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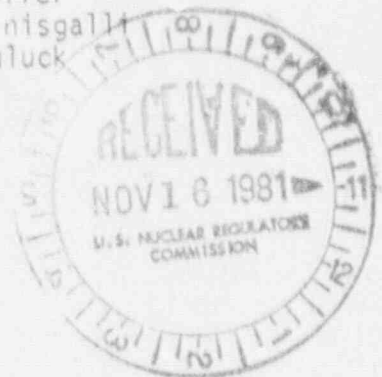
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Docket No. 50-397

MEMORANDUM FOR: Robert L. Tedesco, Assistant Director  
for Licensing, DOL

FROM: Daniel R. Muller, Assistant Director  
for Environmental Technology, DE

SUBJECT: SITING ANALYSIS BRANCH DRAFT SER INPUT, WNP-2



Enclosed is Siting Analysis Branch input to the WNP-2 draft SER. On the basis of the information provided by the applicant, and our review we have concluded favorably with regard to Sections 2.1 and 2.2 of the SER and have no open items.

This SER input was prepared by A. A. Sinisgalli (x24907).

Original signed by  
Daniel R. Muller

Daniel R. Muller, Assistant Director  
for Environmental Technology  
Division of Engineering

Enclosure:  
SAB Draft SER Input  
for WNP-2

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DATE	11/13/81	11/13/81	11/13/81	11/17/81	

## WNP-2

### DRAFT SER INPUT

## 2.0 SITE CHARACTERISTICS

### 2.1 GEOGRAPHY AND DEMOGRAPHY

#### 2.1.1 SITE LOCATION

The Washington Public Power Supply System Unit 2 (WNP-2) is located in the southeast area of the U.S. Department of Energy's (DOE) Hanford Site in Benton County, Washington. The site is approximately 5 kilometers (3 miles) west of the Columbia River at River Mile 352, approximately 19 kilometers (12 miles) northwest of Richland, 29 kilometers (18 miles) northwest of Pasco and 34 kilometers (21 miles) northwest of Kennewick. Figure 2.1 shows the general region of the WNP-2 site.

The site is situated near the middle of the relatively flat, essentially featureless plain which can be described as a shrub steppe with sage brush interspersed with perennial native and introduced annual grasses extending in a northerly, westerly and southerly direction for several miles. The plain is characterized by slight topographic relief with a maximum grade across the plant site of approximately ten feet.

The reactor is located at  $46^{\circ}28'18''$  north latitude and  $119^{\circ}19'58''$  west longitude. The approximate Universal Transverse Mercator coordinates are 5,148,840 meters north and 320,930 meters east.

### 2.1.2 EXCLUSION AREA AUTHORITY AND CONTROL

The applicant has defined the exclusion area as a circle with its center at the reactor and a radius of 1950 meters (6400 feet) (See Figure 2-2).

There are no residents within the exclusion area. Industrial facilities located in the site area are the H.J. Ashe Substation and the WNP Units 1 and 4. A highway and a railroad traverse the exclusion area. Other than these facilities there are no activities unrelated to the operation of WNP-2 within the exclusion area. Both WNP-1 and 4 and their respective access roads will be owned and operated by WPPSS. The 1950 meter (6400 feet) radius exclusion area extends outside the plant property. All land outside the plant property but within the exclusion area is owned by the United States and is managed by the U. S. Department of Energy (DOE) as part of the Hanford Site. The applicant has obtained a long-term lease from DOE over this area which gives it the authority, required by Part 100, to determine all activities in this area. In case of emergency, the applicant has made arrangements with federal and state authorities to control traffic on the routes traversing the exclusion area, including possible removal of personnel at the Ashe Substation.

We conclude, by virtue of lease agreement with the United States government, that the applicant has the authority to determine all activities within the exclusion area, as required by 10 CFR Part 100.

### 2.1.3 POPULATION DISTRIBUTION

The resident population in the vicinity of the WNP-2 site is shown as a function of distance in the table below.

Year	0-1 Miles	0-2 Miles	0-3 Miles	0-5 Miles	0-10 Miles
1980	0	0	0	80	1306
2000	0	0	0	225	3614
2030	0	0	0	290	4147

The nearest community with a population of more than 1,000 persons is the City of Richland, Washington (1980 estimated population of 33,512) located about 19 kilometers (12 miles) SSE of the site.

The nearest significant transient population are located at DOE area 400 (HEDL) located about 3 to 4 miles SW of the plant. The employment level at area 400 is currently 1187.

