

Fact Sheet for NPDES and State Waste Discharge General Permit for Boatyards

March 16, 2016

Purpose of this fact sheet

This fact sheet is a companion document to the National Pollutant Discharge Elimination System (NPDES) and State Waste Discharge General Permit for Boatyards (boatyard general permit). It explains the nature of the proposed discharges, summarizes the history of the permit, documents the Washington State Department of Ecology's (Ecology's) decisions for limiting the pollutants in the wastewater discharges, provides the regulatory and technical bases for those decisions, and fulfills the requirements of Washington Administrative Code (WAC) Section 173-226-110.

On March 16, 2016, Ecology prepared and made available a draft permit for boatyards and this accompanying fact sheet for public evaluation during a minimum 30-day review period (WAC 173-226-130). Copies of the draft general permit and this fact sheet will be available at Ecology regional offices and via the Internet for public review and comment from March 16, 2016, through April 29, 2016. Details about how to prepare and submit comments are in Appendix D (Public Involvement Information).

After the public comment period has closed, Ecology will make changes to the draft NPDES general permit in response to comments, summarize substantive comments, and provide responses to them in Appendix E (Responses to Comments). Ecology will maintain the final fact sheet and permit in the permit file as part of the legal history.

Summary

The boatyard general permit provides coverage for discharges of treated pressure-wash wastewater and stormwater runoff from certain boatyards to waters of the State. The general permit provides coverage for boatyards that:

1. Engage in the construction, repair, or maintenance of small vessels (boats or ships), where 85% of those vessels are 65 feet or less in length; or
2. Generate more than 85% of their gross receipts from revenues returned from the construction, repair, or maintenance of those small vessels.

The boatyard general permit includes both technology-based and water quality-based limits or benchmarks depending on the source of the wastewater and the receiving water.

This fact sheet reviews the monitoring data reported during the previous permit cycle and certain ambient receiving water data for a similar time period. Based on those data, a reassessment of the potential to pollute found that a lower discharge limit for acute exposure to total lead was warranted for boatyards that discharged stormwater runoff to Lake Union and the Lake Washington Ship Canal.

The draft permit contains only two substantive changes from the current permit (effective June 1, 2011 through May 31, 2016). These changes are:

1. Requirement that Permittees provide all permit-required monitoring and other reports to Ecology in an electronic form, unless Ecology has issued a written Permittee-specific waiver.
2. Decrease in the maximum daily limit for total lead discharged to Lake Union or the Lake Washington Ship Canal from 185 ug/L to 78 ug/L.

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INTRODUCTION

The Federal Clean Water Act (CWA, 1972, and later modifications, 1977, 1981, and 1987) established water quality goals for the navigable (surface) waters of the United States. One of the mechanisms for achieving the goals of the CWA is the National Pollutant Discharge Elimination System (NPDES), administered by the U.S. Environmental Protection Agency (EPA). The U.S. EPA has delegated the administration of the NPDES permit program to the State of Washington. The Washington State Legislature accepted the delegation and assigned the power and duty for conducting NPDES permitting and enforcement to the Washington State Department of Ecology (Ecology). The Legislature defined Ecology's authority and obligations for the wastewater discharge permit program in Chapter 90.48 of the Revised Code of Washington (RCW).

The Washington Administrative Code (WAC) requires that boatyards obtain coverage under an NPDES general permit before discharging wastewater to the waters of the State. The following regulations apply to NPDES general permits:

- Water quality criteria for groundwaters, bases for effluent limits, and other requirements (Chapter 173-200 WAC)
- Water quality criteria for surface waters, bases for effluent limits, and other requirements (Chapter 173-201A WAC)
- Sediment management standards, bases for effluent limits, and other requirements (Chapter 173-204 WAC)
- Whole effluent toxicity testing and limits (Chapter 173-205 WAC)
- Procedures Ecology follows for NPDES permits (Chapter 173-220 WAC)
- Determination and payment of fees (Chapter 173-224 WAC)
- Procedures Ecology follows for issuing and administering NPDES general permits (Chapter 173-226 WAC)
- Plans and reports for construction of wastewater facilities (Chapter 173-240 WAC)

A general permit is designed to provide environmental protection under conditions typical for the covered industrial group. This permit regulates pollutant discharge primarily through best management practices (BMPs) designed to minimize or eliminate the discharge of pollutants, stormwater treatment, numeric benchmarks or limits to assure pollutant control, and prohibition of all pressure-wash wastewater discharges to surface water. This permit may not be appropriate for every situation. When site-specific conditions at a facility are not typical of the industrial

group or they are beyond the scope of the general permit, an individual permit may be required. The establishment of a general permit for the small shipyard industry is appropriate because:

- The wastewater characteristics among facilities are similar.
- A standard set of permit requirements can effectively provide environmental protection.
- Facilities in compliance with permit conditions will be in compliance with water quality standards.

Appendix C of this fact sheet identifies the legal or technical bases underlying each of the special and general conditions of the proposed boatyard general permit.

ACTIVITIES, DISCHARGES, AND FACILITIES THAT REQUIRE THIS PERMIT

The discharge of wastewater from boatyards to surface water requires an NPDES permit. Also, no pollutants may be discharged from any commercial or industrial operation into waters of the State except as authorized under a wastewater discharge permit. Boatyards meet the legal definition of commercial or industrial operation, the process wastewater contains pollutants, and boatyards are point source dischargers. This general permit satisfies the legal requirement for an NPDES permit for boatyards that employ pressure washing to clean boats, particularly their hulls, and that produce stormwater runoff from areas where industrial activities occur which then discharges to waters of the State.

Both the current boatyard general permit (effective June 1, 2011, through May 31, 2016) and the draft boatyard general permit (issued March 16, 2016; to be effective July 2, 2016, through June 30, 2021) provide coverage for facilities that:

1. Engage in the construction, repair, or maintenance of small vessels (boats or ships), where 85% of those vessels are 65 feet or less in length; or
2. Generate more than 85% of their gross receipts from revenues returned from the construction, repair, or maintenance of those small vessels.

ACTIVITIES, DISCHARGES, AND FACILITIES EXCLUDED FROM COVERAGE UNDER THIS PERMIT

Facilities that conduct boatyard activities exclusively indoors or that provide only the following services, whether conducted by the vessel's owner or by an agent or contractor hired by the owner, do not require coverage under this permit:

- Use of tidal grids solely for emergency repair or for inspection by marine surveyors.
- Minor engine repair or maintenance within the engine space without vessel haul-out.
- Topsides cleaning, detailing, and bright work.

- Electronics servicing and maintenance.
- Marine sanitation device (MSD) servicing and maintenance that does not require haul-out.
- Minor repairs or modifications to the vessel rigging or superstructure (topside).

These activities, which do not require coverage under this permit, are often conducted in marinas. Marinas or boat owners conducting boatyard activities may be subject to penalty for discharging pollutants without a permit. In addition, marinas must follow the in-water hull cleaning instructions in the Ecology divers advisory (Ecology, 1999). Marinas on aquatic lands leased from the Washington Department of Natural Resources must, in accordance with RCW 90.48.386, maintain and follow a plan of operations detailing how all water pollution control requirements of State law will be met or risk losing the lease.

The permit does not provide coverage for related or ancillary industrial or commercial facilities, such as a repair shop for marine engines. Those facilities may qualify for coverage under the industrial stormwater general permit, if necessary. Ecology has issued guidelines for this type of work to prevent water pollution.

Discharges from facilities located on “Indian Country” as defined in 18 U.S.C. §1151, except portions of the Puyallup Reservation as noted in the permit, are not covered by the boatyard permit.

Discharges from activities operated by any department, agency, or instrumentality of the executive, legislative, or judicial branches of the Federal government of the United States, or another entity, such as a private contractor performing industrial activity for any such department, agency, or instrumentality, are not covered by the boatyard general permit.

This general permit does not cover vessel deconstruction activities that take place in the water or on a floating drydock or barge. For these situations, the boatyard must obtain either an individual permit or the vessel deconstruction general permit.

BACKGROUND INFORMATION

HISTORY

Under Task P-20 of the Puget Sound Water Quality Authority Plan (1989), Ecology was directed to carry out a program for detection and identification of unpermitted discharge sources. One of the significant unpermitted point source discharge groups found by the Elliott Bay and Lake Union Urban Bay Action Teams was the boatyard industry.

Ecology signed a Memorandum of Agreement with the U.S. EPA for development and issuance of a general permit for small shipyards. During the development of the permit it was decided to describe facilities in this segment of the Ship and Boat Building and Repairing industry as boatyards. A general permit was issued in 1992, reissued in 1997, and again in December 2005. The 2005 permit was modified in 2006 to correct an error. The 2005 permit and 2006 modification were appealed by the Northwest Marine Trade Association (NMTA) and the Puget SoundKeeper Alliance (PSA). The appeal was heard by the Pollution Control Hearings Board in July 2006 and the Board issued a decision in January 2007 (PCHB, 2007). That decision was appealed to Superior Court by NMTA and PSA. The appeal to Superior Court was conditionally settled by incorporating some of the PCHB judgment orders into a second permit modification (January 2008) and the conduct of a pilot test of three stormwater treatment devices during the winter of 2007-2008. The pilot test was funded by PSA, NMTA, and Ecology. A Settlement Steering Committee (steering committee) consisting of NMTA, PSA, their technical consultants and Ecology directed the study. A project manager was hired to oversee day-to-day operation of the pilot test. A contractor was hired to conduct the sampling of the pilot treatment apparatus. The pilot test was conducted for seven storm events, and the contractor presented the data in a report to the steering committee (Taylor Associates, Inc. 2008). An order-of-magnitude economic analysis was conducted by the NMTA technical consultant to estimate cost of installing treatment at a typical boatyard (Arcadis, 2008).

A draft permit modification produced by PSA and NMTA was conveyed to Ecology August 2008 as an agreement between those two parties. Ecology released the draft modification for public comment November 2008. The draft contained benchmarks based on the pilot stormwater treatment data. Based on the comments received, Ecology determined a small business and AKART economic analysis was required to proceed with the permit. That analysis showed some boatyards could not install stormwater treatment and remain in business (Ecology, 2010). The economic analysis was released as a separate but supporting document. Based on the economic analysis, Ecology imposed technology-based limits on boatyards that could afford it and water quality-based limits with a compliance schedule for the others to allow time to fund installation of treatment systems. Those boatyards with water quality-based limits had performance-based limits during the compliance period until treatment system(s) were to be installed. This third iteration of the boatyard general permit was to expire on November 2, 2010, but Ecology extended its coverage until Ecology could complete the next version (the current version), which became effective on June 1, 2011.

By the end of the term of the current boatyard general permit, in early 2016, Ecology had issued coverage to approximately 70 boatyards. A list of the boatyards currently covered under this general permit is provided in Table 1, after page 29 of this fact sheet.

The draft permit published March 16, 2016, is the fifth version of the boatyard general permit. The proposed substantive changes from the current general permit are:

- Decrease of the water quality-based effluent limit required for total lead in stormwater runoff discharges from boatyards to Lake Union and the Lake Washington Ship Canal.
- Electronic reporting to Ecology of monitoring data and various applications, plans, and reports.

This draft permit continues the requirement for certain best management practices and the prohibition of direct discharge of pressure-wash wastewater to surface waters.

DESCRIPTION OF THE INDUSTRY

Industry Processes

The applicable Standard Industrial Classifications (SICs) are:

SIC No. 3731 (NAICS No. 336611) Ship Building and Repairing: “Establishments primarily engaged in building and repairing all types of ships, barges, and lighters, whether propelled by sail or motor power or towed by other craft. This industry also includes the conversion and alteration of ships.”

SIC No. 3732 (NAICS No. 336612) Boat Building and Repairing: “Establishments primarily engaged in building and repairing all types of boats.”

A boatyard, as defined for the purpose of this permit, is a facility engaged in the construction, repair, and maintenance of small vessels, where 85% of those vessels are 65 feet or less in length, or the boatyard generates more than 85% of its gross receipts working on those vessels. Services provided may include, but are not limited to: pressure washing; bottom and topside painting; engine, prop, shaft, and rudder repair and replacement; hull repair; joinery; bilge cleaning; fuel and lubrication system repair or replacement; welding and grinding on the hull; buffing and waxing; topside cleaning; MSD repair or replacement; and other activities necessary to maintain a vessel. This document will use the generic terms pressure washing and pressure-wash wastewater for all pressure-washing activities at boatyards.

A boatyard may employ one or more of the following to remove or return a vessel to the water: marine railway, drydock, crane, hoist, ramp, or vertical lift. Some yards may build a limited number of custom boats usually constructed of fiberglass or aluminum. Permanent moorage facilities are not usually a feature of a boatyard although a few boatyards do have such facilities.

Historically, boat repair has been done outdoors on the waterfront. The vessel was supported in a cradle, on barrels, or in a sling while work was done on the hull. Some boatyard facilities are

endeavoring to change operations in order to do the boat repair under cover. This will contribute to quality control, reduce or eliminate discharges, and improve worker safety. If all activities are performed indoors, under cover, with no outside activities or exposure except haul-out, coverage under this permit may not be required.

WASTEWATER TREATMENT PROCESSES

Boatyards covered by this general permit are prohibited from discharging pressure-wash wastewater directly to waters of the State. Permittees must discharge their pressure-wash wastewater, whether pretreated or not, to a municipal sanitary sewer system.

While this general permit does not explicitly require treatment of stormwater runoff from boatyards, some treatment may be necessary to comply with discharge limits and to ensure that pollutant concentrations in the runoff do not exceed benchmark concentrations. The permit also requires the implementation of several best management practices (BMPs) to prevent violation of water quality standards.

DISCHARGE OUTFALL

Typically, the outfalls through which boatyards discharge their stormwater runoff to the environment discharge to either the nearby or adjacent surface waterbody or to an infiltration area that must be located at least 200 feet from the edge of the nearest surface waterbody.

SOLID WASTES

Boatyards that accumulate solid wastes from treatment of pressure-wash wastewater or stormwater runoff must handle and dispose of those wastes in compliance with relevant solid waste regulations. Boatyards covered by this general permit generally employ the local municipality or a local contractor to haul solid wastes offsite and dispose of them properly.

DESCRIPTION OF THE RECEIVING WATERS

Boatyards covered by this permit may discharge stormwater runoff to the following three different types of receiving waters: fresh water, marine water, and groundwater. Some of these waterbodies may be impaired by specific pollutants. The type and condition of the particular receiving water to which a given boatyard discharges constitute the bases for permit-specified limits, benchmarks, and required BMPs. A summary of historical total hardness, copper, lead, and zinc concentrations in fresh and marine receiving waters in Western Washington is provided in Table 2, located after page 29 of this fact sheet.

