

WAC 173-340-730 Surface water cleanup standards. (1) General considerations.

(a) Surface water cleanup levels shall be based on estimates of the highest beneficial use and the reasonable maximum exposure expected to occur under both current and potential future site use conditions. The classification and the highest beneficial use of a surface water body, determined in accordance with chapter 173-201A WAC, shall be used to establish the reasonable maximum exposure for that water body. Surface water cleanup levels shall use this presumed exposure scenario and shall be established in accordance with this section.

(b) In the event of a release of a hazardous substance to surface water from a site, a cleanup action that complies with this chapter shall be conducted to address all areas of the site where the concentration of the hazardous substances in the surface water exceeds cleanup levels.

(c) Surface water cleanup levels established under this section apply to those surface waters of the state affected or potentially affected by releases of hazardous substances from sites addressed under this chapter. The department does not expect that cleanup standards will be applied to stormwater runoff that is in the process of being conveyed to a treatment system.

(d) Surface water cleanup levels shall be established at concentrations that do not directly or indirectly cause violations of groundwater, soil, sediment, or air cleanup standards established under this chapter or other applicable state and federal laws. A site that qualifies for a Method C surface water cleanup level under this section does not necessarily qualify for a Method C cleanup level in other media. Each medium must be evaluated separately using the criteria applicable to that medium.

(e) The department may require more stringent cleanup levels than specified in this section where necessary to protect other beneficial uses or otherwise protect human health and the environment. Any imposition of more stringent requirements under this provision shall comply with WAC 173-340-702 and 173-340-708.

(2) Method A surface water cleanup levels.

(a) **Applicability.** Method A surface water cleanup levels may only be used at sites that qualify under WAC 173-340-704(1).

(b) **General requirements.** Method A surface water cleanup levels shall be at least as stringent as all of the following:

(i) Concentrations established under applicable state and federal laws, including the following requirements:

(A) All water quality criteria published in the water quality standards for surface waters of the state of Washington, chapter 173-201A WAC, as amended;

(B) Water quality criteria based on the protection of aquatic organisms (acute and chronic criteria) and human health published under section 304 of the Clean Water Act.

(C) National toxics rule (40 C.F.R. Part 131);

(ii) For surface waters that are classified as suitable for use as a domestic water supply under chapter 173-201A (excluding marine waters), concentrations derived using the methods specified in WAC 173-340-720 for drinking water beneficial uses; and

(iii) For a hazardous substance deemed an indicator hazardous substance for surface water under WAC 173-340-708(2) and for which there is no value in applicable state and federal laws, a concentration that does not exceed the natural background concentration or the

practical quantitation limit, subject to the limitations in this chapter.

(3) **Method B surface water cleanup levels.**

(a) **Applicability.** Method B surface water cleanup levels consist of standard and modified cleanup levels as described in this subsection. Either standard or modified Method B surface water cleanup levels may be used at any site.

(b) **Standard Method B surface water cleanup levels.** Standard Method B cleanup levels for surface waters shall be at least as stringent as all of the following:

(i) **Applicable state and federal laws.** Concentrations established under applicable state and federal laws, including the following requirements:

(A) All water quality criteria published in the water quality standards for surface waters of the state of Washington, chapter 173-201A WAC;

(B) Water quality criteria based on the protection of aquatic organisms (acute and chronic criteria) and human health published under section 304 of the Clean Water Act unless it can be demonstrated that such criteria are not relevant and appropriate for a specific surface water body or hazardous substance; and

(C) National toxics rule (40 C.F.R. Part 131);

(ii) **Environmental effects.** For hazardous substances for which environmental effects-based concentrations have not been established under applicable state or federal laws, concentrations that are estimated to result in no adverse effects on the protection and propagation of wildlife, fish, and other aquatic life. Whole effluent toxicity testing using the protocols described in chapter 173-205 WAC may be used to make this demonstration for fish and aquatic life;

(iii) **Human health protection.** For hazardous substances for which sufficiently protective, health-based criteria or standards have not been established under applicable state and federal laws, those concentrations that protect human health as determined by the following methods:

(A) **Noncarcinogens.** For surface waters that support or have the potential to support fish or shellfish populations, concentrations which are estimated to result in no acute or chronic toxic effects on human health as determined using Equation 730-1.