The applicant has chosen a low population zone (LPZ) radius of 4.8 kilometers (3 miles). The current and projected (through 2030) residential population within the LPZ is zero.

The applicant has indicated that the nearest densely populated center, as defined in 10 CFR Part 100, of about 25,000 or more persons, is the City of Richland, Washington, located about 19 kilometers (12 miles) S to SSE of the site. The population center distance is at least one and one third times the LPZ radius of 4.8 kilometers (3 miles), as required by 10 CFR Part 100.

We made an independent estimate of the 1970 population within a 80 kilometers (50 miles) radius of 200,300 persons which agreed reasonably well with the applicant's value of 251,684. The applicant projects that this population will increase to a value of about 383,828 by the year 2030. This represents a growth rate of about 8.8% per decade for the period from 1980 to 2030. The staff has calculated a 10% per decade growth rate using the Bureau of Economic Analysis projections for those BEA areas within a 80 kilometers (50 miles) radius of the WNP2 site resulting in an estimated population in the year 2030 of 322,585 persons.

#### 2.1.4 CONCLUSIONS

On the basis of the 10 CFR Part 100 definitions of the exclusion area, the low population zone and the population center distance, our analysis of the onsite meteorological data from which the relative concentration factors ( $X/Q$ ) were calculated (See Section 2.3 of this report), and the calculated potential radiological dose consequences of design basis accidents (See Section 15.0 of this report), we have concluded that the exclusion area, low population zone and population center distance meet the criteria of 10 CFR Part 100 and are acceptable.

## 2.2 NEARBY INDUSTRIAL, TRANSPORTATION, AND MILITARY FACILITIES

### 2.2.1 TRANSPORTATION ROUTES

The WNP-2 site is serviced by a new two-lane paved access road connected to the DOE road system. State Highway 240 traverses the Hanford Site from Richland, Washington from the southeast to the northwest. The highway passes within about 11 kilometers (7 miles) of WNP-2 in the southwest quadrant. The highway connects into State Highway 24, which goes west to Yakima, Washington and across the Vernita bridge on the Columbia River 37 kilometers (23 miles) to the northwest (See Figure 2-3).

The existing mainline railroad track (which is owned and operated by the DOE in support of the Hanford Operations), the WNP-2, the WNP-1 and 4, and the FFTF railroad spurs all run within the exclusion area of the plant site (Figure 2-4). During 1978 the following railroad cars of potentially dangerous materials were transported past the site via the mainline track:

Caustic Soda	34
Chelating Compound	2
Chlorine	3
Helium	30
Hydroacetic Acid	1
Radioactive Material	53
Sulfuric Acid	7



Discussions with DOE confirmed that the above shipments, as to type and frequency, are typical with no anticipated changes. The DOE, Richland Operations office has agreed to notify WPPSS prior to transporting any explosive shipments of more than 1,800 pounds (a detonation of which will yield an overpressure equal to 1 psi at the nearest safety related equipment) past the WNP2 site (none has been shipped in the past 10 years). They will also inform WPPSS of any plans to regularly ship explosives of a lesser quantity by rail past the site. WPPSS will provide an analysis to the NRC of the potential consequences prior to the start of such shipping. With this agreements, we find that the railroad will pose no undue hazard to the safe operation of WNP-2.

Makeup water inlet structures are located in the Columbia River 315 feet from the shoreline at low riverflow (36,000 cfs; El. 341.73 ft.) at RM 351.75. A significant amount of Columbia River barge traffic moves as far upstream as the Ports of Pasco and Kennewick. Also, a docking facility established by the Port of Benton in North Richland (8 miles downstream of the WNP2 site) is accessible by barges with a maximum 16 feet of draft (normally 2500 to 3000 tons). The first use of this facility was in April, 1973 when the FFTF reactor vessel was offloaded. Traffic to the North Richland Dock is very infrequent in comparison to that in Pasco and Kennewick due to the lack of large industrial concerns in the region between Richland and Priest Rapids Dam. On several occasions in the past, lightly loaded barges have transported material to the vicinity of the Hanford Site. This required maintenance of an adequate flow from Priest Rapids Dam during the transite period. At present no barge traffic moves past the WNP2 water intake structure nor is any anticipated.

On the basis of the separation distances involved, the nature of the materials transported and the plant design characteristics, we conclude that traffic along these transportation routes will not adversely affect the safe operation of WNP-2.

#### 2.2.2 Nearby Facilities

There are no military bases, missile sites, manufacturing plants, chemical plants, chemical storage facilities or airports within a 8 kilometers (5 mile) radius of the site.