Ecology conducted a receiving water study during the winter of 2008 and 2009 in Lake Union and Puget Sound (Ecology, 2009). The study was mandated by the PCHB in its 2007 decision. The study parameters, sample sizes, and locations were determined by the steering committee. The study focused on copper, zinc, and lead in the receiving water (total and dissolved), total suspended solids, and hardness (fresh water). The results from all Lake Union and Lake

Washington Ship Canal samples were below the acute and chronic criteria for copper, lead, and zinc. Lake Union and Lake Washington Ship Canal sampling stations yielded equivalent concentrations for the parameters measured. The marine stations in Puget Sound showed some differences, with urban bay stations typically showing the highest concentration of metals. All sampling locations met water quality criteria for the three metals, and lead was typically below detection or quantitation levels.

WASTEWATER CHARACTERIZATION

Wastes generated by boatyard activities include spent abrasive grit, spent solvent, spent oil, pressure-wash wastewater, paint over-spray, paint drips, various cleaners and anti-corrosive compounds, paint chips, scrap metal, welding rods, wood, plastic, resin, glass fibers, and miscellaneous trash such as paper and glass. If not adequately controlled, these pollutants can enter the wastewater stream through the application and preparation of paints and the painted surface; the handling, storage, and accidental spills of chemicals, leaks, or drips of paints, solvents, or thinners; the fracturing and breakdown of abrasive grits; and the repair and maintenance of mechanical equipment. Hull preparation for painting is commonly done by pressure washing, sanding, grinding or scraping, and some abrasive blasting.

The two main wastewater streams from boatyards are: (1) Pressure-wash wastewater; and (2) Stormwater runoff. Other minor potential sources are cooling water, pump testing, gray water, sanitary waste, wash-down of the work area, and engine bilge water. Gray water and sanitary waste go to municipal treatment or on-site treatment. Engine room bilge water and oily wastes are typically collected and disposed of through a licensed contracted disposal company.

PRESSURE-WASH WASTEWATER

In 1992, raw pressure-wash wastewaters have been sampled by Ecology, local shipyards, boatyards, and the Municipality of Metropolitan Seattle (METRO) (Hart Crowser, 1997). The METRO data, summarized in Table 3, which is located after page 29 of this fact sheet, showed that the concentrations of copper, lead, and zinc in the untreated pressure-wash wastewater exceeded the typical standards for discharge to sanitary sewer systems by about a factor of 10, and exceeded surface water quality ambient standards by factors of about 9,000; 30; and 80, respectively.

During the current term of the boatyard general permit (2011-2016), permittees provided to Ecology discharge monitoring reports (DMRs) that characterized the pressure-wash wastewater that they discharged to their local publicly-owned treatment works (POTWs). The data on this treated wastewater are summarized in Table 4, which is located after page 29 of this fact sheet, for total copper, lead, and zinc, and pH for each season (June through September) from 2011 through 2014. The data showed median pH values ranging from 7.1 to 7.5 standard units (S.U.), with only four permittees reporting values greater than 9.0 S.U. All the seasonal median concentrations for each of the metals were less than their respective allowed limits. In 2011 and 2012, the seasonal average concentrations of copper and zinc exceeded their respective allowed limits, while the seasonal average concentration of lead exceeded its allowed limit in only 2012.

In 2014 and 2015, none of the seasonal averages for the three monitored metals were reported in the treated pressure-wash wastewater discharges at concentrations that exceeded their respective limits.

STORMWATER RUNOFF

The 2005 permit required monitoring of stormwater runoff from boatyards for copper, oil & grease, and total suspended solids (TSS). These monitoring data are given in Table 5, which is located after page 29 of this fact sheet. Based on these data, Ecology removed the monitoring requirements for oil & grease and TSS in the 2008 permit modification.

The permit modification in 2008 required additional monitoring of stormwater for lead and zinc. These monitoring data are for stormwater runoff controlled solely by best management practices (BMPs). A summary of some of the monitoring data reported by the boatyards on their discharge monitoring reports from 1998 through 2014 is presented in Table 5.

The median reported copper value for the period of 1998 to 2002 was 410 ug/L, which is about four times higher than the median value reported between 2006 and 2008 (Table 5). These results showed a continued reduction in copper concentration (not tested for statistical significance).

A full characterization of toxic pollutants in stormwater runoff from three representative boatyards in the spring of 2006 is summarized in Table 6, located after page 29 of this fact sheet (Ecology, 2006). The freshwater and marine water quality criteria (if available) are shown after the name of the pollutants.

The results of analyzing organotins in boatyard stormwater runoff collected during April and May of 2006 is summarized in Table 7, located after page 29 in this fact sheet. The U.S. EPA-recommended acute criteria for tributyltin are 0.46 µg/L for fresh water and 0.37 µg/L for marine water. Except for the April sampling at the Seaview Boatyard East (6.0 ug/L), the concentrations of all tributyltin results were less than the criteria.

During the current term of the boatyard general permit (2011-2016), permittees provided to Ecology discharge monitoring reports that characterized the stormwater runoff that they discharged to either the ground or the nearby surface waterbody. The data on this treated stormwater runoff is presented in Tables 8a, 8b, and 8c (located after page 29 of this fact sheet) for total copper, lead, and zinc for each season (October through May) from 2011 through 2015. Table 8a addresses stormwater runoff discharged to all waterbodies; Table 8b addresses discharges to only fresh waterbodies; and Table 8c addresses discharges to only marine waters. The reported average seasonal results (and, to a lesser degree, the seasonal median results) appeared to decrease over the 4-year period. This apparent trend was not evaluated for statistical significance.

SUMMARY OF COMPLIANCE WITH PREVIOUSLY ISSUED PERMIT

The data showed that all the seasonal median values for total copper, lead, and zinc were less than their respective benchmarks. In the 2011/2012 and 2012/2013 seasons, the seasonal average concentrations of copper exceeded the copper benchmark concentration, while the seasonal average concentration of zinc exceeded its benchmark in all four seasons. None of the seasonal average lead concentrations exceeded the lead benchmark. While the rates of compliance generally appeared to improve over the course of these four years (October 2011 through May 2015) (not tested for statistical significance), the total number of monitoring results submitted by the permittees was low, only about two-thirds of the total expected number.

COMPLIANCE WITH STATE ENVIRONMENTAL POLICY ACT

State law exempts the issuance, reissuance, or modification of any wastewater discharge permit from the State Environmental Policy Act (SEPA) process as long as the permit contains conditions that are no less stringent than Federal and State rules and regulations (RCW 43.21C.0383 and WAC 197-11-855). This exemption applies only to existing discharges, not to new discharges. New facilities must demonstrate compliance with SEPA as part of project authorization and approval in order to be eligible for coverage under the boatyard general permit.

PROPOSED PERMIT LIMITS

Federal and State regulations require that effluent limits set forth in an NPDES permit must be either technology- or water quality-based. Technology-based limits are based upon the treatment methods available to treat specific pollutants and are cost modified. Technology-based limits are set by regulation or developed on a case-by-case basis (40 CFR 125.3, and Chapter 173-220 WAC). State laws (RCW 90.48.010; 90.52.040; and 90.54.020) require the use of all known, available, and reasonable methods (AKART) to prevent and control the pollution of waters of the State.

Water quality-based limits are based upon compliance with the Surface Water Quality Standards (Chapter 173-201A WAC), Ground Water Standards (Chapter 173-200 WAC), Sediment Quality Standards (Chapter 173-204 WAC) or the National Toxics Rule (40 CFR 131.36). The more stringent of these two limits (technology or water quality-based) must be chosen for each of the parameters of concern. Each of these types of limits is described in more detail below.

Technology-based effluent limits for discharges consisting of process wastewater typically are based on some type of treatment technology to reduce the pollutants in that wastewater. Stormwater differs from process wastewater in that it is not a continuous discharge, the pollutant sources are not continuous, and the pollutant concentrations are highly variable. The U.S. EPA, in their stormwater permits, has determined that the use of structural controls and best

management practices (BMPs) to prevent the discharge of pollutants via stormwater runoff may be equivalent to the “best conventional pollutant control technology” (BCT) and the “best available technology economically achievable” (BAT), which are the federally mandated technology-based treatment levels.

Title 40 CFR 122.2 defines BMPs as “schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce pollution of waters of the United States.” BMPs also include treatment requirements, operating procedures, and practices to control site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. BMPs are techniques for pollution prevention or, in other words, preventing the pollutants from getting into the wastewater (e.g., stormwater runoff).

The U.S. EPA has defined shipyards as a point source category. This category includes the facilities that Ecology has separated out and calls “boatyards.” The U.S. EPA draft document “Development Document for Shipbuilding and Repair” (U.S. EPA, 1978) recommended BMPs as the primary method of controlling waste discharges from shipyards to waters of the State. BMPs achieve pollution control through careful management of the product streams, segregation of potential pollutants in waste streams, and preventing or minimizing contact between water and waste material. Shipyards and boatyards have similar operations.

The Development Document for Shipbuilding and Repair also determined that BMPs constitute the “best practicable control technology currently available” (BPT) for the shipyard industry. Ecology concluded that BMPs constituted BCT for stormwater discharges in the boatyard industry and that collection, recycling, and treatment of pressure-wash wastewaters constituted BAT.

METRO Treatment Study

METRO (Municipality of Metropolitan Seattle) received a National Estuary Grant to do a treatment study of Puget Sound shipyard and boatyard wastewater and storm water. The study involved sampling of pressure-washing wastewater from a number of these facilities, and testing prototype collection and treatment systems to determine which methods could consistently meet state and local water quality standards.

METRO produced an analytical report of their findings and developed a guidance manual which was distributed to shipyards, boatyards, and publicly-owned treatment works (POTW). The manual includes options for treatment and discharge of pressure-wash wastewater, bilge and ballast water, and contaminated stormwater to receiving waters, municipal treatment plants, or off-site treatment facilities.

BMPs to collect and contain wastes and minimize waste generation during vessel repair and maintenance work have been researched, compiled, and distributed in Washington by Ecology, the Lake Union Association Water Quality Committee, and the Puget Sound Shipbuilders Association (1990), with funding assistance from the Puget Sound Water Quality Authority.

Many of the sources discussed in the Wastewater Characterization section of this fact sheet can be contained, controlled, or substantially reduced by the implementation of BMPs. BMPs are an

essential component of this proposed NPDES general permit. BMPs include structural controls, such as catch basins and drains, berms, dikes, and appropriate containment for oils, chemicals, and wastes; roofed storage areas; and wastewater treatment facilities. Facilities covered by this general permit are required to implement the BMPs described in Special Condition S3 (Mandatory Best Management Practices) of the permit.

TECHNOLOGY-BASED LIMITS FOR PRESSURE-WASH WASTEWATER

The primary source of the heavy metals in pressure-wash wastewater is from paint removed from boat hulls. As noted previously, the copper concentration in this untreated wastewater exceeded the water quality criteria by several orders of magnitude. The next most common metals, by frequency and in magnitude, in boatyard and shipyard wastewater (or contaminated stormwater), were zinc and lead.

METRO's work clarified and expanded the list of options for treatment and disposal of boatyard wastewaters. The treatment study project was closely aligned with the initial development of the first general NPDES permit for boatyards. The study's project manager and project coordinator made valuable contributions to the general permit development by assisting Ecology in establishing standards for best available technology practices for boatyards.

More specifically, the alternatives for managing pressure-wash wastewater are:

- (1) Recycling it and conserving its use.
- (2) Collection and discharge (with pretreatment as necessary) of the wastewater to the sanitary sewer, which may include chemical addition followed by sedimentation and possibly evaporation.

Option 1 - Recycle/Conservation

The preferred means of preventing pollution from pressure washing hulls is recycling the pressure-wash wastewater. The typical configuration is multi-stage filtration with some storage capacity. Water lost from evaporation during pressure washing can be made up from rain water falling on the wash pad or from tap water. The solids collected from the filters or from sedimentation in the storage tank are air-dried under cover and handled as solid waste. The recycled water may eventually become contaminated, requiring disposal or treatment. In that case the wastewater may be collected by a licensed waste hauler and treated off-site.

Option 2 - Discharge to a Publicly-Owned Treatment Works

For boatyard facilities which have the ability to connect to a publicly-owned treatment works (POTW), recycling, with occasional discharge of contaminated recycle water to the POTW, is the best treatment method. The recycled water may have to be treated with a polymer and settled before discharge in order to meet the discharge limits of the permit.

For facilities with excess contaminated water, the contaminated water must be hauled to a treatment facility for proper treatment and disposal. METRO's guidance manual gives a more detailed discussion of recycling options for pressure-wash wastewaters.

Since all boatyards have eliminated direct discharges of pressure-wash wastewater to surface water, Ecology has determined that AKART for pressure-wash wastewater is recycling, evaporation, or treatment and discharge to the sanitary sewer. Discharges to the sanitary sewer must meet the discharge requirements included in this permit for non-delegated POTWs or the requirements specified by delegated POTWs. Delegated POTWs are municipal wastewater treatment systems that have received Federal pretreatment delegation by a permit system through Ecology, to restrict the pollutant loading or concentration of pollutants to their system.

TECHNOLOGY-BASED LIMITS FOR STORMWATER RUNOFF

As previously noted, the U.S. EPA has determined that BMPs are BPT for stormwater discharges under the U.S. EPA multi-sector stormwater general permit and in their draft effluent guidelines for shipyards. Ecology required BMPs beginning in 2005 and incorporated a process for additional BMPs when benchmarks were exceeded.

The Northwest Marine Trade Association, Puget SoundKeepers Alliance, and Ecology conducted a pilot treatment study at several boatyards during the October-May season. Three different types of treatment devices were installed at three boatyards in the Seattle area, and multiple storm events were sampled. The results of the study are in a report entitled *Boatyard Stormwater Treatment Technology Study* – final report dated March 2008, and is available on the Ecology web site at: <http://www.ecy.wa.gov/programs/wq/permits/boatyard/index.html>. The cost of installing and operating each of the three treatment devices was estimated for the three model boatyards. The net present value of the most cost-effective treatment device of the three pilot treatment devices was \$255,000 per acre (Arcadis, 2008). The estimated cost for treatment and the preparation work (grading and repaving) for a 2-acre boatyard was \$400,000 to \$900,000. This document is available at: http://www.nmta.net/PDF/BoatyardCostAnalysis_051908.pdf.

The 2005 permit was modified as required by the settlement agreement in 2008 to incorporate PCHB orders numbered 2, 3, 7, and 8. This permit modification, as noted above, was appealed by the PSA (appeal 2). The appeal was on the permit modification Section S3.C *Receiving Water Studies*. This section was added according to the PCHB order 7.

Annual monitoring of stormwater was required in the first issuance of the Boatyard Permit (1992) to verify the effectiveness of best management practices. Compliance with the monitoring requirement was poor. The few discharges sampled at each boatyard failed to provide the feedback necessary to verify the effectiveness of best management practices or to characterize discharges. Ecology then determined that more than one sample per year was necessary. Therefore, Ecology required four samples per year in the 1997 permit. The 2005 permit required five samples per year. Four samples were required during the times the boatyard activity was highest (spring and fall) and one sample was required in January, the time of highest rainfall. Ecology has determined that five samples collected from fall to spring are adequate to characterize pollutant control activities for stormwater.

