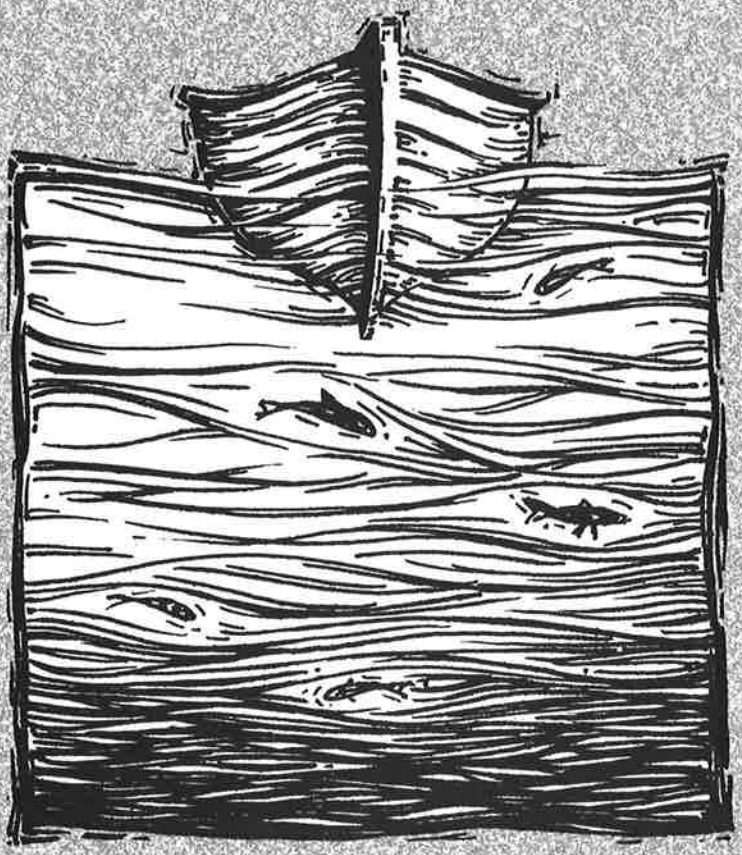
time for action



Jan. 8, 1991

RECREATIONAL BOAT POLLUTION AND THE CHESAPEAKE BAY

A REPORT TO THE CHESAPEAKE EXECUTIVE COUNCIL

RECOMMENDATIONS FROM:

THE IMPLEMENTATION COMMITTEE OF THE CHESAPEAKE BAY PROGRAM

THE RECREATIONAL BOAT POLLUTION WORK GROUP

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EXECUTIVE SUMMARY

The 1987 Chesapeake Bay Agreement includes the commitment ***"to eliminate pollutant discharges from recreational boats"*** as one of its water quality objectives. This challenge was re-emphasized by EPA Administrator William K. Reilly in December of 1989 on the occasion of his assuming the Chairmanship of the Chesapeake Executive Council.

In response to this challenge, the Recreational Boat Pollution Work Group was created by the Chesapeake Bay Program Implementation Committee in May, 1990. All segments of the Bay community with an identified interest in vessel waste management were represented on the Work Group. Representatives from the marine industry, boating clubs, environmental organizations, Federal and state agencies, local government, the legislatures and citizen user groups all played an active role.

The Work Group recognized at the outset that the "elimination" of recreational boat pollutants was a lofty and perhaps even unattainable goal. The Work Group further recognized that substantial work and resources have already been dedicated to achieving this goal. Nevertheless, the group accepted the challenge to develop an institutionalized framework to continue to work toward the attainment of this goal. The Work Group agreed to deliberate openly with a view towards the optimal solutions, but recognized that its recommendations should be couched in realistic and achievable terms.

The recommendations of the Workgroup are far-reaching. They are the strongest measures yet considered to address the issues associated with recreational vessel pollution in the Bay region. It calls for all parties, whether more closely linked to the regulated or the regulatory side of the issue, to become full partners in the solution. Specifically, the report recommends:

- That we identify sensitive areas in the Bay and target them for designation as "No Discharge Zones". The EPA should clarify the criteria to be used in this process.

- All jurisdictions should develop new, or enhance existing, programs to provide additional sewage pumpout facilities Bay-wide and assure that these facilities have access to municipal treatment plants. These facilities should be kept operational, should be easily available at reasonable cost and should accommodate portable toilet wastes.

- Municipal sewage plants should be encouraged and educated so they will accept wastes from pumpout facilities and manufacturers should be required to substitute less harmful disinfectants for those now in use.

- The EPA and US Coast Guard should review all marine sanitation device requirements, encourage the development of better equipment and ensure that regulations are enforceable.

- By July 1, 1991 work should start with the boating industry to ensure installed toilets comply with federal regulations, and that pumpout fittings are standardized basin-wide.

- A common logo, sign, and/or buoy for pumpout stations, and "No Discharge Zones" should be adopted throughout the Bay basin.

- A concerted and directed educational effort should be undertaken for the 1992 boating season to inform boaters - and the public - about vessel waste problems.

- Research to assess the magnitude and location of pollutant discharges from recreational and commercial boats should be undertaken or enhanced.

- Before June 1, 1992, programs should be developed to address pollution from houseboats and other live-aboard vessels.

- By July 1, 1991, the jurisdictions should encourage a "no discharge" policy at marinas, community piers and yacht clubs.

INTRODUCTION

The 1987 Chesapeake Bay Agreement recognizes that many sources of pollution have contributed to the general decline of water quality in the Chesapeake Bay watershed. Steps are already underway to address many of the major sources of pollution recognized in the Agreement, including discharges from sewage treatment plants and industrial facilities, and runoff from urban areas and farm fields. With more than thirty-two distinct commitments made in the Agreement, the signatories attempted to prioritize their efforts, tackling the most significant contributors of pollutants first in a systematic approach to restore the water quality and living resources of the Chesapeake Bay.

The Executive Council has also directed that we not overlook or disregard other sources of pollution that are, perhaps, less important when viewed from a Bay-wide water quality perspective. Under certain circumstances, these relatively minor discharges can have a substantially negative impact on local water quality. The Council members have repeatedly emphasized that the Chesapeake Bay must be regarded as an integrated ecosystem and the cumulative impacts of individual decisions and actions, even when taken on a small scale, cannot be ignored.

Ecologically, the integrity of our smaller rivers and streams must be maintained. These water corridors are the lifeblood of our estuary. They are frequently important spawning and nursery areas for living resources, provide habitat for many other important wildlife species, and deliver a constant source of fresh water to maintain the delicate balance of the estuary. Many of these picturesque and peaceful byways and backwaters also provide major, but unquantified, aesthetic benefits.

One potential threat to water quality in the Bay's creeks and harbors is the discharge of pollutants from recreational boats. While the effect of a single boat on the Bay may seem insignificant, multiply it by the large number of boats that use the Bay at various times and such effects become both significant and increasingly apparent. However small, boat pollutants can and should be minimized through better education, management, technological advancement and enforcement.

Clearly, there will always be some environmental impact associated with any use of the Bay, but the key to success is to keep these impacts to a minimum. Sewage, oil and grease, anti-freeze, boat bottom paint and trash have all been identified as elements of the boating community's waste stream. Fortunately, the boating community has always been supportive of efforts to restore Chesapeake Bay. They can be expected to become partners in any actions aimed at eliminating, or at least minimizing, this impact.

