DOE/EA-0429

Environmental Assessment for the Environmental and Molecular Sciences Laboratory at the Hanford Site, Richland, Washington

September 1992

U.S. Department of Energy
Richland, Washington 99352

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1.0 Summary

This environmental assessment presents estimated environmental impacts from the construction and operation of the U.S. Department of Energy's (DOE's) Environmental and Molecular Sciences Laboratory (EMSL), which is proposed to be built on DOE's Hanford Site near Richland, Washington. The proposed location is at the south end of the 300 Area near the Columbia River. The EMSL, if constructed, would be a new laboratory facility approximately 18,580 square meters (200,000 square feet) in size.

Construction impacts are expected to be minimal. If the EMSL is constructed, approximately 8 hectares (20 acres) would be necessary for the building, parking lots, and landscaping. No federally listed threatened or endangered species are dependent on this site. Nearby cultural resources would not be impacted by construction or operation. The proposed action is not located on wetlands or in the Columbia River floodplain as defined in 10 CFR 1022. Noise and gaseous emissions from construction equipment would be similar to that for any other construction job of similar size.

Routine operation of the EMSL, if constructed, would result in the generation of small quantities of gaseous, liquid, solid, radioactive, and hazardous wastes. The impacts of these wastes were examined and found to be not significant. Ecological and socioeconomic impacts are also not expected to be significant.

2.0 Purpose of and Need for the Proposed Action

The proposed action is to construct and operate a new office and laboratory facility at DOE's Pacific Northwest Laboratory (PNL) at the Hanford Site near Richland, Washington.

The purpose of the proposed action is to provide a suitable facility for the Environmental and Molecular Sciences Laboratory. The EMSL, if constructed, would house basic and applied research components of the Environmental Science Research Center (ESRC) and the Molecular Science Research Center (MSRC).

The proposed facility is needed in order to provide, in a single location, the combined office and laboratory facilities necessary to conduct applied research directed toward environmental compliance and remediation programs carried out by DOE at the Hanford Site and other DOE sites. Both basic and applied research are prominent components of the DOE's Research, Development, Demonstration, Testing, and Evaluation Program that has been organized to meet the DOE's environmental restoration and waste management commitments. The EMSL responds to a need for both basic and applied research and would, if constructed, facilitate application of the research to the Hanford Site where as

much as one-half of DOE's hazardous and radioactive wastes are stored or buried. A new facility is also needed to provide vibration stability for very sensitive scientific apparatus and to allow appropriate access for visiting scientists.

The EMSL, if constructed, would be a modern research facility in which experimental, theoretical, and computational techniques can be focused on molecular-level phenomena. Research would be directed toward applying molecular research to environmental restoration problems, such as the chemical and transport behavior of complex mixtures of contaminants in the natural environment. The facility would accommodate state-of-the-art molecular research equipment and high-speed computer and communications equipment and would enhance collaborative research among environmental, chemical, materials, biological, and computer scientists. The proposed action is not covered by the Hanford Federal Facility Agreement and Consent Order.

3.0 Proposed Action and Alternatives

The proposed action and alternatives to the proposed action are discussed in this chapter.

3.1 Proposed Action

The proposed action is to construct and operate the EMSL at the Hanford Site (Figure 1). Two of the DOE's PNL administrative entities are proposed to be housed in the EMSL: the MSRC and the basic research component of the ESRC. The EMSL is proposed to be located at the south end of the 300 Area, east of George Washington Way, north of Horn Rapids Road, and west of the Columbia River (Figure 2) on land owned by DOE.

The conceptual design for the EMSL facility includes approximately 18,580 square meters (200,000 square feet) of floor space for laboratories, offices, research support shops, computer and graphics rooms, storage areas, conference rooms, a library, kitchen, lunchroom, and a 100-person lecture hall. The conceptual design permits integration of the EMSL laboratory and support activities with those of the existing PNL and 300 Area facilities. Equipment currently planned for the laboratory includes computers, excimer and dye lasers, molecular beam apparatus, mass spectrometers, optical spectrometers, electron spectrometers, nuclear magnetic resonance spectrometers, scanning and analytical electron microscopes, scanning tunneling microscopes, an atomic force microscope, material synthesis apparatus, a 2-MeV tandem accelerator, a 500-kV ion implanter, an intense cluster source, and dedicated rooms and gloveboxes for handling hazardous and radioactive tracer laboratory materials.

Site development includes construction of utility extensions, driveways, parking lots, and landscaped areas. The water line would require a trench approximately 305 meters (1,000 feet) long directly to the west to a City of Richland water line. The sewer, electricity, and natural gas lines

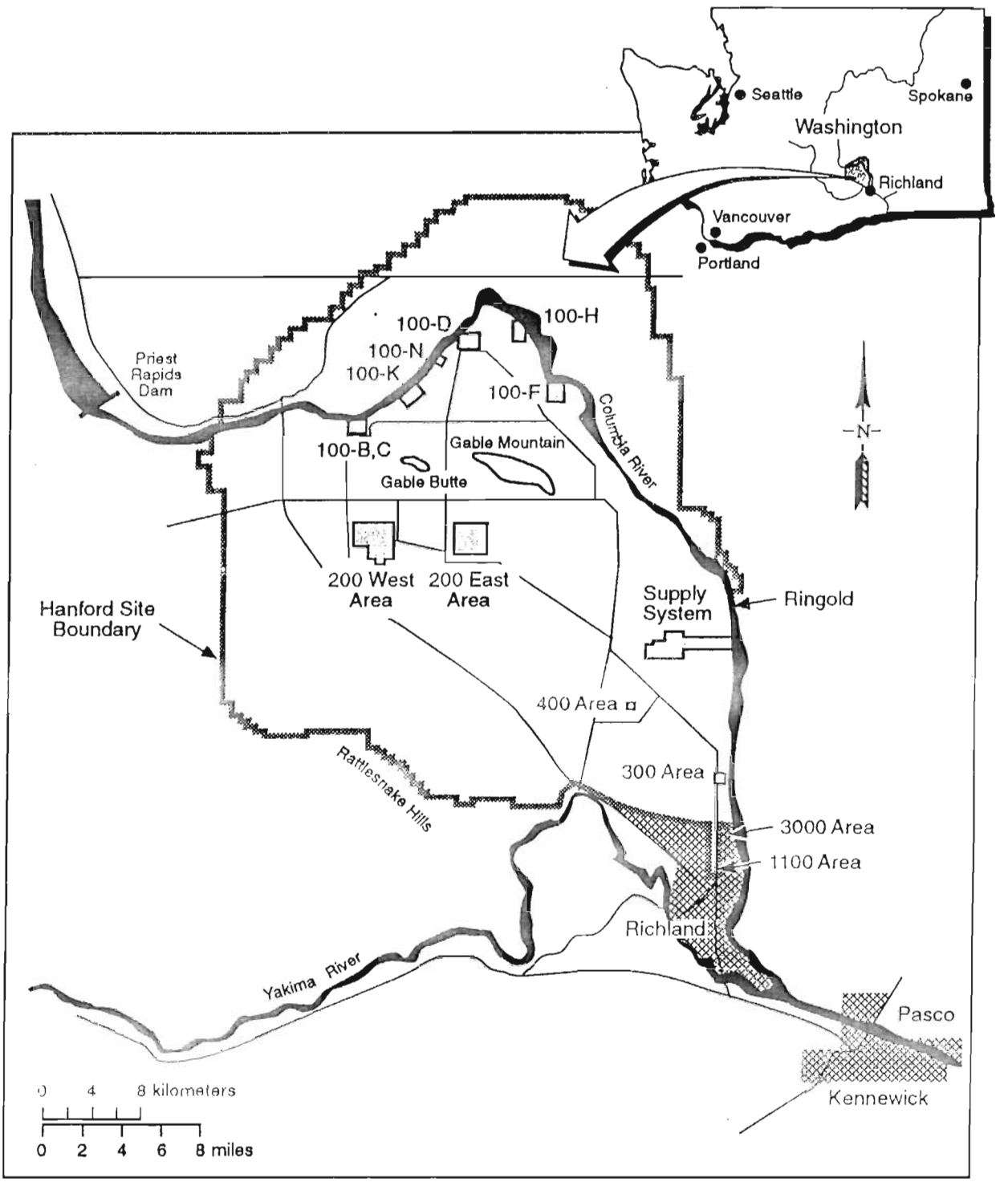


Figure 1. The Hanford Site

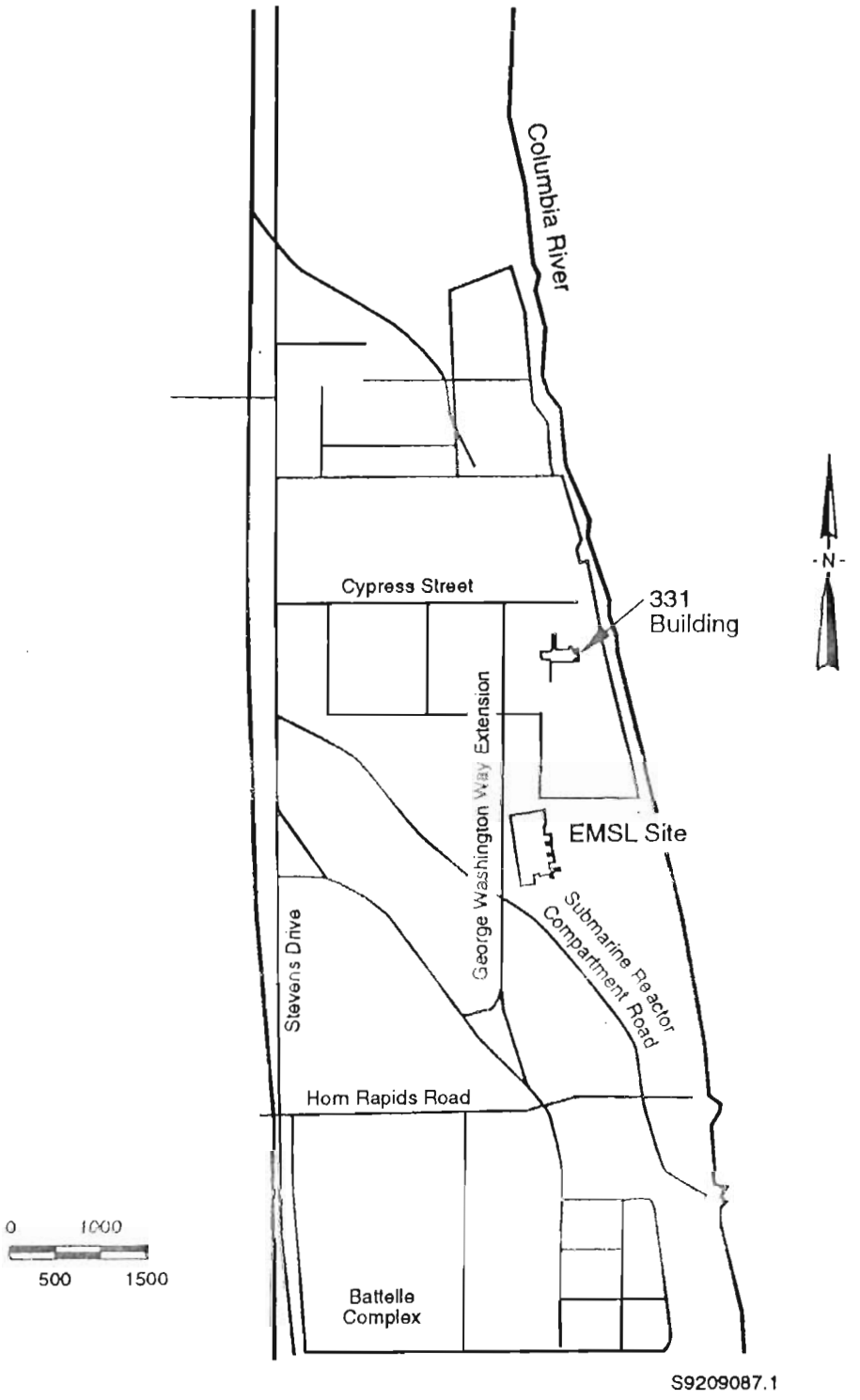


Figure 2. The 300 Area

would require a trench approximately 610 meters (2,000 feet) long to the south along George Washington Way to the city limits of Richland. Two paved parking lots, covering about 2 hectares (5 acres), would be constructed to provide parking for 260 vehicles (Figure 3). Landscaping would include lawn, ground cover, and an automatic sprinkler system. Storm drains would be built to ensure adequate drainage. Storm drain discharges would be routed to dry wells that would allow drainage to the soil column. No direct drainage to the Columbia River is proposed.

