

CHAPTER 250. ADMINISTRATION OF LAND RECYCLING PROGRAM

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Authority

The provisions of this Chapter 250 issued under sections 104(a), 301(c) and 303(a) of the Land Recycling and Environmental Remediation Standards Act (35 P.S. §§ 6026.104(a), 6026.301(c) and 6026.303(a); section 105(a) of the Solid Waste Management Act (35 P.S. § 6018.105(a)); and section 1917-A of The Administrative Code of 1929 (71 P.S. § 510-17), unless otherwise noted.

Source

The provisions of this Chapter 250 adopted August 15, 1997, effective August 16, 1997, 27 Pa.B. 4181, unless otherwise noted.

Cross References

This chapter cited in 25 Pa. Code § 78a.66 (relating to reporting and remediating spills and releases); and 25 Pa. Code § 287.101 (relating to general requirements for permit).

Subchapter A. GENERAL PROVISIONS

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§ 250.1. Definitions.

In addition to the words and terms defined in the act, the following words and terms, when used in this chapter, have the following meanings, unless the context clearly indicates otherwise:

ASTM—The American Society for Testing and Materials.

Act—The Land Recycling and Environmental Remediation Standards Act (35 P. S. §§ 6026.101—6026.909).

Agricultural purposes—Commercial agricultural activities, including, but not limited to, irrigation of crops, watering of livestock, and food production, processing or packaging.

Anisotropy—The variability of a physical property based on direction, for example, variation in permeability in relation to direction of groundwater flow.

Community water system—As defined in the Pennsylvania Safe Drinking Water Act (35 P.S. §§ 721.1—721.17), a public water system, which serves at least 15 service connections used by year-round residents or regularly serves at least 25 year-round residents.

EQL—Estimated quantitation limit—The lowest concentration that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions.

Enterprise zone—An area specially designated as an enterprise zone under requirements determined by the Department of Community and Economic Development.

Environmental covenant—A servitude, as set forth in a document prepared under 27 Pa.C.S. Chapter 65 (relating to Uniform Environmental Covenants Act), arising under an environmental response project which imposes activity and use limitations.

Environmental protection acts—Includes:

- (i) The Clean Streams Law (35 P.S. §§ 691.1—691.1001).
- (ii) The Municipal Waste Planning, Recycling and Waste Reduction Act (53 P.S. §§ 4001.101—4001.1904).
- (iii) The Hazardous Sites Cleanup Act (35 P.S. §§ 6020.101—6020.1305).
- (iv) The Low-Level Radioactive Waste Disposal Act (35 P.S. §§ 7130.101—7130.906).
- (v) The act of July 13, 1988 (35 P.S. §§ 6019.1—6019.6), known as the Infectious and Chemotherapeutic Waste Disposal Law.
- (vi) The Air Pollution Control Act (35 P.S. §§ 4001—4015).
- (vii) The Surface Mining Conservation and Reclamation Act (52 P.S. §§ 1396.1—1396.31).
- (viii) The Noncoal Surface Mining Conservation and Reclamation Act (35 P.S. §§ 3301—3326).
- (ix) The Dam Safety and Encroachments Act (32 P.S. §§ 693.1—693.27).
- (x) The Solid Waste Management Act (35 P.S. §§ 6018.101—6018.1003).
- (xi) Other State or Federal statutes relating to environmental protection or the protection of public health.

Habitats of concern—A habitat defined as one of the following:

- (i) Typical wetlands with identifiable function and value, except for exceptional value wetlands as defined in § 105.17 (relating to wetlands).
- (ii) Breeding areas for species of concern.
- (iii) Migratory stopover areas for species of concern.
- (iv) Wintering areas for species of concern.
- (v) Habitat for State endangered plant and animal species.
- (vi) Federal, State and local parks and wilderness areas, and areas designated as wild, scenic or recreational.
- (vii) Areas otherwise designated as critical or of concern by the Game Commission, the Fish and Boat Commission or the Department of Conservation and Natural Resources.

Heterogeneity—Nonhomogeneous structure, composition and physical properties.

MCL—Maximum contaminant level.

MDL—*Method detection limit*—The instrument-specific minimum measured concentration of a substance that can be reported with 99% confidence to be distinguishable from the method blank result.

MSC—Medium-specific concentration.

NIR—Notice of Intent to Remediate.

NPDES—*National Pollutant Discharge Elimination System*—The National system for the issuance of permits under section 402 of the Federal Clean Water Act (33 U.S.C.A. § 1342) including a state or interstate program which has been approved in whole or in part by the EPA.

PQL—*Practical quantitation limit*—The lowest limit that can be reliably achieved within specified limits of precision and accuracy under routine laboratory conditions for a specified matrix and based on quantitation, precision and accuracy, normal operation of a laboratory and the practical need in a compliance-monitoring program to have a sufficient number of laboratories available to conduct the analyses.

Property—A parcel of land defined by the metes and bounds set forth in the deed for that land.

Regulated discharge—A point or nonpoint source discharge subject to the permit or approval requirements of Chapters 91—96, 97 (reserved) and 102—105 and any diffuse surface or groundwater discharge to surface waters which has the potential to cause an exceedance of the water quality standards in Chapter 93 (relating to water quality standards).

Risk assessment—A process to quantify the risk posed by exposure of a human or ecological receptor to regulated substances. The term includes baseline risk assessment, development of site-specific standards and risk assessment of the remedial alternatives.

SIA—*special industrial area*—Property where there is no financially viable responsible person to perform remediation or property located within an enterprise zone, and where the property was used for industrial activity.

Secondary contaminants—A regulated substance for which a secondary MCL exists, and no lifetime health advisory level exists.

Site—The extent of contamination originating within the property boundaries and all areas in close proximity to the contamination necessary for the implementation of remediation activities to be conducted under the act.

Species of concern—Species designated as of special concern, rare, endangered, threatened or candidate by the Game Commission, the Fish and Boat Commission or the Department of Conservation and Natural Resources, if the species has not also been designated threatened or endangered by the Federal government.

TF—Transfer factor.

Volatile compound—A chemical compound with either a boiling point less than 200° centigrade at 1 atmosphere or a Henry's law constant greater than or equal to 1×10^{-5} atm–m³/mol and a molecular weight less than 200 g/mol, where:

atm = standard atmosphere

m³ = cubic meter

mol = mole

g = gram

g/mol = molar mass

Authority

The provisions of this § 250.1 amended under sections 104(a) and 303(a) of the Land Recycling and Environmental Remediation Standards Act (35 P.S. §§ 6026.104(a) and 6026.303(a)); and section 1920-A of The Administrative Code of 1929 (71 P.S. § 510-20).

Source

The provisions of this § 250.1 amended November 23, 2001, effective November 24, 2001, 31 Pa.B. 6395; amended January 7, 2011, effective January 8, 2011, 41 Pa.B. 230; amended November 19, 2021, effective November 20, 2021, 51 Pa.B. 7173. Immediately preceding text appears at serial pages (384211) to (384212) and (355261) to (355262).

§ 250.2. Application of remediation standards.

(a) This chapter provides remediation standards which shall be used whenever site remediation is voluntarily conducted or is required under environmental statutes in section 106 of the act (35 P. S. § 6026.106).

(b) A person who is required to perform a site remediation under an enforcement action of the Department shall meet the following:

(1) Select one or a combination of the background standards contained in Subchapter B (relating to background standard), Statewide health standards contained in Subchapter C (relating to Statewide health standards) and site-specific standards, contained in Subchapter D (relating to site-specific standards).

