Follow the gravel road past the US Ecology Office, by the Washington State Department of Health Trailers, and to the east of the fenced burial grounds, along the power lines for approximately 2.6 miles. The air sampler is on top of a small hill to the west/right side of the road.

Check-in, and training is required for access to this sampling location. For requirements contact sample collection staff supervisor.

Relevant web sites

<http://training.pnl.gov/default.asp?fsb=0>

<http://aracsweb.pnl.gov/intercontractor/default.asp>.

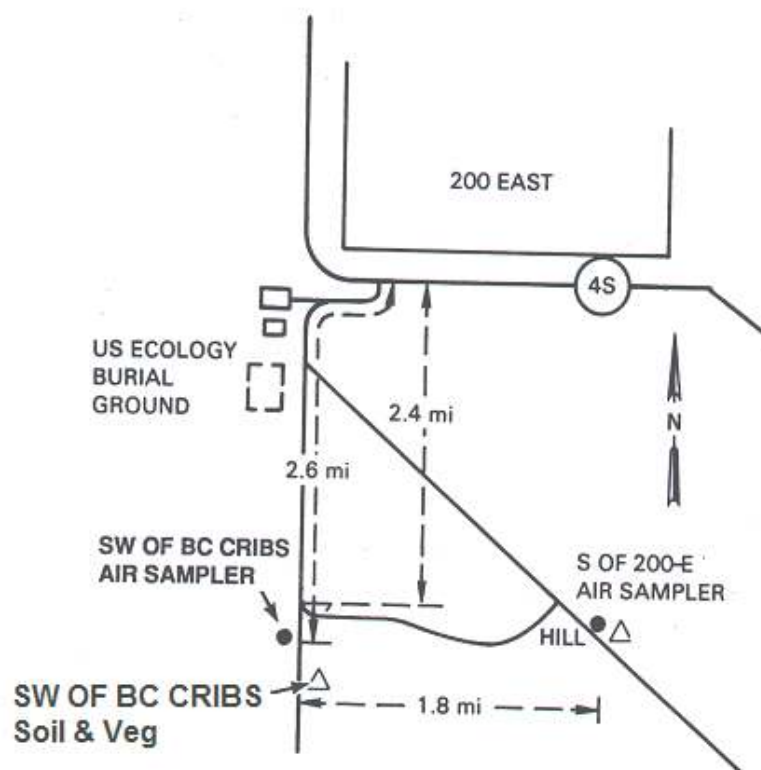


Figure 1.22. Air Sampling Location at SW B/C Crib



Figure 1.23. SW B/C Crib Air Sampler

200 W SE

1. Enter the 200 West Area via the main entrance on Rt. 3.
2. Turn left onto Albany along the inside of the perimeter fence after passing through the gate.
3. Proceed south on Albany to the air sampler at the corner of Albany and 13th Street.

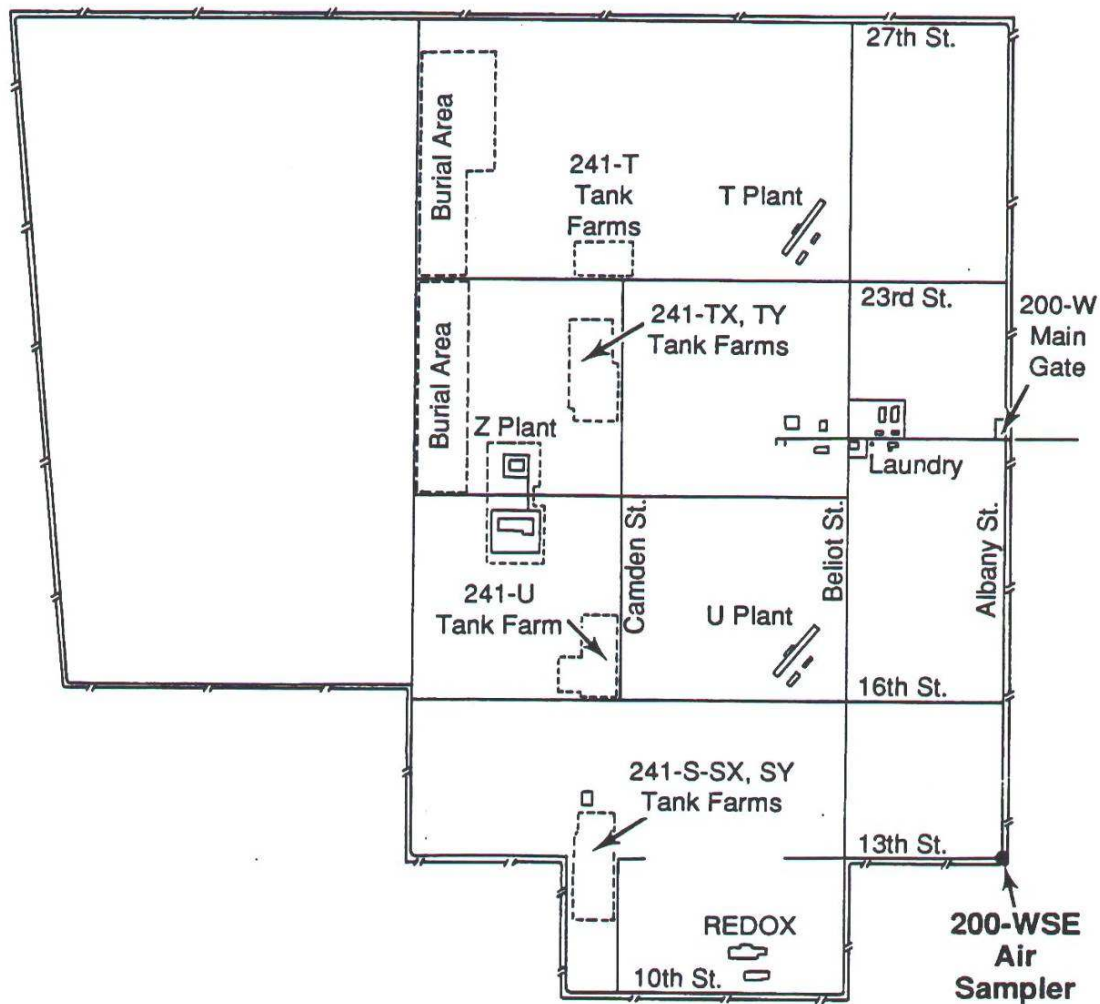


Figure 1.24. Air Sampling Location at 200 W SE



Figure 1.25. 200 W SE Air Sampler

300 WATER INTAKE

1. Enter 300 Area via Cypress Street Gate.
2. Turn left (north) at the east end of Cypress Street, near the river.
3. Follow the 300 Area perimeter fence around the parking lot, past the 337 building.
4. The 3614-A Building is on the right side of the road, between the east side of the 315 Building and the river. It is a small, metal, cream-colored building.
5. The air sampling hutch is located along the fence just north of the 3614-A Building.

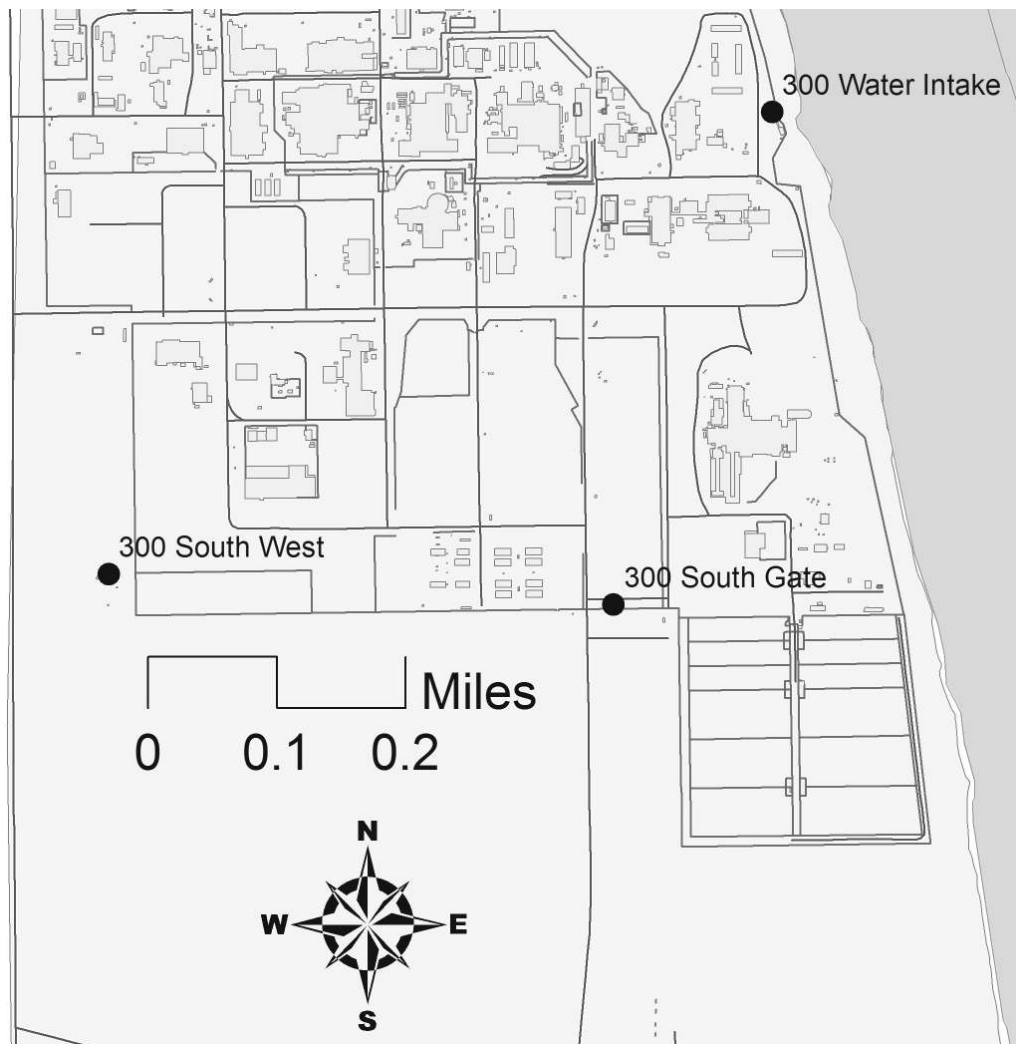


Figure 1.26. Air Sampling Location at the 300 Water Intake



Figure 1.27. 300 Water Intake Air Sampler

300 SOUTH GATE

1. The 300 South Gate air sampler is just east of the 300 Area south gate, inside the perimeter fence.
2. Turn east just pass the green electrical transformers onto the paved path.

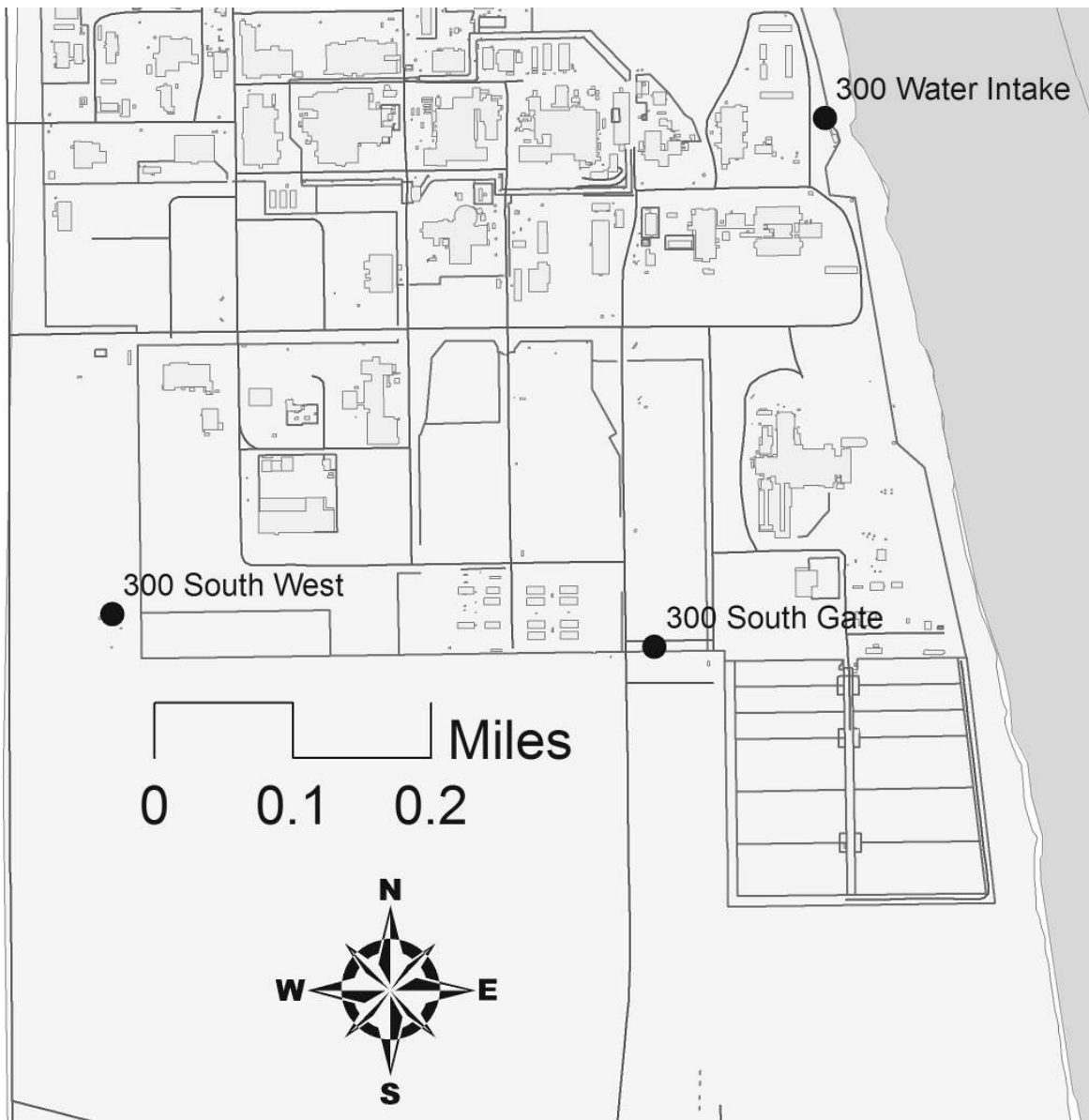


Figure 1.28. Air Sampling Location at 300 South Gate



Figure 1.29. 300 South Gate Air Sampler

300 SOUTH WEST

1. Travel North on Stevens Drive (Rt. 4S) to the Cypress street entrance.
2. Turn south onto the dirt road just outside the perimeter fence. Follow the road towards the low light brown building at the south west corner of the 300 area fence-line. A meteorology tower is close by.
3. The air sampling station is located to the east of the brown building.

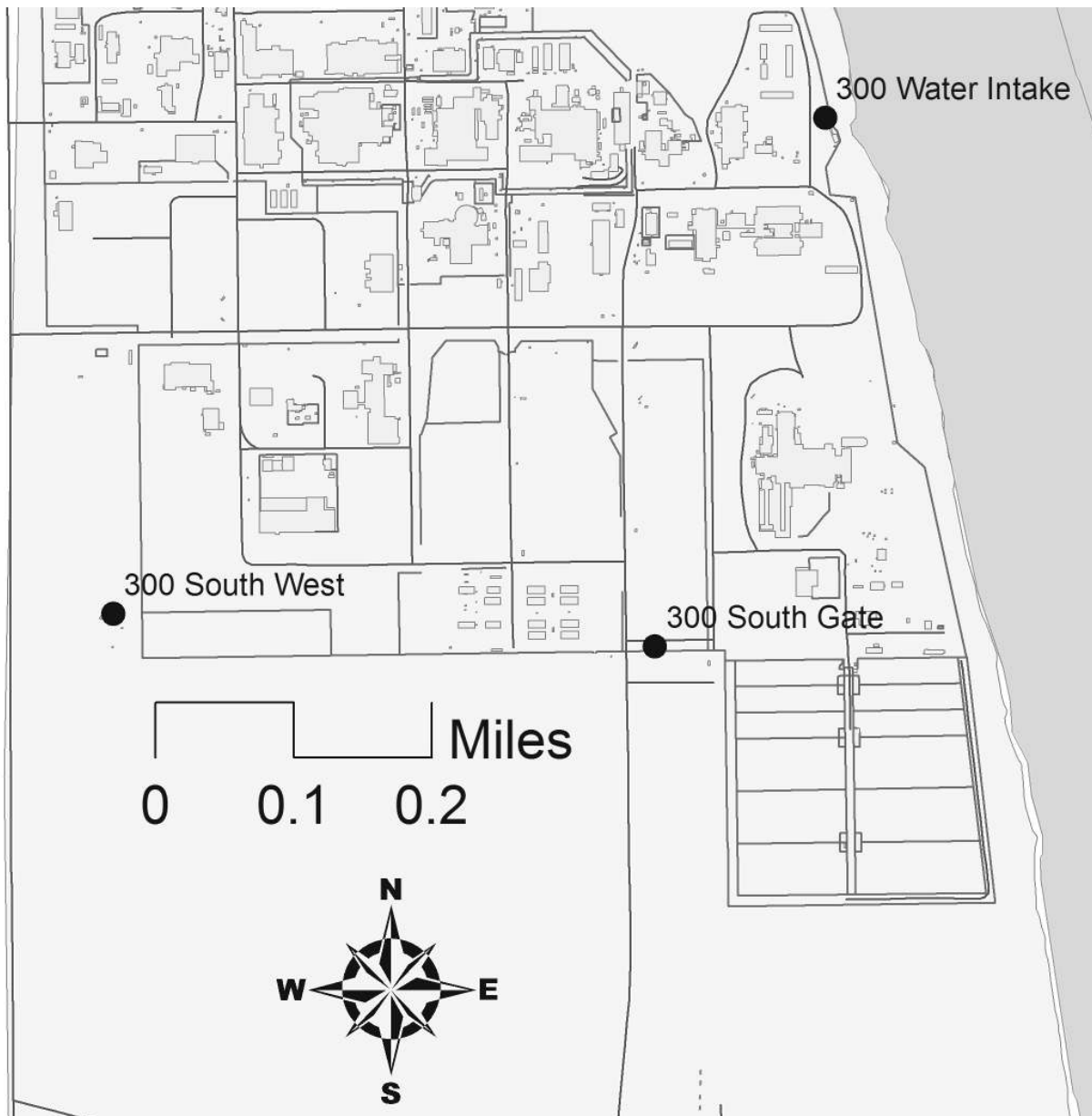


Figure 1.30. Air Sampling Location at 300 South West



Figure 1.31. 300 South West Air Sampler

300 TRENCH

NOTE: This area is under construction/clean-up. The following directions may not be accurate and change depending on activities. You may have to undergo specific training and check in procedures to this location.

1. Travel north on Stevens Drive (R. 4S).
2. Just before crossing the first set of railroad tracks, turn right (toward the river) onto a partially paved gravel road.
3. Continue on the gravel road to the 4-way intersection. Continue straight through the intersection.
4. The 300 Trench air sampler is located between the main road and an access road leading to the former trench (now fenced in).

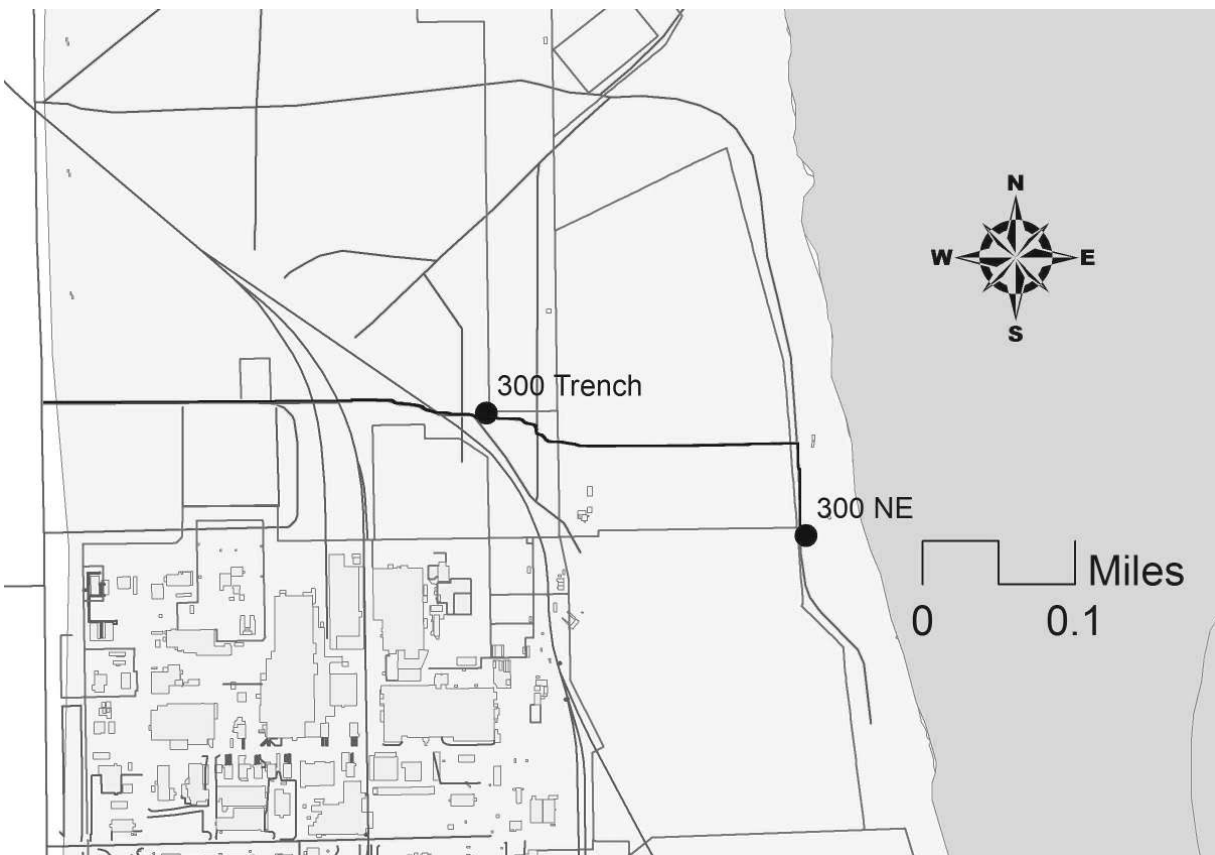


Figure 1.32. Air Sampling Location at 300 Trench



Figure 1.33. 300 Trench Air Sampler

300 NE

NOTE: This area is under construction/clean-up. The following directions may not be accurate and change depending on activities. You may have to undergo specific training and check in procedures to this location.

1. Travel north on Stevens Drive (R. 4S).
2. Just before crossing the first set of railroad tracks, turn right (toward the river) onto a partially paved gravel road.
3. Continue on the gravel road to the 4-way intersection. Continue straight through the intersection, going due east. Do not veer to the north or south.
4. This road ends at a road paralleling the river. Turn south (right).
5. The 300 NE air sampler is located at the base of a power pole.

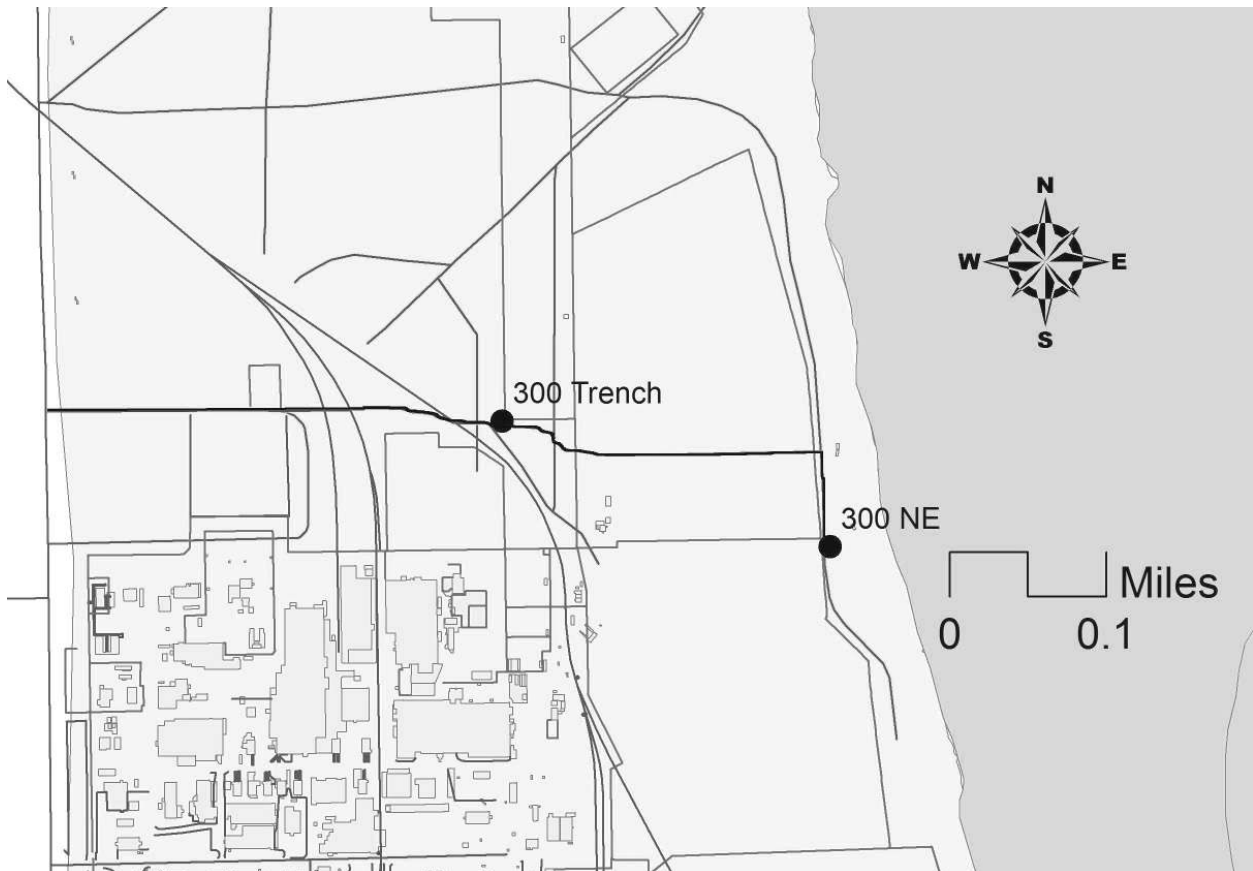


Figure 1.34. Air Sampling Location at 300 NE



Figure 1.35. 300 NE Air Sampler

400 E

1. Travel north on Rt. 4S, turn left (west) at the FFTF access road.
2. Turn right (north) into the dirt parking lot before the FFTF fence line.
3. The air sampler is located in the northwest area of the parking lot.

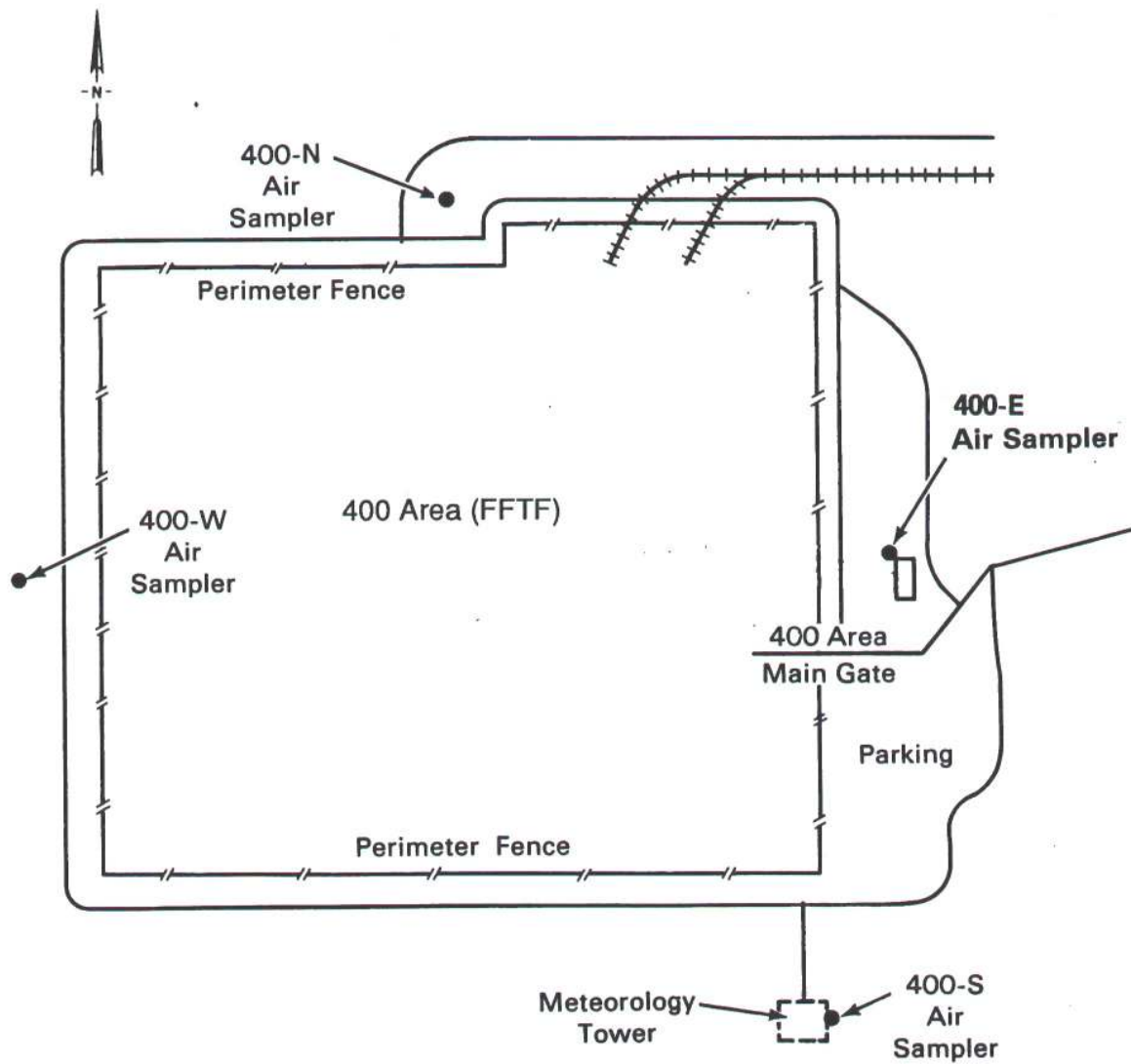


Figure 1.36. Air Sampling Location at 400 E



Figure 1.37. 400 E Air Sampler

400 N

1. Follow the road to FFTF and turn right onto the road around the perimeter fence.
2. Continue on the FFTF perimeter fence road to the north side.
3. The 400 N air sampler is located near a jog in the fence line approximately halfway along the north perimeter fence on the north side of the road.

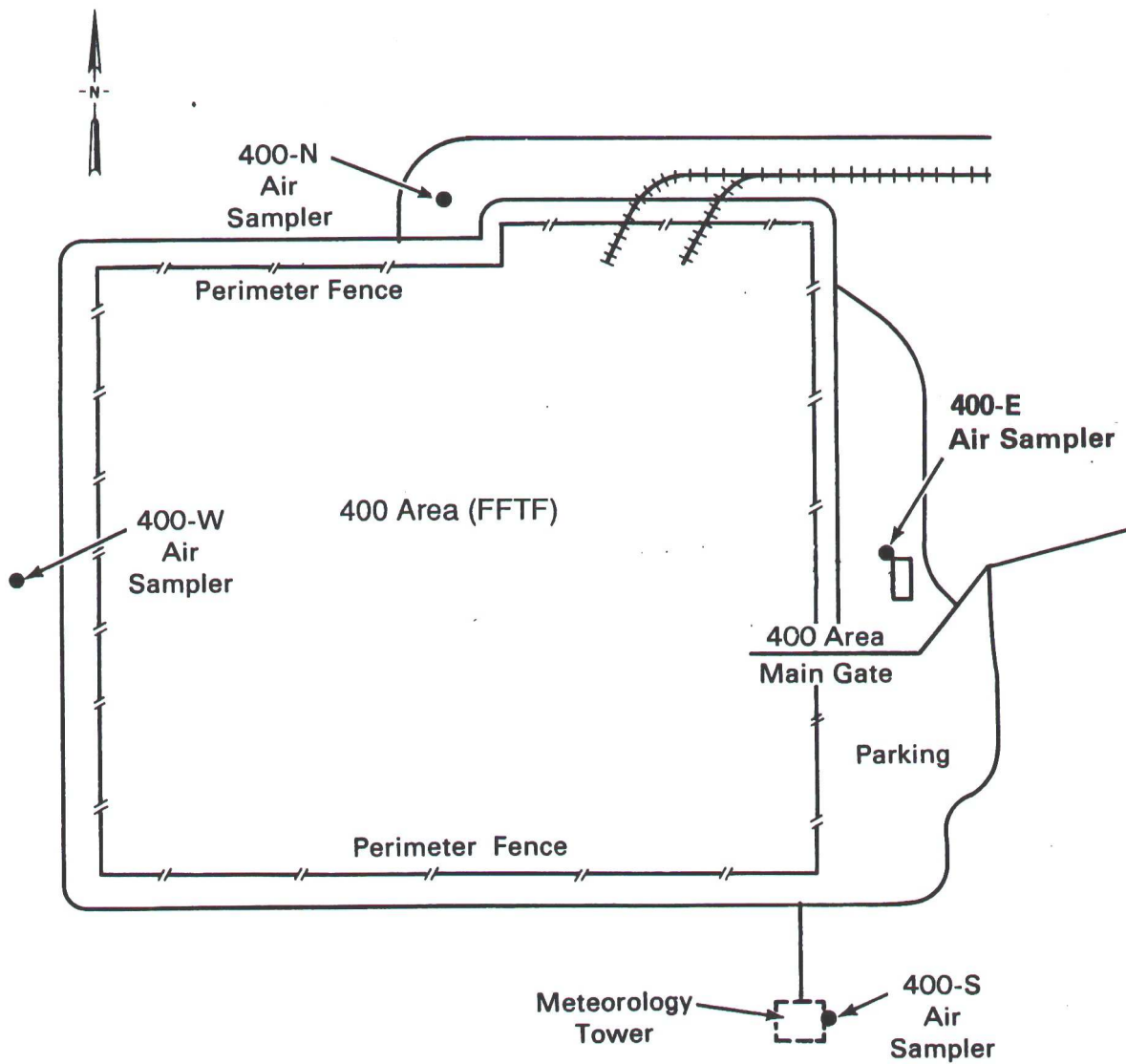


Figure 1.38. Air Sampling Location at 400 N



Figure 1.39. 400 N Air Sampler

WYE BARRICADE

1. Wye Barricade is located near the intersection of Rt. 4S, Rt. 2S and Rt. 10.
2. The air sampling hutch is located east of the guardhouse on top of a small knoll. There is a meteorology tower and equipment near the sampling hutch. It is easily seen from the road. Be sure to go through the guard station before driving to the sampler.

Note: Other contractors and the State of Washington also have air samplers at this location, so care should be taken to collect samples from the PNNL sampler (look for the PNNL name tag).

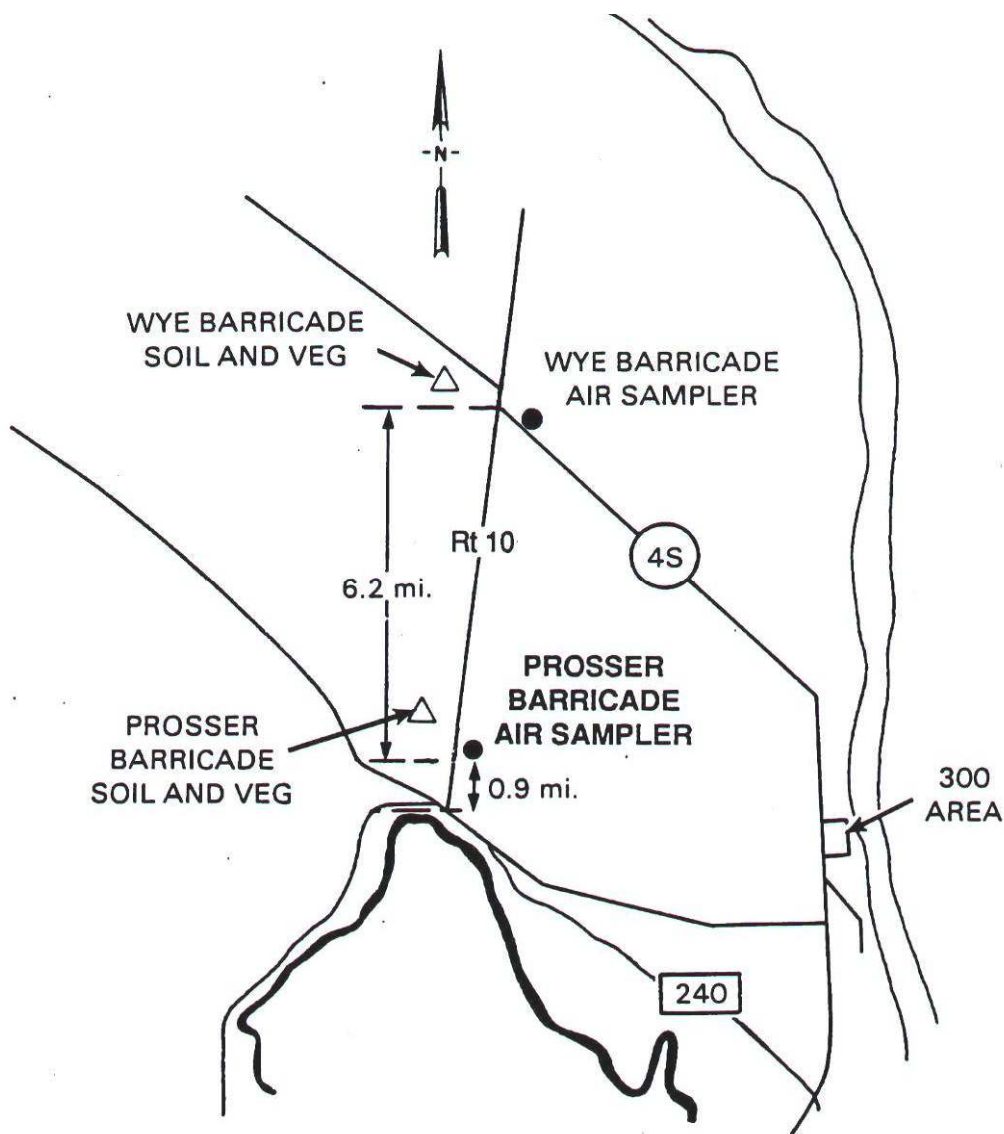


Figure 1.40. Air Sampling Location at Wye Barricade



Figure 1.41. Wye Barricade Air Sampler

GABLE MOUNTAIN

1. From Wye Barricade follow route 2S North.
2. Stay on road as it bends around and becomes route 11A heading west. Go 3.2 miles past the intersection with route 2 north.
3. Turn north on an unmarked paved road. Take the paved road for 0.7 mile, and then head East (right) onto the gravel road.
4. Follow the gravel road up the hill for 1.3 miles. The air hutch is at the South end of the first building.

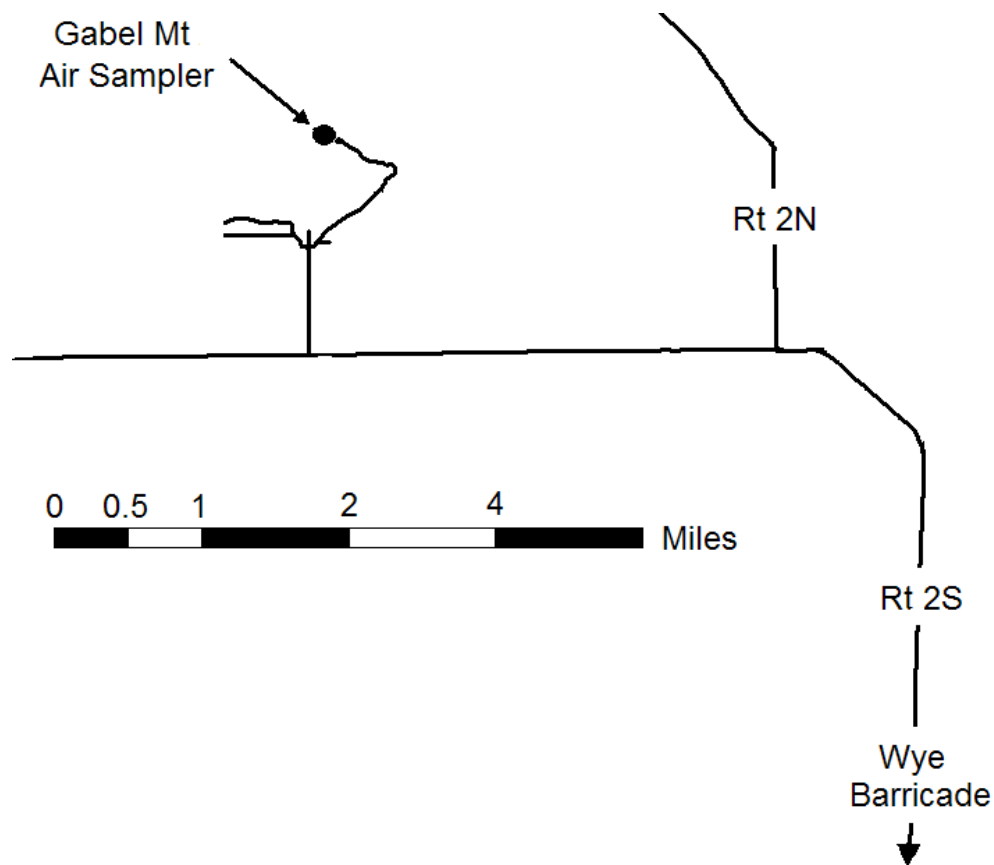


Figure 1.42. Air Sampling Location at Gable Mountain



Figure 1.43. Gable Mountain Air Sampler (looking to the west)

1.1.2 Off Site Locations

RINGOLD MET TOWER

1. Travel east on Interstate-182 across the Columbia River Bridge.
2. Turn north on Road 68. Take Taylor Flats Road to Eltopia – Ringold Road.
3. Turn left and continue on past Ringold. The road will become Rickert Road.
4. Continue on to the intersection of Rickert Road and Ranger Lane Road. The air sampler is located next to a power pole near the meteorology tower on the left side of the road at the intersection.

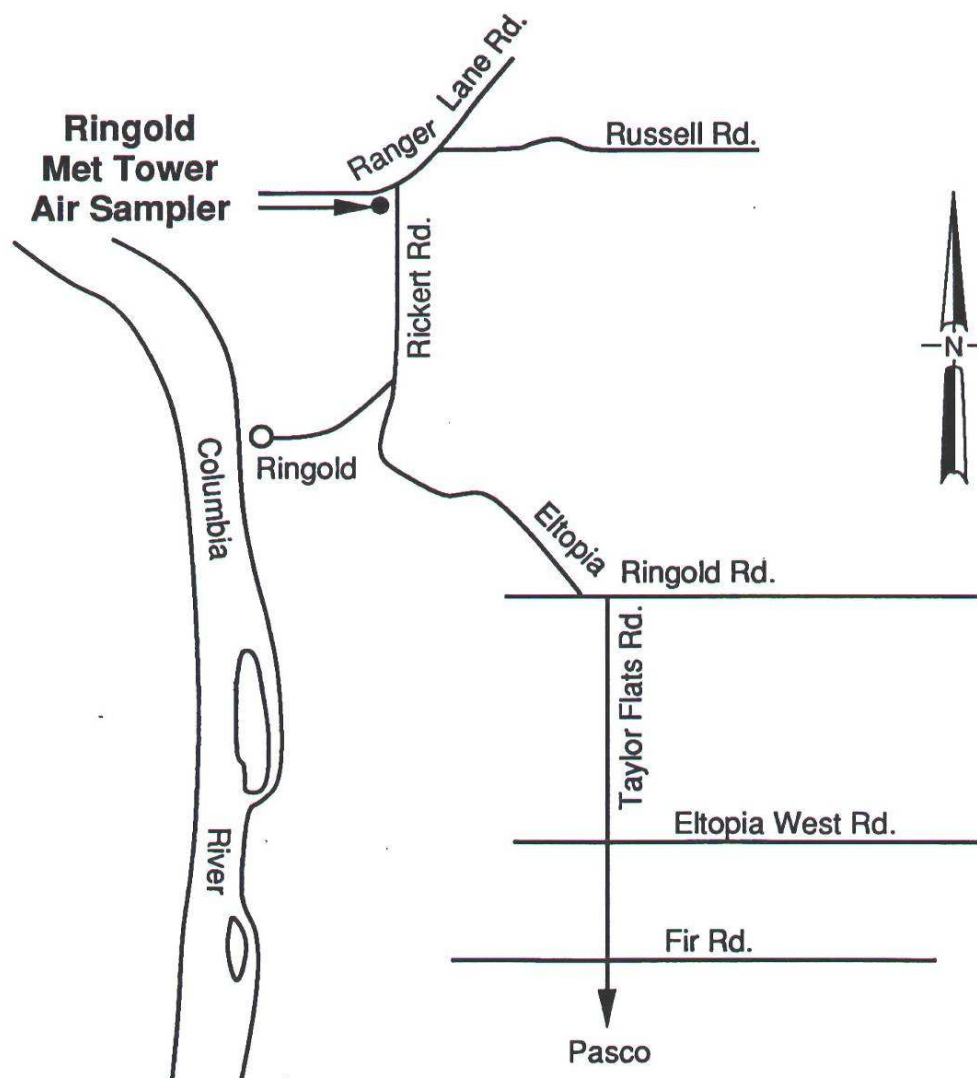


Figure 1.44. Air Sampling Location at Ringold Met Tower



Figure 1.45. Ringold Met Tower Air Sampler

W END OF FIR ROAD

1. Travel I-82 from Richland across the Columbia River bridge and turn off at Road 68 exit.
2. Follow Road 68 northward to Taylor Flats Road.
3. Continue on Taylor Flats Road to Fir Road and turn left (west).
4. Follow Fir Road to the end of the pavement.
5. Turn left onto the gravel road and head down hill toward the river.
6. 0.7 miles from the end of the pavement, turn left onto a dead-end dirt road. The air sample is located near an Energy Northwest air sampler.



Figure 1.46. Air Sampling Location at W End of Fir Road



Figure 1.47. Air Sampling Location at W End of Fir Road

DOGWOOD MET. TOWER

1. Travel north on Taylor Flats Road to Dogwood Road.
2. Turn left (west) onto Dogwood Rd. and travel 1.6 miles to the corner of Dogwood Rd. and Cottonwood Dr.
3. Turn right (north) onto Cottonwood Dr. (dirt road). Take the first left (20 yards from the end of pavement) and travel 0.4 miles (west) along a small irrigation canal.
4. The air sampler is located on the right at the Dogwood Met. Tower.

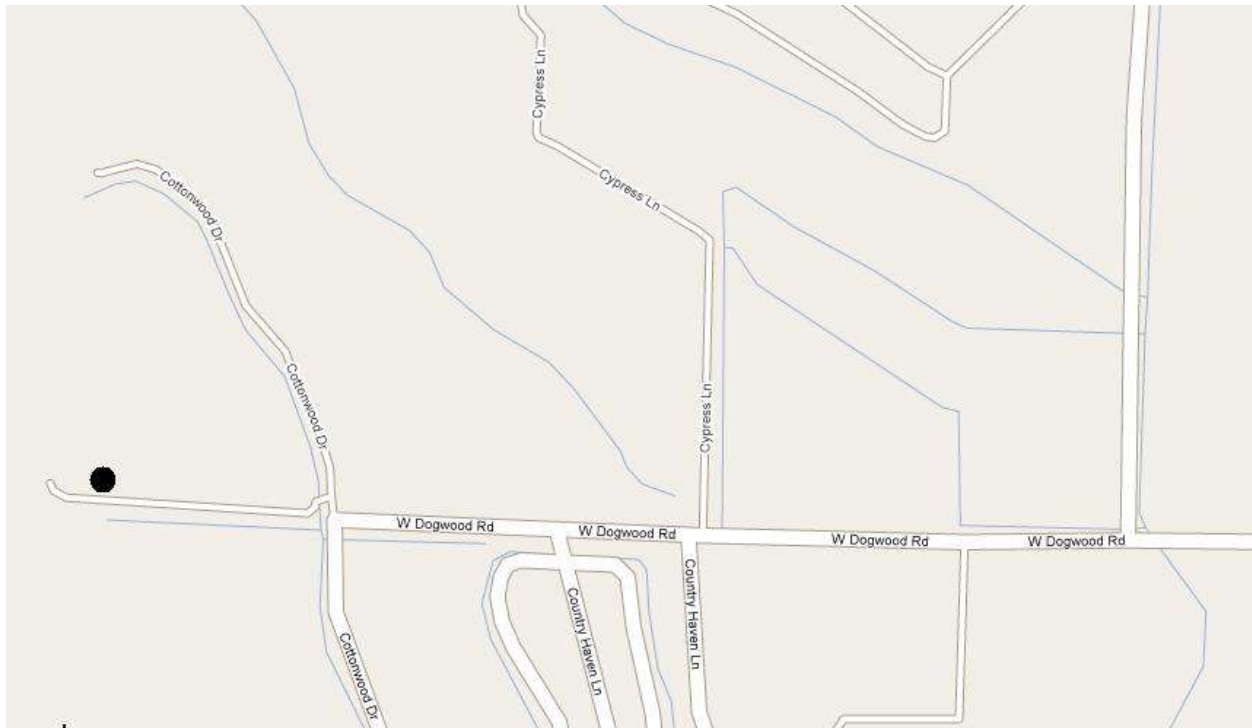


Figure 1.48. Air Sampling Location at the Dogwood Met. Tower



Figure 1.49. Dogwood Met Tower Air Sampler

BYERS LANDING

1. Traveling north on Road 68, take the left fork (Road 68) at Taylor Flats intersection.
2. From the intersection, continue on towards the river for approximately 5 miles to the irrigation return spillway.
3. Turn right (east) and go up the gravel road on the north side of the spillway.
4. Look for a fork in the road approximately one-half mile up the hill and beyond the white bridge across the spillway.
5. The air sampler is located on the left (north) side of the road near the cement block building at the fork in the road.

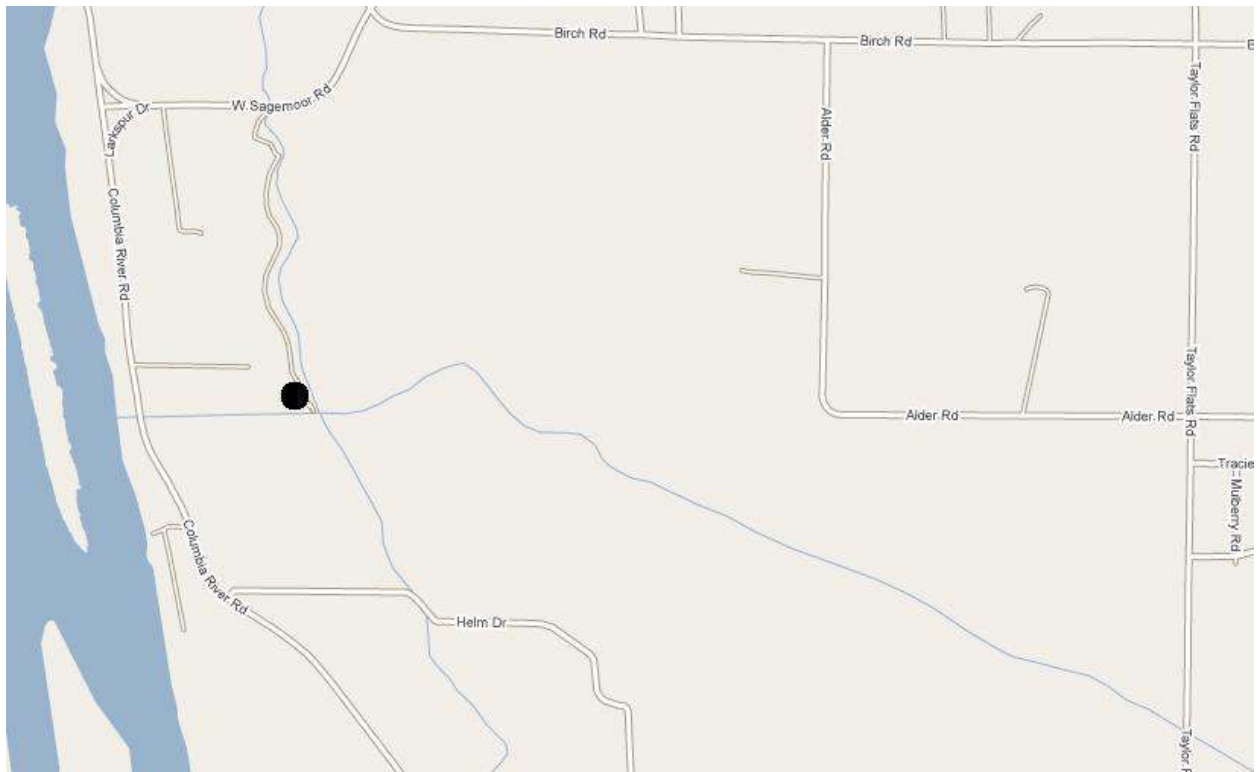


Figure 1.50. Air Sampling Location at Byers Landing



Figure 1.51. Byers Landing Air Sampler

BATTELLE COMPLEX

1. From Stevens Dr., turn east onto Battelle Blvd.
2. Turn South onto Einstein Avenue. Turn west on the road just north of the tennis courts and softball field. Just west of the tennis courts and softball field is black top.
3. The sampler is located due south of the black top, out from right field of the softball diamond.

