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 AUTH. NAME: BOUCHEY, G.D. AUTHOR AFFILIATION: Washington Public Power Supply System  
 RECIP. NAME: SCHWENCER, A. RECIPIENT AFFILIATION: Licensing Branch 2

SUBJECT: Forwards revised response to NRC 810617 request for addl. info re NRC Executive Order 11988 re flood plain mgt. Structures located in flood plain are circulating water intake pipes & cooling water blowdown outfall.

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**Washington Public Power Supply System**

P.O. Box 968 3000 George Washington Way Richland, Washington 99352 (509) 372-5000

June 24, 1981  
G02-81-151  
NS-L-GCS-81-177

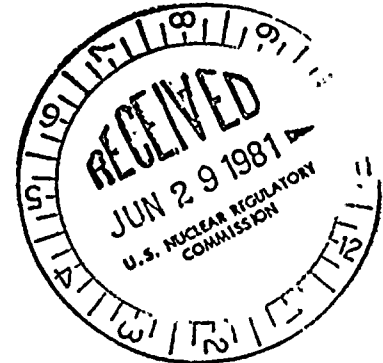
Docket No. 50-397

Director of Nuclear Reactor Regulation  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Attention: Mr. A. Schwencer, Chief  
Licensing Branch No. 2

Subject: WNP-2 DES REQUEST FOR ADDITIONAL INFORMATION

Ref.: Letter, G. D. Bouchey to A. Schwencer, same  
subject, dated June 10, 1981.



Dear Mr. Schwencer:

The referenced letter provided a copy of our previous response to NRC questions relative to Executive Order 11988 flood plain management.

Attached for your use is a revised response which reflects additional information requested in a phone conversation on June 17, 1981, between Messrs. Auluck and Staley of the NRC and Chasse and Sorensen of the Supply System.

In summary, the only structures associated with WNP-2 which are located in the flood plain are the circulating water intake pipes and the cooling water blowdown outfall. These structures, which are described in the Environmental Report--Operating License Stage, are located on the bed of the Columbia River and are submerged even at minimum flow.

We trust that the attached provides the necessary information.

Very truly yours,

G. D. Bouchey  
Director, Nuclear Safety

GDB:GCS:nm

cc: O. K. Earle, B&R  
J. R. Lewis, BPA  
N. S. Reynolds, D&L

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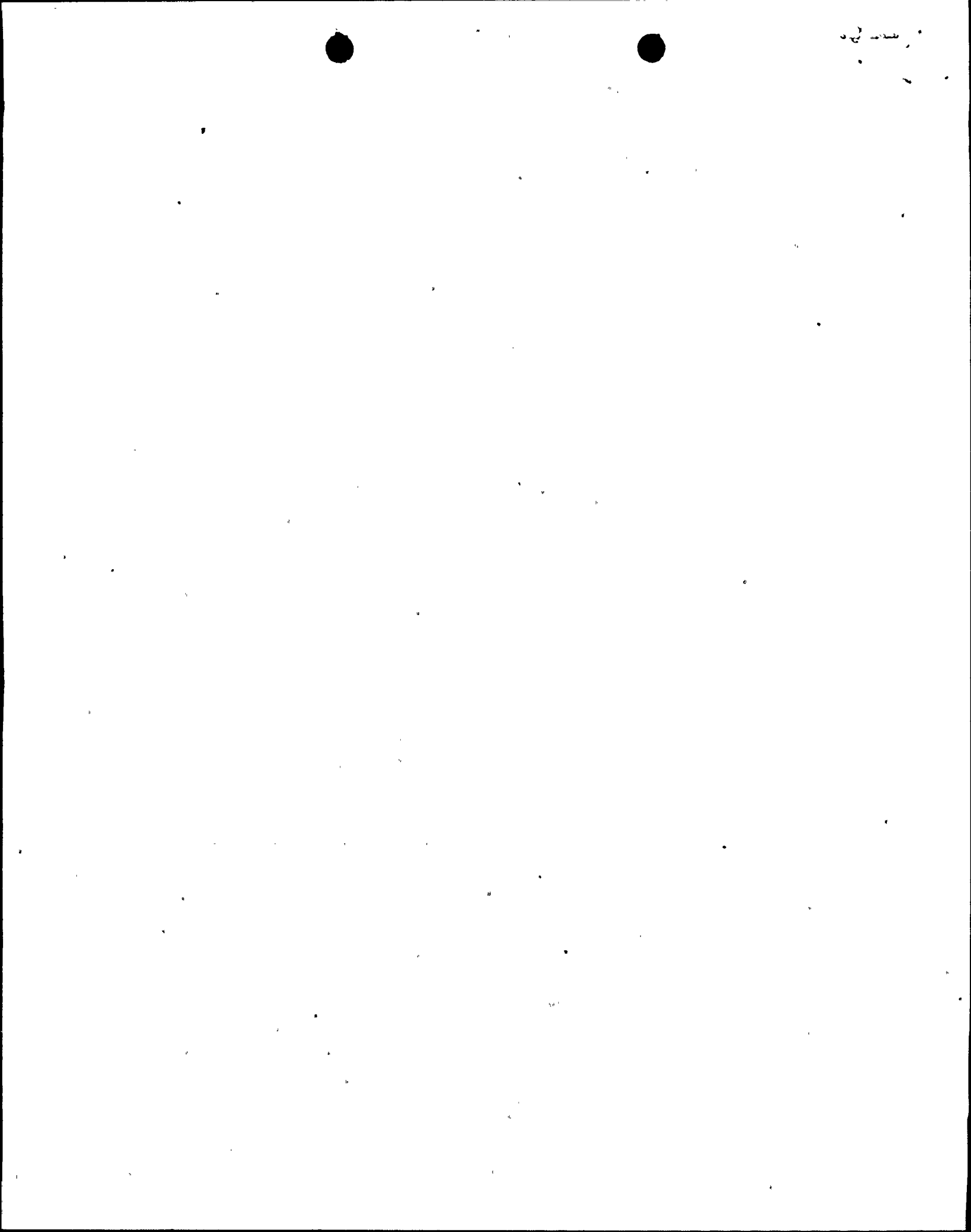
## ATTACHMENT

