Ohio Administrative Code

Rule 3745-300-08 Generic numerical standards.

Effective: February 16, 2025

[Comment: For dates of non-regulatory governmentpublications, publications of recognized organizations and associations,federal rules, and federal statutory provisions referenced in this rule, seerule 3745-300-15 of the Administrative Code titled "Incorporation byreference - voluntary action program."]

(A) Generic numerical standards.

(1) Applicability.

(a) Generic numerical standards listed in this rule for hazardous substances and petroleum may be used to demonstrate compliance with applicable standards provided the exposure scenario for the property comports with land use and activity patterns used to derive the generic numerical standard. Generic numerical standards are provided for complete exposure pathways to petroleum releases [paragraph (B) of this rule], direct-contact with hazardous substances in soil [paragraph (C) of this rule], indoor air exposure due to vapor intrusion from environmental media to human receptors [paragraph (C)(4) of this rule], unrestricted potable use for hazardous substances in ground water [paragraph (D) of this rule], complete exposure pathways to human and ecological receptors from surface water and sediment [paragraphs (F), (G), and (H) of this rule]. The appendices to this rule provide the generic numerical standards.

(b) Applicable standards shall be derived in accordance with rule 3745-300-09 of the Administrative Code if the criteria in paragraphs (A)(2) and (A)(3) of rule 3745-300-09 of the Administrative Code are met. Demonstration of compliance with applicable standards at a property may be made with a combination of generic numerical standards in accordance with this rule and standards developed through a property-specific risk assessment in accordance with rule 3745-300-09 of the Administrative Code or any other applicable standards.

(c) If radioactive materials are identified at a property, the property may be subject to the Atomic

Energy Act and regulations adopted thereunder and Chapters 3701. and 3747. of the Revised Code and rules adopted thereunder. If radionuclides or radioactive materials are present at a property, the volunteer shall contact the Ohio department of health's bureau of environmental health and radiation protection regarding the cleanup of the radionuclides or radioactive material. Remedy approval by the Ohio department of health is considered sufficient to meet applicable standards for radionuclides or radioactive materials for the voluntary action and may be considered a generic numerical standard.

(2) Assumptions. The following assumptions apply for all generic numerical standards except for the generic direct-contact soil standards for petroleum described in paragraph (B) of this rule, direct-contact soil standards for lead described in paragraph (C)(3)(a)(v) of this rule, the generic unrestricted potable use standards based on maximum contaminant levels or other regulatory established criteria described in paragraph (D) of this rule, and potable use standards for petroleum described in paragraph (D)(3)(a) of this rule:

(a) Single chemical. The generic numerical standards assume a single COC is present within an identified area.

(i) Hazardous substances shall not exceed the following risk and hazard levels:

(a) The single chemical generic standards for hazardous substances that have carcinogenic effects are based on a cancer risk level of one excess cancer in a population of one hundred thousand (1×10^{-5}).

(b) The single chemical generic standards for hazardous substances that have non-carcinogenic effects are based on a hazard index of one.

(ii) As determined in accordance with paragraph (F)(6) of rule 3745-300-07 of the Administrative Code, the concentration of a COC shall not exceed the single chemical generic standard for that chemical.

(b) Cumulative adjustment for multiple chemicals.

(i) When more than one COC is present in each media within an identified area and an applicable

generic standard for each of the COCs is in this rule, the standard for each COC shall be adjusted for the presence of multiple chemicals to meet the risk and hazard levels described in paragraph (A)(2)(a) of this rule within each identified area.

(ii) All final cumulative human health carcinogenic risk and non-carcinogenic hazard levels are based on one significant figure.

(c) Summation of risk and hazard across complete exposure pathways.

(i) If more than one complete exposure pathway exists to each receptor population, the incremental cancer risk and hazard indices determined for each exposure pathway shall be summed to calculate a cumulative cancer risk and hazard index to each receptor population.

(ii) All final cumulative human health carcinogenic risk and non-carcinogenic hazard levels are based on one significant figure.

(d) Points of compliance. In accordance with paragraph (I) of rule 3745-300-07 of the Administrative Code, the volunteer shall comply with the applicable standards at all points of compliance at the property, for each environmental media and complete exposure pathway.

(B) Generic numerical standards for petroleum.

(1) Applicability. The generic numerical standards referenced in paragraph (B)(3) of this rule apply to all petroleum releases regardless of the source or how the petroleum was released after eligibility requirements in accordance with rule 3745-300-02 of the Administrative Code are met.

(2) Assumptions.