Boatyards covered under this permit are required to adopt the BMPs listed in the permit if appropriate for their facility. Other BMPs which are specific for the facility are expected to be

developed as required by the facility to meet the permit benchmark values. Special condition S8 (Stormwater Pollution Prevention Plan) of the permit requires these BMPs be listed in a facility-specific document called the Stormwater Pollution Prevention Plan (SWPPP). This plan is expected to be updated as necessary, and it is a public document. The SWPPP also incorporates a monitoring plan, a spill plan, and weekly visual monitoring, as required in the previous permit.

The draft permit released for public comment in November 2008 contained benchmarks of 14.7 and 29 µg/L copper based on the demonstrated average concentration and variance observed during the pilot study of multimedia filtration. Comments received on these benchmarks disputed that they represented the performance expected when the apparatus was in actual operation as opposed to a test situation. In the period since the release of the 2008 draft, several boatyards have installed multimedia filtration stormwater treatment devices. The data from these were combined with the pilot test data from the boatyards and Pacific Fishermen pilot test (CH2M Hill, 2008) to derive new benchmarks. The data are presented in Appendix C of the April 21, 2010, fact sheet, which is available on the Ecology boatyard web site at: <http://www.ecy.wa.gov/programs/wq/permits/boatyard/index.html>. The benchmarks were calculated in the same manner as the effluent limit derivation presented in the U.S. EPA Technical Support Document, (U.S. EPA, 1991). The copper data were not normally distributed, so they were transformed by the log normal transformation to derive benchmarks. The zinc data were normally distributed after removal of the outliers.

Since lead in treated effluent was typically at or below a measureable concentration, no benchmarks were calculated. The 2011 permit did continue to require monitoring for lead.

Beginning in 2005, copper and zinc limits were imposed in the permit as benchmarks. Benchmarks have been used instead of limits because adaptive management has been a useful process in stormwater management. This is evident in the declining copper concentrations in the boatyard data. Some boatyards may be able to consistently meet the current benchmarks with source control BMPs or with additional alternative treatment devices. Effluent limits, as used in this permit, consist of benchmarks plus adaptive management. In this permit, any exceedance of a benchmark requires a Level 1 response. This response is an examination by the boatyard of the probable cause of the exceedance and an action to be instituted that will cause the stormwater runoff to meet the benchmark in the next monitoring period. After four exceedances of a benchmark, the boatyard must submit a Level 2 report. This is intended to allow the boatyard time to plan for various options and finance treatment if BMPs are still unsuccessful.

After six exceedances, the boatyard must begin its Level 3 Response. Within 3 months of reporting the sixth benchmark exceedance, the Permittee must choose to follow either the Treatment or the Permit Modification track. If the Permittee chooses the Treatment track, the Permittee must submit an engineering report to Ecology within 3 months of reporting the sixth benchmark exceedance. In most cases, if the Level 2 report was done correctly, then the Level 3 report will include an analysis of the design of the treatment device, the grading of the yard, and the pumps and stormwater collection system. This engineering report must also include an analysis of how the treated wastewater will be conveyed to the receiving water or sanitary system, and the characteristics of the receiving water. If the Permittee chooses the Permit Modification track, the Permittee must convince Ecology that either:

1. Installation of necessary treatment BMPs is not feasible by the Level 3 deadline, up to a maximum of 15 months following reporting the sixth benchmark exceedance; or
2. Installation of treatment BMPs is not feasible or not necessary to prevent discharges that may cause or contribute to violation of a water quality standard.

“Not feasible” may *not* be based on financial limitations or distress. Examples of situations where the installation of treatment BMPs may actually be “not feasible” are where the requirements of a local permitting authority delay or prevent the installation, where the local fire marshal has imposed land or building use restrictions, or where the Permittee’s lease agreement with the site owner precludes the installation.

The permit also contains sections addressing the circumstance of boatyards currently at the Level 2 or 3 Response stages. The time to submit engineering reports is relatively short along the Treatment track, but boatyards at this stage have had some period of advance notice.

WATER QUALITY-BASED EFFLUENT LIMITS

In order to protect existing water quality and preserve the designated beneficial uses of Washington surface waters, WAC 173-201A-060 states that waste discharge permits shall be conditioned such that the discharge will not cause a violation of Surface Water Quality Standards. The Washington State Surface Water Quality Standards (Chapter 173-201A WAC) is a state regulation designed to protect the beneficial uses of the surface waters of the State. Surface water quality-based effluent limits may be based on an individual wasteload allocation (WLA) or on a WLA developed during a basin-wide total maximum daily load (TMDL) study. General permits may use a risk-based analysis to develop limits.

The benchmarks and limits for copper, lead, and zinc in the proposed permit (version 5) remained the same as those in the current permit (effective June 1, 2011) except for lead in discharges to Lake Union or the Lake Washington Ship Canal. Those benchmarks and limits were formulated as: (water quality criteria) times (dilution factor of 5) times (a receiving water effect) times (translator - a conversion factor to convert total metal to dissolved metal in the receiving water).

NUMERICAL CRITERIA FOR THE PROTECTION OF AQUATIC LIFE

“Numerical” water quality criteria are numerical values set forth in the State of Washington Water Quality Standards for Surface Waters (Chapter 173-201A WAC). They specify the maximum levels of pollutants allowed in receiving waters to be protective of aquatic life. Numerical criteria set forth in the water quality standards are used along with chemical and physical data for the wastewater and receiving water to derive the effluent limits in the discharge permit. When surface water quality-based limits are more stringent or potentially more stringent than technology-based limits, they must be used in a permit.

The State water quality criteria, WAC 173-201A, for acute toxic effects due to copper in marine water is 4.8 µg/L (dissolved) and in fresh water is 7.2 µg/L (dissolved) at a receiving water hardness of 40 mg/L, which is a typical hardness for Lake Union.

The State water quality criterion, WAC 173-201A, for acute toxic effects due to lead in marine water is 210 µg/L (dissolved), and the fresh water acute criterion is 24 µg/L (dissolved) at a receiving water hardness of 40 mg/L.

The State water quality criteria, WAC 173-201A, for acute toxic effects due to zinc in marine water is 90.0 µg/L (dissolved), and the fresh water acute criterion is 53 µg/L (dissolved) at a receiving water hardness of 40 mg/L.

NUMERICAL CRITERIA FOR THE PROTECTION OF HUMAN HEALTH

The U.S. EPA has promulgated 91 numeric water quality criteria for the protection of human health that are applicable to Washington State (40 CFR Part 131). These criteria are designed to protect humans from cancer and other disease and are primarily applicable to consumption of fish and shellfish and to drinking water obtained from surface waters.

Discharges to Non-Impaired Surface Waters

Ecology determined water quality-based limits using a risk based model and the U.S. EPA Technical Support Document (TSD) method (U.S. EPA), illustrated in Tables 10 and 11, which are located after page 29 in this fact sheet. Discharges to non-impaired freshwaters were addressed as shown in Table 10, and discharges to non-impaired marine waters were addressed as shown in Table 11. Calculations employed the available effluent data reported for total copper, lead, and zinc in stormwater runoff discharges during the current permit term; the receiving water data for the same parameters plus the total hardness in freshwater; and the U.S. EPA acute water quality criteria for human health and aquatic life. Since discharges of stormwater runoff are short-term and episodic, Ecology judged that chronic exposure scenarios were not relevant and that a low dilution factor of 5 was reasonable. The calculations indicated that only total copper and total zinc in the anticipated stormwater discharges posed reasonable potentials for causing a violation of water quality standards.

Therefore Ecology retained from the current permit the benchmarks for total copper and zinc. The maximum daily benchmarks for total copper and total zinc in discharges of stormwater runoff to fresh and marine waters were 147 and 90 ug/L, respectively. A summary of the proposed benchmarks alongside the current benchmarks is provided in Table 13, located after page 29 of this fact sheet.

Discharges to Impaired Surface Waters

Section 303(d) of the Federal Clean Water Act requires Washington State periodically to prepare a list of all surface waters in the State for which beneficial uses of the water – such as for drinking, recreation, aquatic habitat, and industrial use – are impaired by pollutants. These waterbodies are water quality-limited estuaries, lakes, and streams that fall short of State surface water quality standards, and are not expected to improve within the next 2 years.

Waters placed on the 303(d) list require the preparation of total maximum daily loads (TMDLs), a key tool in the work to clean up polluted waters. TMDLs identify the maximum amount of a pollutant to be allowed to be released into a waterbody so as not to impair uses of the water, and allocate that amount among various sources.

Ecology's assessment of which waters to place on the 303(d) list is guided by Federal laws, State water quality standards, and the State 303(d) policy. This policy describes how the standards are applied, requirements for the data used, and how to prioritize TMDLs, among other issues. The goal is to make the best possible decisions on whether each body of water is impaired by pollutants, to ensure that all impaired waters are identified and that no waters are mistakenly identified.

Lake Union and the Lake Washington Ship Canal are still on the Ecology 303(d) list for lead. Therefore, the limit for total lead was calculated using the U.S. EPA TSD with a dilution factor of 1.0. The reasonable potential determination and limit calculation for lead discharged to Lake Union or the Lake Washington Ship Canal are shown in Table 12, located after page 29 in this fact sheet. Based on the conditions of the receiving water and new monitoring data reported during the current permit term, the numeric value for this limit changed from 185 µg/L to 78 µg/L. This value was used as the daily maximum limit. The maximum daily benchmarks for total copper and total zinc were the same as for non-impaired fresh waterbodies, i.e., 147 and 90 µg/L, respectively. A summary of the proposed benchmarks alongside the current benchmarks is provided in Table 13, located after page 29 of this fact sheet.

No other waters receiving boatyard stormwater runoff were listed as impaired for metals on the current 303(d) list. If additional waterbodies become listed in the future, Ecology will, as needed, issue new limits to individual permittees as administrative orders and revised coverages.

Discharges to the Ground

A treatment technology identified as an economical treatment method in an engineering report for shipyard stormwater was discharging to an infiltration basin or trench lined with metal-absorbent material. This treatment was called "enhanced filtration" (Hart Crowser, 1997). Any discharge to an infiltration basin or trench must be located far enough from surface water so as not to be deemed a surface discharge due to hydraulic continuity. In addition, the discharge must comply with the groundwater standards. This permit continues to require that this type of discharge be at least 200 feet from the nearest surface water and meet maximum daily limits of 1,000 µg/L for total copper; and 1,020 µg/L for total zinc. The limit for copper is the groundwater criterion for copper, and the limit for zinc is technology-based. Both limits should be obtainable with proper BMPs at the facility. Meeting the limits at the point of discharge to the infiltration basin or trench (the treatment device) eliminates the need for groundwater sampling. This condition is continued from the current permit. A summary of the proposed benchmarks alongside the current benchmarks is provided in Table 13, located after page 29 of this fact sheet.

Sediment Quality Criteria

There is little data to judge the impact of boatyard activity on sediment quality. One study found that sediment quality in two Puget Sound boatyard/marinas was well below current sediment quality criteria for copper, lead, and zinc (Crecelius, E. et al, 1989). Ecology collected sediment

samples at three boatyards in 2006 to determine the impact of boatyard stormwater runoff to sediment quality (Ecology, 2006). Sediment contamination appeared to correlate with stormwater runoff contamination. Ecology believes that controlling the sources of the pollutants in stormwater will cause a reduction of pollutants in the sediments.

NARRATIVE CRITERIA

In addition to numerical criteria, “narrative” water quality criteria (WAC 173-201A-030) limit toxic, radioactive, or deleterious material concentrations below those which have the potential to adversely affect characteristic water uses, cause acute or chronic toxicity to biota, impair aesthetic values, or adversely affect human health. Narrative criteria protect the specific beneficial uses of all fresh (WAC 173-201A-130) and marine (WAC 173-201A-140) waters in the State of Washington.

COMPARISON OF PROPOSED EFFLUENT LIMITS AND BENCHMARKS WITH RECENT MONITORING DATA

A comparison between the proposed limits and benchmarks for stormwater runoff and the numerical monitoring data reported during the first four years of the current permit term is presented in Table 14, which is located after page 29 of this fact sheet. The average percentages of reported numerical results for total copper and zinc that would have achieved the proposed benchmarks were about 79% and 64%, respectively. All of the total lead results reported for Lake Union and the Lake Washington Ship Canal would have complied with the new proposed limit. The fractions of permittees who did not exceed the proposed total copper and zinc benchmarks compared with all those permittees who had reported numerical results were about one-half to two-thirds for copper, and one-fourth to one-half for zinc.

MONITORING REQUIREMENTS

DISCHARGES OF PRESSURE-WASH WASTEWATER

Discharges of pressure-wash wastewater are restricted to discharges to POTWs. Ecology requires monitoring by those boatyards that discharge to non-delegated POTWs. The monitoring schedule for discharges of pressure-wash wastewater will be the same as the schedule in the current permit: Once monthly in June, July, August, and September. The POTW limits and monitoring frequency in this permit were adopted from METRO's pretreatment limits. Pretreatment limits established by delegated POTWs have similar limits and monitoring requirements for discharge into their systems.

Samples and measurements taken to meet the requirements of this general permit must represent the volume and nature of the monitored discharge within the monthly monitoring period, including representative sampling of any unusual discharge or discharge condition such as bypasses, upsets, and maintenance-related conditions affecting effluent quality.

DISCHARGES OF STORMWATER RUNOFF TO WATERS OF THE STATE

The Permittee must monitor discharges of stormwater runoff from the areas of the facility where industrial activity occurs. The Permittee must collect samples from a location or locations affected by boatyard-related activities and as noted on the application for coverage. If stormwater runoff from the industrial areas of a facility occurs as sheet flow, then the Permittee must construct a collection point to collect an adequate sample volume. If stormwater runoff discharges do not occur during a monthly sampling period, then the Permittee must indicate that on the discharge monitoring report (DMR) for that monitoring period. Stormwater runoff must be monitored in accordance with the monitoring schedule shown in Table 15, which is located after page 29 of this fact sheet.

ANALYTICAL PROCEDURES

Sampling and analytical methods used to meet the monitoring requirements specified in this general permit must conform to the latest revision of the "Guidelines Establishing Test Procedures for the Analysis of Pollutants" contained in 40 CFR Part 136. The required analytical methods and detection and quantitation levels are provided in Table 16, which is located after page 29 of this fact sheet. The Permittee must ensure laboratory results comply with the detection limit and quantitation level specified in the table. However, if an alternate method from 40 CFR Part 136 is sufficient to produce measurable results in the sample, the Permittee may use that method for analysis. If the Permittee uses an alternate method, it must report the test method and quantitation level on the DMR. If the Permittee is unable to obtain the required quantitation level due to matrix effects, the Permittee must report the matrix-specific method detection limit and quantitation level on the DMR.

