TESTIMONY OF DANIEL P. SHEER, Ph.D.
Planning Engineer
INTERSTATE COMMISSION ON THE POTOMAC RIVER
BASIN
March 28, 1978
before the Md. House of Delegates Committee
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Gentlemen:

I come before you today to present factual information concerning the consequences of approval of the Low Flow Allocation Agreement and the withdrawal of additional water from the free-flowing Potomac for water supply for the Washington Metropolitan Area.

My name is Daniel P. Sheer. For the last four years I have been the planning engineer for the Interstate Commission on the Potomac River Basin. During that time I have become intimately familiar with many of the water resource management problems in the Potomac Basin. Most recently I have been involved in using the Environmental Protection Agency's computer model of the Potomac for the analysis of the downstream water quality effects of waste discharges in the Washington Metropolitan Area. I supervised the computer runs on which the water quality analysis in the U.S. Army Corps of Engineers Draft Environmental Impact Statement Concerning Proposed Potomac River Water Intake Structures is based. In addition, I have been directly involved in formulating alternatives for increasing the available water supply for the Washington Metropolitan Area without causing environmental impacts outside the metropolitan area. Initial results of this work are presented in "A Perspective On The Washington Metropolitan Area Water Supply Problem". I hold a Ph.D. in environmental engineering from the Johns Hopkins University. My doctoral thesis work concerned water supply in the Potomac Basin.

In discussing the environmental impacts of increased withdrawals, it is convenient to separate the river into three reaches below the proposed water supply intakes. The first reach covers the distance from Watkins Island to

Chain Bridge, just below the District of Columbia line. It is in this reach of the river that the most severe environmental impacts will occur. Without additional supplies, during times of extreme low flow two sections of the channel will be completely dry. The first section comprises 1.2 miles of rock-lined channel between the Little Falls intake and Chain Bridge. The second is on the north side of Watkins Island, below the WSSC intake to the tip of the island. The channel on the south side of the island will remain relatively normal. Below the island to the Little Falls intake, flows will be reduced. Because of the provisions of the Low Flow Allocation Agreement, flows in this section of the river will equal the sum of the WAD allocation of water and the amount determined to be necessary for environmental flow-by. As a practical matter, this flow should rarely fall below 500 cfs, because the WAD will continue to have the largest proportional share of the river flow.

Flows this low in the river are not desirable, although they do occur naturally. When they occur there is damage, significant damage, to the aquatic and related terrestrial environment. Portions of the riverbed become dry, and some fish will be stranded in isolated pools. Fortunately, this damage is not irreversible. Periods of higher flows, whether of natural origin or due to flow augmentation, of 2-4 years duration will return the river to its normal state. Reduced flows will occur even in the absence of the projects or the Low Flow Allocation Agreement, as the WSSC will continue to construct emergency weirs in the case of low flow (see p. 9-7 of the DEIS). Further, in the absence of the permits, increased use will almost certainly be made of the existing 450 mgd WAD intake at Little Falls.

Significant impacts from the proposed actions are not expected with high

probability much prior to the year 2000. Denial of permits has the potential for causing quite severe water shortages in the Fairfax County Water Authority (FCWA) and WSSC service areas for some 20 years prior to that date. It could well be argued that the short term impacts of denial would be more severe than the long term impacts of approval.

It is not unreasonable to further argue that the long run environmental impacts of denial will be larger than those associated with approval. Low flows are aggravated by current facilities. Additional facilities to increase flows in the Potomac will alleviate those impacts. With no assurance that permits for withdrawal facilities on the Potomac will be granted, development of such facilities is substantially less likely.