Perhaps more than any other boat-generated pollutant, discharges of human wastes from boats have the potential to degrade water quality. For the most part, vessel discharges pose the greatest threat to water quality in places were boats tend to congregate. These marinas, recreational boating centers, and raft-up sites are often located in quiet, protected waters. Unfortunately, these waters are also often ecologically fragile areas with restricted circulation, which are slow to flush themselves of pollutants. They are common locations for oyster beds, fish spawning and nursery habitats, and large beds of submerged aquatic vegetation.

When considering boat sewage management, it is important to remember that less than 20% of the estimated 200,000 boats that use the Bay at various times are of a size large enough to have an installed toilet on board. The rest of the boaters are reliant on portable toilets or the availability of onshore facilities. Therefore, when management plans for boat sewage are devised, programs for the management of both marine toilets and onshore facilities must be considered.

THE RECREATIONAL BOAT POLLUTION WORK GROUP

In response to a stated objective of the 1987 Chesapeake Bay Agreement and at the direction of the Chesapeake Bay Program Implementation Committee, the Recreational Boat Pollution Work Group was created in May of 1990. The charge to the Work Group was to research the available information concerning waste discharge from boat toilets, to review progress in efforts to reduce the impacts and magnitude of overboard boat discharge, and to make recommendations for the implementation of programs and procedures to reduce the overboard discharge of wastes from recreational vessels.

All segments of the Bay community with an identified interest in vessel waste management were represented on the Work Group. Representatives from the marine industry, boating clubs, environmental organizations, Federal and state agencies, local government, the legislatures and citizen user groups all played an active role. In addition,a mailing list of other interested parties was maintained and Work Group members actively solicited input, advice and recommendations from representatives of their particular constituency throughout the six month process.

A "strawman" document was developed and circulated among the Work Group in an attempt to establish points of agreement and to identify issues for consideration. The major points of agreement are either stated or implied within the text of the Report. The Group agreed, for instance, that the Chesapeake Bay is an estuary of extraordinary economic and environmental importance deserving of the highest possible standards of protection. It was also understood from the outset that boat sewage was only one element in the array of pollutants discharged from recreational boats. Other elements include oil and grease, anti-freeze, debris, toxic anti-fouling paints and gasoline; all are worthy of management programs aimed at reducing their presence in the waste stream.

The Work Group recognized early in its deliberations that the discharge of wastes from recreational vessels created a relatively minor impact on water quality when compared to other point and nonpoint sources of pollution. In response to the objectives of the Chesapeake Bay Agreement, however, the Work Group agreed that the recreational boat contributions to pollution should be targeted and reduced as much as possible, regardless of the magnitude of that contribution.

The Group reviewed existing laws and regulatory programs concerning vessel waste management in Maryland, Virginia, Pennsylvania and the District of Columbia, as well as relevant federal law. Other states with more extensive background in this area, particularly in the Great Lakes region, were interviewed and a survey of the available literature was conducted and reviewed. Several major themes permeated discussions during the six month evaluation process:

(1) The boating public and the marine industry, which derive great pleasure and/or economic benefit from availability and utilization of Bay waters, are concerned with and committed to preserving the environmental integrity of the Chesapeake Bay and its tributaries;

(2) There is an imperative need for broad-based education concerning the effects of overboard discharge, the location, use and utility of pump-out stations and the potential impact of other boating-related pollutants;

(3) There are legislative and regulatory avenues, some of which are currently funded, in place which represent a practical approach to installing and maintaining pump-out stations in the Bay area, though these mechanisms should be strengthened and more thoroughly utilized;

(4) There is widespread interest in the concept of establishing portions of the Bay and its tributaries as "No Discharge Zones"; and

(5) Programs to enforce both the state laws prohibiting the discharge of raw sewage and the federal requirements prohibiting the discharge of raw sewage and governing the operation of marine sanitation devices are largely unenforced.

Neither the Work Group nor this report has attempted to resolve all of the issues or questions concerning recreational boat pollution, particularly as it pertains to overboard waste discharge. However, this report does identify those issues which will be helpful in addressing the commitments in the Chesapeake Bay Agreement and the charge to the Work Group, and presents information about these issues.

This report generally characterizes the potential water quality problems which may be attributable to boat discharges. It provides a brief description of the pollutants contained in wastewater discharged by marine toilets and the potentially damaging role these pollutants play in the aquatic environment. The relevant state and federal laws are also summarized. Finally, the report summarizes the major issues identified and discussed by the Work Group and offers recommendations to improve the management and solicit the involvement of the Chesapeake Bay boating community.

The recommendations that are offered in this Report reflect the consensus of the Work Group. Finally, but most importantly, the recommendations, if implemented, will bring us closer to achieving the Executive Council's objective to "eliminate the discharge of pollutants from recreational boats".

POLLUTANTS DISCHARGED BY BOATS

Recreational and commercial vessels can contribute a variety of pollutants to the Chesapeake Bay and its tributaries. Many pollution incidents attributable to boats are unintended, and almost all are preventable or controllable.

A number of toxic substances such as oil, gas and anti-freeze are essential for vessel use and maintenance. To the degree which these substances reach our streams and waterways, however, they represent a serious threat to living resources. Used boat motor oil is suitable for recycling through standard used oil recycling centers. Options must be developed and utilized to encourage the proper disposal or re-use of these substances.

Boats are also a source of trash, litter and debris which foul the waters of the Bay. This is not purely an aesthetic matter. Plastic, paper and other non-biodegradable materials represent a particular hazard to fish and wildlife.

The disposal of human wastes generated aboard recreational and commercial vessels constitutes a distinct and significant problem. The issue includes a variety of questions and several layers of regulatory authority. The Work Group determined that this issue should be addressed on a priority basis and that the bulk of its recommendations would center on sewage management solutions. Solving the problem of vessel sewage disposal--especially the discharge of raw sewage--is absolutely necessary in order to achieve the more comprehensive goal of eliminating pollutant discharges from recreational boats. In addition, the Group offers a number of suggestions for improving the management of other boating-related pollutants. These recommendations appear on the final pages of this report.

POLLUTANTS DISCHARGED BY MARINE SANITATION DEVICES

The identity and quantity of pollutants discharged from marine sanitation devices vary depending upon the type of device and the manner in which it is used and maintained. Boats with holding tanks that discharge their wastes into pump-out facilities do not contribute wastewater pollutants directly to the waters of the Bay. These wastes, following collection, are transferred to either a local sewage treatment facility or septic system for proper treatment. As an alternative to a holding tank, some boaters opt for the use of flow-through (Type I or Type II) marine sanitation devices. These systems, depending on their type and state of repair, can contribute a number of potentially harmful chemicals and other pollutants to the Bay and its tributaries. Boats which totally avoid the use of holding tanks through the use of an open seacock or Y-valve are directly contributing raw sewage to the Bay.

The principal concerns associated with the discharge of sewage from boats are the potential threat to public health and the impact on living resources. Sanitary waste discharges from boats contribute a variety of pollutants to the Bay's waters. Nutrients such as phosphorus and nitrogen, oxygen-consuming materials and bacteria--all substances found in many point and nonpoint sources--may also be found in boating wastes. Toxic substances may also be found in the waste stream as a result of chemical additives.

While industrial and municipal point sources and runoff-related nonpoint sources contribute far more of these substances to the Bay, large numbers of boat discharges can potentially endanger public health and add to the nutrient enriched and low oxygen conditions, particularly in congested harbors, rafting areas, and other resource-sensitive areas. The types of pollutants included in vessel waste discharges, and their potential impacts, are identified below:

Intestinal Microorganisms

These microorganisms originate in the digestive process and are found in human feces and urine. They are often indicators of other pathogenic microorganisms which can cause diseases such as hepatitis, gastroenteritis and cholera. They are a cause for concern for two reasons. First, they are a potential source of disease transmission to swimmers and others who come into contact with contaminated waters. Second, elevated coliform levels, an indicator of enteric microorganisms, trigger the automatic closure of shellfish beds. Case studies have shown that human consumption of shellfish contaminated with sewage can result in serious illness. The issue of shellfish contamination has developed into a significant problem for environmental managers and watermen in the Chesapeake watershed during the past several years.