(2) Demonstrate compliance with the substantive, procedural and notice requirements of the act and this chapter.

(c) To qualify for liability protection under the act, a person conducting remediation shall comply with this chapter and the act. Administrative and procedural requirements for remediations in paragraphs (1) and (2) shall be used in lieu of those requirements listed in this chapter to qualify for liability protection under the act.

(1) Persons remediating sites placed on the Pennsylvania Priority List shall comply with the Hazardous Sites Cleanup Act (35 P. S. §§ 6020.101—6020.1305), except for the cleanup levels which are set by the act.

(2) Persons remediating releases from storage tanks regulated under the Storage Tank and Spill Prevention Act (35 P. S. §§ 6021.101—6021.2104) shall comply with the requirements of the corrective action process under the Storage Tank and Spill Prevention Act, except for the cleanup levels which are set by the act.

Cross References

This section cited in 25 Pa. Code § 250.201 (relating to scope).

§ 250.3. Management of contaminated media.

(a) Contaminated media removed for reuse, treatment or disposal shall be managed in accordance with the Solid Waste Management Act (35 P. S. §§ 6018.101—6018.1003), The Clean Streams Law (35 P. S. §§ 691.1—691.1001), the act of July 13, 1988 (P. L. 525, No. 93) (35 P. S. §§ 6019.1—6019.6), known as the Infectious and Chemotherapeutic Waste Law, the Air Pollution Control Act (35 P. S. §§ 4001—4015) and the regulations thereunder.

(b) The Department may waive procedural and operating requirements for onsite remediation activities based on a written demonstration of any of the criteria in section 902(b) of the act (35 P. S. § 6026.902).

§ 250.4. Limits related to PQLs.

(a) The PQLs shall be selected from the PQLs or EQLs specified by the EPA in the most current version of the EPA's drinking water or solid waste analytical methods.

(b) For regulated substances when PQLs or EQLs set by the EPA exceed an MCL or HAL or have a health risk that is greater (less protective) than the risk levels set in sections 303(c) and 304(b) and (c) of the act (35 P. S. §§ 6026.303(c) and 6026.304(b) and (c)) and for substances when no EQL has been established by the EPA, the PQL shall be established by the methodologies in paragraph (1) or (2).

(1) A level set by multiplying 3.18 by the published method detection limit (MDL) of the most recently approved EPA methodology.

(2) A level set by multiplying 3.18 by the instrument-specific MDL. If multiple instruments are used, then the PQL is set by averaging the instrument-specific MDLs and multiplying that value by 3.18.

(c) For regulated substances which have no limits related to PQLs identified in subsection (b)(1) or (2), a person shall demonstrate attainment under the site-specific standard or the background standard.

(d) When a minimum threshold MSC is used as a Statewide health standard, the minimum threshold MSC is the Statewide health standard regardless of whether it is higher or lower than a quantitation limit established by this section.

(e) Nothing in this section restricts the selection of valid and generally accepted methods to be used to analyze samples of environmental media.

Authority

The provisions of this § 250.4 amended under sections 104(a) and 303(a) of the Land Recycling and Environmental Remediation Standards Act (35 P. S. §§ 6026.104(a) and 6026.303(a)); and section 1920-A of The Administrative Code of 1929 (71 P. S. § 510-20).

Source

The provisions of this § 250.4 amended November 19, 2021, effective November 20, 2021, 51 Pa.B. 7173. Immediately preceding text appears at serial pages (382749) to (382750).

Cross References

This section cited in 25 Pa. Code § 250.701 (relating to scope).

§ 250.5. Public notice by applicant.

(a) Public notice under the background, Statewide health or site-specific standard and under a special industrial area cleanup shall be initiated by the applicant through an NIR. For remediations proposing the use of a site-specific standard or, for remediations under an SIA agreement, the public and the municipality where

the site is located shall be provided a 30-day period, in the NIR, in which the municipality may request to be involved in the development of the remediation and reuse plans for the site.

(b) The remedial investigation report, the risk assessment report and the cleanup plan, prepared under a site-specific remediation, may not be submitted to the Department until after the initial 30-day public and municipal comment period following the submission of the NIR has expired.

(c) The baseline environmental report, prepared under an SIA remediation, shall be submitted after the initial 30-day public and municipal comment period has expired.

(d) For areas not covered entirely by a nonuse aquifer areawide certification granted under § 250.303(f) (relating to aquifer determination; current use and currently planned use of aquifer groundwater), at the same time a request for a nonuse aquifer designation under the Statewide health standard is made to the Department, the remediator shall send notice to every municipality and community water supplier servicing the area requested for designation as nonuse under § 250.303(b). The notice must include a copy of the request for determination of nonuse aquifer submitted to the Department.

(e) Upon receipt of notice of a request for a nonuse aquifer designation, the municipality and community water supplier shall have 45 days to indicate to the Department and the remediator any information relevant to the requirements of § 250.303.

(f) Reasonable proof of the mailing of the municipal notices and arranging for the publication of newspaper notices, required under sections 302(e), 303(h), 304(n) and 305(c) of the act (35 P.S. §§ 6026.302(e), 6026.303(h), 6026.304(n) and 6026.305(c)), shall be submitted at the same time the NIR, plan or report is submitted to the Department. Examples of reasonable proof include:

(1) A copy of the letter to the municipality with a United States Postal Service Certified Mail Receipt, PS Form No. 3800.

(2) A copy of the proposed text of the newspaper notice and the anticipated publication date.

Authority

The provisions of this § 250.5 amended under sections 104(a) and 303(a) of the Land Recycling and Environmental Remediation Standards Act (35 P.S. §§ 6026.104(a) and 6026.303(a)); and section 1920-A of The Administrative Code of 1929 (71 P.S. § 510-20).

Source

The provisions of this § 250.5 amended November 23, 2001, effective November 24, 2001, 31 Pa.B. 6395; amended August 26, 2016, effective August 27, 2016, 46 Pa.B. 5655. Immediately preceding text appears at serial page (285758).

Cross References

This section cited in 25 Pa. Code § 250.303 (relating to aquifer determination; current use and currently planned use of aquifer groundwater).

§ 250.6. Public participation.

(a) The publication date of the summary of the NIR in a newspaper of general circulation in the area of the site shall initiate the 30-day public and municipal comment period during which the municipality can request to be involved in the development of the remediation and reuse plans for a site being remediated to a site-specific standard or for remediation at an SIA.

(b) The person proposing remediation shall be responsible for developing and implementing a public involvement plan if both of the following circumstances exist:

(1) The remediation involves a site-specific standard or an SIA cleanup.

(2) A municipality, through its official representatives, has requested, in writing, to be involved in the development of the remediation and reuse plans within the 30-day public and municipal comment period identified in the notice to the municipality and the newspaper notice.

(c) If a public involvement plan has been initiated, the person proposing remediation shall, at a minimum, include the following three measures in the plan to involve the public in the development and review of the remedial investigation report, risk assessment report, cleanup plan and final report:

(1) Provide public access at convenient locations for document review.

(2) Designate a single contact person to address questions from the community.

(3) Use a location near the remediation site for any public hearings and meetings that may be part of the public involvement plan.

(d) If a public involvement plan has been requested, the person proposing the remediation shall notify the Department and submit the plan to the municipality and the Department prior to its implementation.