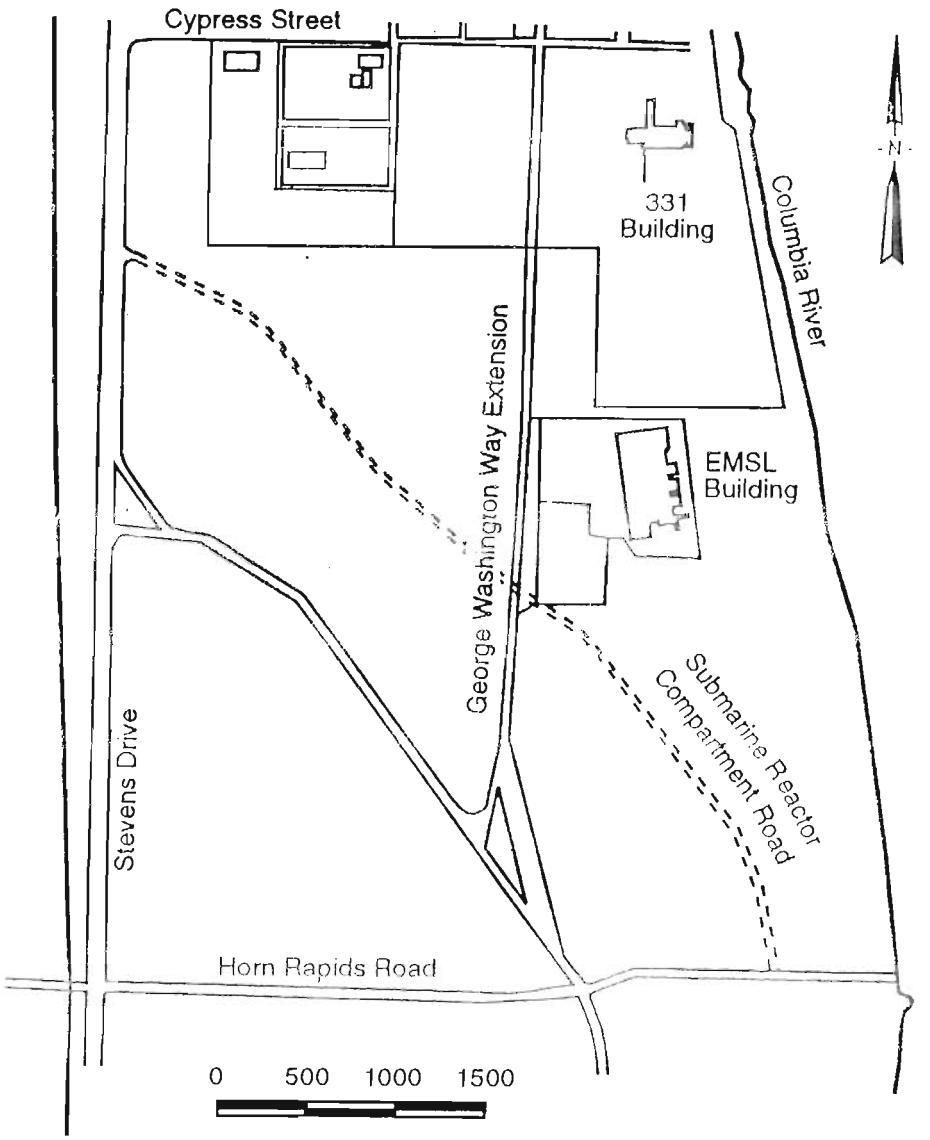


Figure 3. The EMSL Site

The EMSL conceptual design includes state-of-the-art controls and monitoring systems to prevent release of hazardous substances to the environment. The nature of molecular research is such that only small quantities of sample materials and associated chemicals are needed. Therefore, no potential exists for large releases of hazardous substances. Chemicals planned for use and storage in the EMSL are typical of those used in a university chemistry laboratory. It is intended that hazardous substances, as defined in 40 CFR 302 pursuant to Section 102(a) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), not be present in the EMSL in amounts greater than reportable quantities. [A "reportable quantity" is an amount that, if released, requires notification of the U.S. Environmental Protection Agency (EPA)]. A list of selected hazardous substances expected to be used in the EMSL is presented in Table 1 along with the reportable quantity of each substance in kilograms.

Small quantities of radioactive materials such as carbon-14, chlorine-36, chromium-51, cobalt-60, iodine-125, iodine-131, nickel-63, phosphorus-32, potassium-42, sodium-22, strontium-90, sulfur-35, technetium-99, and tritium are expected to be present in the proposed EMSL for radioactive isotope labeling of samples to perform radioactive tracer experiments. The total activity of any isotope stored in the EMSL is intended to be in the range of 1 to 10 millicuries, except for phosphorus-32, which may be stored in the amount of 20 millicuries. Radioactive materials in experimental use at any one time are intended to have activity levels in the microcurie range. In addition, natural or depleted uranium may be used as a salt in 200- to 250-gram quantities annually for subsurface contamination transport studies within the laboratory.

Approximately 200 scientists, technicians, and support staff are expected to work in the EMSL. In addition, approximately 60 visiting scientists may be working in the proposed EMSL at any given time. Visiting scientists are expected to stay for periods of 1 month to 1 year.

3.2 Onsite Alternatives

The Fuels and Materials Examination Facility (FMEF) and other laboratories and offices at Hanford were considered for housing the proposed EMSL, but were not considered viable alternatives because 1) all suitable facilities were in use; 2) none of the available facilities meet the stringent vibration isolation requirements for the planned research instruments such as analytical electron microscopes, laser spectrometers, and ultra-high resolution mass spectrometers; and 3) all of the available facilities are in personnel-restricted entry areas, which does not allow appropriate access for visiting scientists.

Alternative building sites at Hanford were evaluated. Of several sites considered, i.e., sites in the 300 Area, 1100 Area, and a site just north of the Battelle complex, the one chosen (Figure 2) was selected on the basis of 1) accessibility to existing PNL and 300 Area facilities, 2) small environmental impacts, 3) accessibility to visiting scientists, 4) DOE ownership, and 5) accessibility to Washington State University Tri-Cities.

Table 1. Hazardous Substances Expected To Be Present in the Environmental and Molecular Sciences Laboratory[a]

Hazardous Substance	Reportable Quantity, kilograms	Hazardous Substance	Reportable Quantity, kilograms
Acetic acid	2270	Methanol	2270
Acetic anhydride	2270	Methyl iodide	45.4
Acetone	2270	Methylene chloride	454
Acetonitrile	2270	Naphthalene	45.4
Acetophenone	2270	Nickel chloride	45.4
Acetyl chloride	2270	Nitric acid	454
Ammonia	45.4	Nitric oxide	4.54
Ammonium chloride	2270	Nitrogen dioxide	4.54
Ammonium dichromate	4.54	Paraformaldehyde	454
Benzene	4.54	Phenol	454
Benzyl chloride	45.4	Phosphine	45.4
Butanol	2270	Phosphorus trichloride	454
Butanone	2270	Phosphoric acid	2270
Carbon disulfide	45.4	Phthalic anhydride	2270
Carbon tetrachloride	4.54	Potassium chromate	4.54
Chlorine	4.54	Potassium cyanide	4.54
Chlorobenzene	45.4	Potassium dichromate	4.54
Chloroform	4.54	Potassium hydroxide	454
m-Cresol	454	Potassium permanganate	45.4
Cyclohexane	454	Pyridine	454
Dibutyl phthalate	4.54	Quinoline	2270
Diethylamine	45.4	Silver nitrate	0.454
Dimethylamine	454	Sodium	4.54
Dioxane	45.4	Sodium azide	454
Ethyl acetate	2270	Sodium cyanide	4.54
Ferric sulfate	454	Sodium dichromate	4.54
Fluorine	4.54	Sodium fluoride	454
Formaldehyde	45.4	Sodium hydroxide	454
Formic acid	2270	Sodium phosphate, dibasic	2270
Hexachlorobenzene	4.54	Sulfuric acid	454
Hydrazine	0.454	Tetrahydrofuran	454
Hydrochloric acid	2270	α-Trichloroethane	454
Hydrofluoric acid	45.4	Toluene	454
Hydrogen sulfide	45.4	Vanadium pentoxide	454
Lead acetate	2270	Mixed-xylenes	454
Maleic anhydride	2270	Zinc chloride	454
Mercury	0.454		

(a) NOTE: Quantities are reportable quantities in kilograms from Table 302.4 in 40 CFR 302. Quantities present in EMSL are intended to be much less than the reportable quantities.

3.3 Offsite Alternatives

Under this alternative, the proposed EMSL would be constructed at a location away from the Hanford Site. No environmental benefits associated with locating the proposed EMSL offsite, versus on the Hanford Site as described in the proposed action, were identified. DOE does not prefer this alternative because the research presently being conducted at Hanford, similar to that which would be performed at the EMSL, would have to be moved at additional expense offsite to another location.

3.4 No Action Alternative

"No action" means that the proposed EMSL would not be built. This alternative was not selected because if the proposed EMSL were not built, DOE would be deprived of a critical facility that would assemble both the scientists and equipment required to conduct basic and applied research in the environmental and molecular sciences needed to support DOE's environmental restoration programs. No action would not meet the need for the proposed action.

4.0 Affected Environment

The environment at the Hanford Site is described in detail by Cushing et al. (1991). Therefore, only a very brief summary relevant to the EMSL is presented here.

The Hanford Site occupies an area of approximately 1450 square kilometers (560 square miles) within the semiarid Pasco Basin of the Columbia Plateau in southeastern Washington State (Figure 1). Only about 6 percent of the land area has been disturbed and is actively being used or has been used for the production of nuclear materials, for research, or for waste management activities. A sitewide transportation network connects widely separated facilities. The Columbia River flows eastward through the northern part of the Hanford Site and southward to form part of the eastern border of the Site. The Yakima River flows along part of the Site's southern boundary and joins the Columbia River below the City of Richland, which is adjacent to the Site on the southeast. Lands adjoining the Site to the west, north, and east are primarily range and agricultural lands supporting both dry and irrigated farming. The cities of Richland, Kennewick, and Pasco (commonly referred to as the Tri-Cities) comprise the nearest population center and are southeast of the Site. Population within 80 kilometers of the Site is approximately 282,000. Approximately 16,000 people are employed on the Hanford Site.