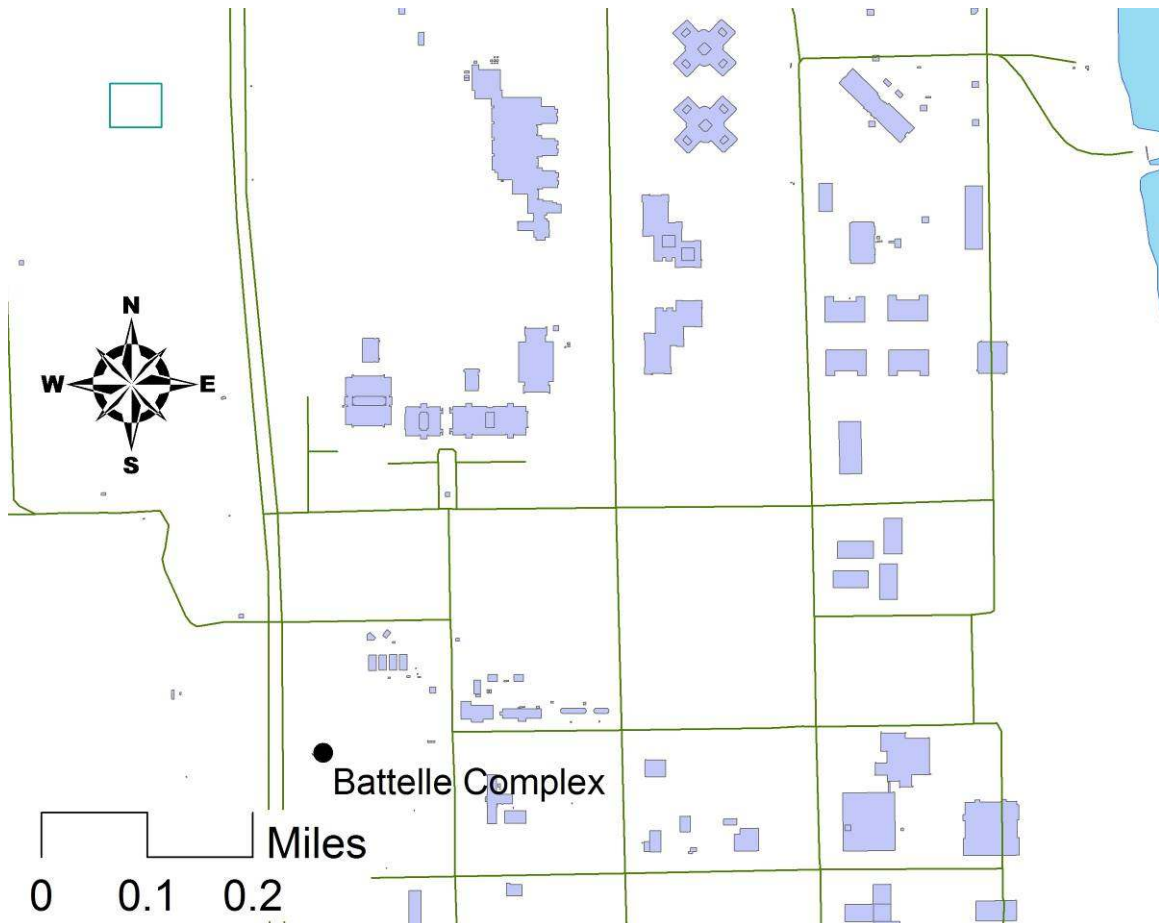


Figure 1.52. Air Sampling Location at Battelle Complex



Figure 1.53. Battelle Complex Air Sampler

HORN RAPIDS SUBSTATION

1. The Horn Rapids Substation air sampler is located near the power substation on Horn Rapids Road. The name of the substation is "White Bluffs Substation," but the location name is "Horn Rapids Substation."
2. Travel 4.2 miles west of the Stevens Drive and Horn Rapids Road intersection.
3. The substation is on the north side of Horn Rapids Road.
4. The sampling hutch is next to the substation fence at southeast corner.

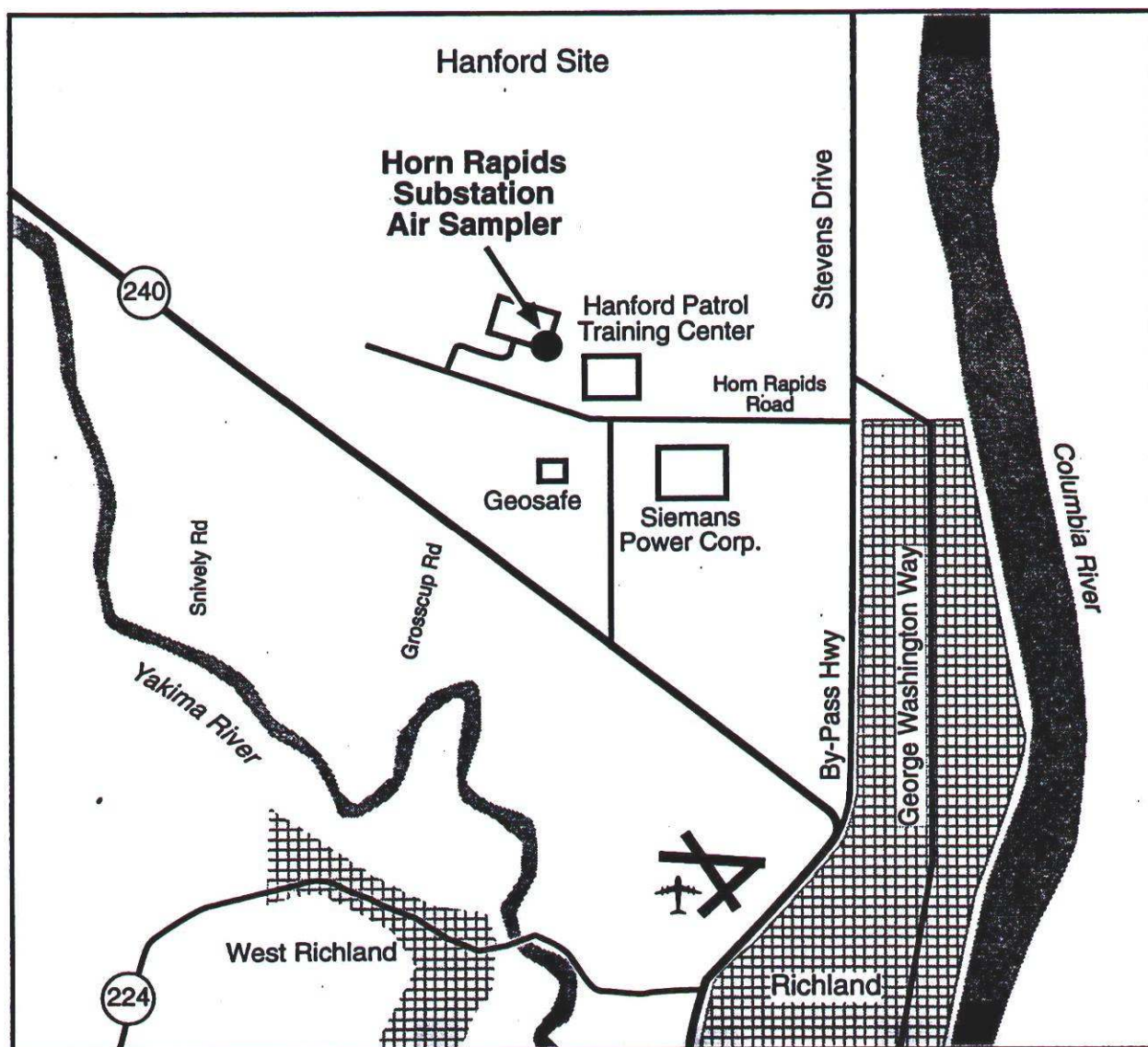


Figure 1.54. Air Sampling Location at the Horn Rapids Substation



Figure 1.55. Horn Rapids Substation Air Sampler

PROSSER BARRICADE

1. The Prosser Barricade is located on Rt. 10 between the Wye Barricade and Highway 240.
2. It is 6.2 miles from the stop sign at the intersection of Rt. 4S and Rt. 10 and 0.9 mile from the intersection of Rt. 10 and Highway 240.
3. The area is indicated by a large white government sign on the east side of Rt. 10, reading "Restricted Government Area," etc.
4. The air sampler is just north of the government sign at the base of a power pole.

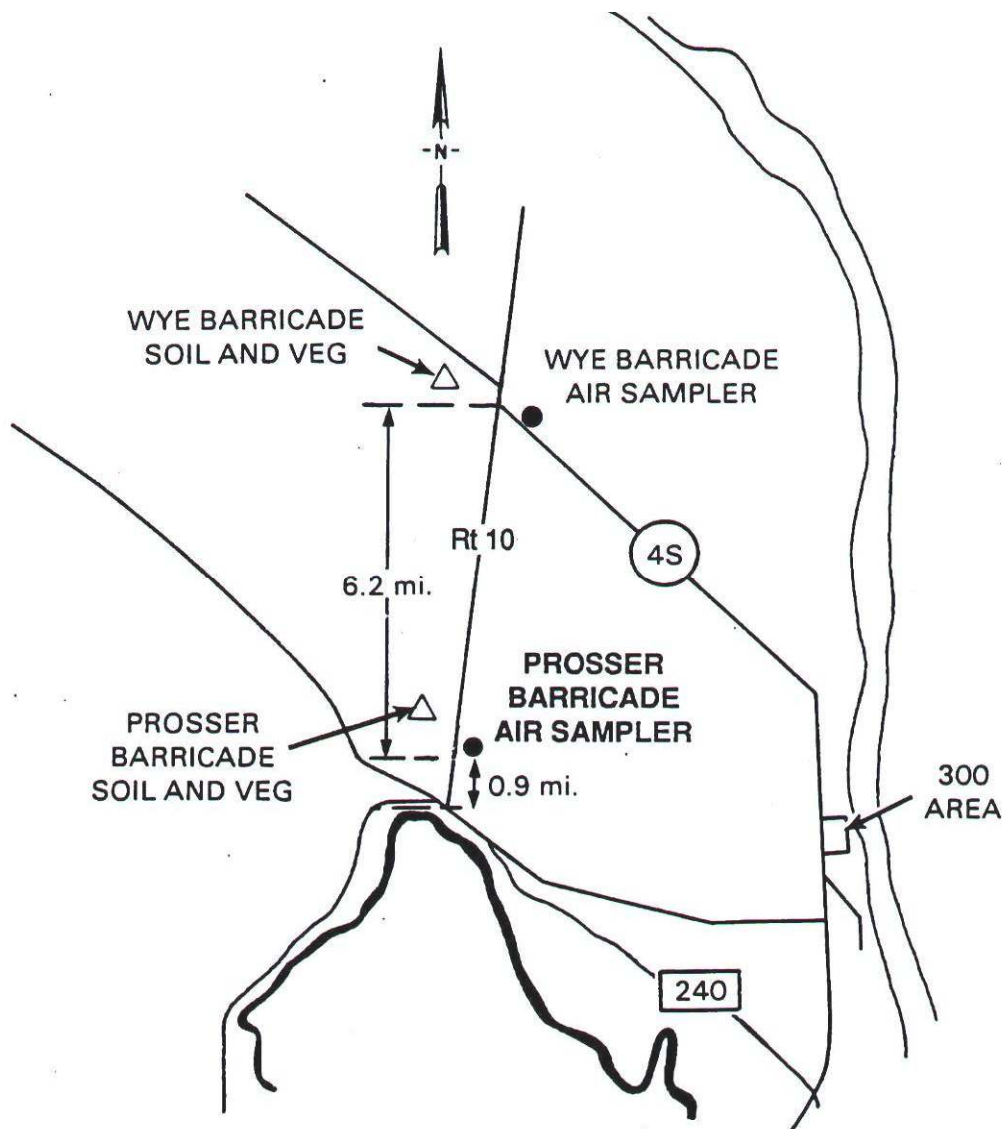


Figure 1.56. Air Sampling Location at the Prosser Barricade



Figure 1.57. Prosser Barricade Air Sampler

YAKIMA BARRICADE

1. The Yakima Barricade air sampler is located approximately 50 ft north of the Yakima Barricade.
2. The air sampler is in an open sagebrush area next to the meteorology tower and can be easily seen from Rt. 11A.
3. From highway 240, enter through the gate, and turn north to access the air sampler.

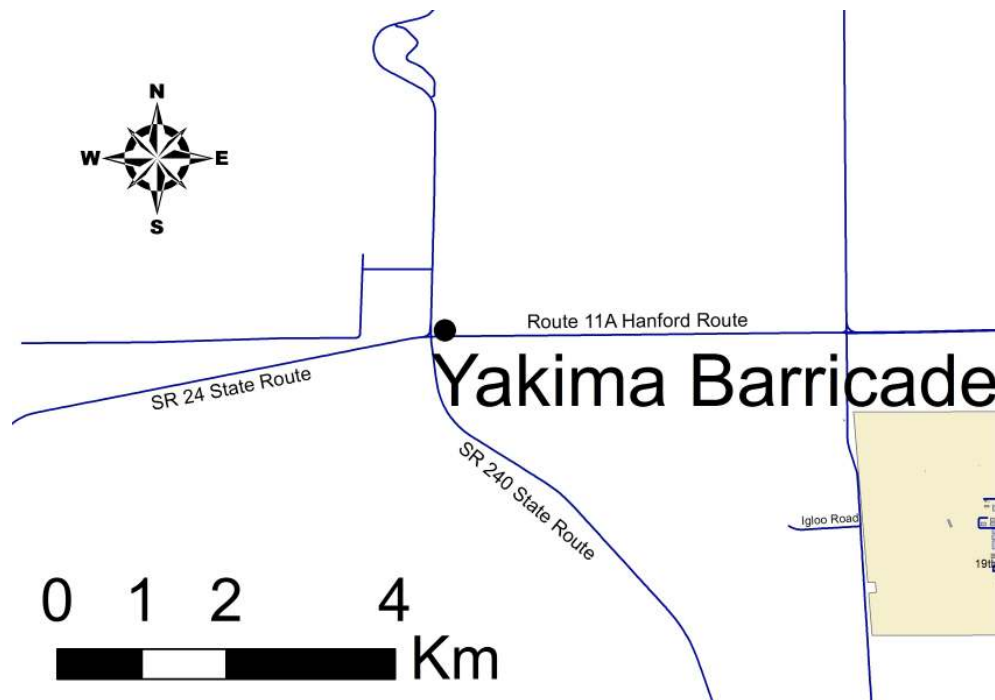


Figure 1.58. Air Sampling Location at Yakima Barricade



Figure 1.59. Yakima Barricade Air Sampler

RATTLESNAKE SPRINGS

1. Take Highway 240 from Richland heading northwest to gate number 118 on the southwest side of the road.
2. Enter gate 118 and follow a dirt and gravel road along the power line approximately 0.6 miles. The gate is kept locked by USFWS. Access instructions can be obtained from collection staff supervisor.
3. Turn left (south) on a dirt trail and go 0.1 mile along a power line spur. The air sampler is located by the second power pole.

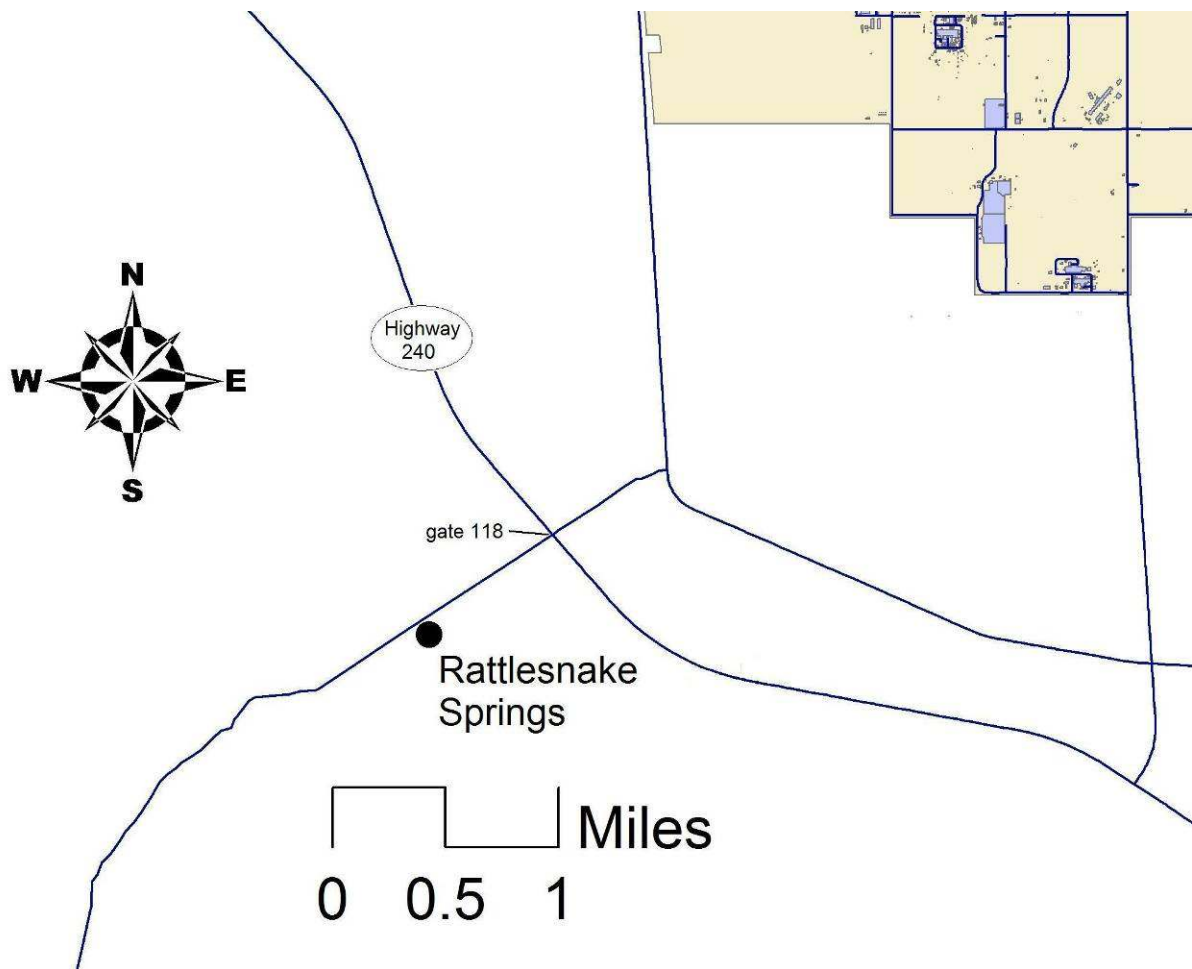


Figure 1.60. Air Sampling Location at Rattlesnake Springs



Figure 1.61. Rattlesnake Springs Air Sampler

WAHLUKE SLOPE

1. Cross the Vernita bridge traveling north on Highway 24 toward Othello.
2. Go uphill and continue on, passing under a power line.
3. Turn left on a paved road, G-SW that intersects with the road to Mattawa. To the left are two frame houses, a metal garage building with two doors and several trailer houses.
4. Turn right at the stop sign. The air sampling hutch is out in the sagebrush approximately 50 ft to the right (south) of the highway.

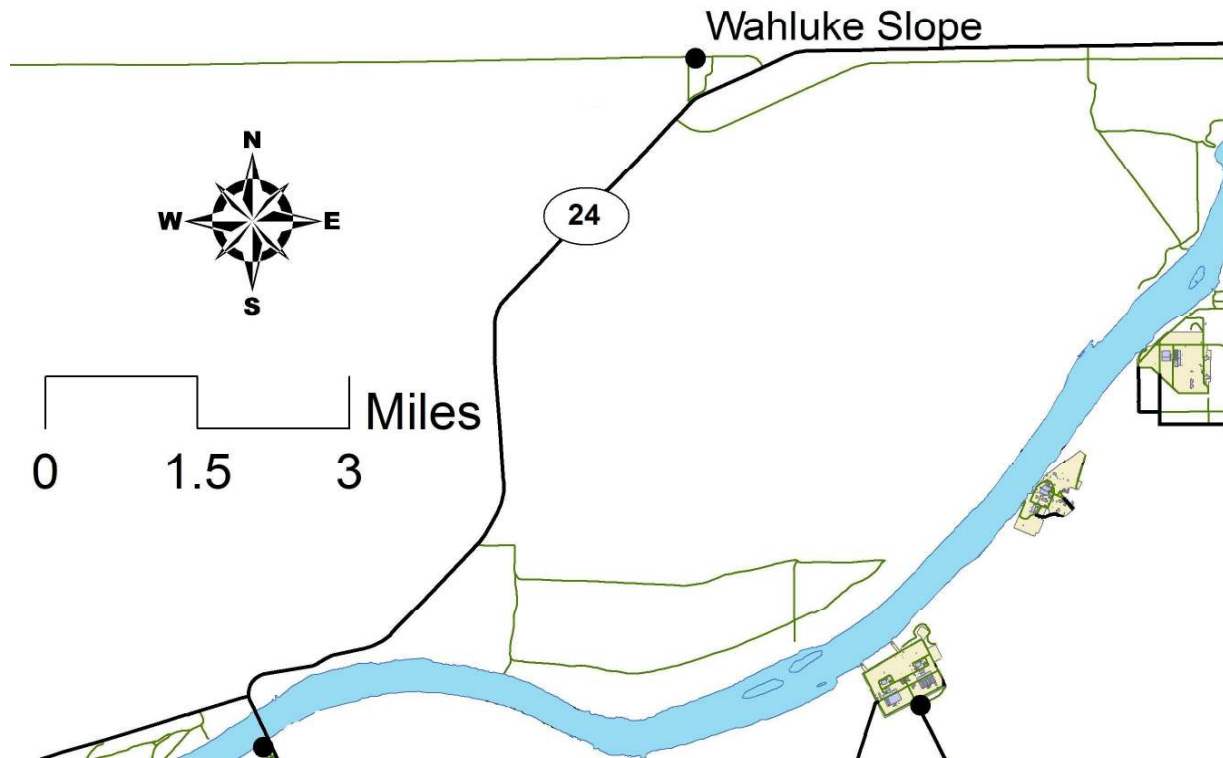


Figure 1.62. Air Sampling Location at Wahluke Slope



Figure 1.63. Wahluke Slope Air Sampler

**S END VERNITA
BRIDGE**

The Vernita Bridge air sampler is located at the northwest corner of the Vernita Bridge rest area. The Vernita Bridge rest area is near the south end of the Vernita Bridge on Highway 240/24 going north from the Tri-Cities towards Mattawa and Vantage.

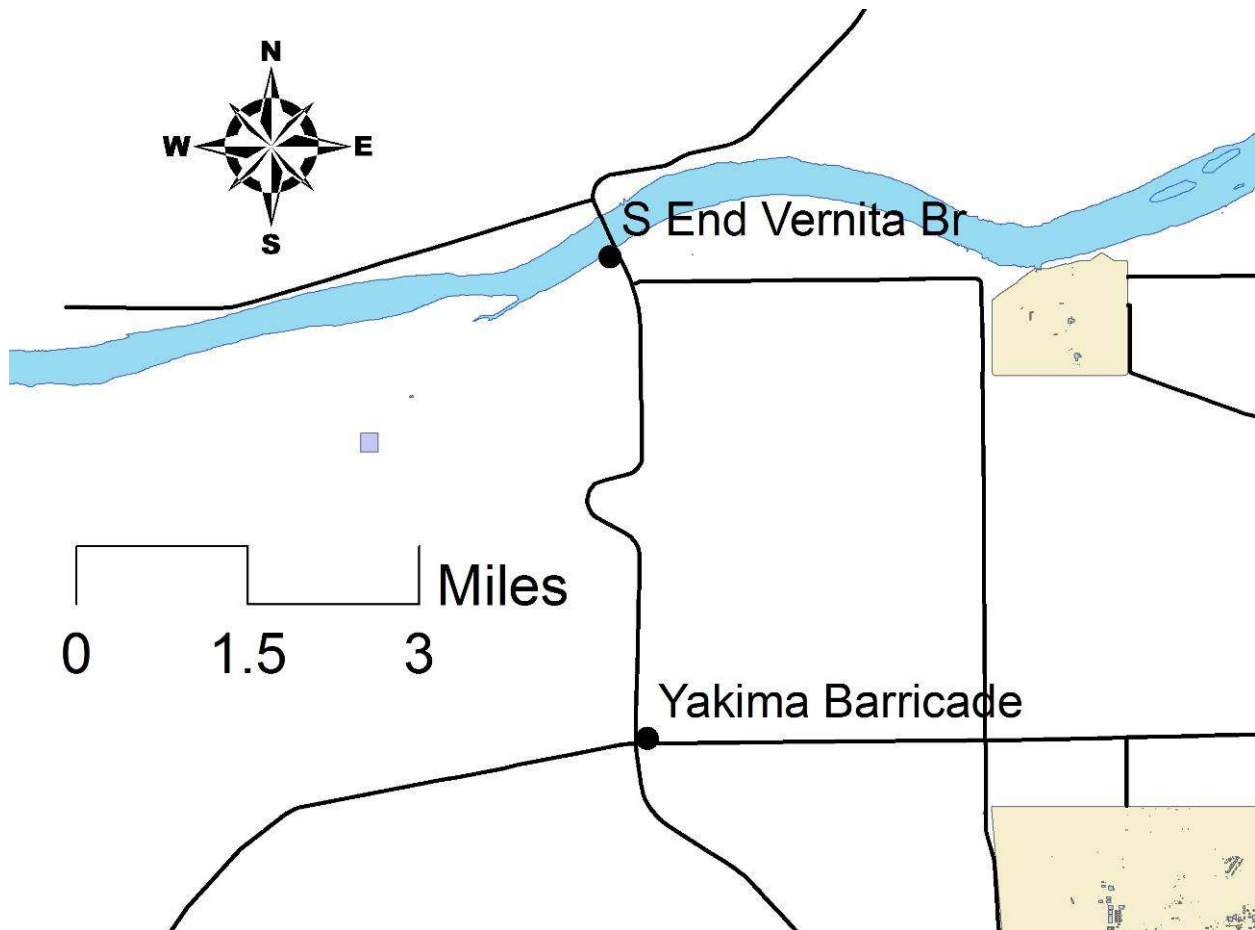


Figure 1.64. Air Sampling Location at S End Vernita Bridge



Figure 1.65. S End Vernita Bridge Air Sampler

**BASIN CITY
ELEMENTARY
SCHOOL**

1. From Richland, travel to Basin City.
2. From main street (Road 170) in Basin City, turn right (north) onto Bailie Blvd. and then left into the school parking lot.
3. The air sampler is located in a fenced area near the edge of the parking lot and the front lawn of the school.



Figure 1.66. Air Sampling Location at Basin City Elementary School



Figure 1.67. Basin City Elementary School Air Sampler

**LESLIE GROVES
PARK (COESS)**

1. In north Richland turn east off George Washington Way onto Snyder.
2. Continue east on Snyder to the Leslie Groves Park boat launch at the end of Snyder Street.
3. The air sampler is located in the fenced area between the public restroom building and Snyder Rd, due west from the boat launch.



Figure 1.68. Air Sampling Location at Leslie Groves Park



Figure 1.69. Leslie Groves Air Sampling Station

PASCO

1. Turn off I-182 at the Columbia Basin College (CBC)/Airport/20th Ave. exit and turn north (left) on 20th Avenue.
2. Travel north to the CBC Campus and take a left on Service Rd.
3. Drive around the Vocational Bldg. to the northwest side. The air sampler is located just north of two small maintenance buildings (directly south of the Technical Building).

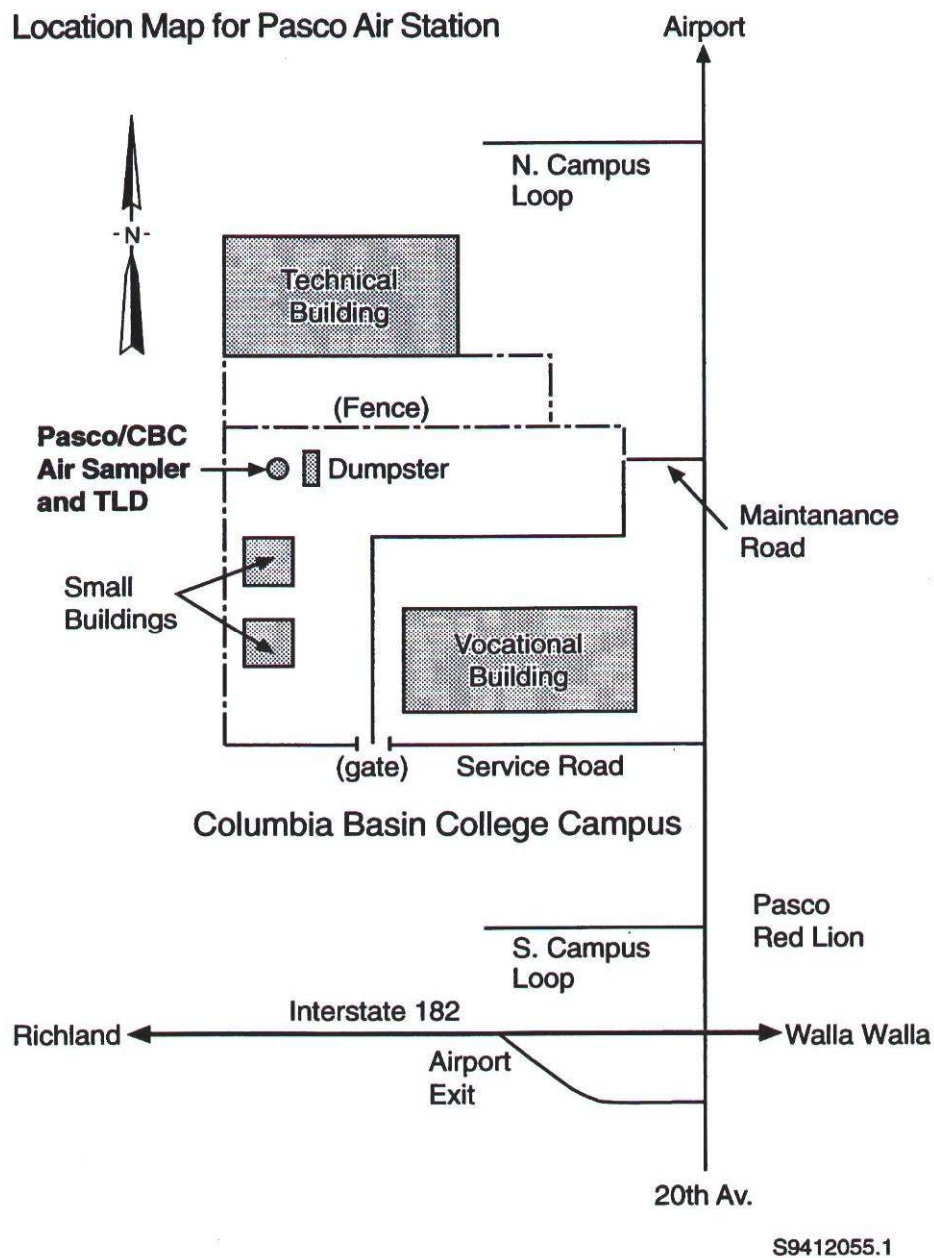


Figure 1.70. Air Sampling Location at Pasco



Figure 1.71. Pasco Air Sampling Station

KENNEWICK

1. From Richland, take Highway 240 east to Kennewick.
2. Take the Umatilla Exit, south, (Highway 395) and continue on Highway 395 to 10th Ave.
3. Go left on 10th Ave. and right onto Ely St. just past the P.U.D. facilities located on the right side of the road. Travel 0.4 miles south on Ely St.
4. The air sampler is located behind the fence on Ely St. on property belonging to the county road dept. Their property borders the P.U.D. property on the left side of Ely St.
5. Turn left through the gate in front of the road dept. building and go left along the fence to the wooden power pole. The air sampler is next to the power pole and can be easily seen from Ely St.

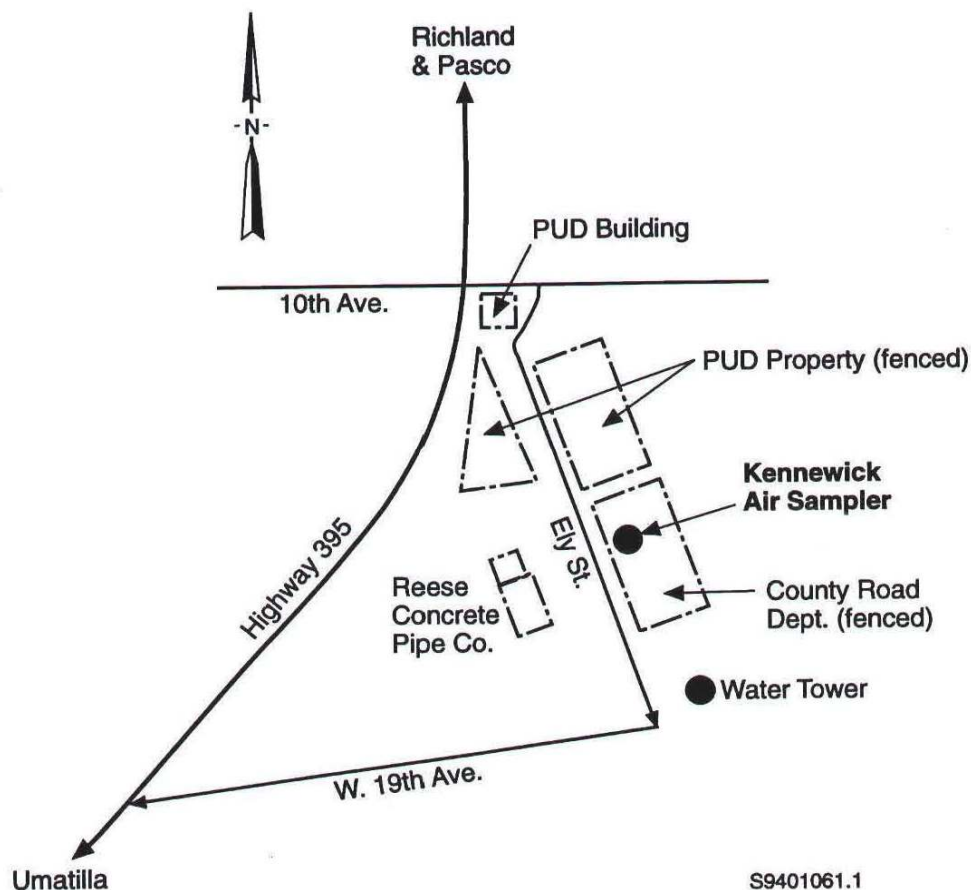


Figure 1.72. Air Sampling Location at Kennewick



Figure 1.73. Kennewick Air Sampler

BENTON CITY

1. From Highway 240, turn south onto Horn Road (South 225) traveling toward Benton City.
2. Go 9 miles to the road just north of Benton City High School. This is the road just south of the Red Apple grocery store. This road has no street sign or name.
3. Travel west in front of the school to the road just west of the school, Highlands. Turn left (south) and proceed to the south fence line of the school.
4. Turn left on the access road south of the school.
5. The air sampler is located inside a fenced pond area.

NOT AVAILABLE AT THIS TIME

Figure 1.74. Air Sampling Location at Benton City



Figure 1.75. Benton City Air Sampler

MATTAWA

1. Traveling north on Highway 243, 5.5 miles past the road to Priest Rapids Dam, turn to the right (east) on the road to Mattawa.
2. Drive to Mattawa, turn right on Broadway and go two blocks to the water tower, which will be on the left-hand (east) side of the street.
3. There is a cyclone fence enclosing the water tower and two cement block buildings.
4. The air sampler is located at the south end of the block building closest to the water tower.



Figure 1.76. Air Sampling Location at Mattawa



Figure 1.77. Mattawa Air Sampler

OTHELLO

1. Turn left (west) off Highway 17 onto the main street, (Cunningham), in Othello, passing the International Dunes Motel.
2. Turn right (north) off the main street onto 8th Ave.
3. Approximately $\frac{1}{2}$ block on the right look for a gate opening into a fenced gravel parking area on East Columbia Basin Irrigation District property.
4. The air sampler is located inside the fence near a power pole, just north of the gate.

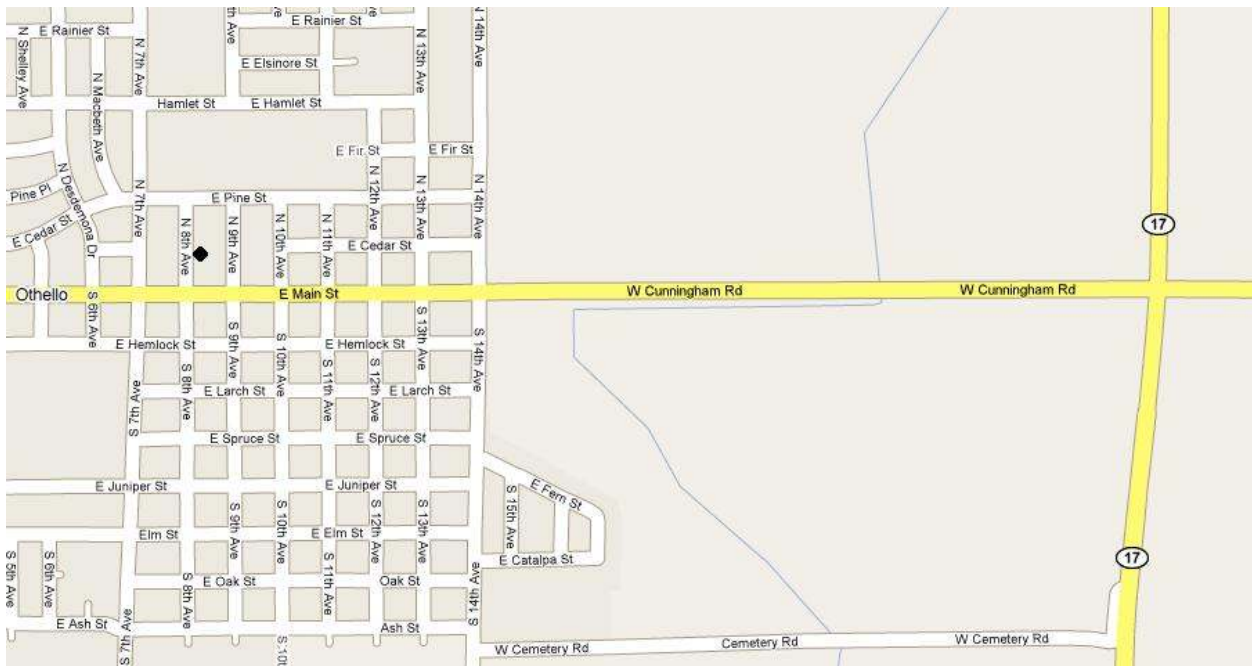


Figure 1.78. Air Sampling Location at Othello



Figure 1.79. Othello Air Sampler

YAKIMA

1. Travel north on Interstate-82 to Yakima and take Exit 36 (the Union Gap exit) to Valley Mall Blvd. and turn left.
2. Turn right (north) off Valley Mall Blvd. onto Main (which becomes 1st). Look for signs to airport.
3. Turn left (west) off 1st onto Washington.
4. Continue on Washington to the intersection of Washington and 24th Avenue. There is a traffic light at this intersection and the airport is on your left.
5. Turn left at 24th into the airport parking area and take an immediate right. Follow the road around the fence line (which is on your right) to the air monitoring hutches located inside a fenced yard.



Figure 1.80. Air Sampling Location at Yakima



Figure 1.81. Yakima Air Sampler

2.0 Water and Sediment Sampling Locations

2.1 Introduction

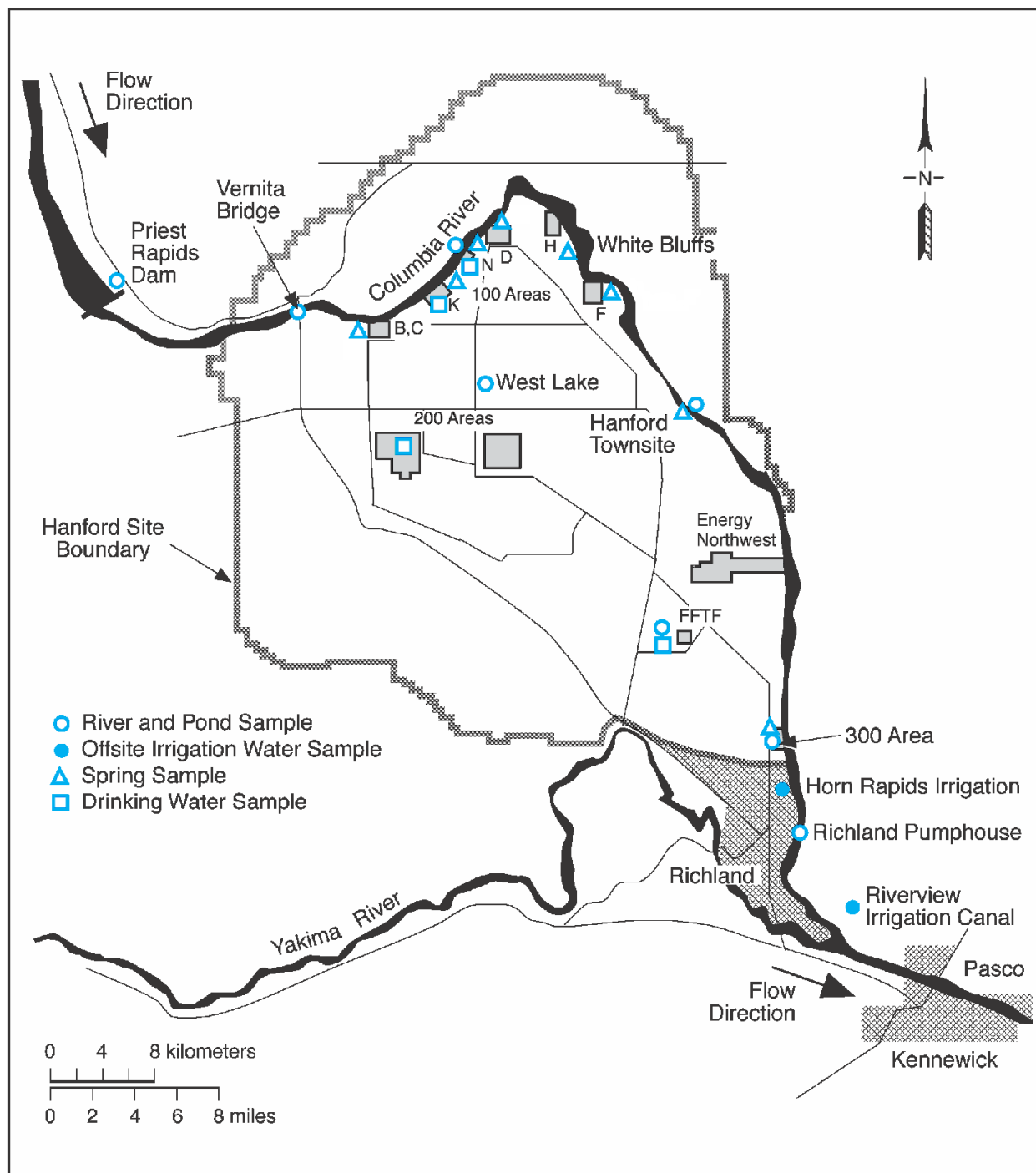
The collection and analysis of water and sediment samples for radiological and nonradiological constituents is an integral part of the Surface Environmental Surveillance Project (SESP). These samples provide a means of assessing the impact of Hanford operations, determining the compliance status with applicable standards, evaluating the effectiveness of effluent control and monitoring systems, and evaluating the potential dose to the public from waterborne radionuclides.

Water samples are routinely collected from the Columbia River, local irrigation systems, riverbank springs, onsite ponds, and onsite drinking water systems. Grab samples are typically used when the water characteristics are relatively stable; the stream does not flow continuously; information on minimum, maximum, and variability (time or spatial) is desired; or the parameters to be analyzed are likely to change during storage time. Composite samples are used to determine average concentrations and provide assurance that pollutants did not flow by the sample location between sample dates. Continuous samples are also used in determining average concentrations and allow for the very large volumes of water needed to detect some contaminants that are present at very low concentrations. Grab samples are generally collected manually while the composite and continuous samples are collected using automatic sampling systems.

Sediment samples are collected from locations along the Columbia River between Priest Rapids and McNary Dams. Samples are collected either from the shoreline or from a boat, using a small clamshell dredge. All samples are taken from the top 15 cm of sediments. Previous sampling has shown that slightly elevated levels of some Hanford-produced radionuclides exist in surface sediments behind McNary Dam and in shoreline slough areas located near the operating areas. Both water and sediment sampling locations are depicted in Figure 2.1.

Where possible, riverbank spring locations are identified using a Hanford River Marker (HRM) designation such as (037-1). The 037 portion indicates the spring is located at Hanford river marker 3.7. The “dash one” indicates it is the 1st spring downriver from marker 3.7, for a location with multiple springs there could be “dash two” or “dash three” for the same Hanford River Marker number.

A general knowledge of roads and highways on and around the Hanford Site is necessary to successfully use this manual. Supplemental information (Maps, Gazetteer, etc.) may be necessary if user is unfamiliar with local routes.



G01120042.2

Figure 2.1. Water and Sediment Sampling Locations

Table 2.1. Geographic Positioning System (GPS) Data for SESP Water Sampling Locations

Sample Type	Sample Location	Longitude	Latitude
Water Monitoring Stations	Priest Rapids Dam	46.646011	119.906451
	Richland Pumphouse	46.314714	119.259629
Columbia River Transects ^(a)	Vernita Bridge 1	46.642663	119.728230
	Vernita Bridge 2	46.643349	119.728625
	Vernita Bridge 3	46.643909	119.728826
	Vernita Bridge 4	46.644550	119.729274
	100 N 1	46.684045	119.562474
	100 N 2	46.684375	119.563227
	100 N 3	46.684620	119.563432
	100 N 4	46.684821	119.563847
	100 N 5	46.684986	119.564223
	100 N 6	46.685069	119.564496
	100 N 7	46.685633	119.565179
	100 N 9	46.685848	119.566156
	100 N 10	46.686022	119.566624
	100 N Shore HRM 8.4	46.670708	119.577056
	100 N Shore HRM 8.9	46.678623	119.567905
	100 N Shore HRM 9.2	46.681247	119.565174
	100 N Shore HRM 9.8	46.688332	119.557625
	100 F Shore HRM 18	46.669706	119.455555
	100 F Shore HRM 22	-	-
	100 F Shore HRM 23	46.617308	119.409706
	Hanford Townsite 1	46.560792	119.325593
	Hanford Townsite 2	46.560825	119.325318
	Hanford Townsite 3	46.560830	119.324953
	Hanford Townsite 4	46.560864	119.324756
	Hanford Townsite 5	46.561259	119.324657
	Hanford Townsite 6	46.561037	119.324074
	Hanford Townsite 7	46.561507	119.324273
	Hanford Townsite 8	46.562114	119.323790
	Hanford Townsite 9	46.562419	119.323666
	Hanford Townsite 10	46.562516	119.323482
	Hanford Townsite 26	46.580744	119.368242
	Hanford Townsite 27	46.572619	119.352914
	Hanford Townsite 28	46.566075	119.371317
	Hanford Townsite 30	46.545814	119.312242

Table 2.1. (contd)

Sample Type	Sample Location	Longitude	Latitude
	300 Area 1	46.360309	119.267327
	300 Area 2	46.360321	119.266781
	300 Area 3	46.360312	119.265897
	300 Area 4	46.360320	119.265039
	300 Area 5	46.360305	119.264429
	300 Area 6	46.360325	119.261361
	300 Area 7	46.360320	119.260815
	300 Area 8	46.360307	119.260504
	300 Area 9	46.360318	119.259867
	300 Area 10	46.360312	119.259321
	300 Area Shore HRM 41.5	46.384153	119.273828
	300 Area Shore HRM 42.1	46.376658	119.272847
	300 Area Shore HRM 42.5	46.371003	119.271219
	300 Area Shore HRM 42.9	46.363483	119.268803
	Richland Pumphouse 1	46.314956	119.258753
	Richland Pumphouse 2	46.314962	119.257649
	Richland Pumphouse 3	46.314936	119.256897
	Richland Pumphouse 4	46.314976	119.255649
	Richland Pumphouse 5	46.315071	119.255309
	Richland Pumphouse 6	46.315234	119.252059
	Richland Pumphouse 7	46.315101	119.251465
	Richland Pumphouse 8	46.315172	119.250528
	Richland Pumphouse 9	46.315358	119.249420
	Richland Pumphouse 10	46.315748	119.248866
	Richland Pumphouse HRM 43.5	46.355816	119.266988
	Richland Pumphouse HRM 43.9	46.349758	119.266187
	Richland Pumphouse HRM 45	46.335316	119.262260
	Richland Pumphouse HRM 45.8	46.323539	119.259970
Irrigation Water	Riverview Canal	46.258340	119.180452
	Horn Rapids Area	46.341205	119.283990
Riverbank Spring Water	100 B 037-1	46.637428	119.655922
	100 B 038-1	46.634746	119.655440
	100 B 039-2	46.6381	119.6516
	100 K (6-3)	46.651383	119.606023
	100 K (7-7)	46.661280	119.591192
	100 N (8-13)	46.683240	119.563011

Table 2.1. (contd)

Sample Type	Sample Location	Longitude	Latitude
	100 D (102-1)	46.6940	119.5500
	100 D (110-1)	46.701148	119.537462
	100 H (145-1)	46.7114	119.4895
	100 H (15-2)	46.7036	119.4774
	100 H (15-3)	46.702417	119.476500
	100 F (20-7)	46.636123	119.419123
	100 F (21-1)	46.6362	119.4190
	Hanford Townsite (HR 28.2)	46.5673	119.3415
	Hanford Townsite (28.2)	46.565433	119.336558
	Hanford Townsite (DR-28.2)	46.564032	119.333328
	300 Area (41-9)	46.38004	119.27355
	300 Area (42-2)	46.376674	119.272950
	300 Area (DR-42-2)	46.372221	119.271806
	300 Area (42-7)	46.36713	119.27001
	Richland Spring (43-7)	46.35165	119.26643
Onsite Pond Water	FFTF (Fenced Marsh)	46.44336	119.35725
	FFTF (Well Bldg)	46.440234	119.362212
	West Lake	46.601732	119.545227
Onsite Drinking Water	100 K Drinking water	46.64638	119.59364
	FFTF	46.43552	119.36080
	200W Drinking water	46.55449	119.61823
	100 N Drinking water	46.67339	119.56931
Columbia River Sediment	McNary Oregon Shore	45.933192	119.259510
	McNary 1/3 Oregon Shore	45.935353	119.258856
	McNary Washington Shore	45.946294	119.258738
	McNary OR side near Dam	45.9340	119.2880
	McNary WA side near Dam	45.9410	119.2840
	Priest Rapids Yakima Shore	46.659995	119.941239
	Priest Rapids 1/3 Grant Shore	46.661149	119.934380
	Priest Rapids Grant Shore	46.667486	119.922408
	Priest Rapids 2/3 Grant Shore	46.669561	119.916387
	PRD Grant side near Dam	46.6550	119.9040
	PRD Yakima side near Dam	46.6490	119.9170
	White Bluffs Slough	46.678119	119.461595
	100 F Slough	46.635254	119.417651
	Hanford Slough	46.590607	119.382753
	Richland Pumphouse	46.313850	119.260428

(a) Columbia River transect stations are numbered such that station 1 is closest to the Hanford shoreline. All other stations are positioned equidistant away from the shore.

Table 2.2. Geographic Positioning System (GPS) Data for Hanford River Marker (HRM) Locations

Hanford River Mile Markers				
US State Plane NAD 1983, Washington South, m, HAE				
Mile #	Latitude	Longitude	Elevation	Comment
0	Need GPS Coordinates			Vernita Bridge (no signpost)
1	46.645087	119.713343	104	
2	46.645924	119.693915	95	In grove of vegetation, hard to see
3	46.641437	119.673231	95	
4	46.637478	119.649766	109	
5	46.642064	119.626776	110.3	Near old irrigation building between 100-B and 100-K
6	46.648413	119.612000	99.6	Upriver from 100-K Launch
7	46.657210	119.595700	100.7	Downriver from 100-K
8	46.666375	119.581509	102.3	Upriver from 100-N
9	46.679254	119.566037	117.3	Top of bluff 100-N Springs
10	46.691092	119.552940	120.8	Top of bluff between 100-N and 100-D
11	46.700532	119.537749	109	Top of bluff at 100-D Spring
12	46.715033	119.528367	96.4	On floodplain
13	46.718371	119.514058	99.4	Near warning siren
14	46.714338	119.496537	118.1	Top of bluff between Locust Groves upriver from 100-H
15	46.707276	119.481083	100.1	Upriver of 100-H Reactor (moved from island in floodplain to top of bluff)
16	46.694251	119.466204	98.4	Peninsula above White Bluffs Slough
17	46.684672	119.454694	95.5	Peninsula above White Bluffs Slough moved from 150730 580017
18	46.669440	119.456257	94.9	On floodplain, near power line
19	46.659696	119.439191	96.7	Top of bluff, head of 100-F Slough
20	46.653181	119.418052	96	On island, 100-F Slough
21	46.638127	119.410629	93.6	On island #10, 100-F Slough
22	46.630199	119.416315	96.3	
23	46.617560	119.411063	95.8	
24	46.605991	119.399008	91.5	On floodplain
25	46.596024	119.384797	93.1	Top of bluff, upriver of wooden power line
26	46.580035	119.369215	95.2	Downriver from Hanford Townsite Launch
27	46.572055	119.353579	93.9	
28	46.565579	119.338590	93.2	Top of bluff, Lower Hanford Townsite (SESP spring location)
29	46.556607	119.324534	94.7	Top of bluff, end of Hanford Townsite Road
30	46.545337	119.312536	95.2	Top of bluff, across from Savage Island
31	46.532953	119.294871	91.1	Below the bluff

Table 2.2. (contd)

Mile #	Latitude	Longitude	Elevation	Comment
32	46.518447	119.276615	99.9	Top of bluff, 1st island above Ringold
33	46.503473	119.270427	100.4	Top of bluff, across from top of island at Ringold
34	46.493321	119.269481	95.4	Top of bluff, Ringold power line
35	46.479755	119.267722	87.4	On floodplain, between power lines
36	46.466481	119.265665	95	800 m downriver from WPPSS Pumphouse
37	46.451528	119.269534	102.5	Top of bluff, head of Wooded Island
38	46.438604	119.272316	93.6	Top of bluff, Lower End of Wooded Island
39	46.422850	119.271675	96.6	Top of bluff
40	46.406347	119.269113	88.5	Top of bluff
41	46.390222	119.273018	94.5	Top of bluff, 800 m upriver from 300-TEDF
42	46.378447	119.273589	89.9	North side of 300 Area on bluff
43	46.361472	119.268456	88.6	Between 300 Area and unimproved boat launch
44	46.348951	119.266306	89.7	Just upriver of Submarine Compartment Dock
45	46.335260	119.263545	90.9	Above WSU-TC, near bike path
46	46.321463	119.260307	88.1	Ferry Street, Richland

2.2 Columbia River Fixed-Location Water Monitoring Stations

PRIEST RAPIDS DAM

NEED ACCESS BADGE

1. Proceed north across the Vernita Bridge on Highway 24.
2. The road turns into Highway 243 north of the bridge, proceed west on 243 to the Priest Rapids Dam access road, approximately 8 miles. The access is marked with a "Priest Rapids Dam" sign on the left.
3. Turn left onto the access road and proceed to Priest Rapids Dam, Take the left fork to the access gate. Contact the control room, phone # 2717, via the phone at the access gate and let them know that you are coming in to collect the water sample at level # 2. Access through the gate using the automated access badge reader.
4. Proceed to the parking lot in front of the power house. Enter through the main entrance using the automated access badge reader and sign the visitor/ subcontractor log book, Name, company, location (level # 2) and time in.
5. Proceed down hall past several offices to the elevator at the end of the hall, enter elevator and go down to level 2 (you enter on level 5) after exiting turn right and passed several pumps. The sample station is mid-way across dam on your right.
6. After obtaining samples be sure to log out and contact the control room via the phone just outside the main entrance and let them know that you have collected your samples and that you are leaving the dam.

NOTE: You will need a hard hat for access into the dam. Access badges are obtained at the Grant county public utility district main office, east of Wanapum dam.

