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and Legal Examiner John Von Reis.

The parties were represented as follows:

APPLICANT: WASHINGTON PUBLIC POWER SUPPLY SYSTEM  
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and

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COUNCIL MEMBER AGENCIES:

DEPARTMENT OF ECOLOGY  
By George Hansen  
External Affairs Director  
Olympia, Washington 98504

Mr. Darrel Peeples, Attorney for the Council, also participated in the hearing.

Having examined the record and file in the matter and having been advised thereof, the Council makes the following findings of fact:

FINDINGS OF FACT

1. On May 17, 1972, pursuant to application 71-1, the

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State of Washington and the Washington Public Power Supply System (hereinafter referred to as "WPPSS" or "the Supply System"), a municipal corporation of the State of Washington, entered into a site certification agreement setting forth conditions attendant upon the construction of WPPSS's (Hanford) Project No. 2, to be built on the then United States Atomic Energy reservation in Benton County, Washington. In part, this agreement specified facilities and limits for the discharge of pollutants from the Hanford Number 2 Project into the waters of the Columbia River. The project is to become operational during 1979.

2. The Supply System has requested the Council to recommend to the governor certification of sites on the Hanford Nuclear Reservation in Benton County, Washington, for construction of WPPSS's Nuclear Projects Numbers 1 and 4. These projects, to be located near the aforementioned site for Hanford Nuclear Project #2, would, if operational, result in the discharge of pollutants into the Columbia River by means of a single outfall.

3. On January 20, 1975, WPPSS applied to the Council for an NPDES permit authorizing it to discharge pollutants into the Columbia River at outfall 002, Latitude  $46^{\circ} 28' 17''$ , longitude  $119^{\circ} 15' 45''$ . WPPSS also requested certification that its discharges would be in compliance with Sections 301, 302, 306 and 307 of the Federal Water Pollution Control Act, which matter the Council has disposed of by previous agreement. On January 31, 1975, WPPSS requested that the Council recommend

modification of the May 17, 1972, Hanford No. 2 site certification agreement to eliminate provisions therein duplicative of or inconsistent with the terms of any NPDES permit issued for the project. The Federally drawn requirements which must be met before an NPDES discharge authorization permit may issue became effective after the May 17, 1972, agreement was drawn.

4. On May 29, 1974, WPPSS applied to the Council for an NPDES permit for its Nuclear Projects Nos. 1 & 4, which permit would authorize pollutant discharges into the Columbia River at outfall 001, latitude 46° 28' 23", longitude 119° 15' 50". Applicant also sought from the Council certification that its discharges would be in compliance with Sections 301, 302, 306 and 307 of the Federal Water Pollution Control Act.

5. On February 4, 1975, the Council published draft permits for Nuclear Projects Numbers 2 and 1 & 4, and made tentative determinations that it would approve NPDES permits as stated in the drafts.

6. On February 4, 1975, the Council consolidated the two matters mentioned in findings of fact three and four above, and set them for public hearing on March 6, 1975.

7. The parties to the March 6, 1975, public hearing stipulated that certain changes should be made in the Council's tentative draft NPDES permit for Project No. 2, issued February 4, 1975. The parties submitted the stipulations to the Council for

its consideration. The Council, in light of these stipulations, finds the following changes appropriate on the record of the proceedings:

a.) To clarify the functions of specified facilities, and to remove technical inaccuracies in the draft language, the following wording should be adopted as general condition 5 of any NPDES permit issued for Hanford Nuclear Project No. 2:

"Excess process water shall not be discharged to the river unless sampling and analysis has demonstrated that the water complies with the applicable regulations on liquid radioactive discharges. Excess process water not meeting these conditions shall be processed in the liquid radwaste treatment system prior to discharge to the river. The liquid radwaste treatment system shall provide facilities with 24-hour retention capabilities; liquids may be discharged only after sampling and analysis demonstrate that all applicable regulations are complied with. No other liquid radwaste shall be discharged."

b.) To specify circumstances upon which applicant would be permitted to discharge effluent from its liquid radwaste system, the following wording is appropriate as note 1 of portion 5B (pertaining to low volume waste sources) of any NPDES permit issuing for the aforementioned Project No. 2:

"Flow (GPD) (1)"

"Note (1): Permittee is allowed on an intermittent basis to discharge subject to the provisions of G.5 herein to a maximum of 285,000 GPD additional flow originating from the liquid radwaste treatment system."

c.) To assure the accuracy and completeness of discharge monitoring reports, the time stated in general condition 15 by which applicant must submit these reports should in all instances be changed to 28 days.

d.) Permitting applicant to discharge such amounts of the following pollutants as may be necessary in its operations and in keeping with good standards of stewardship consistent with applicable Federal and state requirements standards:

- a. Acids and caustics when used for pH control;
- b. Material occurring in the air which when entrained in the cooling tower gets washed out of the air and added to the coolant;
- c. Biological materials from the recirculated water system;

- d. Materials naturally occurring in the water supply which are concentrated as a result of the cooling tower operation;
- e. Oil and grease originating in the recirculated cooling water blowdown, and
- f. Materials resulting from plant chemistry effects upon plant materials.