Average monthly temperatures range from -1.5°C (29°F) in January to 24.7°C (76.5°F) in July. Average annual rainfall is 16 centimeters (6.3 inches). Air quality is considered good. Washington State classifies the water quality of the Columbia River near Hanford as Class A or excellent (suitable for domestic use).

Plant and animal species suited to the semiarid climate and the Columbia River and its banks can be found on the EMSL site. Endangered species surveys conducted in January and April 1992 concluded that no plants or animals on the federal list of threatened, endangered, or candidate species occur on the proposed site for the EMSL (see Appendix A). The EMSL area may, however, be used for nesting by burrowing owls and for foraging by Swainson's hawks that nest west of Stevens Drive (both are state candidate species). Deer use the site as a corridor. Bald eagles and peregrine falcons, which are federally listed species, visit other areas of the Hanford Site, but not the proposed EMSL site. Long-billed curlews have been observed nesting near the proposed EMSL site, but were not observed on the site during the surveys. Also, long-billed curlews are no longer being considered for listing as a federal threatened or endangered species. Canada geese use the site occasionally in fall and winter during their migration.

A cultural resources review of the proposed EMSL site and surrounding area was conducted in late fall 1991 (see Appendix B). This review consisted of a literature review and archeological pedestrian survey. During the survey, two cultural resource sites were located. Cultural site HT-91-071, identified as a dump site, is a low-density scatter of tin cans covering 5 square meters (54-square feet) and is not deemed to be significant. Cultural site HT-91-072 is a prehistoric Native-American campsite that is approximately 120 meters (394 feet) from the Columbia River. The proposed facility and parking lot would be located over 150 meters from the Columbia river and at least 30 meters (98 feet) from the campsite. A buffer zone has been established in which no proposed EMSL construction activities or land alteration would be permitted within 150 meters of the Columbia River.

The proposed EMSL site is not located in either a floodplain or a wetland as defined by 10 CFR 1022 ("Compliance with Floodplain/Wetlands Environmental Review Requirements"). The unregulated probable maximum Columbia River flood has a flow volume of 1,600,000 cfs at Hanford and would reach an elevation of approximately 385 feet at the EMSL site. This is below the elevation of the ground floor of the EMSL, which is 390 feet. The probable maximum flood is a greater flood than either the 100-year flood or the 500-year flood, for which the regulations in 10 CFR 1022 require consideration. The EMSL site is, however, located on two operable units selected for potential remedial action under CERCLA. Although the proposed site is not known to be associated with any retired or abandoned waste facilities, it is located at the south end of an underground plume containing uranium from retired process water disposal ponds.

5.0 Environmental Impacts

The environmental impacts from the construction and operation of the proposed EMSL are expected to be similar to the impacts from the construction and operation of a typical university chemistry building.

5.1 Construction Impacts

Construction impacts include impacts on the atmospheric environment, impacts on the terrestrial environment, and construction accidents. EMSL construction activities are expected to last 24 months.

5.1.1 Atmospheric Impacts

Diesel-powered equipment used during construction of the proposed EMSL will meet applicable air emission standards. Dust generated during the construction phase will be minimized by frequent watering. Ambient noise levels may be temporarily increased. The estimated equipment noise during earthmoving is in the range of 85 to 100 dBA at the nearest road, although there are no residences nearby. During general construction, any increased noise levels are expected to be intermittent and in the estimated range of 85 to 95 dBA at the nearest road. Construction workers will be required to wear appropriate hearing protection along with other safety equipment. No adverse noise impact on nearby indoor office workers is expected. EMSL construction activities are expected to last 24 months.

5.1.2 Terrestrial Impacts

The construction site contains no critical habitat for federally listed endangered or threatened species. If candidate species are found onsite during construction, activities impacting the species will be halted until a biological assessment can carried out and any adverse impacts mitigated.

If any previously unknown paleontological, prehistoric, or historic artifacts are discovered during construction, activities potentially impacting the artifacts will be halted and the artifacts protected until the find is properly assessed and discussed with the state historic preservation officer. During excavation, including excavation of utility corridors, an archaeologist from the Hanford Cultural Resources Laboratory will be present to ensure that any newly discovered artifacts are properly protected.

5.1.3 Impacts on CERCLA Remedial Actions

CERCLA remedial actions are not expected to impact or be impacted by construction or operation of the EMSL. Any CERCLA remedial action that might take place would be related to the 300 Area groundwater plume and could easily be conducted with existing technology and without impacting the EMSL.

5.1.4 Construction Accidents

Based on National Safety Council (NSC 1986) statistics for 1985 and on a total of 150 workers employed in construction of the EMSL over 24 months, approximately 12 lost-workday accidents involving construction workers are expected.

5.2 Operational Impacts

If the EMSL is constructed, atmospheric emissions, liquid discharges, and solid waste generation can be expected to occur during routine operation. Appropriate controls, as discussed below, will minimize any impacts. Neither noise levels nor socioeconomic resources are expected to be affected by routine operations.

5.2.1 Atmospheric Emissions

The EMSL conceptual design includes best-available radionuclide control technology for each room and/or hood dedicated to experiments with radionuclides. This technology includes establishing controlled radiation zones with high-efficiency particulate air (HEPA) filtered exhaust from all hoods and gloveboxes. HEPA filters are tested on an annual basis and are replaced when required, due to dust loading (static pressure drop), testing, age, or flow reduction. HEPA filters are removed in accordance with the appropriate manufacturer's written instructions for the filter housing type and, if contaminated, are disposed of as low-level radioactive waste in existing waste disposal facilities onsite. The conceptual design also includes provision for installing additional best-available radionuclide control technology should new radionuclides with different control requirements be needed for experimental work. Stack exhausts will be monitored for radioactive emissions. DOE maintains an Effluent Monitoring Program for all stacks on the Hanford Site. Maintenance and calibration of the monitors are conducted on a regular basis. All emissions will be controlled to meet applicable state and federal regulations. During routine operations very small emissions of radionuclides may occur. For the purposes of calculating an effective dose equivalent to a maximally exposed member of the public, it was assumed that over the period of a year 1 microcurie of uranium-238 and 50 microcuries of each of the other radionuclides listed in Section 3.1 would be released. With this scenario, the effective dose equivalent to the maximally exposed offsite individual is approximately 3×10^{-4} millirem per year. This dose is less than the 0.03-millirem dose received by the maximally exposed offsite individual from Hanford operations in 1990 (Woodruff and Hanf 1991) and much less than the limit in 40 CFR 61 ("National Emission Standards for Hazardous Air Pollutants") of 10 millirem per year for emissions of radionuclides to the atmosphere from DOE facilities.

An annual population dose was also calculated for routine operation of the EMSL based on the same source terms. This population dose is 6.6×10^{-4} person-rem per year. Based on a conversion factor of 800 fatal cancers per one millon person-rems, the annual number of cancer deaths calculated from routine operation of the EMSL is 5×10^{-7}.

Small quantities of nonradioactive but toxic or otherwise hazardous materials are expected to be used in experiments in the EMSL. Administrative procedures call for these materials to be present in the EMSL only in less than reportable quantities (40 CFR 302) and to be used only in dedicated chemical hoods or rooms with appropriate emission control technology and monitors. Scrubbers are planned to be included in chemical hoods where appropriate. Two gas/oil boilers using state-of-the-art combustion technology and not requiring supplemental emissions controls are planned for the EMSL.

5.2.2 Liquid Effluents

Construction of the EMSL would require a 12-inch sanitary sewer line to be connected to the City of Richland sewer system. The DOE will obtain a City of Richland sanitary discharge permit and will meet all permit conditions. Since the materials discharged to the sanitary sewer will be limited to those compatible with the City of Richland's sewer treatment plant, no adverse impacts are expected from this discharge.

A separate process sewer system is designed to collect waste liquids from laboratory sinks, hood sinks, and floor drains and to route them to holding tanks. These tanks will be continuously monitored for pH and will be sampled on a routine basis for hazardous materials. If the tank waste is found to be in compliance with the City of Richland sanitary discharge permit, or if the tank waste is treated to meet permit requirements, these liquids will be pumped to the sanitary sewer system. Wastes unsuitable for sanitary sewer disposal will be packaged and disposed of in accordance with Resource Conservation and Recovery Act (RCRA) requirements and with Washington State Dangerous Waste Regulations. (Future references to RCRA include the Washington State Dangerous Waste Regulations.) DOE administrative controls will be maintained, for example, annual training of personnel on hazardous waste disposal and labeling of all sinks and drains having restrictions for drain use.

Storm drains will be built to ensure adequate water drainage from parking lots. Storm drain discharges will be routed to dry wells that will allow drainage to the soil column. No direct or indirect discharges to the river are expected, and no permit is expected to be required.

5.2.3 Liquid and Solid Hazardous and Radioactive Waste

About 2,000 liters of liquid hazardous, radioactive, and mixed wastes are expected to be generated in the EMSL each year. The staff in the proposed EMSL will minimize the use of hazardous and/or toxic materials in accordance with PNL-MA-822, "Waste Minimization and Pollution Prevention Awareness Program." Liquid radioactive wastes will be collected separately, packaged, and disposed of in compliance with applicable federal and state requirements and DOE orders. Liquid hazardous wastes and mixed wastes will also be collected separately and managed in compliance with applicable federal and state requirements and DOE orders.

The quantity of solid radioactive, hazardous, and mixed wastes expected to be generated during research activities in the EMSL is not expected to exceed twenty 55-gallon drums per year. All solid waste generated will be managed and disposed of in accordance with applicable federal, state, and local requirements and DOE Orders.

Hazardous wastes will be disposed of offsite at the Arlington, Oregon hazardous waste facility; radioactive wastes will be disposed of in the Hanford 200 Area; and mixed wastes will be stored at an existing Hanford 200 Area facility for future disposal.

5.2.4 Noise Levels

Noise levels are not expected to increase over current ambient external background levels during EMSL operation.

5.2.5 Socioeconomic Impacts

The proposed action would add not more than 260 people to the 16,000 Hanford Site workforce. If every worker came from outside the Tri-Cities area (maximum case), this would represent about a 1.3 percent increase in the total Site workforce. Increases of less than 5 percent of the present labor force have been determined to have little effect on an existing community (U.S. Department of Housing and Urban Development 1976).

5.2.6 Occupational Hazards

Workers in the EMSL are expected to be confronted with the same occupational hazards as those found in most chemical research laboratories. Because the facility is intended to be used by visiting scientists, full-time EMSL staff members will oversee visitor activities and will be responsible for ensuring that all visitors receive appropriate training. Training on instrument operation, safety procedures, and administrative procedures for handling and disposing of chemicals and radionuclides will be required before staff and visitors are allowed to work independently in the facility.