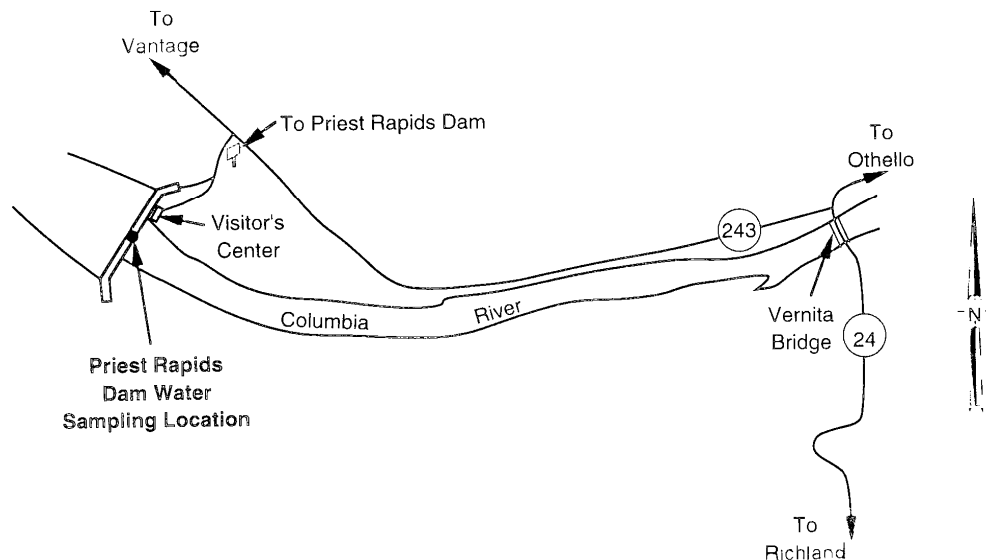


Figure 2.2. Water Sampling Location at Priest Rapids Dam

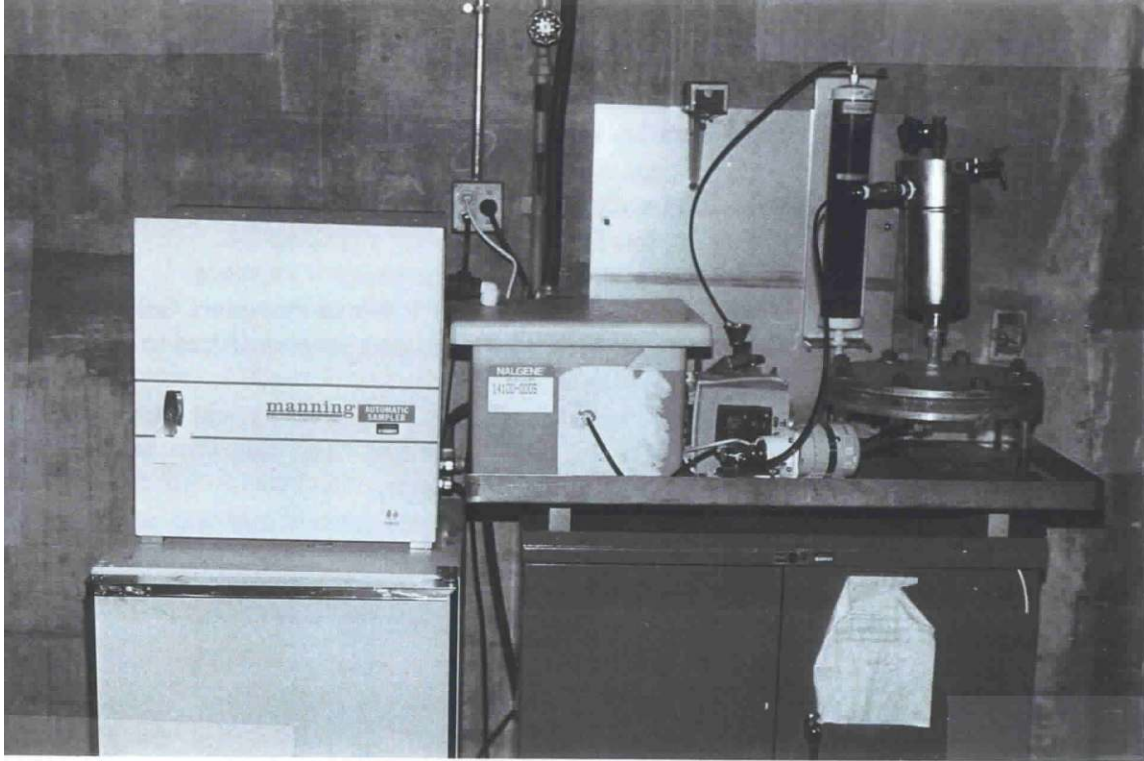


Figure 2.3. Priest Rapids Dam Water Sampling Location

RICHLAND PUMPHOUSE

NEED KEY TO GATE

1. Turn east off George Washington Way onto Snyder Road.
2. Proceed to Leslie Groves Park boat launch at the end of Snyder Road.
3. The pumphouse is located to the left of the launch ramp at the edge of the river. The gate at the front of the pier is kept locked.
4. The water sampling equipment is located in a small fiberglass shed on top of the intake structure.

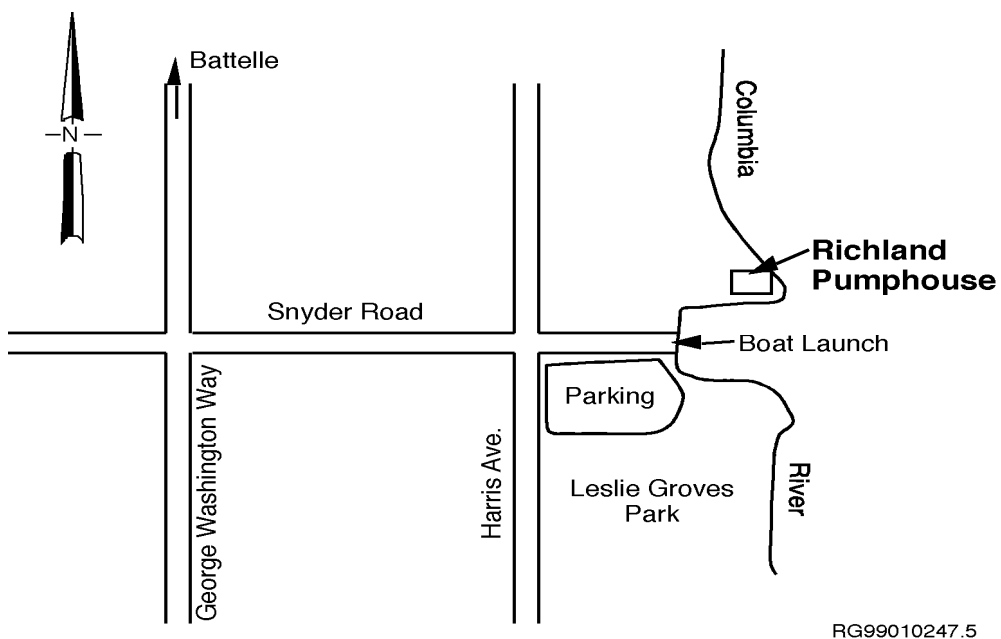


Figure 2.4. Water Sampling Location at Richland Pumphouse

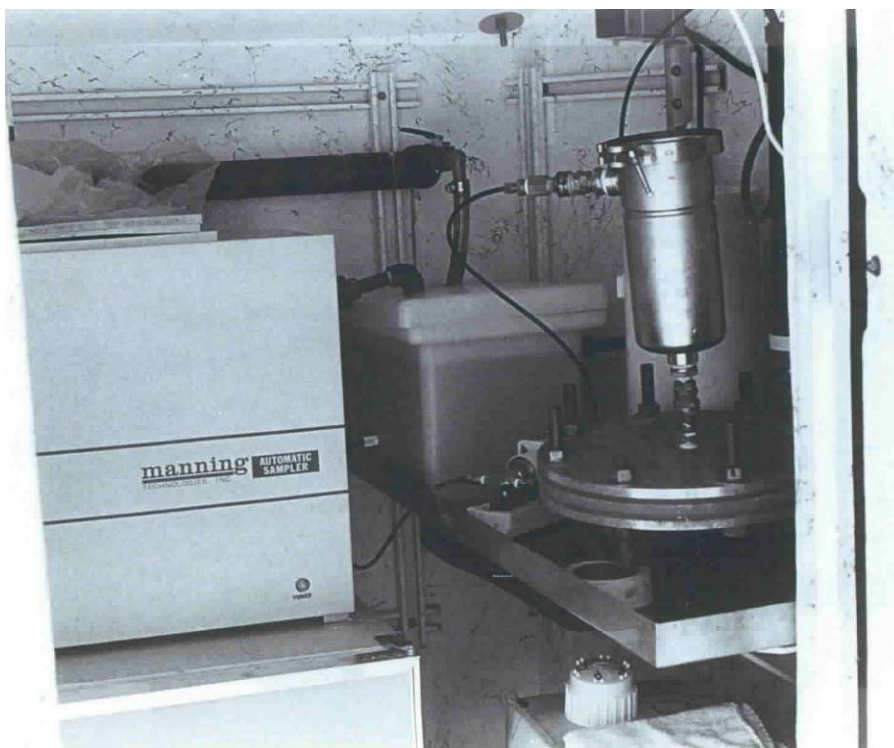
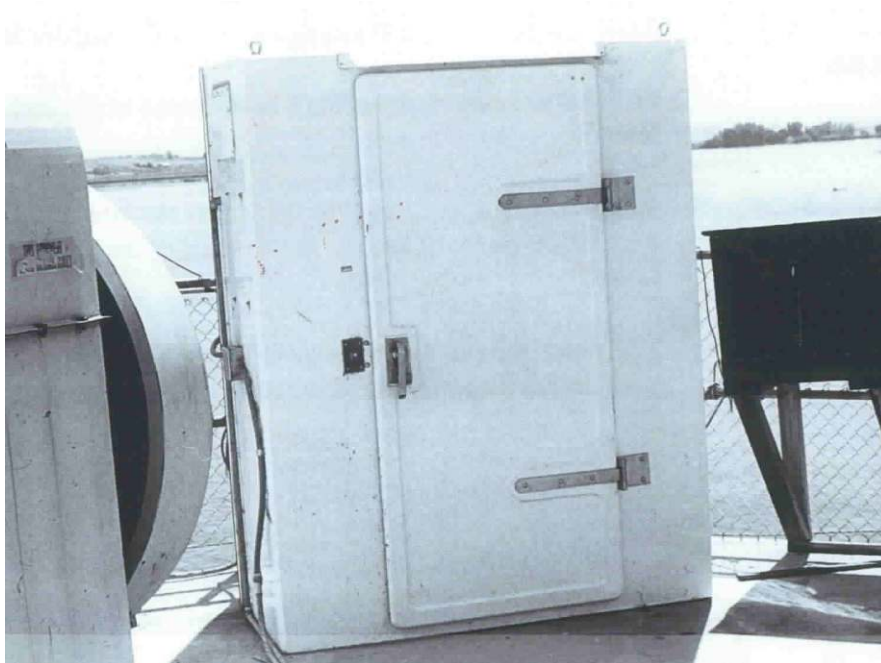


Figure 2.5. Richland (Pumphouse) Water Sampling Location

2.3 Columbia River Transects and Nearshore Locations

VERNITA

1. Proceed north across the Vernita Bridge on Highway 24.
2. The boat launch is located on the west side of the bridge.
3. The sampling site is located approximately 300 meters downstream of the Vernita Bridge. The transect lies along the line extending from the Old Vernita Ferry landing on the Hanford (south) side of the river to a small white sign on the road going up the hill on the Wahluke Slope (north) side of the river. This location is at Hanford river marker 0.3.

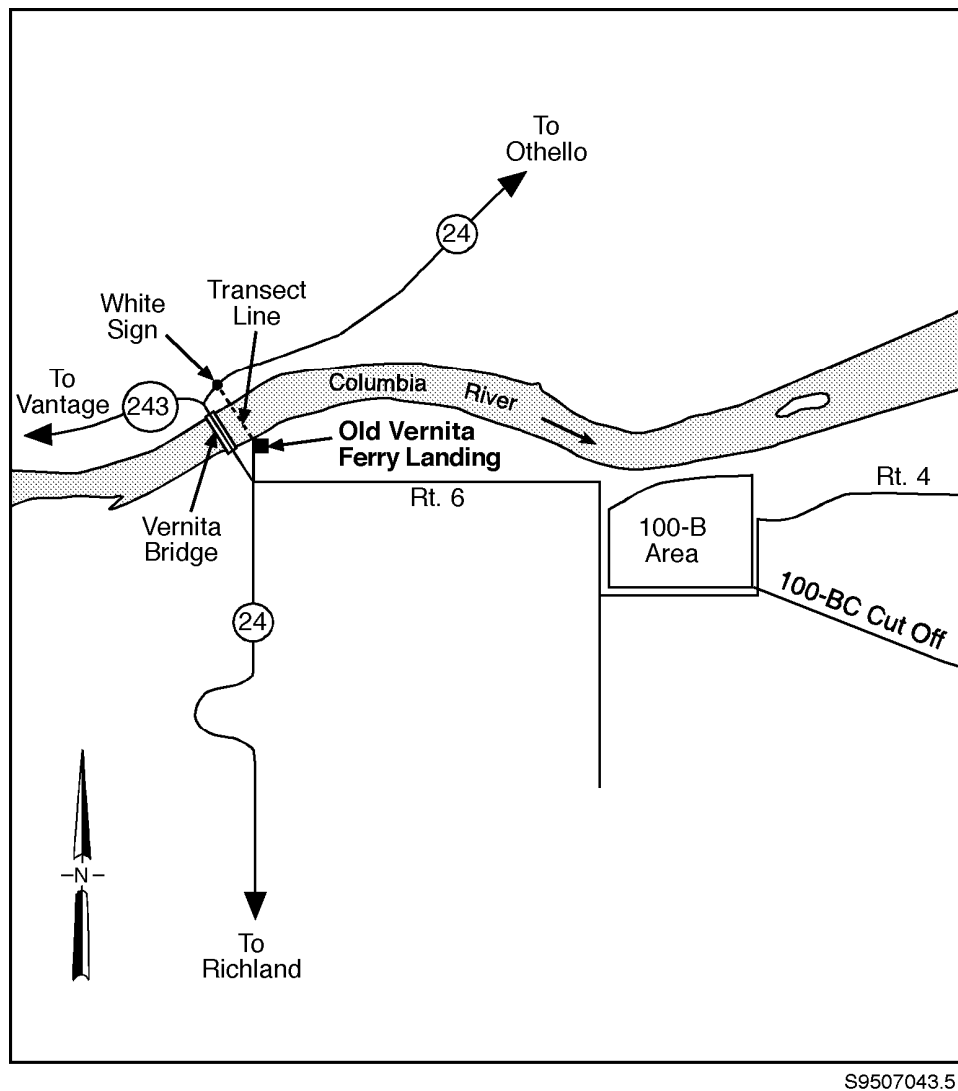


Figure 2.6. Vernita Bridge River Transect Sampling Location



Figure 2.7. Vernita Bridge River Transect Location

100 N AREA

1. The sampling site is located at the downstream (east) end of the Hazardous Waste Zone in the 100 N Area. The transect lies along the line extending from the downstream end of the Hazardous Waste Zone on the Hanford (south) side of the river to a small tree on the northwest side of the river. This location is at Hanford river marker 9.5.
2. 100 N nearshore samples are collected at the following locations (see Section 2.0 for GPS coordinates):
 - ◆ 100 N Shore HRM 8.4 (at 2nd power line above 100 N reactor)
 - ◆ 100 N Shore HRM 8.9 (at Sr-90 hot spot, N8-T cassion)
 - ◆ 100 N Shore HRM 9.2 (halfway between transect location and Sr-90 hot spot, N5-13 cassion)
 - ◆ 100 N shore HRM 9.8 (approximately 400 m downriver from 100 N transect location)

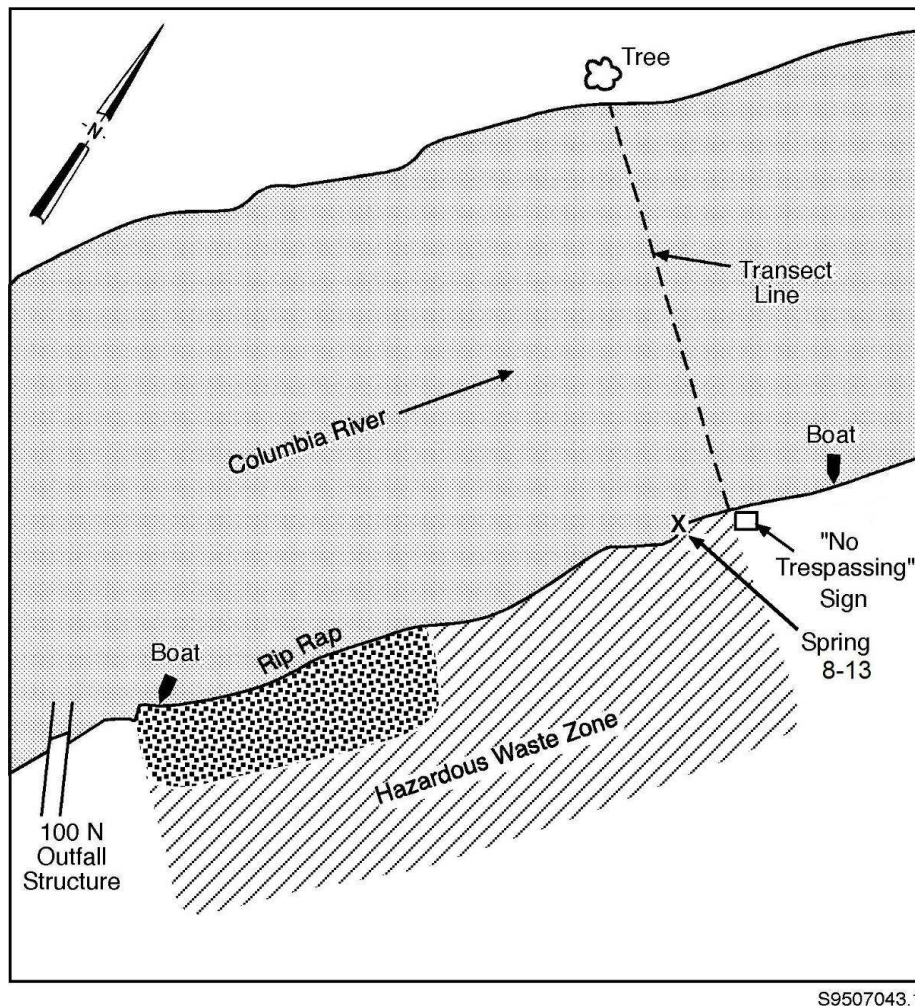


Figure 2.8. 100 N River Transect Sampling Location



Figure 2.9. 100 N River Transect Location - Downstream End of Hazardous Waste Zone

HANFORD TOWNSITE

1. The sampling site is located in the vicinity of Hanford river marker 28.7 on the upstream end of Savage Island. The transect lies along the line extending from the Emergency Evacuation Siren on the Hanford (southwest) side of the river to a tree just upstream of Savage Island.
2. Hanford Townsite nearshore samples are collected at the following locations (see Section 2.0 for GPS coordinates):
 - ◆ Hanford Townsite HRM 26 (Hanford River Marker 26)
 - ◆ Hanford Townsite HRM 27 (Hanford River Marker 27)
 - ◆ Hanford Townsite HRM 28 (Hanford River Marker 28)
 - ◆ Hanford Townsite HRM 30 (Hanford River Marker 30)

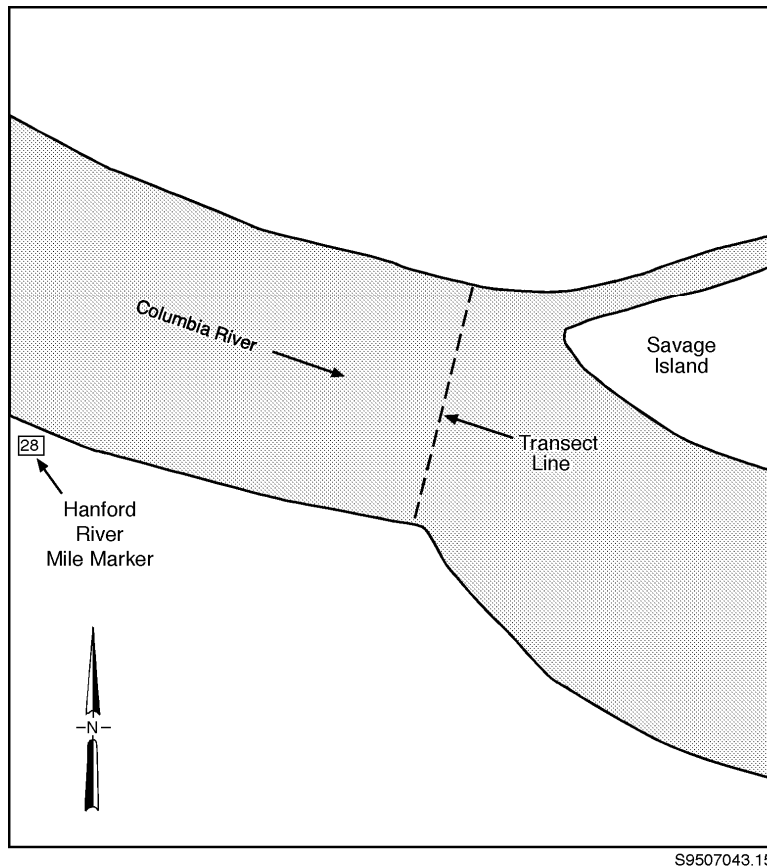


Figure 2.10. Hanford Townsite River Transect Sampling Location



(a)



(b)

Figure 2.11. Hanford Townsite River Transect Location: (a) Emergency Evacuation Siren, and (b) Tree Upstream from TLD Station

300 AREA

1. The sampling site is located approximately 600 to 700 meters downstream of the 331 Building in the 300 Area. The transect lies along the line extending from the downstream corner of the 300 Area perimeter fence on the Hanford (west) side of the river to a point 30 meters upstream of the rip rap baffle of a large irrigation flume on the east side of the river. **Note:** An island intersects the transect at this location and sampling must be split between the two sides of the island. This location is at Hanford river marker 43.1.
2. 300 Area nearshore samples are collected at the following locations (see Section 2.0 for GPS coordinates):
 - ◆ 300 Area Shore HRM 41.5 (at 300 Area TEDF outfall)
 - ◆ 300 Area Shore HRM 42.1 (near SESP riverbank spring sampling location 42-2)
 - ◆ 300 Area Shore HRM 42.5
 - ◆ 300 Area Shore HRM 42.9 (between 331 building and the wind tunnel facility)

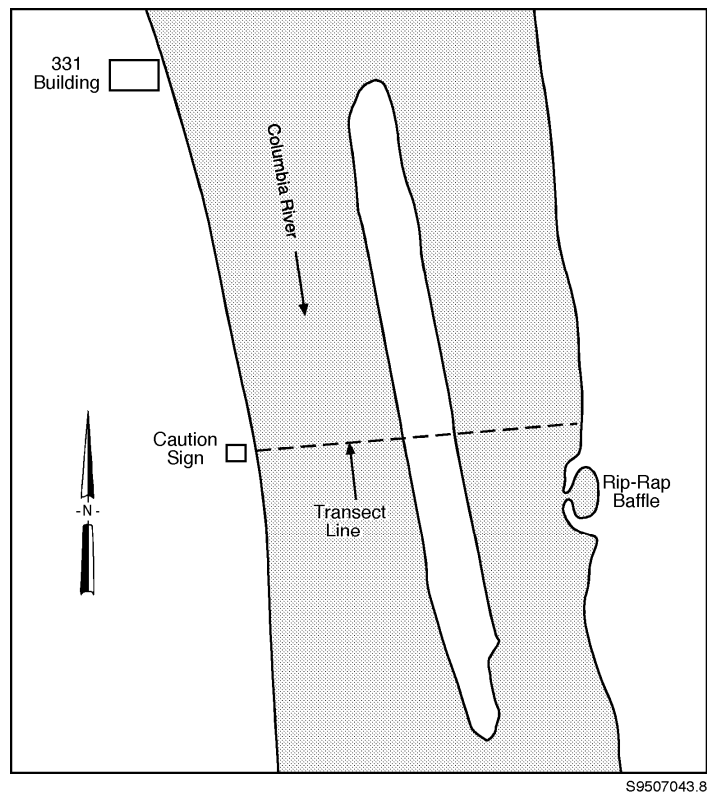


Figure 2.12. 300 Area River Transect Sampling Location



(a)



(b)

Figure 2.13. 300 Area River Transect Location: (a) Downstream Corner of 300 Area Perimeter Fence, and (b) Rip- rap Baffle of Irrigation Flume

RICHLAND PUMPHOUSE

1. Turn east off George Washington Way onto Snyder Road.
2. Proceed to Leslie Groves Park boat launch at the end of Snyder Road.
3. The sampling site is located approximately 30 to 45 meters upstream of the Richland pumphouse. The transect lines up with the bottom of a gully on the Franklin County (east) side of the river. Note: An island intersects the transect at this location and sampling must be evenly split between the two sides of the island. This location is at Hanford river marker 46.4.
4. Richland pumphouse nearshore samples are collected at the following locations (see Section 2.0 for GPS coordinates):
 - ◆ Richland pumphouse HRM 43.5 (approximately 100 m above unimproved public boat launch above Battelle fields pumphouse)
 - ◆ Richland pumphouse HRM 43.9 (between Battelle fields pumphouse and Port of Benton dock [where the sub reactors are taken off the barges])
 - ◆ Richland pumphouse HRM 45 (between WSU-TC library and starch plant)
 - ◆ Richland pumphouse HRM 45.8 (5 houses upriver from Ferry St., large wooden stairs)

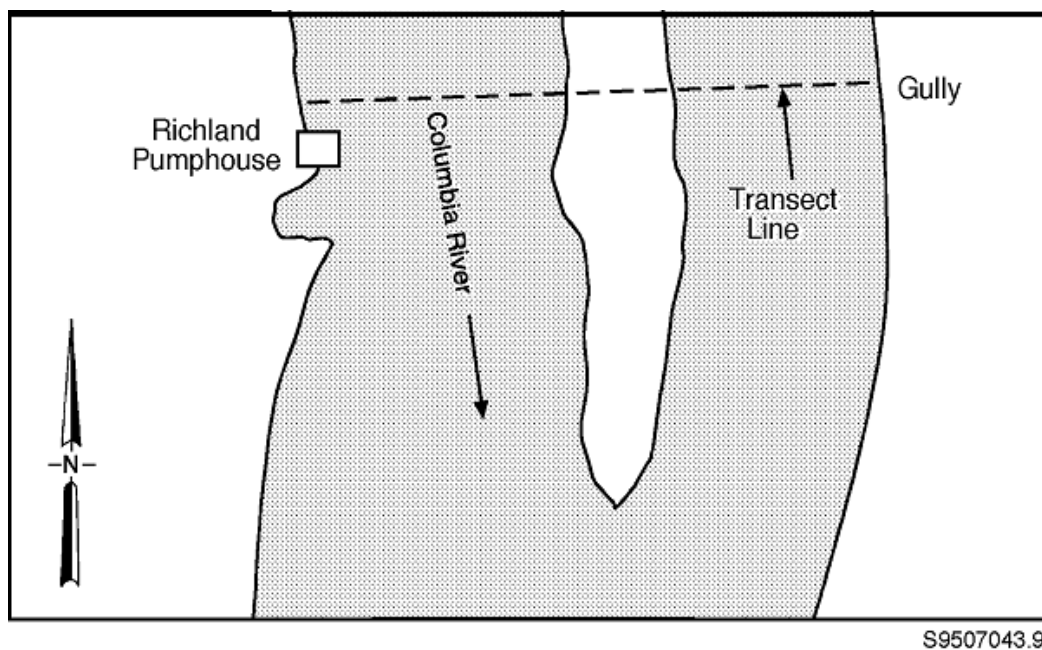


Figure 2.14. Richland Pumphouse River Transect Sampling Location



(a)



(b)

Figure 2.15. Richland Pumpouse River Transect Markers: (a) Richland Pumpouse, and (b) Bottom of Gully

2.4 Irrigation Water

- RIVERVIEW CANAL**
1. Follow Interstate-182 to Pasco and take the Road 68 exit (Exit 9).
 2. Turn right at the stop light and drive 0.4 mile to the irrigation canal.
 3. Samples are collected from the canal near a valve located just to the west of the road.

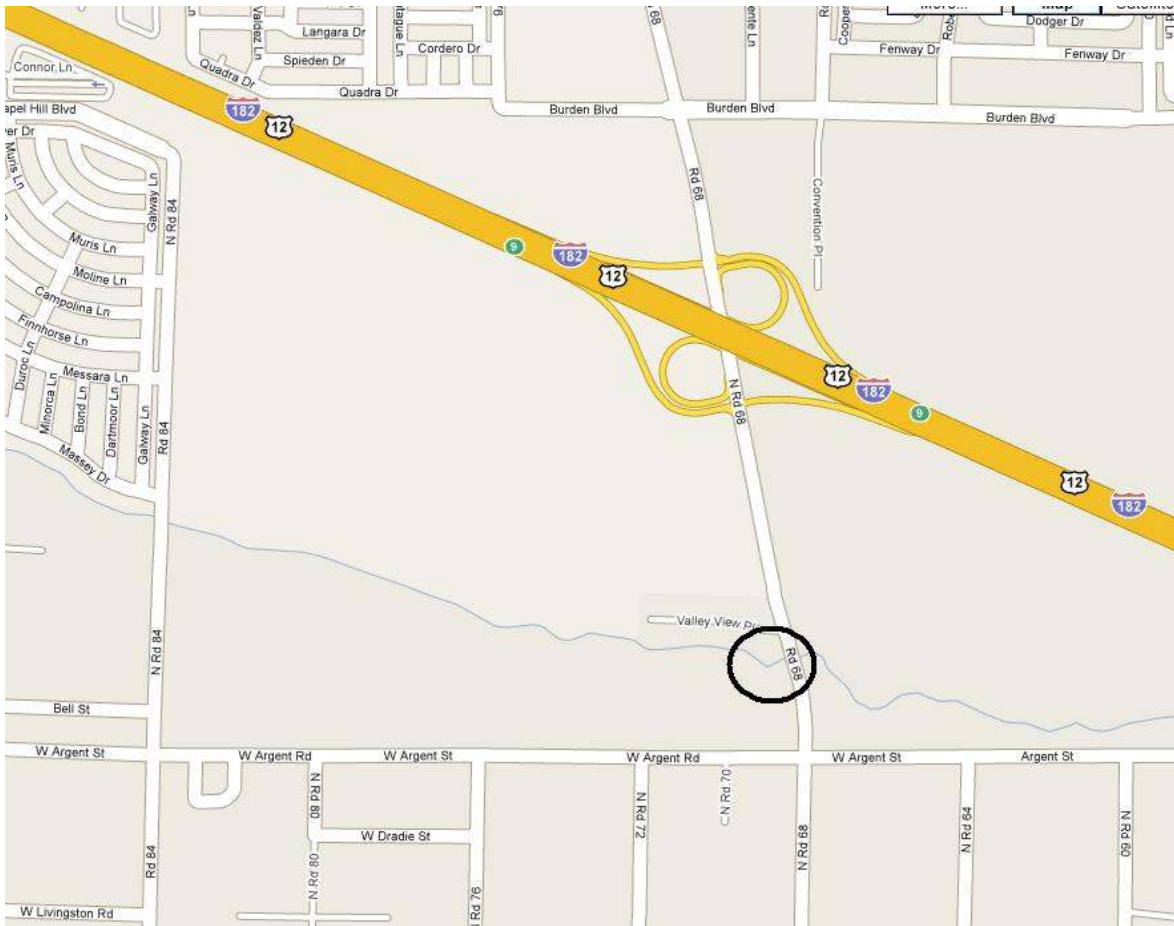


Figure 2.16. Irrigation Water Sampling Location at Riverview Canal



Figure 2.17. Riverview Canal Irrigation Water Sampling Location

HORN RAPIDS IRRIGATION

1. From Battelle Blvd., turn south onto Einstein Ave.
2. Pull into the Battelle Staff Association Softball field and Tennis court.
3. Collect the sample from the irrigation outlet at the Softball field.

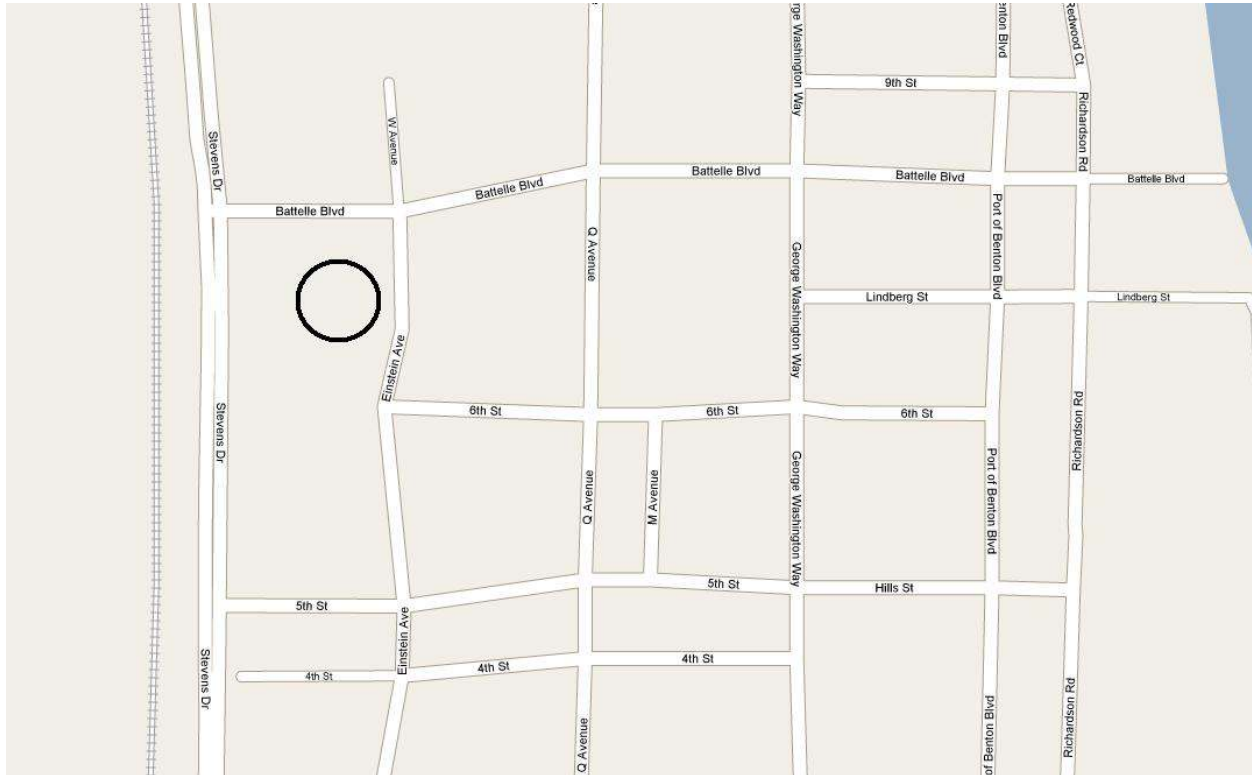


Figure 2.18. Horn Rapids Irrigation Sampling Location

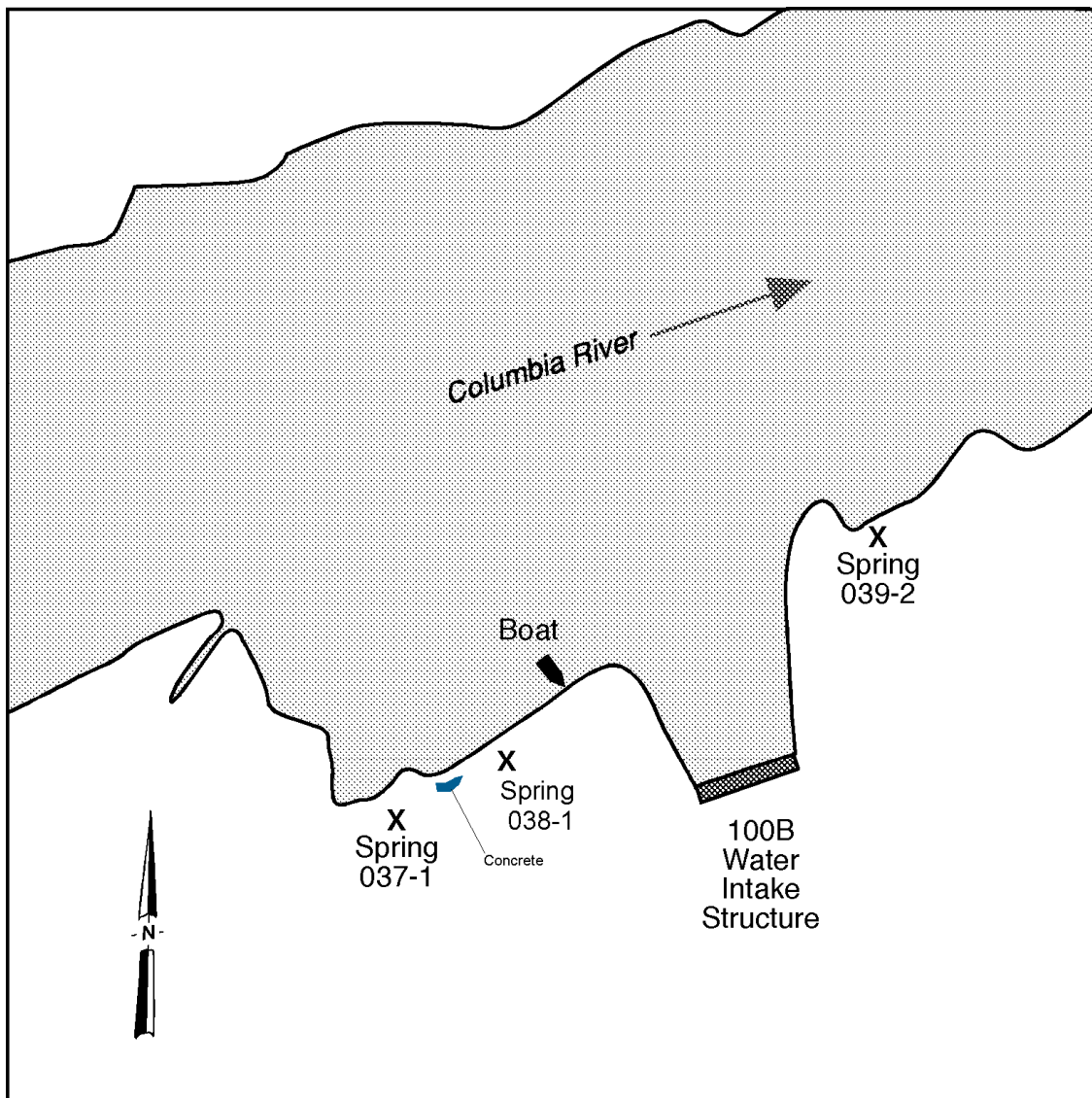


Figure 2.19. Horn Rapids Irrigation Sampling Location

2.5 Riverbank Spring Water

100 B

1. Several springs are located near the 100 B Water Intake Structure. Spring 037-1 is approximately 200 meters upstream from the intake. Spring 039-2 is located approximately 50 meters downstream from the first point below the intake.
2. Spring 037-1 can be reached by road.
3. Spring 039-2 can only be reached by boat.



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Figure 2.20. 100 B Spring Sampling Locations

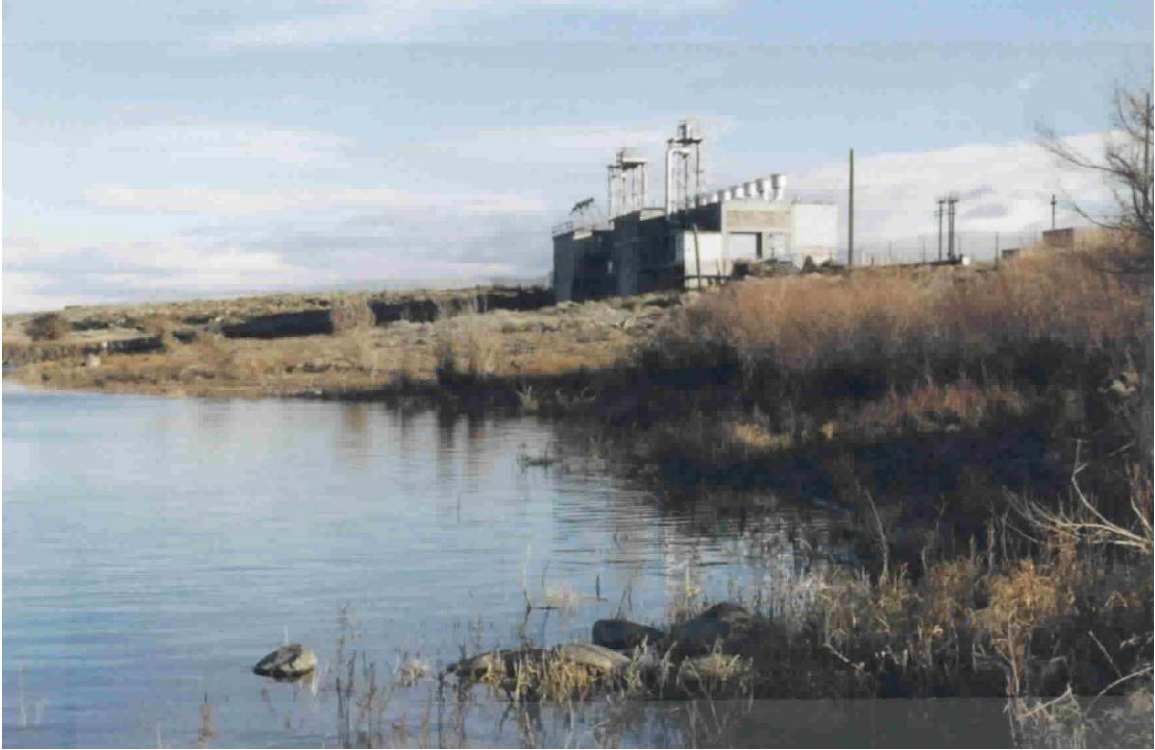


Figure 2.21. 100 B Shoreline Features

100 K

1. There are several springs at the 100 K Area located between the two water-intake structures. These springs do not flow each year.
2. The spring located near the western inlet, Spring "A" (063-1), is approximately 50 meters downstream from the inlet. Walk around the rock point on the downstream side of the inlet. The spring is typically 3-10 meters from the shoreline depending on river flow. **This is the preferred sampling location.** If it is not flowing, go 50 to 100 meters downstream until you find an active spring.
3. Spring 077-1 is located 0.3 miles upriver from Hanford river marker 8.
4. The 100 K Springs are only reachable by boat.

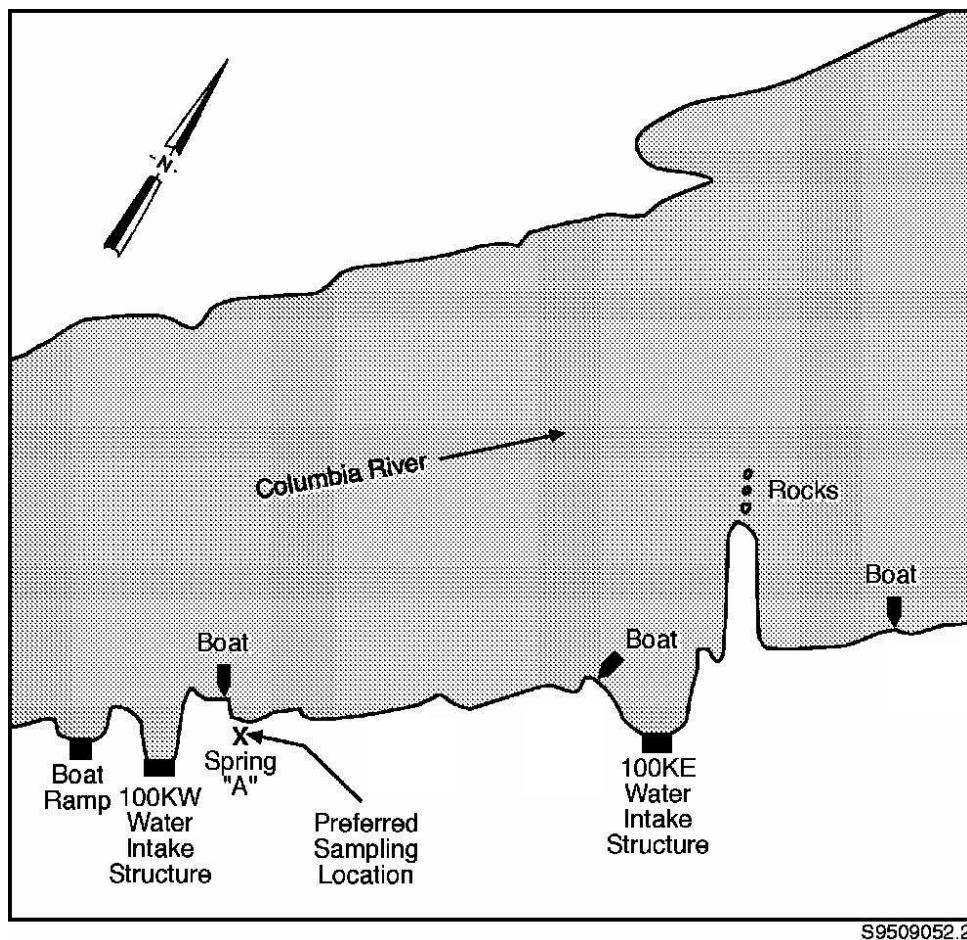


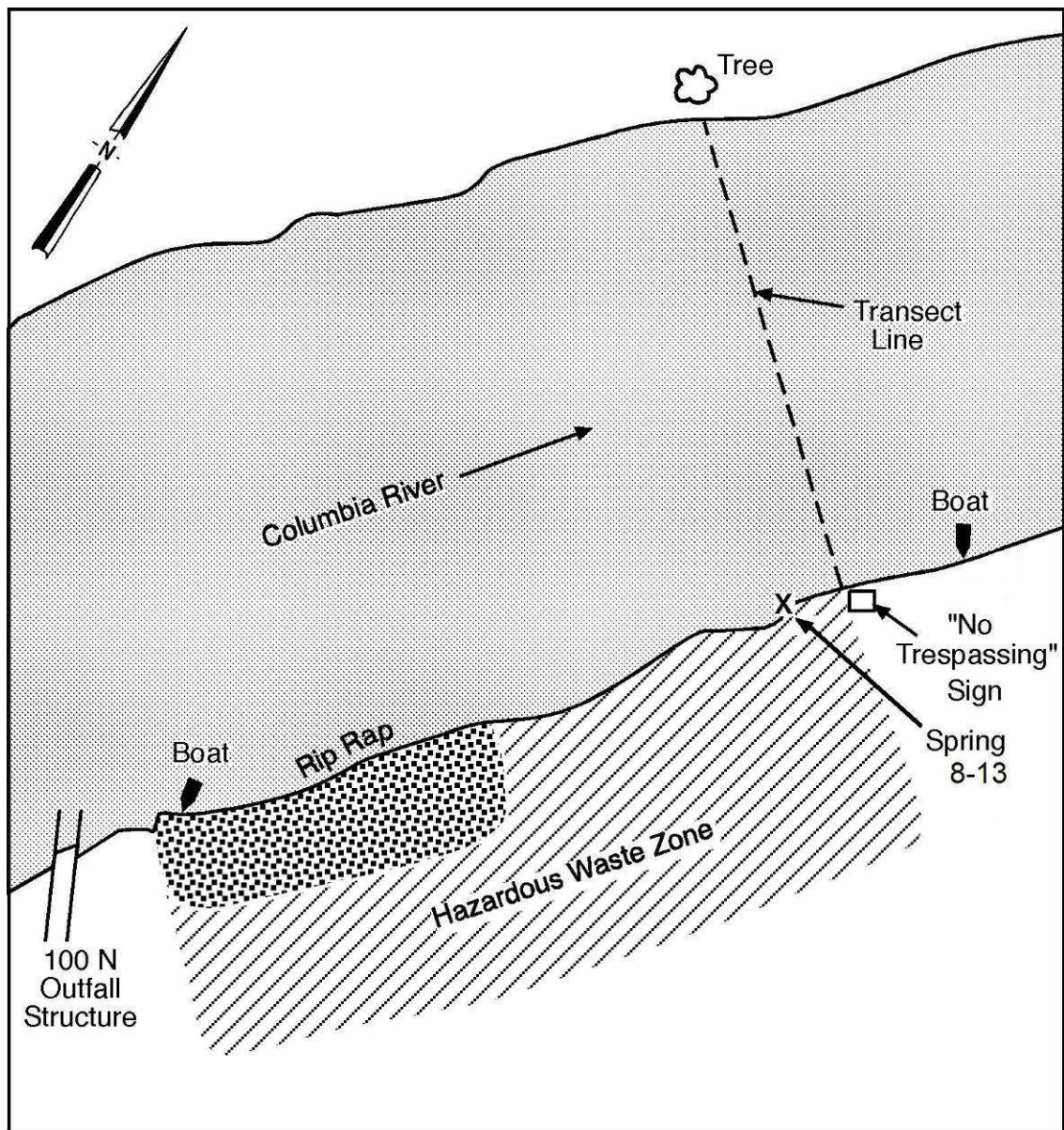
Figure 2.22. 100 K Spring Sampling Location



Figure 2.23. 100 K Shoreline Features

100 N

100N Spring 8-13 is located downstream of the rip-rap area and in-situ reactive apatite barrier. The spring is at the end of the shoreline road, at the downstream end.



S9507043.1

Figure 2.24. 100 N Spring Seep Sampling Location



Figure 2.25. 100 N Shoreline Features at N Spring 8-13

100 D

1. Spring 110-1 is located in an inlet approximately 25 meters downstream of the Hanford river mile 11. It is typically very close to the shoreline of the river and is often submerged. It can be reached by road. When approaching 100-D from route 2N, turn north on a dirt road after crossing the rail-road tracks. Follow this road ~1.5 miles to an intersection with another dirt road. Turn left and continue ~0.75 miles until you reach the river access. Follow road south away from river and take next right. This will lead to spring 110-1.
2. Spring 102-1 is located on the large point upstream of the 100 D Intake Structure. This spring can be reached from land by a steep road at the northwest perimeter of the 100 D Area. Follow the access roads to the ISRM barrier (array of groundwater wells). The road to the spring 102-1 turns north off of the ISRM gravel pad just southwest of an old chain-link fence.

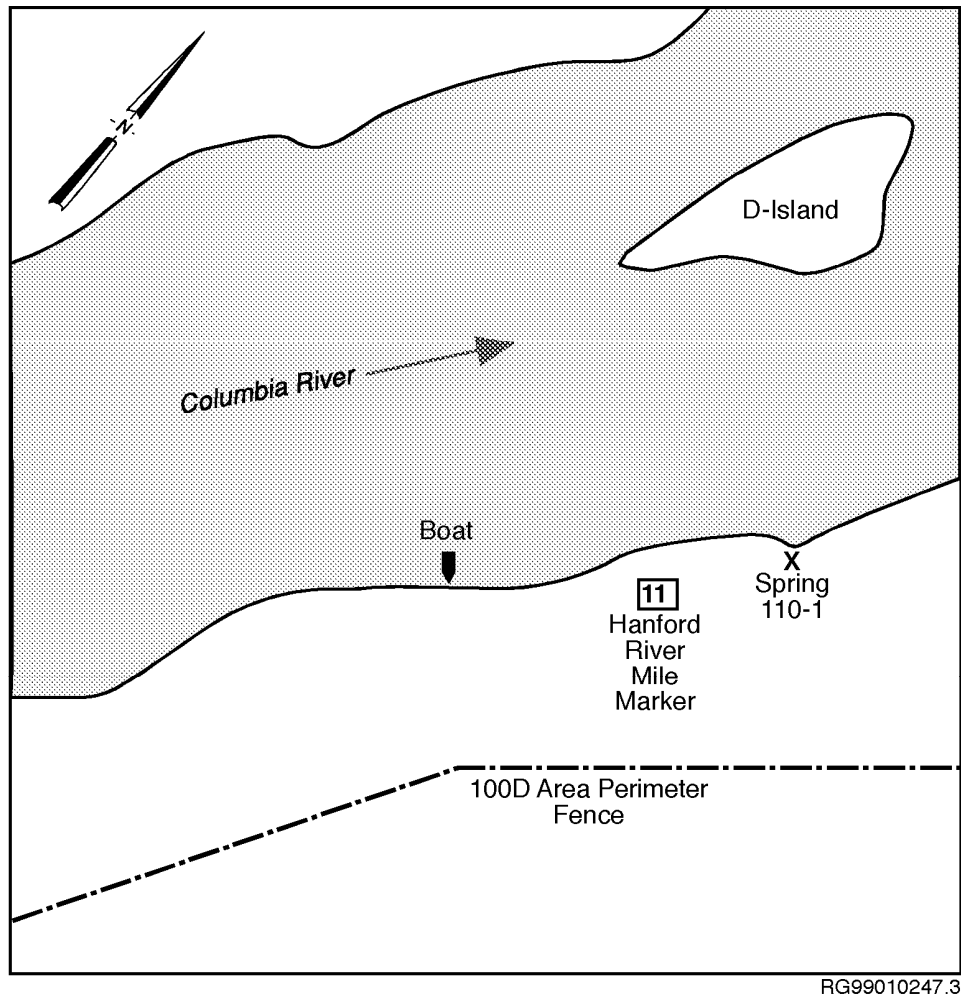


Figure 2.26. 100 D Spring Sampling Location



Figure 2.27. 100 D Shoreline Features at Spring 100-D 110-1

100 H

1. Spring 152-2 emanates from beneath the old 100 H outfall structure. The back of the structure has been filled in with large basalt rock. The lower portion of the structure consists of a 6-meter wide cracked concrete slab. The spring typically flows from a crack that runs parallel to the river flow very close to the water's edge. The spring is often submerged. An alternative spring location (153-1) is available approximately 150 meters downstream of the outfall structure.
2. Spring 145-2 is located 0.5 mile down river from Hanford river mile 14. The spring is at the base of a steep bank, downstream from a small concrete building located on the bank.
3. The 100 H Springs are reachable by road.