Authority

The provisions of this § 250.6 amended under sections 104(a) and 303(a) of the Land Recycling and Environmental Remediation Standards Act (35 P.S. §§ 6026.104 and 6026.303(a)); and section 1920-A of The Administrative Code of 1929 (71 P.S. § 510-20).

Source

The provisions of this § 250.6 amended November 23, 2001, effective November 24, 2001, 31 Pa.B. 6395; amended November 19, 2021, effective November 20, 2021, 51 Pa.B. 7173. Immediately preceding text appears at serial page (382751).

§ 250.7. Fees.

(a) Resubmission of a cleanup plan, remedial investigation, risk assessment or final report will require payment of the appropriate fee identified in the act for each resubmission.

(b) The Department will disapprove a plan or report that is submitted without the appropriate fee.

(c) The Department may waive the fee for resubmission of a plan or report if the resubmission is related to correcting minor administrative or technical deficiencies. The fee waiver is limited to the following:

(1) One time for each plan or report to correct administrative deficiencies if the corrections are made within 15 days of notice of the deficiencies by the Department.

(2) One time for each plan or report to correct technical deficiencies if the corrections are made within 60 days of notice of the deficiencies by the Department.

Authority

The provisions of this § 250.7 amended under sections 104(a) and 303(a) of the Land Recycling and Environmental Remediation Standards Act (35 P.S. §§ 6026.104(a) and 6026.303(a)); and section 1920-A of The Administrative Code of 1929 (71 P.S. § 510-20).

Source

The provisions of this § 250.7 amended August 26, 2016, effective August 27, 2016, 46 Pa.B. 5655. Immediately preceding text appears at serial page (285759).

§ 250.8. Publication.

The Department will publish a notice of its final actions on plans and reports in the *Pennsylvania Bulletin*.

§ 250.9. Interaction with other environmental statutes.

(a) A release of a regulated substance at a solid waste facility which did not receive waste after September 7, 1980, shall be remediated in accordance with this chapter and the act.

(b) Nothing in this chapter affects the permitting, operation, design, performance or closure requirements under the environmental protection acts or regulations thereunder. The remediation standards as defined in Chapters 271 and 287 (relating to municipal waste management—general provisions; and residual waste management—general provisions), do not substitute for design and performance standards required under the solid waste management regulations. See Articles VIII and IX (relating to municipal waste; and residual waste management). In the case of hazardous waste facilities, remediations shall comply with requirements applicable under the Resource Conservation and Recovery Act (42 U.S.C.A. §§ 6901—6986).

(c) An unpermitted release or spill of a regulated substance at a permitted solid waste facility that is outside a disposal or processing unit, including surface impoundments, waste storage areas, associated piping and underlying containment systems, shall be remediated in accordance with this chapter and the act.

Authority

The provisions of this § 250.9 amended under sections 5(b) and 402 of The Clean Streams Law (35 P.S. §§ 691.5(b) and 691.402); section 302 of the Municipal Waste Planning, Recycling and Waste Reduction Act (53 P.S. § 4000.302); section 408(e) of the Pennsylvania Used Oil Recycling Act (58 P.S. § 408(e)); sections 1905-A, 1917-A and 1920-A of The Administrative Code of 1929 (71 P.S. §§ 510-5, 510-17 and 510-20); sections 104(a), 301(c) and 303(a) of the Land Recycling and Environmental Remediation Standards Act (35 P.S. §§ 6026.104(a), 6026.301(c) and 6026.303(a)); section 105(4) of the Waste Tire Recycling Act (35 P.S. § 6029.105(4)); sections 301 and 302 of the Radiation Protection Act (35 P.S. §§ 7110.301 and 7110.302); and the Vehicle Code, 75 Pa.C.S. § 4909(e).

Source

The provisions of this § 250.9 amended January 12, 2001, effective January 13, 2001, 31 Pa.B. 235. Immediately preceding text appears at serial page (233643).

§ 250.10. Measurement of regulated substances in media.

(a) For measuring regulated substances in soil and sediments, analyses shall be performed on a dry weight basis.

(b) For metals in soil, analyses shall be performed on total metals, except for hexavalent and trivalent chromium, which analyses shall be performed individually.

(c) For groundwater, samples for metals analysis shall be field filtered and field acidified in accordance with the most current version of the *Groundwater Monitoring Guidance Manual*, Department of Environmental Protection, 3610-BK-DEP1973.

(d) For groundwater where monitoring is being performed at a drinking water well, samples for metals analysis shall be field acidified and unfiltered in accordance with the most current version of *Land Recycling Program Technical Guidance Manual, Appendix A: Groundwater Monitoring Guidance*, Department of Environmental Protection, document number 261-0300-101, or in accordance with an alternative sampling method that accurately measures regulated substances in groundwater.

(e) For surface water, samples for metals analysis shall be field acidified in accordance with approved EPA analytical methods in § 16.102 (relating to approved EPA analytical methods and detection limits).

(f) For air, samples and analyses shall be performed in accordance with Chapters 131 and 139 (relating to ambient air quality standards; and sampling and testing).

Authority

The provisions of this § 250.10 amended under sections 104(a) and 303(a) of the Land Recycling and Environmental Remediation Standards Act (35 P.S. §§ 6026.104(a) and 6026.303(a)); and section 1920-A of The Administrative Code of 1929 (71 P.S. § 510-20).

Source

The provisions of this § 250.10 amended November 19, 2021, effective November 20, 2021, 51 Pa.B. 7173. Immediately preceding text appears at serial page (382753).

§ 250.11. Periodic review of MSCs.

The Department will review new scientific information that relates to the basis of the MSCs as it becomes available and will propose appropriate changes for the consideration of the EQB as necessary, but in no case more than 36 months after the effective date of the most recently promulgated MSCs.

Source

The provisions of this § 250.11 adopted January 7, 2011, effective January 8, 2011, 41 Pa.B. 230.

§ 250.12. Professional seal.

Reports submitted to satisfy this subchapter containing information or analysis that constitutes professional geologic or engineering work as defined by the Engineer, Land Surveyor and Geologist Registration Law (63 P.S. §§ 148—158.2) must be sealed by a professional geologist or engineer who is in compliance with that statute.

Authority

The provisions of this § 250.12 added under sections 104(a) and 303(a) of the Land Recycling and Environmental Remediation Standards Act (35 P.S. §§ 6026.104(a) and 6026.303(a)); and section 1920-A of The Administrative Code of 1929 (71 P.S. § 510-20).

Source

The provisions of this § 250.12 added November 19, 2021, effective November 20, 2021, 51 Pa.B. 7173.

Subchapter B. BACKGROUND STANDARD

Sec.

250.201. Scope.

250.202. Establishing background concentrations.

250.203. Points of compliance.

250.204. Final report.

Cross References

This subchapter cited in 25 Pa. Code § 250.2 (relating to application of remediation standards); 25 Pa. Code § 250.9 (relating to interaction with other environmental statutes); 25 Pa. Code § 250.703 (relating to general attainment requirements for soil); and 25 Pa. Code § 250.704 (relating to general attainment requirements for groundwater).

§ 250.201. Scope.

This subchapter sets forth requirements and procedures for a person selecting the background standard, as provided in § 250.2 (relating to application of remediation standards).

§ 250.202. Establishing background concentrations.

(a) Background concentrations shall be established based on a site characterization, as set forth in § 250.204(a)—(e) (relating to final report).

