



U.S. Environmental Protection Agency

This document is one section from the Response to Public Comments Document regarding the “Draft National Guidance: Best Management Practices for Preparing Vessels Intended to Create Artificial Reefs,” published in August 2004. You can find the Response to Comments document in its entirety at <http://www.epa.gov/owow/oceans/habitat/artificialreefs/index.html>.

**Response to Public Comments Regarding the
“Draft National Guidance: Best Management
Practices for Preparing Vessels Intended to Create
Artificial Reefs”**

**Responses to Comment #
EPA-HQ-OW-2004-0003-0026 (Continued)**

May 2006

**Response to Public Comments regarding the
Draft National Guidance: Best Management Practices for Preparing
Vessels Intended to Create Artificial Reefs
69 Fed. Reg. 46141 (August 2, 2004)**

Docket ID: EPA-HQ-OW-2004-0003. “Draft National Guidance: Best Management Practices for Preparing Vessels Intended to Create Artificial Reefs.” 69 Fed. Reg. 46141 (August 2, 2004).

Public Comment

Docket Document ID: EPA-HQ-OW-2004-0003-0026

Author Date: October 1, 2004

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Basel Action Network

Comment # O-I-11:

1. Reefing or disposal at sea is at or near the bottom of the globally acknowledged waste management hierarchy and is not the environmentally preferable option.

Response to Comment # O-I-11:

Because this document is intended to provide guidance to those who have chosen to pursue the artificial reef management option, it would not be appropriate to reference the waste management hierarchy in the final guidance document. The overall purpose of the BMP guidance document, as set out in Section 3516 of P.L. 108-136, is to provide “guidance recommending environmental best management practices to be used in the **preparation of vessels for use as artificial reefs**” (emphasis added). The comment appears to be directed at the underlying legislation, not the BMP guidance itself. For further discussion regarding the BMP guidance document’s purpose and scope, see *General Response # O-I-0 to Basel Action Network Comments*.

EPA disagrees that the specific practice of reefing of vessels for habitat creation has been globally acknowledged as being at or near the bottom of any waste management hierarchy. In the context of EPA’s solid waste management hierarchy, artificial reefing of obsolete vessels is a form of reuse, and hence superior to recycling. Further, the draft BMP guidance document does address salvage of useful materials on the vessels (draft BMPs, pg 8), and placement of vessels as artificial reefs as a means to re-use and recycle the vessel for habitat creation.

Comment # O-I-12:

2. PCBs, both in liquid or solid matrices, are very significant and unnecessary threat to the marine environment, fish stocks and human health. It is known that the highest levels of PCBs have been found in the tissues of African-Americans, which raise serious environmental justice concerns.

Response to Comment # O-I-12:

With regard to PCBs, see *Response to Comment #s O-I-26 through O-I-53*. With regard to environmental justice issues, see *Response to Comment # O-I-42*.

Comment # O-I-13:

3. Legal issues posed by the Basel Convention, Stockholm Convention and London Convention and its 1996 Protocol are at odds with these Guidelines but appear to have been ignored by the government.

Response to Comment # O-I-13:

With regard to the applicability and content of the referenced treaties, see *Response to Comment #s O-I-54 through O-I-70* below. For further discussion regarding the BMP guidance document's purpose and scope, see *General Response # O-I-0 to Basel Action Network Comments*.

BAN's specific comments on these three critical issue areas follow:

II. Waste Management Hierarchy – “Reefing” as Dumping

Comment # O-I-14:

The Reefing Guidance must make it explicit that the disposal of end-of-life vessels as artificial reefs is at or near the least preferred waste management option in the globally recognized waste management hierarchy.

Under the United Nations Environment Program, government-designated experts have outlined the elements of an international strategy and an action program for dealing with wastes, including technical guidelines for environmentally sound management of hazardous wastes:

1. Prevent the generation of wastes;

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2. Reduce to a minimum the wastes generated by economic activities;
3. Recover, reuse and recycle the greatest possible quantity of those wastes which are still generated; and
4. Dispose of, in an environmentally sound manner, any remaining waste.¹

This globally accepted waste management hierarchy was again enunciated in the Basel

Convention on the Transboundary Movement of Hazardous Wastes and their Disposal (Basel Convention) Guidance Document on Transboundary Movements of Hazardous Wastes Destined or Recovery Operations. In this document, it is manifestly stated that:

“Special consideration should therefore be given by governments to taking appropriate steps to ensure that the generation of hazardous wastes within their territories is reduced to a minimum. An important component of this would be promoting the development and use of cleaner production methods applicable to activities generating hazardous wastes and the *recovery of hazardous wastes unavoidably generated by such activities.*”

The United States Environmental Protection Agency (EPA) also observes the waste management hierarchy.²

Response to Comment # O-I-14:

See *Response to Comment # O-I-11* above. To the extent this comment is focused on potentially hazardous constituents in vessels, the BMP guidance document provides recommended clean-up goals that specifically address removal of such constituents. The constituents identified in the BMP guidance include, but are not limited to: fuels and oil, asbestos, polychlorinated biphenyls (PCBs), paints, debris (e.g., vessel debris, floatables, introduced material), and other materials of environmental concern (e.g., mercury, refrigerants).

Comment # O-I-15:

While some might claim that using a ship as an artificial reef is a form of “re-use”, this cannot really be said to be true as the ship in question never served the purpose of a reef in its past. Claiming such is tantamount to saying that if the very same obsolete vessels were dumped onto US national deserts or wetlands, bird roosting and nesting places are in turn created and that is a form of “re-use”. This comparison is made to illustrate that since the proposal to dump these wastes is in the relatively out-of-sight, out-of-mind *marine* environment, this form of waste application can be called by some “beneficial to nature” and seen as acceptable. However, were the same waste proposed to be dumped in a land wilderness area, the public would be outraged particularly when they were known to contain hazardous wastes and such dumping would likely be illegal.