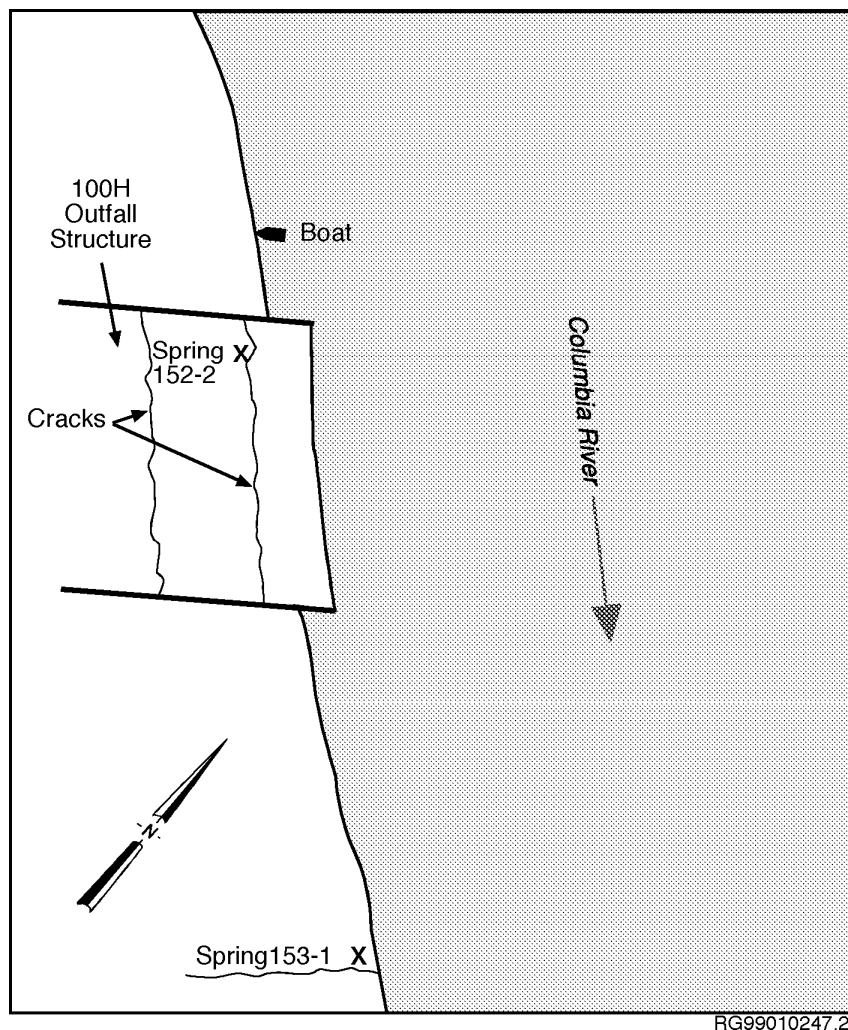


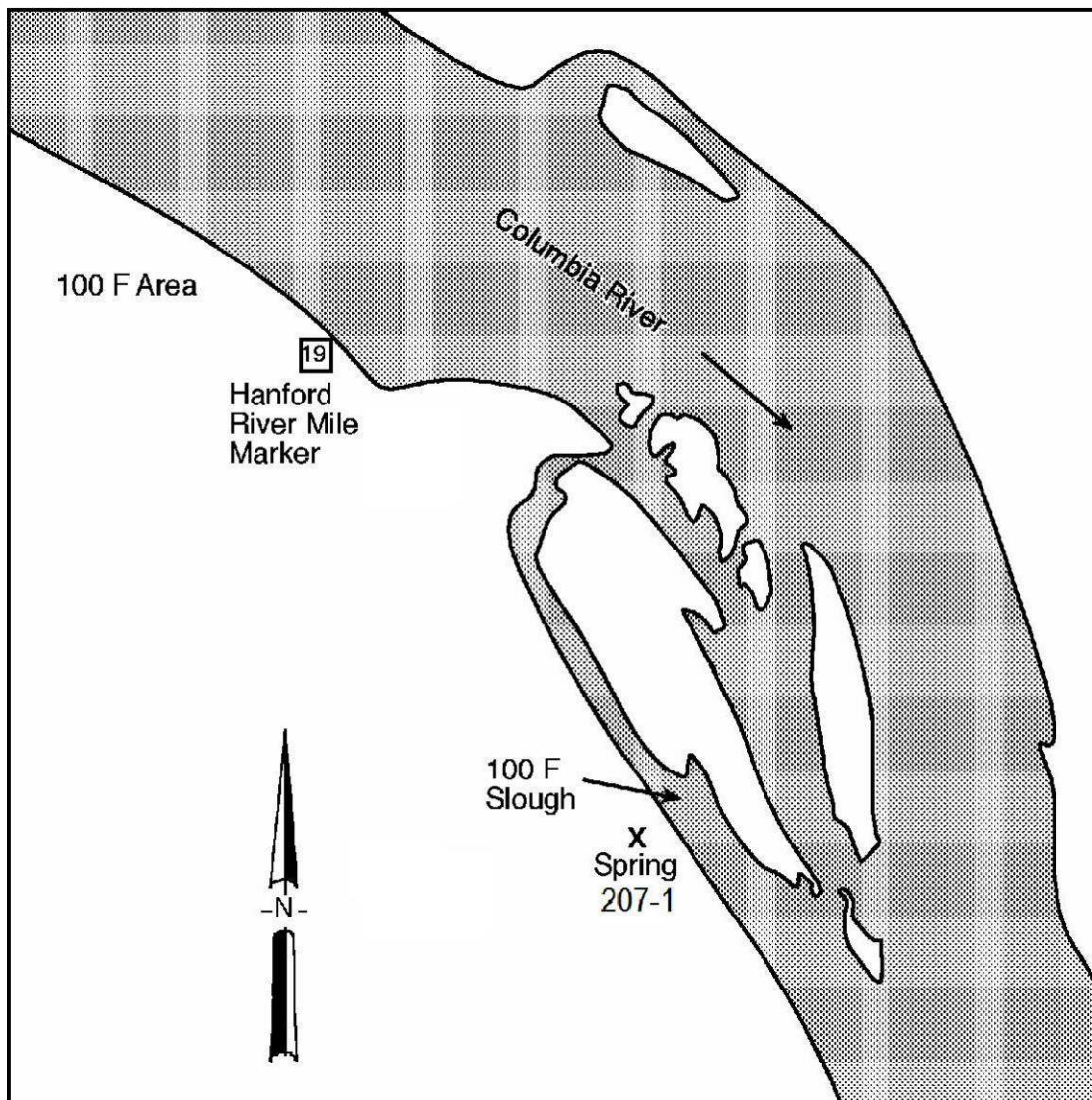
Figure 2.28. 100 H Spring Sampling Location



Figure 2.29. 100 H Shoreline Features (Spring 152-2)

100 F

1. Spring 207-1 is the preferred location and can be found near the downstream end of the 100 F slough. This spring can be reached from a dirt road off Route 2 north (about 1 $\frac{3}{4}$ miles south of the entrance to the 100 F Area). A river warning siren is in the vicinity of the spring.
2. 100 F Spring 207-1 is best accessed by road. Boat access is extremely difficult during low river stages necessary for active spring discharge.



S9509052.3

Figure 2.30. 100 F Spring Sampling Location



Figure 2.31. 100 F Shoreline Features at Spring 207-1

HANFORD TOWNSITE

1. There are several springs located just downstream from Hanford river mile (HRM) 28. HRM 28 is approximately 1 mile downstream of the last group of trees at the old Hanford Townsite and 1 mile upstream from Savage Island (in the vicinity of Hanford well #45-2).
2. Spring UR 28-2 (upriver from 28-2) is located approximately $\frac{1}{4}$ mile above Hanford river marker 28 with the seep emerging from a large creek [ditch].
3. Spring 28-2 is located approximately 0.1 mile downriver from Hanford river marker 28.
4. Spring DR 28-2 (downriver from 28-2) is located approximately 0.3 mile downriver from Hanford river marker 28.
5. These springs are reachable by boat or truck.

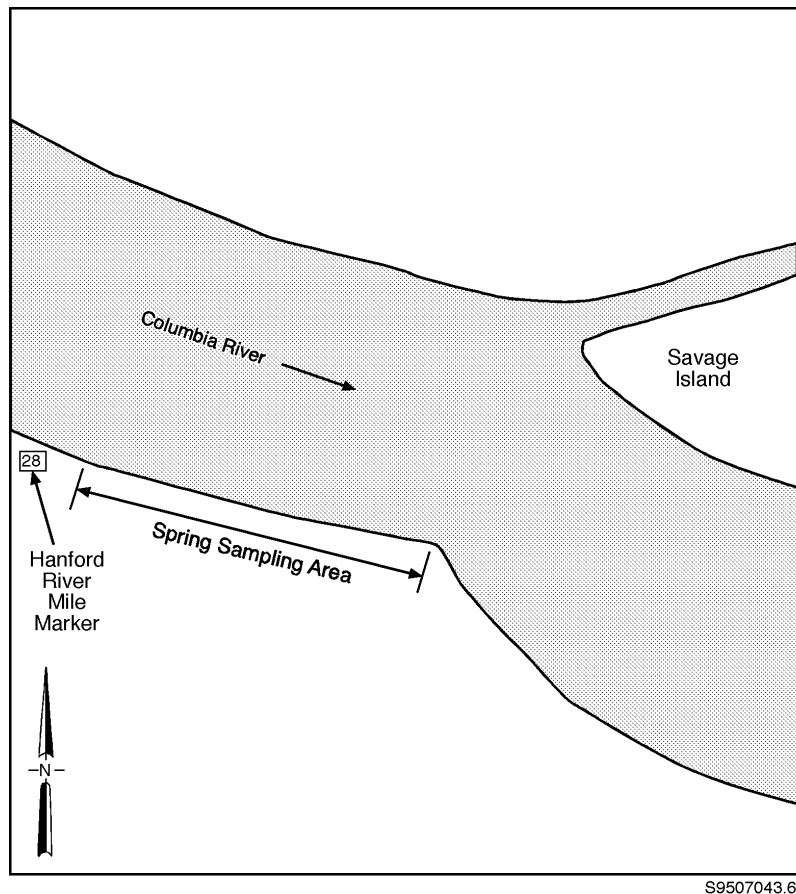


Figure 2.32. Hanford Townsite Spring Sampling Location



Figure 2.33. Hanford Townsite Shoreline Features at Spring 28-2

300 AREA

1. Spring 41-9 is located upriver from Hanford river marker 42. This spring is on a sandy beach below a high bluff.
2. Spring (42-2) is located just downstream from a point across the river from Johnson Island (i.e., Pyramid Island). Look for a big tree with little shrubs, where a small rocky area extends out into the river. The spring emanates from the upstream side of the bank next to the big tree. This spring is located at Hanford river marker 42-1.
3. Spring DR 42-2 is located downstream (Down River) at Hanford river marker 42-4.
4. Spring 42-7 is located downstream of the old 300 Area water intake.
5. Richland Spring 43-7 is located on a sandy beach immediately upstream of the Horn Rapid Road irrigation pump house.
6. Springs 41-9, 42-2, DR 42-2, and Richland Spring 43-7 are reachable by road or boat. Spring 42-7 is best accessed by boat.

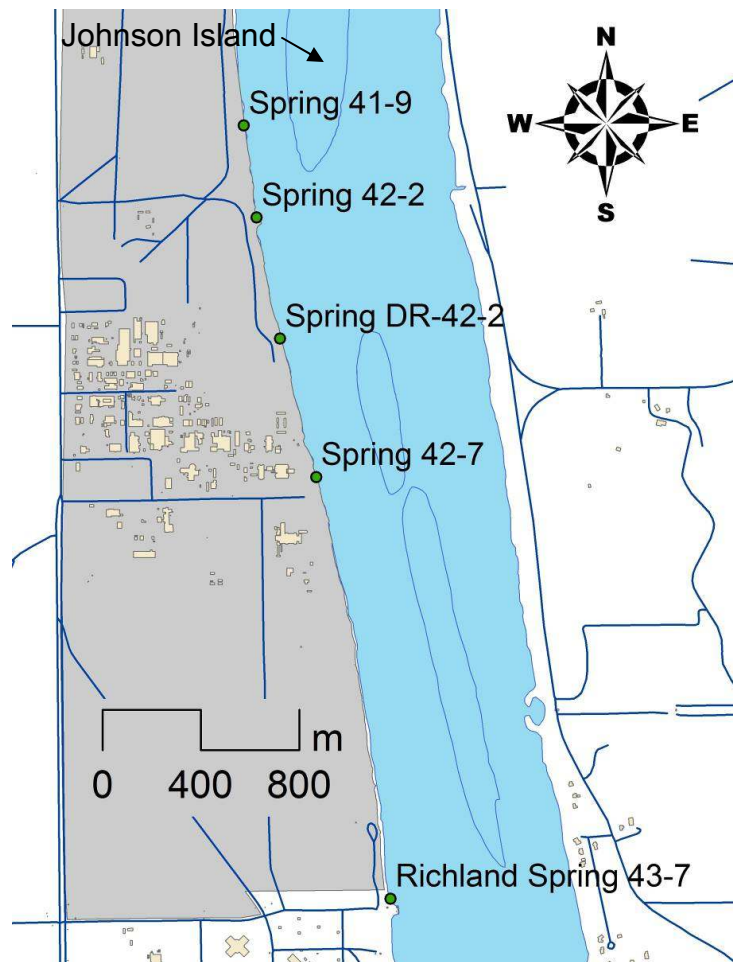


Figure 2.34. 300 Area Spring Sampling Locations



Figure 2.35. 300 Area Shoreline Features at Spring 42-2

2.6 Onsite Pond Water

FFTF POND

1. Drive to the 400 Area main gate.
2. Turn right and follow the outside perimeter road around to the north side of 400 Area.
3. Cross three railroad tracks and turn right on a gravel road that curves to the right.
4. Continue on to a fenced marshy area located on the left (north) side of the road. Samples should be collected from the fenced marsh, if possible. Otherwise samples can be collected from the well in the fenced building located just to the west of the marsh.

Note: The water in the fenced marsh and the well building are 400 Area process water (primarily cooling tower effluent).

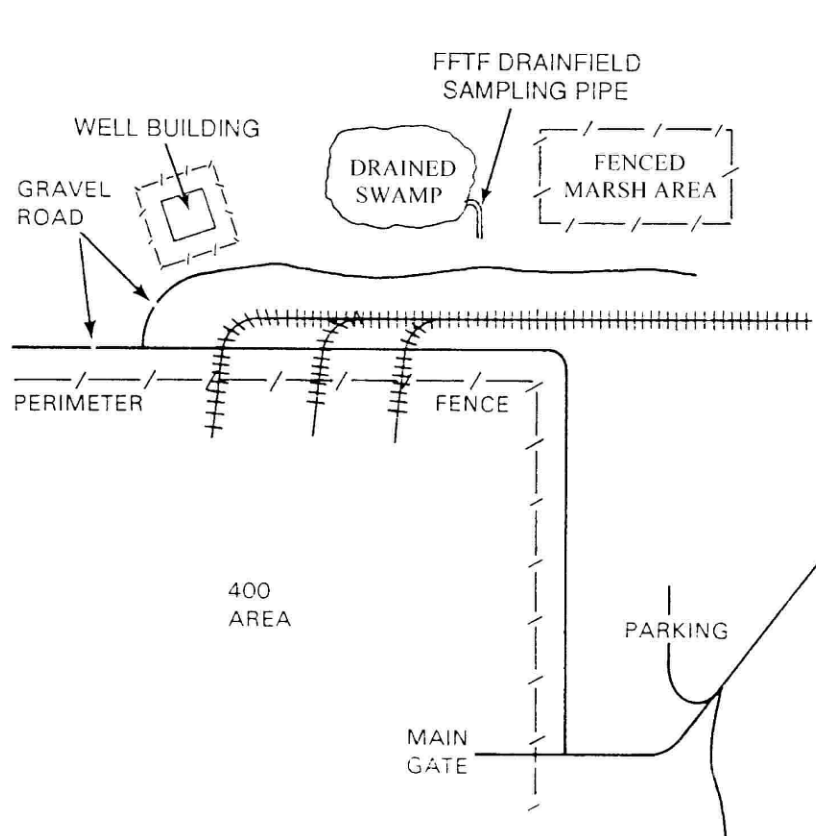


Figure 2.36. Water Sampling Location at FFTF Pond



Figure 2.37. FFTF Pond

WEST LAKE

1. Travel north 1.6 miles on Route 4N from the intersection of Route 4N and Route 11A.
2. At the bottom of the hill, look for a small green sign with an arrow pointing left to 100 B-C. Turn right (east) near the sign onto a gravel road.
3. Follow this road 0.6 miles to the berm on the west shoreline extending partway into the pond. Proceed with caution, because it is easy for a vehicle to become stuck at this location. Do not drive onto the roadway extending into the lakebed or drive down any alternate route to the water's edge.
4. The water sample (grab sample) is taken from the shoreline near the tip of the berm (if possible). If the sample cannot be collected at the top of the berm, walk to the closest accessible water to collect the sample.
5. West Lake varies in size according to the season. In the summer the lake may be reduced to a small salt-encrusted pond.

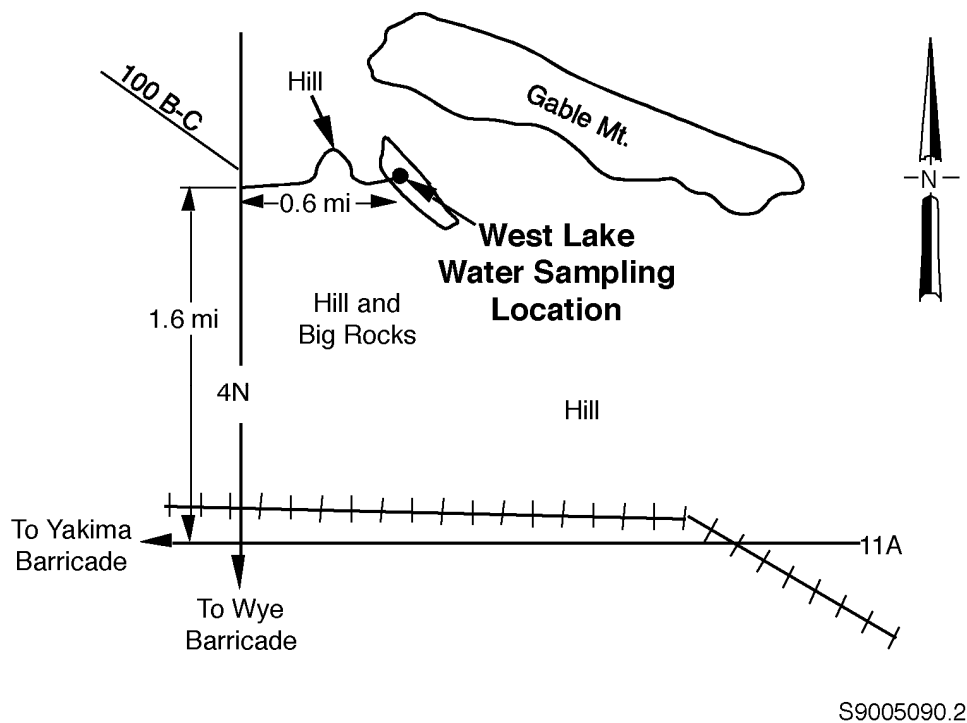


Figure 2.38. Water Sampling Location at West Lake

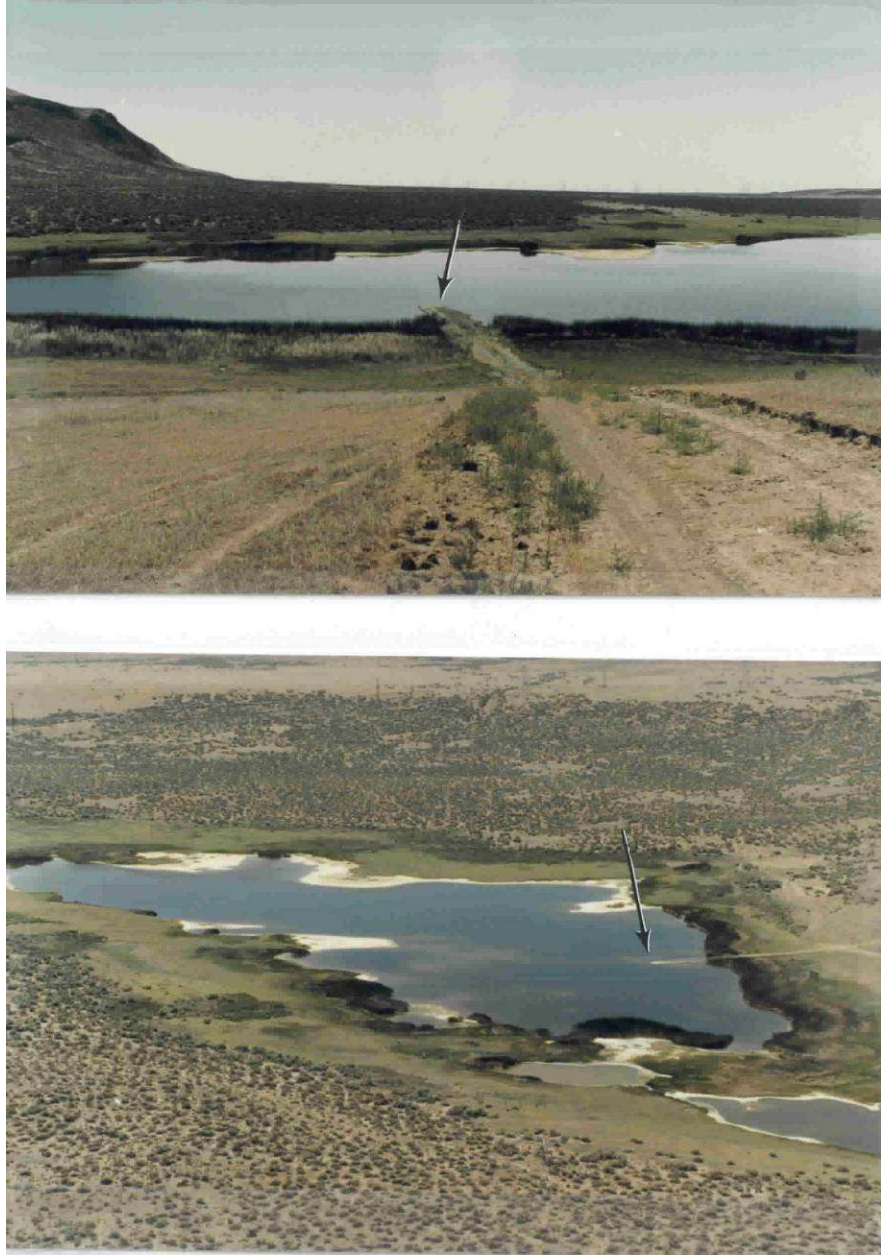


Figure 2.39. West Lake Water Sampling Location

2.7 Onsite Drinking Water

FFTF

Points of Contact - notify prior to collection of sample:

Bill Starkey (power Operator Supervisor) – 376-2872

Operators – 376-4275 FFTF Control Room – 376-0456

Mike Hupp – WCC for escort to access 400 areas 376-3398

1. Proceed west on Kentucky Blvd. To guard shack. Go thru gate into 400 area reactor compound on to Madison street. Turn Left (west) on Texas St.
2. Turn Left (South) on Tyler St. follow Tyler St. for approximately 200 yds. 481 pump house is located on your left (East). Sample taken at sink inside 481 pump house.
3. If 481 pump house is out of operation sample will be taken at 481-A pump house located on Tyler St. on west side of rd about 200 ft from Texas St. Operator will show where sample will be taken.

Note: An escort is required to enter into 400 FFTF inner fence area.

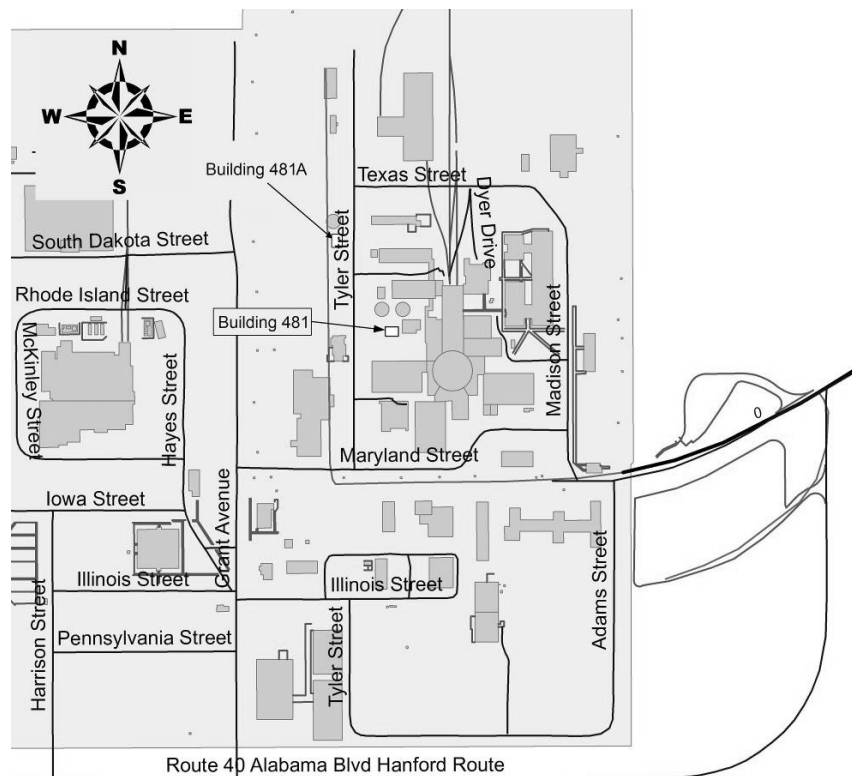


Figure 2.40. Water Sampling Location at FFTF



Figure 2.41. FFTF Water Sampling Location

**200 WEST AREA
WATER
TREATMENT
PLANT**

Points of Contact - notify prior to collection of sample:

Operator – 373-2748

Sam Camp (Operations Supervisor) – 373-5824

Jim Day (Operations Manager) – 373-2366; Cell Phone 529-0846

1. Follow Rt 3 into 200W Area. Stop on 20th St. at intersection.
2. Go straight thru the intersection (west) for about 100 yards. The 283W bldg is on the right side (north)
3. Go thru the door on the West side of the bldg into the lab.
4. Samples are taken at the sink inside 283-W.

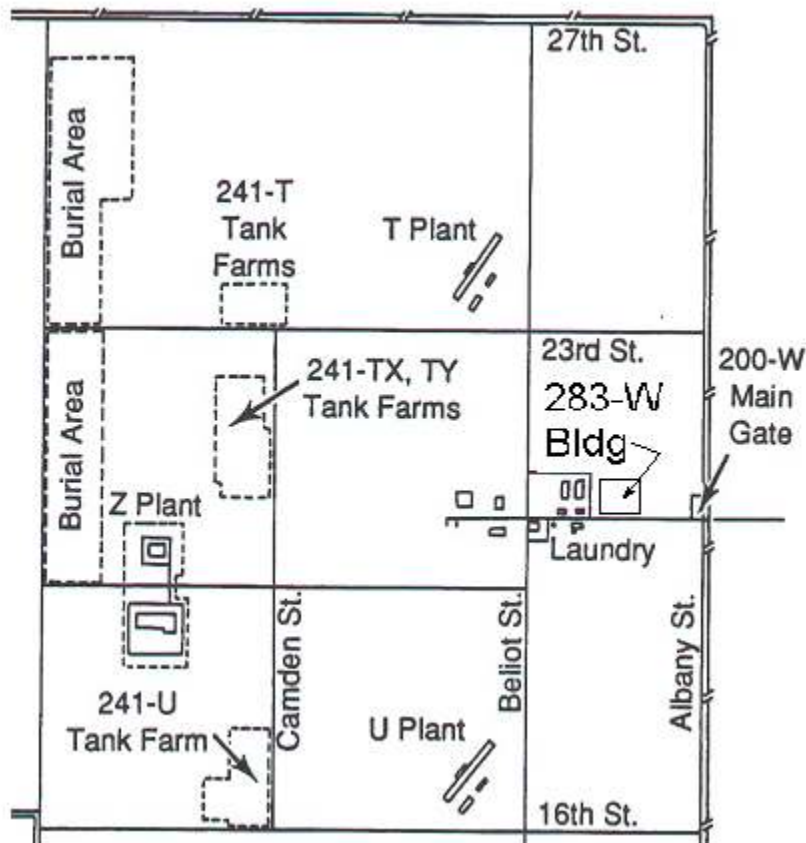


Figure 2.42. 200-West Water Sample Location



Figure 2.43. 200W Area Water Sample Location

100N WATER TREATMENT PLANT

The 100-N reactor complex is an active D&D site. Check on access restrictions prior to entering any active areas.

1. Follow N Ave. to 100N outer guard gate. Proceed thru gate into 100N complex.
2. Turn left (South/West) onto paved road before passing thru 100N inner guard gate. Travel approximately 300 ft.
3. Turn right (West) towards 183N bldg. 186N bldg is a small building to the North of 183N bldg.
4. Samples are taken inside bldg 186N at sample port. Use valve # TV-7 to operate sample line.

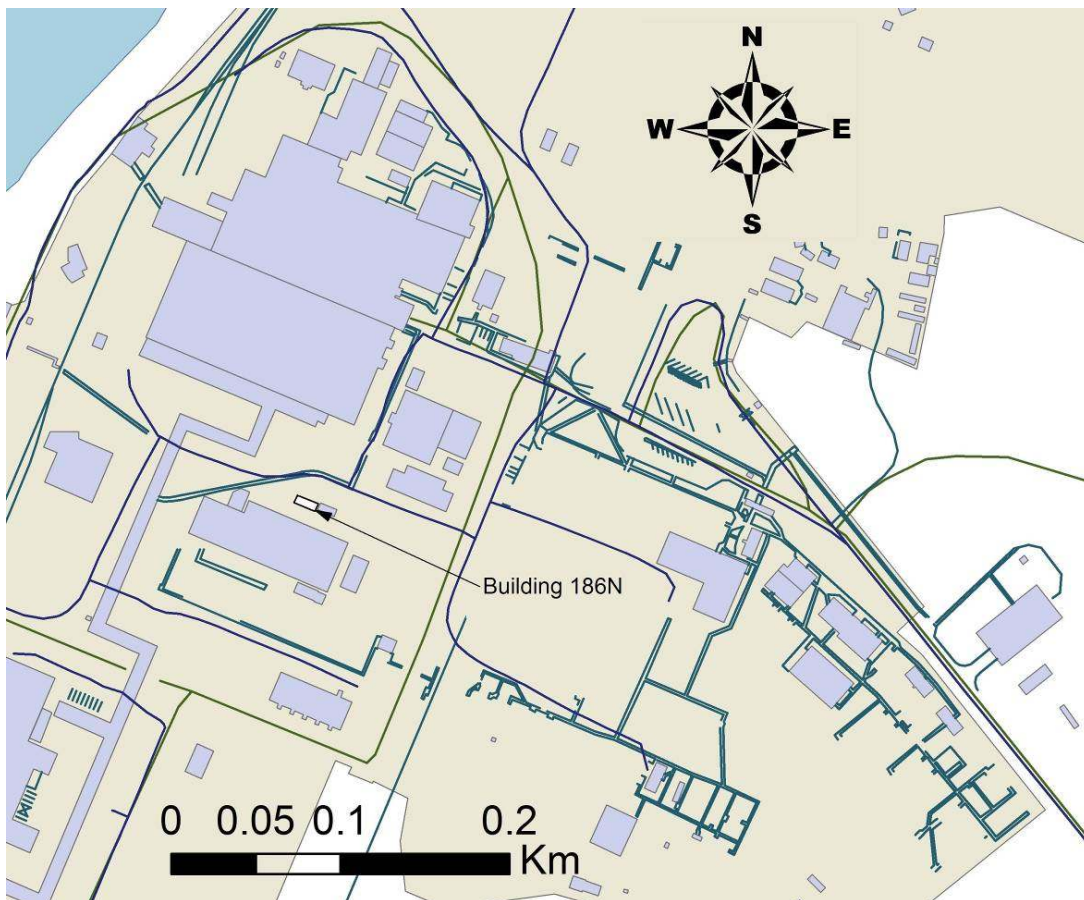


Figure 2.44. 100N Water Sample Location



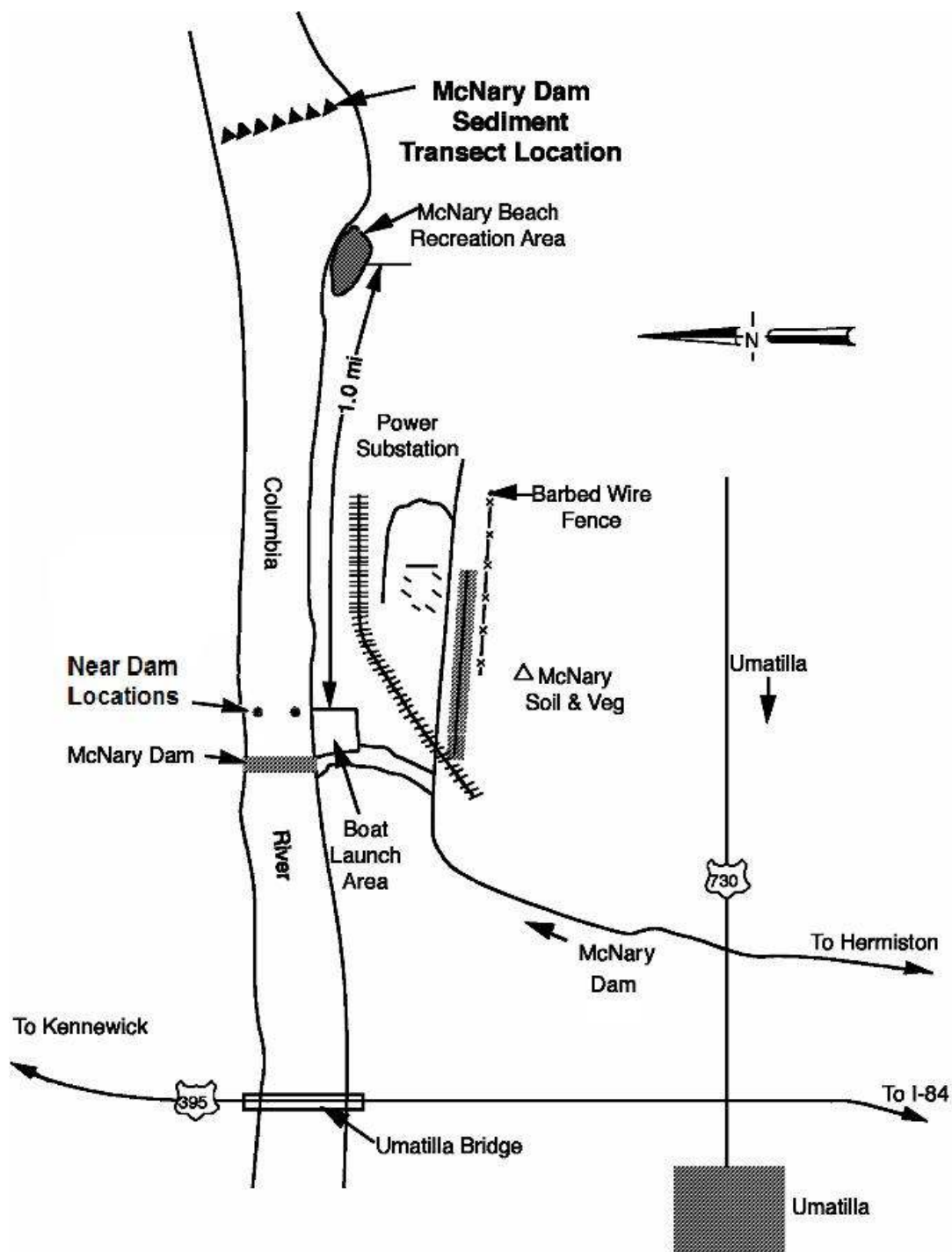
Figure 2.45. 100N Water Sample Collection Location

2.8 Columbia River Sediment

MCNARY DAM

BOAT NEEDED

1. Proceed south from Kennewick on Highway 395 to the Umatilla/Hermiston exit on the Oregon side of the Umatilla Bridge.
2. Turn left (east) off of Highway 395 onto Highway 730.
3. Travel east on Highway 730 for about 1 mile, then turn left (north) onto McNary Dam Road. Pass by the dam and follow directional signs to the boat launch.
4. Boat upriver about 1.0 mile to the bay just upstream of the first park encountered on the Oregon shoreline.
5. The sampling transect consists of 4 stations beginning near a grove of trees upstream of the park on the Oregon shoreline and proceeding to a point near a break in the bluffs on the Washington shoreline.
6. Sediment samples may also be collected at two locations near the boat exclusion buoys at the dam. The sample McNary – Washington side near dam is collected approximately 100 – yards above the red marker buoy south of the Washington shore (two green navigation markers are present on the Washington shore). The sample McNary – Oregon side near dam is at the 4th white marker buoy from the red marker buoy (moving from the Washington shore to the Oregon shore). The use of the GPS to find these locations is recommended.



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Figure 2.46. Sediment Sampling Location at McNary Dam



(a)



(b)

Figure 2.47. McNary Dam Sediment Transect Markers: (a) Grove of Trees Upstream of Park, and (b) Break in Bluffs. Note: recent samples have been collected near dam locations which are downriver from this location.

**PRIEST RAPIDS
DAM**

**GATE KEY MAY BE
NEEDED**

BOAT NEEDED

1. Proceed to the community of Desert Aire on Highway 243.
2. Turn left into Desert Aire.
3. Continue down Main Street through town toward the river.
4. The entrance to the boat launch is on the left across from the golf course clubhouse. A small fee is required to launch the boat. If the gate is locked, a key can be obtained from the office adjoining the swimming pool across the street from the boat launch entrance.
5. Boat downriver from the launch approximately 3/4 mile, just upstream of the island. Caution is advised in the shallow waters just upstream of the island.
6. The sampling transect extends from near the Grant County shoreline to near the Yakima County shoreline. There is a drain culvert entering the river beneath the railroad tracks on the Yakima County side of the river.
7. Sediment samples may also be collected at two locations near the boat exclusion buoys at the dam. The PRD – Grant side near dam location is approximately 400 yards off shore from the 1st pump intake structure on the Grant County shore above the dam (typical depth of 45 ft.). The PRD – Yakima side near dam location is near the eastern end of the bridge-like structure on the dam (near the Yakima County shore) and the sampling depth is typically 80 ft. The use of the GPS to find and document these locations is recommended.

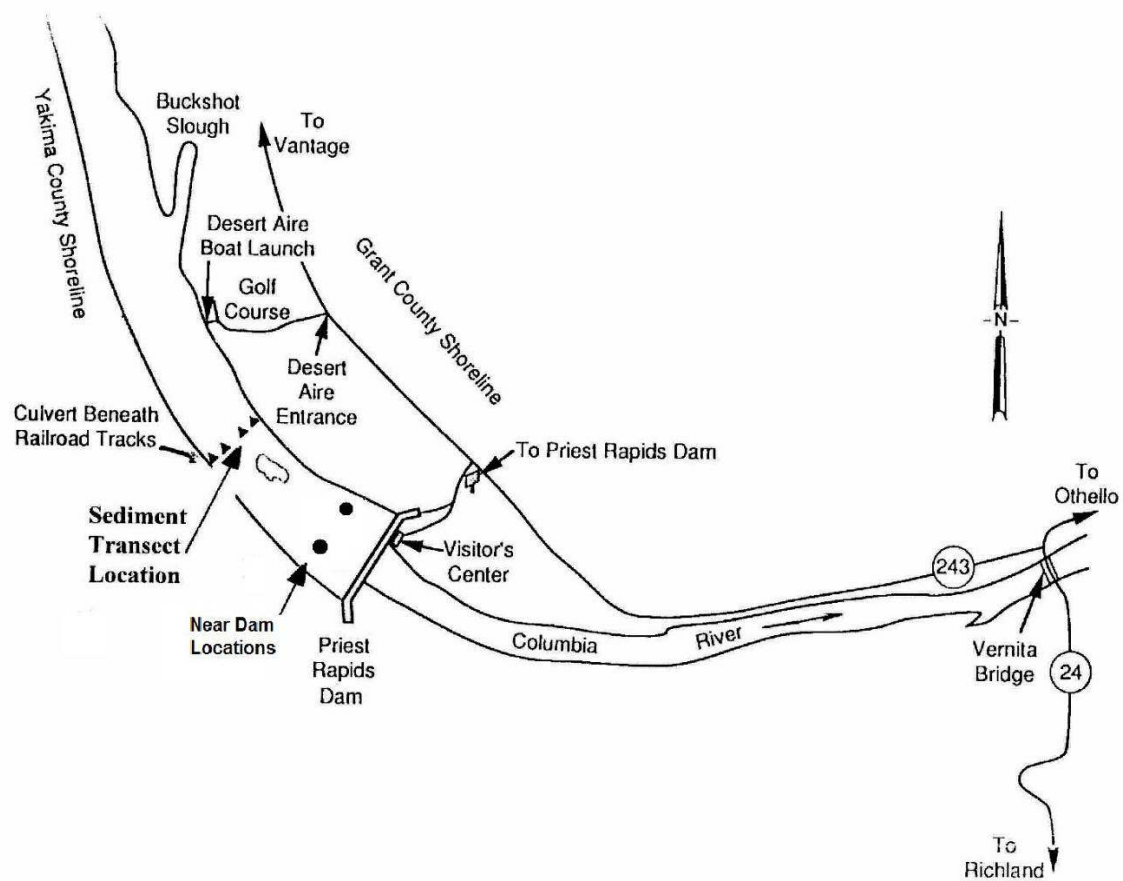


Figure 2.48. Sediment Sampling Location at Priest Rapids Dam

WHITE BLUFFS SLOUGH

From the White Bluffs boat ramp; proceed upstream along the west bank (Hanford side) of the river. The downstream end of the slough is approximately 200 meters from the boat ramp. Caution is advised in the shallow waters. Enter the slough and continue upstream approximately 25 meters to the White Bluffs TLD location. Collect the sample from the center of the slough, if possible. If rocks are encountered, move the boat closer towards the Hanford shore and try again. Several boat repositions may be necessary to locate suitable material.

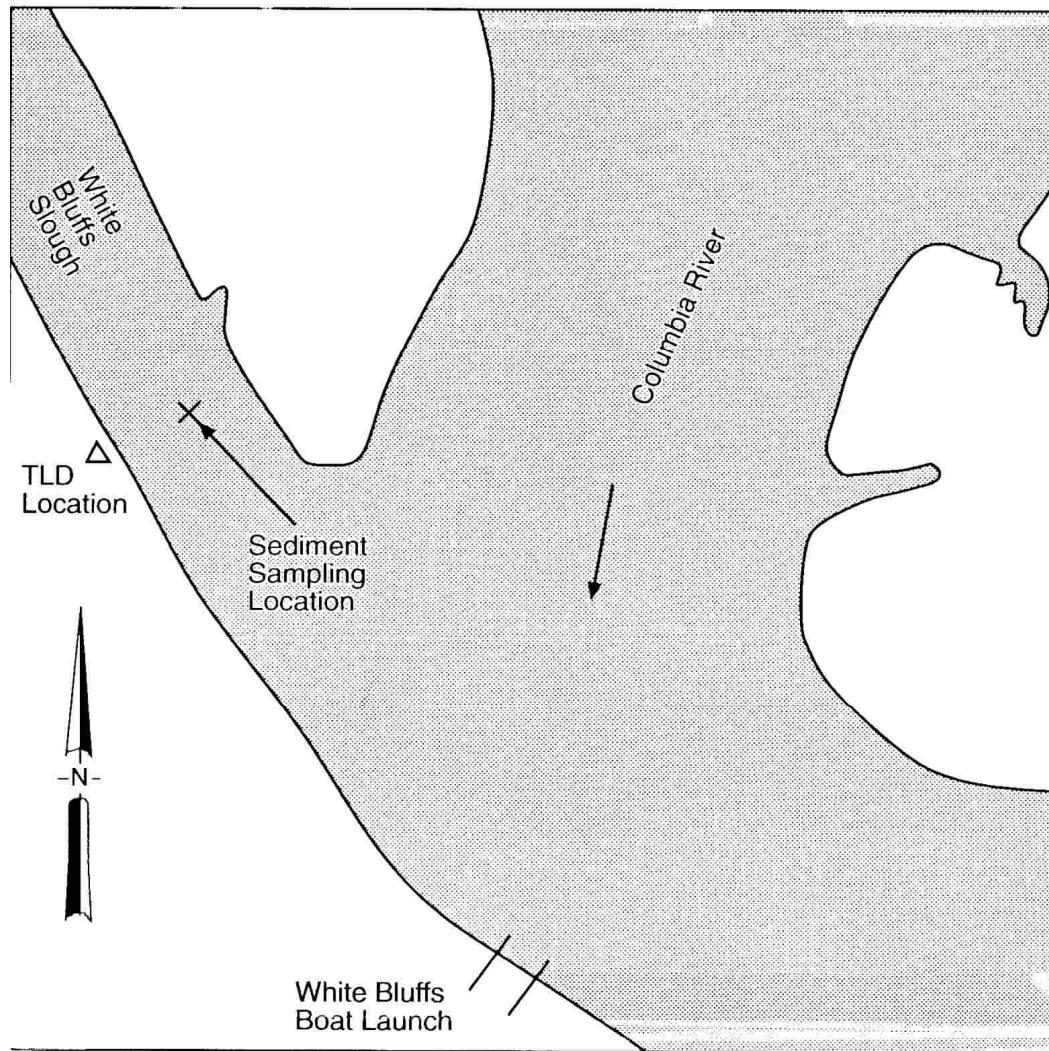


Figure 2.49. White Bluffs Slough Sediment Sampling Location

100 F SLOUGH

From Hanford river mile 19, proceed downstream around the point bar approximately one mile to the downstream end of the slough. Caution is advised in the shallow waters. Boat into the slough 100 - 200 meters and collect a sample from the center of the slough, if possible.

Note: Depending on river flow, the sampling location may need to be reached on foot.

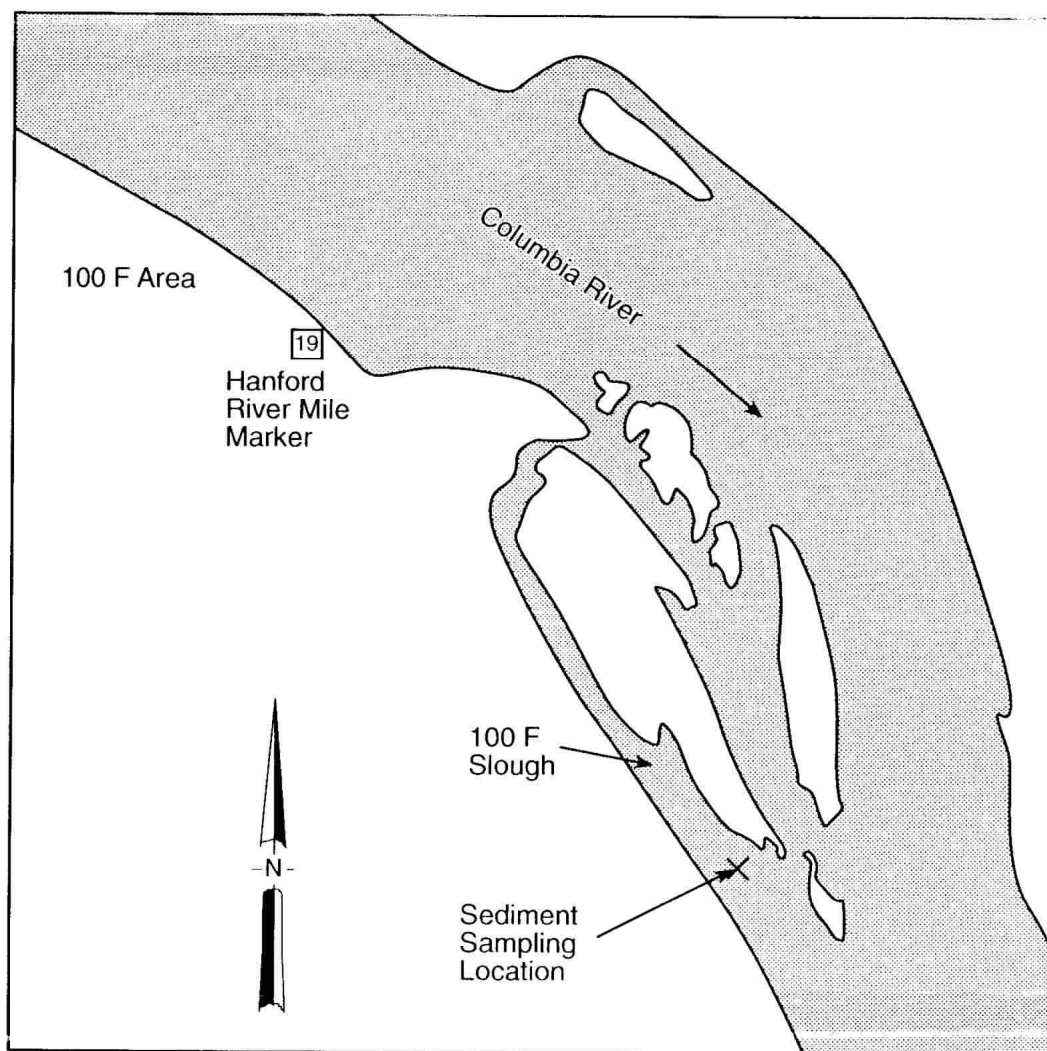


Figure 2.50. 100 F Slough Sediment Sampling Location

HANFORD SLOUGH

The downstream end of the slough is located at the wooden power line towers at the old Hanford Townsite. Slowly enter the slough from the downstream end taking caution to avoid shallow areas. This slough has a greater amount of rock in it than other sloughs and pockets of fine-grained sediment are sometimes difficult to find. If necessary, beach the boat and proceed slowly up the slough on foot. The sample should be collected near the downstream end of the slough in the vicinity of the wooden power line towers.

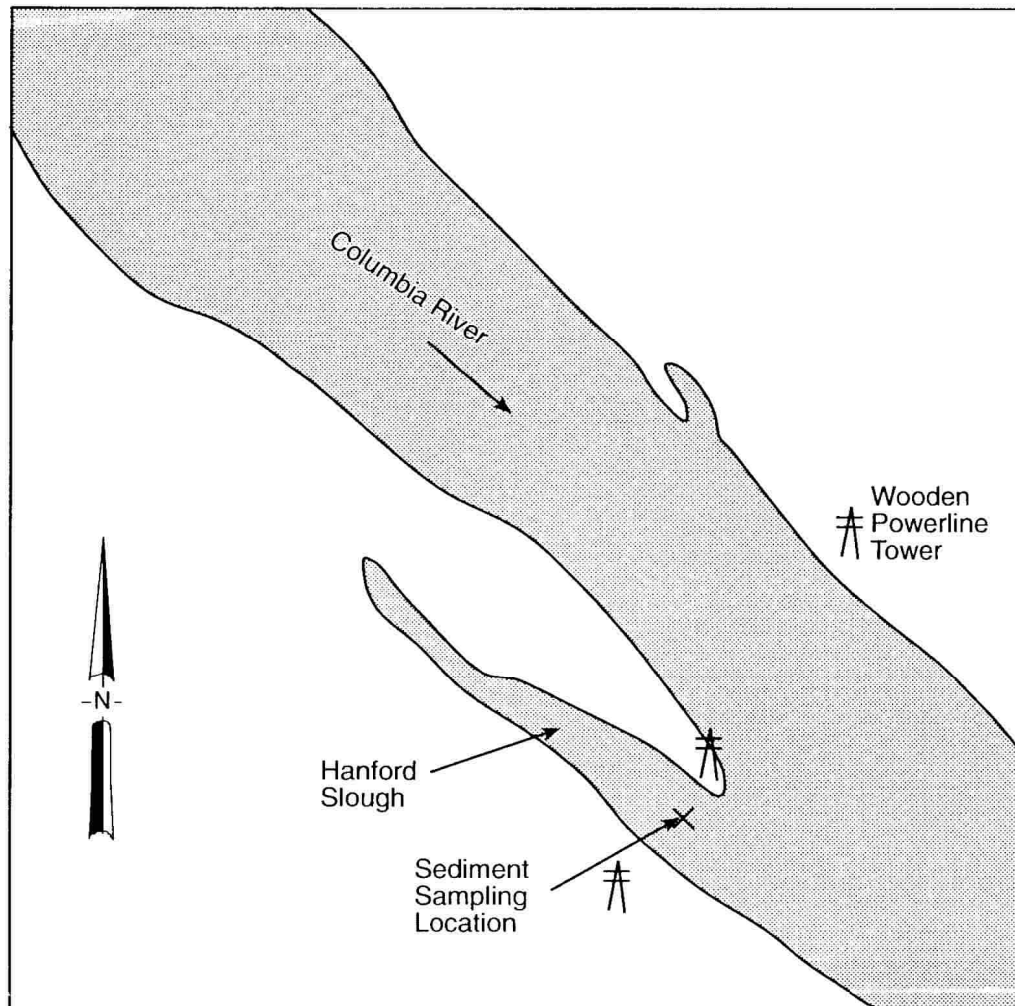
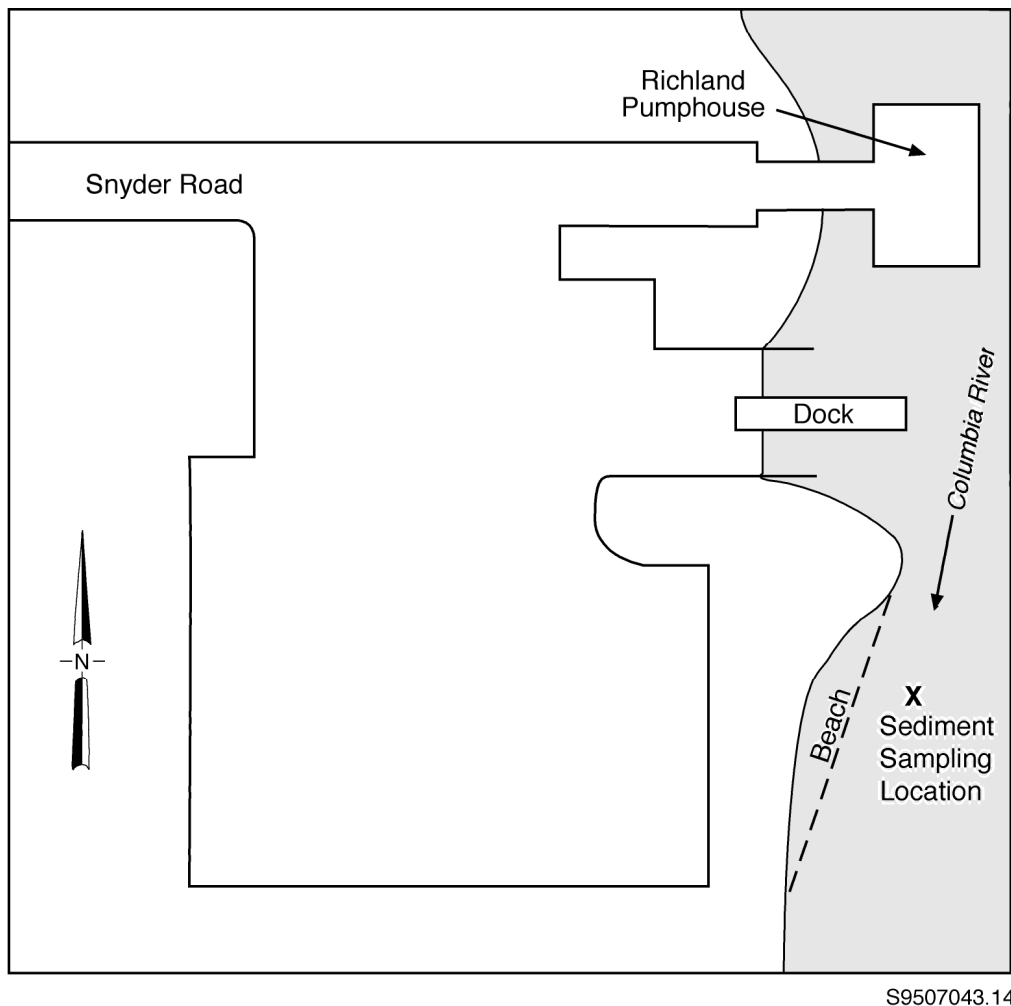


Figure 2.51. Hanford Townsite Slough Sediment Sampling Location

RICHLAND PUMPHOUSE

1. Turn east off George Washington Way onto Snyder Road.
2. Proceed to Leslie Groves Park boat launch at the end of Snyder Road. This location can be reached by walking from the parking lot.
3. The sampling site is approximately 150 meters downstream from the Richland Pumphouse boat dock. Proceed downstream around the small rocky point at the inlet area to the boat ramp staying close to the Richland shoreline. Look for a small sandy beach. The sample should be collected from the river bottom, 10 to 15 meters from the shoreline of the beach.



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Figure 2.52. Richland Pumphouse Sediment Sampling Location

2.9 Riverbank Spring Sediment

100 B AREA, 100 N AREA, OLD HANFORD TOWNSITE, AND 300 AREA

Riverbank springs sediment samples are collected concurrent to riverbank springs water samples at the 100-B Area, 100-N Area, old Hanford Townsite, and the 300 Area sampling locations. See Section 2.4 of this document for riverbank spring locations.



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U.S. DEPARTMENT OF
ENERGY

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under Contract DE-AC05-76RL01830

Surface Environmental Surveillance Project: Locations Manual

Volume 2 – Farm Products, Soil & Vegetation, and Wildlife

BG Fritz
JA Stegen

GW Patton
TM Poston

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(9/2003)

Surface Environmental Surveillance Project Locations Manual

Volume 2 – Farm Products, Soil & Vegetation, and Wildlife

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JA Stegen TM Poston

2009

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

Pacific Northwest National Laboratory
Richland, Washington 99352

Summary

Environmental surveillance of the Hanford site and surrounding areas is conducted by the Pacific Northwest National Laboratory (PNNL) 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*, and DOE Order 5400.5, *Radiation Protection of the Public and the Environment*. The environmental surveillance sampling design is described in the Hanford Site *Environmental Monitoring Plan*, *United States Department of Energy, Richland Operation Office* (DOE/RL-91-50). This document contains the locations of sites used to collect samples for the Surface Environmental Surveillance Project (SESP). Each section includes directions, maps, and pictures of the locations.