Consider the possibility of interconnecting the Potomac and local reservoir water supplies as a case in point. Even without augmentation from Bloomington, such interconnections would raise the dependable yield of the total local water supply to about 900 mgd gallons per day over a prolonged drought with a 50 year recurrence interval. Some of this water could be used to reduce drought impacts on the Potomac River and Estuary. Such interconnections are totally impractical without permit approval. Due to lack of intake facilities, additional water could not be withdrawn from the Potomac during high flow periods to maintain water levels in the local reservoirs for use during low flow periods. Better operation of Bloomington reservoir, the only large upstream source of water supply , is also of little value if the permits are denied.

The Potomac Estuary begins in the District of Columbia. There will be impacts from increased withdrawals in this section of the river, although they will not be nearly as severe or serious. The attached figures, taken from the DEIS illustrate the extent of the impacts. Due to decreased flushing rates in the

uppermost 5 miles of the estuary, some violations of the District's D.O. standard may occur at extreme low flows. Chlorophyll A levels in that 5 mile stretch will also increase to levels found around Blue Plains because of the reduced flushing. The area will not become stagnant. The natural tidal range in the area is about 2 feet, and the currents associated with the tides alone are sufficient to cause some flushing and much water movement.

Anadromous fish migration in the area should not be affected. Fish cannot now migrate above the Little Falls weir except during high flow spring seasons. If the fish ladder at that weir is made operational, migration will be possible regardless of the additional withdrawals. The minimum monthly flow for any month during any historical spawning season is more than 1 billion gallons per day above the projected withdrawal rates.

Niether the Low Flow Allocation Agreement nor the proposed water intake facilities should have any discernible impact below the District of Columbia line. The previously mentioned figures illustrate this. Quoting the Draft Environmental Impact Statement, "the overall impact on estuarine hydrography would be minimal, since approximately 70 to 80 percent of the water would be returned to the river as sewage effluent. Flushing rates in the extreme upper estuary would be decreased in extreme low flow periods, but would be essentially unaffected 98 percent of the time. The additional input at the estuarine sewage treatment plants would not have a major hydrologic impact, given the large volume of the estuary and the short duration of extreme low flow periods. There is no indication that the salt wedge would reposition". There can be no impact on salinity for the simple reason that there is no significant increase in water consumption. It can be argued that provision of adequate water supply to the

Metropolitan Area is insurance against future salinity impacts. Such impacts could be caused by increased agricultural irrigation upstream or large scale evaporative cooling for electric generation. Both activities involve large scale consumptive use of water. The potential for large consumptive use in the Metropolitan Area is very low, with the unlikely exception of extremely large scale use of land treatment for sewage disposal. This, like agricultural irrigation, involves significant water losses.

In summary, the environmental impacts associated with the Low Flow Allocation Agreement and the proposed intakes are confined primarily to the free-flowing Potomac above Chain Bridge, and entirely to the Metropolitan Area. The impacts are serious, and must be balanced against the consequences of severe water supply shortages in the same area.

It is important to note that regardless of the approval of permits for the proposed intake structures, the Low Flow Allocation Agreement is necessary to insure an orderly appropriation of water using current facilities. The Low Flow Allocation Agreement contains the only enforcable provision for maintaining any flow to the estuary. Complex legal issues were involved in the 7 years of negotiations leading to the Low Flow Allocation Agreement. The Low Flow Allocation Agreement provides an equitable, sensible solution to the problem of conflicting claims to water in the river. Without a low flow allocation agreement, these claims are likely to be settled in the courts under the press of a drought situation, and with the water supply of over a million Marylanders at stake. Ratification of this agreement is a very serious matter.