According to the Richland Operations Office of the DOE, there are no plans for storage facilities, airports, oil and gas pipelines, or tank farms on the Hanford Site. There are, however, the H. J. Ashe Substation, the DOE's Fast Flux Test Facility (FFTF), the WNP-1 and 4 construction sites, the Wye radioactive waste burial ground and a permanent meteorological tower within a 8 kilometers (5-mile) radius of the site.

Airports, low level Federal airways, and airport instrument approaches in the vicinity of the WPPSS projects are shown in Figure 2-5. Federal airway V4N is located over WNP-2 with a minimum enroute altitude of 3500 feet above mean sea level (MSL). Traffic approaching Pasco on airways V298, V298N, or V4N may be routed onto an arc 14 nautical miles from the Tri-Cities Airport. As shown on Figure 2-5, this arc, which has a minimum altitude of 3000 feet MSL, passes within a few miles of WNP-2. Also, two instrument approach procedures for the Richland Airport permit maneuvering, as part



of the initial approach segments, within an area that includes the WPPSS projects at a minimum altitude of 2100 feet MSL. The Richland airport is 19 kilometers (12 miles) south of the plant, and the Tri-Cities Airport in Pasco is 29 kilometers (18 miles) southeast. Vista Field in Kennewich is located 31 kilometers (19 miles) south southeast and is used almost exclusively by small, private aircraft. In addition to these airports are the privately owned McWhorter and Hathaway Ranch airstrips located 32 kilometers (20 miles) southwest and 21 kilometers (13 miles) northeast, respectively. A DOE airstrip 23 kilometers (14 miles) northwest of WNP-2 has been closed since May, 1976.

Military aircraft activity is limited to periodic use of part of the airspace over the Hanford Site as a marshalling area for aircraft participating in training missions on the Yakima Firing Center located between 30 and 50 miles northwest of WNP-2. Such operations are typically scheduled at two to three year intervals and may include six aircraft per day for eight days of exercises. All flights would be more than 1000 feet above ground level and all operations would be conducted under Visual Flight Rules (VFR) conditions.

An explosives and ordinance test-site operated by Battelle-Northwest Laboratories approximately 21 kilometers (13 miles) northwest of the site was abandoned in mid-1975. Explosives for operations such as quarrying or seismic studies on the Hanford Site are brought to the blasting site as needed and unused quantities are removed immediately. The only explosives stored on the Hanford Site are small arms ammunition

for use by the reservation security patrol. There are no explosives or munitions stored within five miles of the WNP-2 site. A small arms firing range used for training by the security patrol is located 13 kilometers (8 miles) due south of the plant.

The H.J. Ashe Substation is located approximately 0.8 kilometers ( $\frac{1}{2}$  mile) north of WNP-2 and is operated by the Bonneville Power Authority as part of its transmission system.

Within the exclusion area radius of 1950 meters, two identical 1250 MWe PWR nuclear power plants (WNP-1 and WNP-4) are under construction for WPPSS. The fuel load dates for these projects are December, 1984, and beyond 1985, respectively. Transport of all materials and men to and from the two sites will be regulated by WPPSS. These projects have their own access road which ties into Route 4, 2.6 kilometers (1.6 miles) south of the WNP-2 access road tie. It is not anticipated that construction of these two projects will interfere with the WNP-2 project.

The DOE's Fast Flux Test Facility (FFTF), located about 4.8 kilometers (3 miles) southwest of the WNP-2 site, is a sodium cooled fast reactor for testing reactor fuel elements. The NRC staff has conducted a safety review of this facility and concluded that it presents no undue risk to public health and safety beyond its site boundary consistent with the safety considerations for light water reactors (See NUREG-0359 Suppl. 1, May 1979 for further details).