All personnel will wear radiation dosimeters and appropriate eye protection. The occupational radiation dose to an EMSL staff member during normal operations is estimated to be 20 millirem per year or lower. This estimate was obtained from the Annual Dose Review conducted by PNL for DOE (DOE 1987) involving staff working with radioactive chemicals used for molecular labeling. The estimate is substantially lower than the DOE occupational limit of 5 rem per year annual effective dose equivalent in DOE Order 5480.11. Based on a conversion factor of 800 fatal cancers per 1 million person-rems and on an occupancy of 260 persons in the EMSL, 0.004 fatal cancers are expected to workers from each year of operation of the EMSL.

The EMSL is being designed in accordance with the requirements of the Washington Industrial Safety and Health Act and the Occupational Safety and Health Act. Laser systems will be designed in accordance with American National Standards Institute Standard Z136.1 requirements (ANSI 1986).

5.2.7 Potential Accidents

The EMSL conceptual design incorporates protection from earthquake, wind, flood, and fire, and the EMSL management plan incorporates personnel training in safety reviews and safe laboratory practices. Nevertheless, accidents are still possible.

The planned EMSL operations were evaluated, and the following accident scenario was developed to give a reasonable estimate for a radioactive release to the atmosphere and the potential

6.0 Applicable Environmental Regulations and Permit Requirements

It is DOE's policy to "conduct [its] operations in compliance with the letter and spirit of applicable environmental statutes, regulations, and standards" (DOE Order 5400.1). If the EMSL is constructed, DOE will meet the requirements of applicable environmental laws, regulations, and permits.

Approval may be required pursuant to the Clean Air Act under the National Emission Standards for Hazardous Air Pollutants (NESHAPs) regulations for the construction of any new source of hazardous air pollutants (specifically radionuclides). This approval may be issued by the EPA (40 CFR 61.07), by the Washington State Department of Health (WAC 402-80-060), or by both. Registration of the two EMSL boilers with the Tri-County Air Pollution Control Authority and review of their emissions to the air will be required before operation.

The City of Richland sewer permit requirements will be met. A National Pollutant Discharge Elimination System permit for the discharge of storm waters will not be required.

The proposed EMSL will meet all applicable federal, state, and local regulations pertaining to the generation and handling of hazardous and radioactive wastes.

The proposed site of the EMSL does not occupy a wetland and is not within the Columbia River 500-year floodplain. Therefore, no floodplain/wetland environmental review is required under 10 CFR 1022. The site of the proposed EMSL is not within the Columbia River comprehensive conservation study area (Public Law 100-605), so no special steps are necessary to meet the requirements of that law.

Federal regulations with respect to historic preservation and species protection will be met, although no permits are required.

7.0 List of Persons and Agencies Consulted

The U.S Fish and Wildlife Service, the Washington Department of Wildlife, and the state historic preservation officer were consulted in the preparation of this environmental assessment.

8.0 References

American National Standards Institute (ANSI). 1986. *Safe Use of Lasers*. ANSI Standard Z136.1, New York.

Cushing, C. E., D. A. Baker, J. C. Chatters, D. L. Hadley, D. J. Hoitink, E. B. Moore, T. M. Poston, A. G. Thurman, R. W. Wallace, and B. K. Wise. 1991. *Hanford Site National Environmental Policy Act Characterization*. PNL-6415 Rev. 4, Pacific Northwest Laboratory, Richland, Washington.

Napier, B. A., R. A. Peloquin, D. L. Strenge, and J. V. Ramsdell. 1988. *GENII The Hanford Environmental Radiation Dosimetry Software System*. Vol. 1 and 2, PNL-6584, Pacific Northwest Laboratory, Richland, Washington.

National Safety Council. 1986 edition. *Accident Facts*. National Safety Council, Washington, D.C.

U.S. Department of Energy. 1987. *20th Annual Report on Radiation Exposures for DOE and DOE Contractor Employees*. DOE/EH-0128, Washington, D.C.

U.S. Department of Housing and Urban Development (DHUD). 1976. *Rapid Growth from Energy Projects, Ideas for State and Local Action*. HUD-CPD-140, FEA/G 76/394, U.S. Department of Housing and Urban Development, Washington, D.C.

Woodruff, R. K., and R. W. Hanf, editors. 1991. *Hanford Site Environmental Report for Calendar Year 1990*. PNL-7930, Pacific Northwest Laboratory, Richland, Washington.

Appendix A

Endangered Species Act

Appendix A

Endangered Species Act

This appendix contains biological survey reports and the letter from the U.S. Fish and Wildlife Service concerning the potential existence of threatened or endangered species at the EMSL Site.

Battelle
Pacific Northwest Laboratories
Battelle Boulevard
P.O. Box 999
Richland, Washington 99352
Telephone (509)

March 24, 1992

Mr. Jeffrey W. Haas
U.S. Fish and Wildlife Service
3704 Griffin Lane S.E., Suite 102
Olympia, WA 98501-2192

Dear Mr. Haas:

The U.S. Department of Energy (DOE) has proposed the construction and operation of a laboratory and office building at the south end of the 300 Area on the Hanford Site. This building, if constructed, would be known as the Environmental and Molecular Sciences Laboratory (EMSL). The conceptual design of the EMSL includes a 200,000-square-foot laboratory and office building located on a 20-acre site immediately east of George Washington Way. This 20-acre site is presently undeveloped, but shows evidence of previous human use. Maps of the proposed site are attached.

DOE's Pacific Northwest Laboratory (PNL) is preparing an environmental assessment on the project and, as part of this responsibility, it is necessary to consider the impacts of the project on any threatened or endangered species. Accordingly, PNL requests from you the current list of endangered, threatened, and candidate species for the area and also the locations of any critical habitat as required by Section 7 of the Endangered Species Act.

Dr. Richard Fitzner of PNL conducted a biological evaluation of the site in January 1992. This evaluation is also attached. If you have any questions, please call me at (509) 376-1089 or Dr. Fitzner at (509) 376-3626.

Sincerely yours,

Emmett Moore

Emmett Moore

cc: Ted Clausing
Richard Fitzner

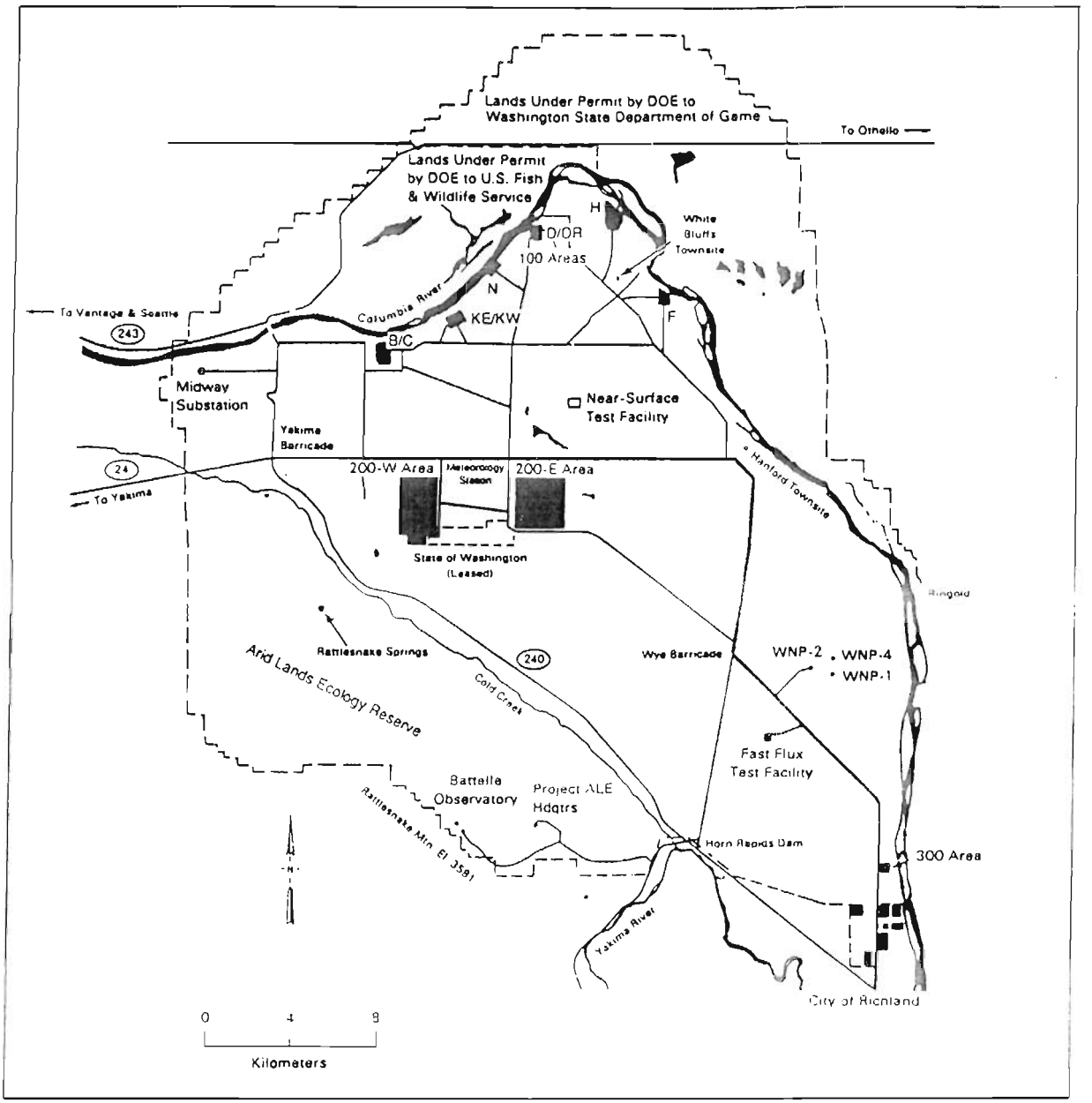


FIGURE 4.1. Hanford Site Map

D	7,000 - 22,000
E	22,000 - 70,000
F	70,000 - 220,000
G	220,000 - 700,000

The data shown here have been processed in a manner that suppresses the natural background. The results are displayed as relative levels of man-made radionuclide activity. It is nearly impossible to convert the relative levels of activity to a meaningful exposure rate because of the complex distribution of the nuclides.