Response to Comment # O-I-15:

As posed by the commenter, if use of obsolete vessels for artificial reef creation were viewed as disposal, under the waste management hierarchy, this would discourage use of obsolete vessels in favor of virgin materials or purpose-built structures. This in turn would have environmental consequences (e.g., energy use, natural resource extraction) not associated with environmentally-sound re-use of obsolete vessels. The placement of appropriately prepared/cleaned vessels with the intent to create an artificial reef is the “re-use” or “recycling” of the vessel itself. Further, placement of appropriately prepared/cleaned vessels for the creation of artificial reefs is not ocean dumping within the meaning of either relevant international treaties or U.S. domestic law (see *Response to Comment #s O-I-1, O-I-63, O-I-64, and O-I-67* below). Placement of vessels as artificial

reefs is subject to regulation under domestic law (see *Response to Comment # O-I-67*), including careful consideration of the environmental impacts resulting from such placement. Thus, the suggestion that the analogy is between an “out of sight out of mind” regime for marine waters, as opposed to careful regulation on land, is inaccurate.

Comment # O-I-16:

In other words, we are creating a double standard whereby the marine environment is somehow “improved” by dumping whereas the tertiary environment would be marred and contaminated. The fact that such dumping in the marine environment is even being considered has everything to do with economic exploitation of this double standard (less concern over marine wilderness than tertiary wilderness) rather than any proper focus on attaining the basic national environmental goals stressed in the National Environmental Policy Act.³

These goals include:

- Assure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings.

¹ Report of Ad hoc meeting of Government designated experts (Nairobi, 9-11 December 1991) UNEP/CHW/WG.2/1/3.

² See at <http://www.epa.gov/epaoswer/non-hw/muncpl/facts.htm>.

³ The National Environmental Policy Act of 1969, 42 USC § 4331 et. seq. [hereinafter NEPA].

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- Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.⁴

Response to Comment # O-I-16:

See *Response to Comment #s O-I-5* and *O-I-15*, respectively. The determination as to the issuance of permits for placement of artificial reefs under the authorities identified in *Response to Comment # O-I-67* is subject to environmental documentation under the National Environmental Protection Act. See, 33 CFR 230.2.

Comment # O-I-17:

The proper term is not “reuse” but one might consider the term “alternative use” – e.g. to create entertainment for scuba divers, fish aggregation, or erosion control. But such “alternative use” does not fit well within the waste management hierarchy. Alternative uses for wastes, even toxic wastes can readily be devised for any waste but that hardly means that they are environmentally sound or desirable.

Response to Comment # O-I-17:

For discussion on the potential for artificial reefs to enhance the marine environment and on the concept of reefing as “re-use” of a vessel, see *Response to Comment # O-I-15*. In addition, the alternative use that is really at issue is the placement of artificial reefs for habitat creation in accordance with all applicable federal, State, and local laws, not, as the comment seems to suggest, the random or haphazard devising of alternative uses for waste.

Comment # O-I-18

We can equally entertain the notion that toxic waste can be used to fill road beds, construction materials, create dams, fill up holes, etc., but these uses are a far cry from what is meant by “recovery, reuse, recycle”. Clearly, ocean deposit of ships for so-called artificial reefs is more accurately described in the 4th step of the waste management hierarchy as a form of disposal. Indeed the EPA admits this by proposing to apply *disposal* criteria found in 40 CFR 761.62(c) for the PCB content in the vessels.

Response to Comment # O-I-18:

With regard to the discussion of vessel-to-reef projects as the “re-use” of a vessel, see *Response to Comment # O-I-17*. For further discussion pertaining to placement of vessels as artificial reefs and ocean disposal, see *Response to Comment #s O-I-1, O-I-63, O-I-64, and O-I-67*. For discussion pertaining to the waste management hierarchy, see *Response to Comment #s O-I-8, O-I-11, and O-I-15*.

We also note that for purposes of domestic law under the Toxic Substances Control Act (TSCA), the reefing of a ship with regulated PCBs remaining onboard is considered to be disposal of those PCBs under 40 CFR 761. For further discussion regarding PCBs and TSCA, see *Response to Comment #s O-I-26 through O-I-53*. Although the vessel itself is being “reused” or “recycled” as an artificial reef, the materials with regulated PCBs have reached the end of their useful life and as such, are being disposed.

Comment # O-I-19:

Indeed *disposal* is precisely the category in which it is referred to in the Basel Conventions in its Annex IV of Disposal operations. There the lists are separated into two categories – the D list for final disposal and the R list (“resource recovery, recycling, reclamation, direct re-use or alternative uses”). The Basel listing is D7 (Release into seas/oceans including sea-bed insertion) – a form of final disposal.

Response to Comment # O-I-19:

The comment appears to be merely an assertion of the commenter’s own opinion rather than a comment on the draft BMP guidance. For this reason, no response is necessary. Additional responses related to comments regarding the Basel Convention are provided in *Response to Comments # O-I-55 and O-I-56*.

Comment # O-I-20:

Regardless of whether specific interest groups such as sport fishers or divers advocate “artificial reefs” to make their hobbies more interesting, this form of waste management can never be seen as environmentally preferable to Step 3 of the hierarchy of waste management – resource recovery.

Thus, using end-of-life vessels, as artificial reefs should only be considered when it is impossible to recover the scrap resources from a vessel e.g. the steel.

The benefits of advocating and promoting recycling of scrap steel from end-of-life vessels are obvious. Minimization of water and air pollution, and mining wastes if scrap steel from vessels is recycled instead of mining virgin ore. Annually, steel recycling “saves the energy equivalent to electrically power about one-fifth of the households in the United States (or about 18 million homes) for one year.”⁶

Response to Comment # O-I-20:

Several options exist for managing obsolete and decommissioned military and commercial vessels. These options include re-use of the vessel or parts of the vessel, recycling or scrapping, creating artificial reefs, and disposal on land or at sea. The BMP guidance document discusses vessel clean-up and preparation for one of those management options, specifically artificial reefing. For further discussion regarding recycling/scrapping, see *Response to Comment # O-I-15*.

Comment # O-I-21:

For the proper implementation of Reefing Guidance, users must be apprised of the true status of disposal at sea in the waste management hierarchy. Waste management professionals and policy makers must be clear that under the widely accepted waste management hierarchy, disposal is the least preferred among the various waste management options, and not as inaccurately characterized in the Reefing Guidance as just another option.