Biochemical Oxygen Demand (BOD)

The organic matter contained in human wastes is decomposed by bacteria when it is discharged into the water. As the bacteria break down this organic matter, they consume oxygen. If too much organic matter is discharged into a river or stream, the resulting bacterial action can seriously deplete the water's dissolved oxygen content. Without an adequate supply of dissolved oxygen, fish and other aquatic life forms cannot survive. Oysters and other shellfish are particularly susceptible to low oxygen conditions, as they are in fixed locations and cannot escape to more oxygen-rich waters.

Biochemical oxygen demand, or BOD, is a measurement of the amount of oxygen that will be consumed as a result of the decomposition of organic wastes. Many areas of the Bay experience problems as a consequence of low dissolved oxygen levels, particularly during the summer months. The biochemical oxygen demand associated with discharges from marine sanitation devices may pose a problem in the small creeks and harbors where many boats are concentrated. However, it should be noted that there are other factors leading to high BOD, such as decaying plant and animal matter.

Nutrients

The nutrients phosphorus and nitrogen are essential to the growth of all plants. When present in excessive amounts, however, nutrients trigger algal blooms that reduce light penetration through the water column, in many cases eliminating submerged aquatic vegetation. When this algae dies and is decomposed, dissolved oxygen levels can be reduced to the point where aquatic life is threatened. Nutrient over-enrichment undoubtedly constitutes the most serious threat to the quality of Bay waters.

Human wastes discharged from marine sanitation devices contain phosphorus and nitrogen. Although MSD discharges do not appear to be a significant source of these nutrients on a Bay-wide basis, boat discharges do have the potential to exacerbate nutrient enrichment problems in small creeks and marinas where many boats tend to congregate.

Toxic Pollutants

Most flow-through marine sanitation devices use a variety of chemicals to partially treat wastes prior to discharge. Some of these chemicals, including chlorine, zinc, quaternary ammonium, formaldehyde and dimethylaminoethylene dichloride are toxic to marine and estuarine life. Some Type I MSDs rely principally on the use of large doses of chemical disinfectants to treat the sewage. A minimum of research has been conducted to ascertain the threat posed by the discharge of toxic contaminants from marine sanitation devices. Again, the potential threat for damage is greatest in the Bay's recreational boating centers where many boats are present.

FEDERAL LAW REGULATING MARINE SANITATION DEVICES

The Federal Water Pollution Control Act was adopted by Congress in 1972. The law was amended in 1977 to become the Clean Water Act and again in 1987 to become the Water Quality Act of 1987. It requires the EPA to promulgate standards designed to prevent the discharge of untreated

or inadequately treated sewage into the waters of the United States. The United States Coast Guard (USCG) is required to promulgate regulations governing the design, construction, installation, and operation of marine sanitation devices. The Coast Guard is also responsible for enforcing those regulations.

Section 312 of the Water Quality Act requires the installation of a marine sanitation device (MSD) on all vessels with installed toilet systems operating in the navigable waters of the United States. Portable toilets are not considered installed toilets and are not subject to the regulations. Treated discharges from MSDs certified by the USCG may be discharged into navigable waters such as the Chesapeake Bay.

Coast Guard Regulations

The Water Quality Act requires the Coast Guard to promulgate regulations governing the design, construction, installation and use of MSDs. The regulations do not require boats to be equipped with a toilet or marine head. However, if a toilet is installed, it must be equipped with an operable Marine Sanitation Device that is built and certified to meet Coast Guard standards. Toilets that directly discharge raw sewage are illegal in U.S. territorial waters (i.e., within three miles of the coast). Direct overboard discharge of portable toilet wastes is also a violation of state water quality regulations. The current Coast Guard regulations (33CFR159) were issued on January 30, 1975.

Regulations promulgated by the United States Coast Guard provide for the use of three different types of marine sanitation devices:

TYPE I MSD

These devices treat human waste before discharge with disinfectant chemicals, maceration or by other means. The treated discharge must not have a fecal coliform bacteria count of greater than 1000 per 100 milliliters at point of discharge. In addition, the effluent cannot contain any visible floating solids.

TYPE II MSD

Type II devices provide a greater degree of treatment than Type I, and generally have higher power and greater space requirements. Thus, they are usually installed only in larger boats such as cargo and passenger vessels. Effluent from these devices may not have a fecal coliform bacteria count in excess of 200 per 100 milliliters at point of discharge. These devices must also remove suspended solids to 150 milligrams per liter or less at point of discharge.

Most Type II systems use a combination of chemical, biological, electrical or incineration methods in the treatment process. Some of these systems use chlorine or other disinfecting chemicals. While a single Type II system does not appear to pose a significant threat, the cumulative impact of many Type II systems might prove to be toxic to marine life. However, there are few recreational vessels with Type II MSDs operating on Chesapeake Bay.

TYPE III MSD

Type III MSDs are designed to prevent the discharge of human waste from boats in any form. The most common kinds of Type III MSD used on Chesapeake Bay are holding tanks, designed to retain all waste until pumped out. Other acceptable Type III MSDs can involve the recirculation or incineration of waste materials.

Sewage collected in a holding tank is required to be properly disposed of on shore, or at sea beyond the three-mile territorial limit. The installation of pump-out facilities is not required by the Coast Guard regulations. Their availability at marinas and other locations is primarily a function of state law, state-sponsored incentive programs and local boater demand.

The regulations require that any MSD installed since 1980 be a Type II or III, unless a waiver is granted by the Coast Guard. Shortly after the regulations were issued, it became apparent that there were no readily available Type II MSDs suitable for smaller vessels. The Coast Guard issued a waiver on 10 July 1978, with the concurrence of EPA, which stated that the Type II MSD requirement for vessels 65 feet or less in length was waived until adequate Type II MSDs became available for smaller vessels. Consequently, Type I MSDs may be installed on any vessel 65 feet or less in length and replacement MSDs for those vessels after 30 January 1980 may continue to be Type I, II, or III. Although this measure was intended to be only temporary, the MSD regulations have not been changed to reflect this continuing waiver.

The Coast Guard regulations also include certification and testing requirements for manufacturers of marine sanitation devices and overall enforcement responsibilities. The states are pre-empted from issuing MSD standards more stringent than those promulgated by the EPA. It is important to note that manufacturers are also governed by the regulations. Any vessel constructed after 30 January 1980, with an installed toilet, is required to be equipped with a certified MSD.

Environmental Protection Agency Standards

The Water Quality Act required the EPA to develop standards for discharge from marine sanitation devices which are designed to prevent the discharge of untreated or inadequately treated sewage into or upon the navigable waters of the United States from new and existing vessels. The current EPA standards (40 CFR 140) were issued on January 29, 1976.

In addition to the promulgation of discharge standards, the EPA may, under certain circumstances, allow a state to prohibit all discharges (whether treated or not) from marine toilets, thus declaring the area a "No Discharge Zone". Any state may petition the EPA Administrator for a "No Discharge Zone" to be designated in some or all of the waters of the state. However, EPA may only affirmatively determine the validity of the petition for "No Discharge" designation if the state certifies:

(1) That the protection of the waters covered by the request requires a greater degree of protection than would be provided by the requirements ordinarily applicable to marine toilets; and

(2) That adequate and reasonably available pump-out facilities exist for the safe and sanitary removal of sewage from all vessels using such waters.