OTHER PERMIT CONDITIONS

REPORTING AND RECORDKEEPING

Ecology based Special Condition S9 (Reporting and Recordkeeping Requirements) on its authority to specify any appropriate reporting and recordkeeping requirements to prevent and control waste discharges (WAC 173-220-210). Permittees must submit discharge monitoring reports (DMRs) to Ecology by the 28th day of the month immediately following every month during which monitoring is required. Unless authorized by a written waiver from Ecology, Permittees must submit their DMRs electronically using the online Ecology WebDMR program, which is accessible at: <http://www.ecy.wa.gov/programs/wq/permits/paris/webdmr.html>. Their data will then be automatically stored in Ecology's Permitting and Reporting Information System (PARIS). Permittees unable to submit electronically (e.g., those who do not have an Internet connection) must contact their Ecology regional permit administrator to request a waiver and to obtain instructions on how to provide hardcopy paper versions of the required reports and documentation. Since about the year 2010, Ecology has been asking NPDES and state waste discharge Permittees to provide their monitoring data electronically to expedite their required reporting and minimize errors in the transfer of their data into PARIS.

NON-ROUTINE AND UNANTICIPATED WASTEWATER

Non-routine and unanticipated wastewater consists of process wastewater not identified in Special Condition S1 (Permit Coverage Required), not routinely discharged, and not anticipated at the time of permit application, such as waters used to pressure-test storage tanks or fire water systems or of leaks from drinking water systems. The Permittee must address any such wastewaters in accordance with the terms of Special Condition S5 (Non-Stormwater Miscellaneous Discharges).

STORMWATER POLLUTION PREVENTION PLAN

In accordance with 40 CFR 122.44(k) and (s), the reissued permit includes requirements for the development and implementation of a stormwater pollution prevention plan (SWPPP) along with best management practices (BMPs) to minimize or prevent the discharge of pollutants via stormwater discharged from areas associated with industrial activity to waters of the State. BMPs constitute best conventional pollutant control technology (BCT) and best available technology economically achievable (BAT) for stormwater discharges. Facilities that discharge stormwater from their site to a surface waterbody or to a stormwater conveyance system that discharges to a surface waterbody must prepare a SWPPP. Ecology has determined that each Permittee must develop a SWPPP and implement adequate BMPs in order to meet the requirements of "all known, available, and reasonable methods of prevention, control, and treatment" (AKART).

The purpose of a SWPPP is to prevent the contamination of stormwater to the maximum extent practical. The SWPPP must identify the potential contaminants to stormwater, the potential sources of stormwater contamination from industrial activities, and the actions that the facility must implement to manage stormwater and the sources of contamination to comply with the

requirement under Chapter 90.48 RCW to prevent or minimize contamination of stormwater to protect the beneficial uses of waters of the State.

Each Permittee must continuously review and revise its SWPPP as necessary to assure that stormwater discharges do not degrade water quality. Each Permittee must retain the SWPPP on site or within reasonable access to the site and make it available for review by Ecology when requested.

Best Management Practices

Best management practices (BMPs) are the actions identified to manage, prevent contamination of, and treat stormwater. BMPs identify schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of waters of the State. BMPs also identify treatment systems, operating procedures, and practices used to control plant site runoff, spillage or leaks, sludge or waste disposal, and drainage from raw material storage. Permittees must ensure that their SWPPP includes the operational and structural source control BMPs listed as “applicable” in the applicable Ecology stormwater management manual.

The language in the second paragraph of Special Condition S3.C (In-Water Vessel Maintenance and Repair) in the proposed permit differs slightly from the requirements of the 2011 permit. During the current term of the permit, Ecology Inspectors noted that the public were frequently confused by how to judge the 25% limit to minor repairs topside. Therefore, Ecology has adjusted the language to be similar to the second bullet item in Special Condition S1.B (Exemption from Coverage).

While Permittees that provide areas at their facilities for individual boat owners and operators to service their own vessels themselves (“do-it-yourselfers”) may not be held directly responsible for the bad practices of those individuals, Permittees remain liable for the water quality of discharges of stormwater runoff from those do-it-yourself areas. Therefore, Permittees should require do-it-yourselfers to adhere to the same BMPs as those required for boatyards by the general permit.

Operational Source Control BMPs

Operational source control BMPs include a schedule of activities, prohibition of practices, maintenance procedures, employee training, good housekeeping, and other managerial practices to prevent or reduce the pollution of waters of the State. These activities do not require construction of pollution control devices but are very important components of a successful SWPPP. Employee training, for instance, is critical to achieving timely and consistent spill response. Pollution prevention is likely to fail if employees do not understand the importance and objectives of BMPs. Prohibitions might include eliminating outdoor repair work on equipment and certainly would include the elimination of intentional draining of crankcase oil onto the ground. Good housekeeping and maintenance schedules help prevent incidents that could result in the release of pollutants. Operational BMPs are cost-effective methods to control pollutants and protect the environment. The SWPPP must identify all the operational BMPs and how and where they are to be implemented. For example, the SWPPP must identify the subject

matter of applicable training, when training will take place, and who is responsible to assure that employee training occurs.

Structural Source Control BMPs

Structural source control BMPs include physical, structural, or mechanical devices or facilities intended to prevent pollutants from entering stormwater. Examples of structural source control BMPs include erosion control practices, maintenance of stormwater facilities (e.g., cleaning out sediment traps), construction of roofs over storage and working areas, and direction of equipment wash water and similar discharges to the sanitary sewer or a dead end sump. Structural source control BMPs likely include a capital investment but are cost effective compared to cleaning up pollutants after they have entered stormwater.

Treatment BMPs

Operational and structural source control BMPs are designed to prevent pollutants from entering stormwater. However, even with an aggressive and successful program, stormwater may still require treatment to achieve compliance with water quality standards. Treatment BMPs remove pollutants from stormwater. Examples of treatment BMPs are detention ponds, oil/water separators, biofiltration, and constructed wetlands.

Volume and Flow Control BMPs

Ecology recognizes the need to include specific BMP requirements for stormwater runoff quantity control to protect beneficial water uses, including fish habitat. Controlling the rate and volume of stormwater discharge maintains the health of the watershed. New facilities and existing facilities undergoing redevelopment must implement the requirements for peak runoff rate and volume control identified in the applicable “Stormwater Management Manual for Western [or Eastern] Washington,” or any revisions thereof. Permittees should identify volume and flow control measures that they can implement over time to reduce the impact of uncontrolled release of stormwater.

Ecology-Approved Stormwater Management Manuals

Consistent with RCW 90.48.555(5) and (6), the reissued permit requires each Permittee to implement BMPs described in the applicable “Stormwater Management Manual for Western [or Eastern] Washington,” or any revisions thereof, or practices that are demonstrably equivalent to practices contained in stormwater technical manuals approved by Ecology. The SWPPP must document that the BMPs not selected from Ecology-approved manuals provide an equivalent level of pollution prevention, compared to the applicable stormwater management manuals, including the technical basis for the selection of each stormwater BMP (scientific, technical studies, and/or modeling) which supports the performance claims for the selected BMPs.

PERMIT TERM

Ecology is issuing this permit for a term of 5 years, as allowed by WAC 173-226-220.

ECONOMIC IMPACT ANALYSIS

Ecology's Waste Discharge General Permit Program rule (WAC 173-226-120) requires an economic impact analysis (EIA) of any draft wastewater general permit intended to directly cover small businesses. The analysis is required to serve the following purposes:

- A brief description of the compliance requirements of the draft general permit.
- The estimated costs for complying with the permit, based on existing data for facilities to be covered under the general permit.
- A comparison, to the greatest extent possible, of the cost of compliance for small businesses with the cost of compliance for the largest ten percent of the facilities to be covered under the general permit.
- A discussion of what mitigation the permit provides to reduce the effect on small businesses (if a disproportionate impact is expected), without compromising the mandated intent of the permit.

RCW 19.85.020(4) defines a small business as any business entity, including a sole proprietorship, corporation, partnership, or other legal entity, that is owned and operated independently from all other businesses, and that has fifty or fewer employees.

In 2010, Ecology deemed the level of performance from multimedia filtration as AKART. The term AKART has been defined as an engineering and economic decision process which is equivalent to the Federal BCT, BAT determination. (Chapter 4 in Ecology, 2015). Therefore, Ecology combined the EIA with an economic evaluation of AKART and summarized the evaluations in Ecology Publication Number 10-10-018, in April 2010.

The 2010 EIA determined the general permit had a disproportionate impact on small business, but there were no opportunities for mitigation without compromising the mandated intent of the permit.

The November 2015 EIA (Ecology, 2015a) again determined the general permit had a disproportionate impact on small business, but there were no opportunities for mitigation without compromising the mandated intent of the permit.

ZEBRA MUSSELS

The proposed permit contains reporting and treatment requirements for zebra mussels. Zebra mussels (*Dreissena polymorpha*) have spread throughout the Great Lakes and other waterways in 18 states. Two Canadian provinces believe they were accidentally introduced into Lakes Erie and St. Clair in the 1980s. This introduction has been attributed to a discharge of ballast water from a commercial freighter, but other introductions are known to have come from hull biofouling.

Zebra mussels will continue to expand their range as naturally flowing water carries their young, known as veligers, downstream. Commercial and recreational vessels and equipment can also spread zebra mussels when they move from infested waters to uninfested waters. Adult mussels may attach to any hard surface and the veligers may be transported in water.

A list of potential carriers includes:

- * Boats, trailers and other equipment
- * Scientific equipment
- * SCUBA and snorkel gear
- * Live wells
- * Raw water
- * Plants and animals

Placing these items in uninfested waters without following precautions may lead to an accidental introduction of mussels. Any boats or vessels from outside the State of Washington should be carefully examined, and all boats or vessels from east of the Rocky Mountains should be considered infected.

Water hotter than 110 degrees F will kill veligers and 140 degrees F will kill adult mussels.

Therefore, the permit contains inspection, reporting, and quarantine requirements to minimize the potential for infestation of zebra mussels.

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Table 1. Facilities Currently Covered under this Permit.

Facility Name	Permit Number	Receiving Waterbody (specific to general)	Waterbody Type
Albert Jensen & Sons, Inc.	WAG030001	Friday Harbor, San Juan Channel	Marine
Anacortes Rigging & Yacht Services, LLC	WAG031051	Fidalgo Bay	Marine
Blaine Marine Services, LLC	WAG030119	Drayton Harbor, Semiahmoo Bay, Strait of Georgia	Marine
Bremerton Yacht Club	WAG030011	Phinney Bay, Dyes Inlet, Port Washington Narrows	Marine
Cap Sante Marine South Yard	WAG030022	Fidalgo Bay	Marine
CJ Marine	WAG994264	Puget Sound (South-Central)	Marine
CSR Marine East - Shilshole; Seaview East Boatyard	WAG031052	Salmon Bay, Lake Washington Ship Canal	Fresh
CSR Marine South	WAG030009	Puget Sound (Central)	Marine
CSR Marine West	WAG030100	Salmon Bay, Lake Washington Ship Canal	Fresh
Dagmars Marina	WAG030059	Snohomish River, Possession Sound (North), Puget Sound	Fresh
Deer Harbor Boatworks	WAG030103	N/A	N/A
Delta Marine Industries, Inc.	WAG030091	Duwamish Waterway	Fresh
Endor Marine, LLC	WAG030047	Salmon Bay, Lake Washington Ship Canal	Fresh
Gig Harbor Boat Yard, Inc.	WAG031009	Gig Harbor, Colvos Passage, Puget Sound	Marine
Hilton Harbor Marina	WAG030024	I and J Street Waterway, Bellingham Bay (Inner)	Marine
Howard Moe Enterprises	WAG031048	Hoquiam River, Grays Harbor (Inner)	Fresh
Hylebos Marina	WAG031020	Hylebos Waterway, Commencement Bay (Inner)	Marine
Islands Marine Center	WAG030072	Fisherman Bay, San Juan Channel	Marine
Jensen Motor Boat Company	WAG030088	Portage Bay, Lake Union / Lake Washington Ship Canal	Fresh
John Dunato & Company, Inc.	WAG030025	Lake Union / Lake Washington Ship Canal	Fresh
Keyport Undersea Charter & Salvage	WAG030073	Liberty Bay, Puget Sound	Marine
Kitsap Marine Industries, Inc.	WAG030027	Sinclair Inlet	Marine

Table 1. Facilities Currently Covered under this Permit (continued).

Facility Name	Permit Number	Receiving Waterbody (specific to general)	Waterbody Type
La Conner Marina, Port of Skagit County	WAG030036	Swinomish Channel, Padilla Bay, Skagit Bay	Marine
La Conner Maritime Services	WAG030074	Swinomish Channel, Padilla Bay, Skagit Bay	Marine
Larsson Marine, LLC	WAG030004	Portage Bay, Lake Union / Lake Washington Ship Canal	Fresh
Lovrics Sea-Craft	WAG030090	Guemes Channel, Rosario Strait	Marine
Marine Servicenter	WAG030095	Flounder Bay, Burrows Bay, Rosario Strait	Marine
Marine Services & Assist	WAG030083	Cornet Bay, Puget Sound	Marine
Mariners Haven	WAG030070	Oak Harbor, Saratoga Passage, Skagit Bay	Marine
Maritime Commerce Center	WAG030084	Salmon Bay, Lake Washington Ship Canal	Fresh
McNeil Island Boatyard, DOC	WAG031038	Balch Passage, Puget Sound (South)	Marine
Modutech Marine, Inc.	WAG031016	Hylebos Waterway, Commencement Bay (Inner)	Marine
Morris & Company, DBA Ocean Alexander Marine Yacht Sales	WAG031053	Portage Bay, Lake Union / Lake Washington Ship Canal	Fresh
Nordlund Boat Company, Inc.	WAG031025	Upper Turning Basin, Hylebos Waterway, Commencement Bay (Inner)	Marine
North Harbor Diesel, Inc.	WAG030123	Fidalgo Bay, Guemes Channel, Rosario Strait	Marine
North Island Boat Company	WAG030139	Flounder Bay, Burrows Bay, Rosario Strait	Marine
North Lake Marina	WAG030014	Lake Washington	Fresh
Citadel Marine Center Holdings	WAG031056	Blair Waterway, Commencement Bay (Inner), Puget Sound	Marine
Northern Marine Industries, Inc.	WAG030135	Salmon Bay, Lake Washington Ship Canal	Fresh
Platypus Marine, Inc.	WAG031047	Port Angeles Harbor, Strait of Juan de Fuca (Central)	Marine
Point Roberts Resort, LP	WAG030037	Strait of Georgia	Marine
Port of Edmonds	WAG030034	Puget Sound (North Central)	Marine
Port of Everett Marina West	WAG030131	Possession Sound (North), Puget Sound	Marine
Port of Ilwaco Boatyard & Marina	WAG031017	Baker Bay, Columbia River	Fresh
Port of Port Angeles Boatyard	WAG031027	Port Angeles Harbor, Strait of Juan de Fuca (Central)	Marine

Table 1. Facilities Currently Covered under this Permit (continued).