[Equation 730-1]

$$\text{Surface water cleanup level} = \frac{\text{RfD} \times \text{ABW} \times \text{UCF1} \times \text{UCF2} \times \text{HQ} \times \text{AT}}{(\text{ug/l}) \quad \text{BCF} \times \text{FCR} \times \text{FDF} \times \text{ED}}$$

Where:

RfD	=	Reference dose as specified in WAC 173-340-708(7) (mg/kg-day)
ABW	=	Average body weight during the exposure duration (70 kg)
UCF1	=	Unit conversion factor (1,000 ug/mg)
UCF2	=	Unit conversion factor (1,000 grams/liter)
BCF	=	Bioconcentration factor as defined in WAC 173-340-708(9) (liters/kilogram)
FCR	=	Fish consumption rate (54 grams/day)
FDF	=	Fish diet fraction (0.5) (unitless)
HQ	=	Hazard quotient (1) (unitless)
AT	=	Averaging time (30 years)
ED	=	Exposure duration (30 years)

(B) **Carcinogens.** For surface waters which support or have the potential to support fish or shellfish populations, concentrations that are estimated to result in an excess cancer risk less than or equal to one in one million (1×10^{-6}) as determined using Equation 730-2.

[Equation 730-2]

$$\text{Surface water cleanup level = } \frac{\text{RISK} \times \text{ABW} \times \text{AT} \times \text{UCF1} \times \text{UCF2}}{\text{CPF} \times \text{BCF} \times \text{FCR} \times \text{FDF} \times \text{ED}}$$

(ug/l)

Where:

CPF	=	Carcinogenic potency factor as specified in WAC 173-340-708(8) (kg-day/mg)
RISK	=	Acceptable cancer risk level (1 in 1,000,000) (unitless)
ABW	=	Average body weight during the exposure duration (70 kg)
AT	=	Averaging time (75 years)
UCF1	=	Unit conversion factor (1,000 ug/mg)
UCF2	=	Unit conversion factor (1,000 grams/liter)
BCF	=	Bioconcentration factor as defined in WAC 173-340-708(9) (liters/kilogram)
FCR	=	Fish consumption rate (54 grams/day)
FDF	=	Fish diet fraction (0.5) (unitless)
ED	=	Exposure duration (30 years)

(C) **Petroleum mixtures.** For noncarcinogenic effects of petroleum mixtures, a total petroleum hydrocarbon cleanup level shall be calculated using Equation 730-1 and by taking into account the additive effects of the petroleum fractions and volatile hazardous substances present in the petroleum mixture. As an alternative to this calculation, the total petroleum hydrocarbon cleanup levels in Table 720-1 may be used. Cleanup levels for other noncarcinogens and known or suspected carcinogens within the petroleum mixture shall be calculated using Equations 730-1 and 730-2. See Table 830-1 for the analyses required for various petroleum products to use this method; and

(iv) **Drinking water considerations.** For surface waters that are classified as suitable for use as a domestic water supply under chapter 173-201A WAC, concentrations derived using the methods specified in WAC 173-340-720 for drinking water beneficial uses.

(c) **Modified Method B surface water cleanup levels.** Modified Method B surface water cleanup levels are standard Method B surface water cleanup levels modified with chemical-specific or site-specific data. When making these adjustments, the resultant cleanup levels shall meet applicable state and federal laws and health risk levels required for standard Method B surface water cleanup levels. Changes to exposure assumptions must comply with WAC 173-340-708(10). The following adjustments may be made to the default assumptions in the standard Method B equations to derive modified Method B surface water cleanup levels:

(i) Adjustments to the reference dose and cancer potency factor may be made if the requirements in WAC 173-340-708 (7) and (8) are met;

(ii) Adjustments to the bioconcentration factor may be made if the requirements in WAC 173-340-708(9) are met;

(iii) Where a numeric environmental effects-based water quality standard does not exist, bioassays that use methods other than those specified in chapter 173-205 WAC may be approved by the department to

establish concentrations for the protection of fish and other aquatic life;

(iv) The toxicity equivalency factor procedures described in WAC 173-340-708(8) may be used for assessing the potential carcinogenic risk of mixtures of chlorinated dibenzo-p-dioxins, chlorinated dibenzofurans and polycyclic aromatic hydrocarbons; and

(v) Modifications incorporating new science as provided for in WAC 173-340-702 (14), (15) and (16).