⁴42 USC § 4331, b.

⁵The Basel Convention on the Transboundary Movement of Hazardous Wastes and their Disposal *see* at <http://www.basel.int>.

⁶*See* at <http://www.recycle-steel.org/fact/main.html>.

This reference to the waste management hierarchy must be placed into the Reefing Guidance in order to have a consistent nationwide application as mandated under Section 3516 of the NDRA.

Response to Comment # O-I-21:

See Response to Comment # O-I-11.

Comment # O-I-22:

This is vital in the context of what is needed to manage the greater numbers of obsolete vessels expected to arise. We can expect very large amounts of ships that will need to be disposed of in the future, and not just those with US flags. It is a global industry in need of global solutions, for which the United States should play a major role.

Response to Comment # O-I-22:

This comment addresses future needs for disposal of a growing number of obsolete ships over the years and thus is beyond the scope of the guidance document, which addresses clean-up goals for vessels that will be used to create artificial reefs (see also *General Response # O-I-0 to Basel Action Network Comments* above). The U.S. is an active participant, however, in International Maritime Organization (IMO) activities addressing ship recycling issues, including participation on a joint IMO/ILO/Basel Convention workgroup that was held in February 2005 (see Report of 53d Session of Marine Environment Protection Committee, MEPC 53/24 at pp 17-28).

Comment # O-I-23:

The principle of environmental justice does not allow us to export toxic waste ships to low-wage countries such as India, China, or Bangladesh. The Basel Convention, for which the US is now readying implementation legislation, obligates every country to become self-sufficient in environmentally sound waste management.⁷ We should not be allowed to shift our global hiding places for waste from developing countries to the global commons (our seas).

Response to Comment # O-I-23:

The guidance document addresses clean-up goals for vessels that will be used to create artificial reefs and comments related to ship exports are thus beyond the scope of the guidance document (see also *General Response # O-I-0 to Basel Action Network Comments* above).

With regard to the status of the Basel Convention in the U.S., see *Response to Comment # O-I-58* below. With regard to use of the high seas as a “global hiding-place” for waste, see *Response to Comment #s O-I-1 and O-I-15*.

Comment # O-I-24:

The development of a national infrastructure and capacity of the appropriate scale to deal with all such ships via recycling and resource recovery in an environmentally sound manner are what proper self-sufficiency and the waste management hierarchy entail, particularly for the wealthiest country on earth.

Response to Comment # O-I-24:

This comment is beyond the scope of the document (see *General Response # O-I-0 to Basel Action Network Comments* above). With regard to waste management hierarchy issues, see also *Response to Comment # O-I-15*.

Comment # O-I-25:

By diverting even a few ships to ocean disposal, at this critical period of industrial development of the American ship recycling industry, we limit the profitability and sustainability of such recyclers, forestalling (perhaps permanently) their development. As such, any preference for ocean dumping, particularly at this point in history, is seen as even more misguided.

Response to Comment # O-I-25:

See *Response to Comment #s O-I-8 and O-I-9*.

III. Removal of All PCBs Is Essential

Double Standards

Comment # O-I-26:

The Reefing Guidance, inappropriately and inexplicably excuses from removal PCB impregnated solid materials that are less than or equal to a concentration of 50ppm. Perhaps even more stunning is the fact that even levels higher than 50ppm of PCBs in a solid matrix do not have to be removed if a disposal permit is granted under 40 CFR 761.62(c). The precise language in the proposed rulemaking is as follows:

“Remove all solid materials containing PCBs > or = 50ppm, which includes but is not limited to felt gasket and faying material, cables, paints, rubber gaskets as well as battle lanterns and fluorescent light ballasts. EPA recognizes that non-liquid PCBs may be difficult to locate and remove and that removal may jeopardize the integrity of the ship. If non-liquid PCBs > or = to 50ppm are to remain on the vessel, then 40 CFR Part 761 requires you to obtain a PCB disposal permit under 40 CFR 761.62(c).”⁸

⁷ Article 4.2, b, Basel Convention.

⁸ Draft National Guidance: Best Management Practices for Preparing Vessels Intended to Create Artificial Reefs, p.27.

PCB levels in the environment, which in the past were seen to be declining have been steadily increasing in the last 10 years. This is very alarming and should command more precaution on the part of the EPA than is witnessed in the Reefing Guidance.

Response to Comment # O-I-26:

EPA wishes to clarify that this is a guidance document and not a formal rulemaking. As such, this guidance does not substitute for any statute or regulation, nor is it a regulation itself.

Under 40 CFR 761, manufactured products containing less than 50 ppm of solid PCBs are not regulated for disposal; therefore, EPA cannot require their removal and disposal. Manufactured products containing ≥ 50 ppm of solid PCBs that are to be disposed are considered PCB bulk product waste. Disposal of PCB bulk product waste other than as specified at 40 CFR 761.62(a) or (b) is allowed only if EPA finds that the disposal will not result in an unreasonable risk to human health or the environment (40 CFR 761.62(c)). As the disposal of PCB bulk product waste via the sinking of a vessel is not a method listed at 40 CFR 761.62(a) or (b), EPA would need to determine that this method does not pose an unreasonable risk before granting an approval.

Comment # O-I-27:

First, it is essential to bear in mind that the cutoff point of 50ppm was developed years ago, not with the marine environment in mind, but with respect to the levels for which PCB wastes that would be allowed to possibly avoid being placed in a controlled landfill.

Response to Comment # O-I-27:

Given that the PCBs in PCB bulk product waste are tightly bound within the product matrix, EPA believes that 50 ppm is an appropriate lower limit for PCB bulk product waste (see 63 FR 35411). The PCBs are expected to leach out of the matrix more slowly than PCBs from other materials. The relative leachability should hold in an aqueous environment as well as a terrestrial environment.