8. The parties to the March 6, 1975, public hearing stipulated that certain changes should be made in the Council's tentative draft NPDES permit for Projects Nos. 1 & 4 issued February 4, 1975. The parties submitted the stipulations to the Council for its consideration. The Council, in light of these stipulations, finds the following changes appropriate on the record of the proceeding:

a.) To clarify the functions of specified facilities and to remove technical inaccuracies in the draft language, the following wording should be adopted as general condition 5 of any NPDES permit issued for WPPSS Nuclear Projects Nos. 1 & 4.

"Excess process water shall not be discharged to the river unless sampling and analysis has demonstrated that the water complies with the applicable regulations on liquid radioactive discharges. Excess process

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water not meeting these conditions shall be processed in the liquid radwaste treatment system prior to discharge to the river. The liquid radwaste treatment system shall provide facilities with 24-hour retention capabilities; liquids may be discharged only after sampling and analysis demonstrate that all applicable regulations are complied with. No other liquid radwaste shall be discharged."

b.) To specify circumstances upon which applicant would be permitted to discharge effluent from its liquid radwaste system, the following wording is appropriate as note 1 of portion 5B (pertaining to low volume waste sources) of any NPDES permit issuing for the aforementioned WPPSS Projects Nos. 1 & 4.

"flow (GPD) (3) "

"Note (3): Permittee is allowed on an intermittent basis to discharge subject to the provisions of G.5 herein to a maximum of 108,000 GPD additional flow originating from the liquid radwaste treatment system."

c.) To assure the accuracy and completeness of discharge monitoring reports, the time stated in general condition 15 by which applicant must submit these reports should in all instances be changed to 28 days.

d.) Permitting applicant to discharge such amounts of the following pollutants as may be necessary in its operations and in keeping with good standards of stewardship consistent with applicable Federal and state requirements standards:

- a. Acids and caustics when used for pH control and for metal cleaning;
- b. Material occurring in the air which when entrained in the cooling tower gets washed out of the air and added to the coolant;
- c. Biological materials from the recirculated water system;
- d. Materials naturally occurring in the water supply which are concentrated as a result of the cooling tower operation;
- e. Oil and grease originating in the recirculated cooling water blowdown, and
- f. Materials resulting from plant chemistry effects upon plant materials.

9. Mr. William Waddell, environmental engineer with the supply system, described generally the No. 2 Project's discharge system, the discharge outfall's configuration in the river from the initial point 225 feet off the river's west bank between river miles 351 and 352, and the river's characteristics in the region of the proposed discharge point. The discharge point was chosen to provide a 5 foot water cover over the discharge point at 36,000 cfs minimum flow.

Mr. Waddel also described the discharge system, the outfall configuration in the river, and the river characteristics in the vicinity of the discharge for WPPSS Projects Nos. 1 & 4. The No. 1 & 4 discharge will be located approximately 600 feet upriver from the Number 2 discharge point. The No. 1 & 4 outfall will be located approximately 125 feet off the river's west bank at a site chosen pursuant to criteria similar to those applied to the No. 2 outfall site selection. River characteristics at the two sites are essentially constant.

10. Mr. Richard R. Stickney, WPPSS nuclear engineer, identified materials to be passed out as part of the No. 2 Project's discharge flows, including those items identified in finding of fact 7d above. WPPSS needs authority to discharge all materials listed in finding 7d above in order to operate Project No. 2.

The operation of Project No. 2 will necessitate discharge, on an intermittent basis, of up to 285,000 GPD additional flow from the liquid radwaste treatment system. Applicant states it will

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make such discharges only in accordance with conditions noted in Finding of Fact 7a above.

Mr. James Hanlon, nuclear engineer with the Supply System, identified those materials to be discharged in the No. 1 & 4 flows, including those materials listed in Finding of Fact 8d above. To operate Projects Nos. 1 & 4, WPPSS needs authority to discharge all materials listed in that finding. The operation of Projects Nos. 1 & 4 will also necessitate intermittent discharges of up to 108,000 GPD additional flow from the liquid radwaste system, which flows applicant states it will allow only in accordance with conditions stated in Finding of Fact 8a above.