(b) The background concentrations shall be established using analysis of samples of regulated substances present at the property but not related to any release at the property. If all areas on the property are affected by a release, background shall be determined at points off the property in accordance with § 250.204(f)(7) and (8).

(c) Background concentrations shall be established by a methodology that is statistically valid and consistent with the methodology used to demonstrate attainment under Subchapter G (relating to demonstration of attainment).

Cross References

This section cited in 25 Pa. Code § 271.1 (relating to definitions); and 25 Pa. Code § 287.1 (relating to definitions).

§ 250.203. Points of compliance.

(a) For attainment of the background standard for groundwater, the point of compliance shall be throughout the contaminant plume, including areas of the plume that are outside the property boundary, as determined by the site characterization.

(b) For attainment of a background soil standard, the point of compliance shall be throughout the area of the soil that has become contaminated as a result of releases on the property.

(c) For attainment of a surface water quality standard, compliance shall be measured for point source discharges at the point of discharge in accordance with limits specified in the NPDES permit.

(d) For the emission of regulated substances to outdoor air, the point of compliance for any applicable air quality standard shall be as specified in the air quality regulations in Subpart C, Article III (relating to air resources).

Cross References

This section cited in 25 Pa. Code § 250.701 (relating to scope).

§ 250.204. Final report.

(a) For sites remediated under the background standard, the person conducting the remediation shall submit a final report to the Department which documents attainment of the selected standard. The final report shall include site characterization information in subsections (b)—(e). The site characterization shall be conducted in accordance with scientifically recognized principles, standards and procedures. The level of detail in the investigation, and the selected methods and analyses, that may include models, shall sufficiently define the rate of movement and the present and future extent and fate of contaminants to ensure continued attainment of the remediation standard. Interpretations of geologic and hydrogeologic data shall be prepared by a professional geologist licensed in this Commonwealth.

(b) As derived from specific knowledge of the subject property, historic use of the subject property or regulated substance usage information regarding the subject property, an appropriate number of sample locations should be investigated from the identified media of concern to characterize the nature and composition of the contaminants including the following:

- (1) Source characterization or development of a conceptual site model.
- (2) The vertical and horizontal extent of contamination within each media of concern.
- (3) The direction and rate of contaminant movement and fate and transport of all contaminants within each media of concern.
- (4) A determination of the appropriate remedial technology for each media of concern.

(c) Descriptions of sampling and decontamination methodologies and analytical quality assurance/quality control procedures should be included within a Sampling and Analysis Plan and Quality Assurance Plan. Copies of soil and geologic boring descriptions and as-built construction drawings of wells used for site characterization should be included in the report. Copies of laboratory analytical results and applicable laboratory quality control results should be included within the report, including historical data and data eliminated from consideration based on data validation protocols. Analytical results should be presented within the report in table form.

(d) If soil is determined to be a media of concern, the site characterization shall determine the relative location of soil samples necessary to characterize the horizontal and vertical extent of contamination based on factors such as hydraulic conductivity of the soils, heterogeneity of the soils and the nature of the contaminants. The horizontal and vertical extent of soil with concentrations of regulated substances above the selected standard shall be defined by an appropriate number of samples inside and outside of the area that exceeds the standard. Soil samples from the area with the anticipated highest levels of contamination shall be obtained, as appropriate, to determine the applicability of the proposed remedial action or handling and disposal requirements, or both, for that soil during remediation.

(e) If groundwater is determined to be a media of concern, the site characterization shall characterize the effects of a release on groundwater to adequately determine how naturally occurring physical and geochemical characteristics define the movement of groundwater and contaminants beneath the surface, including the delineation of the position of aquifers, as well as geologic units which inhibit groundwater flow. The site characterization shall meet the following conditions:

(1) If appropriate, the characterization shall consider the heterogeneity and anisotropy of aquifer materials based on hydraulic conductivity values (measured or published), and the effect of local and regional groundwater flow directions and any influence from pumping wells.

(2) Defining the horizontal extent of concentrations of regulated substances above the standard shall require more than one round of groundwater sampling from properly constructed and developed monitoring wells taken a sufficient number of days apart to yield independently valid results.

(3) When characterizing the vertical extent of groundwater contamination, the person shall perform more than one round of groundwater sampling and shall consider the specific gravity of the regulated substances identified in the groundwater in the site, and the potential for naturally occurring or induced downward vertical hydraulic gradients.

(4) When characterizing the vertical extent of groundwater contamination, properly constructed monitoring wells or nested monitoring wells should be utilized to focus groundwater sampling in zones of potential contaminant accumulation such as zones directly above a confining layer. Samples shall be taken a sufficient number of days apart to yield independently valid results.

(f) Final reports for the background standard shall include the following additional information:

(1) Descriptions of treatment, removal or decontamination procedures performed in remediation. The description shall include the methodology and analytical results used to direct the remediation and determine the cessation of remediation.

- (2) Descriptions of the sampling methodology and analytical results, including the appropriate statistical methodologies, which pertain to whether the remediation has attained the selected standard, following the requirements of Subchapter G (relating to demonstration of attainment).
- (3) Documentation of compliance with postremediation care requirements, if they are needed to maintain the selected standard.
- (4) All sampling data.
- (5) For fate and transport analyses, submission of the following information:
 - (i) The name and version of the analysis, a description of the analysis, and the name of the organization or person which developed the analysis, if modeling is used.
 - (ii) The site characterization data used in the analysis.
 - (iii) Any assumptions used in the analysis and justification for the assumptions.
 - (iv) Appropriate documentation of the quality assurance and quality control of the analysis.
 - (v) Documentation of the results of the analysis in appropriate figures and tables.
- (6) A summary of sampling methodology and analytical results that relate to the determination of the background concentration. The summary shall contain the following:
 - (i) For soil, the final report shall identify the background reference region within which all background samples were collected.
 - (ii) For groundwater, the final report shall identify background reference wells.
- (7) Documentation that background reference areas for soil meet the following criteria:
 - (i) The background reference region and background reference areas shall be free of contamination from any release at the site.
 - (ii) Sampling at the background reference area and the contaminated area shall be comparable and random.
 - (iii) A background reference area selected for comparison with a given contaminated area may not differ significantly from that contaminated area in physical, chemical or biological characteristics that might cause measurements in the background reference area and the contaminated area to differ.
- (8) Documentation that background reference groundwater concentrations have been determined at hydrogeologically upgradient points that characterize the groundwater flow onto the site that are not affected by any release at the property.
- (g) If engineering controls are needed to attain or maintain a standard, if institutional controls are needed to maintain a standard, if the fate and transport analysis indicates that the remediation standard may be exceeded at the point of

compliance in the future, or, if the remediation relies on natural attenuation, a postremediation care plan shall be documented in the final report. The plan shall include the following:

- (1) Reporting of any instance of nonattainment.
- (2) Reporting of measures to correct nonattainment conditions.
- (3) Monitoring on a quarterly basis, or as otherwise approved by the Department, that demonstrates the effectiveness of the remedy and periodic reporting of monitoring results and analysis.
- (4) Maintenance of records at the property where the remediation is being conducted for monitoring, sampling and analysis.
- (5) A schedule for operation and maintenance of the controls and submission of proposed changes.
- (6) If requested by the Department, documentation of financial ability to implement the remedy and the postremediation care plan.