Surface Environmental Surveillance Project

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.

A general knowledge of roads and highways on and around the Hanford Site is necessary to successfully use this manual. Supplemental information (Maps, Gazetteer, etc.) may be necessary if user is unfamiliar with local routes.

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3.0 Farm Products Sampling Locations

3.1 Introduction

Alfalfa and several foodstuffs, including milk, vegetables, fruits, and wine are collected at locations in the Hanford Site environs (Figure 3.1). Samples are collected primarily from locations in the prevailing downwind directions (i.e., to the south and east of the Site). Samples are also collected in generally upwind directions somewhat distant from the Site to provide information on levels of radioactivity that could be attributed to worldwide fallout. Farm products obtained from the Riverview Area are irrigated with water pumped from the Columbia River downstream of the Site.

Milk is the only farm product collected routinely at specific locations within the sampling areas. Therefore, the only maps and photos of individual sampling sites included in this section are of those farms supplying milk for analyses. With the exception of wine, the remainder of the farm products are obtained at various locations within each area. Specific sampling sites are picked based on product availability. Wine samples produced from grapes grown in or near the Sagemoor area of Pasco and in the Yakima Valley are obtained from local wineries. Collected wine samples are processed from grapes harvested during the current sample year.

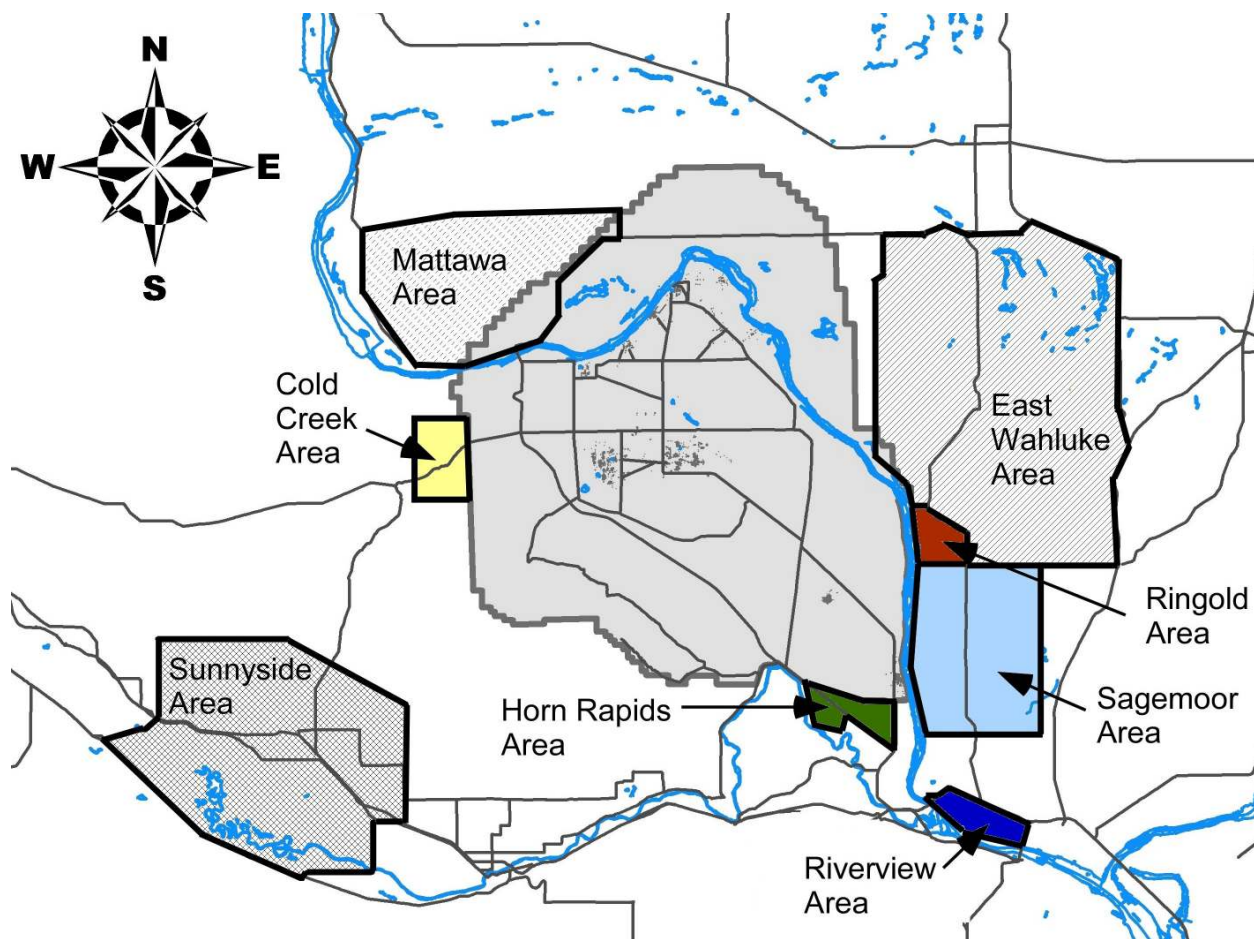


Figure 3.1. Farm Products Sampling Areas

3.2 East Wahluke Area

The East Wahluke food and farm products sampling area consists of a large agricultural area that borders the Hanford Site and is in the general downwind direction. The boundary, beginning in Eltopia, extends north along Highway 395 to the Highway 17 intersection. Then north along Highway 17 to S Athney Road. South and west along S. Atheny and Muse roads to Highway 24. West on Highway 24 to Hendricks (or Mt Vista) Road. South on Hendricks to Mt Vista Road, then south on Mt Vista Road until it ends. Here, the boundary continues to the Columbia River, then along the edge of the river to Ringold Road. East on Ringold Road to Eltopia Ringold Road to Taylor Flats Road. South on Taylor Flats Road to Eltopia Road. East on Eltopia Road to Highway 395.



Figure 3.2. East Wahluke Farm Products Sampling Area

BAGINSKI DAIRY

Latitude

46.7318

Longitude

-119.1542

1. Take Road 68 off of I-182 north to the fork in the road. Veer right and stay on Taylor Flats Road until it intersects Ringold Road (about 13.2 miles).
2. Turn Left and follow Ringold Road for 9.7 miles to Sagehill Road. Turn left onto Sagehill Road and head north.
3. Turn right (east) on Highway 24 and follow the highway until it angles left (north). Just to the north of the bend, exit the highway to your right (S Radar Road).
4. Follow this road south a short distance and turn Left (East) onto Muse Road. Go approximately 1.0 mile.
5. Turn right at the dairy.



Figure 3.3. Milk Sampling Location at the Baginski Dairy



Figure 3.4. Baginski Dairy

Latitude
46.6248
Longitude
-119.2165

1. Take Road 68 off of I-182 north to the fork in the road. Veer right and stay on Taylor Flats Road until it intersects Ringold Road (about 13.2 miles).
2. Turn left and follow Ringold Road until it veers right and follow it down the hill and past Ringold on to Road 170 (Ranger Lane Drive). Follow Road 170 in a north-easterly direction for 4.5 miles to Sagehill Road. Turn left on Sagehill Road and head north.
3. Turn left (west) on Hollingsworth Road and drive approximately
4. 2 miles. Turn right on N. Wahluke Road and drive approximately 1.7 miles. The Davidson Brothers Dairy is the on the right side of N. Wahluke Road approximately 0.4 mile from Hollingsworth Road.



Figure 3.5. Milk Sampling Location at the Davidson Brothers Dairy



Figure 3.6. Davidson Brothers Dairy

SCHEENSTRA FARM

Latitude

46.6439

Longitude

-119.2186

1. Take Road 68 off of I-182 north to the fork in the road. Veer right and stay on Taylor Flats Road until it intersects Ringold Road (about 13.2 miles).
2. Turn left and follow Ringold Road until it veers right and follow it down the hill and past Ringold on to Road 170 (Ranger Lane Drive). Follow Road 170 in a northeasterly direction for 4.5 miles to Sagehill Road. Turn left on Sagehill Road and head north.
3. Follow Sagehill for 2.2 miles and turn left (west) off Sagehill Road onto Hollingsworth Road.
4. After driving 2 miles, turn right (north) off Hollingsworth Road onto North Wahluke Slope Road.
5. Continue on North Wahluke Slope Road 1.9 miles to the Scheenstra Farm on the left side of the road.
6. Enter the milk house through the side door towards the north end of the building to collect the milk sample.



Figure 3.7. Milk Sampling Location at the Scheenstra Farm



Figure 3.8. Scheenstra Farm

3.3 Sagemoor Area

The Sagemoor food and farm products sampling area is an agricultural area north of the City of Pasco. This area is encompassed by Glade Road on the east, Eltopia Road on the north, the Columbia River on the west and Selph Landing Road on the South.



Figure 3.9. Sagemoor Farm Products Sampling Area

BLEAZARD FARM

Latitude

46.4267

Longitude

-119.1950

1. Take Road 68 exit off of I-182 and head north 2.4 miles to the fork in the road. Take the right-hand branch (Taylor Flats Road).
2. The Bleazard Farm is on the east side (right) of Taylor Flats Road between Dogwood Road and Elm Road. It is easily identified by the white board fence around the front yard with a pole gateway that has a "Bleazard" name board hanging from the top in the center. There is a row of trees by the driveway leading to a yellow cement block farmhouse.
3. The milk sample is collected in the barn behind the house.



Figure 3.10. Milk Sampling Location at the Bleazard Farm



Figure 3.11. Bleazard Farm

**VAN BATAVIA
(VAN RYNZ) DAIRY**

Latitude
46.4220
Longitude
-119.1445

1. Take Road 68 exit off of I-182 and head north 2.4 miles to the fork in the road. Take the right-hand branch (Taylor Flats Road).
2. Drive north on Taylor Flats Road to Edwin Markham School located at the intersection of Elm and Taylor Flats Roads.
3. Turn right on Elm and proceed eastward to Everett Road.
4. Turn right (south) at Everett Road onto a dirt road. This road leads directly to the Van Batavia Dairy.

NOTE: The dairy owners have requested that PNNL staff drive slowly on this road to minimize road dust, particularly when passing corrals holding dairy cattle. The barns and milk room are located on the west (right) side of this dirt road.

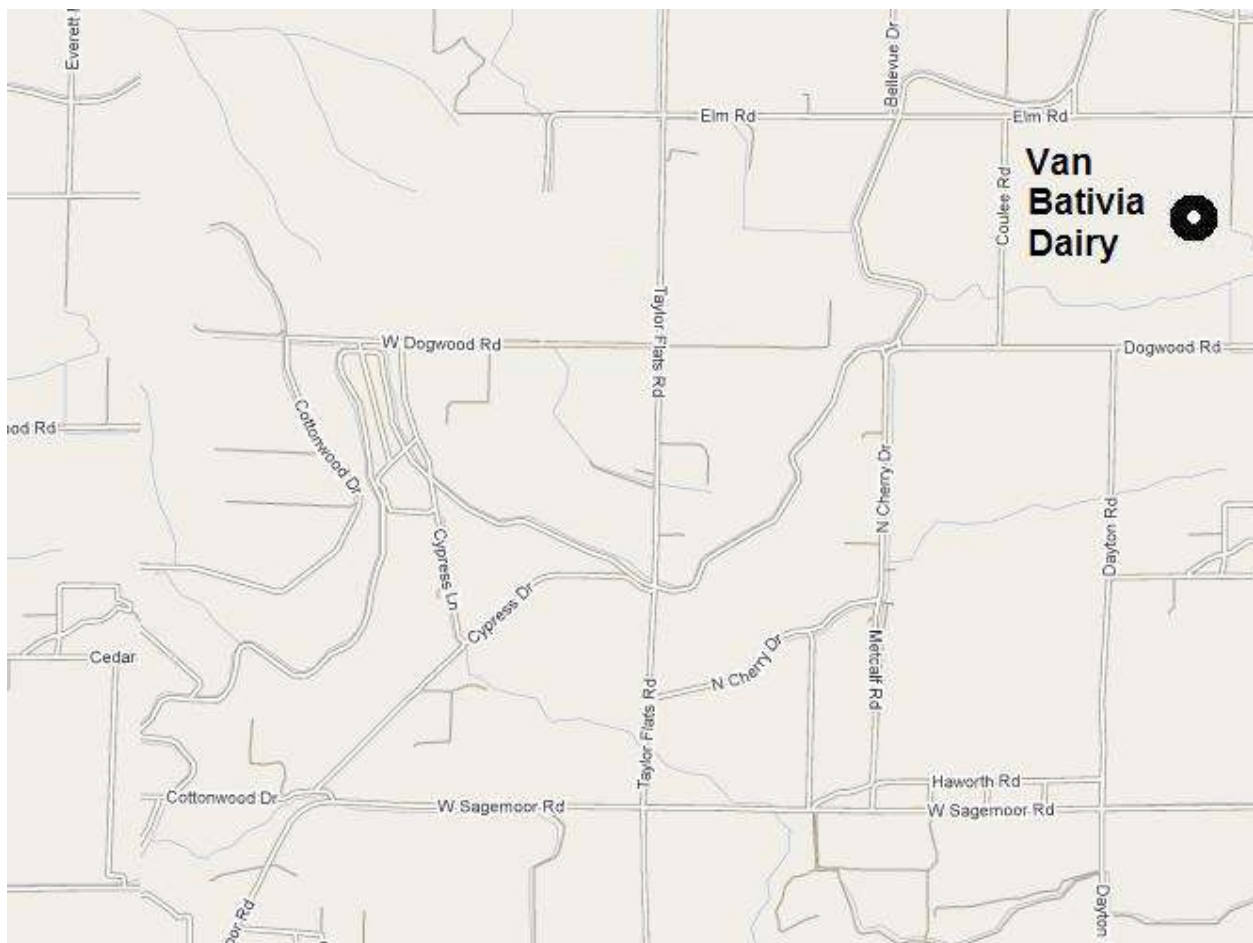


Figure 3.12. Milk Sampling Location at the Van Batavia Dairy

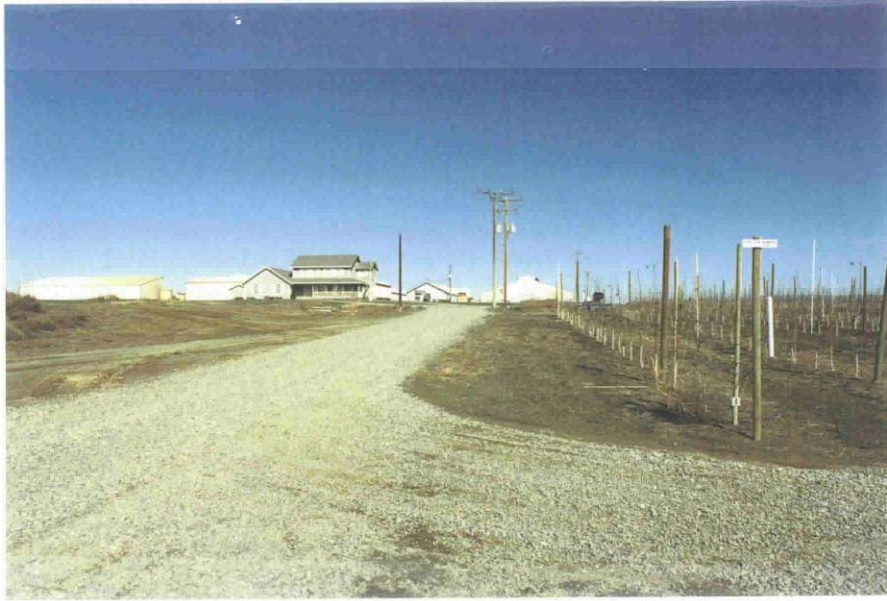


Figure 3.13. Van Batavia Dairy

LEWIS FARM

Latitude

46.3444

Longitude

-119.1988

1. Follow Interstate-182 toward Pasco and exit at Road 68.
2. Turn left (north) at the stop sign.
3. When the road forks, go right on Taylor Flats Road.
4. Continue on Taylor Flats Road past Selph Landing Road.
5. The Lewis Farm is located on the left (west) side of Taylor Flats Road a short distance beyond Selph Landing Road.



Figure 3.14. Milk Sampling Location at Lewis Farm



Figure 3.15. Lewis Farm

3.4 Ringold Area

The Ringold Area is a relatively small area located between the Sagemoor and East Wahluke sampling areas. The boundary is the Columbia River to the west, the East Wahluke Area on the north and east, and the Sagemoor Area to the South.

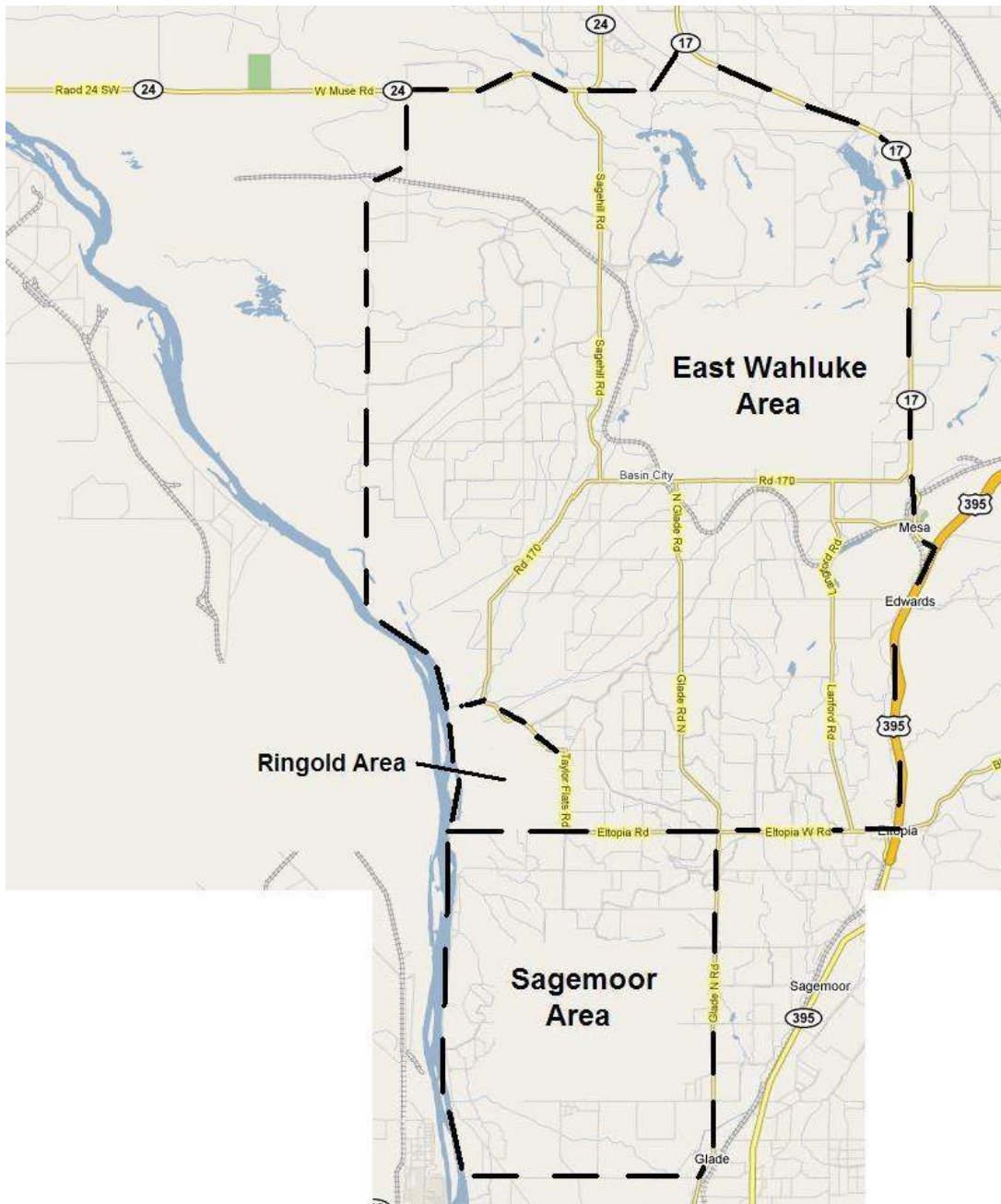


Figure 3.16. Ringold Food and Farm Products Sampling Area

3.5 Riverview Area

The Riverview sampling area is that portion of Pasco and Franklin County encompassed by interstate I-182, the Columbia River and US Highway 395. Also included in the sampling area is a small (~1.2 mi²) area west of I-182 bordered by Court Street, Harris Road and I-182.

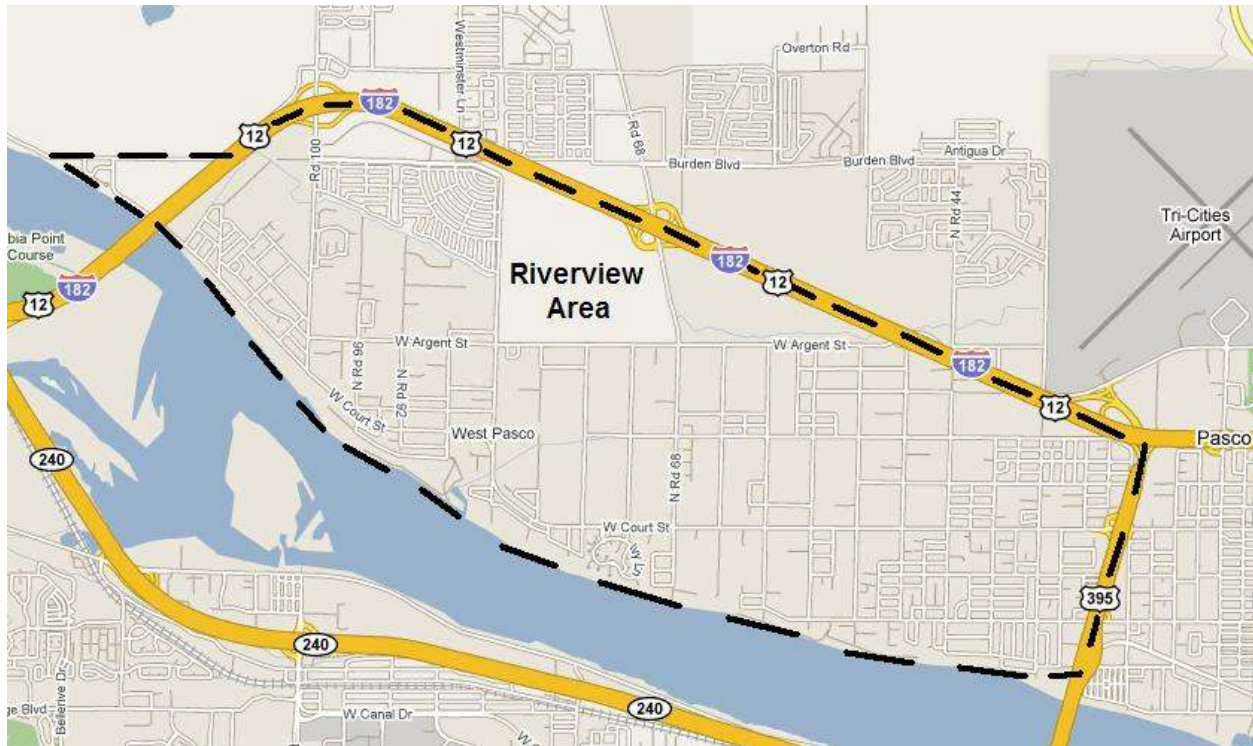


Figure 3.17. Riverview Farm Products Sampling Area

3.6 Sunnyside Area

The Sunnyside Food and Farm Products sampling area is an agricultural area centered on the city of Sunnyside. The boundary is as follows: From Grandview, south on Euclid Road to E. Euclid Road, and east to Highway 22 in Mabton. Northwest on Highway 22 to Highway 223. North of highway 223 to Beam Road. North on Beam Road to E. Houghton Drive. East on E. Houghton until it ends. Between here and Highway 241, the northern boundary is defined by the edge of irrigated farmland. At the intersection of Highway 241 and irrigated farmland, the boundary extends south to the intersection of Highway 241 and the Roza canal. East along the Roza canal to where it crosses North County Line Road. South on North County Line Road to McCreadie Road. Southwest on McCreadie Road to Highway 12. West on Highway 12 to Euclid Road.

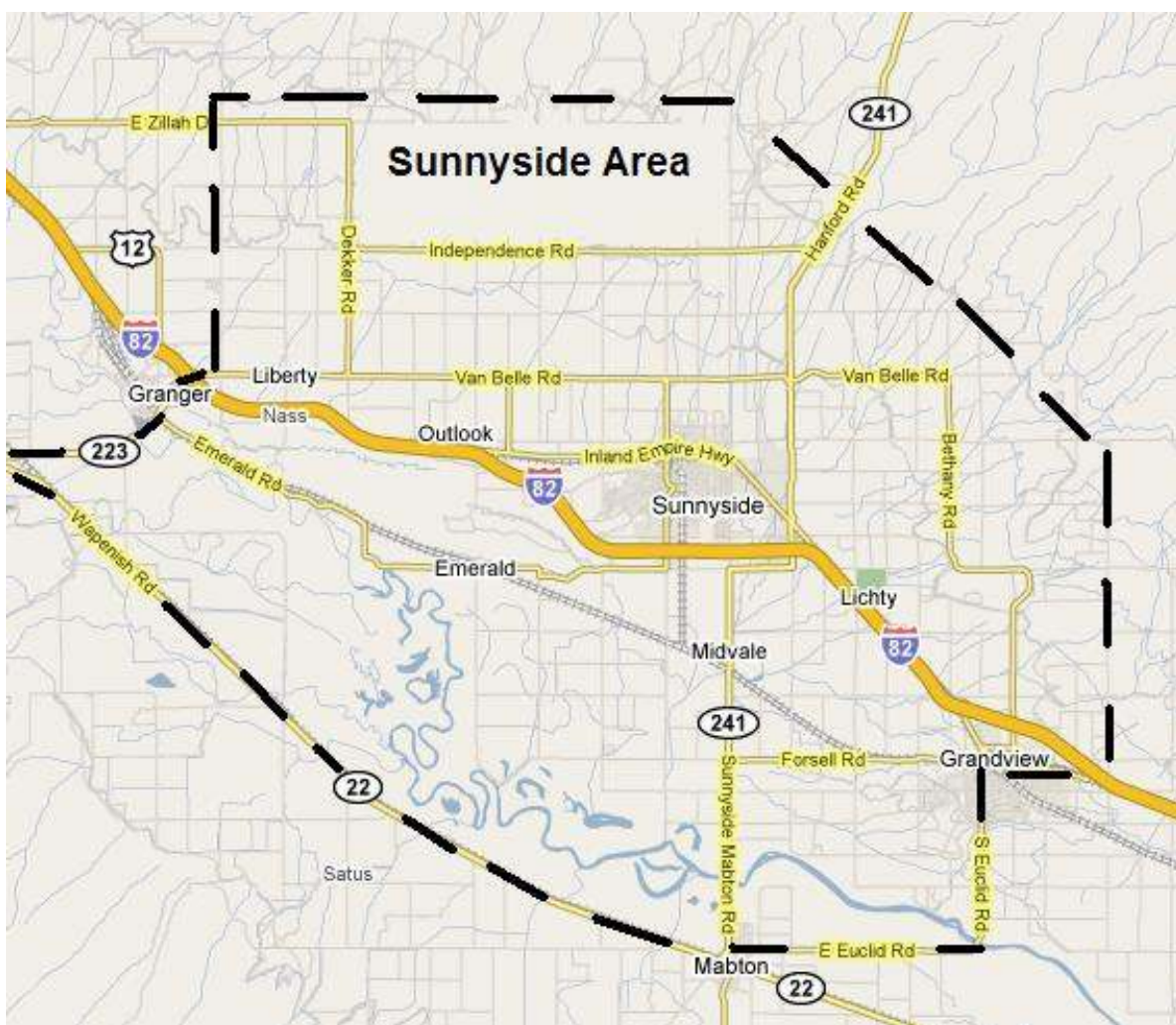


Figure 3.18. Sunnyside Farm Products Sampling Area

**SCHEENSTRA
(SUNNYSIDE) FARM**

Latitude

46.30481

Longitude

-119.98207

1. When traveling between the Hanford Site and Yakima on Interstate 82, take the eastern most Sunnyside Exit (69).
2. Head south on Highway 241 (Waneta Road).
3. Stay on Highway 241 as Waneta Road turns into Alexander Road.
4. Take the first right (turn north) into the Dairy. The dairy is located on a hill overlooking the interstate and Exit 69.

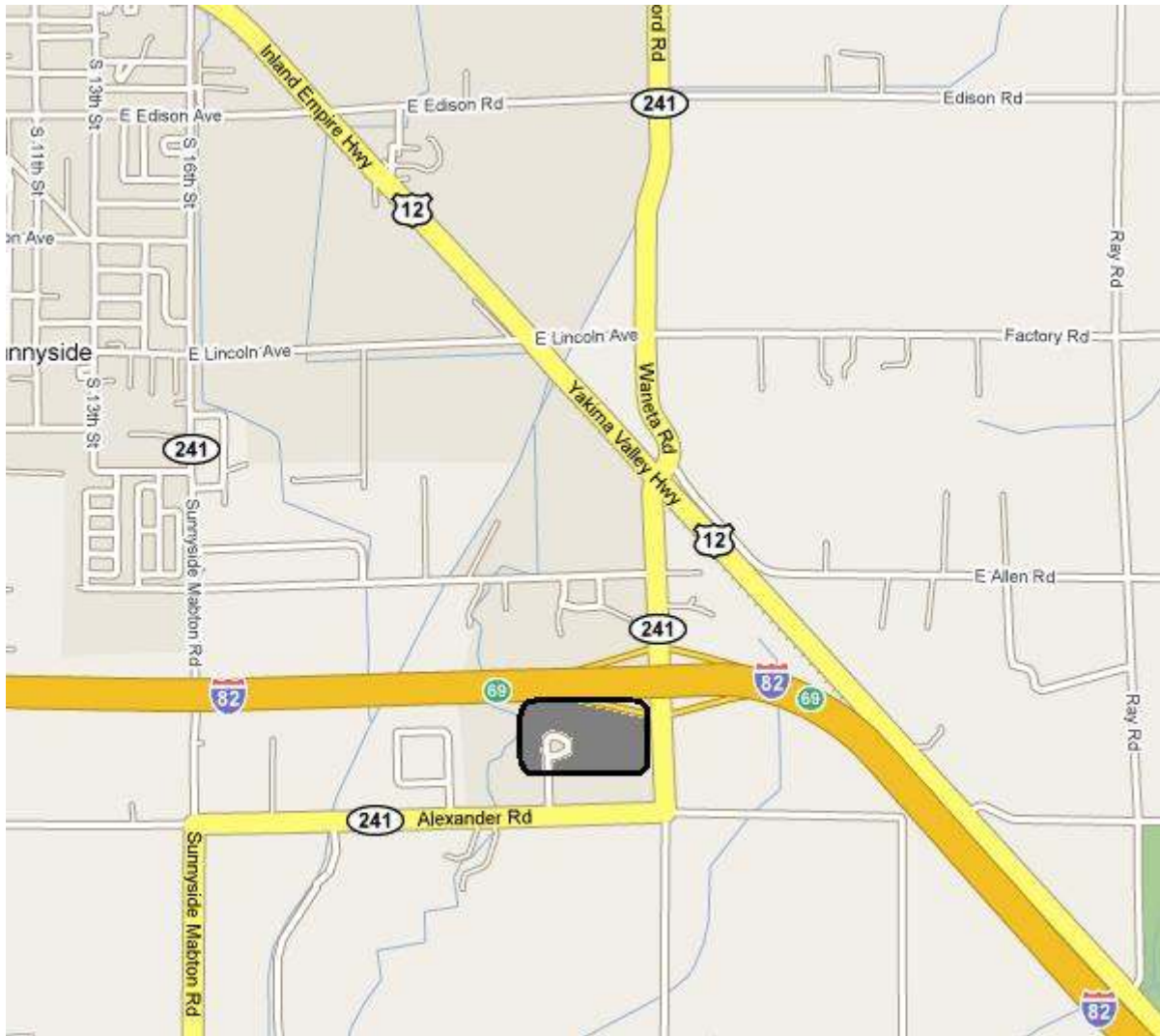


Figure 3.19. Milk Sampling Location at the Meeker Farm

MEEKER FARM

Latitude
46.3607
Longitude
-120.0000

5. When traveling between the Hanford Site and Yakima on Highway 24, turn right (south) on Highway 241 and drive about 15.1 miles to where Highway 241 (Sheller Road) intersects Independence Road.
6. Turn right on Independence Road and go to Washout Road.
7. Turn left (south) and follow Washout Road 1 mile to Arrow-Smith Road.
8. The Meeker Farm is the first place to the right on the corner. Arrowsmith Road goes up a small hill. At the top of the hill, the gravel driveway goes straight into the farmyard to a cement block barn where the milk sample is collected.



Figure 3.20. Milk Sampling Location at the Meeker Farm



Figure 3.21. Meeker Farm

3.7 Cold Creek Area

The Cold Creek Area is a limited agricultural area located on the western edge of the Hanford Site, west of the Yakima Barricade entrance. There are no physical markers for this area, but it is in-between the Highway 240 and Highway 241 intersections with Highway 24. It lies entirely within the Cold Creek Drainage, which drains onto the Hanford Site.

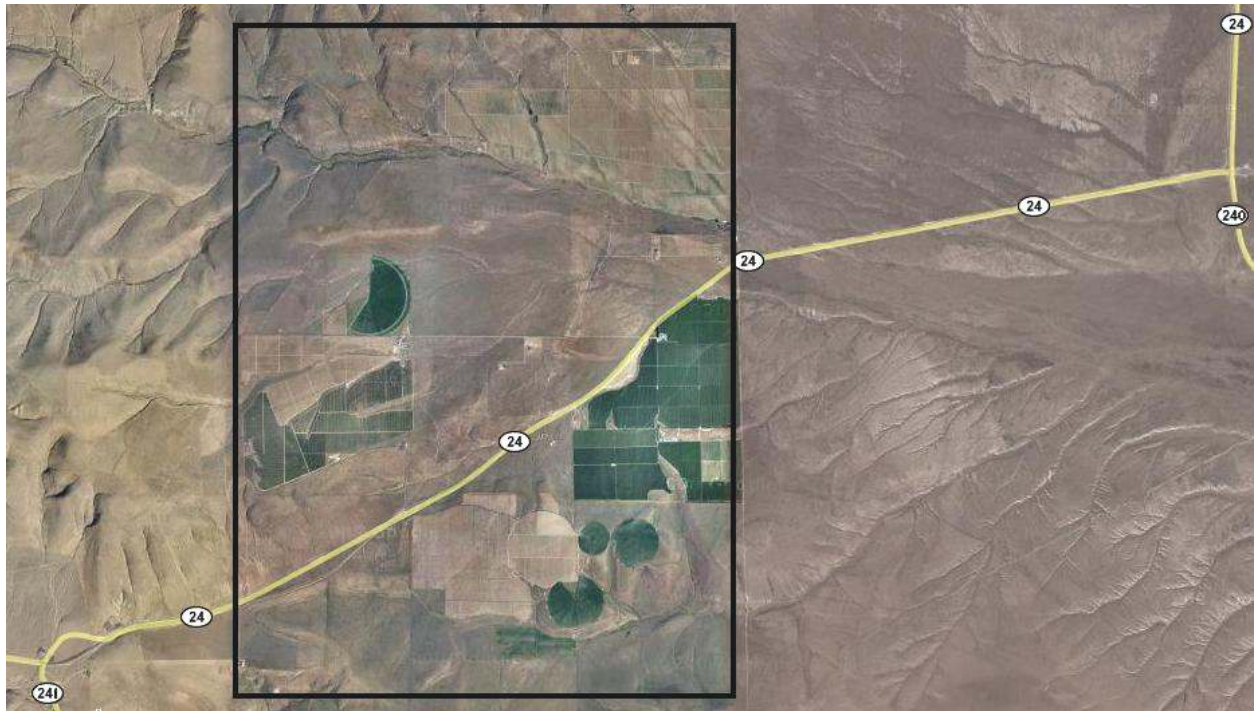


Figure 3.22. Cold Creek Farm Products Sampling Area

3.8 Mattawa Area

The Mattawa Food and Farm Products sampling area is defined by the following boundary, starting at the intersection of State Highways 24 and 243 near Vernita Bridge. Northeast on Highway 24 to E SW Road. North on E SW Road to the irrigation canal. West along the canal until it ends, then due west to Highway 243. South and east on Highway 243 to the intersection with Highway 24.



Figure 3.23. Mattawa Farm Products Sampling Area

3.9 Horn Rapids Area

The Horn Rapids food and farm products sampling area is a relatively small area located between north Richland and the Yakima River. The boundary begins at the intersection of Stevens Drive and Highway 240, and extends north on Stevens Drive to Horn Rapids Road. The fields on the Battelle Campus are also within the Horn Rapids Area. Proceed west on Horn Rapids Road to Highway 240 (note that Horn Rapids Road is not drivable the entire distance between Stevens Drive and Highway 240). From the intersection of Horn Rapids Road and Highway 240, west to N Snively Road. South on N Snively Road to N Grosscup Road. East and North on N Grosscup Road to Highway 240. Southeast on Highway 240 to the intersection with Stevens Drive.

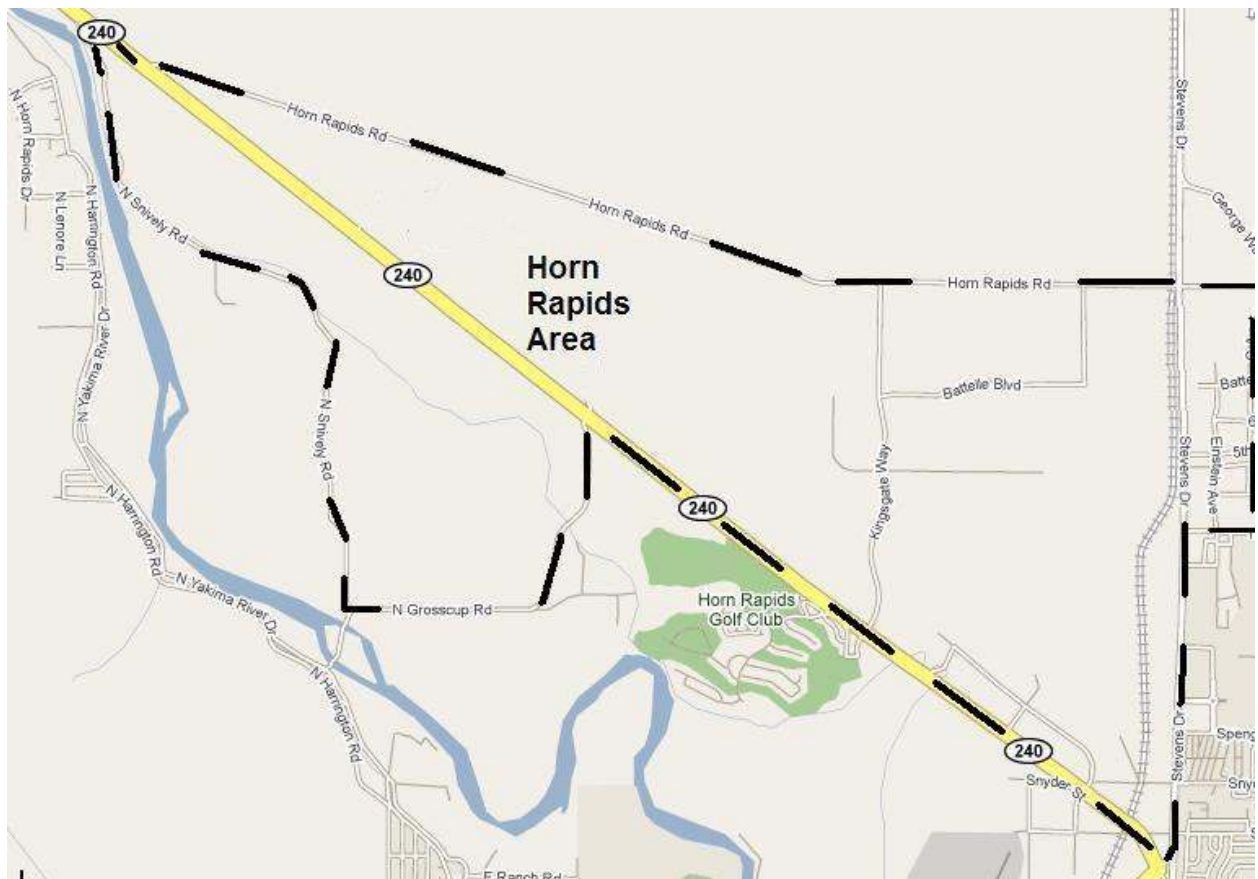


Figure 3.24. Horn Rapids Farm Products Sampling Area

4.0 Soil and Vegetation Sampling Locations

4.1 Introduction

Surface soil and vegetation samples are collected from a number of undisturbed unirrigated locations to monitor the potential buildup of atmospherically deposited radionuclides. By comparing results from samples collected at downwind locations to results from upwind or distant locations, the contribution of radionuclides from Hanford operations can be assessed.

4.2 Soil and Vegetation Sample Locations Collocated at Air Sampling Stations

The following soil and vegetation sampling locations are located next to air sampling locations. The locations are marked with a sign. This table includes GPS coordinates for these sampling locations. For directions, maps, and pictures of these locations, refer to the air sampling location with the same name in Volume I, Section 1.

Table 4.1. Soil and Vegetation Samples Collected at Air Monitoring Stations

Coordinate System: Latitude-Longitude			
Latitude Longitude Units: Degrees			
Elevation Units: Meters			
Feature Name	Latitude	Longitude	Elevation
ONSITE			
200 ESE	46.539908	119.504666	202
E of 200 E	46.550166	119.497579	190
S of 200 E	46.514645	119.519424	191
Yakima Barricade	46.577978	119.726094	227
Rattlesnake Springs	46.512378	119.681845	180
Wye Barricade	46.481704	119.391460	148
OFFSITE			
Wahluke Slope	46.736887	119.640927	189
W end Fir Road	46.340423	119.282326	176
100 K	46.643988	119.59572	136

Table 4.2. GPS coordinates for each Soil and Vegetation Sampling Location

Coordinate System: Latitude-Longitude			
Latitude Longitude Units: Degrees			
Elevation Units: Meters			
Feature Name	Latitude	Longitude	Elevation
ONSITE			
100 N Shore Above HGP	46.6696	119.5766	130
100 N Spring Shoreline	46.6778	119.5684	130
Above 100 D Pumphouse	46.6922	119.5517	135
E of 100-N Area	46.6736450	119.541957	133
NE 100-N Area	46.6913043	119.5517111	140
200-ENC	46.569213	119.5387103	185
E of 200W gate	46.5546096	119.6070158	224
S of 200W	46.5106201	119.6094658	190
SW BC Cribs	46.5073848	119.5551843	204
N of 300 Area	46.3851074	119.274720	119
S of 300 Area	46.3517	119.2709	122
SE side FFTF	46.4369278	119.3557674	174
400 E	46.4361	119.3539	171
100 Area Fire Station	46.6350526	119.5590562	162
ALE Field Lab	46.38947	119.53530	378
Hanford Townsite	46.5865712	119.4010022	124
Hanford Rivermile 28 Shoreline			116
Prosser Barricade	46.3923288	119.412032	146
OFFSITE			
Riverview- Harris farms	46.2707	119.2442	116
Byers Landing	46.3585054	119.2460884	140
Sagemoor Farms	46.3707	119.2459	170
Taylor Flats No. 2	46.3775	119.2605	122
Ringold	46.4935	119.2507	292
Berg Ranch	46.7382044	119.3448482	240
N end Vernita Bridge	46.647714	119.73022	133
Benton City	46.3395616	119.4820438	150
Sunnyside	46.3989	119.9502	447
Walla Walla	46.0552	118.4337	228
McNary Dam	45.925411	119.288916	90
Moses Lake	47.1331	119.2585	354
Washtucna	46.7577	118.3107	312
Connell	46.66346	118.877342	275
Othello	46.8113	119.1331	341
Yakima	46.5218	120.4890	335

**100 N SHORE
ABOVE HGP**

Latitude
46.6696

Longitude
119.5766

1. Take Route 4-N towards 100 N Area. Take turn-off to the left to 100-N Area. Just prior to reaching the 100 N Area building complex, turn left.
2. Follow this road around the 100 N Reactor area and the former HGP Steam Turbine Complex. This road will cross two sets of railroad tracks. After crossing the second set, turn towards the river along a road just outside of the 100N-HGP fence line.
3. Soil and vegetation are collected between the river shoreline and this last leg of the road that parallels the shoreline.



Figure 4.1. Soil and Vegetation Sampling Location at 100 N Shore Above HGP



Figure 4.2. 100 Shore Above HGP Soil and Vegetation Sampling Location

100 N SPRING SHORELINE

Latitude
46.6778

Longitude
119.5684

1. Take Route 4-N towards the 100 N Area. Take turn-off to the left to 100 N Area.
2. Travel through the parking lot north of 1120 Building and take the dirt road heading east out of the parking lot.
3. Follow the road until it T's, then turn left. Continue on the road until you get outside the fenced area.
4. The sampling area is between the perimeter fence and the river shoreline.

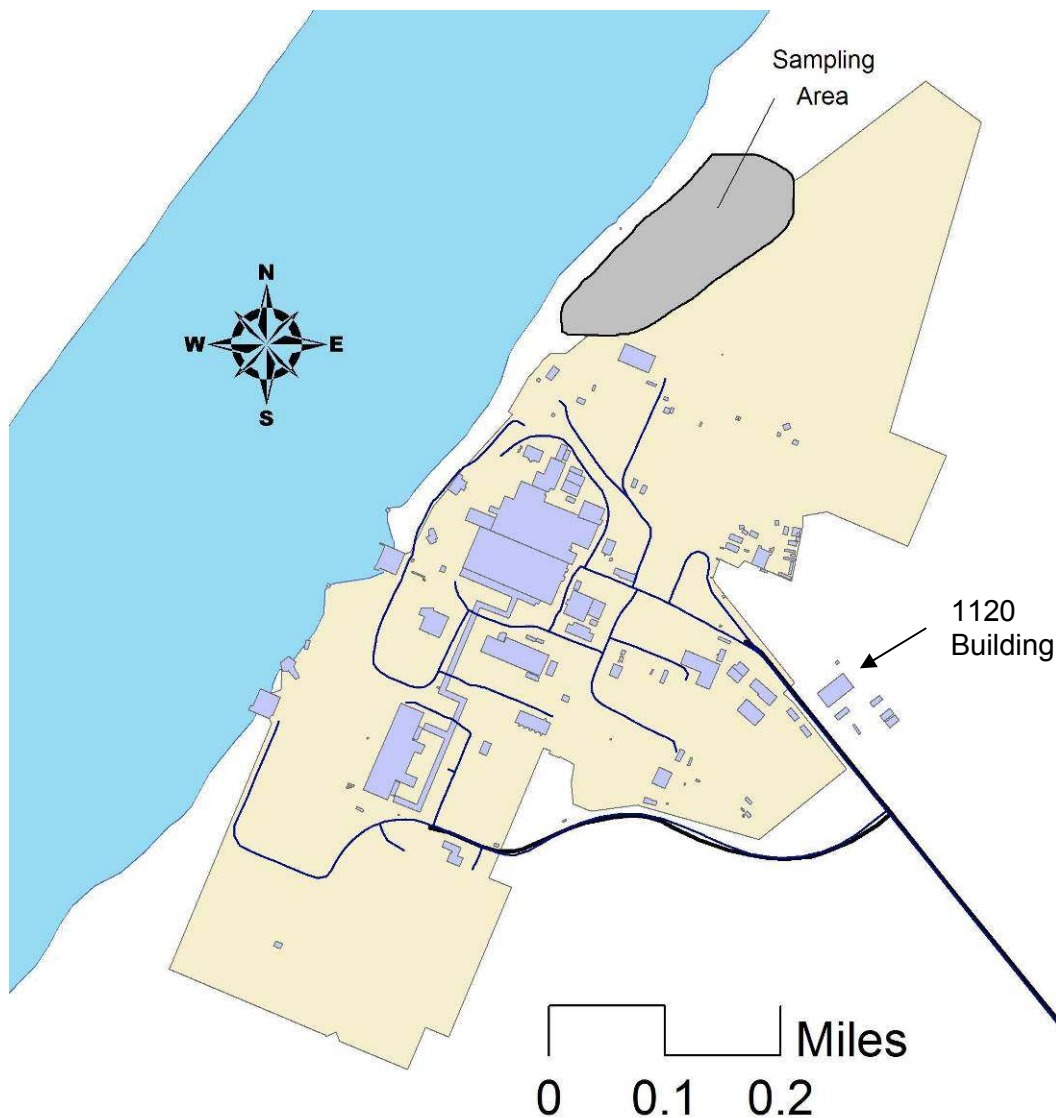


Figure 4.3. Soil and Vegetation Sampling Location at 100 N Spring Shoreline



Figure 4.4. 100 N Spring Shoreline Soil and Vegetation Sampling Location

ABOVE 100 D PUMPHOUSE

Latitude
46.6922

Longitude
119.5517

1. Take 4-N towards 100 D Reactor.
2. Turn left (west) on to a paved road and follow the perimeter road around the reactor to where it follows the river shoreline eastward towards the water intake structure. The road drops down to a point about 70 yd short of the intake structure.
3. Soil and vegetation is collected from the area between the river shoreline and this road that descends down to the shoreline. This is near the downstream end of the ISRM barrier (a long line of groundwater wells).

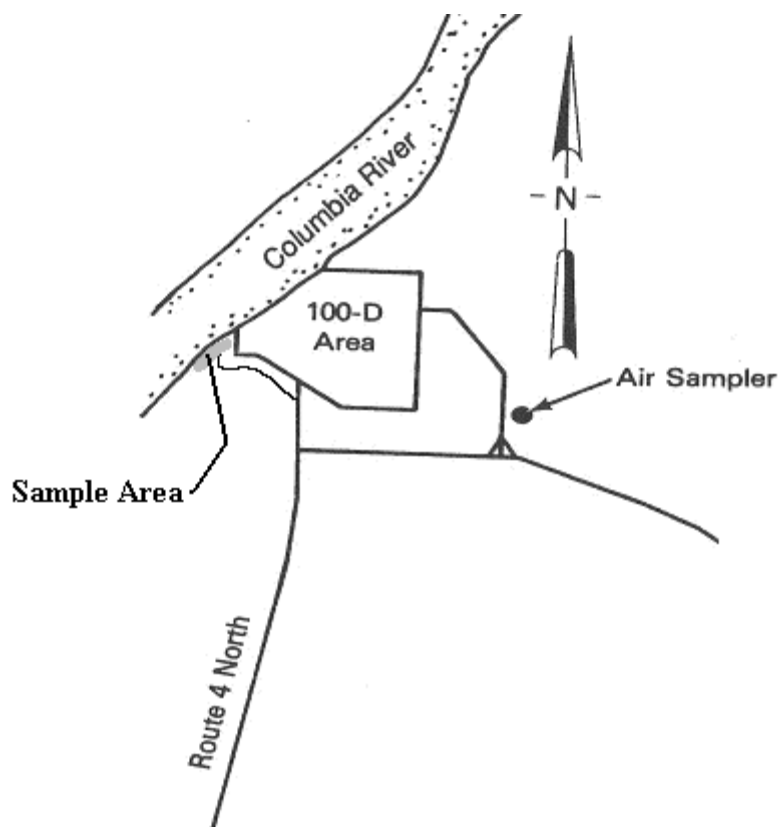


Figure 4.5. Soil and Vegetation Sampling Location Above 100 D Pumphouse



Figure 4.6. Above 100 D Pumphouse Soil and Vegetation Sampling Location

E OF 100 N

Latitude
46.6736450

Longitude
119.541957

1. Travel north on Rt. 4N past the road into the 100 N Area, to the railroad tracks.
2. Pass over the railroad and turn right (east) on a gravel trail along the railroad tracks. Go 0.2 miles to the power line
3. Turn left (North) on dirt road along power line, then go 0.2 miles. Soil and vegetation are sampled east of the power lines opposite the second set of power poles.

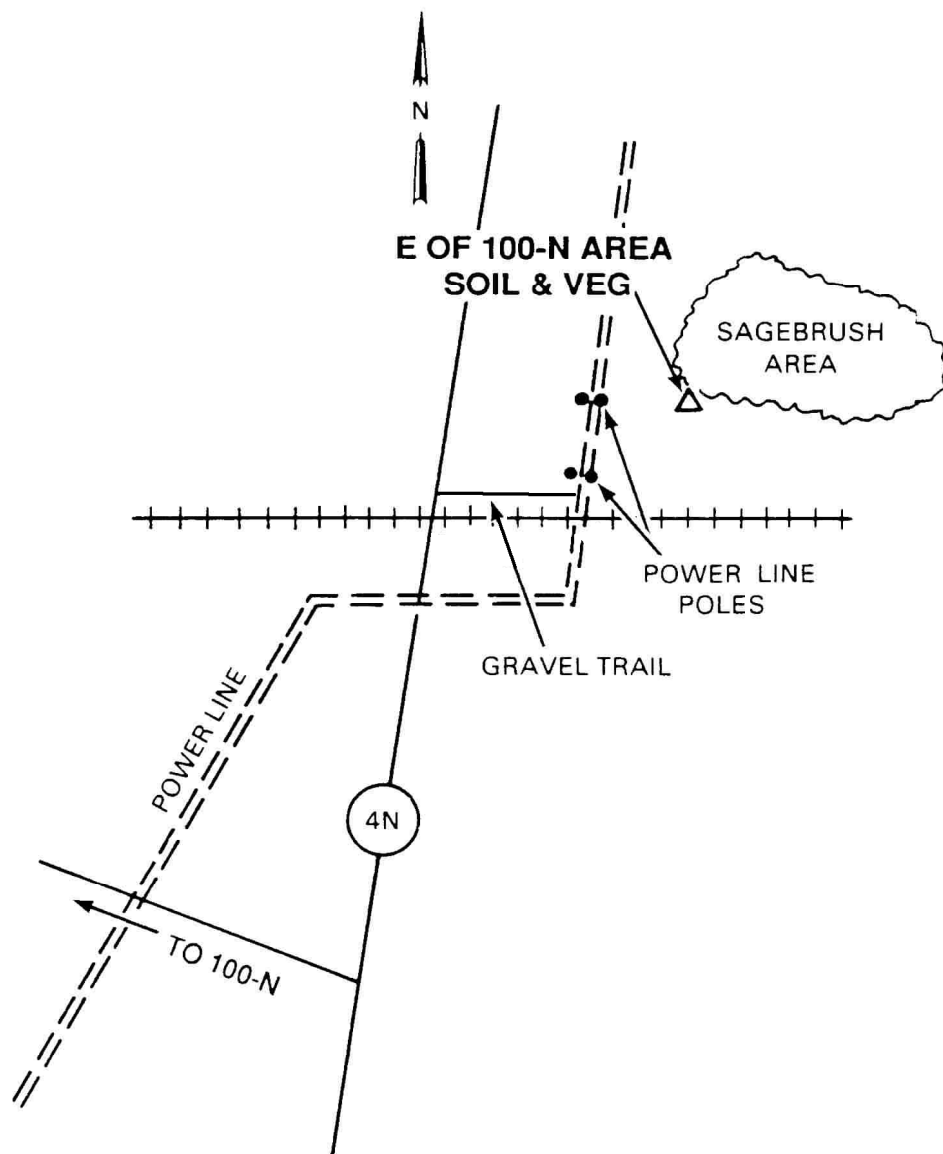


Figure 4.7. Soil and Vegetation Sampling Location E of 100 N



Figure 4.8. E of 100 N Soil and Vegetation Sampling Location

NE OF 100 N

Latitude
46.6913043

Longitude
119.5517111

1. Travel north on Rt. 4N 1.8 miles beyond the turnoff to the 100 N Area.
2. Turn left (west) on paved road 0.3 miles, road will turn north.
3. Turn left (west) on gravel road towards met tower. Follow dirt trail around crib area for 0.2 miles.
4. Follow the trail 0.3 miles to a small cement block building. Soil and vegetation are sampled a short distance southwest of the building.