Comment # O-I-28:

It is shocking to consider what the legal options would be under US statutes if the same PCB contaminated materials that are known to exist on obsolete vessels were to be deposited on land. The Toxics Substance Control Act provides that for solid PCBs above 50ppm, there are generally four options:

- Placement in a solid waste landfill possessing required leach control systems;
- Hazardous waste incinerator;
- TSCA or RCRA hazardous waste landfill; and
- Utilize the risk-based permit approach under 40 CFR 761.62(c).⁹

As we can see, the first three options require human intervention to control leachate or emissions that will not exist in the marine environment. They also require monitoring, post-closure monitoring, and post-closure corrective action. Regarding the 4th option, which is being proposed for ships in the Reefing Guidance it is vital to note that this option has never ever before been used to justify marine disposal of PCBs. A very dangerous new precedent is thus being proposed here.

Response to Comment # O-I-28:

The disposal requirements for PCB waste are described at 40 CFR Part 761. These regulations provide the option of managing PCB wastes in a manner other than that specifically prescribed in the regulations, if EPA determines that this alternate method will not result in an unreasonable risk to human health or the environment. To date, EPA has issued one risk-based disposal approval to dispose of PCB bulk product waste on a vessel to be sunk as an artificial reef. The application and its supporting documents have undergone rigorous internal and external reviews by EPA and by EPA's Science Advisory Board. EPA determined that the disposal of the PCB bulk product waste on that ship would not pose an unreasonable risk to human health and the environment.

EPA intends to make both pre- and post-sinking monitoring a condition of any risk-based disposal approval issued for a vessel-to-reef project.

Comment # O-I-29:

Further, the risk-based approach in this instance is inappropriate for the following reasons:

1. The risks, however negligible one might consider them, are completely unnecessary. As mentioned before, there are other far more appropriate ways to dispose of PCB waste than by dumping it at sea.
2. PCBs can have estrogenic effects and impact biota, mimicking or interfering with hormonal action at extremely low levels (e.g. in the parts per trillion range) thus, it can be said that in fact there are no known "safe levels" for PCBs.

Response to Comment # O-I-29:

Although the draft BMP guidance document mentions various options for managing obsolete and decommissioned military and commercial vessels (e.g., reuse of the vessel or parts of the vessel, recycling or scrapping, creating artificial reefs, and disposal on land or at sea), the purpose of the BMP guidance document is to present information on the preparation of vessels when employing the vessel management option of artificial reefing. It is beyond the scope of the BMP guidance document to provide a decision process to determine the management option for obsolete and decommissioned military and commercial vessels.

EPA is aware of the health impacts and risks from PCB exposure. However, an in-depth discussion of the health and ecological effects of PCBs is outside the scope of the BMP guidance document. EPA will make a ship-by-ship, site-specific determination under 40 CFR 761.61(c) or 40 CFR 761.62(c) on whether alternate disposal of PCB bulk product

waste or PCB remediation waste via reefing of the ship containing these PCB wastes presents an unreasonable risk to human health and the environment. This will be the basis of EPA's determination for each ship as to whether the alternate disposal method via ship reefing should be approved. EPA will not make a generic determination as part of the BMP guidance document.

Comment # O-I-30:

The EPA's recognition that "non-liquid PCBs may be difficult to locate and remove and the removal may jeopardize the integrity of the ship," is without basis. The integrity of a ship can hardly be seen as a vital consideration when the ships are going to be dumped into the sea. Towing such ships with flotation devices no matter what the integrity is clearly feasible. The higher goal of preventing the dangerous PCBs in the vessels from migrating into the marine environment should trump these other issues.

Response to Comment # O-I-30:

EPA does believe that the watertight integrity of the vessel must be taken into consideration during vessel preparation to prevent accidental or premature sinking that could result in injury or death to employees involved with towing and sinking activities. However, it is outside of EPA's expertise and the scope of the BMP guidance document to discuss different towing practices and options. Vessel owners or vessel-to-reef project sponsors have the responsibility of developing a towing and sinking plan prior to applying for a vessel and executing the scuttling of a vessel.

⁹40 CFR 761.62.

PCBs are PCBs – No Distinctions

Comment # O-I-31:

In allowing for permits to dump PCBs in the marine environment above or below 50ppm (a landbased derived figure), the EPA has also leaned heavily on a distinction between so-called "solid" and "liquid" PCBs that is not supportable. PCBs are not commonly classified as "solid" or "liquid" in scientific literature because PCBs only exist at normal temperatures as viscous, oily liquids. The so-called "solid" or "non-liquid" PCB's present in vessels are more accurately liquid PCB's impregnated into porous materials like gaskets, filters, and cables, or mixed with paints.

Response to Comment # O-I-31:

EPA agrees that solid materials containing PCBs can be better represented by other terminology. EPA will revise the draft BMP guidance document to use the regulatory

terms “PCB bulk product waste” and “PCB remediation waste” rather than “solid PCBs.” EPA believes that it is appropriate to continue to use the term “liquid PCBs,” which is a regulatory term defined at 40 CFR 761.3.

Comment # O-I-32:

PCB’s are toxic in any form, regardless of whether the PCB’s are in free liquid form, impregnated into porous materials or in thick resins and they have a great propensity to leach out of whatever matrix in which they are placed. We have attached herein the declaration of Dr. Peter deFur, a nationally recognized expert on ecological risk assessment pertaining to endocrine disrupting chemicals and the generation, release, and discharge of toxic chemicals, that he made regarding risks posed by PCBs on the Chesapeake Bay System that discusses this matter in greater detail.

Response to Comment # O-I-32:

The referenced declaration of Dr. Peter deFur was received. This document has been identified as Public Comment Docket Document ID # EPA-HQ-OW-2004-0003-0027.

Comment # O-I-33:

If anything, the matrix in which PCBs are placed (solid or liquid) only modulates the rate at which PCBs might be released into the environment. As we are not talking about temporary deposit into the marine environment of the vessels, the question of time becomes moot – sooner or later the PCBs will be released into the marine environment. We can see no evidence herein that the EPA expects the PCBs to degrade in the marine environment into harmless substances. Thus, the only bearing that a slower rate of release can have is upon diffusion and dilution.