LEGEND

NUMBERS 1 THROUGH 6 ON FIGURE 9 CORRESPOND TO SPECTRA 1 THROUGH 6 ON FIGURE 8

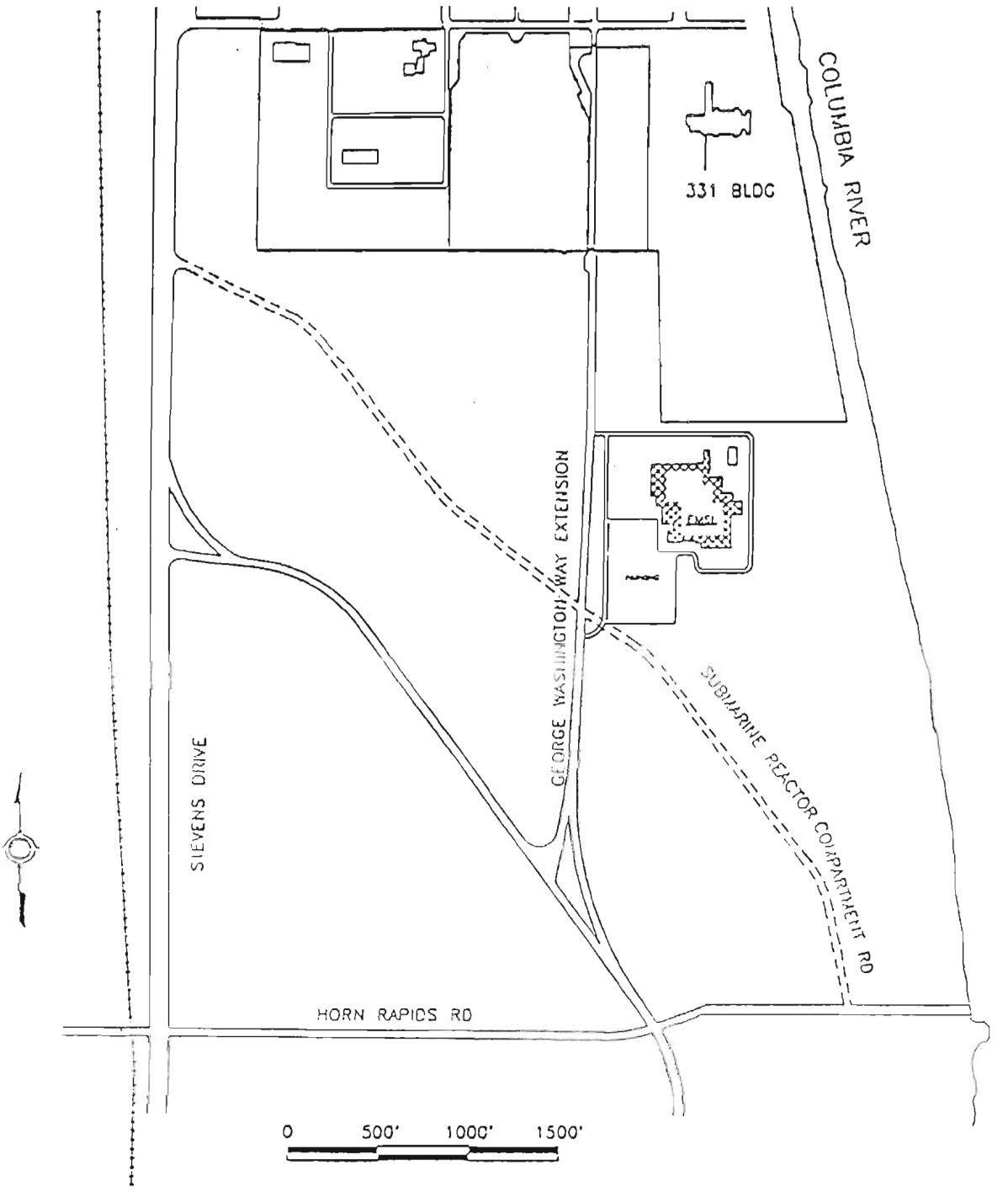


FIGURE 3. Conceptual Site Plan

Biological Evaluation for EMSL Site 2

Richard E. Fitzner
K6-09/Phone 376-3626

A site visit was conducted on the proposed EMSL Site 2 in January of 1992. The purpose of the visit was to ascertain whether or not any threatened, endangered, candidate, or otherwise sensitive species or habitat might be impacted by construction and operation of the EMSL on site 2.

Vegetation

Site 2 can be characterized as consisting of an understory of cheatgrass (Bromus tectorum) and Sandberg's bluegrass (Poa sandbergii). Cheatgrass dominates the understory vegetation. The dominant shrubs are sagebrush (Artemisia tridenta) and rabbitbrush (Chrysothamnus nauseosus and C. vicidiflorus). Jim-hill mustard (Sisymbrium altissium) an annual forb is noticibly abundant. There is no evidence to suggest than any sensitive plant species occur in the vicinity. The site has a history of past disturbance, probably over 20 years ago.

Wildlife

The site visit did not reveal the presence of any threatened or endangered or candidate species, but this is also not the best time of the year to conduct wildlife surveys, since many species have not returned from wintering areas to the south. Several flocks of lesser Canada geese (Branta canadensis taverneri and B.c. parvipes) numbering over 200 were noted feeding on cheatgrass on the proposed site. The close proximity of the site to the Columbia River and the McNary National Wildlife Refuge add to its importance as a feeding area for migratory geese. Deer tracks were also observed on the site. There is a local herd of about 20 mule deer (Odocoileus hemionus) that move between the 300 Area and the Battelle alfalfa fields. The proposed site may disrupt the movement patterns of this herd or eliminate their movement between foraging and resting areas.

Past observations (since 1970) have shown that the proposed site is used for foraging by the Swainson's hawk (Buteo swainsoni). A pair of these hawks nests on the West side of Stevens Drive, north of Horn Rapids Road. These birds frequently fly over the Battelle fields and the undeveloped lands between Horn Rapids Road and the 300 Area. The Swainson's hawk is not a federally listed species, but is a sensitive State candidate for possible listing as threatened or endangered. Long-billed curlews (Numenius americanus) have been observed nesting near the proposed site in past years and can be expected to use the area for foraging and nesting in the future. The construction and operation of the EMSL would likely impact one or two pairs of these birds. Construction timing should consider the nesting chronology of the curlew in order to minimize impacts to the species. Burrowing owls (Athene cunicularia) have been observed nesting on the proposed site in years past. The construction and operation of the EMSL would likely impact nesting birds. The owl is listed as a candidate species by the Washington Dept. of Wildlife.

Recommendations

Prior to construction, a thorough site visit (during April/May) should be conducted to determine if in fact, any state or federal listed birds, mammals, reptiles or amphibians are using the proposed Site 2. Preliminary examination does not reveal any indication of rare species of wildlife, but surveys were not conducted during the breeding season, when wildlife species are present and active. In particular, nests of breeding birds should be located and avoided during construction and pre-construction activities. The Migratory Bird Treaty Act prohibits destruction of the nests or eggs of migratory birds.

It is unlikely that any federally listed endangered or threatened species will be found using the proposed site 2. Bald eagles have not been observed using this site in over 20 years of winter surveys. Peregrine falcons may pass through the site, but have no reason to frequent the area, except to rest. The major concern would be the federal candidate, the long-billed curlew. Care should be taken to insure the construction does not destroy any nest or important feeding areas. Since the species is presently a candidate, PNL will not be required to conduct a formal Section 7(c) Biological Assessment. The state candidate species also do not require any

formal consultation with state or federal agencies. I suggest however, that if construction does become imminent, a mitigation plan be formulated to provide for enhancement of sensitive species habitat elsewhere on Hanford or adjacent areas. A construction plan should also be formulated to insure that the work force be informed and educated about disturbing wildlife. For instance, vehicles should drive slowly enough to avoid wildlife that may be crossing roads. Joggers and noon-time recreationists should not be frequenting areas of undeveloped habitat. They should not be walking the river bank, where waterfowl and other wildlife may be nesting or living. A fence could be placed around the construction area to keep personnel in and wildlife out of the construction area.

In summary, the Site 2 likely does have some value for several sensitive wildlife species. The EMSL will impact these wildlife, but measures can be taken to minimize impacts.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Fish and Wildlife Enhancement
3704 Griffin Lane SE, Suite 102
Olympia, Washington 98501-2192
(206) 753-9440 FAX: (206) 753-9008

April 29, 1992

Emmett Moore
Batelle
Pacific Northwest Laboratories
P.O. Box 999
Richland, Washington 99352

FWS Reference
1-3-92-SP-431

Dear Mr. Moore:

This is in response to your letter, dated March 24, 1992 and received in this office on March 27. Enclosed is a list of proposed and listed threatened and endangered species, and candidate species that may be present within the area of the proposed project to construct and operate the Environmental and Molecular Sciences Laboratory on the Hanford Site, in Benton County, Washington. The list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under Section 7(c) of the Endangered Species Act of 1973, as amended (Act). We have also enclosed a copy of the requirements for Department of Energy (DOE) compliance under the Act, as well as the most recent Animal Candidate Review listing. Please note that the long-billed curlew and Swainson's hawk are "3C" species. The definition of "3C" may be found on page 58805 of the above listing.

To the best of our present knowledge, there are no listed species within the area of the subject project. However, candidate species may occur in the vicinity of the project.

Candidate species are included simply as advance notice to federal agencies of species which may be proposed and listed in the future. However, protection provided to candidate species now may preclude possible listing in the future. If early evaluation of your project indicates that it is likely to adversely impact a candidate species, the DOE may wish to request technical assistance from this office.

In addition, please be advised that federal and state regulations may require permits in areas where wetlands are identified. You should contact the Seattle District of the U.S. Army Corps of Engineers for Federal permit requirements and the Washington State Department of Ecology for State permit requirements.

Your interest in endangered species is appreciated. If you have additional questions regarding your responsibilities under the Act, please contact Jim Michaels or Kimberly Williams of my staff at the letterhead phone address.

Sincerely,

for David C. Frederick
Field Supervisor

kmw/kr
Enclosures
c: WDW, Olympia (Nongame)
WNHP, Olympia

LISTED AND PROPOSED ENDANGERED AND THREATENED SPECIES AND CANDIDATE SPECIES WHICH MAY OCCUR WITHIN THE AREA OF THE PROPOSED PROJECT TO CONSTRUCT AND OPERATE THE ENVIRONMENTAL AND MOLECULAR SCIENCES LABORATORY ON THE HANFORD SITE, IN BENTON COUNTY, WASHINGTON. (T10N R28E S14)

1-3-92-SP-431

LISTED

None.

PROPOSED

None.

CANDIDATE

Columbia pebblesnail *(Fluminicola (=Lithoglyphus) columbianus* (Hemphill in Pilsbry, 1899)) [great Columbia River spire snail] - may occur adjacent to the project site.

Loggerhead shrike *(Lanius ludovicianus)* - may occur in the vicinity of the project.

Pygmy rabbit *(Brachylagus idahoensis)* - may occur in the vicinity of the project.

ATTACHMENT B
FEDERAL AGENCIES' RESPONSIBILITIES UNDER SECTIONS 7(a) AND 7(c)
OF THE ENDANGERED SPECIES ACT OF 1973, AS AMENDED

SECTION 7(a) - Consultation/Conference

Requires:

1. Federal agencies to utilize their authorities to carry out programs to conserve endangered and threatened species;

2. Consultation with FWS when a federal action may affect a listed endangered or threatened species to ensure that any action authorized, funded, or carried out by a federal agency is not likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical habitat. The process is initiated by the federal agency after it has determined if its action may affect (adversely or beneficially) a listed species; and

3. Conference with FWS when a federal action is likely to jeopardize the continued existence of a proposed species or result in destruction or an adverse modification of proposed critical habitat.

SECTION 7(c) - Biological Assessment for Construction Projects *

Requires federal agencies or their designees to prepare a Biological Assessment (BA) for construction projects only. The purpose of the BA is to identify any proposed and/or listed species which is/are likely to be affected by a construction project. The process is initiated by a federal agency in requesting a list of proposed and listed threatened and endangered species (list attached). The BA should be completed within 180 days after its initiation (or within such a time period as is mutually agreeable). If the BA is not initiated within 90 days of receipt of the species list, please verify the accuracy of the list with our Service. No irreversible commitment of resources is to be made during the BA process which would result in violation of the requirements under Section 7(a) of the Act. Planning, design, and administrative actions may be taken; however, no construction may begin.