### HYDROLOGIC ENGINEERING GENERIC QUESTIONS

- 371.03E Provide descriptions of the floodplains of all water bodies, including intermittent water courses; within or adjacent to the site. On a suitable scale map provide delineations of those areas that will be flooded during the one-percent chance flood in the absence of plant effects (i.e., pre-construction floodplain).

The flood history of the Hanford Reach of the Columbia River is discussed in Section 2.4 of the WNP-2 FSAR and ER-OL. In the vicinity of the site, the river is broad, swift, and relatively shallow. The unregulated one-percent flood has a peak discharge of about 650,000 cfs near the site (see ER-OL Fig. 2.4-3). When control by up-river structures is considered, the one-percent flood is 440,000 cfs. This yields a water elevation of 363 ft. MSL at WNP-2. This may be compared with the makeup water pump house elevations shown on ER-OL Fig. 3.4-5. The attached figure (taken from USGS 15' Quadrangle, Wooded Island, Wa., 1978) shows the topographic detail of the site vicinity. There are no intermittent water courses within or adjacent to the site.

The attached figure indicates a natural depression or basin-like area just east of WNP-2. Subsection 2.4.3 of the FSAR includes an evaluation of the flooding in this area from a hypothetical probable maximum precipitation (PMP) event over a 33-square mile "drainage basin". This PMP (determined by FSAR Ref. 2.4-4) has a 6-hour rainfall of 9.2 inches with a peak hour of 5.2 inches. The runoff analysis assumed conservative soil, cover, and antecedent moisture conditions and took no credit for sub-basin storage. The resulting flood levels, calculated for the purpose of a safety evaluation, are based on greatly exaggerated runoff from an extremely conservative rainfall. In fact, this area between WNP-2 and WNP-4 is not an intermittent water course; there is no obvious physical evidence (e.g., surface drainage patterns) that the area has carried or ponded water. Available data indicates that the one-percent 1-hour and 6-hour rainfalls for the Hanford Site are 0.8 and 1.6 inches, respectively (ER-OL Ref. 2.3.1). When the numerous natural depressions and infiltration losses (approximately 2 inches/hour) for the sandy Hanford soils are considered, it is obvious that the 100-year rainfall cannot result in predictable runoff. Accordingly, this low area adjacent to WNP-2 is not a floodplain and is not indicated as such on the attached figure.



Hydrologic Engineering Generic Questions  
Page 2

- 371.04E Provide details of the methods used to determine the floodplains in response to [371.03E]. Include your assumptions of, and bases for, the pertinent parameters used in the computation of the one-percent flood flow and water elevation. If studies approved by Flood Insurance Administration (FIA), Housing and Urban Development (HUD) or the Corps of Engineers are available for the site or adjoining area, the details of analyses need not be supplied. You can instead provide the reports from which you obtained the floodplain information.

Information on Columbia River discharge exceedence intervals has been assembled by the Pacific Northwest River Basins Commission (ER-OL Ref. 2.4-7) using USGS and COE data. A relevant portion of this information is included in Figures-2.4-2, 3, and 4 of the ER-OL. Definition of the regulated one-percent flood and resulting river stage was provided by the Corps of Engineers (Ltr., David Sweger, Hanford Reach Study Manager, COE, to R. A. Chitwood, WPPSS, May 30, 1980).

- 371.05E Identify, locate on a map, and describe all structures and topographic alterations in the floodplains.