Facility Name	Permit Number	Receiving Waterbody (specific to general)	Waterbody Type
Port of Port Townsend	WAG031006	Port Townsend Bay, Admiralty Inlet, Puget Sound (North)	Marine
Reed Brothers Shipyard	WAG030038	Reads Bay, Lopez Sound, Rosario Strait	Marine
Roche Harbor Marine, Inc.	WAG994262	Roche Harbor, Haro Strait	Marine
Sea Marine	WAG031003	Admiralty Inlet, Puget Sound (North)	Marine
Seattle Boat Company	WAG030071	Lake Washington	Fresh
Seattle Mobile Marine Fisherman's Terminal	WAG994251	Salmon Bay, Lake Washington Ship Canal	Fresh
Seaview Boatyard, Inc. East	WAG030042	Salmon Bay, Lake Washington Ship Canal	Fresh
Seaview Boatyard, Inc. North	WAG030118	Squalicum Harbor, Bellingham Bay (Inner)	Marine
Seaview Boatyard, Inc. West	WAG030043	Shilshole Bay, Puget Sound (Central)	Marine
Seaview Yacht Service Fairhaven	WAG030137	Bellingham Bay (Inner)	Marine
Shelton Yacht Club	WAG031010	Oakland Bay	Marine
Skyline Marina	WAG030039	Flounder Bay, Burrows Bay, Rosario Strait, Strait of Georgia	Marine
South Bend Boat, LLC	WAG031000	Willapa River	Fresh
South Park Marina	WAG030045	Duwamish Waterway	Fresh
Suldans Boat Works, Inc.	WAG030046	Sinclair Inlet	Marine
Swantown Boatyard	WAG031043	East Bay, Budd Inlet, Puget Sound	Marine
Swegle Boatworks	WAG031042	Willapa River	Fresh
Tacoma Marine Services	WAG031026	Thea Foss Waterway, Commencement Bay, Puget Sound	Marine
The Landings at Colony Wharf	WAG030006	Whatcom Creek Waterway, Bellingham Bay	Marine
The Shipyard, LLC	WAG031039	Hoquiam River	Fresh
Walsh Marine	WAG030053	Drayton Harbor, Strait of Georgia	Marine
West Sound Marina, Inc.	WAG030054	West Sound	Marine

Table 1. Facilities Currently Covered under this Permit (continued).

Facility Name	Permit Number	Receiving Waterbody (specific to general)	Waterbody Type
Yacht Performance Center	WAG030106	Portage Bay, Lake Union / Lake Washington Ship Canal	Fresh
Yachtfish Marine Port Orchard	WAG030016	Sinclair Inlet	Marine
Yachtfish Marine Seattle	WAG030076	Lake Union	Fresh
Yardarm Knot, Inc.	WAG031055	Salmon Bay, Lake Washington Ship Canal	Fresh
Zittels Marina, Inc.	WAG031012	Baird Cove, Nisqually Reach, Puget Sound	Marine

Table 2. Characteristics of Receiving Waters

	Total Hardness (mg/L as CaCO ₃)	Total Copper (ug/L)	Dissolved Copper (ug/L)	Total Lead (ug/L)	Dissolved Lead (ug/L)	Total Zinc (ug/L)	Dissolved Zinc (ug/L)
Marine Waters							
Number of Results (2011-2015)	NA	44 pairs		40 pairs		40 pairs	
Average	NA	4.07	0.70	0.027	0.004	0.54	0.49
Standard Deviation	NA	21.1	1.36	0.02	0.004	0.16	0.2
Geometric Mean	NA	0.55	0.40	0.02	0.003	0.52	0.45
95th Percentile	NA	7.78	4.41	0.06	0.008	0.89	0.87
90th Percentile	NA	1.18	0.63	0.05	0.005	0.85	0.72
Median	NA	0.38	0.32	0.02	0.003	0.50	0.43
Average Diss/Total Ratio	NA	0.782		0.501		0.914	
Lake Union and Lake Washington Ship Canal							
Number of Results (2006, 2007, and 2008)	35	NL		45 pairs		NL	
Average	40.3	NL	NL	0.11	0.03	NL	NL
Standard Deviation	2.7	NL	NL	0.05	0.01	NL	NL
Geometric Mean	NA	NL	NL	0.10	0.03	NL	NL
95th Percentile	45.7	NL	NL	0.20	0.04	NL	NL
90th Percentile	NA	NL	NL	0.18	0.03	NL	NL
Median	39.7	NL	NL	0.10	0.03	NL	NL
Average Diss/Total Ratio	NA	NL		0.305		NL	
Fresh Surface Water Bodies							
Number of Results (2011-2015)	(a, b) 374	(a) 537 pairs		(a, b) 10 pairs		(a, b) 134 pairs	
Average	57.0	3.90	2.82	0.20	0.06	30.4	25.4
Standard Deviation	25.8	27.9	26.0	0.17	0.04	262	251
Geometric Mean	NA	1.11	0.75	0.14	0.06	3.30	2.13
95th Percentile	102	5.30	2.68	0.50	0.11	14.3	11.7
90th Percentile	NA	3.24	2.09	0.49	0.06	10.7	6.38
Median	50.6	1.07	0.71	0.17	0.05	2.50	2.00
Average Diss/Total Ratio	NA	0.340		0.216		0.752	

The source of these data was the Ecology Environmental Information Management database.

(a) = In Western Washington only.

(b) = Excluding Lake Union and Lake Washington Ship Canal.

mg/L = Milligrams per liter.

ug/L = Micrograms per liter.

NA = Not applicable

NL = Not impaired per the current 303(d) list.

Table 3. Characteristics of Untreated Boatyard Pressure-Washing Wastewater (1992)

Parameter	Average Concentration	Greatest Reported Value or Range
Arsenic ($\mu\text{g/L}$)	80	100
Copper ($\mu\text{g/L}$)	55,000	190,000
Lead ($\mu\text{g/L}$)	1,700	14,000
Tin ($\mu\text{g/L}$)	490	1,400
Zinc ($\mu\text{g/L}$)	6,000	22,000
Oil and grease (mg/L)	None visible	None visible
pH (S.U.)	7.2	6.7 to 8.2
Total Suspended Solids (mg/L)	800	3,100
Turbidity (NTU)	469	1,700

The source of these data was the study conducted by METRO (1992).

$\mu\text{g/L}$ = Micrograms per liter.

mg/L = Milligrams per liter.

NTU = Nephelometric turbidity units.

S.U. = Standard units.

Table 4. Summary of Seasonal Pressure-Washing Wastewater Monitoring Data for the Boatyard General Permit, 2011 through 2014

	June through Sept 2011				June through Sept 2012				June through Sept 2013				June through Sept 2014			
	Copper (Lim=2.4)	Lead (Lim=1.2)	Zinc (Lim=3.3)	pH (5.0-11.0)												
Number of Permittees with Monitoring Data	12	12	12	12	13	13	13	13	12	12	12	12	12	12	12	12
Number of Maximum and Single Sample Values	42	41	42	40	44	44	44	48	43	44	43	46	42	42	42	43
Median of Maximum and Single Sample Values (mg/L or S.U.)	0.58	0.0030	0.10	7.4	0.64	0.0020	0.12	7.1	0.27	0.0021	0.15	7.5	0.53	0.0033	0.16	7.1
Average of Maximum and Single Sample Values (mg/L or S.U.)	1.9	0.064	36	NA	183	9.8	50	NA	0.77	0.023	0.42	NA	0.76	0.043	0.63	NA
Number of Discharge Limit Excursions	4	0	2	3	7	2	4	1	4	0	1	0	1	0	1	1
Number of Permittees Who Exceeded the Limit	3	0	2	3	3	1	3	1	2	0	1	0	1	0	1	1
Number of pH Values Greater than 9.0	---	---	---	8	---	---	---	10	---	---	---	4	---	---	---	6
Number of Permittees with pH Values Greater than 9.0 (a)	---	---	---	3	---	---	---	3	---	---	---	3	---	---	---	3

Lim = Discharge Limit.
mg/L = Milligrams per liter.
S.U. = Standard units.
NA = Not applicable.

(a) = Only the following four Permittees reported pH values greater than 9.0:
WAG031047 = Platypus Marine, Inc.
WAG031027 = Port of Port Angeles Boatyard
WAG031006 = Port of Port Townsend
WAG030039 = Skyline Marina

Table 5. Selected Statistics for Pollutants in Stormwater Runoff from Boatyards Reported in Discharge Monitoring Reports

Monitoring Period Date Range (Notes)	Parameter	Number of Results	Average (ug/L)	Median (ug/L)	Maximum (ug/L)
1998 - 2002	Total Copper	na	na	410	na
2006 - 2008 (Excluding all values <1.0)	Total Copper	381	492	110	29,100
2006 - 2008	Oil & Grease	200	4,710	5,000	31,000
2006 - 2008	TSS	403	26,400	10,000	1,200,000
2008 - 2010 (Only boatyards without treatment)	Total Copper	239	192	72	5,650
2008 - 2010	Total Lead	133	20.6	4.0	550
2008 - 2010	Total Zinc	206	344	140	6,000
2011 - 2014	Total Copper	844	143	31.1	5,770
2011 - 2014	Total Lead	816	10.9	1.0	1,045
2011 - 2014 (Fresh waters only)	Total Lead	167	11.6	1.0	806
2011 - 2014	Total Zinc	845	157	49.0	5,100

na = Data are not available.

ug/L = Micrograms per liter.

TSS = Total suspended solids.

Table 6. Toxic Pollutants in Stormwater Runoff from Selected Boatyards, April and May 2006

Parameter (ug/L)	Water Quality Criteria (fresh water / marine)	Swantown (marine)		Port Townsend (marine)	Seaview (fresh water)
		04/08/06	04/13/06	05/23/06	04/08/06
1-Methylnaphthalene	na	0.06 U	2.9	0.06 U	0.19
2,4-Dimethylphenol	(380 / 850)	0.16	3	0.06 U	1.1
2-Methylnaphthalene	na	0.06 U	3.3	0.06 U	0.27
2-Methylphenol	na	0.19	0.54	0.07	1
2-Nitrophenol	na	0.25 J	0.25 U	0.26 U	0.26 U
4,6-Dinitro-2-methylphenol	na	0.59 J	0.63 U	0.64 U	0.64 U
4-Chloro-3-methylphenol	na	0.12 U	0.13 U	8.4	0.13 U
4-Methylphenol	na	0.85	0.06 U	1.2	3.1
Acenaphthene	(670 / 990)	0.06 U	0.11	0.06 U	0.22
Acenaphthylene	na	0.06 U	3.9	0.06 U	0.42
Anthracene	(9,600 / 110,000)	0.06 U	0.07	0.06 U	0.58
Benzo(a)anthracene	(0.0028 / 0.031)	0.06 U	0.05 J	0.14	0.24
Benzo(a)pyrene	(0.0028 / 0.031)	0.06 U	0.06 U	0.04 J	0.26
Benzo(b)fluoranthene	(0.0028 / 0.031)	0.06 U	0.05 J	0.2	0.39
Benzo(g,h,i)perylene	na	0.06 U	0.08	0.06 J	0.16
Benzo(k)fluoranthene	(0.0028 / 0.031)	0.06 U	0.07	0.15	0.4
Benzoic acid	na	5.8	1.3 U	0.74 J	1.3 U
Benzyl alcohol	na	0.64	0.13 U	0.13 UJ	4.5
bis(2-Ethylhexyl) phthalate	(1.8 / 5.9)	2.8	1.3 UJ	2.1	15
Butylbenzylphthalate	na	0.39	0.14	0.03 J	2.1
Caffeine	na	2.7	0.61	0.46	15
Carbazole	na	0.06 UJ	0.06 UJ	0.06 UJ	1.2 J
Chrysene	(0.0028 / 0.031)	0.07 J	0.08	0.26	0.82
Dibenzofuran	na	0.06 U	0.08	0.06 U	0.29
Diethylphthalate	na	0.28 J	0.05 J	0.09 J	1.2
Dimethylphthalate	(313,000 / 2,900,000)	1	0.22	0.68	13 E
di-N-Butylphthalate	na	2.6	0.54	0.16 J	4.3
Fluoranthene	(300 / 370)	0.12	0.35	0.42	2.4
Fluorene	(1,300 / 1,400)	0.06 U	0.29	0.06 U	0.33
Indeno(1,2,3-cd)pyrene	(0.0028 / 0.031)	0.06 U	0.06 U	0.05 J	0.12
Isophorone	(8.4 / 600)	0.06 U	0.06 U	0.06 U	0.35
Naphthalene	na	0.06 U	2.6	0.06 U	0.32
Phenanthrene	na	0.13	0.12	0.15	2.1
Phenol	(21,000 / 4,600,000)	0.84	0.55	0.29	4.6
Pyrene	(960 / 11,000)	0.1	0.63	0.38 J	1.3
Retene	na	0.08	0.06 U	0.06 U	0.58

The source of these data was the study conducted by Ecology in 2006 (Ecology Pub. No. 06-03-041).

E = Exceeds calibration range.

J = Estimated concentration.

na = None available.

U = Not detected at or above the reported value.

UJ = Not detected at or above the reported estimated value.

Table 7. Organotin in Stormwater Runoff from Selected Boatyards, April and May 2006

Parameter (ug/L)	Water Quality Criteria (freshwater / marine)	Swantown (marine)			Port Townsend (marine)	Seaview (freshwater)	
		04/08/06	04/13/06	05/31/06	05/23/06	04/08/06	05/23/06
Dibutyltin	na	0.041 J	0.002 UJ	0.033 J	0.010	0.064 J	0.10
Monobutyltin	na	0.001 UJ	0.001 UJ	0.012 J	0.006 J	0.001 UJ	0.014
Tributyltin	(0.460 / 0.37)	0.22	0.13	0.010 J	0.18 J	6.0	0.36

The source of these data was the study conducted by Ecology in 2006 (Ecology Pub. No. 06-03-041).

J = Estimated concentration.

na = None available.

UJ = Not detected at or above the reported estimated value.