FIGURE 1

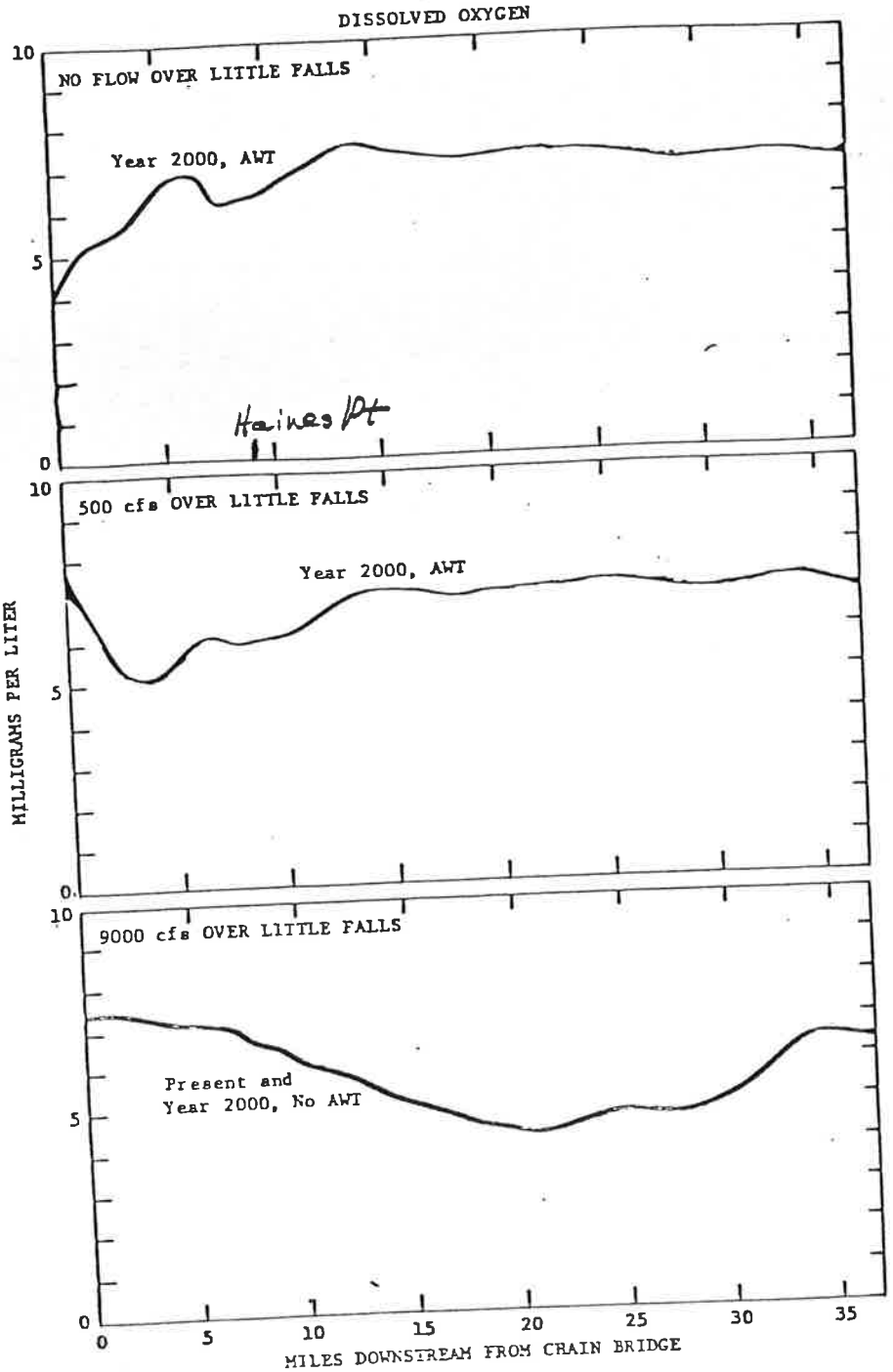

FIGURE 8-5
DISTRIBUTION OF DISSOLVED OXYGEN IN THE POTOMAC ESTUARY AS PREDICTED BY THE WATER QUALITY SIMULATION MODEL