To complete the BA, your agency or its designee should: (1) conduct an onsite inspection of the area to be affected by the proposal, which may include a detailed survey of the area to determine if the species is present and whether suitable habitat exists for either expanding the existing population or potential reintroduction of the species; (2) review literature and scientific data to determine species distribution, habitat needs, and other biological requirements; (3) interview experts including those within the FWS, National Marine Fisheries Service, state conservation department, universities, and others who may have data not yet published in scientific literature; (4) review and analyze the effects of the proposal on the species in terms of individuals and populations, including consideration of cumulative effects of the proposal on the species and its habitat; (5) analyze alternative actions that may provide conservation measures; and (6) prepare a report documenting the results, including a discussion of study methods used, any problems encountered, and other relevant information. Upon completion, the report should be forwarded to our Endangered Species Division, 3704 Griffin Lane SE, Suite 102, Olympia, WA 98501-2192.

---

* "Construction project" means any major federal action which significantly affects the quality of the human environment (requiring an EIS), designed primarily to result in the building or erection of human-made structures such as dams, buildings, roads, pipelines, channels, and the like. This includes federal action such as permits, grants, licenses, or other forms of federal authorization or approval which may result in construction.

DON'T SAY IT WRITE IT...!!!

To: Emmett Moore

From: R.E. Fitzner

Subject: Biological Evaluation of EMSL

Date: 14 May, 1992

A thorough site visit was conducted on the mornings of April 22-23, 1992. **On both mornings, the entire area surveyed extended from** Horn Rapids Road to the fence at the south end of the 300 area and from the George Washington Way Extension to the Columbia River (Figure 1).

There were no long-billed curlews or Swainson's hawks observed. Additionally, no state or federally listed species were found. I will visit the area again during the first part of June to determine if any broods of curlews might be in the area.

No endangered, threatened or sensitive plant species were observed. Specifically, Rorippa columbiae (state endangered), Cryptantha leucophaea (state sensitive) and a species of Arenaria were searched for but not found.

On both mornings large numbers of meadowlarks, scattered magpies, and a few crows were observed. **On both mornings, pheasants were** heard crowing. Three starlings and two Canada geese were observed flying over the area on the morning of April 23. One California quail was also observed on the morning of April 23.

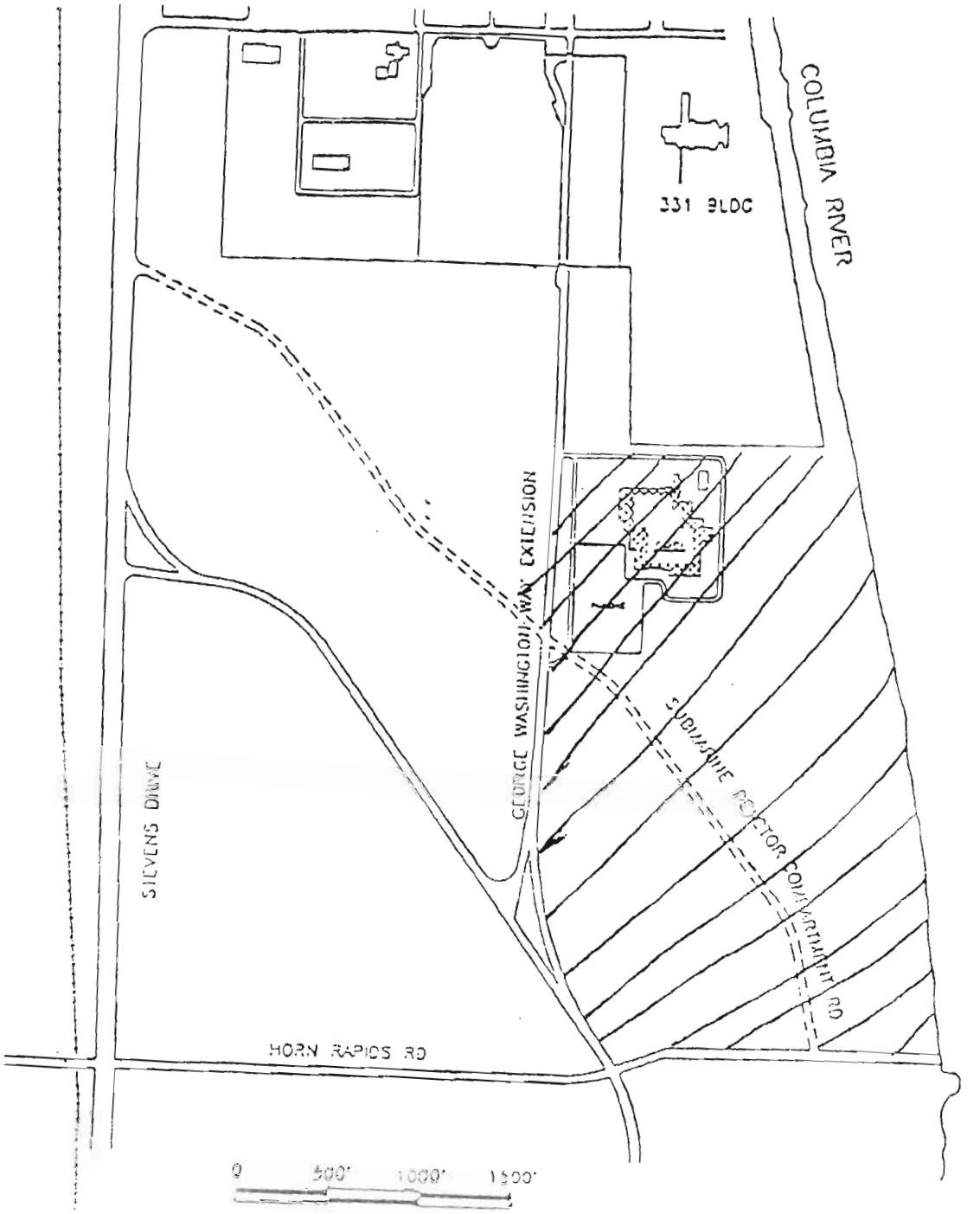


FIGURE L. Area Covered in Site Visits, 22-23 April 1992

Battelle
Pacific Northwest Laboratories
Battelle Boulevard
P.O. Box 999
Richland, Washington 99352
Telephone (509)

October 8, 1992

Dr. Emmett Moore
Battelle Pacific Northwest
Laboratory
SIGMA II Building, Room 309
Richland, WA 99352

Long-Billed Curlews at EMSL

Dear Emmett:

Because of Dick Fitzner's death, an intensive survey of the EMSL vicinity was not conducted during spring and summer, 1992, to determine whether long-billed curlews nest in the area. However, two SRAP students (Mssrs. Larry Alverado and Robert Costello) and I surveyed vegetation just south (<500m) of the EMSL site during 2 days in June of this year. We noted no curlews in the area. Because June is within the nesting season of these birds, any curlews present would have been both visible and audible defending their nests from our trespass.

Sincerely,

Charles A. Brandt
Senior Research Scientist
ENVIRONMENTAL SCIENCES
DEPARTMENT

CAB:smi

File/LB

Appendix B

National Historic Preservation Act

Appendix B

National Historic Preservation Act

This appendix contains the cultural resource survey reports concerning the potential existence of historical or cultural resource areas at the EMSL site.

Battelle
Pacific Northwest Laboratories

Project Number _____

Internal Distribution

Date 4 December 1991

To J. K. McClusky, Facilities & Operations, K1-81. *Cultural Resources Found*

From H. A. Gard, Hanford Cultural Resources Laboratory, P7-54. HG

Subject CULTURAL RESOURCES REVIEW OF EMSL SITE NUMBER 2 EVALUATION. HCRC# 91-300-024.

Ref. 1. Chatters, J. C. editor. 1989. Hanford Cultural Resources Management Plan. PNL-6942, Pacific Northwest Laboratory, Richland, Washington.

In response to your request received 12 November 1991, staff of the Hanford Cultural Resources Laboratory (HCRL) conducted a cultural resources review of the subject project, located in the 300 Area of the Hanford site. According to information supplied by you, the project involves a site characterization study of site #2 for the location of the Environmental and Molecular Sciences Laboratory. Site #2 is bounded on the north by the 300 Area pasture fence, on the west by the George Washington Way extension and the Submarine Road, on the east by the Columbia River, and on the south by the Horn Rapids Extension. The project area measures approximately 1 km north/south and 0.5 km east/west. In addition to providing a cultural resources review, we were requested by your office to locate areas of possible subsurface disturbance.

Our literature and records review showed that no cultural properties are known to be located at the project site. An inspection of aerial photographs revealed that the project site is situated in an area which has been moderately disturbed by past construction. Given the proximity of the project area to the west bank of the Columbia River, the chances of encountering buried cultural material are quite high. Between 26 November 1991 and 3 December 1991 I conducted an archaeological pedestrian survey of the project area employing techniques outlined in the Hanford Cultural Resources Management Plan (Ref. 1). Two archaeological sites were located during this survey and are marked on the enclosed map (Fig. 1). The first of these, temporarily designated as HT-91-071, is a low density historic can dump dating from 1917 to 1929. The second site (HT-91-072) stretches along the entire bank of the Columbia River. It consists of a discontinuous scatter of prehistoric artifacts and fire cracked rock exposed mainly within the dirt track which closely parallels the river. The majority of this deposit appears to be buried. The boundaries of this site could not be accurately determined from surface indications. In addition to the two archaeological sites several Euroamerican features of unknown age were also located. Three of these are identical circular cement foundations (Fig. 1) with approximate diameters of 3.5 m and are over 2.0 m deep. The cement rims of these foundations extend 0.3 m above the ground surface. No artifacts are associated with these feature that could provide a date. Additional research is necessary to ascertain function and period of use. Two irrigation ditches were also located. These run along the east and west edges of the project area and are marked upon the enclosed map (Fig. 1).

Several open excavations are scattered across the project area. These were obviously made with heavy equipment and have been open long enough for revegetation to occur. The majority of these are concentrated in the southern portion of the site, and are easily located by the presence of the backdirt piles. Only one area of probable subsurface disturbance was noted that is not readily apparent. It consists of a large patch of soft gravelly soil which is quite distinct from the surrounding area. The patch measures approximately 100 m by 100 m and is located in the north central portion of the site (Fig. 1). An asphalt pad is located to the east of this area and at least three over grown dirt tracks emanate radially from the area. Numerous large oil filters, apparently from heavy equipment, are scattered throughout this area.

Battelle
HCRC# 91-300-024

It is the finding of the Hanford Cultural Resources Laboratory (HCRL) staff that there are cultural or historic properties in the proposed project area. While final determination will be made by the Washington State Historic Preservation Office (SHPO), only the prehistoric site appears to be significant. Cultural resource clearance for your project can not be given until requests for determinations of significance and findings of effect on the sites have been submitted to the SHPO. This is a Class IV and V case, new construction in a disturbed high-sensitivity area and a Project involving undisturbed ground.

A copy of this has been sent to Charles Pasternak of RL as official documentation of required action. If you have any questions I can be reached at 376-8010. Please utilize the HCRC# for any future correspondence concerning this project.