11. Mr. LaVerle Coleman, supervisor of health physics and chemistry at the Supply System, described the chlorination systems to be used to control biological growth in the No. 2 and 1 & 4 Projects system. Unchecked biological growths would restrict and alter heat transfers in the main condenser tubes, restrict process flows, induce corrosion, restrict cooling tower water flow, and cause other difficulties in plant operation. Chlorination is the most appropriate technique for controlling biological growth in a system of the type applicant proposes. A system of the type designed by applicant does not permit discharge of all residual chlorine in its cooling system within 2 hours.

12. Mr. George Fry, Environmental Engineer for United Engineers and Constructors, discussed the reasons applicant seeks a waiver of EPA chlorine limitations. The EPA chlorine

discharge standards, which permit massive discharges for 2 hours in any 24-hour period and no discharge for the remaining 22 hours, are appropriate for a "once-through" cooling system, but are not compatible with a recirculating water cooling system such as that applicant proposes for its Project No. 2. The incompatibility results from the large volume of water chlorinated in a recirculated cooling system. The volume cannot be discharged during the time set in the EPA standards.

13. Mr. Orville Trapp, a mechanical engineer who serves as the Supply System's manager of engineering, discussed operable chlorine discharge limits for Project No. 2 and for Projects Nos. 1 and 4. Mr. Trapp's testimony supports the finding here made that operation of each of the three proposed plants is incompatible with a chlorine limitation allowing discharge during only 2 hours of any 24.

Mr. Trapp also presented a significant variation WPPSS proposes in measuring chlorine discharge limits for the three plants. While the Council in its draft called for an absolute limit in terms of pounds per day, the Supply System suggests a limit, .1 part per million, based on chlorine concentration in water. Two factors, the recirculatory systems' multimillion gallon capacities and the enormous dissolution potential in the receiving waters of the Columbia, will combine to minimize the chlorine's impact on aquatic biota.

Applicant proposes to inject chlorine into its plant recirculating systems at rates significantly higher than .1 part per million, but also to withhold chlorine discharges to the river for a sufficient period after injection (usually 3 to 5 hours) to permit the chlorine to decay to the .1 part per million level suggested. The discharge from Project No. 2 and the combined discharge from Projects Nos. 1 and 4 will each occur in concentrations not to exceed .1 part per million for approximately 20 hours out of each 24 hour period. A .1 part per million concentration implies a 28-1/2 pound chlorine concentration in the recirculating system.

14. Mr. William Waddel, WPPSS engineer, described the projected dissipation in the Columbia River of the No. 2 Project's discharged heat and chemicals. Chlorine in the mixing zone downstream from the discharge diffuser would be diluted to a concentration of .02 ppm within approximately seven seconds and 22 feet, assuming low flow river conditions of 36,000 cfs and a .1 ppm chlorine concentration at the discharge point, and no chlorine demand from the river. Under the same assumptions, the chlorine concentration at 120 seconds and 300 feet downstream from the discharge point would be approximately .001 part per million.

Assuming a 36,000 cfs minimum river flow, maximum blowdown discharge and a 25°F maximum temperature differential between the Project No. 2 plume and river temperature at the discharge point, the temperature differential in the mixing zone

20 seconds and 50 feet downstream from discharge would be approximately 3° F. At 120 seconds and 300 feet, the differential would be less than .5° F.

Miss Sharon Engstrom, WPPSS environmental engineer, described the anticipated dissipation of the No. 1 & 4 Projects' discharged heat and chemicals in the Columbia River. In the downstream mixing zone, chlorine would be diluted to a concentration of .02 parts per million within approximately 7 seconds and 22 feet assuming the above stated low flow and initial chlorine concentration conditions. At the mixing zone's edge, 120 seconds and 300 feet downstream, the chlorine concentration would be undetectable.

Assuming the same low flow conditions, together with maximum blowdown discharge and a 27° F. temperature differential at the initial discharge point, the differential 30 seconds and 75 feet downstream would be approximately 2° F., while at 120 seconds and 300 feet, the differential would be less than 1° F.

The effect of the No. 1 & 4 thermal plume on river temperature at the point of initial discharge for No. 2 would be less than 0.1° F.

The mixing zones herein discussed conforms with those defined in the Council's February 4, 1975, draft permits. Other materials discharged would be diluted in the mixing zones in a manner similar to that described for chlorine.

15. Dr. Roy E. Nakatani, Professor of Fisheries at the University of Washington and a consultant to the Supply System, testifies as to the impact of discharged materials from the three projects on aquatic biota in the Columbia River. No acute biological shock upon fish on a population basis can reasonably be expected as a result of heat or materials discharged into the mixing zones, though the mixing zones would become less effective rearing areas, and small numbers of individual kills, especially of benthic organisms, might result. Minimal damage to the river's ecosystem outside the mixing zones will result from the proposed project. Strictures contained in the Council's February 4, 1975, draft permit, as modified by proposals noted and described in the above findings, are sufficient to insure the maintenance on a population basis of Columbia River biota in the areas of influence of Project No. 2 and Projects Nos. 1 and 4.