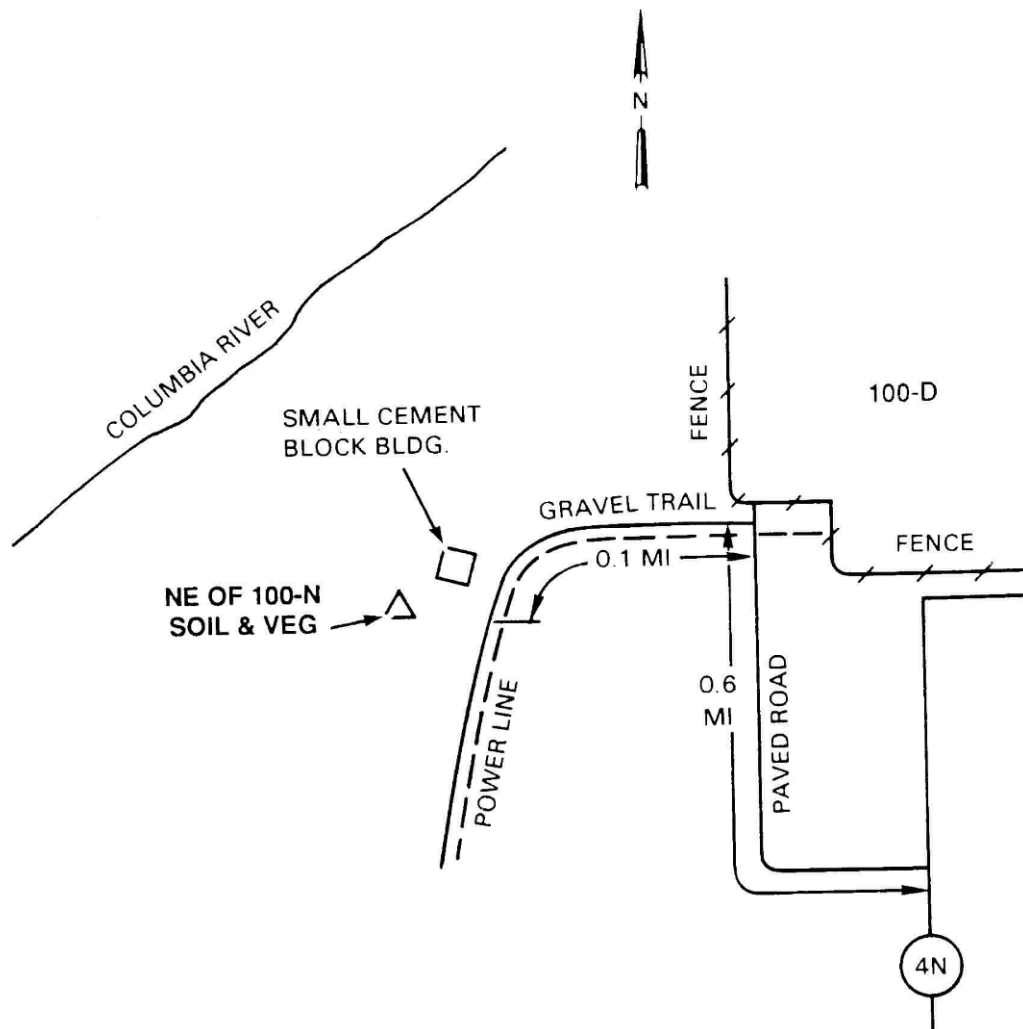


Figure 4.9. Soil and Vegetation Sampling Location NE of 100 N



Figure 4.10. NE of 100 N Soil and Vegetation Sampling Location

**200 ENC (EAST,
NORTHCENTRAL)**

Latitude
46.569213

Longitude
119.5387103

1. Follow the dirt road outside the 200 E perimeter fence along the north side.
2. The soil and vegetation samples are collected approximately 200 ft north of the fence, opposite the power pole at the intersection of 12th Street and Baltimore Avenue.

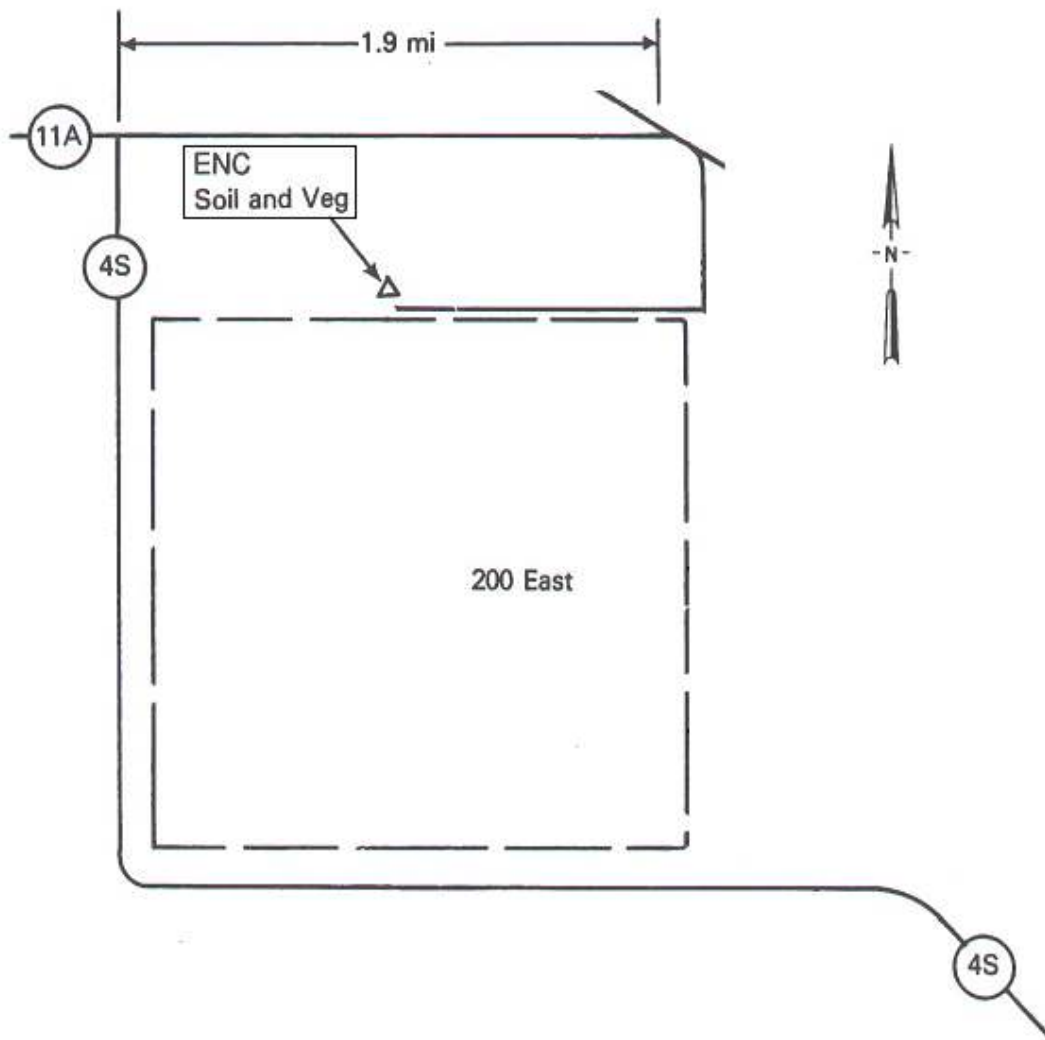


Figure 4.11. Soil and Vegetation Sampling Location at 200 ENC



Figure 4.12. 200 ENC Soil and Vegetation Sampling Location

E OF 200 W GATE

Latitude
46.5546096

Longitude
119.6070158

1. E of 200 W Gate soil and vegetation samples are collected at the northeast corner of Rt. 3 and the north-south road just before you enter 200 W.
2. An environmental sampling sign on a stake marks the location.
3. The sign can be seen from the intersection just outside the 200 W. gate.

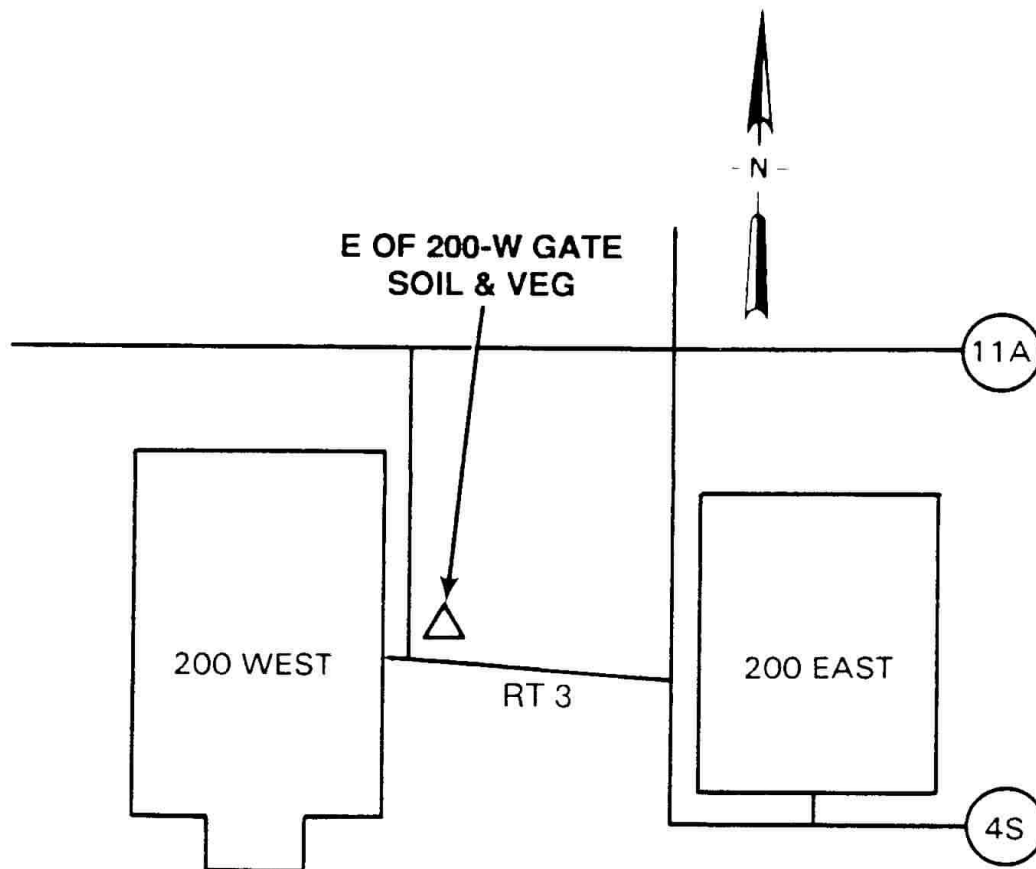


Figure 4.13. Soil and Vegetation Sampling Location E of 200 W Gate



Figure 4.14. E of 200 W Gate Soil and Vegetation Sampling Location

S OF 200 W

Latitude
46.5106201

Longitude
119.6094658

1. Turn south off Rt. 4S onto the Central Landfill Road (Army Loop Road), 14.1 miles from the 300 Area Cypress Street exit.
2. Travel 0.9 mile to the intersection at Army Loop Camp.
3. Soil and vegetation are sampled northeast of the intersection across the road from the Army Loop Camp. The site is on the right (east) side of the gravel road leading north to the 200 W Area a short distance from the corner.
4. The S of 200 W sampling location is 5.9 miles from the intersection of Rt. 11A and Army Loop Road.

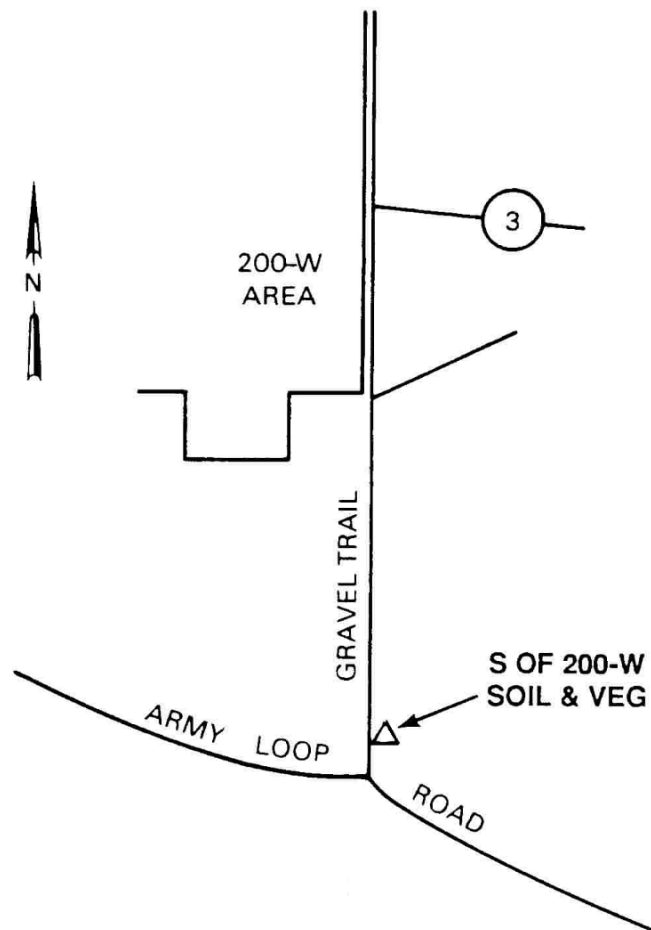


Figure 4.15. Soil and Vegetation Sampling Location S of 200 W



Figure 4.16. S of 200 W Soil and Vegetation Sampling Location

SW OF B/C CRIBS

Latitude
46.5073848

Longitude
119.5551843

1. Turn off Route 4S at the "US Ecology Burial Ground" sign located near the southwest corner of 200 East Area.
2. Follow the gravel road past the US Ecology Office and the fenced burial grounds 2.7 miles.
3. The soil and vegetation sampling site is down the hill and across the road from the SW of B/C Cribs air sampler. An environmental monitoring site sign marks the location.

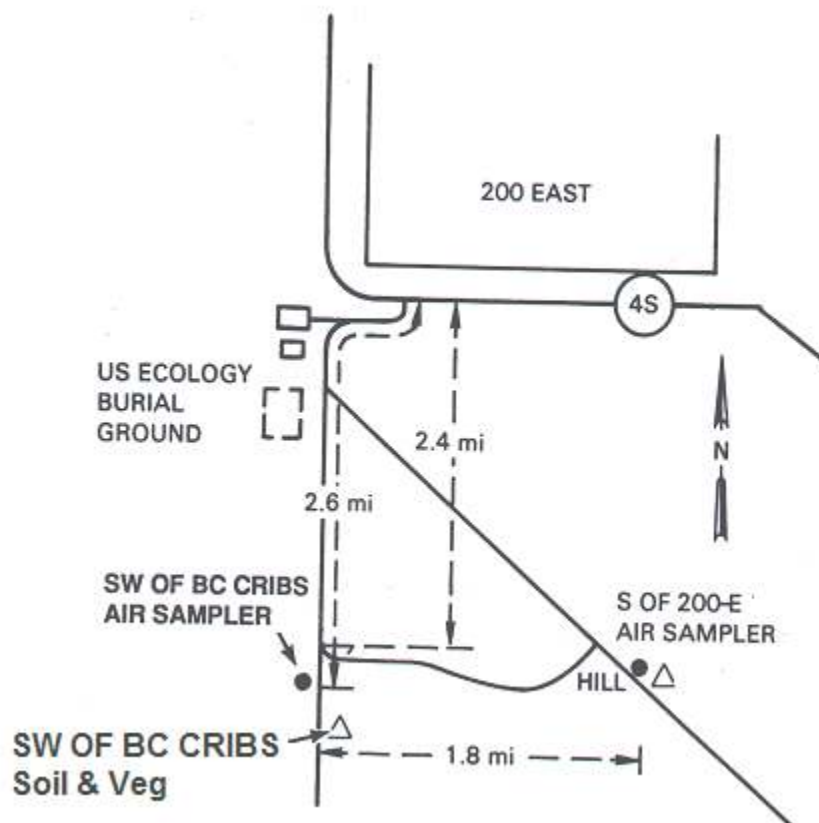


Figure 4.17. Soil and Vegetation Sampling Location SW of B/C Cribs



Figure 4.18. SW of B/C Cribs Soil and Vegetation Sampling Location

N OF 300 AREA

Latitude
46.3851074

Longitude
119.274720

NOTE: This area is under the ERC clean-up effort. The following directions may not be accurate and change depending on the clean-up activities. You may have to undergo specific training and check in procedures to this location.

1. Travel north on Stevens Drive (R. 4S).
2. Just before crossing the first set of railroad tracks, turn right (toward the river) onto a partially paved gravel road.
3. Continue on the gravel road to the 4-way intersection. Continue straight through the intersection, going due east. Do not veer to the north or south.
4. This road ends at a road paralleling the river. Turn north (left).
5. Travel parallel to the river on this road until it begins to make a sweeping turn away from the river. The sampling location is next to a vertical railroad tie on the outside edge of this curve.



Figure 4.19. Soil and Vegetation Sampling Location N of 300 Area



Figure 4.20. N of 300 Area Soil and Vegetation Sampling Location

S OF 300 AREA

Latitude
46.3517

Longitude
119.2709

1. Travel north on George Washington Way to Horn Rapids Road.
2. Turn right (east) from George Washington Way onto Horn Rapids Road.
3. The soil and vegetation samples are collected on the north side of the road, 0.1 miles east of George Washington Way.

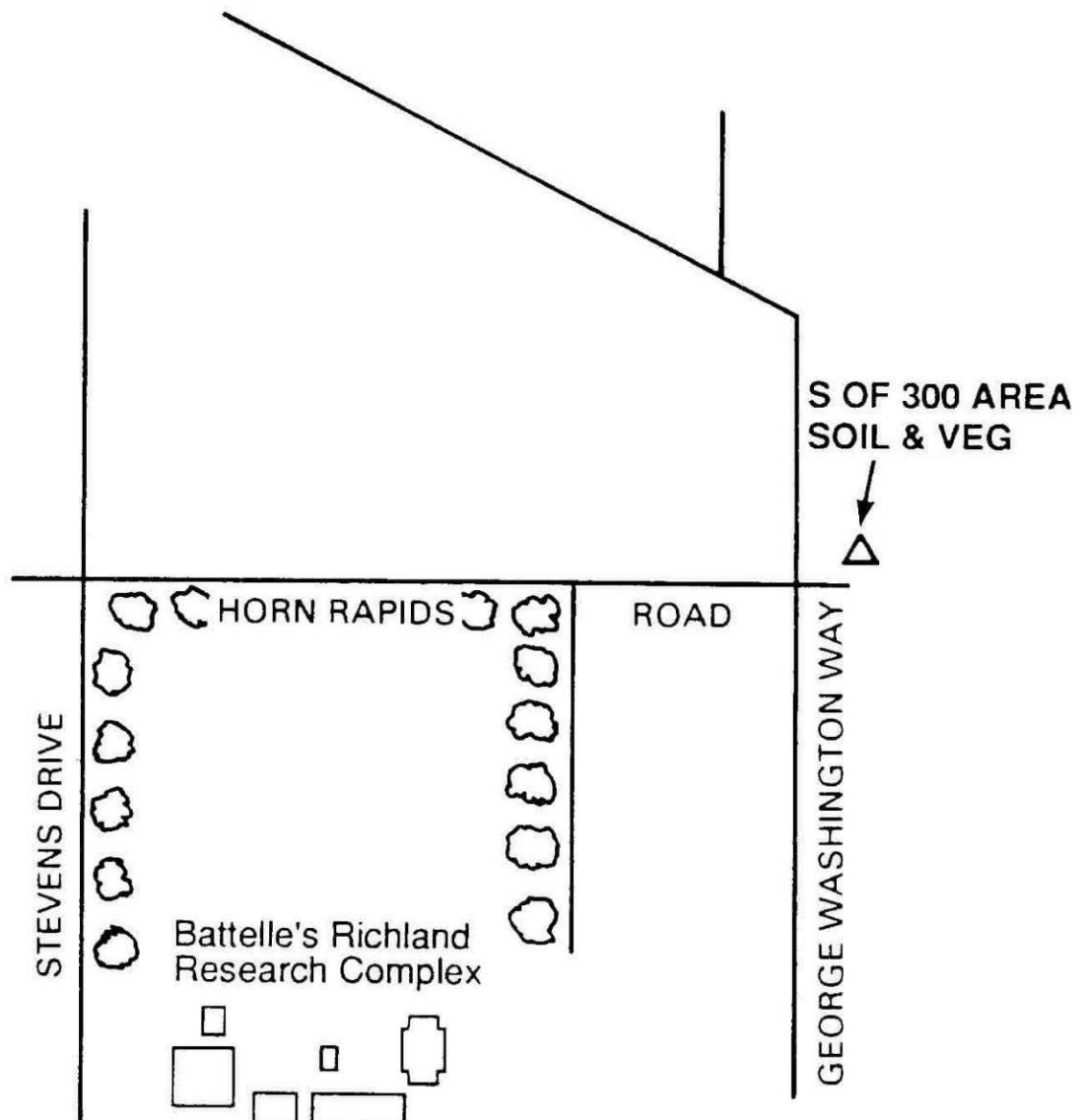


Figure 4.21. Soil and Vegetation Sampling Location S of 300 Area



Figure 4.22. S of 300 Area Soil and Vegetation Sampling Location

SE SIDE OF FFTF

Latitude
46.4369278

Longitude
119.3557674

1. Travel north on Rt. 4S and follow the signs to the FFTF site.
2. Turn to the left (south) onto the road that goes around the south parking lot.
3. Follow the road around three curves to where it goes straight (west) past the parking lot.
4. The soil and vegetation samples are collected on a knoll southeast of the parking lot.

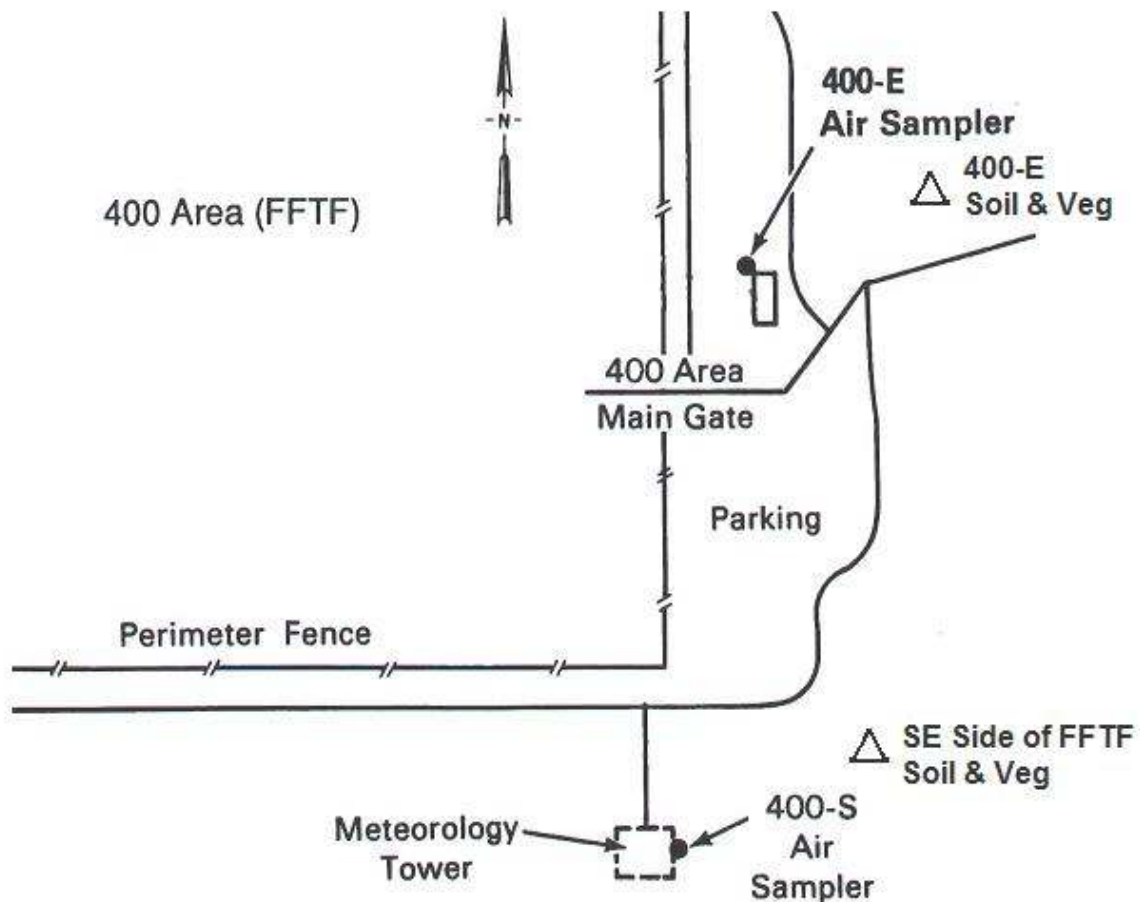


Figure 4.23. Soil and Vegetation Sampling Location SE Side of FFTF



Figure 4.24. SE Side of FFTF Soil and Vegetation Sampling Location

400 E

Latitude
46.4361

Longitude
119.3539

1. Travel north on Route 4S and follow the signs to the FFTF site.
2. Enter the parking lot on the right (north) side of the road.
3. Continue through the parking lot keeping to the right side. The sampling area is located to the right (west) of the parking lot, just past the top of a knoll. An environmental monitoring site sign marks the location.

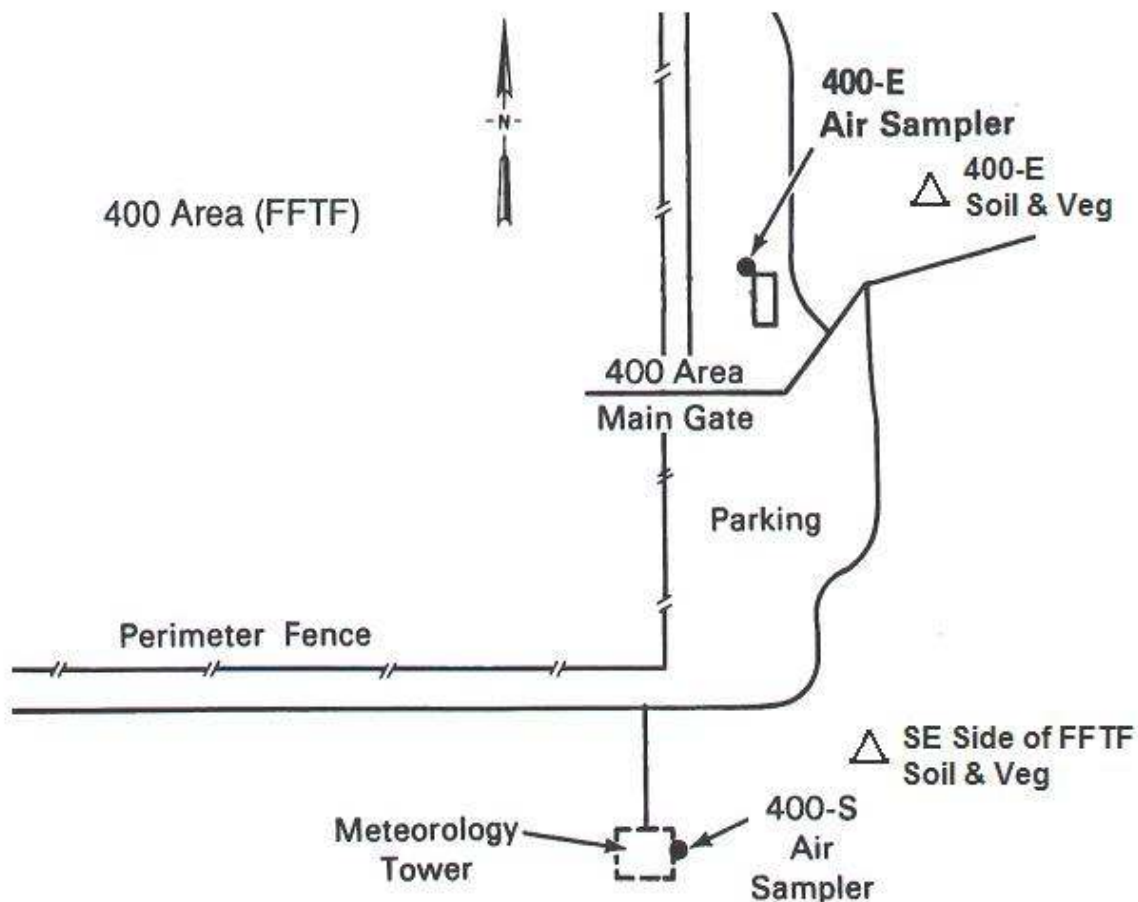


Figure 4.25. Soil and Vegetation Sampling Location at 400 E



Figure 4.26. 400 E Soil and Vegetation Sampling Location

**100 AREA FIRE
STATION**

Latitude
46.6350526

Longitude
119.5590562

1. Travel north on Rt. 4N to Rt. 1. Turn left (west) on Rt. 1 and go approximately 400 ft from the intersection.
2. The 100 Area Fire Station soil and vegetation samples are collected about 100 ft south of Rt. 1.

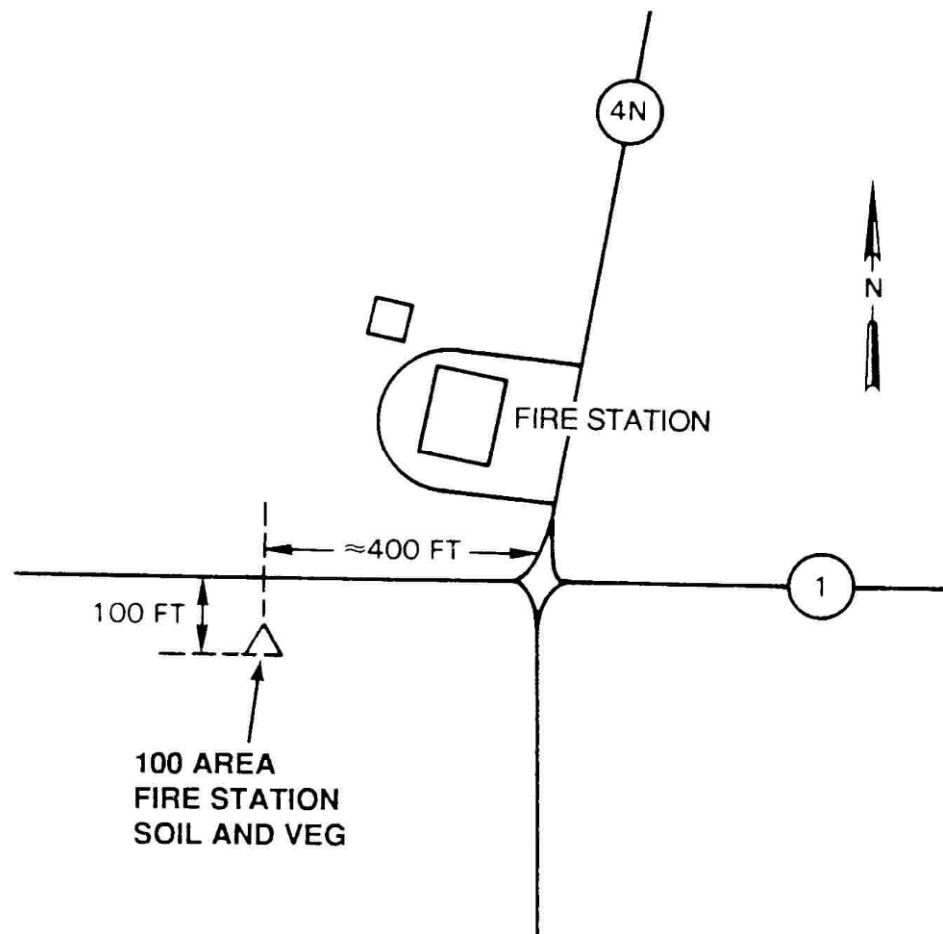


Figure 4.27. Soil and Vegetation Sampling Location at the 100 Area Fire Station



Figure 4.28. 100 Area Fire Station Soil and Vegetation Sampling Location

ALE FIELD LAB

Need Key to Gate 106

Latitude
46.38947

Longitude
119.53530

1. Travel northwest from Richland on Highway 240 and turn left (southwest) onto Horn Road and proceed toward Benton City.
2. Follow Horn Road 1.5 miles, then turn right onto a paved road. Go up the hill to gate 106. Pass through the gate and continue on this road for 4.3 miles.
3. The soil and vegetation samples are collected in a field near where the paved road turns sharply left (southwest) towards the ALE facilities. The collection site is located in the "V" formed where the paved road and the 1200 ft road (dirt) meet.

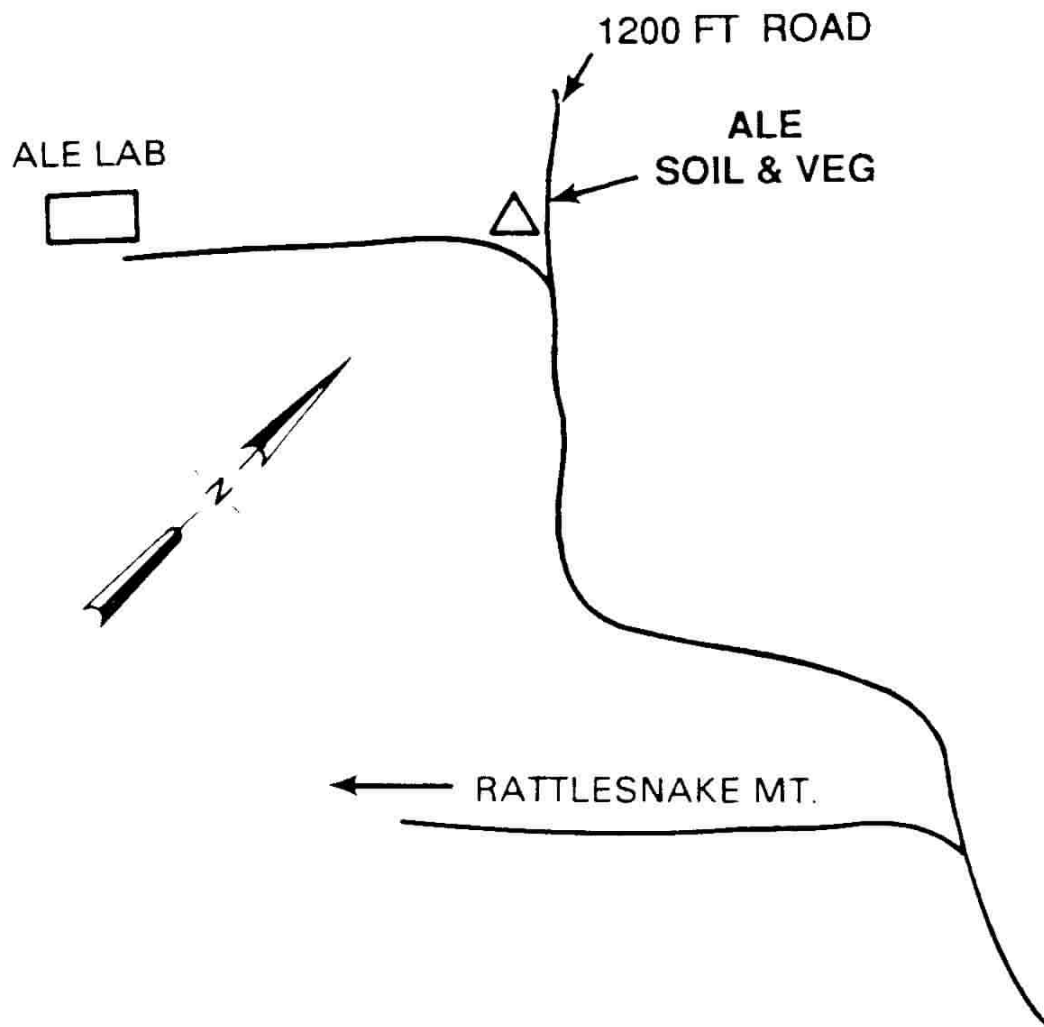


Figure 4.29. Soil and Vegetation Sampling Location at ALE Field Lab



Figure 4.30. ALE Field Lab Soil and Vegetation Sampling Location

HANFORD TOWNSITE

Latitude
46.5865712

Longitude
119.4010022

1. From the Wye Barricade, go north 7 miles on Route 2S to the intersection of Routes 2S, 2N, and 11A.
2. Take 2N north for 0.7 mile and pull into the empty graveled lot on the west side of the highway. Drive to the southwest corner of the lot.
3. The soil and vegetation site is located 80 yds to the southwest. The site is marked with a stake and sign. There is a single tree about 30 yd to the northwest of the stake.

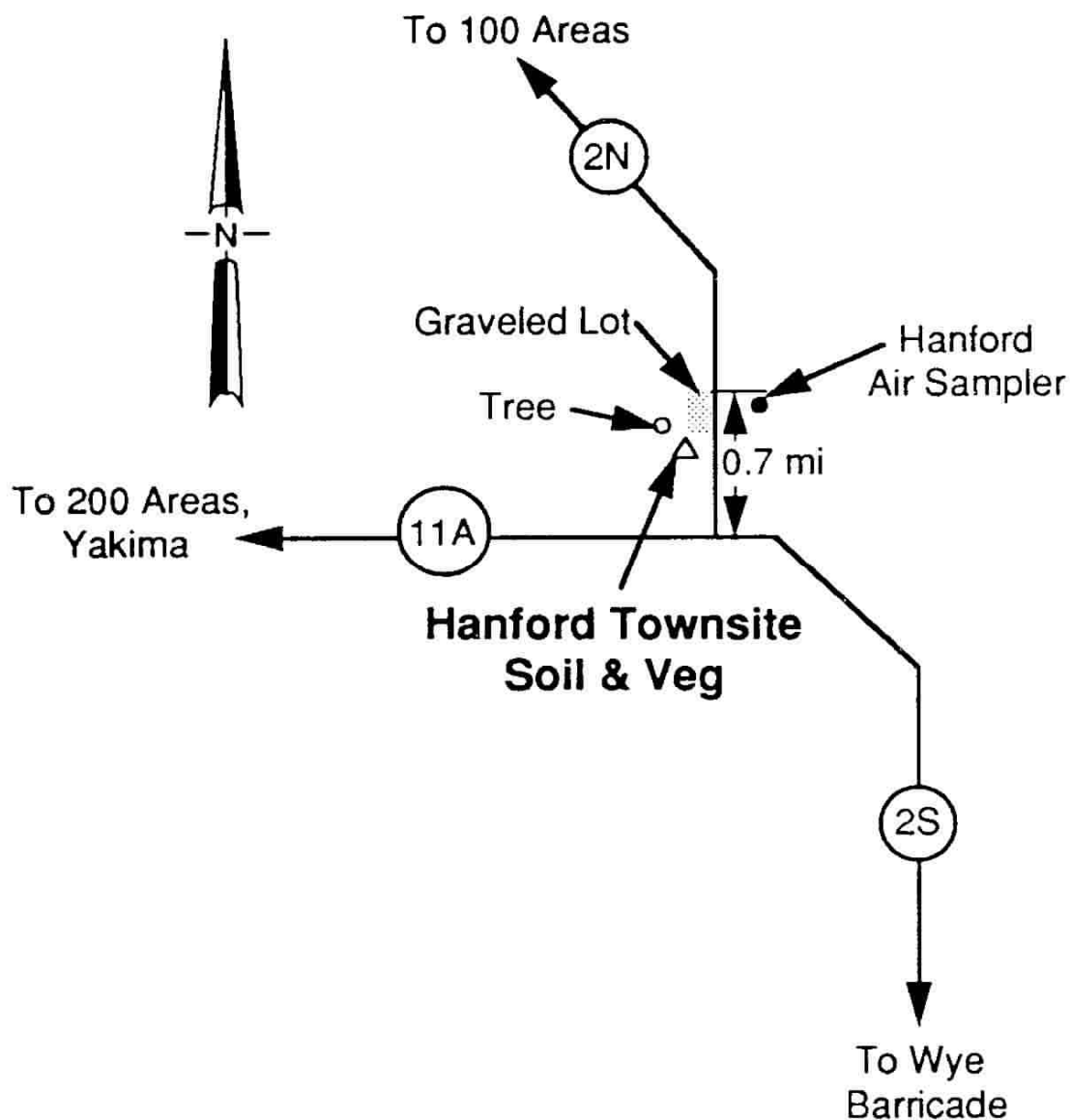


Figure 4.31. Soil and Vegetation Sampling Location at the Hanford Townsite



Figure 4.32. Hanford Townsite Soil and Vegetation Sampling Location

**HANFORD
RIVERMILE 28
SHORELINE**

Latitude
Need coordinates

Longitude

1. Take Route 2-N from Wye Barricade. Drive into the Old Hanford Townsite and drive to the last road that parallels the river.
2. Turn right and drive southward until the improved road changes to dirt. Hanford river-mile marker 28 is about 1/4 mile beyond this point. Shoreline vegetation may be collected anywhere in this region along the shoreline.

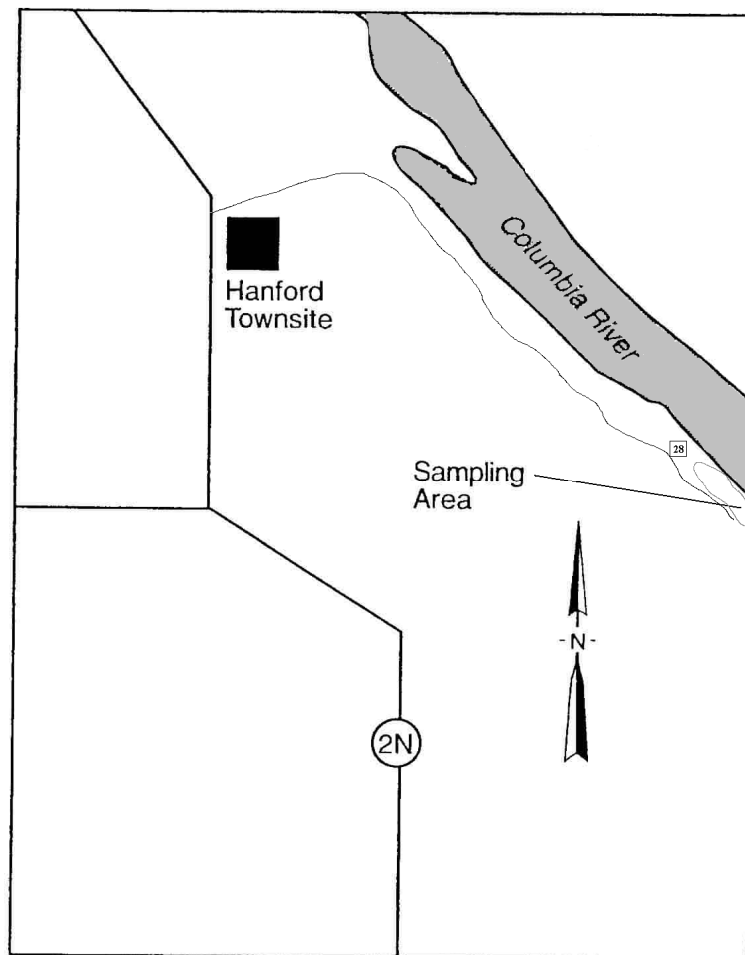


Figure 4.33. Soil and Vegetation Sampling Location at Hanford Rivermile 28 Shoreline



Figure 4.34. Hanford Rivermile 28 Shoreline Soil and Vegetation Sampling Location

**N END OF
VERNITA BRIDGE**

Latitude
46.647714

Longitude
119.73022

1. Travel north on Highway 24, cross the Vernita Bridge and turn left (west) onto the Highway 240 to Vantage.
2. Turn south (toward the river) onto a sandy trail that winds back (east) under the north end of the bridge.
3. Continue on from the bridge 0.4 mile until the trail intersects with another trail.
4. Soil and vegetation samples are collected east of this intersection. An environmental monitoring site sign marks the location.

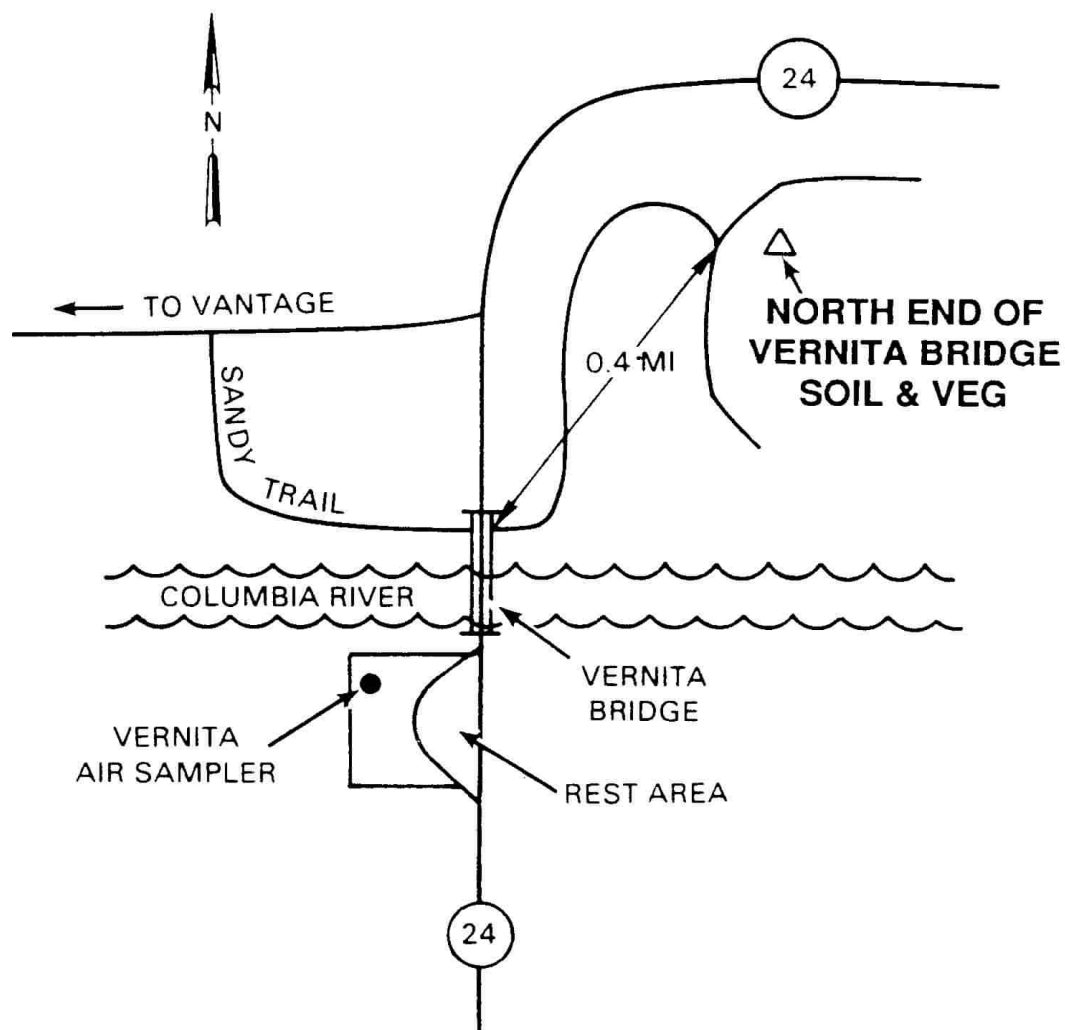


Figure 4.35. Soil and Vegetation Sampling Location at the N End of Vernita Bridge



Figure 4.36. N End of Vernita Bridge Soil and Vegetation Sampling Location

PROSSER BARRICADE

Latitude
46.3923288

Longitude
119.412032

1. The Prosser Barricade is located on Rt. 10 between the Wye Barricade and Highway 240. It is 6.2 miles from the stop sign at the intersection of Rt. 4S and Rt. 10 and 0.9 mile from the intersection of Rt. 10 and Highway 240. The area is indicated by a large white government sign on the east side of Rt. 10, reading "Restricted Government Area," etc.
2. The soil and vegetation samples are collected across the road from the government sign, about 50 yd northwest. A stake with an environmental sampling sign marks the location.

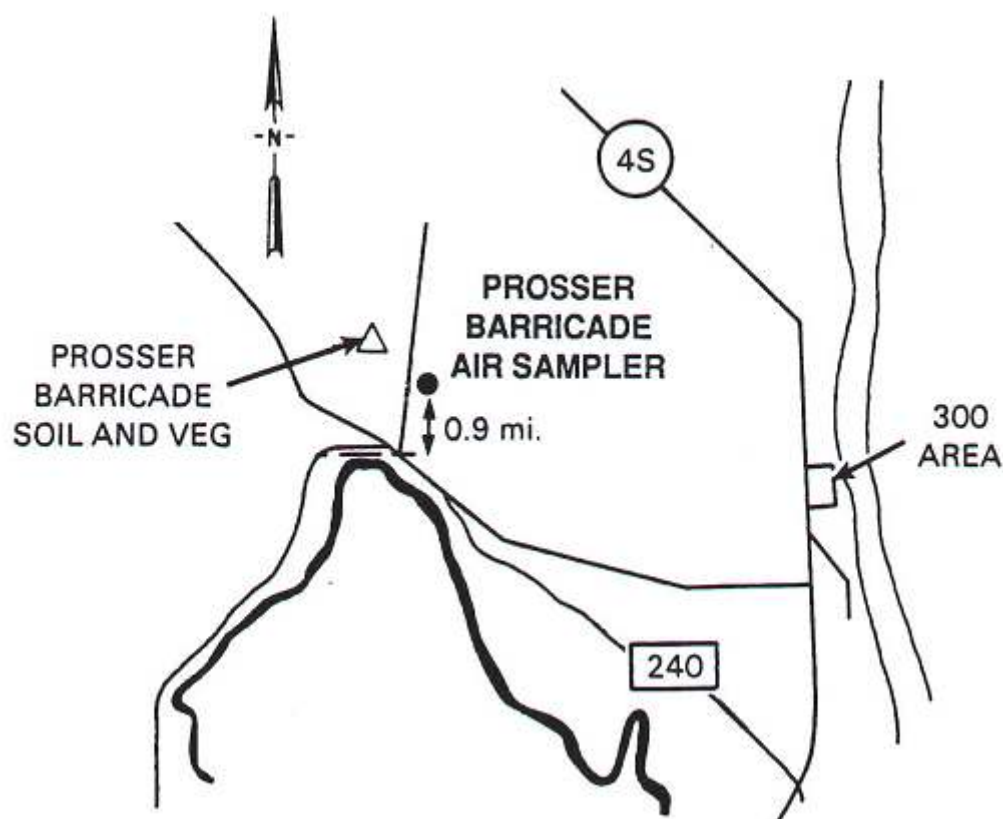


Figure 4.37. Soil and Vegetation Sampling Location at the Prosser Barricade



Figure 4.38. Prosser Barricade Soil and Vegetation Sampling Location

4.3 Offsite Soil and Vegetation

BENTON CITY

Latitude
46.3395616

Longitude
119.4820438

1. Traveling northwest on Highway 240, turn to the left (southwest) onto Horn Road by the Yakima River toward Benton City.
2. Follow Horn Road 4.8 miles to a draw on the right (west) side of the road. Turn onto a dirt trail winding up the draw.
3. The soil and vegetation samples are collected about 100 yd from Horn Road. A stake with an environmental sampling sign marks the location.

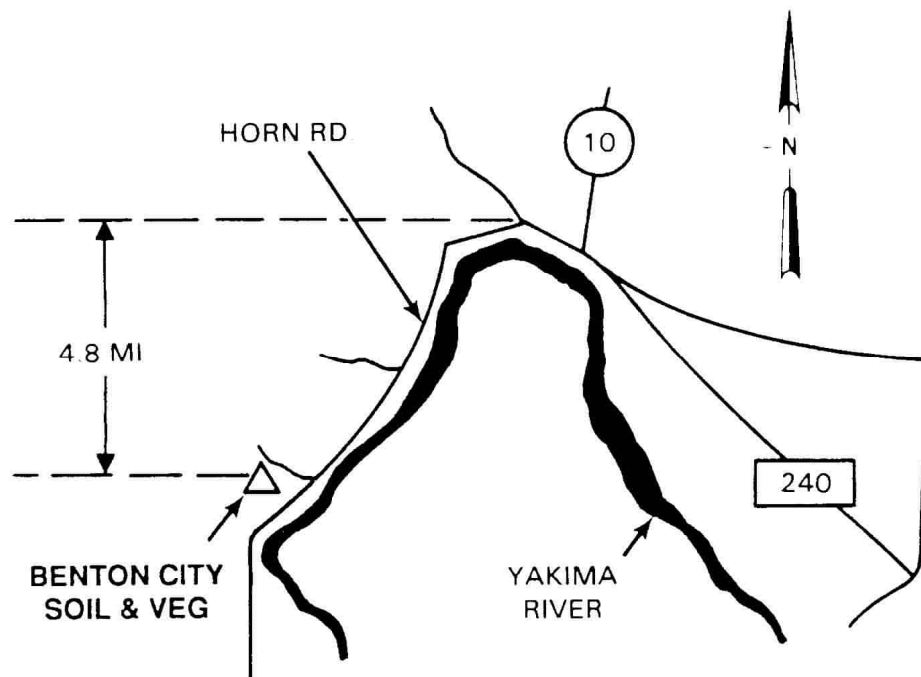


Figure 4.39. Soil and Vegetation Sampling Location at Benton City



Figure 4.40. Benton City Soil and Vegetation Sampling Location

BERG RANCH

Latitude

46.7382044

Longitude

119.3448482

1. Go 13 miles east from the intersection of Highway 24 and the road to Mattawa to get to the Berg Ranch location.
2. Pass under a small power line on wooden poles and turn left (north) onto a gravel trail.
3. There is a small, fenced area (former air surveillance station) along the north side of the highway. There is an environmental sampling sign on a stake at the north edge of the fenced area. The soil and vegetation samples are collected in the field about 50 yd west.