Table 8a. Summary of Stormwater Runoff Monitoring Data for the Boatyard General Permit, To Fresh and Marine Waters, 2011 through 2015

	Oct 2011 through May 2012			Oct 2012 through May 2013			Oct 2013 through May 2014			Oct 2014 through May 2015			Four-Year Summary		
	Copper (BM=147)	Lead (Lim=185)	Zinc (BM=90)	Copper (BM=147)	Lead (Lim=185)	Zinc (BM=90)									
Number of Permittees with Numeric Monitoring Data	43	41	45	51	49	52	46	46	49	45	45	48	54	55	54
Number of Maximum or Single Sample Values	191	184	190	213	206	214	244	235	244	196	191	197	844	816	845
Median of Maximum and Single Sample Values (ug/L)	42.0	1.0	78	33.0	1.0	56	26.0	1.0	38	26.0	1.0	28	31.1	1.0	49.0
95th Percentile of Maximum and Single Sample Values (ug/L)	857	44	963	589	43	674	499	22	636	379	23	521	567	32	679
Average of Maximum and Single Sample Values (ug/L)	182	12	194	174	14	172	118	9.6	156	101	7.2	107	143	10.9	157
Number of Benchmark or Limit Excursions	49	3	85	45	3	79	49	1	84	34	1	56	177	8	304
Number of Permittees Who Exceeded the Benchmark or Limit	18	3	30	22	3	35	21	1	32	13	1	20	35	7	43
Percent of Values that Achieved the Benchmark or Limit	74%	98%	55%	79%	99%	63%	80%	100%	66%	83%	99%	72%	79%	99%	64%
Percent of Permittees that Achieved the Benchmark or Limit	58%	93%	33%	57%	94%	33%	54%	98%	35%	71%	98%	58%	35%	87%	20%
Number of Permittees Who Reported Seasonal Average Values	27	NA	27	31	NA	31	33	NA	33	13	NA	13	---	---	---
Correctly	4	NA	4	6	NA	5	4	NA	4	3	NA	2	---	---	---
Incorrectly	23	NA	23	25	NA	26	29	NA	29	10	NA	11	---	---	---
												Coefficient of Variation =	2.75	5.30	2.11

Table 8b. Summary of Stormwater Runoff Monitoring Data for the Boatyard General Permit, To Fresh Waters, 2011 through 2015

	Oct 2011 through May 2012			Oct 2012 through May 2013			Oct 2013 through May 2014			Oct 2014 through May 2015			Four-Year Summary		
	Copper (BM=147)	Lead (Lim=185)	Zinc (BM=90)	Copper (BM=147)	Lead (Lim=185)	Zinc (BM=90)									
Number of Permittees with Numeric Monitoring Data	10	9	12	12	11	14	11	10	13	10	10	12	13	11	15
Number of Maximum or Single Sample Values	43	39	50	50	47	57	49	46	56	35	35	40	177	167	203
Median of Maximum and Single Sample Values (ug/L)	50	0.80	52.6	26.7	1.29	61.4	17.9	1.0	20.2	23.7	1.5	14.6	22.8	1.0	31.5
95th Percentile of Maximum and Single Sample Values (ug/L)	1,485	34	514	1,064	81	483	109	19	461	106	10	450	386	30	511
Average of Maximum and Single Sample Values (ug/L)	239	7.6	155	225	26	182	45.4	6.5	93.2	31.6	3.4	68.7	140	11.6	128
Number of Benchmark or Limit Excursions	10	0	20	8	1	19	2	0	14	0	0	7	20	1	60
Number of Permittees Who Exceeded the Benchmark or Limit	3	0	7	3	1	6	2	0	6	0	0	2	6	1	9
Percent of Values that Achieved the Benchmark or Limit	77%	100%	60%	84%	98%	67%	96%	100%	75%	100%	100%	83%	89%	99%	70%
Percent of Permittees that Achieved the Benchmark or Limit	70%	100%	42%	75%	91%	57%	82%	100%	54%	100%	100%	83%	54%	91%	40%
												Coefficient of Variation =	3.87	5.59	2.15

Table 8c. Summary of Stormwater Runoff Monitoring Data for the Boatyard General Permit, To Marine Waters, 2011 through 2015

	Oct 2011 through May 2012			Oct 2012 through May 2013			Oct 2013 through May 2014			Oct 2014 through May 2015			Four-Year Summary			
	Copper (BM=147)	Lead (Lim=185)	Zinc (BM=90)	Copper (BM=147)	Lead (Lim=185)	Zinc (BM=90)										
Number of Permittees with Numeric Monitoring Data	33	32	32	39	38	38	35	36	36	35	35	36	40	41	41	
Number of Maximum or Single Sample Values	144	139	143	160	158	161	190	189	190	158	156	159	652	642	653	
Median of Maximum and Single Sample Values (ug/L)	38	1.0	81.0	34.2	1.0	57.0	34.1	1.0	48.0	27.8	0.80	34.0	33.3	1.0	53.4	
95th Percentile of Maximum and Single Sample Values (ug/L)	656	48	999	551	41	682	542	22	701	449	29	538	558	35	717	
Average of Maximum and Single Sample Values (ug/L)	148	14.2	215	157	10.9	173	134	10.3	177	113	8.1	116	138	10.8	169	
Number of Benchmark or Limit Excursions	36	3	68	34	2	64	44	1	72	31	1	49	145	7	253	
Number of Permittees Who Exceeded the Benchmark or Limit	15	3	23	19	2	29	19	1	26	13	1	18	28	6	36	
Percent of Values that Achieved the Benchmark or Limit	75%	98%	52%	79%	99%	60%	77%	99%	62%	80%	99%	69%	78%	99%	61%	
Percent of Permittees that Achieved the Benchmark or Limit	55%	91%	28%	51%	95%	24%	46%	97%	28%	63%	97%	50%	30%	85%	12%	
													Coefficient of Variation =	2.43	5.20	2.05

BM = Benchmark.

Lim = Discharge Limit.

ug/L = Micrograms per liter.

The total numbers of permittees and results were low because only about two-thirds of the permittees submitted monitoring data.

Therefore, the percentages of permittees and results that achieved their benchmark or limit may be biased high.

Table 9. Waterbodies in Western Washington Impaired by Boatyard-Related Pollutants

Water Resources Inventory Area	Water Body Name	Pollutant (in water or sediment)
1 - Nooksack	Bellingham Bay (Inner)	Copper, Lead, Zinc
1 - Nooksack	Fever Creek	Zinc
3 - Lower Skagit-Samish	Padilla Bay, Fidalgo Bay, and Guemes Channel	Copper, Lead, Zinc
3 - Lower Skagit-Samish	Rosario Strait	Copper
8 - Cedar-Sammamish	Lake Union / Lake Washington Ship Canal	Lead, Zinc
9 - Duwamish-Green	Des Moines Creek	Copper, Zinc
9 - Duwamish-Green	Des Moines Creek, East Tributary	Copper
9 - Duwamish-Green	Duwamish Waterway	Copper, Lead, Zinc
9 - Duwamish-Green	Hill (Mill) Creek	Copper
9 - Duwamish-Green	Massey Creek	Copper, Zinc
9 - Duwamish-Green	McSorley Creek	Copper
9 - Duwamish-Green	Newaukum Creek	Copper
10 - Puyallup-White	Hylebos Creek, East Fork	Copper
12 - Chambers-Clover	Dalco Passage and East Passage	Copper, Lead, Zinc
13 - Deschutes	Budd Inlet (Inner)	Copper, Lead, Zinc
15 - Kitsap	Hood Canal (North)	Copper, Lead, Zinc
15 - Kitsap	Port Gamble Bay	Copper, Lead, Zinc
15 - Kitsap	Sinclair Inlet	Zinc
15 - Kitsap	Unnamed Creek (Trib to North Creek)	Lead
18 - Elwha-Dungeness	Port Angeles Harbor	Copper, Lead, Zinc

This list is based on the Washington State 2010 303(d) List, available at:
<http://www.ecy.wa.gov/programs/wq/303d/currentassessmt.html>.

Table 10. Reasonable Potential Calculation for Stormwater Runoff Discharges to Fresh Waterbodies in Western Washington, and Excluding Lake Union and the Lake Washington Ship Canal

Facility		Dilution Factors:							Acute	Chronic
		Aquatic Life							5.0	5.0
		Human Health Carcinogenic								5.0
Water Body Type	Freshwater	All Western WA		Not . . .	Human Health Non-Carcinogenic				5.0	
Rec. Water Hardness	57 mg/L	10-Yr	5-Yr	10-Yr	5-Yr	10-Yr	5-Yr	. . . Lk Union or Ship Canal		
Pollutant, CAS No. & NPDES Application Ref. No.		COPPER - 744058 6M Hardness dependent	COPPER - 744058 6M Hardness dependent	LEAD - 7439921 7M Dependent on hardness	LEAD - 7439921 7M Dependent on hardness	ZINC- 7440666 13M hardness dependent	ZINC- 7440666 13M hardness dependent			
Effluent Data	# of Samples (n)	177	177	167	167	203	203			
	Coeff of Variation (Cv)	3.87	3.87	5.59	5.59	2.15	2.15			
	Effluent Concentration, ug/L (Max. or 95th Percentile)	386	386	30	30	511	511			
	Calculated 50th percentile Effluent Conc. (when n>10)	22.8	22.8	1.0	1.0	31.5	31.5			
Receiving Water Data	90th Percentile Conc., ug/L	3.34	2.09	0.19	0.06	17.6	6.38			
	Geo Mean, ug/L	1.10	0.75	0.06	0.06	2.91	2.13			
Water Quality Criteria	Aquatic Life Criteria, ug/L	Acute	10.0196	10.0196	34.844	34.844	71.0818	71.0818		
		Chronic	7.02142	7.02142	1.35782	1.35782	64.9085	64.9085		
	WQ Criteria for Protection of Human Health, ug/L		1300	1300	-	-	-	-		
	Metal Criteria	Acute	0.681	0.340	0.233	0.216	0.613	0.752		
	Translator, decimal	Chronic	0.681	0.340	0.233	0.216	0.613	0.752		
	Carcinogen?		N	N	N	N	N	N		

Aquatic Life Reasonable Potential

Effluent percentile value		0.950	0.950	0.950	0.950	0.950	0.950
s	$s^2=\ln(CV^2+1)$	1.665	1.665	1.864	1.864	1.314	1.314
Pn	$Pn=(1-\text{confidence level})^{1/n}$	0.983	0.983	0.982	0.982	0.985	0.985
Multiplier		1.00	1.00	1.00	1.00	1.00	1.00
Max concentration (ug/L) at edge of...	Acute	55.245	27.920	1.550	1.344	76.729	81.958
	Chronic	55.245	27.920	1.550	1.344	76.729	81.958
Reasonable Potential? Limit Required?		YES	YES	YES	NO	YES	YES

Aquatic Life Limit Calculation

# of Compliance Samples Expected per month		4	4	4		4	4
LTA Coeff. Var. (CV), decimal		3.87	3.87	5.59		2.15	2.15
Permit Limit Coeff. Var. (CV), decimal		3.87	3.87	5.59		2.15	2.15
Waste Load Allocations, ug/L	Acute	36.7379	41.7379	173.46		285.009	329.889
	Chronic	21.7471	26.7471	6.0291		254.142	299.022
Long Term Averages, ug/L	Acute	3.05673	3.47275	12.9056		31.7974	36.8045
	Chronic	2.60032	3.19817	0.57893		48.5903	57.171
Limiting LTA, ug/L		2.60032	3.47275	0.57893		31.7974	36.8045
Metal Translator or 1?		0.68	0.34	0.23		0.61	0.75
Average Monthly Limit (AML), ug/L		13.7	36.5	9.5		149.4	140.9
Maximum Daily Limit (MDL), ug/L		45.9	122.8	33.4	No MDL	464.9	438.7

Human Health Reasonable Potential

s	$s^2=\ln(CV^2+1)$	1.66468	1.66468
Pn	$Pn=(1-\text{confidence level})^{1/n}$	0.983	0.983
Multiplier		0.02908	0.02908
Dilution Factor		5	5
Max Conc. at edge of Chronic Zone, ug/L		5.44	5.16
Reasonable Potential? Limit Required?		NO	NO

Human Health Limit Calculation

# of Compliance Samples Expected per month	
Average Monthly Effluent Limit, ug/L	
Maximum Daily Effluent Limit, ug/L	

References:

WAC 173-201A.

Technical Support Document for Water Quality-based Toxics Control, US EPA, March 1991, EPA/505/2-90-001, pages 56/99

Table 11. Reasonable Potential Calculation for Stormwater Runoff Discharges to Marine Waterbodies

Facility		Dilution Factors:						Acute	Chronic	
		Aquatic Life						5.0	5.0	
Water Body Type		Marine						Human Health Carcinogenic		5.0
Rec. Water Hardness		mg/L						Human Health Non-Carcinogenic		5.0
Pollutant, CAS No. & NPDES Application Ref. No.		10-Yr	5-Yr	10-Yr	5-Yr	10-Yr	5-Yr			
		COPPER - 744058 6M Hardness dependent	COPPER - 744058 6M Hardness dependent	LEAD - 7439921 7M Dependent on hardness	LEAD - 7439921 7M Dependent on hardness	ZINC- 7440666 13M hardness dependent	ZINC- 7440666 13M hardness dependent			
Effluent Data	# of Samples (n)	652	652	642	642	653	653			
	Coeff of Variation (Cv)	2.43	2.43	5.20	5.20	2.05	2.05			
	Effluent Concentration, ug/L (Max. or 95th Percentile)	558	558	35	35	717	717			
	Calculated 50th percentile Effluent Conc. (when n>10)	33.3	33.3	1.0	1.0	53.4	53.4			
Receiving Water Data	90th Percentile Conc., ug/L	3.00	0.63	0.50	0.01	10.0	0.72			
	Geo Mean, ug/L	0.67	0.40	0.029	0.003	1.65	0.45			
Water Quality Criteria	Aquatic Life Criteria, Acute ug/L	4.8	4.8	210	210	90	90			
	Aquatic Life Criteria, Chronic ug/L	3.1	3.1	8.1	8.1	81	81			
	WQ Criteria for Protection of Human Health, ug/L	-	-	-	-	-	-			
	Metal Criteria Acute Translator, decimal	0.767	0.782	0.442	0.501	0.863	0.914			
	Metal Criteria Chronic Translator, decimal	0.767	0.782	0.442	0.501	0.863	0.914			
	Carcinogen?	N	N	N	N	N	N			

Aquatic Life Reasonable Potential

Effluent percentile value		0.950	0.950	0.950	0.950	0.950	0.950		
s	$s^2=\ln(CV^2+1)$	1.390	1.390	1.826	1.826	1.284	1.284		
Pn	$Pn=(1-\text{confidence level})^{1/n}$	0.995	0.995	0.995	0.995	0.995	0.995		
Multiplier		1.00	1.00	1.00	1.00	1.00	1.00		
Max concentration (ug/L) at edge of...	Acute	87.997	87.775	3.494	3.511	131.754	131.644		
	Chronic	87.997	87.775	3.494	3.511	131.754	131.644		
Reasonable Potential? Limit Required?		YES	YES	NO	NO	YES	YES		

Aquatic Life Limit Calculation

# of Compliance Samples Expected per month		4	4			4	4		
LTA Coeff. Var. (CV), decimal		2.43	2.43	5.2	5.2	2.05	2.05		
Permit Limit Coeff. Var. (CV), decimal		2.43	2.43	5.2	5.2	2.05	2.05		
Waste Load Allocations, ug/L	Acute	12	21.48	1048	1049.98	410	447.12		
	Chronic	3.5	12.98	38.5	40.48	365	402.12		
Long Term Averages, ug/L	Acute	1.2433	2.22551	79.4072	79.5572	47.1675	51.43788		
	Chronic	0.60125	2.22977	3.84069	4.03821	72.8089	80.21344		
Limiting LTA, ug/L		0.60125	2.22551	3.84069	4.03821	47.1675	51.43788		
Metal Translator or 1?		0.77	0.78	0.44	0.50	0.86	0.91		
Average Monthly Limit (AML), ug/L		2.4	8.7			153.9	158.4		
Maximum Daily Limit (MDL), ug/L		7.6	27.5		No MDL	475.1	489.2		

Human Health Reasonable Potential

s	$s^2=\ln(CV^2+1)$								
Pn	$Pn=(1-\text{confidence level})^{1/n}$								
Multiplier									
Dilution Factor									
Max Conc. at edge of Chronic Zone, ug/L									
Reasonable Potential? Limit Required?									