FIGURE 2

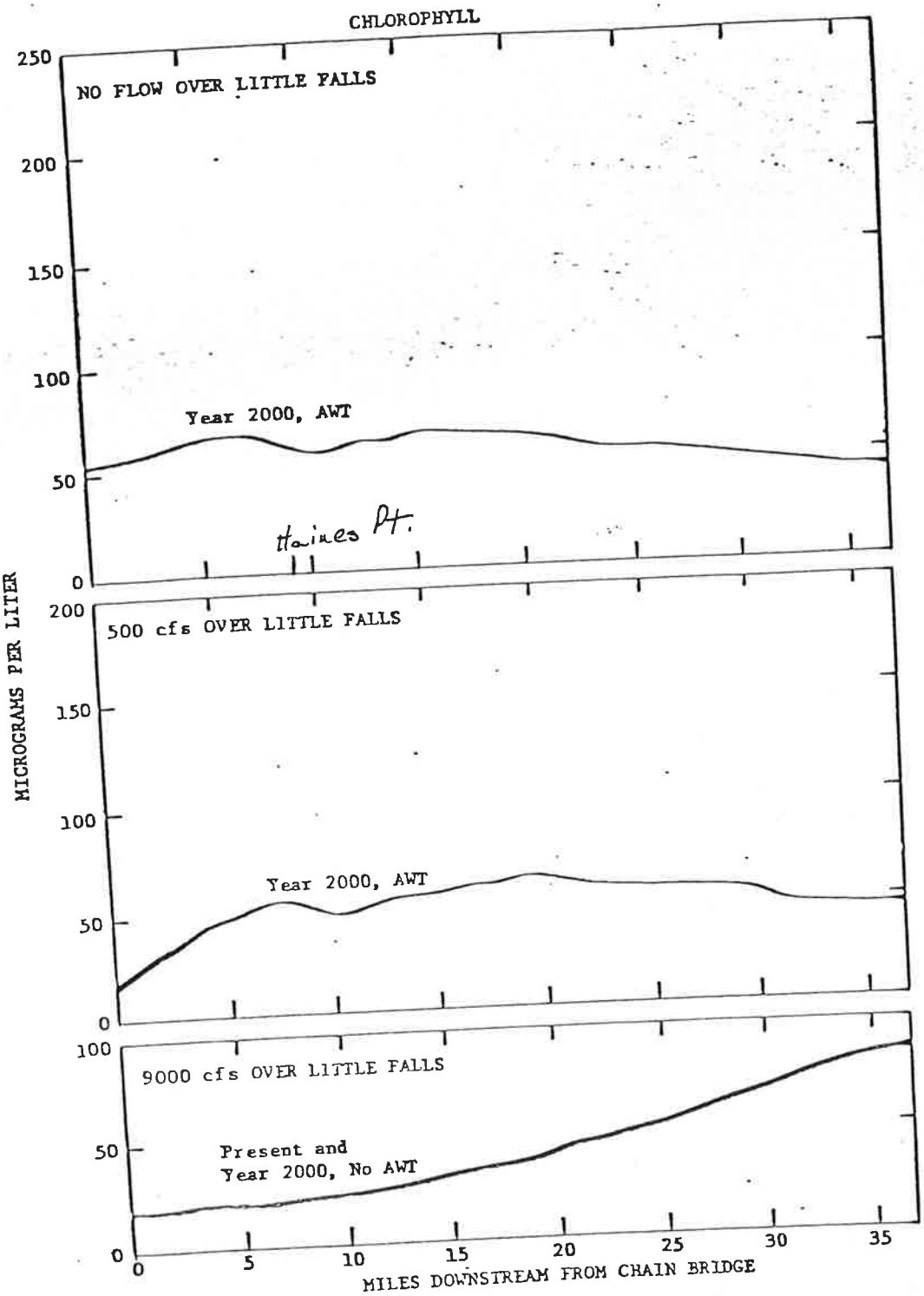

FIGURE 8-6
DISTRIBUTION OF CHLOROPHYLL IN THE POTOMAC ESTUARY
AS PREDICTED BY THE WATER QUALITY SIMULATION MODEL