(d) **Using modified Method B to evaluate surface water remediation levels.** In addition to the adjustments allowed under subsection (3)(c) of this section, adjustments to the reasonable maximum exposure scenario or default exposure assumptions are allowed when using a quantitative site-specific risk assessment to evaluate the protectiveness of a remedy. See WAC 173-340-355, 173-340-357, and 173-340-708 (3)(d) and (10)(b).

(4) **Method C surface water cleanup levels.**

(a) **Applicability.** Method C surface water cleanup levels consist of standard and modified cleanup levels as described in this subsection. Either standard or modified Method C cleanup levels may be approved by the department if the person undertaking the cleanup action can demonstrate that such levels are consistent with applicable state and federal laws, that all practicable methods of treatment have been used, that institutional controls are implemented in accordance with WAC 173-340-440, and that one or more of the conditions in WAC 173-340-706(1) exist.

(b) **Standard Method C surface water cleanup levels.** Method C cleanup levels for surface waters shall be at least as stringent as all of the following:

(i) **Applicable state and federal laws.** Concentrations established under applicable state and federal laws, including the requirements identified in subsection (3)(b)(i) of this section;

(ii) **Environmental effects.** For hazardous substances for which an environmental effects based concentration has not been established under applicable state or federal laws, those concentrations which are estimated to result in no significant adverse effects on the protection and propagation of wildlife, fish and other aquatic life. Whole effluent toxicity testing using the protocols described in chapter 173-205 WAC may be used to make this demonstration for fish and aquatic life;

(iii) **Human health protection.** For hazardous substances for which sufficiently protective, health-based criteria or standards have not been established under applicable state and federal laws, those concentrations which protect human health as determined by the following methods:

(A) **Noncarcinogens.** For surface waters that support or have the potential to support fish or shellfish populations, concentrations that are estimated to result in no significant acute or chronic toxic effects on human health and are estimated in accordance with Equation 730-1 except that the fish diet fraction shall be twenty percent (0.2);

(B) **Carcinogens.** For surface waters that support or have the potential to support fish or shellfish populations, concentrations for which the upper bound on the estimated excess cancer risk is less than or equal to one in one hundred thousand (1×10^{-5}) and are estimated in accordance with Equation 730-2 except that the fish diet fraction shall be twenty percent (0.2);

(C) **Petroleum mixtures.** Cleanup levels for petroleum mixtures shall be calculated as specified in subsection (3)(b)(iii)(C) of this section, except that the fish diet fraction shall be twenty percent (0.2); and

(iv) **Drinking water considerations.** For surface waters that are classified as suitable for use as a domestic water supply under chapter 173-201A WAC, concentrations derived using the methods specified for drinking water beneficial uses in WAC 173-340-720.

(c) **Modified Method C surface water cleanup levels.** Modified Method C surface water cleanup levels are standard Method C surface water cleanup levels modified with chemical-specific or site-specific data. The same limitations and adjustments specified for modified Method B in subsection (3)(c) of this section apply to modified Method C surface water cleanup levels.

(d) **Using modified Method C to evaluate surface water remediation levels.** In addition to the adjustments allowed under subsection (4)(c) of this section, adjustments to the reasonable maximum exposure scenario or default exposure assumptions are allowed when using a quantitative site-specific risk assessment to evaluate the protectiveness of a remedy. See WAC 173-340-355, 173-340-357, and 173-340-708 (3)(d) and (10)(b).

(5) **Adjustments to cleanup levels.**

(a) **Total site risk adjustments.** Surface water cleanup levels for individual hazardous substances developed in accordance with subsections (3) and (4) of this section, including those based on applicable state and federal laws, shall be adjusted downward to take into account exposure to multiple hazardous substances and/or exposure resulting from more than one pathway of exposure. These adjustments need to be made only if, without these adjustments, the hazard index would exceed one (1) and the total excess cancer risk would exceed one in one hundred thousand (1×10^{-5}). These adjustments shall be made in accordance with the procedures specified in WAC 173-340-708 (5) and (6). In making these adjustments, the hazard index shall not exceed one (1) and the total excess cancer risk shall not exceed one in one hundred thousand (1×10^{-5}).