Human Health Limit Calculation

# of Compliance Samples Expected per month									
Average Monthly Effluent Limit, ug/L									
Maximum Daily Effluent Limit, ug/L									

References: WAC 173-201A, Technical Support Document for Water Quality-based Toxics Control, US EPA, March 1991, EPA/505/2-90-001, pages 56/99

Table 12. Reasonable Potential Calculation for Stormwater Runoff Discharges to Lake Union and the Lake Washington Ship Canal

		Dilution Factors:		Acute	Chronic
Facility		Aquatic Life		1.0	1.0
Water Body Type	Freshwater	Human Health Carcinogenic			1.0
Rec. Water Hardness	40.3 mg/L	Lk Union & Ship Canal	Human Health Non-Carcinogenic		1.0
		3 Years	Dilution Factors are 1.0 due to 303(d) impaired listing.		
Pollutant, CAS No. & NPDES Application Ref. No.					
		LEAD - 7439921 7M			
		Dependent on hardness			
Effluent Data	# of Samples (n)		167		
	Coeff of Variation (Cv)		5.59		
	Effluent Concentration, ug/L (Max. or 95th Percentile)		30		
	Calculated 50th percentile Effluent Conc. (when n>10)		1.0		
Receiving Water Data	90th Percentile Conc., ug/L		0.03		
	Geo Mean, ug/L		0.03		
Water Quality Criteria	Aquatic Life Criteria, ug/L	Acute	23.7075		
		Chronic	0.92385		
	WQ Criteria for Protection of Human Health, ug/L		-		
	Metal Criteria Translator, decimal	Acute	0.305		
		Chronic	0.305		
	Carcinogen?		N		
Aquatic Life Reasonable Potential					
Effluent percentile value			0.950		
s	$s^2 = \ln(CV^2 + 1)$		1.864		
Pn	$Pn = (1 - \text{confidence level})^{1/n}$		0.982		
Multiplier			1.00		
Max concentration (ug/L) at edge of...	Acute		9.150		
	Chronic		9.150		
Reasonable Potential? Limit Required?			YES		
Aquatic Life Limit Calculation					
# of Compliance Samples Expected per month			4		
LTA Coeff. Var. (CV), decimal			5.59		
Permit Limit Coeff. Var. (CV), decimal			5.59		
Waste Load Allocations, ug/L	Acute		23.7075		
	Chronic		0.92385		
Long Term Averages, ug/L	Acute		1.76386		
	Chronic		0.08871		
Limiting LTA, ug/L			1.76386		
Metal Translator or 1?			0.31		
Average Monthly Limit (AML), ug/L			22.1		
Maximum Daily Limit (MDL), ug/L			77.7		
Human Health Reasonable Potential					
s	$s^2 = \ln(CV^2 + 1)$				
Pn	$Pn = (1 - \text{confidence level})^{1/n}$				
Multiplier					
Dilution Factor					
Max Conc. at edge of Chronic Zone, ug/L					
Reasonable Potential? Limit Required?					
Human Health Limit Calculation					
# of Compliance Samples Expected per month					
Average Monthly Effluent Limit, ug/L					
Maximum Daily Effluent Limit, ug/L					

References:

WAC 173-201A,

Technical Support Document for Water Quality-based Toxics Control, US EPA, March 1991, EPA/505/2-90-001, pages 56/

**Table 13. Comparison of Current Limits and Benchmarks for Stormwater Runoff with Proposed Limits and Benchmarks . . .
 . . . To Lake Union or the Lake Washington Ship Canal (a)**

Parameter	303(d) Listed?	Current Version		Bases for Proposed Limit or Benchmark	Proposed Version	
		Seasonal Average Benchmark (b)	Maximum Daily Limit or Benchmark		Seasonal Average Benchmark (b)	Maximum Daily Limit or Benchmark
Copper, Total (ug/L)	no	50	147 (benchmark)	Technology / Water quality	50	147 (benchmark)
Lead, Total (ug/L)	YES	not applicable	185 (limit)	NA / Water quality	not applicable	78 (limit)
Zinc, Total (ug/L)	no	85	90 (benchmark)	Technology / Technology	85	90 (benchmark)

. . . To All Other Freshwater Bodies (c)

Parameter	303(d) Listed?	Current Version		Bases for Proposed Benchmark	Proposed Version	
		Seasonal Average Benchmark (b)	Maximum Daily Benchmark		Seasonal Average Benchmark (b)	Maximum Daily Benchmark
Copper, Total (ug/L)	verify	50	147	Technology / Water quality	50	147
Lead, Total (ug/L)	verify	not applicable	not applicable	NA / NA	not applicable	not applicable
Zinc, Total (ug/L)	verify	85	90	Technology / Technology	85	90

. . . To Marine Waters

Parameter	303(d) Listed?	Current Version		Bases for Proposed Benchmark	Proposed Version	
		Seasonal Average Benchmark (b)	Maximum Daily Benchmark		Seasonal Average Benchmark (b)	Maximum Daily Benchmark
Copper, Total (ug/L)	no	50	147	Technology / Water quality	50	147
Lead, Total (ug/L)	no	not applicable	not applicable	NA / NA	not applicable	not applicable
Zinc, Total (ug/L)	no	85	90	Technology / Technology	85	90

**Table 13. Comparison of Current Limits and Benchmarks for Stormwater Runoff with Proposed Limits and Benchmarks . . .
 . . . To Groundwater**

Parameter	303(d) Listed?	Current Version		Bases for Proposed Limit	Proposed Version	
		Seasonal Average Limit (b)	Maximum Daily Limit		Seasonal Average Limit (b)	Maximum Daily Limit
Copper, Total (ug/L)	NA	1,000	1,000	Technology / Water quality	1,000	1,000
Zinc, Total (ug/L)	NA	1,020	1,020	Technology / Technology	1,020	1,020

. . . To Non-Delegated Publicly-Owned Treatment Works

Parameter	303(d) Listed?	Current Version		Bases for Proposed Limit	Proposed Version	
		Seasonal Average Limit (b)	Maximum Daily Limit (d)		Seasonal Average Limit (b)	Maximum Daily Limit (d)
Copper, Total (ug/L)	NA	not applicable	2,400	Technology / Water quality	not applicable	2,400
Lead, Total (ug/L)	NA	not applicable	1,200	NA / NA	not applicable	1,200
Zinc, Total (ug/L)	NA	not applicable	3,300	Technology / Technology	not applicable	3,300
pH (S.U.)	NA	not applicable	5.0 to 11.0	Technology / Technology	not applicable	5.0 to 11.0

- (a) Lake Union and the Lake Washington Ship Canal consist of the surface waters between the Fremont Avenue bridge on the west and the eastern end of the Montlake Cut, about 50 meters west of the University of Washington Canoe House.
 - (b) To determine the "seasonal average" for the purposes of only this general permit, calculate the arithmetic average of all the daily discharge concentrations determined during the entire wet season (October through May). The daily discharge is the arithmetic average measurement of the pollutant over a day. Averaging does not apply to pH, which must be reported as the highest and lowest values if more than one sample is taken in a day.
 - (c) "All Other Freshwater Bodies" excludes Lake Union and the Lake Washington Ship Canal.
 - (d) If the treatment works has more stringent limits, the more stringent limits apply.
- ug/L = Micrograms per liter.
 NA = Not applicable.
 S.U. = Standard units.

Table 14. Comparison of Proposed Discharge Limits and Benchmarks for Stormwater Runoff Discharges to Surface Waters with Recent Monitoring Data, 2011 through 2015

Type of Receiving Water and Parameter with the Proposed Maximum Daily Benchmark or Limit		Numerical Results						Permitted Boatyards . . .								
		October - May 2011 - 2013			October - May 2013 - 2015			October - May 2011 - 2015			October - May 2011 - 2013			October - May 2013 - 2015		
		Total	Greater than the Proposed Benchmark or Limit		Total	Greater than the Proposed Benchmark or Limit		Total	. . . Who Reported Numerical Results		Total	. . . Who Reported Numerical Results Greater than the Proposed Benchmark or Limit		Total	. . . Who Reported Numerical Results Greater than the Proposed Benchmark or Limit	
			Number	Percentage		Number	Percentage		Number	Percentage		Number	Percentage		Number	Percentage
Lake Union and the Lake Washington Ship Canal (a)	Copper, BM = 147 ug/L	20	3	15%	10	0	0%	6	2	33%	2	1	50%	1	0	0%
	Lead, Limit = 78 ug/L	10	0	0%	9	0	0%	6	1	17%	1	0	0%	1	0	0%
	Zinc, BM = 90 ug/L	11	9	82%	9	7	78%	6	2	33%	2	1	50%	1	1	100%
All Other Freshwater Bodies (b)	Copper, BM = 147 ug/L	82	15	18%	75	3	4%	18	11	61%	10	4	40%	10	3	30%
	Zinc, BM = 90 ug/L	96	30	31%	87	21	24%	18	13	72%	12	6	50%	12	5	42%
Marine Waters (c)	Copper, BM = 147 ug/L	304	70	23%	348	75	22%	47	41	87%	36	24	67%	38	21	55%
	Zinc, BM = 90 ug/L	304	132	43%	349	121	35%	47	41	87%	38	32	84%	38	27	71%

(a) = "Lake Union and the Lake Washington Ship Canal" includes all surface water bodies between the Fremont Avenue bridge on the west and the eastern end of the Montlake Cut, about 50 meters west of the University of Washington Canoe House.

(b) = "All other freshwater bodies" includes all freshwater bodies in Western Washington except Lake Union and the Lake Washington Ship Canal.

To date, only boatyards located in Western Washington have applied for and received coverage under the boatyard general permit.

(c) = Permittees identified the type of water body to which they discharged (fresh water or marine).

BM = Benchmark.

Table 15. Schedule for Monitoring Stormwater Runoff Discharges

Parameter	Units	Sampling Point	Minimum Sampling Frequency	Sample Type
Total Copper	µg/L	Consistent Location	One sample in October, November, January, April, and May	Grab or composite
Total Lead	µg/L	Consistent Location	One sample in October, November, January, April, and May	Grab or composite
Total Zinc	µg/L	Consistent Location	One sample in October, November, January, April, and May	Grab or composite
Visual Monitoring	na	Facility	Weekly	Visual

ug/L = Micrograms per liter.

na = Not applicable.

Table 16. Analytical Methods and Specifications

Parameter	Analytical Method (Accuracy)	Detection Limit (a)	Quantitation Level (b)
Total Copper	EPA 200.8 – ICP/MS (±0.1 mg/L)	0.4	2.0
Total Zinc	EPA 200.8 – ICP/MS (±0.1 mg/L)	0.5	2.5
Total Lead	EPA 200.8 – ICP/MS (±0.1 mg/L)	0.1	0.5
pH	SM 4500-H ⁺ B – Meter (±0.02 standard units)	na	na

Analytical methods are from “Methods for Chemical Analysis of Water and Wastes,” U.S. EPA, Environmental Monitoring Systems Laboratory – Cincinnati, EPA-600/4-020, Revised March 1983 and 1979; and “Precision and Recovery Statements for Methods for Measuring Metals,” Appendix D of 40 CFR Part 136.

(a) Detection Limit:

The minimum concentration of an analyte that can be measured and reported with a 99% confidence that the analyte concentration is greater than zero as determined by the procedure given in 40 CFR Part 136, Appendix B.

(b) Quantitation Level (the minimum level of quantitation or practical quantitation level):

- (1) The lowest level at which the entire analytical system must give a recognizable signal and acceptable calibration point for the analyte. It is equivalent to the concentration of the lowest calibration standard, assuming that the laboratory has used all method-specified sample weights, volumes, and cleanup procedures. The quantitation level is calculated by multiplying the method detection limit by 3.18 and rounding the result to the number nearest to $(1, 2, \text{ or } 5) \times 10^n$, where n is an integer. (64 FR 30417)
- (2) The smallest detectable concentration of analyte greater than the method detection limit where the accuracy (precision & bias) achieves the objectives of the intended purpose. (Report of the Federal Advisory Committee on Detection and Quantitation Approaches and Uses in Clean Water Act Programs, Submitted to the U.S. EPA December 2007)

APPENDIX A

ACRONYMS AND UNITS OF MEASURE

Acronym	Meaning
AKART	All known, available, and reasonable methods of prevention, control, and treatment
BAT	Best available technology economically achievable
BCT	Best conventional pollutant control technology
BMP	Best management practice
BPT	Best practicable control technology currently available
CFR	Code of Federal Regulations
CWA	Clean Water Act
DMR	Discharge monitoring report
Ecology	Washington State Department of Ecology
EIA	Economic Impact Analysis
EPA	Environmental Protection Agency
METRO	Municipality of Metropolitan Seattle
MSD	Marine sanitation device
NAICS	North American Industry Classification System
NMTA	Northwest Marine Trade Association
NPDES	National Pollutant Discharge Elimination System
PCHB	Pollution Control Hearings Board
POTW	Publicly-owned treatment works
PSA	Puget SoundKeepers Alliance
RCW	Revised Code of Washington State
SEPA	State Environmental Policy Act, RCW 43.21C
SIC	Standard Industrial Classification
SWPPP	Stormwater pollution prevention plan
TMDL	Total maximum daily load
TSD	Technical Support Document
TSS	Total suspended solids
WAC	Washington Administrative Code
WLA	Wasteload allocation

Unit of Measure	Meaning
cfm	Cubic feet per minute
Degree F	Degree Fahrenheit
mg/L	Milligrams per liter
µg/L	Micrograms per liter
S.U.	Standard units

APPENDIX B

(Reserved)

APPENDIX C

LEGAL BASES FOR BOATYARD PERMIT CONDITIONS

Ecology bases the terms and conditions of its NPDES general permits on State and Federal law and regulations. The summary below identifies each of the conditions in the boatyard general permit, describes their content, and cites the laws and regulations upon which they are based.