Concurrence:

J. C. Chatters, Ph.D., Manager
Cultural Resource Project

cc: C. R. Pasternak, RL (2)

Battelle
Pacific Northwest Laboratories
Battelle Boulevard
P.O. Box 999
Richland, Washington 99352
Telephone (509)

January 14, 1992

Robert Whitlam
State Archaeologist
Office of Archaeology and Historic Preservation
P.O. Box 48343
Olympia, WA 98504-8343

Subject: Finding of Effect for Environmental and Molecular Sciences Laboratory, Hanford Site (EMSL)

Dear Rob:

In early December, the Hanford Cultural Resources Laboratory surveyed the proposed site of the EMSL, a 0.5 km^2 area located between George Washington Way and the Columbia River at the southern edge of Hanford's 300 area. Techniques used were those described in the Hanford Cultural Resources Management Plan (PNL 69-42). We discussed this project by phone the second week of this month. I am providing a preliminary finding of effect to you due to an accelerated schedule for EA preparation. A complete report will be completed well before the building is constructed.

Two cultural resources were found on the property: HT-91-071, a low density can dump dating to approximately 1917 to 1929; and HT-91-072, a buried prehistoric archaeological site in a Holocene fluvial terrace that parallels the Columbia River. Surface indications and geologic conditions in the land surface 2 m above the Holocene terrace give little indication that the latter site extends inland more than 300 ft from the river.

Site HT-91-072 is likely to contain scientific information important for the understanding of prehistory and therefore meets the criteria for National Register Nomination. It lies buried in a stratified fluvial matrix, appears to contain faunal remains, at least shell, and therefore can contribute to understandings of cultural chronologies, subsistence behavior, and seasonality of the local settlement pattern. Site Ht-91-071 is similar to many other sites on Hanford and elsewhere, is very low in artifact diversity, and does not appear to contain preserved faunal material or any other domestic debris besides cans. We do not consider this site to be significant under any National Register criterion.

Finding of Effect. The EMSL building and parking lot are to be located in an area greater than 400 ft from the Columbia River (the map does not accurately portray the location of the building, which current plans place immediately adjacent to the street). This is at least 100 ft beyond the apparent inland extent of HT-91-072. A buffer zone has been established within 400 ft of the Columbia River, in which no construction activities of land alteration will occur. Therefore, it is my conclusion that construction of the EMSL will have no effect on the characteristics of HT-91-072 that make it eligible for the National Register; the values of the site lie below ground.

The possibility remains that human graves or caches, which we would be unable to detect prior to construction, might be exposed during earth leveling and utilities placement. \ Therefore, an HCRL archaeologist will monitor all earth disturbing activities associated with construction.

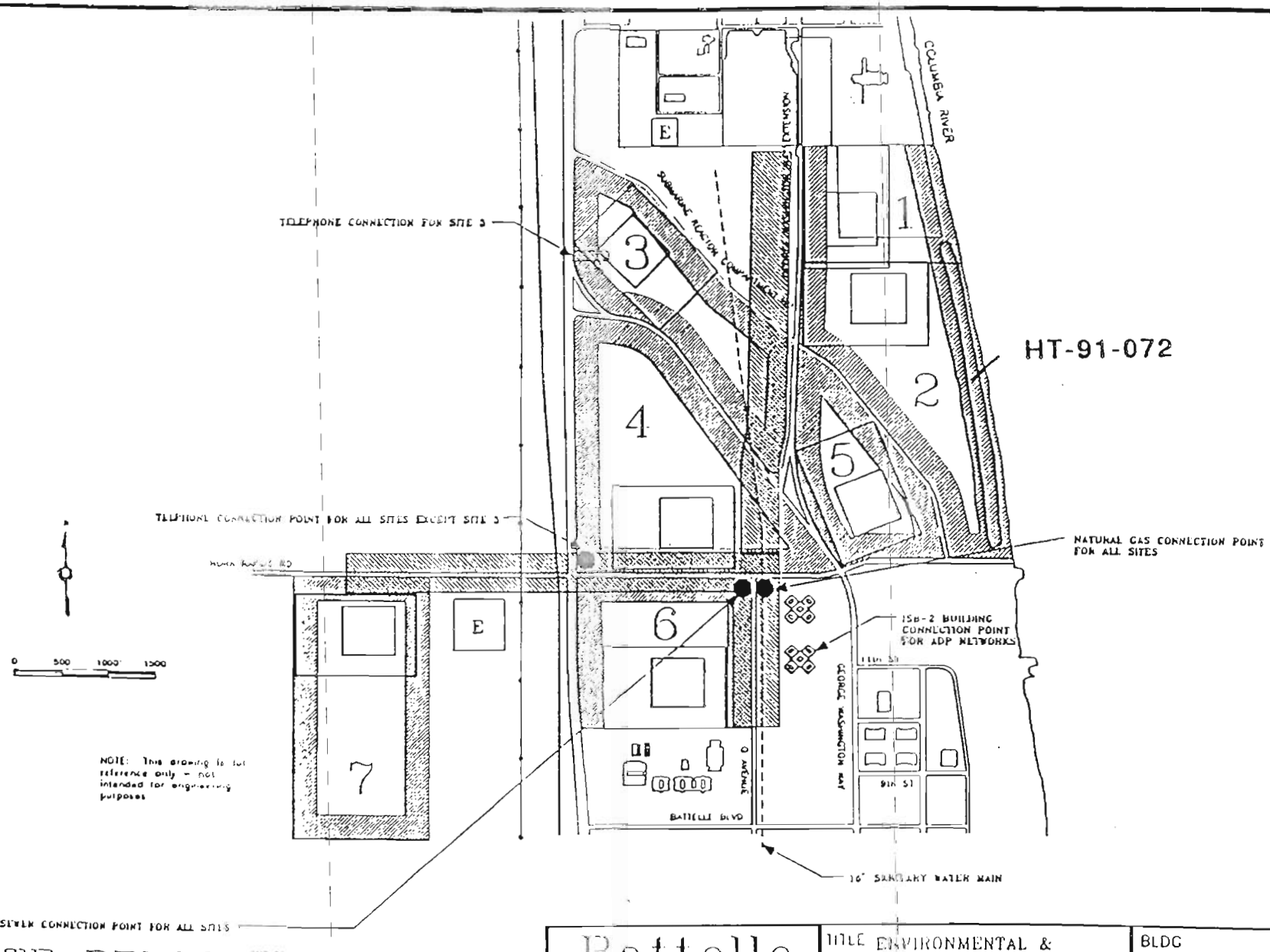
I will contact you for a preliminary concurrence with this finding, understanding that a formal concurrence must await your review of a completed report.

Sincerely,

James C. Chatters, Ph.D.
Manager, Cultural Resources

enclosure

cc: C. R. Pasternak, DOE



SITE RELOCATION PLAN

Battelle, Pacific Northwest Laboratories		TITLE ENVIRONMENTAL & MOLECULAR SCIENCES LABORATORY (D-384)	BLDG EMSL
EDP NUMBER 90-098	REVISION 0	REF DWG	NUMBER SITEPLAN
ENGINEER	DATE 9/4/91		SHEET 1 OF 1

Letter Report

CULTURAL RESOURCES REVIEW
EMSL SITE NUMBER 2
HCRC# 91-300-024.

J. C. Chatters
H. A. Gard

February 1992

Prepared for
the U. S. Department of Energy
under Contract DE-AC06-76RLO 1830

Pacific Northwest Laboratory
Richland, Washington 99352

Introduction

The U.S. Department of Energy, Richland Field Office (RL) is selecting a site for the location of its proposed Environmental and Molecular Sciences Laboratory (EMSL), a major new development at Pacific Northwest Laboratory. The preferred site is a 26.5 ha area adjacent to the Columbia River north of Richland, Washington (Figure1, Site 2). As a part of the environmental compliance process the Hanford Cultural Resources Laboratory (HCRL) was asked to conduct a review of the project area under requirements of Section 106 of the National Historic Preservation Act. HCRL staff conducted a literature search and archaeological survey of the parcel in late 1991 and early 1992; this report describes the findings of that review.

Project Area Description

The project area is a sloping section of a Pleistocene gravel bar topped with Holocene dune sand with a maximum elevation of 123 m a.s.l. Along its east side this landform and separated from it by a steep slope is a river terrace of Holocene age at 110-112 m a.s.l. At the base of a precipitous 5 m-high bank lies the Columbia River. The parcel is bounded on the north by a pasture fence, on the west by George Washington Way and a broad gravel road used for trans-shipment of submarine parts, and on the south by the extension of Horn Rapids Road. Vegetation consists of mature big sagebrush (*Artemisia tridentata*), cheatgrass (*Bromus tectorum*), and bluegrass (*Poa sandbergii*). Ground cover at the time of the survey varied from 0% on a track following the Holocene terrace to 80% on some higher surfaces.

Literature Review and Archaeological Survey

Our literature and records review showed that no cultural properties are known to be located at the project site, although archaeological sites have been identified on the Holocene terrace both upstream and downstream of this area (Cleveland et al. 1976; Drucker 1948; Rice 1968; Thoms et al. 1983). These sites consist of scatters of mussel shells, fire-broken rock, and chipped stone at various depths below the ground surface. Given the continuity of the Holocene terrace into the project area and the similarity of the river channel between this location and the known archaeological sites, there was a high probability for one or more archaeological sites to occur here as well. In addition, human remains are known to have occurred in sand dunes above prehistoric campsites and had

even been found by an earlier HCRL survey in the Holocene terrace[1]. Because of this probability and the fact the project area had never been inspected for cultural resources, an archaeological survey was required.

Between 26 November 1991 and 3 December 1991 H. A. Gard conducted an archaeological pedestrian survey of the project area employing techniques outlined in the Hanford Cultural Resources Management Plan (Chatters 1989). He traversed the area in transects spaced 20 m apart, recording all artifacts or artifact concentrations he encountered. Two archaeological sites, temporarily designated HT-91-071 and HT-91-072, were located during this survey (Fig. 1).

In addition to the two archaeological sites, several Euro-American features of unknown age were also located. Three of these are identical circular cement foundations over 2.0 m deep with approximate diameters of 3.5 m. The cement rims of these foundations extend 0.3 m above the ground surface. No artifacts are associated with these features that could provide a date. Two irrigation ditches were also located. These run along the east and west edges of the project area and are marked on Figure 1.

Cultural Resource Site Descriptions and Evaluation

HT-91-071 This site is a low density scatter of tin cans covering a 5 m^2 area near the intersection of the pasture fence and an old paved road that parallels George Washington Way. Six cans are present, including 4 evaporated milk cans, one coffee can, and a hole-in -top soldered food can. Dimensions and nonmetric characteristics of the cans date this small dump between 1917 to 1929. Sites of this type are extremely common on the Hanford Site. For this reason, and the fact that we have already fully described the contents of this dump, we do not consider HT-91-071 to meet any criteria for nomination to the National Register of Historic places.

HT-91-072 This is a prehistoric Native-American campsite stretching along the Holocene terrace for the entire length of the project area. It consists of a discontinuous scatter of stone flakes, mussel shell, and fire cracked rock exposed mainly within the dirt track that closely parallels the river. No artifacts were found that could place the site in time. The majority of this deposit appears to be buried, perhaps by as much as 1 to 2 m. Like site

[1] This information was provided in a letter report "Cultural Resources Survey of the proposed 300 Area Sewage Treatment System Upgrade, Hanford Site, Washington HCRC 87-300-001" from J. C. Chatters to RL, August 1987.

