

Frequently Asked Questions about the Tar-Pamlico Nutrient Trading Program

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The following questions and answers are provided in rough descending order of their popularity. If you don't find a question here that you have, or a full answer, please feel free to contact the Division staff listed on the Tar-Pamlico home page. Also, the Phase II Agreement document, accessible from the home page, provides the ground rules by which the trading program operates.

Q1: Have the point sources exceeded their caps yet – has point-nonpoint trading occurred?

A: No, as shown in the table at the end of this document, the nutrient caps have yet to be exceeded. How can this be? As part of Phase I, the Association was required to fund an efficiency study on all of its facilities, and to implement the study's recommendations for optimizing plant performance for nitrogen and phosphorus removal. The Association implemented the optimization recommendations during 1990. This action, combined with installation of biological nutrient removal at a couple of the larger facilities as they underwent expansion, yielded sufficient reductions for the Association to stay beneath its cap each year despite increases in flow. For example, while discharge flows increased approximately 20 to 35 percent from 1991 through 1997, total nitrogen concentrations have decreased 10 to 20 percent and total phosphorus concentrations 20 to 40 percent in the same time period.

Q2: If the caps haven't been exceeded, does that mean they were set too high?

A: Finding the appropriate level for a trading cap is always a challenge. Environmental groups who were signatories to Phase I felt that the proposed caps for Phase II were too high and chose not to sign onto the Phase II Agreement. However, DWQ endeavored to set the caps in Phase II based on the performance standard of a 30% reduction in nitrogen loading from, and holding phosphorus loading at, 1991 levels. The Division based these "instream" goals on an involved model of the estuary's water quality that incorporated hydrologic, sediment, and nutrient data to project the effects of altering nutrient inputs on the estuary's photosynthetic production.

Using the estuary model, Division staff evaluated the estuary's response to different projected nutrient loading scenarios, looking at the frequency of exceedences of the 40 ug/l chlorophyll *a* standard. While a 45 percent reduction in nitrogen loading was projected to essentially eliminate chlorophyll *a* exceedences, the less certain nature of the model's predictions under loading conditions so different from those in the input data set led the Division to establish a more conservative interim goal of 30 percent. In short, the caps were set based on what the Division believes was a reasonable management goal. We also recognize the need to periodically revisit the goal, to evaluate current data, and to adapt the management strategy as needed. In that light, the goal and caps will be reevaluated for Phase III.

Q3: Given that the caps have not been exceeded, should the program be considered a success?

A: DWQ believes that the program has clearly been successful to date in achieving its aims. Here's why - equivalent reductions at lower cost. As mentioned above, the Association has accomplished significant reductions in nutrient loading despite increases in flow over the last ten years. It has done so while incurring substantially less cost than would have resulted from applying uniform technology-based requirements on all of its facilities. Allowing the facilities to operate within a "bubble" gives them the flexibility to achieve reductions in a more cost-effective manner, when plants expand and when it better fits the lifespans of their capital investments. The potential exists within the Association for further cost-effective reductions in the future using this approach. Perhaps exceeding its caps and paying for nonpoint source practices would be even more cost-effective, and that is a question the Association will revisit at some point in the future.

Q4: Do individual dischargers have NPDES permits? Do they have nutrient limits?

A: Each discharger has an NPDES permit. Association members' permits include limits for a suite of parameters, but not for nitrogen or phosphorus. Individual Association members' nutrient limits are waived since they are subject to a collective cap. Non-Association facilities, which comprise an estimated 10% of the point source flows in the Basin, are subject to discharge nutrient concentration limits if they expand, and must offset all of their additional nutrient loads at the same rate as Association facilities.

Q5: Water doesn't mix rapidly like air, so how can you use this bubble concept and allow point sources to discharge as much nutrients as they want? Wouldn't this allow any single Association discharger to overload a receiving stream and cause eutrophication problems?

A: While water doesn't necessarily circulate and mix as rapidly as air, nutrients typically don't cause problems in flowing freshwater systems unless they reach extremely high levels. Nutrient-related problems tend to occur in aquatic systems where there are long residence times and clear water. One place where these conditions can exist is where streams are impounded in reservoirs; however, the freshwater Tar River doesn't have features conducive to long residence times. In coastal basins, including the Tar-Pamlico and Neuse, the place where excessive nutrients typically express themselves is at the estuary. Here velocity slows, sediments drop out, and residence time increases. The Pamlico and Neuse estuaries are particularly susceptible to excessive nutrient loading since they empty into Pamlico Sound, a large coastal embayment with a limited number of inlets, and as a result their waters experience long residence times. These conditions have allowed the Division to reasonably apply a "bubble" approach to nutrient loading to the estuary.