Response to Comment # O-I-33:

EPA agrees that the PCBs in the PCB bulk product waste will leach out eventually. EPA believes that the rate from PCB bulk product waste will be relatively slow. While there will be some degradation of PCBs, it will be very slow. However, EPA believes that the level of exposure to PCBs leached from these materials in the aquatic environment will be relatively low per unit of time and will be dispersed by the current. The extent to whether an unreasonable risk will or will not result is dependent upon the specifics of any disposal, e.g., quantity of PCBs, type of material containing the PCBs, fauna and flora in the vicinity of the disposal site, and fishing and consumption patterns.

Comment # O-I-34:

With respect to persistent organic pollutants, however, we have learned in countless studies in the last two decades that nature has a way of taking diluted substances and re-concentrating them (e.g. via bio-magnification) into the food chain. Certainly the Stockholm Convention discussed at length later, does not consider dilution as a solution to pollution. Indeed the impetus in large part to special controls and international action to address persistent organic pollutants through

prohibitions rather than controls was the very fact that assimilative capacity assumptions used in the past for other pollutants, do not apply to persistent organic pollutants.

Response to Comment # O-I-34:

The comment appears to be merely an assertion of the commenter's own opinion rather than a comment on the draft BMP guidance. For this reason, no response is necessary.

Comment # O-I-35:

Once PCBs are in the marine environment they are very persistent and bioaccumulative. PCBs bio-concentrate and bio-magnify in the marine environment so that larger and more fatty fish consumed by humans can result in higher doses of PCBs than might be expected from small diffuse releases.

Response to Comment # O-I-35:

EPA agrees that PCBs are persistent and bioaccumulate in aquatic organisms and that humans can be exposed by consumption of aquatic organisms. However, an in-depth discussion of the health and ecological effects of PCBs is outside the scope of the BMP guidance document. In determining whether disposal of PCB bulk product waste or PCB remediation waste left on a ship that is to be reefed can be approved as the disposal method for these PCB wastes, EPA must consider whether this disposal represents an unreasonable risk to human health and the environment. The ability of PCBs to persist and bioaccumulate, as well as the potential for exposure to PCBs resulting from this method of disposal, are factors in this determination, but are not the only factors considered. EPA considers the estimated quantitative exposure and the risks resulting from the exposure.

Comment # O-I-36:

Contrary to what is stated in the Reefing Guidance, Appendix C, there is no known safe level for PCBs as they have the potential to impact flora or fauna at very low levels (e.g. endocrine disruption). Thus, human health, not to mention the health of wildlife, is very much at risk with respect to persistent organic pollutants, such as PCBs, once deposited in the marine environment, particularly from the pathway of contaminated fish stocks.

Response to Comment # O-I-36:

EPA is aware of the health impacts and risks from PCB exposure. An in-depth discussion of the health and ecological effects of PCBs is outside the scope of the BMP guidance document. In making a determination of whether to approve an alternate disposal method for PCB bulk product waste or PCB remediation waste, EPA must determine if this alternate disposal method would result in an unreasonable risk. In making that determination, EPA considers, among other things, the persistence, bioaccumulation, toxicity and exposures, and the magnitude of the potential risk. Once the level of risk is characterized, EPA makes a policy judgment as to whether it is outweighed by the benefits of the disposal action. The mere existence of some risk is not dispositive under TSCA.

Impact on Sensitive Populations and Environmental Justice

Comment # O-I-37:

The Reefing Guidance properly notes that after sinking, humans are exposed principally through the food chain by eating animals, notably fish that have accumulated PCBs from the sediments. However, the Reefing Guidance must highlight and caution that the concentrations of PCBs are increased through food chain accumulation, and bio-magnification poses a serious threat to human populations consuming PCB contaminated fish or marine life.

Response to Comment # O-I-37:

The draft BMP guidance document does highlight and caution the potential human and environmental impacts of PCBs in the marine environment. The draft BMP guidance document states that PCBs are persistent and bioaccumulative and that PCBs bioaccumulate in fatty or lipid rich tissues. The draft BMP guidance document further states that PCBs have a limited solubility in aqueous solutions and it is suspected that PCBs can leach into a marine or aqueous environment (sediment and water column) where they can be taken up by organisms in the food web. In addition, PCBs bioaccumulate in fish and other animals; PCBs also bind to sediments. Per the draft BMP guidance document, “people who ingest fish may be exposed to PCBs that have been released into the environment.” In response to Comment # O-I-37, the final BMP guidance document provides additional information in the PCB chapter under the section “What are the potential environmental impacts of PCBs” that reads as follows:

“PCBs have been demonstrated to cause a variety of adverse health effects. PCBs have been shown to cause cancer in animals and have also been shown to cause a number of serious non-cancer health effects in animals, including effects on the immune system, reproductive system, nervous system, endocrine system and other health effects. Studies in humans provide supportive evidence for potential carcinogenic and non-carcinogenic effects of PCBs. The different health effects of PCBs may be interrelated, as alterations in one system may have significant implications for the other systems of the body. EPA’s peer reviewed cancer reassessment concluded that PCBs are probable human carcinogens. In addition, PCBs are persistent and bioaccumulative. PCBs bioaccumulate in fatty or lipid-rich tissues. PCBs have a limited solubility in aqueous solutions and PCBs can leach into a marine or aqueous environment (sediment and water column) where they can be taken up by organisms in the food web. PCBs bioaccumulate in fish and other animals; PCBs also bind to sediments. As a result, people who ingest fish may be exposed to PCBs that have been released into the environment and bioaccumulated in the fish they are ingesting.

There is a risk of human exposure during vessel preparation and after sinking the vessel. During vessel preparation, typical routes of human exposure include inhalation, accidental ingestion, or dermal contact. After sinking, exposure routes may be limited to accidental ingestion of or contact with contaminated water and sediments, or ingestion of contaminated fish, shellfish, or crustaceans.”

The BMP guidance is not an appropriate place to present an in depth discussion of PCB exposure and possible health effects. However, EPA maintains a PCB webpage where a more in-depth discussion may be found. That webpage can be accessed at www.epa.gov/pcb.