Special Condition S1 Permit Coverage Required

Identifies the activities, discharges, and facilities that require coverage by the permit; the discharges that are authorized or conditionally authorized under the permit; the geographic area covered by the permit; discharges and facilities excluded from coverage under the permit; and conditions and requirements for permit modification.

40 CFR Part 122.41 (f)
RCW 90.48.195
WAC 173-226-050 (2), (3), and (4)
WAC 173-226-070 (1) (d)
WAC 173-226-080 (1) (a), (d), and (j)
WAC 173-226-100 (2)
WAC 173-226-130 (5)

Special Condition S2 Discharge Limits

Identifies the standards and requirements for compliance with the permit, including discharge limits and other requirements for impaired waterbodies.

40 CFR Part 125.3
40 CFR Part 403
Chapter 173-201A WAC
WAC 173-226-070 (1), (2), (3), and (6) (a) and (c)
Chapter 173-303 WAC

Special Condition S3 Mandatory Best Management Practices

Identifies requirements for facility operation and maintenance, including operational restrictions that support compliance with the permit. This condition describes the 13 mandatory BMPs that are required at permitted boatyards for demonstrating that those boatyards have complied with AKART. These BMPs address the use of vacuum sanders, tidal grids, and paints and solvents; in-water maintenance and repair of vessels; management of solid residues, sacrificial anodes, chemicals, oils, and bilge water; decontamination of washing pads; discharge of sewage and gray water; and oversight of do-it-yourselfers.

40 CFR Part 122.2
40 CFR Part 122.41 (e)
RCW 90.48.555 (5) and (6)
WAC 173-201A-110
WAC 173-226-070 (1) (d) and (3) (d)

Special Condition S4 Compliance with Water Quality Standards

Identifies the applicable State standards for compliance with the permit, including those for surface and groundwater quality and sediment management.

40 CFR Part 131.36

RCW 90.48.010

Chapter 173-200 WAC

Chapter 173-201A WAC

Chapter 173-204 WAC

Special Condition S5 Non-Stormwater Miscellaneous Discharges

Identifies those non-stormwater discharges conditionally approved and the requirements for that approval.

WAC 173-226-070 (1) (d)

WAC 173-226-100 (2)

Special Condition S6 Monitoring Requirements

Identifies the required sampling and analytical procedures for monitoring the characteristics and toxicity of discharges; and requirements for effectiveness monitoring, visual inspections, and operational recordkeeping.

40 CFR Part 122.22

40 CFR Part 122.41 (j) (1) and (4)

40 CFR Part 136

Chapter 173-50 WAC

Chapter 173-205 WAC

WAC 173-226-090 (1) (a), (b), (c), (d), and (e); (4); and (5)

Special Condition S7 Response to Monitoring Results that Exceed Benchmarks

Identifies the required reporting and corrective actions to respond to benchmark exceedances.

40 CFR Part 122.41 (e) and (l) (5)

WAC 173-226-070

WAC 173-226-080 (1) (i) and (4)

Special Condition S8 Stormwater Pollution Prevention Plan

Identifies the requirement for and elements of a facility-specific stormwater pollution prevention plan.

40 CFR Part 122.26 (b) (14)

40 CFR Part 122.44 (k) and (s)

40 CFR Part 125.3

Chapter 90.48 RCW

WAC 173-226-070

Special Condition S9 Reporting and Recordkeeping Requirements

Identifies the results that the Permittee must record; and the requirements for engineering documentation, notification and posting, reporting, records retention, public access to information, coordination of inspections, and other reporting.

40 CFR Part 122.41(j) (2) and (3); (k); and (l) (1), (2), (4), (5), (6), and (7)

WAC 173-226-080 (1) (b) and (4)

WAC 173-226-090 (2) and (3) (a) and (b)

WAC 173-226-180 (4)

WAC 173-226-200 (3) (d)

Special Condition S10 Bypass

Identifies the types of permitted bypasses, the procedures that permittees must follow to maintain compliance with this permit, and Ecology’s possible responses to a bypass event.

40 CFR Part 122.41 (m)

RCW 90.48.120

WAC 173-201A-410

Special Condition S11 Solid Waste Management

Identifies the requirement for the permittee to properly manage solid wastes and prevent the release of leachate.

WAC 173-226-070 (3) (d)

WAC 173-226-100

Special Condition S12 Reporting for Zebra Mussel Control

Identifies notification, quarantine, and pump-out requirements for vessels carrying zebra mussels.

Chapter 77 RCW

Special Condition S13 Termination of Coverage under This Permit

Explains the process and requirements for a permittee to obtain approval from Ecology for terminating its coverage under this permit.

40 CFR Part 122.41 (f)

RCW 90.48.190

RCW 90.48.195

WAC 173-226-080 (3)

WAC 173-226-180 (5)

WAC 173-226-230 (1)

WAC 173-226-240

General Condition G1 Discharge Violations

Identifies the requirement that discharges and activities must comply with the terms and conditions of the permit.

WAC 173-226-080 (a), (d), and (j)

General Condition G2 Proper Operation and Maintenance

Identifies and expands on the requirement for proper operation and maintenance of treatment and control facilities.

- 40 CFR Part 122.41 (e)
- WAC 173-226-080 (1) (i)

General Condition G3 Right of Entry

Identifies Ecology’s right to enter the permittee’s property to inspect, collect samples, and review documents.

- 40 CFR Part 122.41 (i)
- RCW 90.48.090
- WAC 173-226-080 (1) (h)
- WAC 173-226-250 (2)

General Condition G4 Permit Coverage Revoked

Identifies the conditions when Ecology may revoke coverage under the permit.

- 40 CFR Part 122.41 (f)
- Chapter 43.21B RCW
- RCW 90.48.090
- RCW 90.48.190
- RCW 90.48.465
- Chapter 173-224 WAC
- WAC 173-226-130 (5)
- WAC 173-226-240

General Condition G5 General Permit Modification and Revocation

Identifies the conditions when the permit may be modified or revoked.

- 40 CFR Part 122.41 (f)
- RCW 90.48.190
- RCW 90.48.195
- Chapter 173-226 WAC

General Condition G6 Reporting a Cause for Modification

Identifies the conditions when the permit modification may be required and Ecology’s subsequent requirement for a new application for coverage from the permittee.

- 40 CFR Part 122.41 (f), and (l) (1)
- 40 CFR Part 122.62
- WAC 173-220-150 (1) (b)
- WAC 173-226-080 (1) (a), (b), and (d)

General Condition G7 Toxic Pollutants

Identifies requirements for compliance with the Clean Water Act.

- CWA Section 307(a)
- WAC 173-226-070

General Condition G8 Other Requirements of 40 CFR

Incorporates other requirements from Federal regulations.

40 CFR Part 122.41

40 CFR Part 122.42

General Condition G9 Compliance with Other Laws and Statutes

Identifies the requirement for the permittee to comply with other applicable statutes, ordinances, and regulations.

40 CFR Part 122.41

40 CFR Part 122.42

WAC 173-226-070 (3) and (5)

General Condition G10 Additional Monitoring

Identifies the possibility that Ecology may assign additional monitoring requirements.

CWA Section 308

40 CFR Part 122.41 (h)

General Condition G11 Payment of Fees

Identifies the requirement for the permittee to pay fees and Ecology's ability to take actions if fees are not paid.

RCW 90.48.160

RCW 90.48.465

Chapter 173-224 WAC

WAC 173-220-150 (1) (d) (viii)

General Condition G12 Removed Substances

Prohibits the discharge of pollutants removed during treatment.

40 CFR Part 125.3 (g)

RCW 90.48.010

RCW 90.48.080

WAC 173-220-130 (a)

General Condition G13 Requests to be Excluded from Coverage under a General Permit

Identifies how the permittee may be excluded from coverage under this general permit.

WAC 173-216-070

WAC 173-220-040

WAC 173-226-080 (3) and (4)

WAC 173-226-200 (7)

WAC 173-226-240 (4)

General Condition G14 Transfer of Permit Coverage

Identifies how the permittee might transfer permit coverage to another party.

40 CFR Part 122.41 (l) (3)

40 CFR Part 122.61

40 CFR Part 122.63 (d)

WAC 173-226-210

General Condition G15 Duty to Reapply

Identifies the requirement for the permittee to reapply for permit coverage before the current coverage expires.

- CWA Section 301
- 40 CFR Part 122.21 (d)
- 40 CFR Part 122.41 (b)
- RCW 90.48.170
- WAC 173-226-080 (2)
- WAC 173-226-200 (1), (3), and (4)
- WAC 173-226-220 (2)

General Condition G16 Penalties for Violating Permit Conditions

Identifies penalties for violating the terms and conditions of the permit.

- 40 CFR Part 122.41 (a) (2) and (3)
- RCW 90.48.140
- RCW 90.48.144
- WAC 173-226-250 (3), (4), and (5)

General Condition G17 Signatory Requirements

Identifies the requirements for who must sign and certify applications, reports, and other information provided to Ecology.

- 40 CFR Part 122.22
- 40 CFR Part 122.41 (k)
- WAC 173-226-090 (3) (b)
- WAC 173-226-200 (3) (d)

General Condition G18 Appeals

Identifies the types and methods of appealing the permit and its applicability to particular facilities.

- RCW 43.21(B)
- WAC 173-226 190

General Condition G19 Severability

Identifies the effect of invalidation of particular terms of the permit.

- RCW 90.48.904

General Condition G20 Reporting Other Information

Identifies the requirement for informing Ecology of new or corrected information.

- 40 CFR Part 122.41(h) and (l) (8)

General Condition G21 Duty to Comply

Identifies the requirement for the permittee to comply with all conditions of this permit, or face possible penalties for violating the Clean Water Act.

- 40 CFR Part 122.41 (a) and (l) (8)

APPENDIX D

PUBLIC INVOLVEMENT INFORMATION

Revising the Boatyard General Permit

The current boatyard NPDES and State waste discharge general permit was issued by the Washington State Department of Ecology (Ecology) on March 2, 2011. Ecology is now proposing to reissue the permit. This is notice of a draft permit available for public comment. The review and comment period will run from March 16, 2016, until 11:59 PM on April 29, 2016. Ecology will host two informational workshops and two public hearings on the draft permit. Oral comments may be given at the public hearing. Ecology will also accept written comments on the proposed draft permit and fact sheet.

Purpose of the Boatyard General Permit

The boatyard general permit provides coverage for industries located in Washington State that discharge stormwater from areas used to renew the bottom paint on boats. Under Federal and State water quality law (Federal Clean Water Act and State Water Pollution Control Act), a permit is required for the discharge of wastewater, including stormwater runoff. The proposed general permit addresses these legal requirements and controls the discharge of pollutants to protect surface water and groundwater quality in Washington State.

A general permit is similar to an individual wastewater discharge permit except that it covers a group of facilities with similar operations. It implements the Federal Clean Water Act and State Water Pollution Control Act in a single permit. Individual facilities that receive coverage under the general permit are required to comply with the terms and conditions of the permit. Currently, approximately 70 facilities are covered under the boatyard general permit.

Applying for a Boatyard General Permit

Facilities covered under the existing boatyard general permit and have made timely application for renewal will continue to be covered under the reissued permit.

Requesting Copies of the Draft Permit

Beginning March 16, 2016, you can request copies of the draft permit and fact sheet, or you can download copies from the following website:

<http://www.ecy.wa.gov/programs/wq/permits/boatyard/index.html>

Contact: Dena Jaskar
Department of Ecology
P.O. Box 47600
Olympia, Washington 98504-7600
Telephone: (360) 407-6401
FAX: (360) 407-6426
Email: Dena.Jaskar@ecy.wa.gov

Submitting Written and Oral Comments

Ecology will accept written and oral comments on the draft boatyard general permit and fact sheet. Written comments must be postmarked no later than 11:59 PM, April 29, 2016. Oral comments may be presented by attending and testifying at either one of the public hearings. Comments may be submitted by email if the commenter includes name, address, and telephone number in the comment email. Comments should reference specific permit text when possible.

Submit written comments, preferably by email, to:

James M. Maroncelli
Department of Ecology
P.O. Box 47600
Olympia, Washington 98504-7600
BoatyardGPCComments@ecy.wa.gov

Public Workshops and Hearings

Two public workshops and hearings on the draft general permit are scheduled to be held in April 2016. The purpose of the workshops is to explain the general permit, explain the changes from the previous permit, and answer questions in order to facilitate meaningful testimony during the hearings. The purpose of the hearings is to provide an opportunity for people to give formal oral testimony and comments on the proposed permit. Written comments will receive the same consideration as oral testimony. The public workshops and hearings will begin at the times shown below and will conclude when public testimony is completed.

The April 19, 2016, (1:00 PM) workshop and hearing will be held at:
Everett Community College – Corporate & Continuing Education Center
2333 Seaway Boulevard, Room #110
Everett, WA 98203
Map: <http://www.everettcc.edu/visitors/maps/ccec>

The April 20, 2016, (1:00 PM) workshop and hearing will be held at:
Ecology Headquarters Building
300 Desmond Drive SE
Lacey, Washington 98503
(360) 407-6000
Map: http://www.ecy.wa.gov/images/offices/map_hq_swro.pdf

Issuing the Final Boatyard General Permit

The final permit will be issued after Ecology receives and considers all public comments. If public comments cause a substantial change in the permit conditions from the original draft permit, another public notice of draft and comment period may ensue.

Ecology expects to issue the general permit on or about June 1, 2016, if there is no substantial change to the draft. It will be effective 30 days later on July 2, 2016. When issued, a copy of the notice of issuance and Ecology's responses to the comments will be sent to all persons who

submitted written comment or gave public testimony. The response to comments will also be posted on Ecology’s boatyard website at:
<http://www.ecy.wa.gov/programs/wq/permits/boatyard/index.html>.

Right to Appeal

Permittees and the public have a right to appeal this permit to the Pollution Control Hearings Board (PCHB) within 30 days of the date of issuance of the final permit. The appeal process is governed by Chapter 43.21B RCW and Chapter 371-08 WAC.

To appeal you must do the following within 30 days of the date of issuance of this permit:

- File your appeal and a copy of this permit with the PCHB (see addresses below). Filing means actual receipt by the PCHB during regular business hours.
- Serve a copy of your appeal and this permit on Ecology in paper form by mail or in person (see addresses below). Email is not accepted.

Commenters must also comply with other applicable requirements in Chapter 43.21B RCW and Chapter 371-08 WAC.

Street Addresses	Mailing Addresses
<p>Department of Ecology Attn: Appeals Processing Desk 300 Desmond Drive SE Lacey, WA 98503</p>	<p>Department of Ecology Attn: Appeals Processing Desk P.O. Box 47608 Olympia, WA 98504-7608</p>
<p>Pollution Control Hearings Board 1111 Israel Road SW Suite 301 Tumwater, WA 98501</p>	<p>Pollution Control Hearings Board P.O. Box 40903 Olympia, WA 98504-0903</p>

APPENDIX E
RESPONSES TO COMMENTS

To be added upon permit issuance.