Cross References

This section cited in 25 Pa. Code § 245.312 (relating to remedial action); 25 Pa. Code § 245.313 (relating to remedial action completion report); 25 Pa. Code § 250.202 (relating to establishing background concentrations); 25 Pa. Code § 250.312 (relating to final report); 25 Pa. Code § 250.411 (relating to final report); and 25 Pa. Code § 253.1 (relating to definitions).

Subchapter C. STATEWIDE HEALTH STANDARDS

Sec.

- 250.301. Scope.
- 250.302. Point of compliance.
- 250.303. Aquifer determination; current use and currently planned use of aquifer groundwater.
- 250.304. MSCs for groundwater.
- 250.305. MSCs for soil.
- 250.306. Ingestion numeric values.
- 250.307. Inhalation numeric values.
- 250.308. Soil to groundwater pathway numeric values.
- 250.309. MSCs for surface water.
- 250.310. Minimum threshold MSCs.
- 250.311. Evaluation of ecological receptors.
- 250.312. Final report.

Cross References

This subchapter cited in 25 Pa. Code § 250.2 (relating to application of remediation standards); 25 Pa. Code § 250.9 (relating to interaction with other environmental statutes); 25 Pa. Code § 250.602 (relating to risk assessment procedures); 25 Pa. Code § 250.603 (relating to exposure factors for site-specific standards); 25 Pa. Code § 250.605 (relating to sources of toxicity information); 25 Pa. Code § 250.703 (relating to general attainment requirements for soil); and 25 Pa. Code § 250.704 (relating to general attainment requirements for groundwater).

§ 250.301. Scope.

(a) This subchapter sets forth generic Statewide health standards as one of three remediation standards that a person may select. The Statewide health standards are concentrations of regulated substances associated with a specific environmental medium, and are designated as the MSCs. The values used to determine the MSCs are contained in Appendix A, Tables 1—4 and 6 and are the concentrations of regulated substances that shall be met to demonstrate attainment of a Statewide health standard. Appendix A, Table 5 presents the toxicological and physical parameters used to calculate the MSCs in Appendix A, Tables 1—4.

(b) This subchapter sets forth generic Statewide health standards for regulated substances determined by the EPA to be mutagens. Appendix A, Tables 1—4 contain Statewide health standards based upon the methodology for mutagens in §§ 250.306 and 250.307 (relating to ingestion numeric values; and inhalation numeric values) for the following substances classified as mutagens:

<i>Regulated Substance</i>	<i>CAS Number</i>
Acrylamide	79-06-1
Benzo[a]anthracene	56-55-3
Benzidine	92-87-5
Benzo[a]pyrene	50-32-8
Benzo[b]fluoranthene	205-99-2
Benzo[k]fluoranthene	207-08-9
Chromium (VI)	18540-29-9
Chrysene	218-01-9
Dibenzo[a,h]anthracene	53-70-3
Dibromo-3-chloropropane, 1,2-	96-12-8
Dichloromethane	75-09-2
Indeno[1,2,3-cd]pyrene	193-39-5
Methylene bis(2-chloroaniline), 4,4'-	101-14-4
Nitrosodiethylamine, N-	55-18-5
Nitrosodimethylamine, N-	62-75-9
Nitroso-N-ethylurea, N-	759-73-9
Trichloroethylene (TCE)	79-01-6
Trichloropropane, 1,2,3-	96-18-4
Vinyl chloride	75-01-4

(c) This subchapter sets forth minimum threshold MSCs for soil and ground-water that shall be met to demonstrate attainment of the Statewide health standards for regulated substances in Appendix A, Table 6. Minimum threshold MSCs are standards developed for regulated substances for which no chemical-specific toxicological data exist.

(d) For regulated substances which do not have an MSC for the relevant medium on Appendix A, Tables 1—4 or 6, the background standard or site-specific standard shall be met to qualify for a release of liability under the act.

Authority

The provisions of this § 250.301 amended under sections 104(a) and 303(a) of the Land Recycling and Environmental Remediation Standards Act (35 P.S. §§ 6026.104(a) and 6026.303(a)); and section 1920-A of The Administrative Code of 1929 (71 P.S. § 510-20).

Source

The provisions of this § 250.301 amended January 7, 2011, effective January 8, 2011, 41 Pa.B. 230; amended August 26, 2016, effective August 27, 2016, 46 Pa.B. 5655. Immediately preceding text appears at serial pages (356269) to (356270).

Cross References

This section cited in 25 Pa. Code § 250.306 (relating to ingestion numeric values); and 25 Pa. Code § 250.307 (relating to inhalation numeric values).

§ 250.302. Point of compliance.

(a) For attainment of the Statewide health standard for groundwater, the point of compliance is the property boundary that existed at the time the contamination was discovered. Statewide health standards shall be attained at and beyond the point of compliance. The Department may determine, in writing, a point of compliance beyond the property boundary to be appropriate if one of the following situations is demonstrated:

- (1) Structures are located on the property boundary which prohibit internal or external access for a drill rig.
- (2) The property is a small parcel of land with limited space for onsite monitoring wells.
- (3) It is not physically possible to monitor groundwater quality at the property boundary.
- (4) The downgradient property was owned by the same party at the time the contamination was discovered and the use of the groundwater on the downgradient property can be controlled to prevent unacceptable exposure.
- (5) For measuring compliance with the groundwater MSCs that apply to secondary contaminants.

(b) For attainment of the Statewide health standard for soil, the MSC as determined in § 250.305 (relating to MSCs for soil) shall be met at the specified depth.

(c) For the emission of regulated substances to outdoor air, the point of compliance for any applicable air quality standard shall be as specified in the air quality regulations.

Cross References

This section cited in 25 Pa. Code § 250.303 (relating to aquifer determination; current use and currently planned use of aquifer groundwater); and 25 Pa. Code § 250.701 (relating to scope).

§ 250.303. Aquifer determination; current use and currently planned use of aquifer groundwater.

(a) With the exception of seasonal, localized and hydrologically isolated perched systems under a property, all geologic formations or parts or groups of formations in this Commonwealth which are saturated are presumed to be aquifers for the purpose of applying the Statewide health standards. The term includes saturated residuum such as saprolite and other weathered rock strata or intervals developed from underlying bedrock and other saturated deposits overlying these formations to which the geologic formations are hydrologically connected.

(b) All groundwater in aquifers is presumed to be used or currently planned for use, unless determined otherwise by the Department under this section.

(1) The Department may determine, in writing, based on a demonstration by the person remediating a site identified in an NIR, that groundwater is not used or currently planned to be used, if:

(i) The public participation requirements of § 250.5 (relating to public notice by applicant) are met.

(ii) The requirements in subsection (c) are met within the site on the property and within a radius of 1,000 feet downgradient of the points of compliance plus any additional areas to which the contamination has migrated and might reasonably migrate at concentrations that exceed the MSC for groundwater used or currently planned to be used.

(2) Methods appropriate for determining current or currently planned future use may include door-to-door surveys, verifying community water system billing records and interviewing community water system suppliers with regard to their currently planned future groundwater use.

(c) The following requirements shall be met within the area described in subsection (b):

(1) No groundwater derived from wells or springs is used for drinking water or agricultural purposes.

(2) All downgradient properties are connected to a community water system.

(3) The area described in subsection (b) does not intersect a radius of 1/2 mile from a community water supply well source or does not intersect an area designated by the Department as a zone 2 wellhead protection area under Chapter 109 (relating to safe drinking water).