(b) **Adjustments to applicable state and federal laws.** Where a cleanup level developed under subsection (2), (3) or (4) of this section is based on an applicable state or federal law and the level of risk upon which the standard is based exceeds an excess cancer risk of one in one hundred thousand (1×10^{-5}) or a hazard index of one (1), the cleanup level shall be adjusted downward so that the total excess cancer risk does not exceed one in one hundred thousand (1×10^{-5}) and the hazard index does not exceed one (1) at the site.

(c) **Natural background and PQL considerations.** Cleanup levels determined under subsections (2), (3) and (4) of this section, including cleanup levels adjusted under subsection (5)(a) and (b) of this subsection, shall not be set at levels below the practical quantitation limit or natural background concentration, whichever is higher. See WAC 173-340-707 and 173-340-709 for additional requirements pertaining to practical quantitation limits and natural background concentrations.

(d) **Nonaqueous phase liquid limitation.** For organic hazardous substances and petroleum hydrocarbons, the cleanup level shall not exceed a concentration that would result in nonaqueous phase liquid being present in or on the surface water. Physical observations of surface water at or above the cleanup level, such as the lack of a film,

sheen, discoloration, sludge or emulsion in the surface water or adjoining shoreline, may be used to determine compliance with this requirement.

(6) Point of compliance.

(a) The point of compliance for the surface water cleanup levels shall be the point or points at which hazardous substances are released to surface waters of the state unless the department has authorized a mixing zone in accordance with chapter 173-201A WAC.

(b) Where hazardous substances are released to the surface water as a result of groundwater flows, no mixing zone shall be allowed to demonstrate compliance with surface water cleanup levels. See WAC 173-340-720 (8)(d) for additional requirements for sites where contaminated groundwater is flowing into surface water.

(c) As used in this subsection, "mixing zone" means that portion of a surface water body adjacent to an effluent outfall where mixing results in dilution of the effluent with the receiving water. See chapter 173-201A WAC for additional information on mixing zones.

(7) Compliance monitoring.

(a) When surface water cleanup levels have been established at a site, sampling of the surface water shall be conducted to determine if compliance with the surface water cleanup levels has been achieved. Sampling and analytical procedures shall be defined in a compliance monitoring plan prepared under WAC 173-340-410. The sample design shall provide data that are representative of the site.

(b) The data analysis and evaluation procedures used to evaluate compliance with surface water cleanup levels shall be defined in a compliance monitoring plan prepared under WAC 173-340-410.

(c) Compliance with surface water cleanup standards shall be determined by analyses of unfiltered surface water samples, unless it can be demonstrated that a filtered sample provides a more representative measure of surface water quality.

(d) When surface water cleanup levels are based on requirements specified in applicable state and federal laws, the procedures for evaluating compliance that are specified in those requirements shall be used to evaluate compliance with surface water cleanup levels unless those procedures conflict with the intent of this section.

(e) Where procedures for evaluating compliance are not specified in an applicable state and federal law, compliance with surface water cleanup levels shall be evaluated using procedures approved by the department. Where statistical methods are used to evaluate compliance, the statistical methods shall be appropriate for the distribution of the hazardous substance sampling data. If the distribution of the hazardous substance sampling data is inappropriate for statistical methods based on a normal distribution, then the data may be transformed. If the distributions of individual hazardous substances differ, more than one statistical method may be required.

(f) Sampling and analysis of fish tissue, shellfish, or other aquatic organisms and sediments may be required to supplement water column sampling during compliance monitoring.

[Statutory Authority: Chapter 70.105D RCW. WSR 01-05-024 (Order 97-09A), § 173-340-730, filed 2/12/01, effective 8/15/01; WSR 91-04-019, § 173-340-730, filed 1/28/91, effective 2/28/91.]

Reviser's note: The brackets and enclosed material in the text of the above section occurred in the copy filed by the agency.