At the same time, the Phase II Agreement has a stipulation that addresses the potential situation where a single discharger might overload a receiving stream with nutrients and cause eutrophication problems. Under Section VI, if such a localized water quality impact occurs, the Division reserves the right to require nutrient removal of a facility to eliminate the problem. No such situation has occurred as of yet.

Q6: Should the Tar-Pam program really be considered trading? After all, in trading individual dischargers are assigned loading limits within a cumulative cap, and any discharger can only exceed its limits if it buys credits from another discharger that has achieved excess reduction.

A: The Tar-Pamlico program is not trading in that standard sense. To the extent that the Association achieves equity within itself for relative loading differences, that might be considered an informal version of effluent, or point-point trading. But no, the point-nonpoint source ‘trading’ spelled out in the Agreement does not fit the model described above. In the point-nonpoint ‘trading’, the dischargers pay an offset fee for each mass unit of pollutant by which they, as a group, exceed a cap each year. These offset funds go to a voluntary agricultural cost share program, and are used to pay willing farmers 75% of the cost of installing nutrient-reducing Best Management Practices (BMPs) on farms within the Basin.

Thus, the Tar-Pamlico program establishes responsibility at the group level as opposed to the individual level and there is no individual polluter-level transaction. An advantage is that those individual transaction and tracking costs are spared by using an existing program (cost share) combined with minor additional administrative costs of tracking the point source loads annually. Another difference from trading is that the agricultural nonpoint sources are not obligated to participate in this program (they have a separate rule, adopted later, that holds them to county-level loading reductions of their own), so they participate voluntarily through the cost share program. However, for the foreseeable future we anticipate ample interest from farmers in using these funds. Overall, the Tar-Pamlico program might really be described more accurately as an exceedance tax on point sources, the proceeds of which are applied to a more cost-effective method of achieving the reductions.

Q7: Is the trading program considered the ‘TMDL’ required by the Clean Water Act for restoring the Tar-Pamlico’s impairment?

A: The trading program is one element of the implementation strategy portion of the Tar-Pamlico nutrient TMDL (actually, while the cause of impairment is identified as nutrients, the indicator used is chlorophyll-*a*). The trading program provides a means of addressing point source nutrient loads. As part of the trading program, agriculture is the recipient of point source offset fees. At the same time, there is a separate and distinct nonpoint source program that includes requirements for agriculture. This nonpoint source program is the other element of the TMDL’s implementation strategy. The 30 percent nitrogen reduction and “hold phosphorus” goals apply to the nonpoint source program as well. After two years of a voluntary nonpoint source strategy, the Environmental Management Commission determined that insufficient progress was occurring, and called for mandatory NPS measures. During 2000, the Commission adopted a set of rules addressing major nonpoint source subjects: agriculture, urban stormwater, nutrient management, and riparian buffer protection.

**ANNUAL NUTRIENT CAPS AND LOADS
TAR-PAMLICO BASIN ASSOCIATION**

	Phase I (N+P)				Phase II				
	1991	1992	1993	1994	1995	1996	1997	1998	1999
Nutrient Loading Cap (kg/yr)	525,000	500,000	475,000	425,000	N: 405,256 P: 69,744				
Estimated Actual Load (kg/yr)	461,394	436,128	417,217	371,200	N: 372,582 P: 37,360	N: 354,219 P: 43,266	N: 320,670 P: 36,532	N: 344,781 P: 36,864	N: 309,476 P: 32,052
Difference (kg/yr)	63,606	63,872	57,783	53,800	N: 32,674 P: 32,384	N: 51,037 P: 26,478	N: 84,496 P: 33,212	N: 60,475 P: 32,880	N: 95,780 P: 37,692
Percent of Cap	88	87	88	87	N: 92 P: 54	N: 87 P: 62	N: 79 P: 52	N: 85 P: 53	N: 76 P: 46

- ◆ Load estimates calculated by Planning Branch, Division of Water Quality.
- ◆ Load estimates equal the sum of calendar-year monthly load values for each facility, which are based on minimum biweekly nutrient concentrations and daily mass flows.