(4) At the time the nonuse aquifer determination request under subsection (b) is submitted to the Department, there are no existing documents developed by political subdivisions or community water system suppliers detailing the

implementation of groundwater resources development (that is, no currently planned future uses) in the area specified in subsection (b)(1)(ii).

(d) If the Department determines that groundwater is not used or currently planned to be used, the following requirements apply within the area identified in subsection (b):

(1) The requirements in § 250.309 (relating to MSCs for surface water).

(2) The ecological screening process identified in § 250.311 (relating to evaluation of ecological receptors).

(3) The remediator shall establish institutional controls to maintain the integrity of the nonuse aquifer determination, or include a postremediation care plan in the final report detailing the process of routinely assessing and reporting to the Department compliance with subsection (c).

(i) Postremediation care plan provisions shall be implemented through an environmental covenant to insure compliance with subsection (c).

(ii) Postremediation assessment and reporting requirements shall continue until the property owner can demonstrate that the MSC for groundwater in aquifers used or currently planned for use is not exceeded at the point of compliance, and fate and transport analysis shows that the MSC will not be exceeded at that point in the future.

(e) The MSCs for groundwater in an aquifer that is not used or currently planned for use, under § 250.304(d) (relating to MSCs for groundwater), shall be met at the points of compliance identified in § 250.302 (relating to point of compliance)

(f) A nonuse aquifer areawide certification obtained under this subsection may be used by the remediator to demonstrate that the requirements of subsection (c) are met.

(1) With or without the presence of an associated NIR, the Department may determine, in writing, based on a demonstration by a municipal authority or political subdivision, that groundwater is not used or currently planned to be used in a specific geographic area, if the following conditions exist:

(i) The municipal authority or political subdivision demonstrates that the requirements of subsection (c) are met in the specific geographic area.

(ii) Municipal ordinances are in effect that prohibit the use of groundwater from wells or springs for drinking water or agricultural purposes.

(iii) Municipal ordinances are in effect that require all water users to connect to a community water supply system.

(2) If the municipal ordinances relied upon to make the demonstration in paragraph (1) are amended or repealed, the political subdivision or municipal authority who requested the areawide designation shall notify the Department in writing within 30 days of the effective date of the amendment or repeal.

Authority

The provisions of this § 250.303 amended under sections 104(a) and 303(a) of the Land Recycling and Environmental Remediation Standards Act (35 P.S. §§ 6026.104(a) and 6026.303(a)).

Source

The provisions of this § 250.303 amended November 23, 2001, effective November 24, 2001, 31 Pa.B. 6395; amended January 7, 2011, effective January 8, 2011, 41 Pa.B. 230. Immediately preceding text appears at serial pages (285764) to (285766).

Cross References

This section cited in 25 Pa. Code § 245.313 (relating to remedial action completion report); 25 Pa. Code § 250.5 (relating to public notice by applicant).

§ 250.304. MSCs for groundwater.

(a) A person shall implement a remedy under the Statewide health standard that is protective of human health and the environment.

(b) The MSCs for regulated substances in groundwater are presented in Appendix A, Tables 1 and 2. The methodology used by the Department for calculating MSCs in groundwater is detailed in subsections (c)—(f).

(c) The MSCs for regulated substances contained in groundwater in aquifers used or currently planned to be used for drinking water or for agricultural purposes are the MCLs as established by the Department or the EPA in § 109.202 (relating to State MCLs, MRDLs and treatment technique requirements). For regulated substances where no MCL has been established, the MSCs are the Lifetime Health Advisory Levels (HAL) set forth in Drinking Water Standards and Health Advisories (DWSHA), EPA Office of Water Publication No. EPA 822-F-18-001 (March 2018 or as revised), except for substances designated in the DWSHA with cancer descriptor (L) “Likely to be carcinogenic to humans” or (L/N) “Likely to be carcinogenic above a specific dose but not likely to be carcinogenic below that dose because a key event in tumor formation does not occur below that dose.” New or revised MCLs or HALs promulgated by the Department or the EPA shall become effective immediately for any demonstration of attainment completed after the date the new or revised MCLs or HALs become effective.

(1) For regulated substances where neither an MCL nor a lifetime HAL has been established and for substances designated in the DWSHA with cancer descriptor (L) or (L/N), the MSCs are the lowest concentration calculated using the appropriate residential and nonresidential exposure assumptions and the equations in §§ 250.306 and 250.307 (relating to ingestion numeric values; and inhalation numeric values).

(2) If the Lifetime HAL for a substance designated in the DWSHA with cancer descriptor (L) or (L/N) is less than the MSC calculated under paragraph (1), then the Lifetime HAL shall be the MSC.

(d) For regulated substances contained in aquifers not used or currently planned to be used, the MSCs in Appendix A, Tables 1 and 2 are calculated by the following:

(1) For volatile organic regulated substances with an attenuation factor of less than 20, as calculated by the methodology in paragraph (7), ten times the

appropriate residential or nonresidential MSC for groundwater in aquifers used or currently planned to be used containing less than 2,500 mg/l total dissolved solids.

(2) For volatile organic regulated substances with an attenuation factor of greater than or equal to 20, as calculated by the methodology in paragraph (7), 100 times the appropriate residential or nonresidential MSC for groundwater in aquifers used or currently planned to be used containing less than 2,500 mg/l total dissolved solids.

(3) For semivolatile organic and inorganic regulated substances, regardless of the attenuation factor, 1,000 times the appropriate residential or nonresidential MSC for groundwater in aquifers used or currently planned to be used containing less than 2,500 mg/l total dissolved solids.

(4) For benzene, 100 times the appropriate residential or nonresidential MSC for groundwater in aquifers used or currently planned to be used containing less than 2,500 mg/l total dissolved solids.

(5) For regulated substances with no calculated attenuation factor because of a lack of data in Howard, P. H., R. S. Boethling, W. F. Jarais, W. M. Meylan and E. M. Michalenko. 1991. *Handbook of Environmental Degradation Rates*. Lewis Publishers, Inc., Chelsea, MI, the appropriate residential or nonresidential MSC for groundwater in aquifers used or currently planned to be used containing less than 2,500 mg/l total dissolved solids.

(6) For minimum threshold MSCs, 5 micrograms per liter in groundwater shall be used.

(7) The attenuation factor (AF) for an organic regulated substance shall be calculated according to the following formula:

$$AF = K \times KOC$$

Where:

$$K = \text{degradation coefficient} = \frac{0.693}{T_{1/2}}$$

$T_{1/2}$ —half-life of organic regulated substance in groundwater as reported in Howard, P. H., R. S. Boethling, W. F. Jarais, W. M. Meylan and E. M. Michalenko, 1991. *Handbook of Environmental Degradation Rates*. Lewis Publishers, Inc., Chelsea, MI.

KOC—organic carbon partitioning coefficient (see Appendix A, Table 5).

(e) If the groundwater in aquifers used or currently planned for use at the site has naturally occurring background total dissolved solids concentrations greater than 2,500 milligrams per liter, the Statewide health standard for a regulated substance dissolved in the groundwater may be adjusted by multiplying the MSC for groundwater in aquifers by 100. The adjusted Statewide health standard shall then be used in calculating the soil to groundwater pathway numeric value as specified in § 250.308 (relating to soil to groundwater pathway numeric values).