Petitions for No Discharge Zones by states must include:

- A certification that the designated waters require greater environmental protection than the applicable federal standard;
- A map showing the location of all pump-out facilities and their operating hours;
- A description of the location of the pump-out facilities;
- Draft requirements concerning vessels that may be excluded because of insufficient water depth adjacent to the facility;
- Information indicating that the treatment of wastes from the pump-out facilities is in conformance with the federal law;
- Information on vessel population and vessel usage of the subject waters;
- Information on the cost of pump-out at each identified facility; and
- The schedule of operating hours of the pump-out facility.

Whenever a boat, equipped with either a Type I or Type II MSD (those that discharge treated sewage), is operating in waters that have been determined to be a No Discharge Zone by EPA, the MSD must be secured. Closing the seacock and padlocking, using a non-releasable wire-tie, or removing the seacock handle would be sufficient. Locking the door to the head is another acceptable method of securing the MSD while in a No Discharge Zone. The method chosen must be one that presents a physical barrier to the use of the MSD.

At this time, the limited number of pump-out facilities in many parts of the Bay constitute a major stumbling block to EPA approval of No Discharge Zones.

A recent addition to the Marine Sanitation Device section of the Water Quality Act allows a state to promulgate regulations more stringent than the Federal standards and regulations for houseboats resident in the state's waters, where those houseboats are used primarily as a residence, and not primarily as a means of transportation.

Enforcement

Enforcement of MSD requirements presents difficulties for the states as well as the federal government. The sheer number of recreational boaters, their mobility and the myriad responsibilities of the Coast Guard and other state enforcement officials make enforcement of these requirements a relatively low priority. As a result, untreated or inadequately treated wastes are frequently dumped overboard.

Enforcement of Section 312 of the Water Quality Act (addressing boat sewage) is the responsibility of the U.S. Coast Guard. Tankers, container vessels, colliers and passenger

vessels, both U.S. and foreign flag, are routinely inspected by the Coast Guard as they transit U.S. waters. MSDs are checked during these inspections. Other vessels, most notably recreational vessels and commercial fishing vessels, are not subjected to regularly scheduled inspections by the Coast Guard.

Current MSD requirements present several enforcement problems. The dramatic increase in recreational boating over the past ten years has greatly reduced the likelihood that a boater will be checked for compliance with the MSD requirements by USCG or state enforcement personnel. Compared to other waterborne activities, enforcement of these requirements receives a relatively low priority, in part because it is easy for a boat to violate the MSD requirements. It is also difficult for the USCG to detect a violation.

By-pass valves, which may be legally used outside of the three mile limit, may also be used illegally to directly dump sewage overboard into Bay waters. Even boats that could never travel beyond the three mile limit are legally allowed to have by-pass valves. Furthermore, the discharge outlets may be located below the water line, where it is impossible for an inspector to determine whether an illegal discharge is taking place or not.

Enforcement of the MSD requirements is hampered at other points as well. Manufacturers often install a through-hull fitting and include a space in the vessel for a toilet but do not actually install one, allowing a toilet to be easily installed later by a dealer or owner. Once a finished interior is installed on the boat, inspection for a missing MSD may no longer be possible in many instances.

In the field, the regulations are rendered largely unenforceable by several features of the regulations themselves. MSDs are not inspected to ensure they are still "operable' as required by regulation. Any suspected violation is difficult to prosecute because the effluent tests needed to prove that a MSD is not treating sewage adequately are cumbersome, slow to yield results, and may frequently be conducted incorrectly.

Under Section 312(k) of the Water Quality Act, states may elect to share the responsibility for enforcement. The regulations, however, provide little incentive to the states to request authority to share the enforcement responsibility or to pursue the designation of a No Discharge Zone. Once a 312(f)(3) designation has been attained, the states become solely responsible for enforcement in those waters. Any penalties levied in a successful prosecution in the absence of an approved No Discharge petition, however, revert at the present time to the federal government, rather than becoming available to the state. Thus, there is little incentive, financial or otherwise, for the states to assume a more aggressive MSD enforcement program.

It is important to emphasize that a NDZ applies to all vessels, commercial and recreational, regardless of the type of MSD installed. Enforcement in a No Discharge Zone would be the responsibility of the states, not the Coast Guard. Regardless of responsibility, adequate enforcement will continue to be a challenge. Fortunately, a public awareness campaign coupled with a periodic enforcement presence should go a long way toward improved compliance with sewage discharge regulations.

STATE LAWS AND PROGRAMS GOVERNING RECREATIONAL BOAT POLLUTION

Maryland

The Maryland program to deal with the disposition of marine sewage is operated pursuant to legislation adopted by the General Assembly in 1988 and 1989.

Legislation enacted in 1988 allows the use of Waterway Improvement Funds to reimburse marina owners for the cost of installing a pump-out facility. These funds are derived primarily from the 5 percent excise tax paid when boats are purchased in Maryland or used principally in Maryland. Under this authority, the Boating Administration of the Maryland Department of Natural Resources (DNR) accepts grant applications with a maximum allowable grant of $10,000. As of November 1, 1990, 94 applications, representing 21% of Maryland marinas with more than 10 slips, had been received and 20 installations had been completed under the grant program. This brings the total number of operational pump-out facilities on Maryland waters to 52.

Legislation adopted in 1989 requires all state-owned and attended boat launching facilities or marinas to install a marine sewage pump-out station. In addition, any attended boat launching facility or marina purchased, built, or otherwise acquired by the DNR must install a marine sewage pump-out station.

The 1989 General Assembly also enacted a law which requires that on or after July 1, 1989, a person may not construct any additional slips at an existing marina that would result in a total slip capacity of more than 10 slips or construct a new marina with more than 10 slips unless: (1) the wastewater collection and treatment system at the marina is adequate (as determined by the Department of the Environment) to handle any existing and increased flow; and (2) there is a marine sewage pump-out station on-site at the marina that can adequately handle the increased sewage from vessels that is operable and accessible at reasonable times; or (3) the marina has a contract with a pump-out facility that is located not more than two miles from the marina and is adequate to handle the increased sewage capacity from vessels and that is operable and accessible at reasonable times. Before approving the construction of marinas, the Maryland Department of the Environment requires that the provisions of the statutes regarding the installation of pump-out facilities be met.

The Board of Public Works announced a policy in May of 1990 that any marina applying for a wetlands permit must have a pump-out facility or permission to use a pump- out facility located within two miles of the application site.

In March, 1990, Maryland announced action initiatives to accelerate the achievement of the 1987 Chesapeake Bay Agreement goals including the long term goal of eliminating boat sewage discharge into the Bay. Maryland has budgeted over $500,000 for fiscal years 1990 and 1991 for the grant program to install pumpout and dumpout facilities. In addition, Maryland has undertaken the following actions:

- contacted over 440 marinas about the grant program;
- prepared a guidebook for pumpout installations;

- inaugurated two mobile pumpout vessels which provide free pumpouts at various high-density boating areas throughout the boating season;

- undertaken a survey of Maryland's sensitive water areas;

- initiated the "Pump Don't Dump" public education program including posters, 30,000 brochures listing the pumpout locations, television spots, and distributed signs with the pumpout logo to 48 marinas which have pumpout facilities; and

- installed or initiated the installation of pumpout and dumpout facilities at its public parks, marinas and boat ramps.