(a) The points of compliance for generic petroleum standards are identified in paragraph (I) of rule 3745-300-07 of the Administrative Code. In accordance with paragraph (I) of rule 3745-300-07 of the Administrative Code, the volunteer shall comply with the applicable standards at all points of compliance at the property for each environmental medium and complete exposure pathway.

(b) Cumulative adjustment for multiple chemicals and summation of risk across complete exposure pathways that are required for COCs on the property to comply with paragraphs (A)(2) and (E) of this rule may not necessarily apply for generic petroleum standards referenced in paragraph (B)(3) of this rule. Cumulative adjustment for multiple chemicals and summation of risk across complete exposure pathways to meet generic petroleum standards are required only when required by rules adopted under division (B) of section 3737.882 of the Revised Code.

(c) When ground water exceeds unrestricted potable use standards, ground water response requirements in accordance with rule 3745-300-10 of the Administrative Code shall be met. Properties with free product determined in accordance with paragraph (F)(11) of rule 3745-300-07 of the Administrative Code exceed applicable standards for unrestricted potable use of ground water.

(d) Direct-contact with free product exceeds applicable standards when free product is encountered within the points of compliance for soil as determined in accordance with paragraph (I)(1)(a) of rule 3745-300-07 of the Administrative Code.

(e) Restricted residential, commercial with high frequency child exposure, commercial, and industrial land use categories [as determined in accordance with paragraph (C)(2) of this rule] require implementation of institutional controls in accordance with paragraph (C)(2) of rule 3745-300-11 of the Administrative Code.

(3) Generic numerical standards for petroleum. The generic numerical standards for petroleum at residential, commercial, or industrial properties are the standards established in rules adopted under division (B) of section 3737.882 of the Revised Code, as provided in division (B)(1) of section 3746.04 of the Revised Code. The state fire marshal's bureau of underground storage tank regulations administers the rules adopted under division (B) of section 3737.882 of the Revised Code. Property-specific standards for petroleum may be developed in accordance with rule 3745-300-09 of the Administrative Code.

(C) Generic numerical standards for hazardous substances; direct-contact with soils and vapor intrusion to indoor air.

(1) Applicability.

(a) When generic direct-contact soil standards are applied, a volunteer shall select the land use or activity category consistent with the land use definitions in rule 3745-300-01 of the Administrative Code based on the property use, receptor populations, and pathways identified in accordance with paragraphs (E)(6) and (F)(1) of rule 3745-300-07 of the Administrative Code. The exposure factors used in the development of generic numerical standards are in Ohio EPA's "Support Document For the Development of Generic Numerical Standards and Risk Assessment Procedures." Generic direct-contact soil standards for commercial and industrial land uses are equal unless paragraph (C)(2)(b) of this rule or paragraph (B)(1)(b) of rule 3745-300-09 of the Administrative Code applies.

(b) Generic numerical standards for petroleum releases are identified in paragraph (B)(3) of this rule. The standards identified in paragraphs (C)(3) and (D) of this rule and provided in appendix A to this rule apply to releases of hazardous substances.

(2) Land use and activity categories. The generic direct-contact soil standards and vapor intrusion to indoor standards established in this rule are based upon the intended use of the property after the completion of a voluntary action. Standards applied to restricted residential, commercial with high frequency child exposure, commercial, and industrial land use categories require implementation of institutional controls in accordance with rule 3745-300-11 of the Administrative Code. Land use and activity categories shall be determined as follows, as the terms are defined in rule 3745-300-01 of the Administrative Code:

(a) Residential land use category.

(i) Unrestricted residential land use category.

(ii) Restricted residential land use category.

(b) Commercial land use with high frequency child exposure category.

(c) Commercial or industrial land use category.

(d) Construction activities.

(3) Generic numerical direct-contact soil standards.

(a) The generic direct-contact soil standards for carcinogenic and non-carcinogenic COCs are derived considering exposures that include ingestion of soil, dermal contact with soil, inhalation of volatile compounds in outdoor air, and the inhalation and ingestion of particulate emissions.

(i) The generic direct-contact soil standards for carcinogenic and non-carcinogenic COCs for residential land use categories are in table I of appendix A to this rule.

(ii) The generic direct-contact soil standards for carcinogenic and non-carcinogenic COCs for commercial land use with high frequency child exposure are in table II of appendix A to this rule.

(iii) The generic direct-contact soil standards for carcinogenic and non-carcinogenic COCs for commercial and industrial land use categories are in table III of appendix A to this rule.