(f) In addition to the requirements in this section, the MSCs are further limited by solubility as identified in Appendix A, Table 5. The solubility limits are derived from the references in subsection (g), which are keyed to the numbers in Appendix A, Table 5. The following procedure was used to determine the appropriate solubility value for each regulated substance: where multiple sources are

cited in Appendix A, Table 5, the value for the solubility limit is the median of the values in the indicated references.

(1) Using the hierarchy established in subsection (g), the first two references were consulted. If the solubility values agreed within 5%, the selected value is the lower of the two values.

(2) If the values in step (1) did not agree within 5%, the next references in order were consulted until two values that did agree within 5% were found. The selected value is then the median of all the values consulted.

(3) If none of the values in all of the references in subsection (g) agreed within 5%, the selected value is the median of all values in all references.

(g) The references referred to in subsection (f) are:

(1) Lide, D. R., ed. 1996. *CRC Handbook of Chemistry and Physics*, 77th Edition. CRC Press.

(2) Budavari, S., ed. 1996. *The Merck Index*, 12th Ed. Merck and Co.

(3) Perry, R. H., et al. 1997. *Perry's Chemical Engineer's Handbook*, 7th ed. McGraw-Hill, New York.

(4) Howard, P. H. 1991. *Handbook of Environmental Fate and Exposure Data for Organic Chemicals. Vol. III Pesticides*, Lewis Publishers.

(5) Verschueren, K. 1977, *Handbook of Environmental Data on Organic Chemicals*, Van Nostrand Reinhold.

(6) MacKay, D., et al. 1997, *Illustrated Handbook of Physical-Chemical Properties and Environmental Fate for Organic Chemicals*, 5 Volumes. Lewis Publishers, New York.

(7) Montgomery, J. H. 1991, *Groundwater Chemicals Desk Reference*, Vol. II. Lewis Publishers and Montgomery, J. H., and L. M. Welkom. 1990, *Groundwater Chemicals Desk Reference Vol I*, Louis Publishers.

(8) Milne, G.W.A., ed. 1995, *CRC Handbook of Pesticides*, CRC Press, Inc.

(9) National Library of Medicine (Grateful Med), Hazardous Substances Databank.

(10) EPA.1994, *Superfund Chemical Data Matrix. Office of Solid Waste and Emergency Response*, EPA 540-R-94-009.

(11) Mabey, et al. 1982, *Aquatic Fate Process Data for Organic Priority Pollutants*, SRI. EPA Contract Nos. 68-01-3867, 68-03-2981.

(12) Yalkowsky, S.H. and R.M. Dannenfelser. 1992. *Aquasol Database of Aqueous Solubility*. Version 5. College of Pharmacy, University of Arizona—Tucson, AZ. PC Version.

(13) Estimate from Log Kow.

(14) Bennett, S.R., J.M. Bane, P.J. Benford, and R.L. Pyatt. 1984. *Environmental Hazards of Chemical Agent Simulants*. CRDC-TR-84055, Aberdeen Proving Ground, Md.

(15) Munro, N.B. et al. 1999. *The Sources, Fate, and Toxicity of Chemical Warfare Agent Degradation Products*. Environ. Health Perspect. 107(12): 933-4.

- (16) Monteil-Rivera, F., C. Groom, and J. Hawari. 2003. *Sorption and Degradation of Octahydro-1,3,5,7-Tetranitro-1,3,5,7-Tetrazocine in Soil*. Environ. Sci. Technol. 37:3878—3884.
- (17) Seidell, A. 1941. *Solubilities of Organic Compounds*. New York, NY: D. Van Nostrand Co. Inc.
- (18) Riddick, J. A., et al. 1986. *Organic Solvents; Physical Properties & Methods of Purification. Techniques of Chemistry*. 11th Edition. New York, NY: Wiley-Interscience.
- (19) ATSDR (Agency for Toxic Substances and Disease Registry). 2015. *Toxicological Profile for Perfluoroalkyls. Draft for Public Comment*. Agency for Toxic Substances and Disease Registry, Public Health Service, U.S. Department of Health and Human Services, Atlanta, GA. Accessed May 2016. <http://www.atsdr.cdc.gov/ToxProfiles/tp200.pdf>.
- (20) Hekster, F.M., R.W. Laane, and P. de Voogt. 2003. *Environmental and toxicity effects of perfluoroalkylated substances. Reviews of Environmental Contamination and Toxicology* 179:99—121.
- (21) HSDB (Hazardous Substances Data Bank). 2012. U.S. National Library of Medicine, Bethesda, MD. Accessed May 2016. <http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?HSDB>.
- (22) Kauck, E.A., and A.R. Diesslin. 1951. *Some properties of perfluorocarboxylic acids. Industrial & Engineering Chemistry Research* 43(10):2332—2334.
- (23) SRC (Syracuse Research Corporation). 2016. PHYSPROP Database. Accessed May 2016. <http://www.srcinc.com/what-we-do/environmental/scientific-databases.html>.
- (24) OECD (Organisation for Economic Co-operation and Development). 2002. *Hazard Assessment of Perfluorooctane Sulfonate (PFOS) and its Salts*. ENV/JM/RD (2002) 17/FINAL. Report of the Environment Directorate, Joint Meeting of the Chemicals Committee and the Working Party on Chemicals, Pesticides and Biotechnology, Co-operation on Existing Chemicals, Paris, November 21, 2002.

Authority

The provisions of this § 250.304 amended under sections 104(a) and 303(a) of the Land Recycling and Environmental Remediation Standards Act (35 P.S. §§ 6026.104(a) and 6026.303(a)); and section 1920-A of The Administrative Code of 1929 (71 P.S. § 510-20).

Source

The provisions of this § 250.304 amended November 23, 2001, effective November 24, 2001, 31 Pa.B. 6395; amended January 7, 2011, effective January 8, 2011, 41 Pa.B. 230; amended August 26, 2016, effective August 27, 2016, 46 Pa.B. 5655; amended November 19, 2021, effective November 20, 2021, 51 Pa.B. 7173. Immediately preceding text appears at serial pages (382763) to (382766).

Cross References

This section cited in 25 Pa. Code § 250.303 (relating to aquifer determination; current use and currently planned use of aquifer groundwater); 25 Pa. Code § 250.308 (relating to soil to groundwater pathway numeric values); 25 Pa. Code § 250.312 (relating to final report); 25 Pa. Code § 271.1 (relating to definitions); and 25 Pa. Code § 287.1 (relating to definitions).

250-22

§ 250.305. MSCs for soil.

(a) A person shall implement a remedy under the Statewide health standard that is protective of human health and the environment.

(b) The MSCs for regulated substances in soil are presented in Appendix A, Tables 3 and 4. The methodology for calculating MSCs in soil is detailed in subsections (c)—(e) and the MSCs are further limited to not exceed the physical capacity of the soil to contain a regulated substance. This physical limitation is based on an assumed porosity of 0.35, an assumed dry bulk density of soil of 1.8 kilograms per liter and an assumed density of a regulated substance of 1.0 kilograms per liter. This is calculated according to the equation in paragraph (1). For regulated substances which are organics and liquids at standard temperature and pressure (STP) as identified in Appendix A, Table 5 (Chemical Properties), the physical limitation is further limited based on residual saturation with the additional assumption of a residual saturation ratio of substance volume to soil volume of 0.051, as calculated in Equation (2).

$$(1) \quad C_{PL} = \frac{\rho_{RS}^n}{\rho_B}$$

$$(2) \quad MSC = Sr * \frac{\rho_{RS}^n}{\rho_B} * 1,000,000 \text{ mg/kg} = 10,000 \text{ mg/kg}$$

where:

ρ_{rs} = density of the regulated substance = 1.0 kg/L

n = porosity of the soil = 0.35

ρ_B = dry bulk density of the soil = 1.8 kg/L

Sr = residual saturation ratio (substance vol./soil vol.) = 0.051

(c) For the residential standard, the MSC for regulated substances contained in soil is one of the following:

(1) The lowest of the following:

(i) The ingestion numeric value throughout the soil column to a depth of up to 15 feet from the existing ground surface as determined by the methodology in § 250.306 (relating to ingestion numeric values), using the appropriate default residential exposure assumptions contained in § 250.306(d).