It is the goal of the state of Maryland to install sufficient marine sewage pump-out facilities to serve the Bay that will enable the state to petition the EPA to declare Maryland's waters of the Chesapeake Bay a "No Discharge Zone". If approved, this would prohibit the discharge of both treated and untreated sewage from a vessel into Maryland's Bay waters.

The Maryland Department of the Environment has regulations to control the use of vessels as "floating homes". These regulations require any structure meeting this definition to either be connected to public sewer or to an on-site sewage system in the same way as a land-based residence. Still, because of the definition, many live-aboards remain unregulated.

Virginia

The Virginia program to control the disposal of vessel waste relies upon regulation rather than statute. In 1976 the Virginia Water Control Board (VWCB) adopted Regulation No. 5 - Control of Pollution from Boats. This regulation outlines certain requirements which are more stringent than those imposed under Section 312 of the Water Quality Act, such as the mandatory use of holding tanks on boats regularly moored within designated shellfish growing areas. However, the requirements of Regulation No. 5 cannot become effective until the Administrator of the U.S. EPA declares the body of water as a No Discharge Zone. Such certification has not yet been granted in Virginia; therefore, Regulation No. 5 has never been put into effect. However, Virginia has recognized the importance of proper disposal of boat wastes and has developed educational programs and provided information to Virginia boaters concerning these issues that emphasize the need for a commitment from boaters to not discharge wastes overboard.

The regulations adopted by the Virginia Department of Health (VDH) require that adequate onshore sanitary facilities, a dump station for portable toilets and pump-out facilities be provided at each marina or other place where boats are moored. The location of the onshore sanitary facilities are specified so they will be in close proximity to the shore end of the pier. The regulations include requirements concerning the minimum number of toilets, sinks and showers to be provided, based on the seasonal and transient slips at the mooring facility. By statute, the Virginia Marine Resources Commission (VMRC) may not issue a permit for construction of any marina or boat mooring facility until the applicant has obtained approval by the VDH of a plan for sewerage facilities to serve the number of boats and people that the marina or mooring facility was designed to accommodate. The VDH has the responsibility to enforce compliance with the plan for all sewerage facilities as approved.

At the time of the most recent revisions to the VDH Sanitary Regulations for Marinas and Boat Moorings, it had become evident that dry storage facilities needed to be regulated more specifically than had been done in the past. A boat dry storage facility is defined by the regulations as "a boat storage or parking space, whether covered or uncovered, at a marina or other place where boats are moored for the purpose of storing boats on land between use" and is not covered by regulation. The requirement for an establishment to provide a sewage dump station for portable toilets was not included in the regulations until the 1987 amendments were effective. These amendments require the installation of a sewage dump station at all new establishments and at all existing facilities when renovated, expanded or upgraded. Under certain conditions, if an establishment qualifies for an exemption for onshore toilet facilities, it may receive an exemption for the sewage dump station.

The VDH conducts an annual survey program to determine the status of compliance with the regulations. As of January 1, 1990, 933 establishments were in the inventory to be surveyed. Three hundred and fifty (350) establishments are classified as marinas; 423 are classified as other places where boats are moored and there are another 160 locations that have the potential to become a marina or other place where boats are moored and are surveyed to determine if their status has changed.

Of the 933 establishments, there are 773 facilities which are covered by regulations in Virginia. About 90% of those furnish onshore toilet facilities, as required by the regulations, and nearly one-half of the establishments that cannot qualify for an exemption to pump-out requirements have obtained pump-out equipment in compliance with the minimum standards specified in the regulations. The latest survey reports indicate that there are about 200 pump-out facilities reported to be operational and another 71 with approved plans within the Commonwealth. About 200 marina-type establishments provide approved sewage dump stations and another 26 currently have approved plans.

Pennsylvania

Pennsylvania maintains information about boats through its annual registration process. All motorized boats operated in Pennsylvania, except those "documented" with the U.S. Coast Guard, are required to register with the Pennsylvania Fish Commission. An estimated 285,000 boats are registered in the state in 1990. Residents of counties within the Chesapeake Bay drainage basin registered 106,565 boats last year. Only 700 of these boats are greater than 26 feet in length. Boats less than this size generally do not have installed toilets. Due to limited opportunities for large boats in the Susquehanna and Potomac River Basins, the majority of boats over 26 feet operate outside the Chesapeake Bay drainage basin on Lake Erie, the Ohio River system and the Delaware River.

The Fish Commission does not collect information for on-board toilets, marine sanitation devices or pump-out facilities for these devices. Title 58 PA Code Section 97.9 (the Fishing and Boating Regulations) requires the use of Marine Sanitation Devices on boats with installed toilets operating in the waters of the Commonwealth. Holding tanks are required on sole-state waters, impoundments and waters not considered to be federally navigable. Flow-through MSDs are permitted on waters that are Federally navigable, including the Susquehanna River. Section 99.5 of the Code prohibits the dumping of portable toilets overboard into the waters of the Commonwealth. There is currently no requirement for marinas to provide pump-out facilities.

District of Columbia

The District of Columbia has historically maintained an avid boating community and once was a busy commercial port for sailing vessels. The discharge of wastes from boats is not a new issue; however, in the 1960's and 1970's when algal blooms and fish kills were common because of land-based sewage discharges in the waters of the Washington metropolitan area, very little attention was paid to marine discharges. The magnitude of the discharge from boats pales in comparison to the 300 million gallons per day (MGD) discharged from Blue Plains Sewage Treatment Plant with another 25 MGD discharged from combined sewer overflows (now reduced to 3 MGD). However, with the solutions to the conventional sewage problems well underway, the District is reviewing the situation of marine discharges and, in particular, the residential use of vessels.

There are 11 marinas in the District with approximately 1,000 boat slips. Commercial traffic consists primarily of shipments of sand and gravel, petroleum products, and newsprint; there are several local tour boats.

Pump-out stations in the District are currently limited to one small barge-mounted station in the Washington Ship Channel and one nonfunctional station at Columbia Island Marina. The National Park Service is constructing a new pump-out station at the Buzzard Point Marina in the Anacostia River. There are no dump stations for portable toilets.

District of Columbia statutes prohibit the discharge of sanitary sewage, wash or process water, oil-laden bilge water, refuse or litter from watercraft. Partially redundant laws pertaining to docked vessels also include prohibitions against all discharges. These laws have very seldom been enforced due to the difficulty of enforcement and the low priority marine discharges have historically received in the District.

It is estimated that there are approximately 250 boats in District of Columbia waters being used full-time for residential purposes. These boats generally have no holding tanks. The National Park Service has begun the process of banning residential use of boats in their concessionaire-operated marinas. The District of Columbia has begun to refuse water quality certification for marina construction unless residential use of boats at the marina is banned or the boats have a connection to a hard sewer line. Additionally, the District has commissioned a study by the Virginia Polytechnic Institute and State University to define the exact magnitude of the residential boat problem and to identify permanent solutions to the problem as appropriate. The study should be available by early 1991.

FINDINGS AND RECOMMENDATIONS

The findings and recommendations of the Group can be loosely classified into two categories. Some of the recommendations can be implemented on an immediate, or short-term, basis; others represent a longer-term and more policy-oriented commitment which should be adopted by the responsible agencies or jurisdictions. There was general agreement that portions of the Chesapeake Bay should be designated as "No Discharge Zones". Because of federal restrictions on obtaining such designation, however, it was recognized that working toward this goal would involve a sequential process. The necessary elements of this sequence are included in the recommendations of the Work Group. The attainment of the Chesapeake Bay Agreement objective "to eliminate pollutant discharges from recreational boats" will require new initiatives as well as the strengthening and expansion of existing state and federal programs.