Comment # O-I-38:

Fish, birds, and marine mammals are especially sensitive to the effects of PCB’s. Even concentrations of less than a part per billion in eggs can impair the growth of these animals, or alter the normal growth of the young.¹⁰

Response to Comment # O-I-38:

With regard to the health effects from PCB exposure, see *Response to Comment # O-I-36*.

Comment # O-I-39:

The effects of PCB’s on human health and the environment are on reproduction, development of the fetus or embryo, growth and development of the brain, the function of immune systems, endocrine disruption, not to mention PCB’s are carcinogenic.

Response to Comment # O-I-39:

EPA considers PCBs probable human carcinogens. PCBs are classified by the International Agency for Research on Cancer (IARC) as Group 2A probable human carcinogens. This category is used when there is limited evidence of carcinogenicity in humans and sufficient evidence of carcinogenicity in experimental animals.

An in-depth discussion of the health and ecological effects of PCBs is outside the scope of the BMP guidance document. In making a determination of whether to approve an alternate disposal method for PCB bulk product waste or PCB remediation waste, EPA must determine if this alternate disposal method would result in an unreasonable risk. In making that determination, EPA considers, among other things, the persistence, bioaccumulation, toxicity and exposures, and the magnitude of the potential risk. Once the level of risk is characterized, EPA makes a policy judgment as to whether it is outweighed by the benefits of the disposal action. The mere existence of some risk is not dispositive under TSCA.

Comment # O-I-40:

In terms of sensitive populations, children are particularly sensitive to the effects of PCB's¹¹. Recent studies reveal that early exposure to even low levels of PCB's can cause impairment of the brain and of behavior.¹²

Response to Comment # O-I-40:

With regard to the health effects from PCB exposure, see *Response to Comment # O-I-36*.

Comment # O-I-41:

Furthermore, the Center for Disease Control's Second National Report on Human Exposure to Environmental Chemicals found that the highest levels of PCBs were African-Americans. The National Environmental Justice Council documented numerous studies finding high PCB levels among Native American (including Alaskan Native) subsistence anglers in their report "Fish Consumption and Environmental Justice."¹³

Response to Comment # O-I-41:

With regard to the health effects from PCB exposure, see *Response to Comment # O-I-36*.

Comment # O-I-42:

Executive Order No. 12898 on Environmental Justice required this research on human health as a result of environmental impacts on poor and minority communities, and called for guidelines for subsistence consumption of fish and wildlife. The Executive Order also called for public participation and access to such information. Yet in this proposed guidance, there is no evidence EPA considered environmental justice implications of the rule despite the fact that PCBs pose a particular threat to environmental justice communities.

Response to Comment # O-I-42:

This is a guidance document and not a formal rulemaking. As such, this guidance does not substitute for any statute or regulation, nor is it a regulation itself.

EPA does not anticipate environmental justice issues involving PCBs, as the ships will be sunk in areas sufficiently offshore to make daily or subsistence fishing improbable. Only members of the general public with the ability to reach the reefs safely and consistently are expected to visit or "use" the reef (fishing/diving) with any consistency. Also, EPA does not anticipate these reefs to be commercially fished, as commercial fishermen will not risk the loss of their equipment.

¹⁰ Rice, C.P., P. W. O'Keefe and T.J. Kubiak. 20023. Sources, Pathways and Effects of PCB's Dioxins and

Dibenzofurans. Pp 501- 573 In: Hoffman, D.J., B.A. Rattner, G.A. Burton and J. Cairns, Jr. Handbook of Ecotoxicology, 2nd Ed. Lewis Pub. Boca Raton FL.

¹¹ S. Schantz et al., (2003). Effects of PCB exposure on Neurophysiological function in children. Environmental Health Perspectives vol 111: 357-376.

¹² *Id.*

¹³ See at

http://64.233.167.104/search?q=cache:JwhPvGfIJrwJ:www.epa.gov/compliance/resources/publications/ej/fish_consump_report_1102.pdf+Fish+Consumption+and+Environmental+Justice&hl=en

9

Risky Assessments

Comment # O-I-43:

Data from the Navy¹⁴ have revealed that fish and invertebrate tissue levels of PCBs, lead, and cadmium were higher in samples from Navy ship reefs than from reference natural reefs.

Response to Comment # O-I-43:

The studies mentioned in the comment would seem to be the studies conducted on the ex-Vermillion. Because the comment appears to be merely an assertion of fact rather than a comment on the draft BMP guidance, no response is necessary.

Comment # O-I-44:

This shows clearly that the PCBs will leach from ships and enter the food chain. For example, average levels of tissue samples of the fish White Grunt were found to be 16.7 ppb in the tissue in natural reefs as compared to average levels of 1118.9 ppb in White Grunt found around the naval vessel.¹⁵ White Grunt is a species known to stay within a small habitat area during its life span.

Response to Comment # O-I-44:

EPA agrees that the PCBs in the PCB bulk product waste will leach out eventually. EPA believes that the rate from PCB bulk product waste will be relatively slow. While there will be some degradation of PCBs, it will be very slow. However, EPA believes that the level of exposure to PCBs leached from these materials in the aquatic environment will be relatively low per unit of time and will be dispersed by the current. The extent to whether an unreasonable risk will or will not result is dependent upon the specifics of any disposal, e.g., quantity of PCBs, type of material containing the PCBs, fauna and flora in the vicinity of the disposal site, and fishing and consumption patterns.

Comment # O-I-45:

To put this in perspective, it should be noted that many states and local governments regularly issue fish advisories in this range. For example, California's level for triggering a fish consumption warning advisory is 100 ppb.

Response to Comment # O-I-45:

With regard to the health effects from PCB exposure, see *Response to Comment # O-I-36*.

Comment # O-I-46:

Despite these findings, the Navy report makes a claim that the levels are of low risk. However, as we have discussed such risk assessment approaches attempting to establish safe levels are inappropriate.

Response to Comment # O-I-46:

At this time EPA cannot make a generic determination as to whether disposal of PCB bulk product waste or PCB remediation waste via reefing of the ship containing these PCB wastes presents an unreasonable risk to human health and the environment. EPA does believe that it can make a determination based on a case-by-case analysis that takes into account site-specific parameters as well as the persistence, bioaccumulative potential and toxicity of PCBs. Thus the Agency will not apply the Navy report to make a broad determination in this BMP guidance document as to the risk from reefing materials containing PCBs.