(iv) The generic direct-contact soil standards for carcinogenic and non-carcinogenic COCs for the construction activities category are in table IV of appendix A to this rule.

(v) The lead standards in tables I, II, III, and IV of appendix A to this rule account for other factors and assumptions in addition to the carcinogenic or non-carcinogenic risk of lead. Therefore, the cumulative risk considerations in paragraph (A)(2) of this rule are not appropriate and need not be performed for lead.

(b) The soil saturation concentrations are calculated using the U.S. EPA recommended soil saturation equation in paragraph (H)(5) of rule 3745-300-09 of the Administrative Code. This equation is not recommended for compounds that are at solid phase at ambient soil temperatures. Therefore, no generic soil saturation values are calculated for those chemicals for which the melting point is greater than seventeen degrees Celsius. Further, soil saturation values are determined only for those chemicals for which physicochemical parameters used to derive the soil saturation concentrations could be verified. The volunteer may either use the soil saturation levels as listed in appendix A to this rule or may calculate a property-specific soil saturation concentration in place of the generic soil saturation in accordance with paragraph (H)(5) of 3745-300-09 of the Administrative Code.

(4) Generic numerical standards for indoor air due to vapor intrusion from environmental media are derived considering the exposure scenario and the chemical specific inhalation toxicity. Standards apply to indoor air only for chemicals that have volatilized from environmental media to indoor air. Concentrations of COCs in ground water or soil gas may be used to approximate indoor air concentrations through modeling conducted in accordance with rule 3745-300-07 of the Administrative Code.

(a) The standards for indoor air exposure due to vapor intrusion from environmental media for the residential land use category are in table V of appendix A to this rule.

(b) The standards for indoor air exposure due to vapor intrusion from environmental media for the commercial land use with high frequency child exposure category are in table VI of appendix A to this rule.

(c) The standards for indoor air exposure due to vapor intrusion from environmental media for the commercial or industrial land use categories are in table VII of appendix A to this rule.

(D) Generic unrestricted potable use standards for hazardous substances in ground water.

(1) Applicability.

(a) The generic unrestricted potable use standards in paragraph (D)(3) of this rule apply as determined in accordance with rule 3745-300-10 of the Administrative Code.

(b) The standards in paragraph (D)(3) of this rule apply to releases of hazardous substances. Generic numerical standards for petroleum releases are identified in paragraph (B)(3) of this rule.

(2) Assumptions. The generic unrestricted potable use standards in tables VIII and IX of appendix A to this rule are determined using the assumption that the ground water on or from the property will be used as a source of water for drinking, cooking, showering, and bathing.

(3) Generic unrestricted potable use standards for ground water.

(a) The generic unrestricted potable use standards for petroleum at commercial, industrial, and residential properties are the standards established in rules adopted under division (B) of section 3737.882 of the Revised Code, as provided by division (B)(1) of section 3746.04 of the Revised Code.

(b) The generic unrestricted potable use standards based on maximum contaminant levels or other regulatory established criteria are in table VIII of appendix A to this rule. COCs in table VIII of appendix A to this rule need not be included in the cumulative adjustment for multiple chemicals.

(c) The generic risk-derived unrestricted potable use standards are in table IX of appendix A to this rule. COCs in table IX of appendix A to this rule shall be included in the cumulative adjustment for multiple chemicals.

(E) Procedures for cumulative adjustment for multiple chemicals. The following procedures may be used to meet the risk and hazard levels described in paragraph (A)(2)(a) of this rule when more than one COC is present in environmental media within an identified area:

(1) Several procedures may be used to adjust for the presence of multiple carcinogenic COCs in an identified area to comply with paragraph (A)(2)(b) of this rule. One method is to divide the exposure point concentration ($chem_a$) for each COC in the affected media by the "Single Chemical Carcinogenic Standard" ($SCCS_a$) in appendix A to this rule. The resultant ratios are summed as an expression of estimated risk (see equation 1). When the summed ratios result in a value less than or equal to one, at one significant figure in accordance with paragraph (A)(2)(b)(ii) of this rule, carcinogenic risk levels are met on the property for exposure to that media. When the summed ratios result in a value greater than one the carcinogenic risk levels are not met and remedial action is required.