Several basic assumptions underlie the development of the Work Group's recommendations. These assumptions represent a "point of departure" for the Group's further discussions and deliberations, and can be briefly summarized as follows:

(1) The disposal of recreational boat wastes represents a relatively minor, albeit highly visible and controllable, threat to water quality, living resources productivity and public health on a Bay-wide basis. However, boat discharges do have the potential to exacerbate nutrient enrichment problems in small creeks and marinas where many boats tend to congregate.

(2) A concentrated public awareness and education effort directed toward an understanding and acceptance of the problems is an essential component of any program aimed at reducing the improper disposal of vessel-generated wastes.

(3) The numbers and locations of pump-out facilities currently available in the Chesapeake Bay region's tidal waters are inadequate to address the problem of vessel waste disposal in the watershed. Further issues, such as existing pump-out facilities that are installed but not operational or available, pump-out facilities with incompatible fittings for certain vessel types, unreasonably high costs of some facilities, and under-utilized pump-out facilities must be addressed.

(4) Regulations and programs developed to address the problem of vessel pollution should apply to all vessels, commercial as well as recreational, that are not routinely inspected by the Coast Guard for compliance.

(5) The entire issue of vessel waste discharge management is complicated by a "Catch-22" situation. Marina operators are reluctant to install pump-out facilities without adequate boater demand. This demand will most likely not materialize until enforceable "No Discharge Zones" are established or a concentrated and effective educational program is launched. Boaters, on the other hand, are not likely to utilize pump-out facilities extensively until they are adequately informed or required to do so and until pump-out stations are conveniently available at a reasonable cost. Thus, the issues of boater education and the availability and utilization of pump-out facilities are inextricably linked.

(6) Piping may be installed to bypass a holding tank. This bypass valve can be used when the vessel is beyond the three-mile Territorial Sea. It also, unfortunately, permits a quick and easy means to pump directly overboard in Chesapeake Bay, which is inside the baseline of the Territorial Sea. The MSD requirements do not contain provisions which would allow enforcement personnel to quickly ascertain compliance. Further, personnel available for enforcement by the Coast Guard are inadequate.

(7) Several elements of existing law and regulatory procedures defy enforcement at the level of Coast Guard resources made available for the job.

RECOMMENDATIONS

(1) The signatories to the 1987 Chesapeake Bay Agreement, in cooperation with the boating community, should develop, adopt and begin to implement a concerted and directed educational effort to inform the boating community and the public at large of the potential impacts of vessel waste disposal and other boat-related pollutants on the water quality and living resources of the Chesapeake Bay.

Public awareness and acceptance on a very broad scale are key elements in the effort to combat the disposal of untreated or inadequately treated wastes from vessels in the Chesapeake Bay region. This effort must extend to all elements of the interested and affected public. Several aspects which should be included in such an educational effort were explicitly identified by the Work Group:

(a) Beginning with the 1992 boating season, boater registration notifications and applications should include information concerning the potential environmental impacts of vessel waste discharge and the requirements of state and federal law.

(b) Beginning with the 1992 boating season, Maryland, Pennsylvania, Virginia and the District of Columbia should provide information concerning the availability and cost of pump-out facilities and portable toilet dump stations to the owners of recreational boats that could have an installed toilet or secured portable toilet on board. The lists must be periodically updated and made available to this targeted group on an annual basis thereafter. Future updates of the Chesapeake Bay and River Public Access Guide should be coordinated to include designation of locations of pump-out facilities.

(c) The appropriate agencies of Maryland, Pennsylvania, Virginia and the District of Columbia should work together to develop, adopt, and display by January 1, 1992, a common sign (in both color and design) for use throughout the Chesapeake Bay watershed to inform boaters of the availability of pump-out facilities and portable toilet dumping stations. The sign should include a universally-recognized logo and should be clear, succinct, and visible from the water at a distance of 150 feet or more.

The widely-used and recognized symbol to advertise the availability of parking spaces for handicapped persons is a prime example of the utility of a recognizable symbol. It serves both an educational and a public awareness purpose. Maryland has developed a logo suitable for Bay-wide use. If possible, the design of this sign should be coordinated with the multi-state plan currently being developed by the Chesapeake Bay Access Group to develop a common sign depicting Chesapeake Bay access points.

(d) Maryland, Pennsylvania, Virginia and the District of Columbia should prepare uniform educational materials for distribution by boat dealers to new boat owners. Materials should also be distributed to other Bay boating and educational groups such as the Chesapeake Bay Yacht Clubs Association, the Chesapeake Bay Recreational

Boating Council, United States Power Squadrons and Coast Guard Auxiliaries, racing associations, and the state salt water sport fishing associations for circulation to their memberships.

(2) Additional data collection is needed to improve the existing information base concerning the magnitude and location of pollution discharges from recreational and commercial boats.

If Maryland, Virginia and the District of Columbia are to seek "No Discharge Zone" designation for portions of the Bay and its tributaries, they must be able to document the extent of the pollution loadings. Reliable information in this area should be improved. Boating and water use surveys, USCG boarding figures, and aerial surveys during peak boating times as well as water quality surveys might be appropriate mechanisms to assist in obtaining this information. The states and the District of Columbia should work cooperatively to ensure that this information is collected and utilized in a compatible format.

(3) Prior to June 1, 1992, Maryland, Virginia and the District of Columbia should develop regulatory and/or legislative programs designed to specifically address vessel pollution from live- aboard vessels.

There are a number of live-aboard vessels in the Bay watershed that are neither capable of nor intended for use as recreational vessels. They are basically residences which are not required to be connected to existing wastewater treatment facilities. Without question, these live- aboard vessels must be required to meet the standards of land-based residential communities and not those that apply to the occasionally-used recreational vessel. At present, the waste stream of these residences is not addressed by any of the water quality initiatives designed to reduce the discharges of phosphorus and nitrogen to the Bay by 40% by the year 2000.

A recent addition to the Water Quality Act of 1987 (Section 312(f)(1)(B) allows a state to adopt and enforce regulations more stringent than the Federal standards and regulations for "houseboats" resident in the state's waters, where those houseboats are used primarily as a residence, and not primarily as a means of transportation.

(4) The District of Columbia and the state and local governments of Maryland and Virginia must consider the carrying capacity of existing and proposed land-based treatment facilities while planning for the future construction of additional dockside pump-out facilities. If the capacity does not exist, alternatives must be identified.

If pump-out facilities are to be installed in increasing numbers and at more wide-spread locations, care must be taken to ensure that marine toilet wastes, once collected at dockside, can be properly collected and disposed of. Some municipal wastewater treatment facilities have expressed reluctance to collect wastes from pump-out stations. This reluctance stems from concerns about both the capacity of existing treatment systems, and the chemical additives to the sanitary wastes that are collected at pump-out facilities. Efforts should ensure that the planning process for local sewage treatment plants incorporates consideration of the capacity and necessity to collect boat wastes, and that the chemicals used in marine sanitation devices are compatible with those used in land-based treatment facilities.

(5) Maryland and Virginia should encourage local wastewater treatment facilities to accept and process wastes from marine sanitation devices. A comprehensive educational effort concerning the nature of vessel wastes should be directed at the owners and operators of these treatment facilities as well as waste haulers and others involved in waste management programs. Wastewater treatment facility owners and operators should be invited to become active participants in the process by specifically identifying those substances which they are reluctant to accept and by devising appropriate acceptance criteria. The states should assist local facilities by providing technical assistance on these issues.