Comment # O-I-47:

Even if they were deemed appropriate there is simply no data to support a proper risk assessment. The Navy study cited above is not useful as there is really no knowledge of what kinds of PCBs and how many PCBs were in the ship studied (USS Vermillion). As such it is useless other than to tell us that PCBs do indeed leach from such ships into the marine environment and are taken up by fish.

Response to Comment # O-I-47:

See *Response to Comment # O-I-46*.

Comment # O-I-48:

Any risk assessment therefore would have to rely on prospective assessment, using predictive fate transport modeling and as such would have a high degree of uncertainty. What would really be necessary to provide the proper data would be to conduct reefing and monitor the sites for several decades. When in fact, such resources to do this will not likely be supplied by the Federal government (current owners of most of the available ships). Such responsibility would be likely passed to the states impacted. Again there is little guarantee that state resources would exist for reliable data gathering.

Response to Comment # O-I-48:

The process of obtaining, preparing/cleaning, sinking and maintaining the vessel as an artificial reef, all while protecting human health and the environment, is likely to be a

lengthy process that will also be resource intensive. Each State, Commonwealth, or possession of the United States, or any other municipal corporation or political subdivision thereof should carefully consider its long-term financial and legal resource commitments when planning for the transfer of any vessel a vessel-to-reef project.

Comment # O-I-49:

Even if such data gathering were to be accomplished, however, by the time we found an “unreasonable risk” it would be too late to redress it. The damage would have been done.

Response to Comment # O-I-49:

EPA believes that it can determine whether an alternate method of disposal results in an unreasonable risk to human health or the environment. To date, EPA has received and granted one application for a risk-based disposal approval to dispose of PCB bulk product waste via the sinking of a ship containing those wastes as an artificial reef. The application and its supporting documents have undergone rigorous internal and external reviews by EPA and by EPA’s Science Advisory Board. EPA believes that this review is sufficiently rigorous to support a determination that a method will/or will not result in an unreasonable risk to human health or the environment.

Post Disposal Costs, Maintenance, and Corrective Actions

Comment # O-I-50:

Finally, it is very important to note that in practice the EPA requires financial assurances for closure by storers and disposers of PCB waste to cover closure costs. The reefing rules proposal in fact considers reefing as disposal. As that is the case, EPA must herein outline what financial assurance is going to be required, when closure is triggered and when the responsible party is freed from maintaining such financial assurance.

Response to Comment # O-I-50:

It is not clear what the commenter had in mind with regard to “closure” for an artificial reef. While it is true that land-based PCB disposal facilities are closed at the end of their life, there is no expectation that the PCB inventory will be removed at closure. Disposal of the PCBs as part of an artificial reef is considered permanent just as it is for a PCB waste placed in a chemical waste landfill. The requirements for approval of a TSCA chemical waste landfill at 40 CFR§ 761.75 do not include any specific provisions for closure or financial assurance.

Comment # O-I-51:

It is imperative in our view that due to all of the reasons above, and in particular, the lack of any real data about fate and transport of PCBs, it is not appropriate or possible to make use of the 40 CFR 761.62(c) permitting process as it was foreseen.

Response to Comment # O-I-51:

EPA believes that it can determine whether an alternate method of disposal results in an unreasonable risk to human health or the environment. To date, EPA has received and granted one application for a risk-based disposal approval to dispose of PCB bulk product waste via the sinking of a ship containing those wastes as an artificial reef. The application and its supporting documents have undergone rigorous internal and external reviews by EPA and by EPA's Science Advisory Board. EPA believes that this review is sufficiently rigorous to support a determination that a method will/or will not result in an unreasonable risk to human health or the environment.

¹⁴ A Screening Level Ecorisk Assessment for Using Former Navy Vessels to Construct Artificial Reefs, Final Report, July 17, 2003.

¹⁵ *Id.*

Comment # O-I-52:

Indeed, based on all that we now know about PCBs, persistent organic pollutants, endocrine disruption, bioaccumulation, etc. it is absolutely inappropriate to intentionally deposit any level of PCBs into the marine environment.

Response to Comment # O-I-52:

EPA has not made the determination that there is a no unreasonable risk to health or the environment from sinking a vessel containing regulated levels of PCBs as an artificial reef.

Comment # O-I-53:

It is important to note that Canada, more appropriately does *not* use a risk-based approach for ship dumping at sea. Their clean-up standard for ocean disposal of vessels calls for “any equipment or components suspected of containing PCBs must either be removed or certified that the equipment or component does not contain PCBs.”¹⁶

If ship reefing must be done, which we believe is highly dubious based on the waste management hierarchy, the Canadian approach is the correct approach environmentally and legally (see also below re: Stockholm and London Conventions).

Response to Comment # O-I-53:

EPA cannot adopt Canadian regulatory standards. The BMP guidance document references the U.S. regulatory requirements for PCBs under TSCA. This is a stringent set of requirements that, as applied to reefing, would require removal of liquid PCBs and removal of PCB bulk product waste and PCB remediation waste for proper disposal. However, as the BMP guidance document recognizes, in some vessels it may not be feasible to identify and remove every material that could fall under those requirements. The BMP guidance document refers to the provisions in EPA's TSCA regulations allowing for case-by-case risk-based approval to dispose of PCB bulk waste or PCB remediation waste in the marine environment for purposes of creating an artificial reef. Such permits would be based on EPA's finding that the disposal would not pose an unreasonable risk of injury to human health or the environment. 40 CFR 761.61(c) and 761.62(c). Any PCB disposal approved under TSCA would be based on a risk assessment.

IV. Basel, Stockholm and London Conventions

Comment # O-I-54:

As we shall see, what the EPA and MARAD are proposing in the Reefing Guidance flies in the face of international legal norms and obligations some of which directly bear on the United States.

Response to Comment # O-I-54:

Providing recommended practices for clean-up of vessels being used as artificial reefs does not somehow "fly in the face of international legal norms and obligations." The responses to the specific comments presented below provide further detailed and specific reasons for why this is not the case.