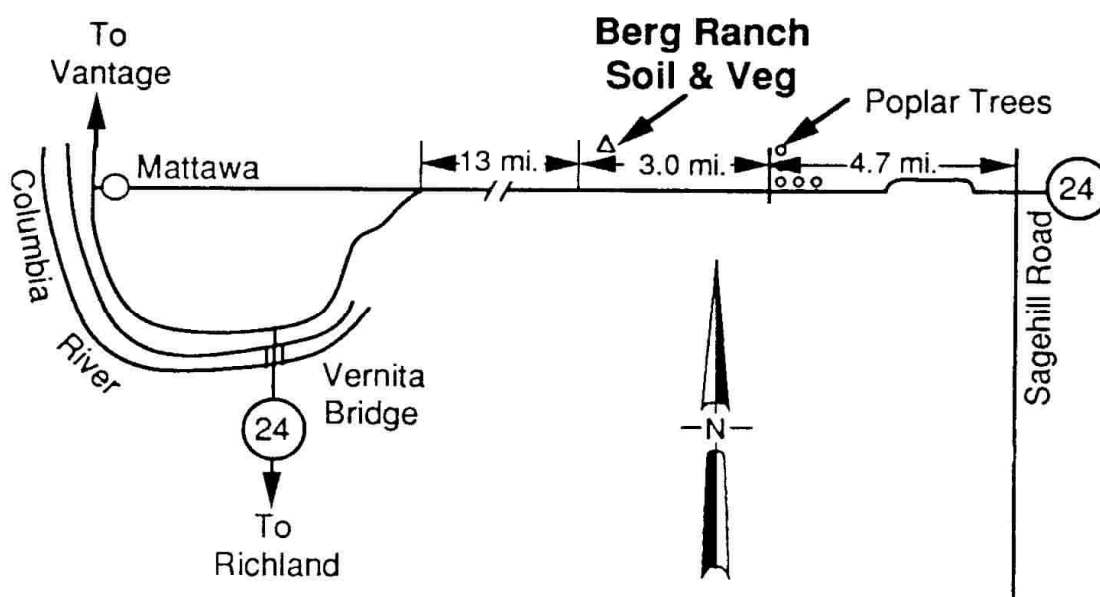


Figure 4.41. Soil and Vegetation Sampling Location at Berg Ranch



Figure 4.42. Berg Ranch Soil and Vegetation Sampling Location

BYERS LANDING

Latitude
46.3585054

Longitude
119.2460884

1. Traveling north on Road 68, take the left fork at Taylor Flats intersection. From the intersection, continue on Road 68 for 5 miles.
2. Turn and go uphill on the north side of the spillway 0.5 mile. The road will make a right angle turn to the left (north).
3. The air sampler is on the left side of the road at the corner. Do not turn left towards the air sampler. Continue east across the canal for 0.1 mile. Samples are collected from an undisturbed area on the left (north) side of the road.

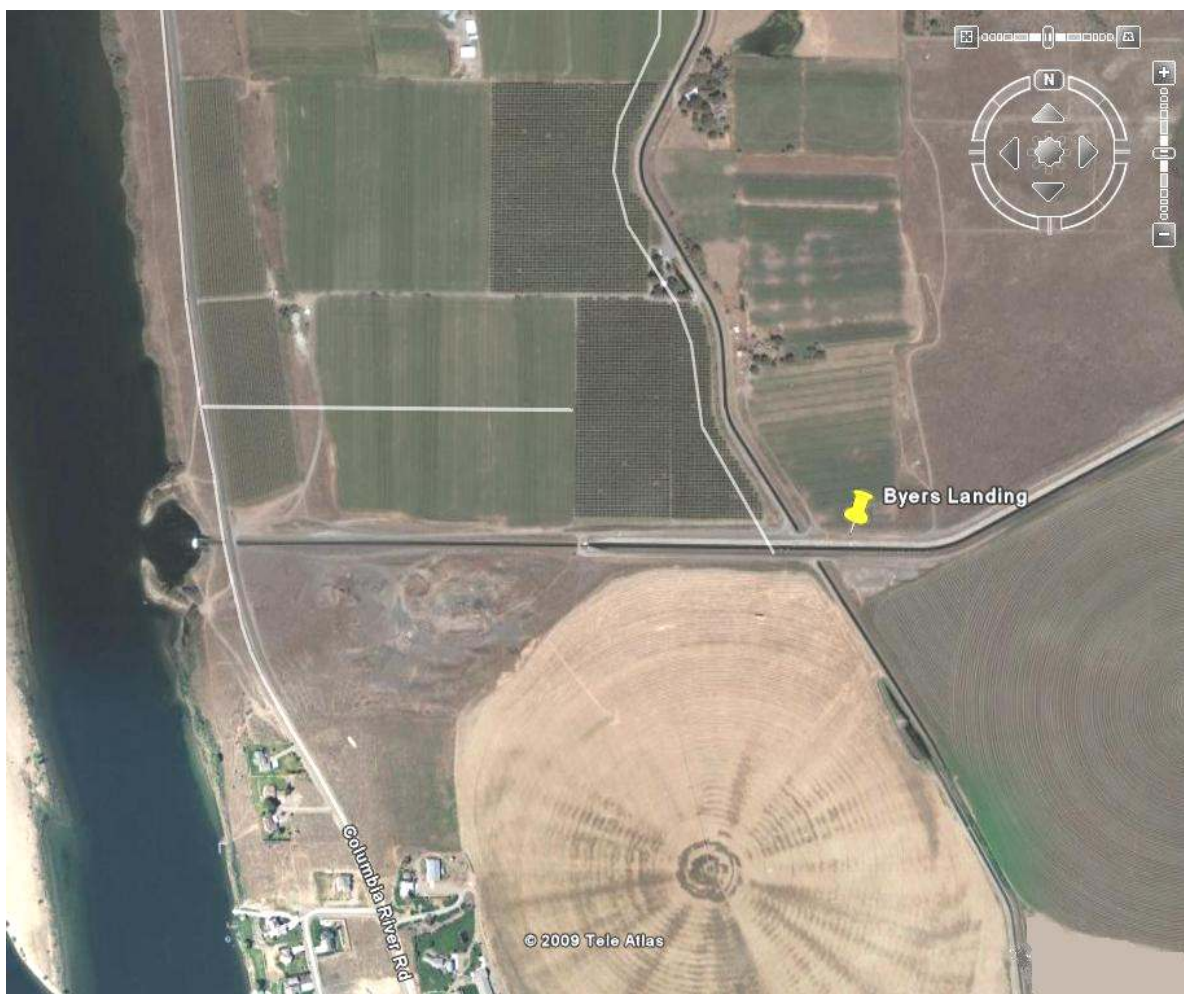


Figure 4.43. Soil and Vegetation Sampling Location at Byers Landing



Figure 4.44. Byers Landing Soil and Vegetation Sampling Location

CONNELL

Latitude
46.66346

Longitude
118.877342

1. Travel north on Highway 395. Take the first Connel Exit (State Highway 260).
2. Travel West on Highway 260 to Columbia Ave. Go north to Clark Street.
3. Go west on Clark Street from the Columbia Ave. intersection, past the Junior High School to the Cemetery Road intersection, (approximately 0.75 mile).
4. The Connell soil and vegetation sample are collected from the sagebrush area on the northeast corner of this intersection.

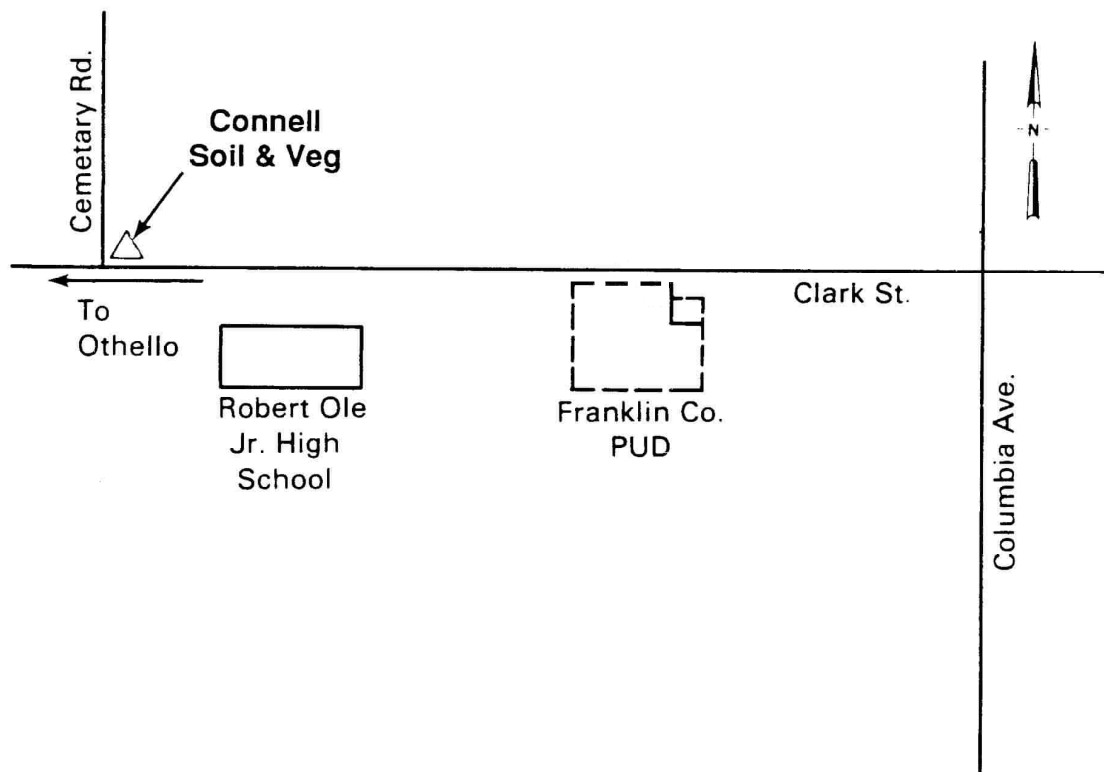


Figure 4.45. Soil and Vegetation Sampling Location at Connell



Figure 4.46. Connell Soil and Vegetation Sampling Location

MCNARY DAM

Latitude
45.925411

Longitude
119.288916

1. Take Interstate-82 to Umatilla. Exit at Umatilla and turn left (east) towards Wallula on Highway 730.
2. Turn off Highway 730 towards the river onto the McNary Dam Road. Pass by the dam and cross the railroad track.
3. The soil and vegetation samples are collected from the sagebrush area to the right (south) of the road, near the end of a barbed wire fence.

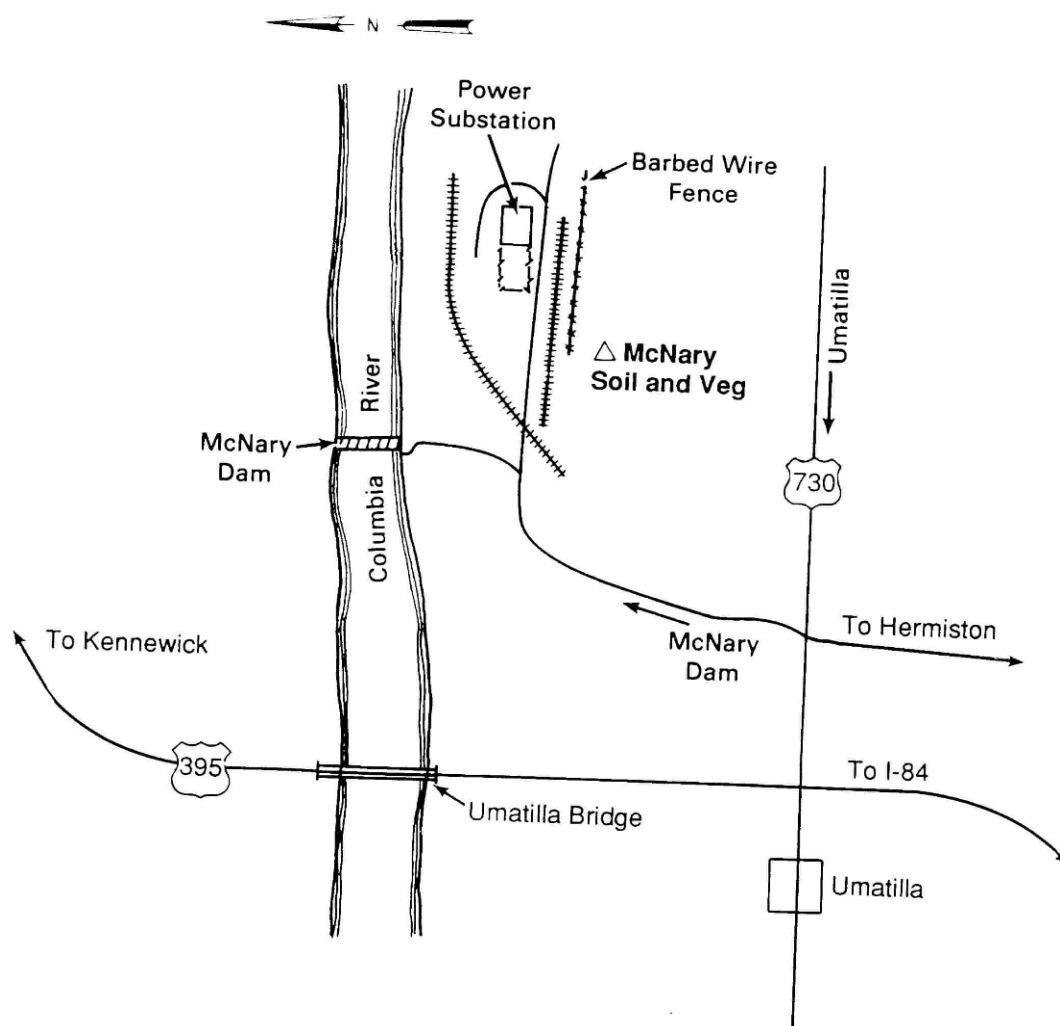


Figure 4.47. Soil and Vegetation Sampling Location at McNary Dam



Figure 4.48. McNary Dam Soil and Vegetation Sampling Location

MOSES LAKE

Latitude
47.1331

Longitude
119.2585

1. Exit Highway 17 onto Wheeler road.
2. Immediately turn right (north) through the parking lot.
3. Proceed through the parking lot to a small building identified as the City of Moses Lake well #11.
4. The soil and vegetation samples are collected from the sagebrush area northwest of the well building.

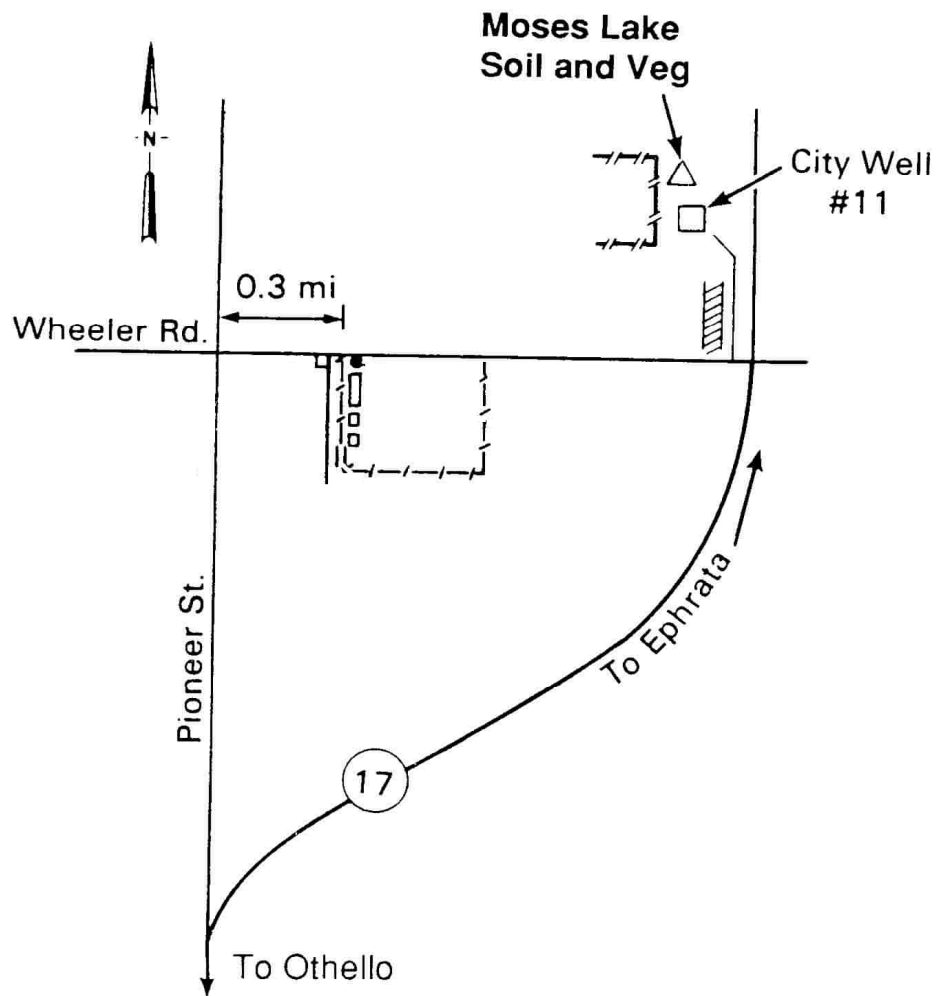


Figure 4.49. Soil and Vegetation Sampling Location at Moses Lake



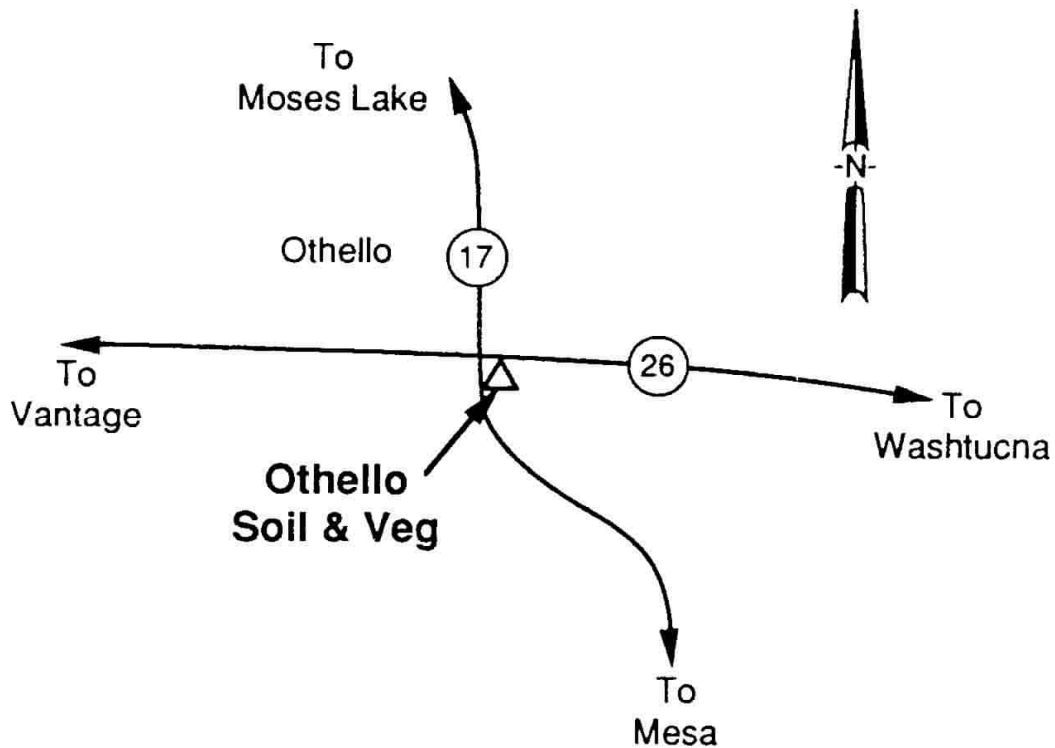
Figure 4.50. Moses Lake Soil and Vegetation Sampling Location

OTHELLO

Latitude
46.8113

Longitude
119.1331

1. The Othello soil and vegetation sample site is located at the intersection of Highway 26 (Othello-Washtucna Highway) and Highway 17 (Othello-Moses Lake Highway).
2. The soil and vegetation samples are collected from the sagebrush area on the southeast corner of this intersection.



S9005090.6

Figure 4.51. Soil and Vegetation Sampling Location at Othello



Figure 4.52. Othello Soil and Vegetation Sampling Location

RINGOLD

Latitude
46.4935

Longitude
119.2507

1. Follow Interstate-182 to Pasco and take the Road 68 exit.
2. Go north on 68 to Taylor Flats Road. Take Taylor Flats Road until it ends at the Eltopia - Ringold Road. Turn left and continue on toward Ringold.
3. At the bottom of the hill turn left towards the river (and public hunting/fishing access) on Ringold Road. Continue to intersection with Ringold River Road.
4. Go south approximately 1 mile. Collect the soil and vegetation samples on the east side of the road.



Figure 4.53. Soil and Vegetation Sampling Location at Ringold



Figure 4.54. Ringold Soil and Vegetation Sampling Location

**RIVERVIEW-
HARRIS
(FARM)**

Latitude
46.2707

Longitude
119.2442

1. From Richland, drive east on Interstate-182 to Pasco.
2. Exit from the freeway at Road 100. Go North on Road 100 to Harris Road. Turn left (west) on Harris Road and continue for 1.2 miles.
3. Collect the sample at the SE corner of the intersection of Harris Road and Court Street.



Figure 4.55. Soil and Vegetation Sampling Location at Riverview-Harris (Farm)



Figure 4.56. Riverview-Harris (Farm) Soil and Vegetation Sampling Location

SAGEMOOR FARM

Latitude
46.3707

Longitude
119.2459

1. Drive north on Road 68 where road forks at the foot of the hill across the river from 300 area.
2. Take right fork east up the hill for 0.75 miles or 0.2 miles west of Sagemoor farms sign.
3. The soil and vegetation samples are collected in a small brushy area on the south side of the road. There is no stake or environmental sign.

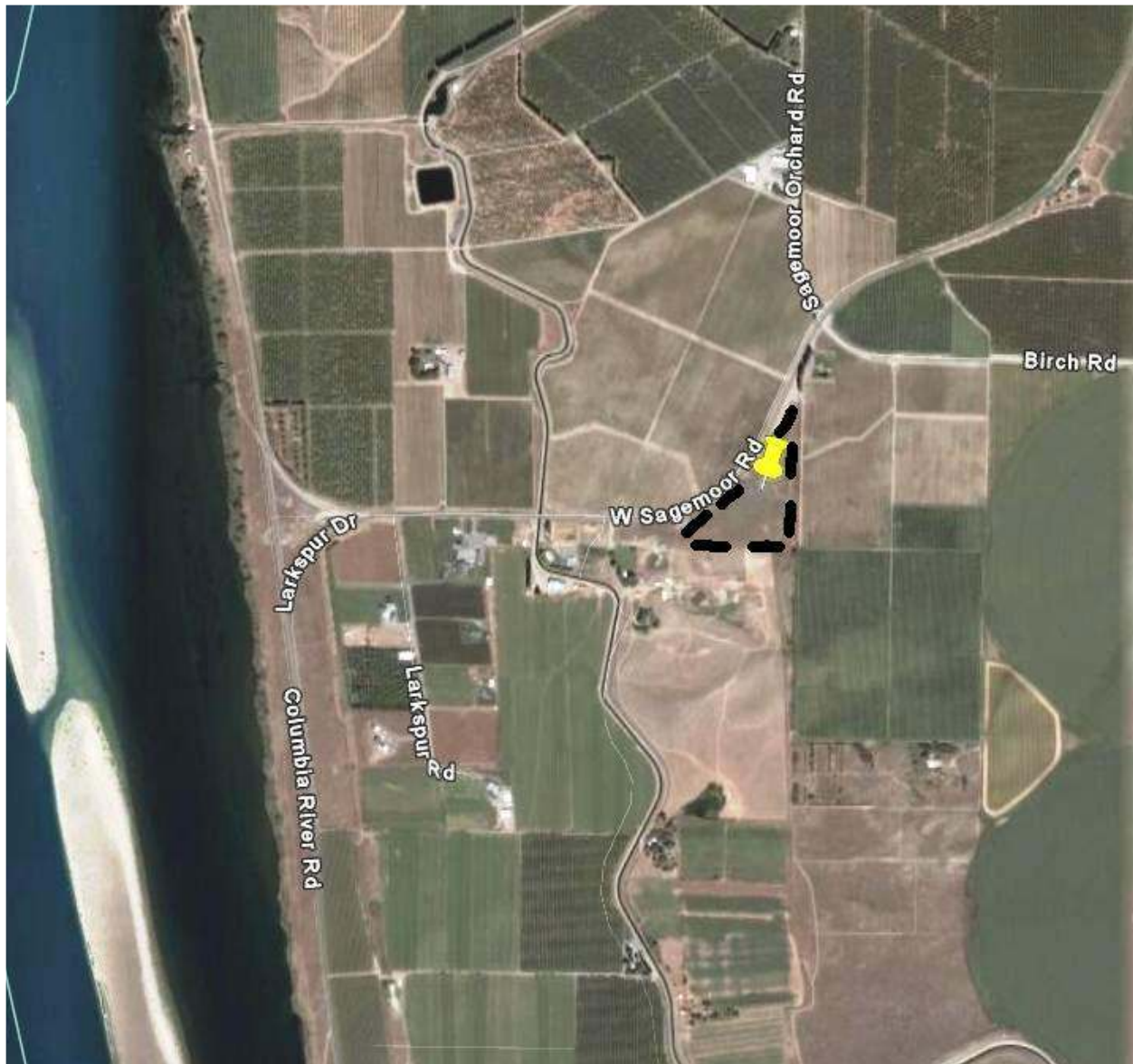


Figure 4.57. Soil and Vegetation Sampling Location at Sagemoor Farm



Figure 4.58. Sagemoor Farm Soil and Vegetation Sampling Location

SUNNYSIDE

Latitude
46.3989

Longitude
119.9502

1. Going south on Highway 241 (Hanford Road) toward Sunnyside, look for the first farm home after going over Rattlesnake Mountain pass. It is a brick farm home on the west (right) side of the highway with a row of pine and fir trees on the north side of the yard. The distance from the farm to Independence Road is 2 miles.
2. The soil and vegetation samples are collected south of the mailbox on the east side of the road. There is no stake or environmental sign.

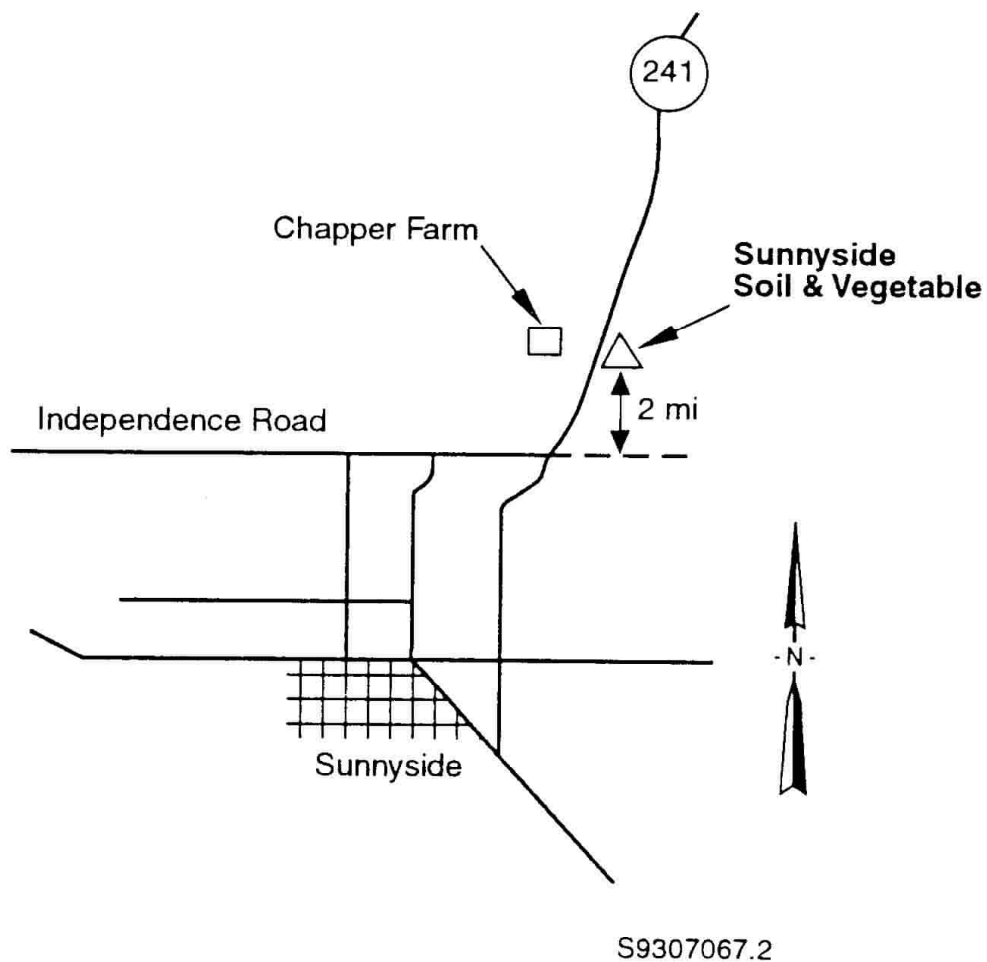


Figure 4.59. Soil and Vegetation Sampling Location at Sunnyside



Figure 4.60. Sunnyside Soil and Vegetation Sampling Location

**TAYLOR FLATS
NO. 2**

**NEED A 4-WHEEL
DRIVE VEHICLE**

Latitude
46.3775

Longitude
119.2605

1. Drive north on Road 68 Columbia River Road to where the road forks at the foot of the hill below Sagemoor Farms across the river from the 300 Area.
2. Take the left fork, following along the river for 1.35 miles. The road will turn in to a gravel/dirt road.
3. The road will end at a mudslide; take samples along east side of road up on hillside about 100 yds south of mudslide.
4. The soil and vegetation samples are collected in a small brushy area on the east side of the road. There is no stake or environmental sign.

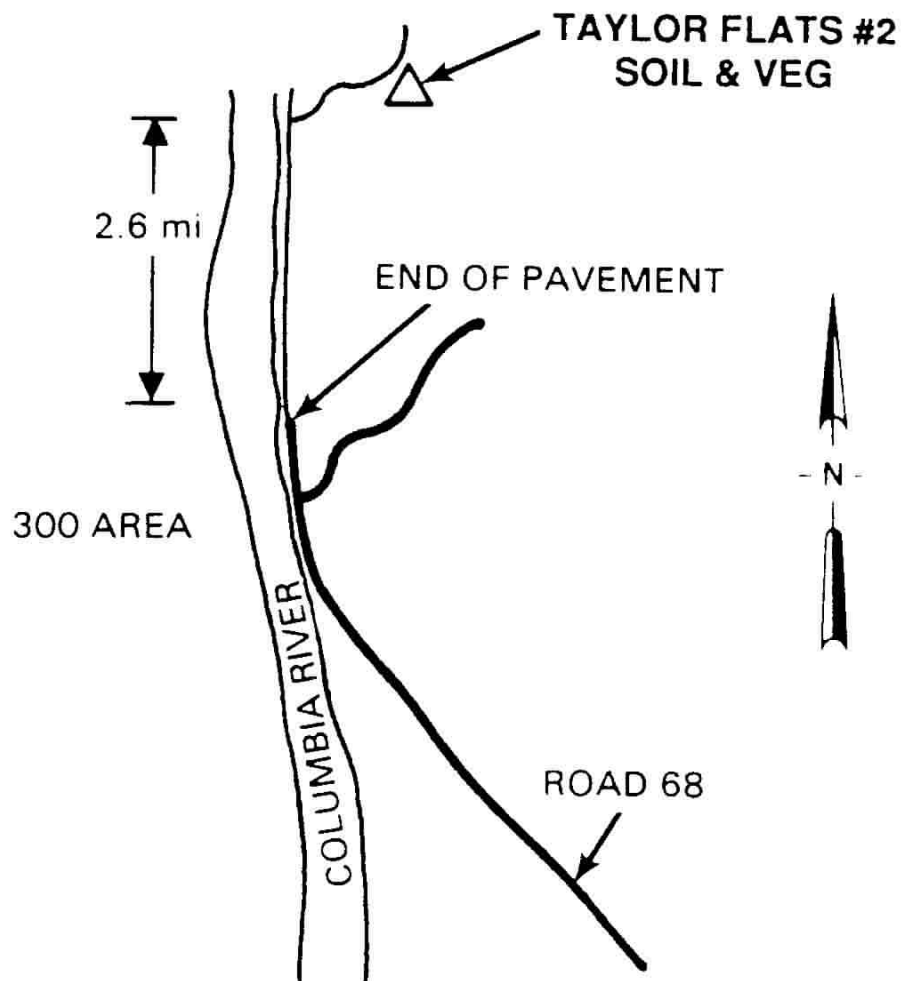


Figure 4.61. Soil and Vegetation Sampling Location at Taylor Flats No. 2



Figure 4.62. Taylor Flats No. 2 Soil and Vegetation Sampling Location

WALLA WALLA

Latitude
46.0552

Longitude
118.4337

1. Proceed toward Walla Walla on Highway 12 to the College Place exit approximately 2 to 3 miles west of Walla Walla. (College Place exit sign is 1/4 mile before the junction).
2. The soil and vegetation samples are collected from the sagebrush area up on the bluff on the north side of the highway from the intersection.

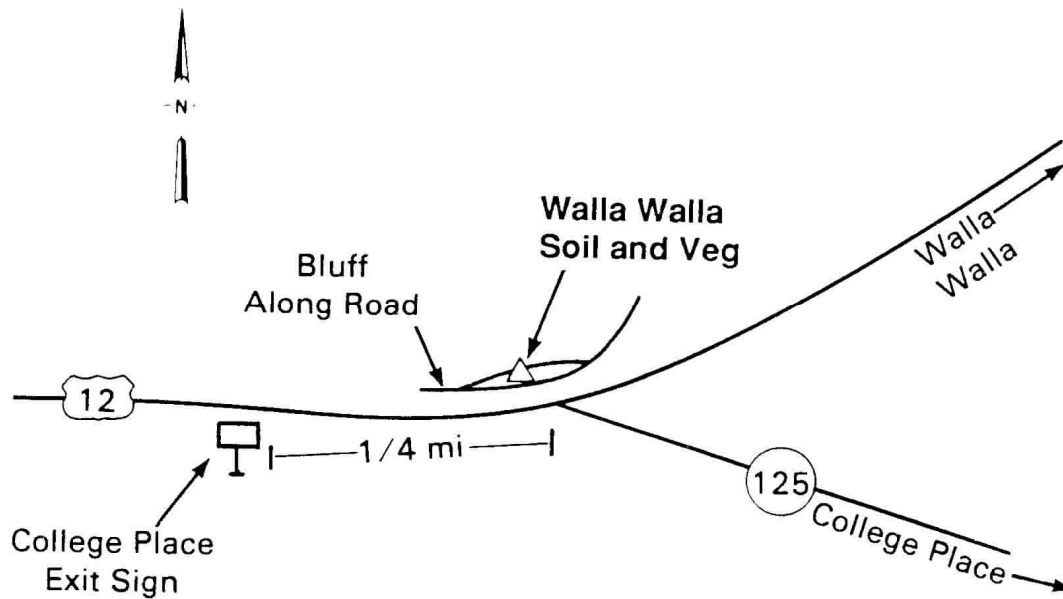


Figure 4.63. Soil and Vegetation Sampling Location at Walla Walla



Figure 4.64. Walla Walla Soil and Vegetation Sampling Location

WASHTUCNA

Latitude
46.7577

Longitude
118.3107

1. At the highway 26 and highway 260 intersection at the North end of Washtucna turn north onto road towards Ritzville.
2. Take an immediate left (West) onto Austin road, follow road around State Highway Dept. bldg. for 0.3 miles.
3. The soil and vegetation samples are collected from the sagebrush area located along the South side of the road behind the state dept. bldg. There are no environmental signs at this location.

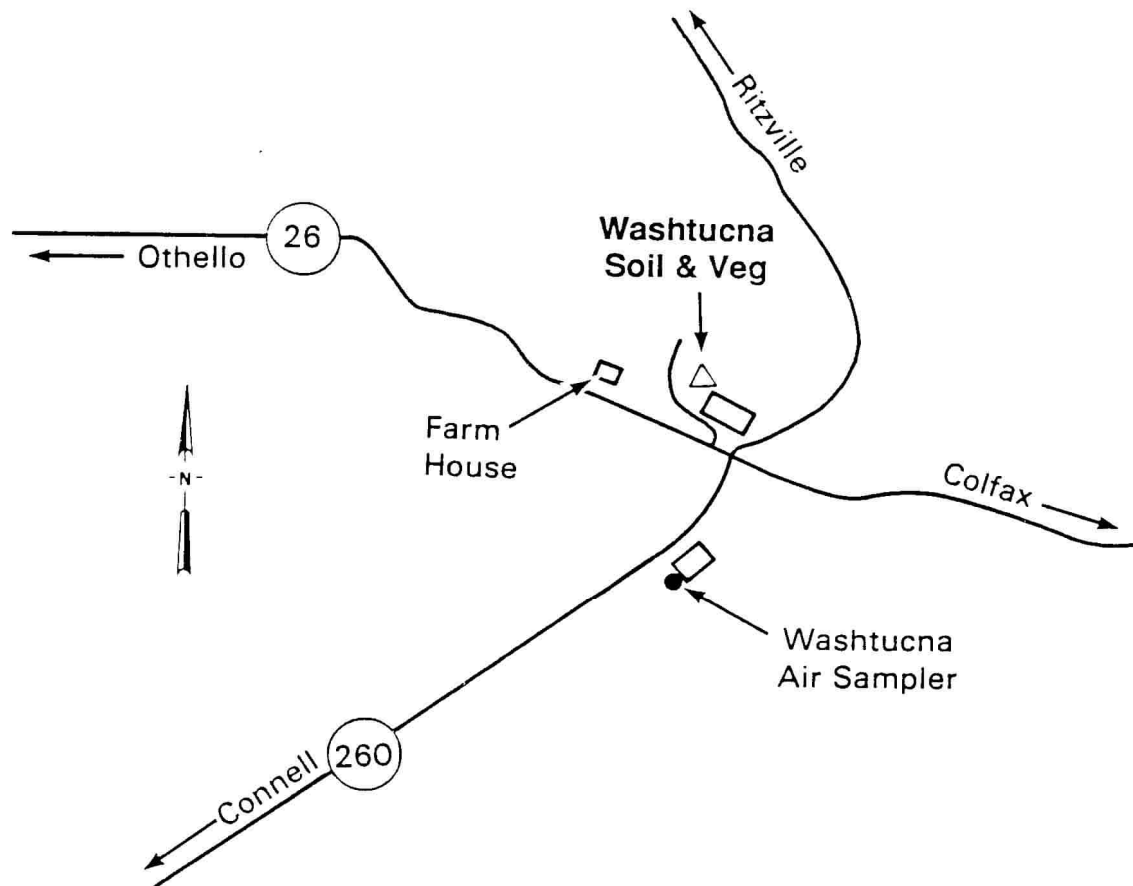


Figure 4.65. Soil and Vegetation Sampling Location at Washtucna



Figure 4.66. Washtucna Soil and Vegetation Sampling Location

YAKIMA

Latitude
46.5198

Longitude
120.4850

1. Traveling north on Interstate-82 to Exit 41 (South of Union Gap), exit and turn left and pass under the freeway.
2. Make a right turn at the 1st road (to Parker), cross over the Yakima River, and continue west to Highway 97.
3. Turn right (north) on Highway 97. The highway divides for ~1/4 mile. At the north end of the divided highway just past the point where the highway comes back together, turn left (west) at the farmhouse on a dirt road.
4. Follow the dirt road past the irrigated land. Collect sample at the base of the hill from native vegetation.

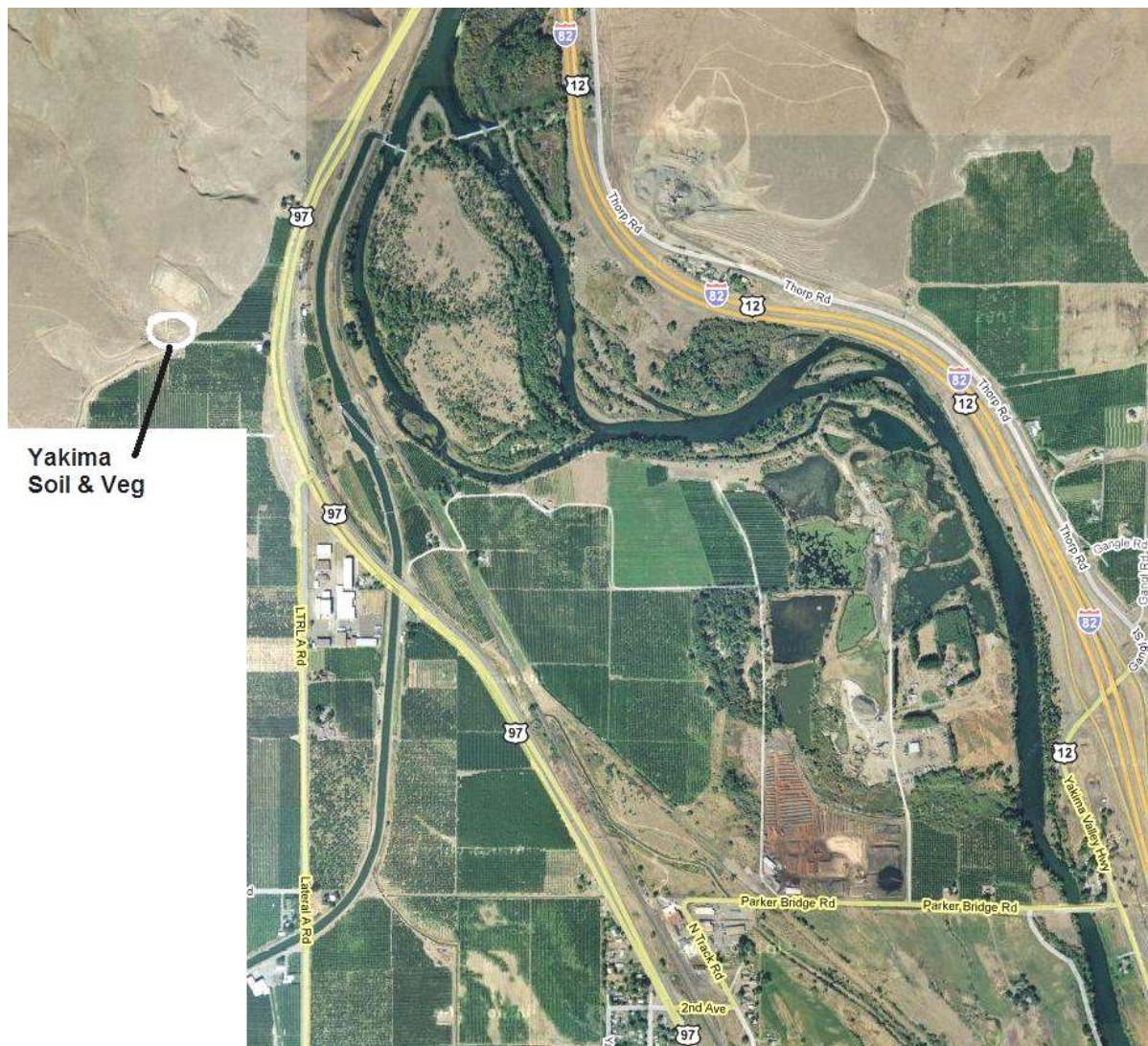


Figure 4.67. Soil and Vegetation Sampling Location at Yakima



Figure 4.68. Yakima Soil and Vegetation Sampling Location

5.0 Wildlife Sampling Locations

5.1 Introduction

Wildlife samples collected on the Hanford Site include fish, clams, game birds, waterfowl, deer, and rabbits. These samples are collected to 1) assess the potential dose impact to the public from both current and historical site operations, 2) verify in-plant controls on the release of radioactive materials, and 3) determine if there is a buildup of long-lived radionuclides of site origin. Additionally, background samples are routinely collected offsite to identify radionuclides attributable to worldwide fallout. Sampling the selected wildlife provides reassurance to the public that DOE is capable of identifying noteworthy changes in the radiological status of the environment.

These wildlife sampling locations illustrate the general area where specific wildlife are to be collected because it is impossible to identify an exact collection site. Sample collection staff need to consult with the Biota Task Leader when sampling fish and wildlife because of the listing of several salmonids and bald eagles as threatened or endangered. Also, selection of background locations may change after the master sampling schedule is issued.

Miscellaneous equipment and/or personal contacts are identified per sampling location.

5.2 Aquatic Biota

100 N TO 100 D AREA AQUATIC BIOTA

This sample collection area is anywhere in the Columbia River between the 100-N Area water intake downstream to D island. The preference is to collect samples near the Benton County shoreline. The map shows where samples have successfully been collected in recent years.

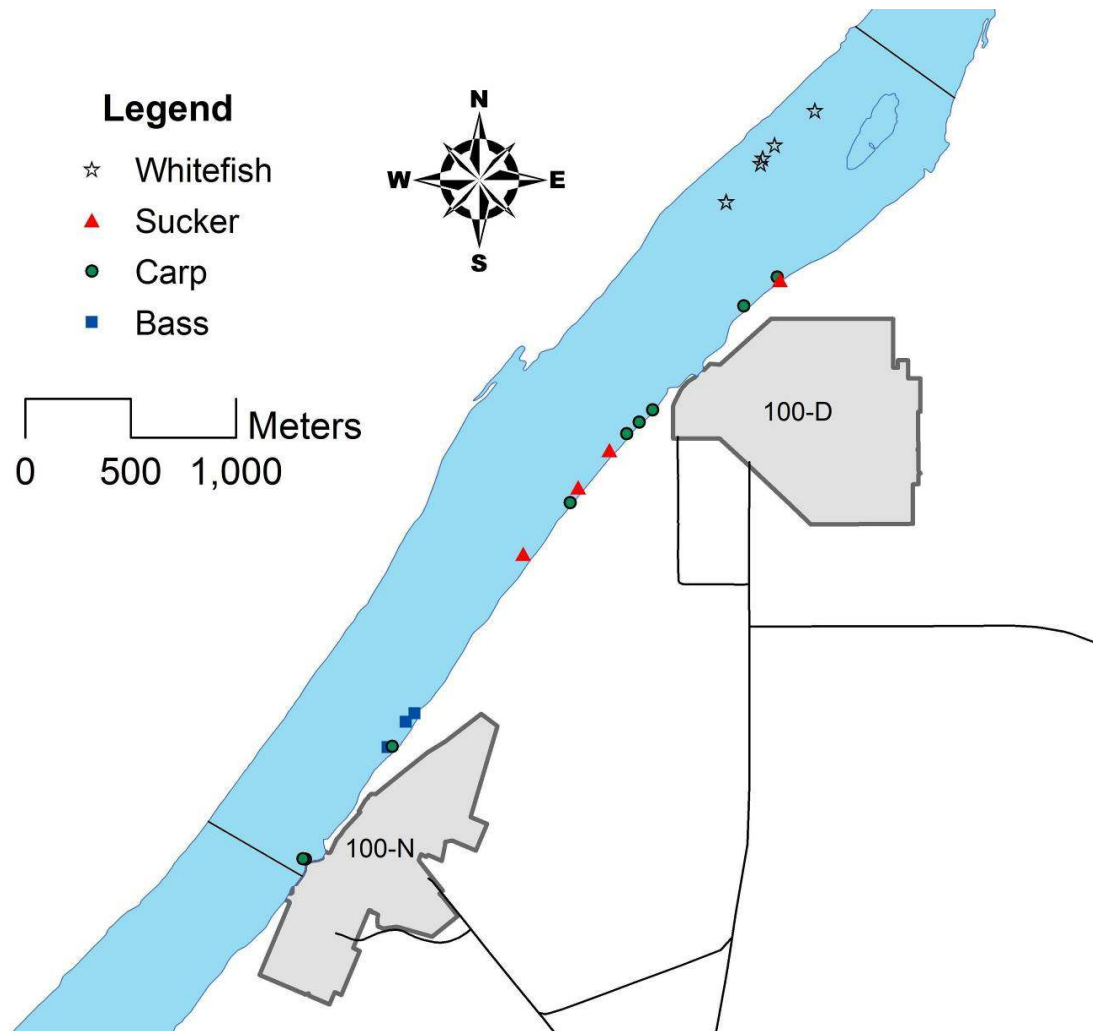


Figure 5.1. 100 N to 100 D Aquatic Biota Sampling Location

100 F AREA SLOUGH AQUATIC BIOTA

This sample collection area is limited to the slough area downstream of the 100-F Area. The map shows where samples have successfully been collected in recent years.

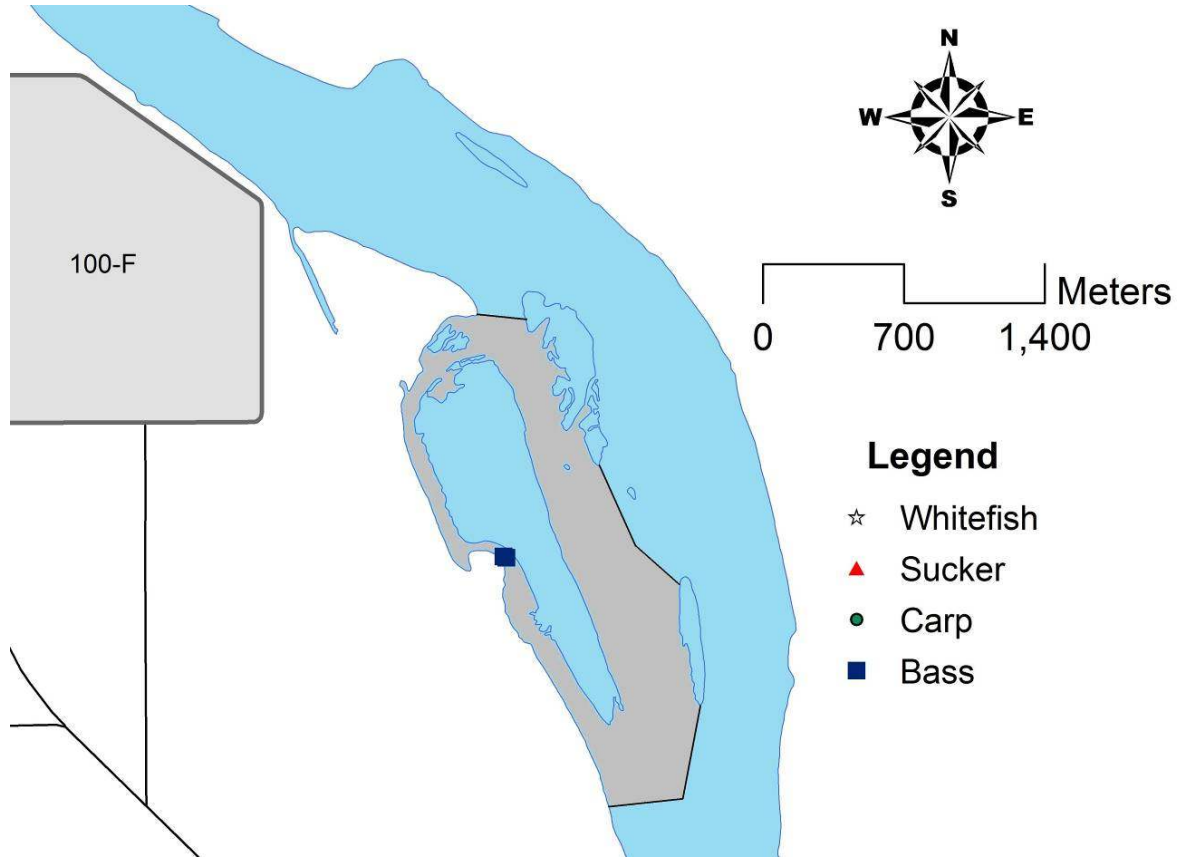


Figure 5.2. 100 F Area Slough Aquatic Biota Sampling Location

HANFORD SLOUGH AQUATIC BIOTA

This sampling location is found near the former Hanford Townsite. The sampling location is the slough/bay formed on the inside of the peninsula that protrudes into the river just upstream of the former Hanford Townsite pumphouse. The map shows where samples have successfully been collected in recent years.

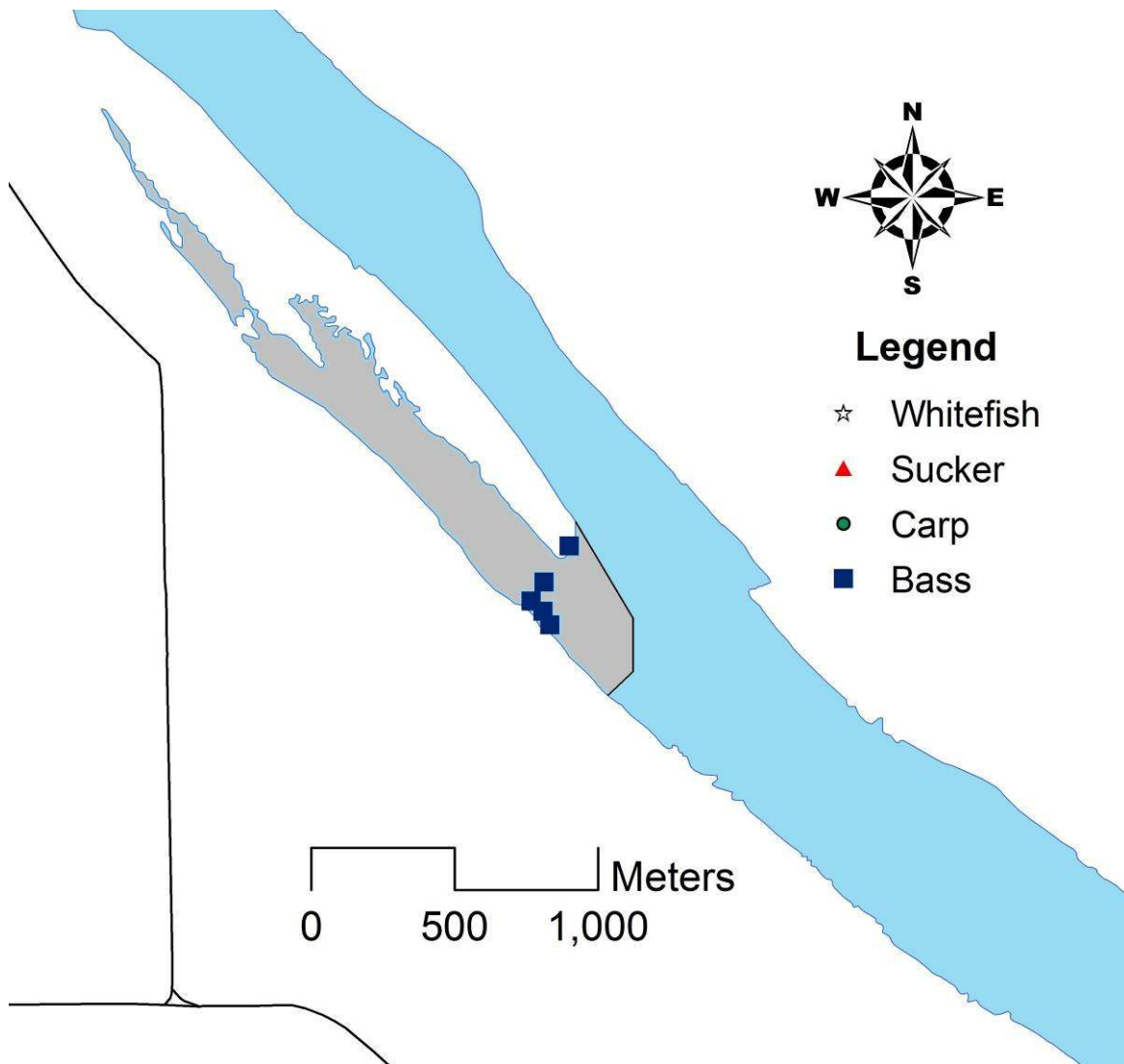


Figure 5.3. Hanford Slough Aquatic Biota Sampling Location

300 AREA AQUATIC BIOTA

The northernmost boundary of this sampling area is a line extending from the downstream tip of Johnson Island to the shore, and downstream to the tip of the next island. The sampling area is on the inside channel, but the sample collection should focus on the shoreline. The southern-most boundary is Horn Road. The map shows where samples have successfully been collected in recent years. This area is adequate for bass, carp, suckers and milfoil.