Studies have shown that sewage holding tank additives containing zinc, quaternary ammonium, formaldehyde and dimethylaminoethylene dichloride can be toxic to biomass in laboratory-scale systems when applied to sewage at concentrations equal to or less than those recommended by the manufacturers. Zinc, formaldehyde and quaternary ammonium additives have been tested in several such studies. In all cases, zinc was found to be more toxic than either formaldehyde or quaternary ammonium. However, additional studies have demonstrated that chemically-treated holding tank wastes diluted by three to four volumes of domestic sewage at the treatment works will allow the mixture to be incorporated within a treatment process without harm to the treatment process.

Marinas receive large pump-out volumes on weekends and during only part of the year, so that even highly loaded systems should be able to recover from intermittent waste loading before any serious operational problem occurs. However, occasionally during the summer months (when specific water quality standards are more likely to be violated), acceptance of boat wastes by sewage treatment facilities could exacerbate the problems. Operators of these plants must be made aware of the potential problems and ensure that sufficient flow volumes are present to successfully incorporate the boat waste into the plant's overall waste stream.

Even if demand for pump-outs increases, marinas can avoid toxicity problems by mixing other wastes with holding tank discharges. Although researchers have found that, at certain concentrations, formaldehyde products reduced effluent quality of lab-scale treatment systems, their results also indicated that the formaldehyde would be sufficiently diluted and rendered harmless as long as boat holding tank waste was kept at 25 percent of the total volume of the system. Because most marinas have restrooms as required by regulations, the major volume of wastes entering marina small treatment works is restroom waste rather than boat holding tank waste. Also, nontoxic additives, such as biological enzymes, have proved effective in retarding sewage odors, and are now being marketed for use in holding tanks.

(6) Marinas which have pump-out facilities should ensure that such facilities are adequate and operational at reasonable times and at a reasonable cost.

Implicit in the goal of increasing the availability of pump-out facilities in Maryland, Virginia and the District of Columbia waters, is the intent that those facilities be accessible and operational for the user. The practice of establishing high user fees must be discouraged since this limits the practical availability of the facility. Unless supported by state grant programs, marina operators should be able to recoup the costs of installation, operation and maintenance of pump-out stations. Consideration should be given to the amortization of facility costs in boat slip rental/leasing costs. In addition, efforts should be made to employ

innovative methods of operation which minimize the need for marina employee assistance as a way to reduce the marina's cost of operation and the potential wait-time for use of the facility. Cost of pump-out service should be widely disseminated.

Common, uniform signs, as discussed above, would also increase awareness and accessibility. Pump-out facilities should utilize connectors and other collection devices which are compatible with a variety of widely-used marine sanitation devices. Facilities should be located adjacent to sufficiently deep water and at a sufficient distance from permanently or semi-permanently moored vessels to ensure maximal availability and utilization.

(7) Provisions for the safe, sanitary and convenient disposal of wastes from portable toilets should be widely encouraged by Maryland, Pennsylvania, Virginia and the District of Columbia.

Without a doubt, the majority of the vessels operating on Chesapeake Bay do not have an installed toilet on board. For these vessels, the boaters must rely on portable toilets or onshore facilities to properly manage their waste.

The disposal of portable toilet wastes often proves difficult and unappealing, partially because of the lack of accessible and easily-used facilities on shore. New technologies are being developed to make portable toilet dumping easier and more sanitary. The states should explore every option for assisting marinas in providing such facilities.

(8) The Coast Guard should require manufacturers of MSDs to substitute the present chemical disinfectants used in MSDs with newer products that are compatible with systems but are less harmful to the marine environment.

There are increasing numbers of products available which can be substituted for more toxic chemicals and accomplish the same desired results. These chemicals are often not only less harmful to the environment, but safer for human exposure as well.

An approval process should be developed by the Coast Guard to certify that additives used to reduce the generation of gases and odors in holding tanks are not harmful to shoreside treatment systems. Once such a list of alternative, less harmful products is developed, the use of such products should be strongly advocated in the Bay region.

(9) The Coast Guard, in consultation with EPA, should review the MSD requirements and take whatever steps are necessary to make those requirements enforceable. There is currently no requirement for periodic maintenance of MSDs or for testing of effluent. These impediments to effective enforcement should be removed.

Several additional problems with the current enforcement regime have been identified, including the use of bypass valves, visual access for inspection purposes to outlets

which are frequently located below the waterline, boat dealers installing toilets with no MSDs and inadequate numbers of inspection personnel. In addition, there is currently no requirement for periodic maintenance of MSDs or for testing of effluent; these issues should be addressed.

(10) When states assume enforcement responsibility, mechanisms should be developed to ensure that fines collected for boat discharge violations are directed to state boating initiatives.

(11) The Coast Guard should review the requirement that permits vessels under 65 feet in length to install a Type I MSD instead of the more effective Type II MSD.

Substantial technological advances have occurred in many products during the past decade. This Work Group could not, however, locate any information that would indicate that any improvements have been made in marine sanitation devices. It appears that more incentives are needed to encourage the manufacturing industry to incorporate such improvements into its MSD product line.

(12) By July 1, 1991, the signatories to the 1987 Chesapeake Bay Agreement, in cooperation with the Maryland and Virginia marine trades associations, should work directly with the Marine Retailers Association of America (MRAA) and the National Marine Manufacturers Association (NMMA) to ensure that there are no violations of federal MSD installation requirements at the manufacturing and sales levels. The Coast Guard should request the MRAA and the NMMA to annually notify its members of the penalties for violations of Section 312(h)(1), (h)(2), (h)(3), and (h)(4) which require proper installation of MSDs for boats equipped with marine toilets.

(13) By March 1, 1991, the Coast Guard, in cooperation with the Maryland and Virginia marine trades associations, the Marine Retailers Association of America and the National Marine Manufacturers Association, should request the American Society of Testing and Materials (ASTM) to establish standards for fittings and positive closure devices to be installed on recreational boats having marine sanitation devices. The standards should be established by ASTM no later than July 1, 1992 and conveyed to the members of MRAA and NMMA. In cooperation with this effort, Maryland, Pennsylvania, Virginia, the District of Columbia, EPA and the Chesapeake Bay Commission should also petition ASTM to pursue development of such standards. Once these standards are developed, they must become the rule for manufacturing, retailing and enforcement in the Bay region.

Boaters frequently cite incompatible fittings as a reason for not using available pump-out facilities. Development of a common fitting for boats under construction and an adapter device for existing boats would eliminate this argument. Furthermore, the fitting should be an accessible deck plate fitting to ensure easy access from outside of the boat.

At present, it is believed that many boaters operate their vessels with an open Y-valve, allowing raw sewage to be discharged into the Chesapeake Bay. Discharge through an open by-pass valve is only legal beyond the three mile limit of the Territorial Sea. However, the through-hull seacock fitting is often located beneath the water-line allowing for

undetectable discharge. Furthermore, the open/close device that operates the valve is easily accessed from inside the vessel, making enforcement efforts highly unsuccessful. New closure devices that do not defy inspection are necessary.

(14) No later than July 1, 1991, Maryland, Virginia and the District of Columbia should identify, based on a set of reasonable criteria, those areas of the Bay and its tributaries which are particularly sensitive to the discharge of wastes generated by recreational and commercial vessels due to public health, environmental and natural resource concerns. The states and the District, in cooperation with EPA, should develop criteria for the identification of areas which are especially vulnerable to MSD discharge. The criteria should be compatible and applicable for use in Maryland, Virginia and District of Columbia waters. Once identified and quantified, these areas should be the subject of detailed plans for their prompt designation as "No Discharge Zones".