16. Applicant has demonstrated that its proposed No. 2 and 1 & 4 steam electric power generating units cannot operate at a level of chlorination consonant with a discharge during only two hours of any day. Residual chlorine discharge from Project No. 2 and from Projects Nos. 1 & 4 satisfy the Council's limits and concerns only if discharges are made in accordance with the following limitations, which limitations are found appropriate for the projects' discharges:

Upon initiating chlorination, permittee shall terminate all discharges from the recirculating water system to the receiving water until the

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total residual chlorine concentration has been at or below 0.1 mg/l for 15 minutes. Chlorine measurement for compliance purposes is to be made at the unit being chlorinated. Sampling is to be performed on a grab basis for both projects.

17. NPDES permits issued by the Council in the form of the Council's aforementioned February 4, 1975, draft permits as for Project No. 2 and Projects Nos. 1 & 4 modified only by those changes proposed by applicant which have been hereinabove found appropriate for the respective plants, issued for a period of not to exceed five years from the date of issuance, establish conditions on discharges adequate for compliances with the requirements of 33 U.S.C. §1342.

18. The Council's February 4, 1975, draft permits, as modified by applicant's proposed changes hereinabove found appropriate, said changes being within the Council's power to make, insure that operation of the Project No. 2 and Projects Nos. 1 & 4 will be in compliance with requirements of Sections 301, 302, 306 and 307 of the Federal Water Pollution Control Act.

19. The following changes should be made in the May 17, 1972, certification agreement between the State of Washington and the Washington Public Power Supply system regarding the construction of Hanford Project No. 2:

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- a. Add to Section III. H. of the Agreement:  
"The outfall shall include features as required to achieve dilution within the limits prescribed in General Condition 4 of the attached NPDES permit";
- b. Replace Section IV. B. in its entirety by the following: "Discharge to the Columbia River shall be done in accordance with the terms and conditions of a valid NPDES permit, which permit is attached hereto. See attachment."

From the foregoing findings of fact, the Council makes the following conclusions of law:

CONCLUSIONS OF LAW

1. The Washington State Thermal Power Plant Site Evaluation Council has jurisdiction over the persons and the subject matter of this proceeding.
2. The Council may properly issue applicant an NPDES permit in the form of the Council's February 4, 1975, draft permit for the project as modified by the above findings of fact in the manner shown in Appendix A attached hereto for applicant's Hanford No. 2 Project. Such permit will issue for a period not to exceed five years from date of issuance.

O R D E R

IT IS, THEREFORE, ORDERED That the application of the Washington Public Power Supply System for an NPDES permit authorizing the discharge of pollutants from its Hanford No. 2 Project be, and the same is hereby, granted on conditions as noted in the permit set forth in Appendix A attached hereto and by this reference made a part hereof.

IT IS FURTHER ORDERED That the application of the Washington Public Power Supply System for an NPDES permit authorizing the discharge of pollutants from its WPPSS Nos. 1 and 4 Projects be, and the same is hereby, granted on conditions as noted in the permit set forth in Appendix B attached hereto and by this reference made a part hereof.

IT IS FURTHER ORDERED That a certificate issue pursuant to 33 USC §1341 stating and affirming that conditions in the NPDES permit now issued for WPPSS Projects Nos. 1 and 4 insure that any discharges made from those two projects will be in compliance with 33 USC §1311, 1312, 1316 and 1317.

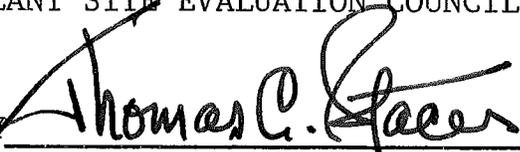
IT IS FURTHER ORDERED That a recommendation be forwarded to the Governor that certain alterations and amendments, as set forth in Appendix C attached hereto and by this reference included as a part hereof, be made to the May 17, 1972, Site Certification

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Agreement for the Hanford No. 2 Nuclear Project entered into between the State of Washington and the Washington Public Power Supply System.

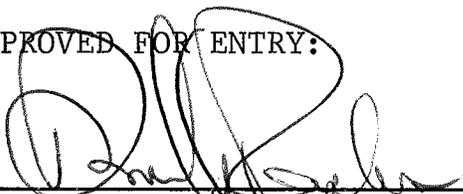
ENTERED THIS 28TH DAY OF APRIL 1975

WASHINGTON STATE THERMAL POWER  
PLANT SITE EVALUATION COUNCIL

BY 

Thomas C. Stacer  
Acting Chairman

APPROVED FOR ENTRY:

BY 

Darrel Peeples  
Assistant Attorney General