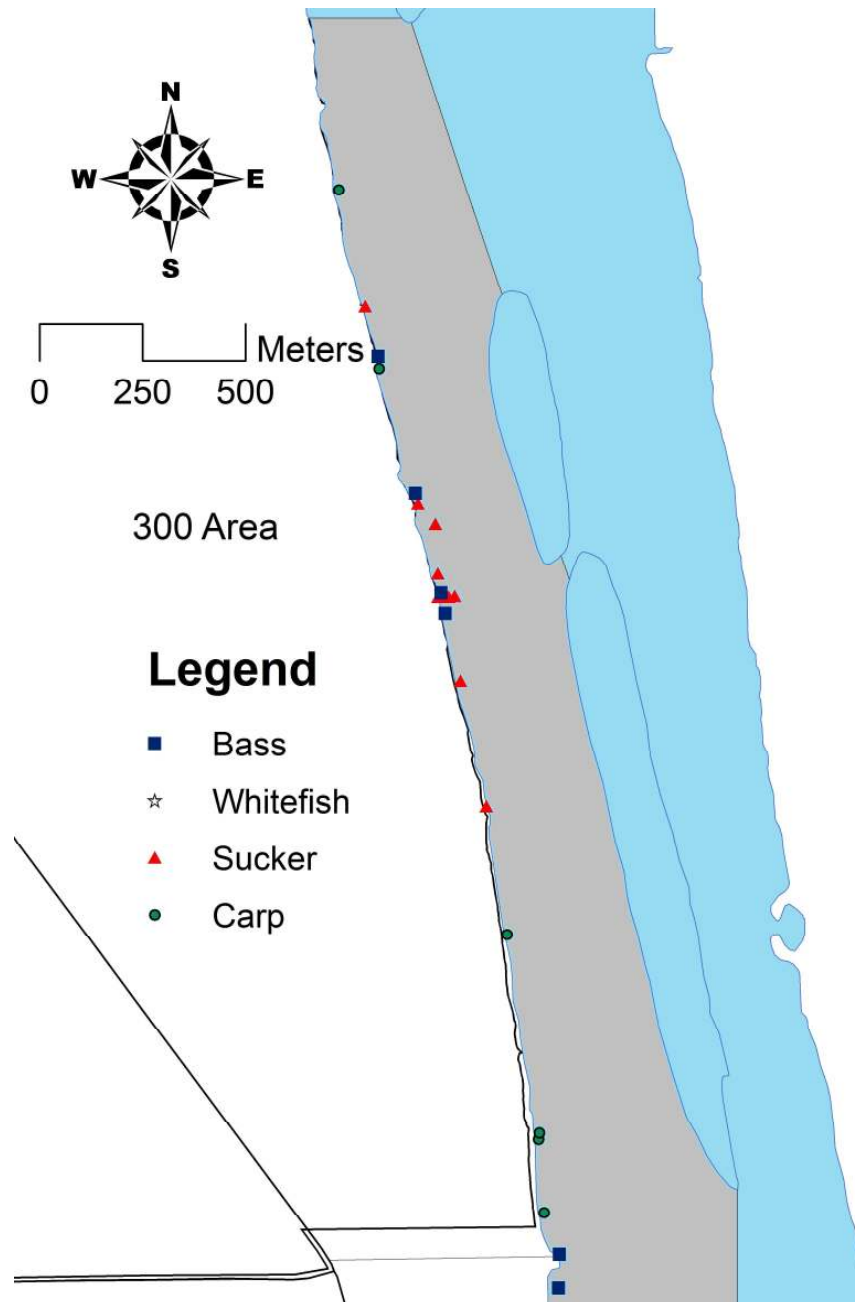


Figure 5.4. 300 Area Aquatic Biota Sampling Location

**ROCKY REACH
BACKGROUND
AQUATIC BIOTA**

Need boat.

**Launch at Lincoln
Rock State Park.**

1. Follow State Highway 240 to Vernita and then proceed on 243 to Vantage. Get on Interstate 90 east to George. Proceed north on State Highway 281 to Quincy. Proceed west on State Highway 28 to Wenatchee. Follow U.S. Highway 97 North along the Columbia River.
2. Sampling may be conducted anywhere upstream of Rocky Reach Dam. A good place to launch the boat is at Lincoln Rock State Park about 1.5 miles upriver from the dam.

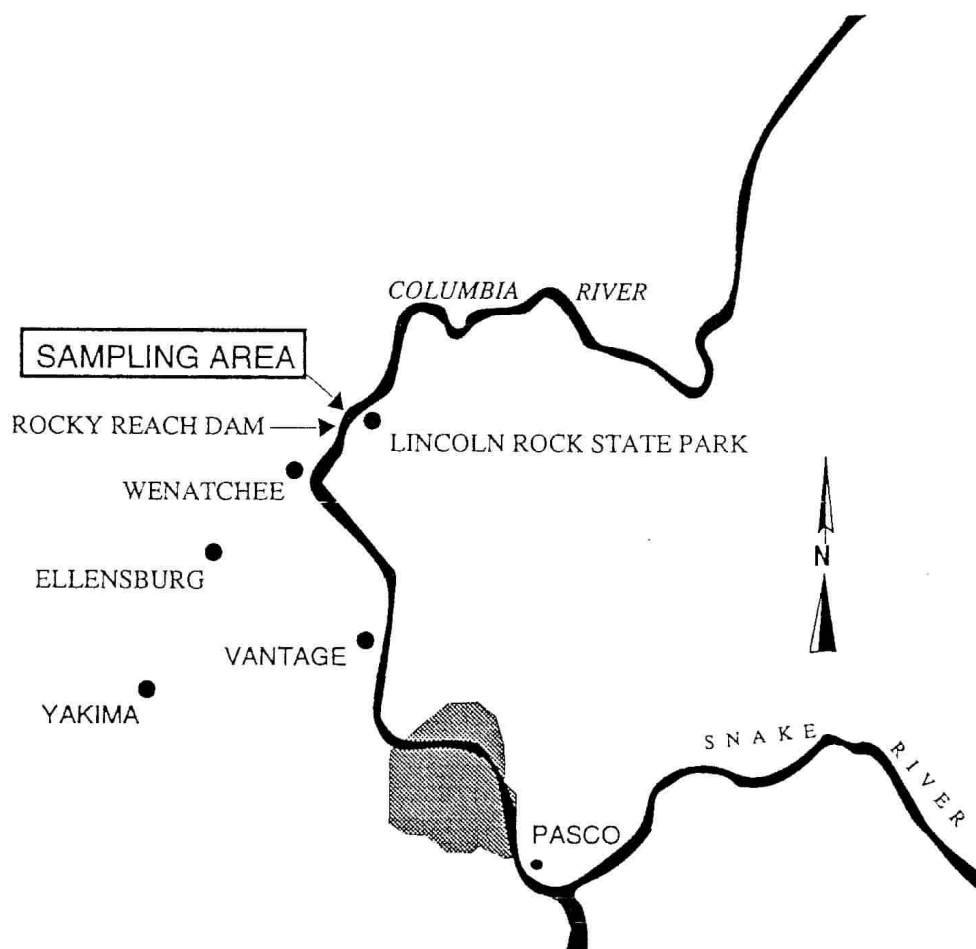


Figure 5.5. Rocky Reach Background Aquatic Biota Sampling Location

**PRIEST RAPIDS
POOL
BACKGROUND
AQUATIC BIOTA**

This sampling location includes the entire Columbia River between Wanapum and Priest Rapids dams. Any boat launch may be used, but the launches at Desert Aire and Wanapum Dam have proven adequate for sampling purposes. The map shows where samples have successfully been collected in recent years.

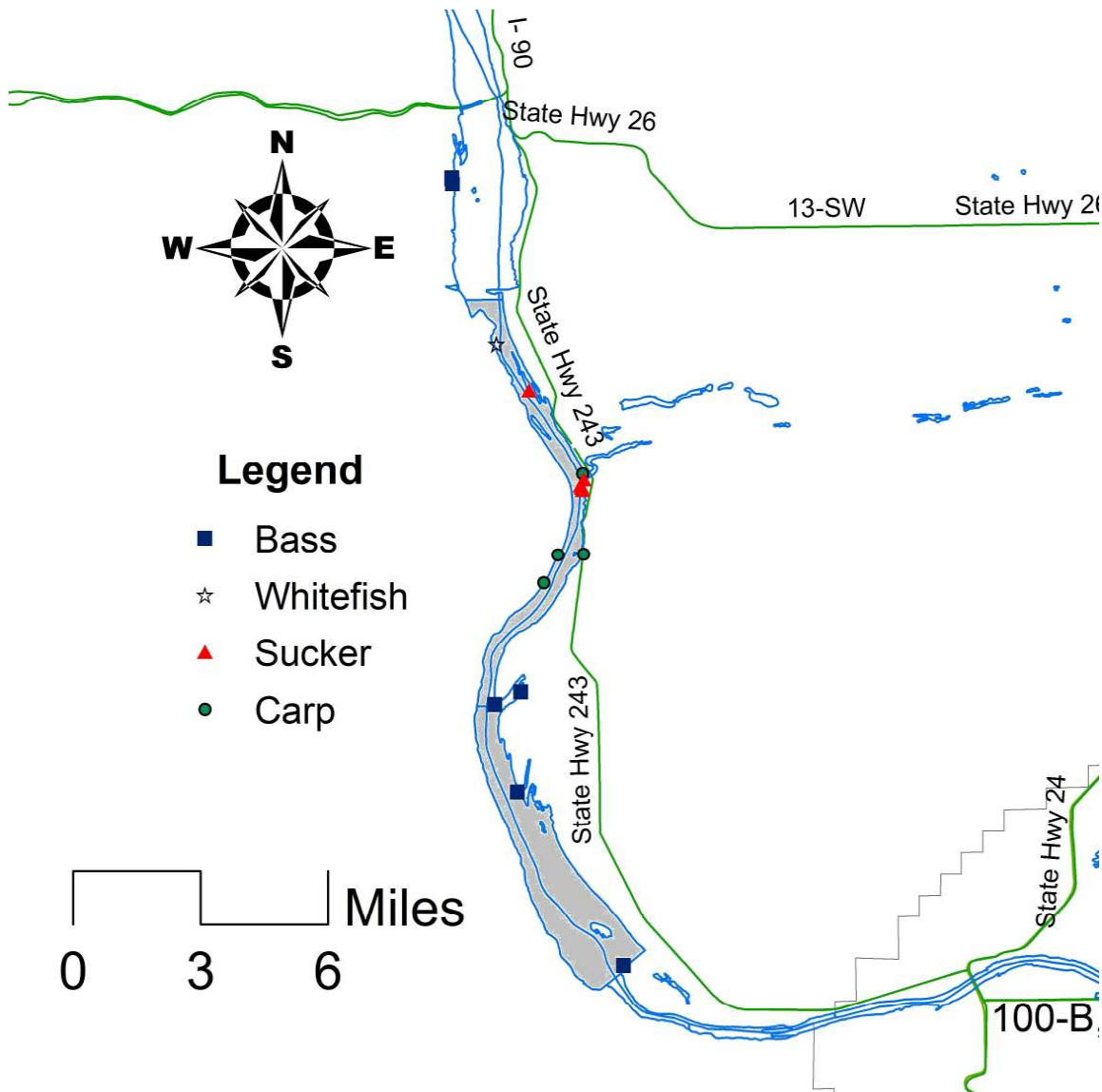


Figure 5.6. Priest Rapids Pool Background Aquatic Biota Sampling Location

5.3 Waterfowl

100 AREAS WATERFOWL

This waterfowl sampling location includes the Columbia River and Columbia River shoreline from the 100 B-C area downstream to the former Hanford Townsite. However, the most successful area for sample collection has been in the portion of the Hanford Reach between the tip of the horn and the 100-F slough. The map shows where samples have successfully been collected in recent years.

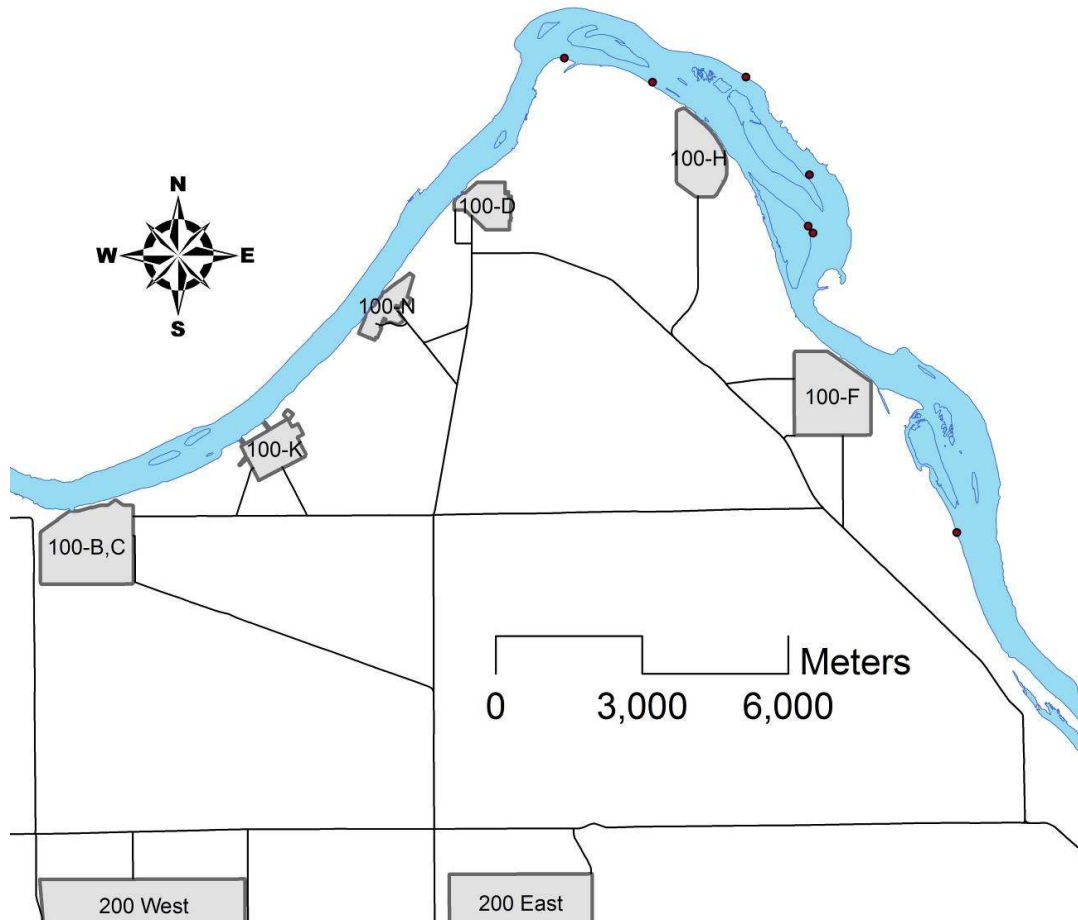


Figure 5.7. 100 Area Waterfowl Sampling Location

HANFORD TOWNSITE TO 300 AREA WATERFOWL

This waterfowl sampling area extends from the former Hanford Townsite downstream to the 300 Area. The sample collection should be limited to the Columbia River and the Columbia River shoreline. The map shows where samples have successfully been collected in recent years.

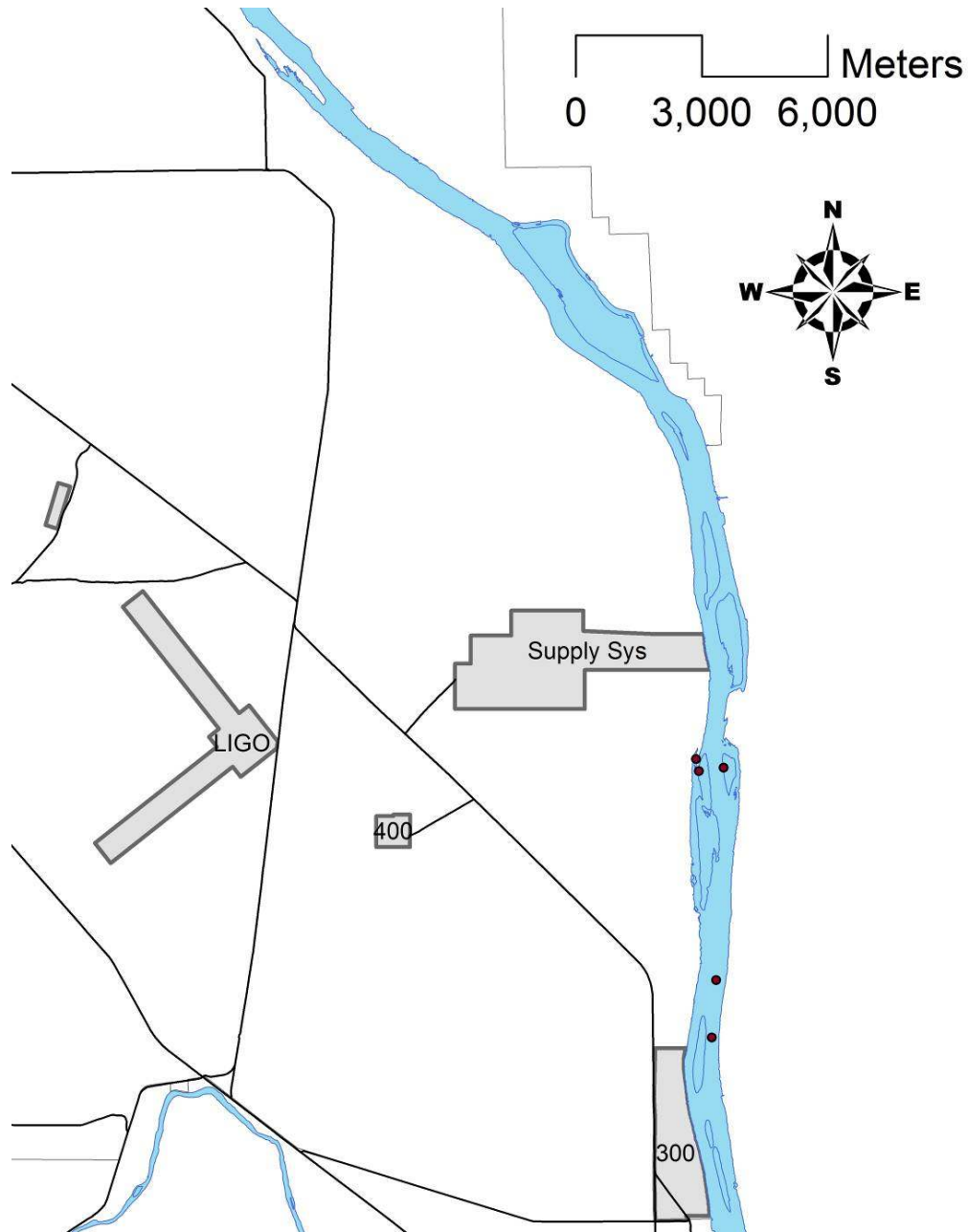


Figure 5.8. Hanford Townsite to 300 Area Waterfowl Sampling Location

**PRIEST RAPIDS
POOL
BACKGROUND
WATERFOWL**

This sampling location includes the entire Columbia River between Wanapum and Priest Rapids dams. Any boat launch may be used, but the launches at Desert Aire and Wanapum Dam have proven adequate for sampling purposes.

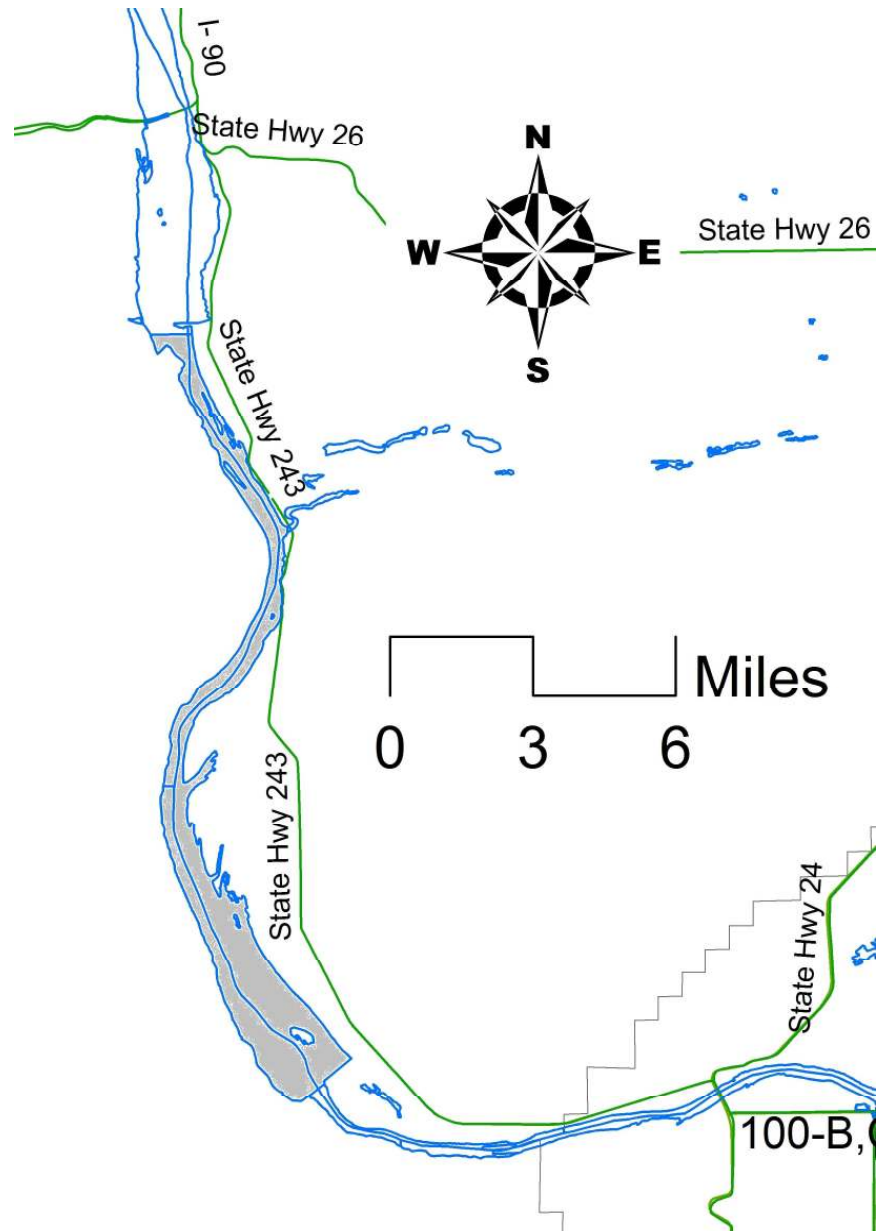


Figure 5.9. Priest Rapids Pool Background Waterfowl Sampling Location

5.4 Upland Game Birds

100 D TO 100 H AND
100 H TO
100 F

The two sample areas are bordered by D, H, and F Reactors. The width of the sample areas is arbitrary; however, the shaded areas include all riparian habitat between the reactors because game birds are most abundant there. If possible, stay within 300 meters of the river shoreline. The map shows where samples have successfully been collected in recent years.

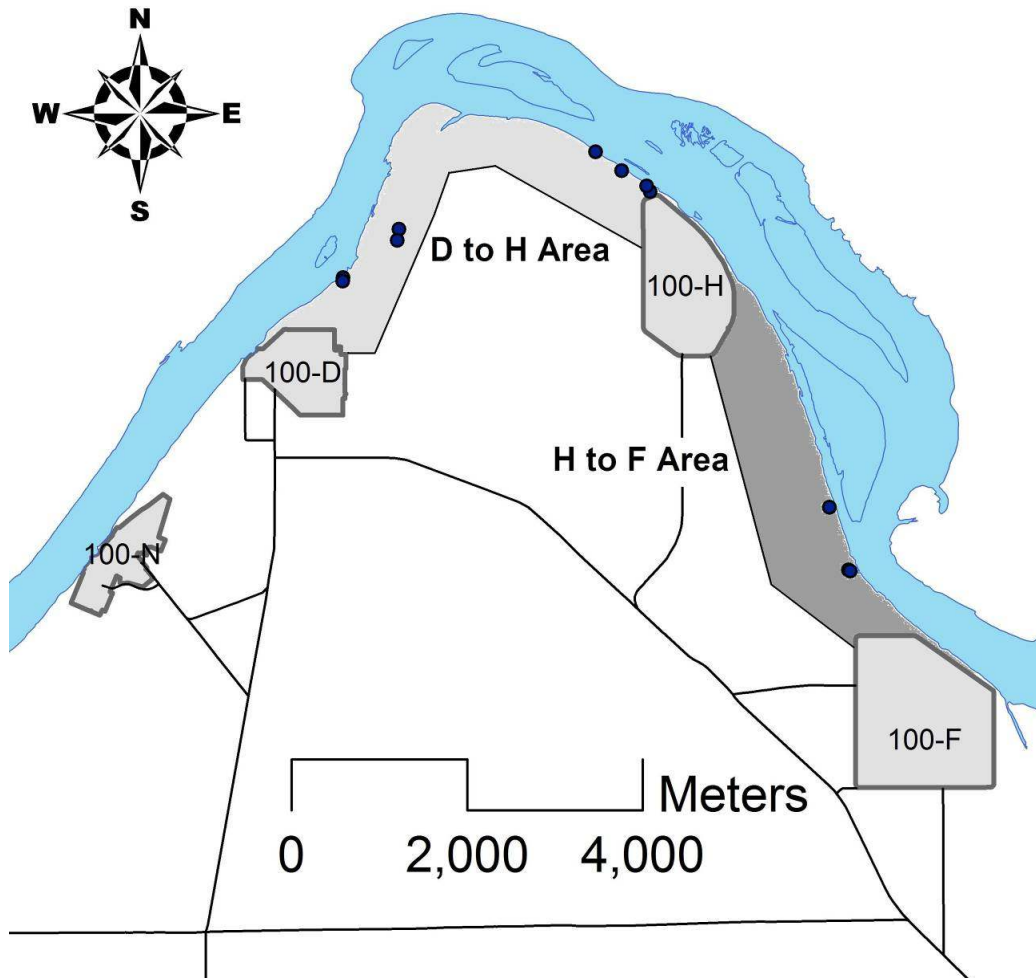


Figure 5.10. Upland Game Bird Sampling Locations

BACKGROUND GAME BIRDS

Background game bird samples are collected on any lands considered to be out of the influence of Hanford site contaminants. Make sure permission is granted by the landowner prior to hunting.

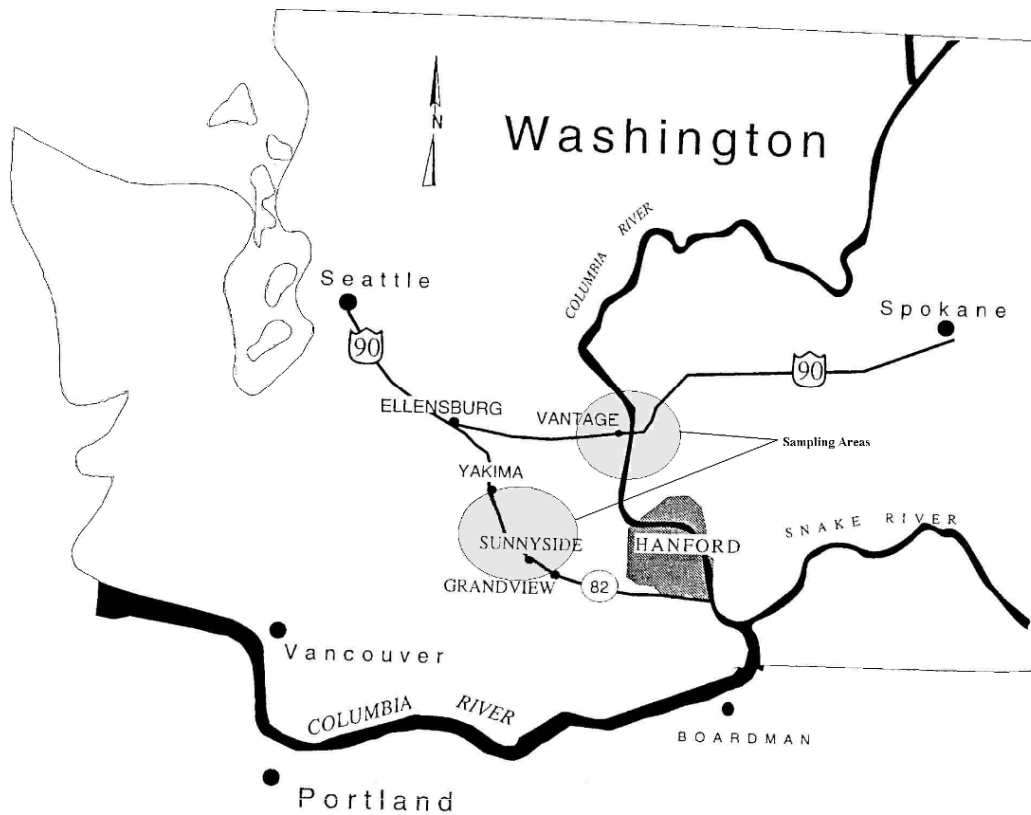


Figure 5.11. Background Game Bird Sampling Locations

5.5 Deer and Elk

100 N AREA DEER

The 100N Area deer sampling area is the area between the Columbia River and route 4N. The northern boundary is the 100D area. The southern boundary is an imaginary line extending due west towards the Columbia River from the intersection of route 4N and the 100N access road. The map shows where samples have successfully been collected in recent years.

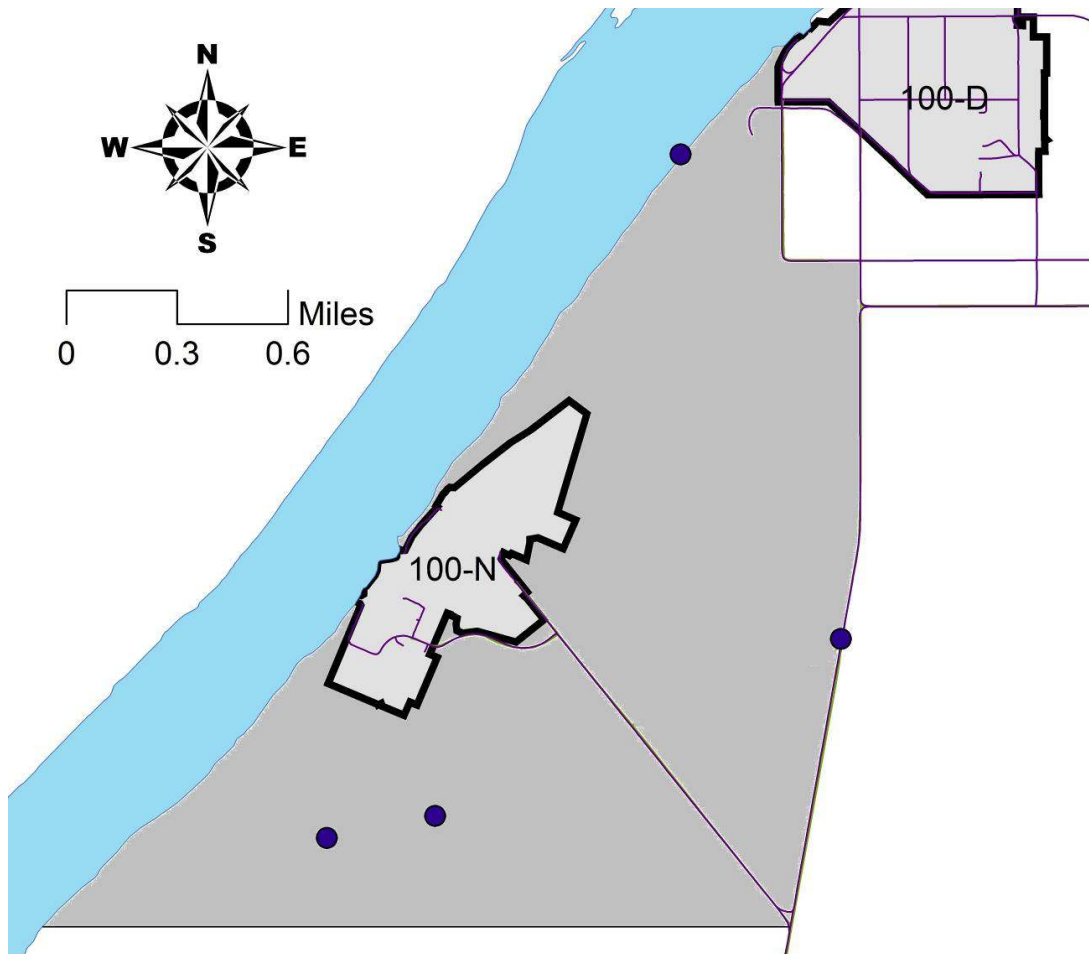


Figure 5.12. 100 N Area Deer Sampling Location

200 AREAS DEER

The 200 Areas sampling area borders are: Army loop road on the south and west perimeter, Route 11A on the northern perimeter, and a north-south line between 11A and the intersection of Army loop road and Route 4S on the eastern perimeter. The map shows where samples have successfully been collected in recent years.

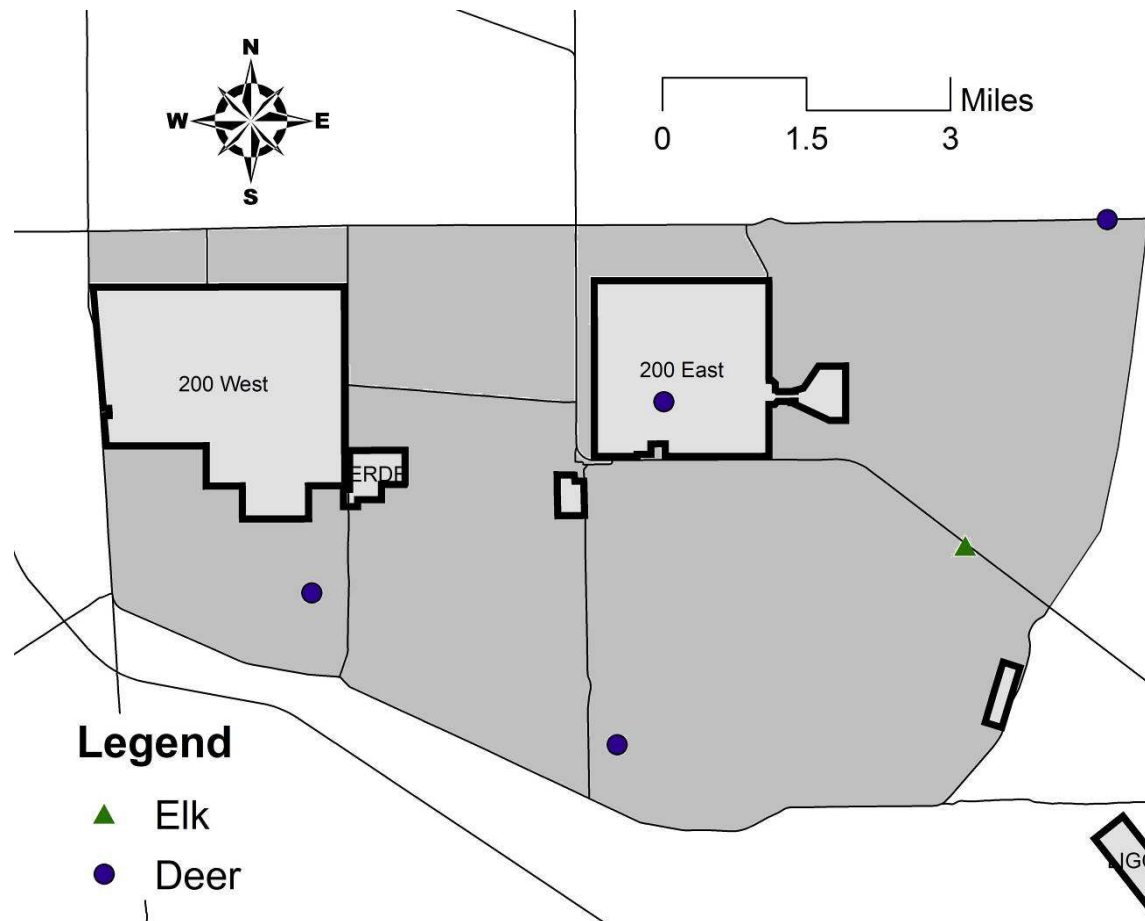


Figure 5.13. 200 Areas Deer Sampling Location

ROADKILL DEER AND ELK

Historically, roadkill deer have been identified by sectors of the site (e.g., southeast, northeast, etc). Recent studies of deer populations suggest that there are essentially three populations of deer that reside on the site exclusive of populations residing on ALE. Along the Hanford Reach there is a northern population and a southern population. There is also a central population that inhabits the 200 Areas, however, since the decommissioning of B-Pond, the status of this central population is uncertain.

Roadkill deer collected from the 100 N deer sampling area will be designated as 100 N Area Deer. Roadkill deer collected on the following sections of Hanford Site roads will be designated as Northern River Deer.

1. Route 6, north of the intersection with Route 11A to intersection with Route 1 (formerly the Northwest Sector).
2. Route 4N of the intersection with route 11A to 100 D Area (terminus of Route 2N) (formerly the Northwest Sector).
3. Route 2N from Mile Post 3 (3 miles from intersection with Route 11A) to its terminus at the intersection with Route 4N at 100 D (formerly the Northeast Sector).
4. Route 1 from its origin (intersection with 2N) to its intersection with Route 4N (formerly the Northeast Sector).

Deer collected on the following sections of Hanford Site roads will be designated as Southern River Deer.

1. Route 2N from its origin (intersection with 11A/2S) north to Mile Post 3 (formerly the Northeast Sector).
2. Route 11A from its origin (intersection with 2N/2S) west to Mile Post 2 (formerly the East Sector).
3. Route 2S from its origin (intersection with 2N/11A) south to its intersection with 4S at the Wye Barricade (formerly the East Sector).
4. Route 4S from Wye Barricade to the 300 Area (formerly the Southeast Sector).
5. Route 10 from the Wye Barricade south to Mile Post 4 (formerly the Southeast Sector).
6. FFTF road from intersection with Route 10 to it intersection with Route 4S (formerly the Southeast Sector).
7. Route 4S from the Wye Barricade west to Mile Post 8 (Intersection with Army Loop Road) (formerly the East Sector).

Deer collected on the following sections of Hanford Site roads will be designated as Central Plateau Deer. Deer specifically collected from the 200 Areas Ponds will still be designated as 200 Areas Deer.

8. Route 11A, Mile Post 2, west to its intersection with Highway 240 (formerly the West Sector).
9. Route 4S from its origin (intersection with 11A) to its intersection with Army Loop road (Mile Post 8) (formerly the West Sector).

10. All of Army Loop Road (formerly the West Sector).
11. Road between 200 East and 200 West Areas and its extension at the 200 West Area entrance to Route 11A (formerly the West Sector).

The elk population located primarily on the ALE Reserve has grown to very large numbers in recent years. Elk have been observed in the 200 Areas and as far east as the White Bluffs boat launch. Elk that are killed on roads are presently sampled and collected when the SESP has been notified. Arrangements have been made with law enforcement agencies to notify the Battelle switchboard operator who in turn notifies SESP staff.

Sample collection procedures are the same as described for deer. Most roadkill elk occur on either Highway 240 or Highway 24 (Vernita Bridge to Yakima Barricade and west towards Yakima). Elk have also frequented the ALE site north of Horn Road. When roadkill elk are called in, there is generally a mile post marker given to identify the general location of the accident.

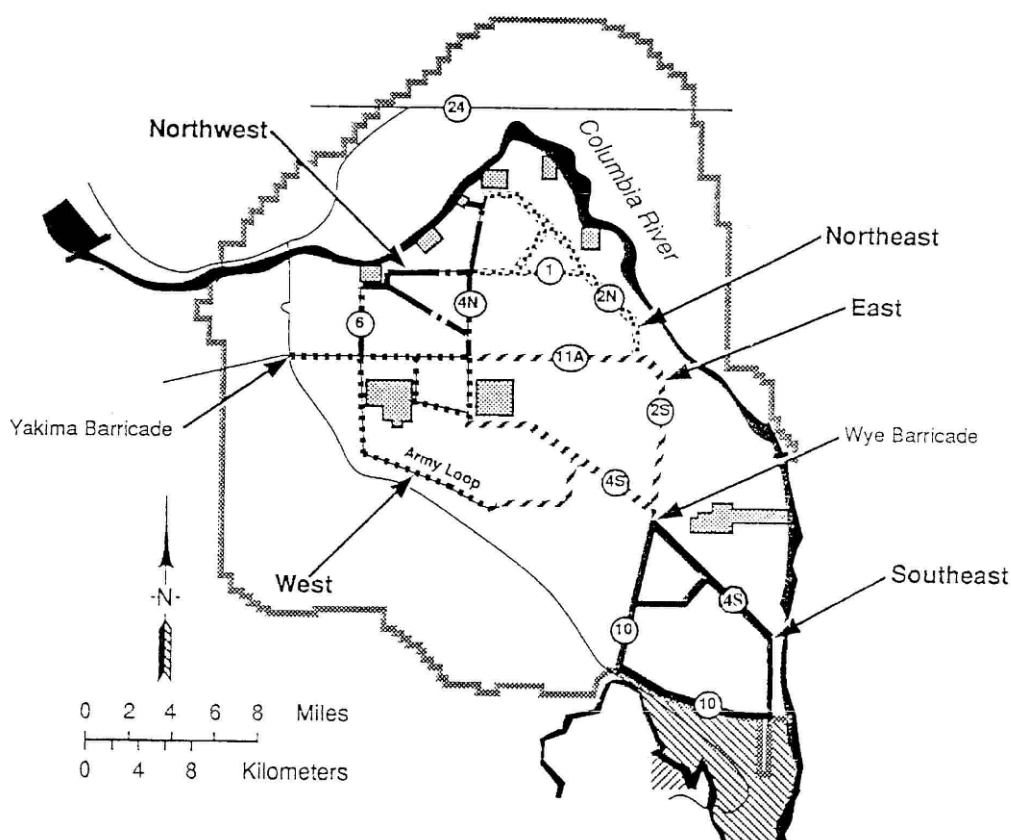


Figure 5.14. Roadkill Deer and Elk Sampling Locations

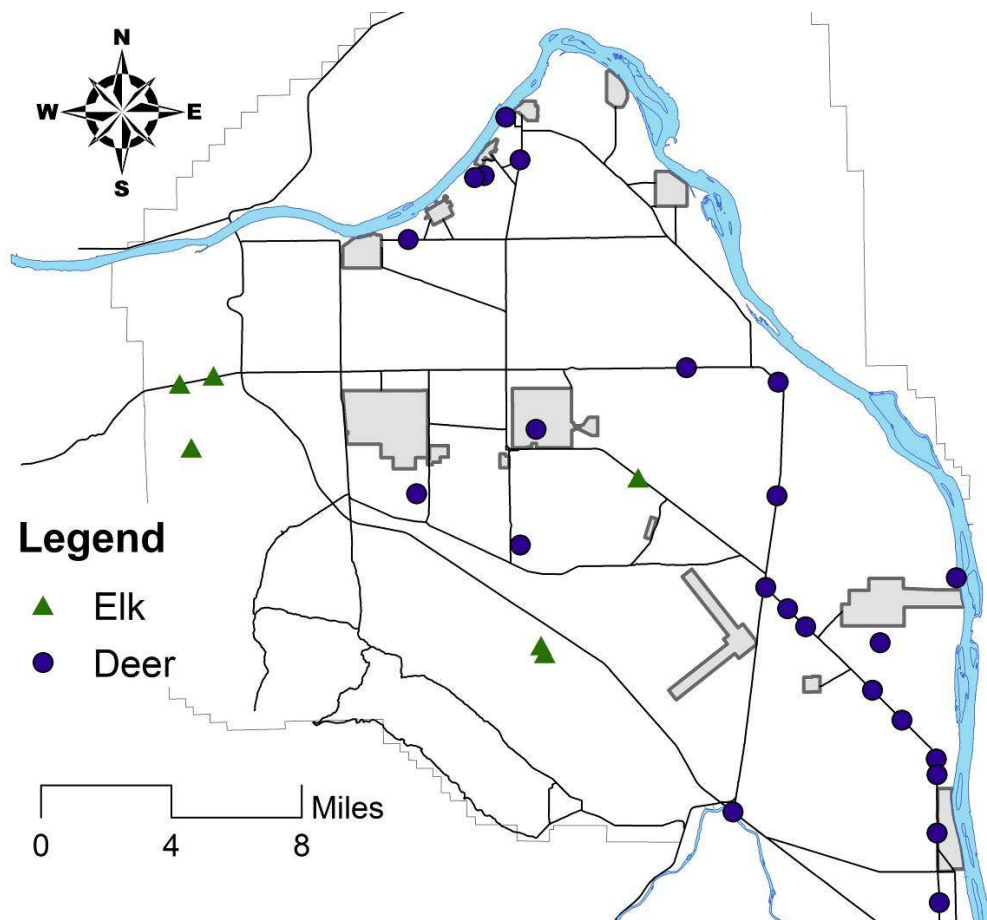


Figure 5.15. Deer and Elk Samples Collected between 2004 and 2008. This map includes both road kill and harvested animals.

**BACKGROUND
DEER**

Background deer samples are collected throughout much of the Pacific Northwest from salvage of roadkill animals or by sportsmen donations. Background locations will be any location deemed uninfluenced by Hanford contaminates. GPS coordinates of each sample will be recorded to locate each individual collection point.

5.6 Rabbits

100 N AREA RABBITS

The 100 N Area rabbit sampling location consists of areas with native vegetation (i.e., sagebrush and rabbit brush) inside and outside of the 100-N Area. Traps shall be located at suitable locations within the shaded area below. The map shows where samples have successfully been collected in recent years.

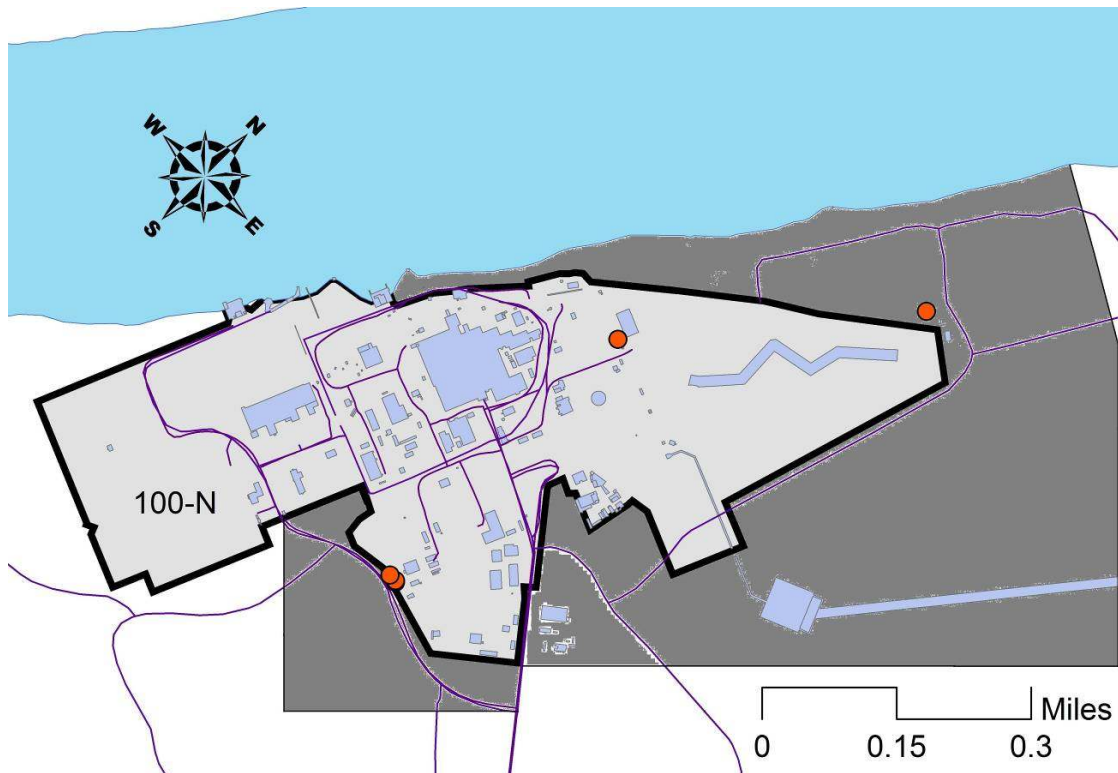


Figure 5.16. 100 N Area Rabbit Sampling Location

200 EAST AREA RABBITS

The 200 East Area rabbit sampling location is an area between route 11A and army loop road. The east boundary is an imaginary line between the intersection of route 4S and army loop road extending up to route 11A. The western boundary is a road that connects route 4N with army loop road. The map shows where samples have successfully been collected in recent years.

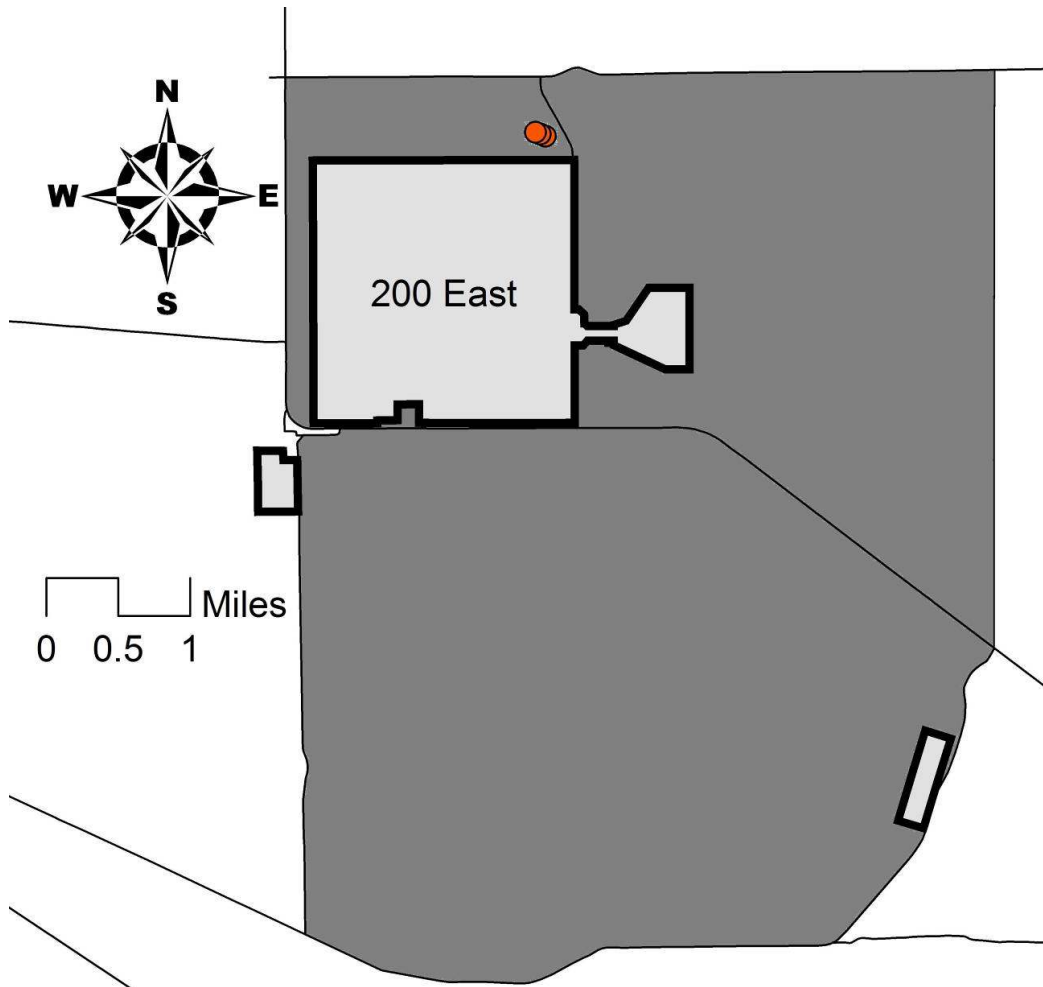


Figure 5.17. 200 East Area Rabbit Sampling Location

200 WEST AREA RABBITS

The 200 West Area rabbit sampling location is an area between route 11A and army loop road. The eastern boundary is a road that connects route 4N with army loop road.

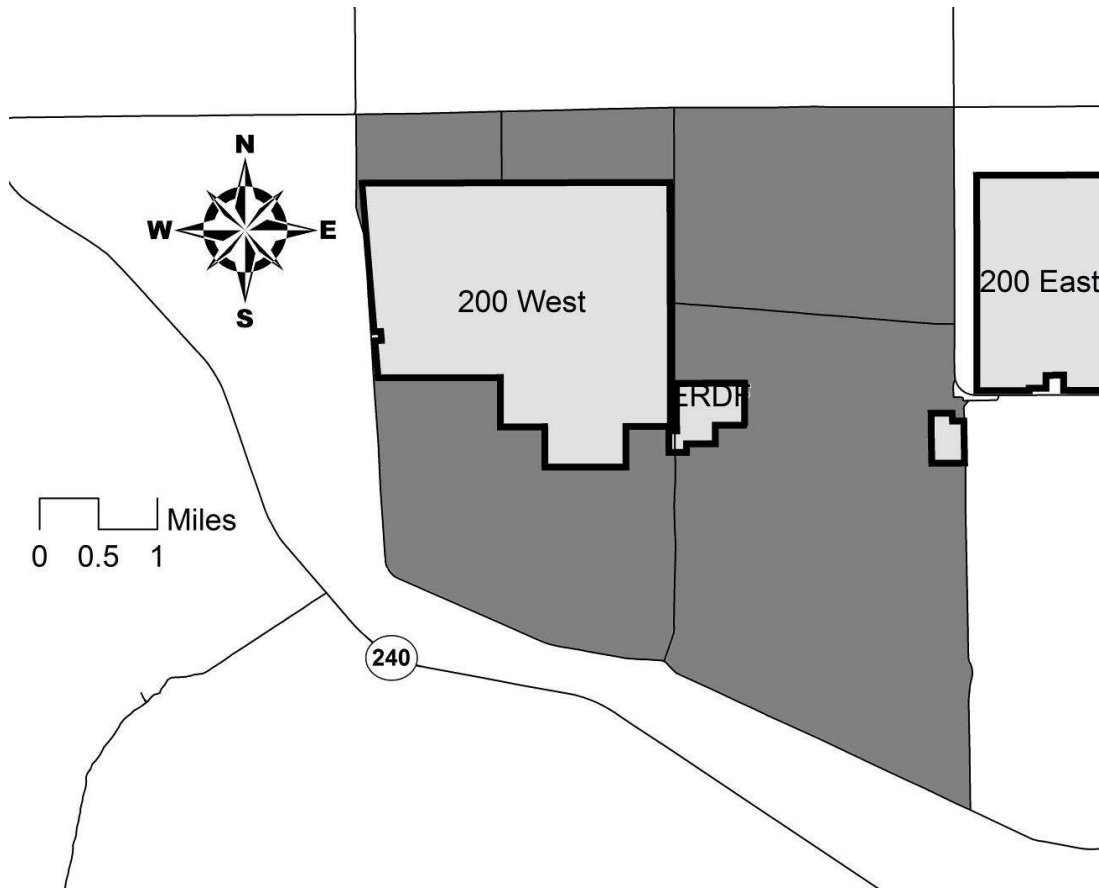


Figure 5.18. 200 West Area Rabbit Sampling Locations

**BACKGROUND
RABBITS**

Background Rabbit samples are collected throughout much of the Pacific Northwest. Background locations will be any location deemed uninfluenced by Hanford contaminates. GPS coordinates of each sample will be recorded to locate each individual collection point.



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