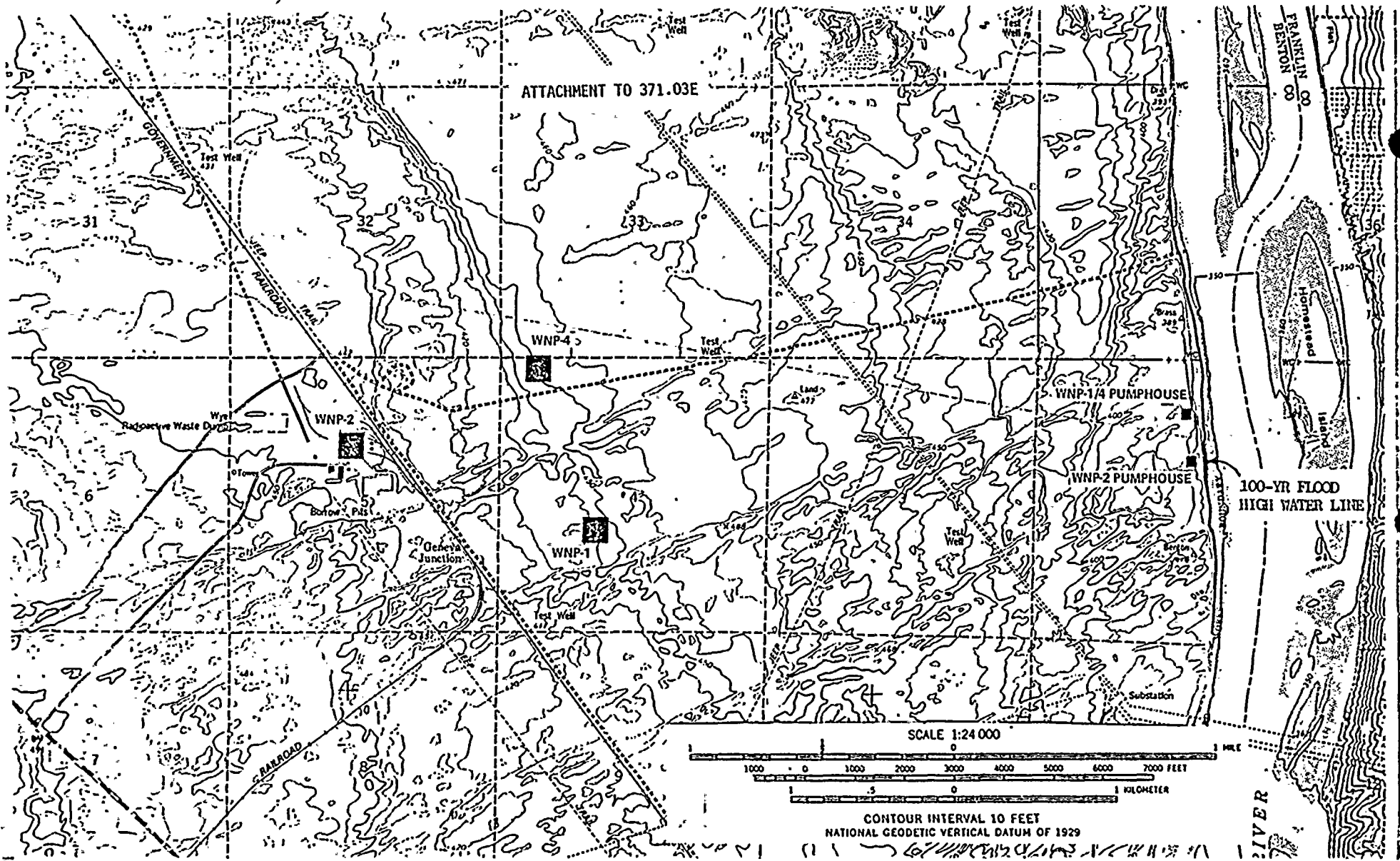
The only structures related to WNP-2 which are located in a floodplain are the makeup water intake pipes and cooling water blowdown outfall, which were installed in 1975. These structures, located on the bed of the Columbia River at River Mile 351.7, are depicted by ER-OL Fig. 3.4-7 and 3.4-10.

- 371.06E Discuss the hydrologic effects of all items identified in [371.05E]. Discuss the potential for altered flood flows and levels, both upstream and downstream. Include the potential effect of debris accumulating on the plant structures. Additionally, discuss the effects of debris generated from the site on downstream facilities.

The hydrologic effects of the structures described above are negligible; the projected area in the cross-section is about 25 square feet. Because of the shape, small area, and submersion, debris cannot accumulate on the structures; periodic inspections by divers have not revealed any attached debris.

- 371.07E Provide the details of your analysis used in response to [371.06E]. The level of detail is similar to that identified in item [371.04E].

The response to 371.06E is based more on common sense judgment than analysis; encroachment on the floodplain by WNP-2 structures is something less than 0.05% of the flow area.





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