45BN164, upstream of the 300 area, the site may consist of multiple occupation strata. Site HT-91-072 is likely to contain scientific information important for the understanding of prehistory and therefore meets the criteria for nomination to the National Register of Historic places (36-CFR-60.4, Criterion d). It lies buried in a stratified fluvial matrix, appears to contain faunal remains, at least shell, and therefore can contribute to understanding of cultural chronologies, subsistence behavior, and seasonality of the local settlement pattern.

Finding of Effect and Adverse Effect

Once a site has been identified and determined eligible for the National Register of Historic Places, the involved federal agency is required by Section 106 to determine if the site is likely to be affected by the proposed action and, if so, if that effect is adverse. The EMSL building and parking lot are to be located in an area greater than 150 m from the Columbia River (the map does not accurately portray the location of the building, which current plans place immediately adjacent to George Washington Way). This is at least 30 m beyond the apparent inland extent of HT-91-072. A buffer zone has been established within 150 m of the Columbia River in which no construction activities of land alteration will occur. Therefore, it is our conclusion that construction of the EMSL will have no effect on the characteristics of HT-91-072 that make it eligible for the National Register; the values of the site lie below ground. This finding was submitted to the Washington State Archaeologist, R. W. Whitlam, an agent of the State Historic Preservation Officer on January 14, 1992. Concurrence was received by phone on February 3, 1992.

Conclusion

Two archaeologist sites, one historic and the other prehistoric were discovered in the proposed Site 2 for the Environmental and Molecular Sciences Laboratory. The historic site is not deemed significant, but the prehistoric site is considered to be eligible for nomination to t he National Register of Historic Places. A finding of effect was completed for this site, in which the HCRL determined and the SHPO concurred that laboratory construction would have no effect on the archaeological site. There is, however the possibility that human graves might exist in the sand dunes west of the archaeological site. Therefore, an HCRL archaeologist is required to be on site during earth leveling and excavation for utility placement phases of laboratory construction.

This report constitutes a cultural resources clearance for EMSL, provided that the above stipulation for an on site monitor is met.

References Cited

Chatters, J. C. editor. 1989. Hanford Cultural Resources Management Plan. PNL-6942, Pacific Northwest Laboratory, Richland, Washington.

Cleveland, G.C., B. Cochran, J. Giniger, and H.H. Hammett. 1976. "Archaeological Reconnaissance on the Mid-Columbia and Lower Snake River Reservoirs for the Walla Walla District Army Corps of Engineers" Washington Archaeological Research Center Project Report 27. Washington State University, Pullman, Washington

Drucker, P. 1948. Appraisal of the archaeological resources of the McNary Reservoir, Oregon-Washington. Report on file, Columbia Basin Project, River Basin Surveys, Smithsonian Institution, Washington, D.C.

Rice, D.G. 1968. Archaeological Reconnaissance of the Hanford Atomic Works. Washington State University Laboratory of Anthropology, Pullman, Washington.

Thoms, A.V. 1983. Archaeological Investigations in Upper McNary Reservoir: 1981-1982. Laboratory of Archaeology and History Project Report No. 15. Washington State University, Pullman, Washington.

Appendix C

Comment Letters

Appendix C

Comment Letters

This appendix contains copies of comment letters from the Confederated Tribes of the Umatilla Indian Reservation and the Wanapum Indian Nation. The State of Washington did not submit comments on the environmental assessment.

CONFEDERATED TRIBES
of the
Umatilla Indian Reservation
P.O. Box 638
PENDLETON, OREGON 97801
Area code 503 Phone 276-3449 FAX 276-3317

DEPARTMENT of
NATURAL RESOURCES

Environmental
Planning/
Rights Protection
Program

August 5, 1992

Alex Teimouri
Environmental Protection Specialist
DEPARTMENT OF ENERGY (DOE)
P.O. Box 550
Richland, WA

Dear Mr. Teimouri:

The Confederated Tribes of the Umatilla Indian Reservation (CTUIR) have received the Environmental Assessment (EA) for the proposed Environmental and Molecular Sciences Laboratory (EMSL). As you are aware the proposed EMSL site is within the ceded lands of the CTUIR and, as such, staff for the CTUIR would like to submit comments on the EMSL-EA.

First, I commend the DOE for providing CTUIR staff an opportunity to comment. Unfortunately, the short time frame (two weeks from receipt of the EA) constricts a thorough analysis. In the future it would be appreciated if comment periods were a minimum of 30 days, preferably longer.

Protection of cultural resources is a paramount concern for the CTUIR. Quotes such as on page one (1) of the EA which states, *"[n]earby cultural resources would not be impacted by construction or operation,"* leaves the tribes wondering about support documentation. Further on page eight (8) it states, *"[t]wo cultural resources were found, one of which, a dump site, was not deemed to be significant. The other site is on the river away from the proposed EMSL site."*

Currently the tribes have a Cultural Resources Program. When I checked with our Cultural Resources Protection Coordinator, Jeff Van Pelt, he indicated he has not seen any information related to these sites. It seems in the best interest of all involved if the tribes could be involved early on in the process to allow for full, effective participation by the CTUIR.

The CTUIR also express concerns about the cultural site away from the "proposed EMSL site." Primarily, without having access to

site construction plans this statement is unverified. It is impossible to determine whether or not there would be any disturbances to the site related to construction or disturbances related to people using the corridor between the EMSL and the river as a pathway of access for riverside recreation.

The issue of cultural sites in the 300 Area drives a bigger problem needing attention. It is not an unreasonable conclusion that as Richland expands and DOE-RL expands that "in-filling" of lands between Richland's city limits and the 300 Area will occur. Hence, the CTUIR would propose a detailed cultural resources study of lands bordered by the Columbia River on the east, Richland city limits on the south, and the 300 Area on the north. The west boundary would be up for discussion.

Protection of the Columbia River and the tribes' fisheries is also of great importance. Hence, any storm drains that are built should be built as to not directly discharge into the river. Again, the tribes were not able to review site construction plans to properly ascertain the status of this concern.

On page ten (10) of the EA it notes the use of high-efficiency particulate air (HEPA) filters. It is my understanding that there are no disposal standards for HEPA's. Further, because atmospheric emissions represent one of the most consistent escape paths for radionuclides from a controlled environment, the tribes request that the following be clearly outlined: HEPA filters should be changed on a regular basis; they should handled in a manner which protects human health and the environment; and, that stack monitors are properly maintained and calibrated.

Most of the identified concerns listed above are more in the nature of a lack of documentation in the EA to properly determine any EMSL affects to tribal interests. At this time an EIS is not needed; however, a response to staff concerns would be greatly appreciated within two (2) weeks of receipt of this letter.

Sincerely,

James R. Wilkinson

James R. (J.R.) Wilkinson, Hanford Projects Coordinator
Environmental Planning and Rights Protection Program (EP/RP)
Department of Natural Resources (DNR)
Confederated Tribes of the Umatilla Indian Reservation

c.c.
Rick George, EP/RP Program Manager
Jeff Van Pelt, Cultural Resources Protection Coordinator (EP/RP)
Kevin Clarke, DOE-RL Indian Nations Program Manager

August 18, 1992

Jim Harmon
Department of Energy
Richland Field Office
Richland, WA 99352

Dear Mr. Harmon:

We received and reviewed the Environmental Assessment for the Environmental and Molecular Sciences laboratory at the Hanford Site.

We do not agree with the building of any new structures on the Hanford project. It has been our experience in the past that one new project or structure just leads to another one. All of them being built upon the ancestral homelands of our people.

We would also like to make a few comments on your EA, specifically, on page 2, under proposed action. It is noted that a water line would require a trench approximately 1,000 feet long directly to the west, to a City of Richland water line. It is also noted that the sewer, electricity and natural gas line would require a trench approximately 2,000 feet long to the south along George Washington Way, to the City limits of Richland. It is not made clear, later in the report that these utility pathways were also surveyed for archaeological resources. On page 8, last paragraph, it is noted that an archaeological survey was conducted of the proposed EMSL site and surrounding area. Were the utility pathways also surveyed? In a recent discussion we had with Jim Chatters, he said that the utility pathways for EMSL were going into existing corridors. According to the EA, this does not seem to be the case.

We appreciate your efforts to keep us informed and look forward to hearing from you in the future.

Sincerely,

Rex Buck
Wanapum

Grant Wyena
Wanapum

Distribution

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Washington State House of Representatives

The Honorable Lane Bray
The Honorable Curt Ludwig

Federal Agencies

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Attn: Richard Cook
Seattle, Washington

U.S. Department of the Interior
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U.S. Fish and Wildlife Service
Olympia, Washington

U.S. Environmental Protection Agency (5)
Attn: Dan Steinborn
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U.S. Fish and Wildlife Service
Region 1
Portland, Oregon

U.S. General Accounting Office
Richland, Washington

State Agencies

Warren Bishop, Chairperson
Nuclear Waste Advisory Council
Washington State Department of Ecology
Olympia, Washington

Evergreen State College
Institute for Public Policy
Attn: Ellen Caywood and Max Power
Olympia, Washington

Washington State Department of Ecology (5)
Attn: Barbara Ritchie, NEPA Coordinator
Olympia, Washington

Local Agencies and Officials

Benton County Commission (3)
Prosser, Washington

Benton County Planning Department
Kennewick, Washington

The Honorable Claude Oliver
Benton County Treasurer
Prosser, Washington

Richland City Council (6)
Richland, Washington

Richland Planning Department
Richland, Washington

Interested Groups

American Friends Service Com.
Portland, Oregon

Association of Washington Cities
Olympia, Washington

Confederated Tribes of the Umatilla Indian Reservation (2)
Pendleton, Oregon

Council of Energy Resource Tribes
Denver, Colorado

Educators for Social Responsibility
Seattle, Washington

National Academies of Sciences and Engineering,
Institute of Medicine
Washington, DC

National Science Foundation
Washington, DC

Physicians for Social Responsibility
Seattle, Washington

R.A.C., Inc.
Attn: Dr. J. E. Till
Neeses, South Carolina

Sierra Club
Northwest Representative
Seattle, Washington

TRIDEC
Kennewick, Washington

USCEA
Attn: Tom Hunt
Portland, Oregon

Wanapum Indian Nation (2)
Attn: Rex Buck
Priest Rapids Dam, Grant County PUD
Mattawa, Washington

WashPIRG
Attn: Wendy Wendlandt
Olympia, Washington

Washington Environmental Council
Seattle, Washington

Yakima Indian Nation (2)
Nuclear Waste Program
Toppenish, Washington

Interested Individuals

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c/o WashPIRG
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Seattle, Washington

Joanne Oleksiak
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Kathleen M. Reyes
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Frank Hammond
Sierra Club, Cascade Chapter
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Richard J. Leaumont
Chairman, Conservation Committee
Lower Columbia Basin Audubon Society
Columbia River Conservation League
Pasco, Washington

Yakima Indian Nation
Attn: Chairperson
Toppenish, Washington

Yakima Indian Nation
Attn: Jim Russell
Toppenish, Washington

David Stewart-Smith
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Heart of America Northwest
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Richland, Washington

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