Development of the criteria should include consideration of such factors as the presence of living resources which are particularly sensitive to discharges of nutrients and toxics, the flushing capacity and other hydrodynamic characteristics of the waterway, and the extent to which an area is utilized for swimming and other water contact recreation. The designation of sensitive areas must also include consideration of open water anchorage areas where large numbers of boats tend to congregate during periods of high use.

(15) The U.S. Environmental Protection Agency should immediately identify those factors that the Agency will use to evaluate "adequate and reasonably available" pump-out facilities when considering a petition for "No Discharge Zone" designation for Chesapeake Bay waters. The EPA, upon request by a state, should consult with that state no later than thirty days following the request, to determine the general requirements for the particular water bodies to be eligible for a No Discharge Zone designation.

Because of the variability among of this country's bays, sounds, creeks and estuaries, the criteria used by EPA to determine the adequacy of pump-out facilities has been left noticeably and intentionally vague. In the past, each petition for No Discharge Zone designation has been determined on a case-by-case basis.

In the Bay region, it is critical that the jurisdictions have a uniform and baseline understanding of the number and availability of pump-out stations which would be considered sufficient. Agreement concerning the basic criteria is essential to the planning efforts of the Bay jurisdictions if they are to move forward with this effort.

The states seeking No Discharge Zone designation should develop an overall sequential plan for areas to be considered and submit this plan for EPA review in advance of any formal petition. This consultation will allow the states to assess the expectations of EPA for achieving "adequate and reasonably available" pump-out facilities in advance of any efforts made on the part of the states to meet this objective.

(16) Prior to the establishment of any "No Discharge Zones", Maryland, Virginia, and the District of Columbia should develop a common buoy and sign to demarcate any such areas. The sign should be concise, uniform in both color and design, and visible from a minimum distance of 150 feet. The

symbol chosen should be used in any informational material developed including, but not limited to, cruising guides, charts and other boating education materials.

(17) Marinas, community piers and private yacht clubs should adopt policies which prohibit overboard discharge where boats are moored or docked. The signatories to the 1987 Chesapeake Bay Agreement should, no later than July 1, 1991, encourage these enterprises to adopt such a policy.

In order to alter well-established behavior patterns on the part of the boating public, an educational program must extend beyond the typical range of brochures and bumper stickers. The marina industry should be prepared to assume, by example, a leadership role in this effort. Boaters in the Chesapeake Bay watershed should be constantly aware of, and take pride in, the benefits of enjoying pollutant-free waters.

(18) The Chesapeake Bay Yacht Racing Association (CBYRA) should develop MSD requirements for all sailboats racing under sanctioned events by the different classes, including the establishment of provisions requiring holding tanks, functional Type I MSDs or portable toilets.

The CBYRA presently requires its participating yacht clubs to disqualify any racer observed throwing cans or other trash over-board. A similar provision should be developed to enforce the MSD requirements and eliminate the use of by-pass values.

(19) Maryland, Virginia and the District of Columbia should develop or enhance new and existing incentive programs to encourage the construction, maintenance and utilization of pump-out facilities in the Chesapeake Bay.

The Maryland grant program has been cited as a successful example of a program to encourage and facilitate the construction and maintenance of pump-out stations. Other jurisdictions should consider the institution of such programs. In addition, the States and the District of Columbia should continue to investigate other potential funding sources such as Coastal Zone Management planning grants and development impact fees to assist in financing such construction. Grants and other types of incentive programs should be expanded to include dump stations and washrack combinations for portable toilets, as well as other new technologies designed to address the problem of marine waste disposal. Funding or other incentive mechanisms should apply to the maintenance and upgrade of existing facilities, as well as the construction of new facilities.

(20) The EPA Chesapeake Bay Liaison Office, in cooperation with the states and federal agencies, should coordinate an annual progress review of the implementation of these recommendations. The review should be conveyed annually to the Chesapeake Bay Program Implementation Committee and to the Chesapeake Executive Council.

RECOMMENDATIONS CONCERNING OTHER BOAT-GENERATED POLLUTANTS

As mentioned previously, the Recreational Boat Pollution Work Group made a decision early in its deliberations to concentrate on boat sewage waste, rather than attempt to focus on all contributions to Bay pollution from recreational and commercial vessels. Throughout the Group's extensive discussions, however, it became increasingly clear that while sewage waste from boats is a serious contributor to Bay pollution, other pollutants such as oil and grease, anti-freeze, bottom paint, gasoline and trash also contribute to the degradation of the water quality.

Many larger vessels (i.e., those over 30 feet in length) are either permanently or semi-permanently kept in the waters of the Chesapeake Bay. These vessels are often maintained in the water and are only hauled once or twice a year for extensive service/maintenance such as the application of new bottom paint, cleaning, washing and waxing, change of mechanical and cooling system fluids, etc. When these vessels are serviced, in or out of the water, there is some concern that used oil and anti-freeze, paint chips, cleaning material, and other toxics return to the local tributary.

While some research has been conducted on the release of toxics from bottom paint, there is little research or statistical data available on the impact of gasoline spillage during fueling, oil released with bilge water, use of emulsifiers or bilge cleaning liquids, anti-freeze discharged through exhaust systems during de-winterization, trash and garbage thrown overboard during recreational use, and associated issues.

The Work Group discussed the MARPOL treaty and its impact on a cleaner marine environment. The types of anti-freeze and their application to marine cooling systems were also discussed. Anti-freeze products currently on the market which may be non-toxic and suitable for boat winterization may, once used, pick up heavy metals such as lead, which are then released overboard. Federal and state regulations on gasoline pumping practices at fuel docks were discussed as well. Each of these pollutant categories creates a negative impact on the Bay's water quality. While these pollutants may be considered "minor" when compared to sewage treatment facility spills, industrial waste discharges under the NPDES program, and agricultural and urban runoff, the Work Group, recognizing the potential cumulative impact of such substances over time, offered the following recommendations concerning pollutants other than boat sewage waste discharge:

- *Maryland, Virginia and the District of Columbia should examine the issue of anti-freeze products used in the marine environment and consider appropriate regulations regarding their use and disposal.*

- *An educational effort concerning the disposal of used anti-freeze, oil, cleaners, paint and other toxic substances should be developed as a Bay-wide effort in cooperation with the boating and marina industries. Results of this campaign, including potential recycling efforts, should be widely distributed to the boating public. It should be made clear to the boating public that the discharge of even small or apparently innocuous amounts of oil and grease can result in potentially very large civil and criminal fines and penalties.*

- *Boaters, boat dealers, marina and boatyard operators and owners should ensure the use of nontoxic maintenance and cleaning solutions whenever possible.*

- *Marina and boatyard owners and operators should ensure the use of environmentally responsible approaches to cleaning and maintenance such as "catch basins" during power-spraying operations, the placement of cleaning and painting operations which are at least thirty yards from the shoreline, and other appropriate measures.*

- *All marinas, boatyards, yacht clubs and other installations where boaters congregate should ensure that sufficient trash receptacles and sanitary facilities are available at all times.*

- *State and local governments should develop programs to facilitate the safe and convenient collection of used oil, anti-freeze and other hazardous wastes generated by the boating community.*

This report was printed by the Chesapeake Bay Commission.
Additional copies may be obtained from:

Chesapeake Bay Program
410 Severn Avenue
Annapolis, MD 21403
(301) 267-0061

Printed on recycled paper