Basel Convention

Comment # O-I-55:

The Basel Convention on the Control of the Transboundary Movement of Hazardous Waste and Their Disposal, adopted in March of 1989 seeks to minimize transboundary movements of hazardous wastes, their generation, and promote environmentally sound management of hazardous and other wastes which are unavoidable. While the United States has failed to ratify the Basel Convention, they have signed it, and thereby indicated intent to ratify it. Indeed it is known that implementation language has been readied this year and is expected to be forwarded to Congress early in 2005.

Response to Comment # O-I-55:

EPA has decided not to make any changes to the guidance in response to BAN's comments regarding the Basel Convention. As BAN itself noted, the United States is currently not a Party to the Basel Convention. In addition, even if the United States were a Party, the Basel Convention concerns the transboundary movement of hazardous wastes, as defined

under the Convention. In the ship reefing context, there is no transboundary movement expected – that is, the ships will not be exported from the U.S. As the ship reefing activities occur completely outside of a transboundary transaction it would appear that the Convention would not apply.

Comment # O-I-56:

The Basel Convention as mentioned earlier does not consider ocean disposal to be a form of recycling or reuse. Annex IV, A of the Basel Convention clearly indicates this practice as a form of final disposal. While most of the thrust of the Basel Convention has to do with transboundary movement of hazardous wastes, Basel also exists to promote environmentally sound management of hazardous wastes and has created numerous technical guidance documents on various waste streams. One of these guidance documents deals with PCBs. Following the adoption of the Stockholm Convention this guidance documents were deemed out-of-date and is now currently in the process of being re-drafted to reflect changing disposal technologies, and the legal frame of the Stockholm Convention.

Response to Comment # O-I-56:

See *Response to Comment # O-I-55*. In addition, while guidelines developed under the Convention are sometimes relevant to the environmentally-sound management of waste wherever it may be, no guidelines have been issued that address the reefing of ships.

Comment # O-I-57:

The most recent draft (August 2004) of the Basel Convention Technical Guidelines for

¹⁶ Environment Canada. 2001b. Clean-Up Standard for Ocean Disposal of Vessels. Revision 1 – July 2001
Environment Canada, Environmental Protection Branch, Pacific and Yukon Region.
http://www.pyr.ec.gc.ca/EN/ocean-disposal/english/cleanupstandard_jul01_e.htm#38

Environmentally Sound Management of Wastes Consisting of, Containing or Contaminated with Polychlorinated Biphenyls, Polychlorinated Terphenyls or Polybrominated Biphenyls¹⁷ does not consider ocean disposal as either a means of destruction or irreversible transformation of PCBs waste as required by the Stockholm Convention, nor does it consider ocean disposal as a means of PCB disposal in the case when destruction or irreversible transformation “does not represent the environmentally preferable option”. The Basel Guidelines considers various environmentally sound destruction options, such as Alkali Reduction, Base Catalyzed Decomposition, Gas Phase Chemical Reduction, etc. to be in line with the mandates of the Stockholm Convention on POPs (the Stockholm requirements are discussed in the succeeding section) – ocean disposal is by no means a method of POPs *destruction*.

Response to Comment # O-I-57:

Although, as the commenter points out, guidance under the Basel Convention does not include ocean placement in its examples of environmentally-sound PCB disposal, the BMP guidance document is not intended to be a comprehensive listing of all acceptable approaches. The BMP guidance document identifies the TSCA regulatory requirements for PCBs.

TSCA consists of a stringent set of requirements that, as applied to reefing, would require removal and proper disposal of liquid PCBs, materials containing PCBs regulated for disposal, and materials containing PCBs as a result of spills. However, as the BMP guidance recognizes, PCBs other than liquids may be difficult to locate and remove. The BMP guidance document refers to the provisions in EPA's TSCA regulations allowing for case-by-case disposal permits to dispose of PCB bulk product waste and PCB remediation waste (materials containing PCBs as a result of spills). Such permits would be based on EPA's finding that the disposal method would not pose an unreasonable risk of injury to health or the environment. 40 CFR 761.61(c) and 761.62(c). Any PCB disposal approved under TSCA would be based on a risk assessment, and EPA will not approve disposal that is not environmentally sound.

While there may be complex issues regarding the extent of PCB bulk product waste or PCB remediation waste removal in individual reefing projects, EPA would consider those issues in the context of individual approval decisions under TSCA. EPA believes that TSCA approval processes are adequate to effectuate any relevant U.S. obligations under the Stockholm Convention.

Comment # O-I-58:

The Basel Convention was also required to look at the case when the POP content is considered "low" in accordance with the Stockholm Convention language. While the draft guideline is not specific as to how to deal with low levels of PCBs, it must be noted that the Basel Convention has already set a standard of 50ppm for the level at which PCBs should be controlled.¹⁸ This is also the level below which negotiations are determining that PCBs will be considered to be "low". Thus, the EPA Guidance Document is remiss (according to international norms) to not manage PCBs above 50ppm (no matter whether they are in solid or liquid matrices) as being in a category that must be destroyed or irreversibly transformed.

Response to Comment # O-I-58:

EPA has decided not to make changes to the BMP guidance document in response to BAN's comments regarding the Basel Convention. As BAN itself noted, the United States is currently not a Party to the Basel Convention. In addition, even if the United States were a Party, the Basel Convention concerns the transboundary movement of hazardous wastes, as defined under the Convention. In the ship reefing context, there is no transboundary movement expected – that is, the ships will not be exported from the U.S. As the ship reefing activities occur completely outside of a transboundary transaction, it would appear

that the Basel Convention would not apply. While guidelines developed under the Basel Convention are sometimes relevant to the environmentally sound management of waste wherever it may be, no guidelines have been issued that address the reefing of ships.

Public Comment Docket Document ID # EPA-HQ-OW-2004-0003-0026 comments and the respective responses are continued in the next document section identified as:

**“Responses to Comment #s
EPA-HQ-OW-2004-0003-0026 (Continued)
To
EPA-HQ-OW-2004-0003-0027”**