Equation 1 - cumulative cancer risk ratio for affected media

$[(chem_a / SCCS_a) + (chem_b / SCCS_b) + ...]$ = cumulative cancer risk ratio

(2) Several procedures may be used to adjust for the presence of multiple non-carcinogenic COCs in an identified area to comply with paragraph (A)(2)(b) of this rule. One method is to divide the

exposure point concentration ($chem_a$) for each COC in the affected media by the "Single Chemical Noncarcinogenic Standard" ($SCNS_a$) in appendix A to this rule. The resultant ratios are summed as an expression of estimated hazard index (see equation 2). When the summed ratios result in a value less than or equal to one at one significant figure in accordance with paragraph (A)(2)(b)(ii) of this rule, non-carcinogenic risk levels are met on the property. When the summed ratios result in a value greater than one the non-carcinogenic risk levels are not met and remedial action is required.

Equation 2 - cumulative noncancer risk ratio for affected media

$[(chem_a / SCNS_a) + (chem_b / SCNS_b) + ...]$ = cumulative noncancer risk ratio

Segregation of hazard indices. Hazard quotients for non-carcinogenic COCs which do not exhibit the same toxic endpoint may be segregated by critical effect and mechanism of action, in accordance with U.S. EPA's "Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual (Part A)" following a procedure, analogous to section 8.2.2 of the document, rather than being aggregated into one cumulative non-cancer risk ratio. A written justification for this approach should be submitted and approved by Ohio EPA prior to attempting to segregate hazard indices. The consideration of all major toxic endpoints and mechanisms of action shall include, at a minimum, those identified with the critical effect upon which the reference dose or reference concentration for each non-carcinogenic COC is based. The source for each reference dose and reference concentration for each non-carcinogenic chemical for which generic direct-contact soil standards are derived, are cited in Ohio EPA's "Support Document for the Development of Generic Numerical Standards and Risk Assessment Procedures." It may be necessary to calculate more than one cumulative non-cancer risk ratio for a property that results from the segregation of non-carcinogenic COCs based on toxic endpoints or mechanisms of action.

(3) For situations where a COC poses both carcinogenic and non-carcinogenic risks and a value for the COC is listed in both the "Standard for a Single Chemical Carcinogens" column and the "Standard for a Single Chemical Non-Carcinogens" column in the tables in appendix A to this rule, or an applicable single chemical carcinogen and non-carcinogen standard is determined in accordance with rule 3745-300-09 of the Administrative Code, the COC shall be included in the multiple carcinogenic chemical adjustment calculation under paragraph (E)(1) of this rule and the adjustment calculation for multiple non-carcinogenic chemicals under paragraph (E)(2) of this rule.

The single-chemical applicable standard for the COC is the lowest of the values determined using the equations in this paragraph or, if appropriate, the soil saturation concentration.

(F) Generic numerical standards for surface water.

(1) Applicability.

(a) The generic numerical standards for surface water in paragraph (F)(2) of this rule apply to a property in accordance with paragraph (F) of rule 3745-300-07 of the Administrative Code.

(b) For all releases of petroleum to surface water of the state, the generic petroleum standards are in paragraph (B) of this rule.

(2) Generic surface water standards.

(a) For all releases or source areas of hazardous substances on or from the property to surface waters of the state, surface water chemical concentrations shall be compared to the chemical criteria pursuant to Chapter 3745-1 of the Administrative Code. The outside mixing zone average criteria for human health and aquatic life and wildlife should be compared against ambient samples averaged over a thirty-day period. Single ambient samples shall not exceed the outside the mixing zone maximum or the outside the mixing zone average, if a thirty-day average is not obtained. If all chemical constituents are below the chemical criteria, then the surface water may be eliminated as an exposure medium. If chemical constituents exceed the chemical criteria, then the surface water shall be further assessed in accordance with rule 3745-300-09 of the Administrative Code. For the purposes of this rule, the generic numerical standards for surface water apply regardless of whether the release or source area of hazardous substances is a point source or nonpoint source.

(b) All regulated point source discharges of pollutants to surface waters of the state and any other regulated discharges that occur from or on the property shall comply with all permit and other applicable requirements of the Water Pollution Control Act, Chapter 6111. of the Revised Code, and the regulations adopted thereunder. The permit and other applicable requirements of point source discharges include, but are not limited to, the following:

(i) The national pollutant discharge elimination system permit issued pursuant to Chapter 3745-33 of the Administrative Code (also referred to as Ohio NPDES permits).

(ii) The water quality certification issued pursuant to Chapter 3745-32 of the Administrative Code.

(iii) A volunteer may obtain a consolidated standards permit for activities conducted in connection with a voluntary action which require permits from the director.

(c) Storm water associated with industrial activity that is discharged to surface waters of the state or is discharged through a separate municipal storm sewer system shall comply with the applicable requirements in 40 CFR 122.26.

(G) Generic numerical standards for human exposure to sediments.