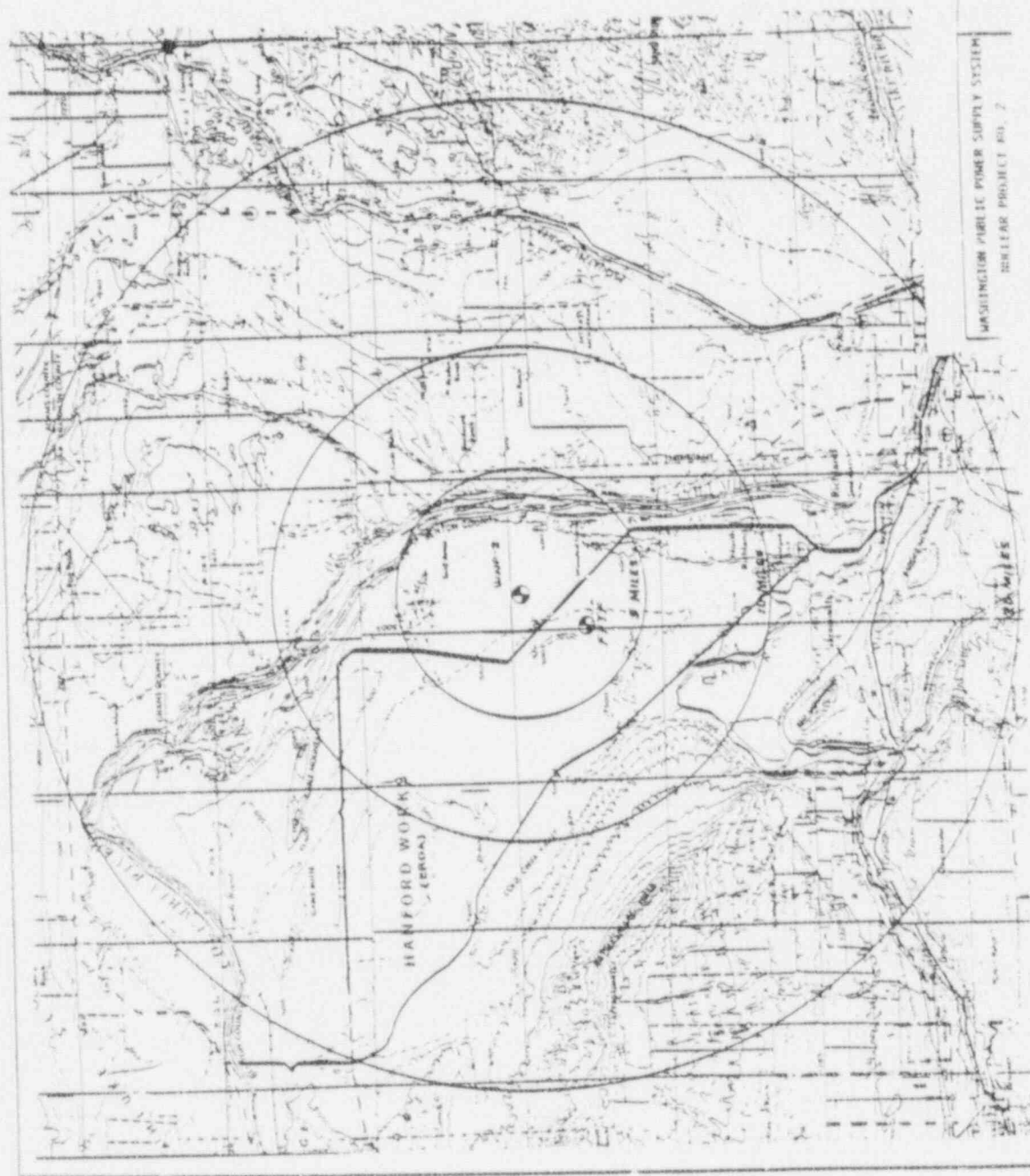
Immediately due west of the WNP2 plant site is a DOE radioactive waste burial ground known as the Wye Burial Ground. Another waste disposal site, 300 North, is located about 5.6 kilometers (35 miles) south of the WPPSS projects.

The nearest petroleum product storage tanks are located 35 kilometers (22 miles) southeast of the site. These consist of 13.5 million gallons at the marine terminal at Big Pasco, 25 million gallons at the Chevron Pipeline Company, and 23 million gallons at the Tidewater Barge Line.

There are no oil or gas pipelines in the vicinity of WNP2. The nearest major natural gas pipeline to the WNP2 site is about 10 kilometers (12 miles) away. This distance eliminates any potential hazard to plant operations due to a natural gas fire or explosion.

### 2.2.3 CONCLUSIONS

Our review has been conducted based upon the criteria given in 10 CFR Part 50, Appendix A, General Design Criterion 4 and in Standard Review Plan Section 2.2.3. We conclude that the plant is adequately protected and can be operated with an acceptable degree of safety as a result of activities at nearby transportation, industrial and military facilities.



GENERAL AREA, 0-20 MILES

WASHINGTON PUBLIC POWER SUPPLY SYSTEM  
BELLAR PROJECT NO. 2

FIGURE  
2-1