(1) Applicability.

(a) For purposes of this rule and rule 3745-300-07 of the Administrative Code, human health exposure pathways to sediments are considered complete when the surface water which contains the sediments meets either of the following criteria:

(i) Produces or can produce a consistent supply of edible-sized fish and the COCs in the sediment are persistent, bioaccumulative, and toxic.

(ii) Is reasonably anticipated to support recreational activities such as wading, swimming, or boating.

(b) For all releases of petroleum on or from the property to surface waters of the state which contain sediments, the generic petroleum standards are in paragraph (B) of this rule.

(c) If the concentrations of COCs in sediment exceed the generic numerical standards for human exposure to sediment, the volunteer shall conduct a human health property-specific risk assessment following the methodology described in paragraph (D) of rule 3745-300-09 of the Administrative Code or conduct a remedy in accordance with 3745-300-11 of the Administrative Code.

(2) Generic numerical standards for human exposure to sediment.

(a) Generic direct-contact standards for sediments are the generic direct-contact soil standards for residential land use specified in table I of appendix A to this rule. Cumulative adjustment for multiple chemicals shall be evaluated in accordance with paragraph (A)(2)(b) of this rule.

(b) If COCs in sediment are persistent, bioaccumulative, and toxic, and the surface water that contains the sediments produces or can produce a consistent supply of edible-sized fish, the volunteer shall conduct a human health property-specific risk assessment in accordance with rule 3745-300-09 of the Administrative Code to evaluate fish consumption.

(H) Generic numerical standards for exposure of important ecological resources to sediments.

(1) Applicability. The volunteer shall do either of the following:

(a) Sample sediments directly and apply the applicable standards in accordance with paragraph (H)(2) of this rule.

(b) Demonstrate compliance with applicable standards in accordance with paragraph (F)(5) of rule 3745-300-09 of the Administrative Code.

(2) Generic numerical standards for exposure of important ecological resources to sediments. To apply applicable standards to sediments in accordance with paragraph (H)(1)(a) of this rule, the volunteer shall compare the concentration of COCs to one of the following ecological reference values:

(a) Ohio-specific sediment reference values by ecoregion in table I of appendix B to this rule.

(b) Consensus-based threshold effects concentration values from MacDonald, Ingersoll and Berger's "Development and Evaluation of Consensus-based Sediment Quality Guidelines for Freshwater Ecosystems" in table II of appendix B to this rule.

(3) If concentrations of COCs do not exceed the generic numerical standards identified pursuant to paragraph (H)(2) of this rule, then the applicable standards are met.

(4) The volunteer shall evaluate the sediments in accordance with paragraph (F) of rule 3745-300-09 of the Administrative Code, or conduct a remedy in accordance with rule 3745-300-11 of the Administrative Code if any of the following criteria apply:

(a) The sediments exceed applicable standards in accordance with this rule.

(b) The sediment samples were not compared to the sediment values in accordance with paragraph (H)(2) of this rule.

(I) Development of soil standards for leaching of COCs from soil to ground water.

(1) Applicability.

(a) Soil standards for leaching may be developed when one or more ground water zones are determined to meet unrestricted potable use standards and the potential for leaching of COCs from soil to ground water is determined to be a complete exposure pathway.

(b) Soil standards for leaching may be developed when one or more ground water zones are determined to exceed unrestricted potable use standards and the potential for leaching of COCs from soil to ground water is a complete exposure pathway that shall be evaluated in accordance with either of the following:

(i) Applicable ground water response requirements in paragraph (E) of rule 3745-300-10 of the Administrative Code.

(ii) A pathway completeness determination in paragraph (F)(1) of rule 3745-300-07 of the Administrative Code.

(2) Soil standards for leaching.

(a) Soil standards for leaching when the underlying ground water zone meets unrestricted potable use standards. Soil standards for leaching are the soil concentrations determined to be protective of the applicable ground water zone and shall not cause unrestricted potable use standards to be exceeded in the ground water zone as demonstrated in accordance with paragraph (F)(4)(a) of rule 3745-300-07 of the Administrative Code.

(b) Soil standards for leaching when the underlying ground water zone exceeds unrestricted potable use standards.

(i) Soil standards for leaching are the soil concentrations determined to be protective of the applicable ground water response requirements for the ground water zone as determined by rule 3745-300-10 of the Administrative Code.

(ii) Soil standards for leaching are the soil concentrations determined to be protective of any other applicable standard in ground water that shall be met in accordance with a pathway completeness determination and the demonstration of compliance with applicable standards.