(ii) The inhalation numeric value throughout the soil column to a depth of up to 15 feet in soil from the existing ground surface, which considers volatilization into the outdoor air and inhalation of particulates, as determined by the methodology in § 250.307 (relating to inhalation numeric values), using the appropriate default residential exposure assumptions contained in § 250.307(d).

(iii) The soil-to-groundwater pathway numeric value throughout the entire soil column as determined by the methodology in § 250.308 (relating to soil to groundwater pathway numeric values).

(2) The lowest of paragraph (1)(i) and (ii) and, in addition, one of the following:

(i) A demonstration of the soil-to-groundwater pathway soil buffer as identified in § 250.308(b), if applicable.

(ii) A soil-to-groundwater pathway equivalency demonstration as identified in § 250.308(d).

(d) For the nonresidential standard, the MSC for regulated substances contained in soil throughout the soil column to a depth of 2 feet from the existing ground surface is one of the following:

- (1) The lowest of the following:
 - (i) The ingestion numeric value as determined by the methodology in § 250.306, using the appropriate default nonresidential exposure assumptions contained in § 250.306(e).
 - (ii) The inhalation numeric value which is the lower of the values for volatilization into the outdoor air and the inhalation of particulates, as determined by the methodology in § 250.307, using the appropriate default nonresidential exposure assumptions contained in § 250.307(d).
 - (iii) The soil-to-groundwater pathway numeric value throughout the entire soil column as determined by the methodology in § 250.308.
- (2) The lowest of paragraph (1)(i) or (ii) and, in addition, one of the following:
 - (i) A demonstration of the soil-to-groundwater pathway soil buffer as identified in § 250.308(b), if applicable.
 - (ii) A soil-to-groundwater pathway equivalency demonstration as identified in § 250.308(d).
- (e) For the nonresidential standard, the MSC for regulated substances contained in soils at depths greater than 2 feet through 15 feet from the existing ground surface, is one of the following:
 - (1) The lowest of the following:
 - (i) The inhalation numeric value which considers volatilization to the outdoor air, as determined by the methodology in § 250.307, using the appropriate default nonresidential exposure assumptions contained in § 250.307(d), and using a transfer factor (TF) based upon the calculated emission rate from subsurface soil as specified in the method of Jury, et al. 1990. *Water Resources Research*, Vol. 26, No. 1, pp. 13—20.
 - (ii) The soil-to-groundwater pathway numeric value throughout the entire soil column as determined by the methodology in § 250.308.
 - (2) The value identified in paragraph (1)(i) and one of the following:
 - (i) A demonstration of the soil-to-groundwater pathway soil buffer as identified in § 250.308(b), if applicable.
 - (ii) A soil-to-groundwater pathway equivalency demonstration as identified in § 250.308(d).
- (f) The MSC for regulated substances contained in soil at depths greater than 15 feet is one of the following:
 - (i) The soil-to-groundwater pathway numeric value as determined by § 250.308(a).
 - (ii) A demonstration of the soil-to-groundwater pathway soil buffer as identified in § 250.308(b), if applicable.
 - (iii) A soil-to-groundwater pathway equivalency demonstration as identified in § 250.308(d).
- (g) A person conducting a remediation of soils contaminated with one or more substances having a secondary MCL, but no toxicological properties listed in Appendix A, Table 5B, will not be required to comply with either the direct contact pathway or the soil-to-groundwater pathway requirements for those substances. The substances shall be subject to the requirements of § 250.311(a) through (f) (relating to evaluation of ecological receptors) with respect to evaluation of ecological receptors.

Authority

The provisions of this § 250.305 amended under sections 104(a) and 303(a) of the Land Recycling and Environmental Remediation Standards Act (35 P.S. §§ 6026.104(a) and 6026.303(a)); and section 1920-A of The Administrative Code of 1929 (71 P.S. § 510-20).

Source

The provisions of this § 250.305 amended November 19, 2021, effective November 20, 2021, 51 Pa.B. 7173. Immediately preceding text appears at serial pages (382766) to (382768).

Cross References

This section cited in 25 Pa. Code § 250.302 (relating to point of compliance); 25 Pa. Code § 250.311 (relating to evaluation of ecological receptors); 25 Pa. Code § 271.1 (relating to definitions); and 25 Pa. Code § 287.1 (relating to definitions).

§ 250.306. Ingestion numeric values.

(a) For a regulated substance which is a systemic toxicant, the ingestion numeric value for that substance was calculated using the appropriate residential or nonresidential exposure assumptions from subsection (d) according to the following equation:

$$MSC = \frac{THQ \times RfD_o \times BW \times AT_{nc} \times 365 \text{ days/year}}{Abs \times EF \times ED \times IngR \times CF}$$

(b) For a regulated substance which is a carcinogen, the ingestion numeric value for that substance was calculated using the appropriate residential or nonresidential exposure assumptions from subsection (d) according to the following equations:

(1) For regulated substances not identified as a mutagen in § 250.301(b) (relating to scope):

$$MSC = \frac{TR \times AT_c \times 365 \text{ days/year}}{CSF_o \times Abs \times EF \times IFadj \times CF}$$

(2) For regulated substances identified as a mutagen, except for vinyl chloride and trichloroethylene, in § 250.301(b):

$$MSC = \frac{TR \times AT_c \times 365 \text{ days/year}}{CSF_o \times Abs \times EF \times AIFadj \times CF}$$

(3) For vinyl chloride:

$$MSC = \frac{TR}{[CSF_o \times Abs \times EF \times IFadj \times CF / (AT_c \times 365 \text{ days/year})] + (CSF_o \times Abs \times IR_c \times CF/BW_c)}$$

(4) For trichloroethylene:

$$MSC = \frac{TR \times AT_c \times 365 \text{ days/year}}{(CSF_{ok} \times AIFadj + CSF_{ol} \times IFadj) \times Abs \times EF \times CF}$$

(c) For a regulated substance that has both an oral reference dose and an oral cancer slope factor, the ingestion numeric value is the lower of the two numbers as calculated by the equations in subsections (a) and (b).

(d) The default exposure assumptions used to calculate the ingestion numeric values are as follows:

<i>Term</i>		<i>Residential Systemic¹</i>	<i>Carcinogens^{2,6}</i>	<i>Nonresidential (Onsite Worker)</i>
THQ	Target Hazard Quotient	1	N/A	1
RfD _o	Oral Reference Dose (mg/kg-day)	Chemical-specific	N/A	Chemical-specific
BW	Body Weight (kg) Soil Groundwater	15 80	N/A	80 80
AT _{nc}	Averaging Time for systemic toxicants (yr) Soil Groundwater	6 30	N/A N/A	25 25
Abs	Absorption (unitless) ³	1	1	1
EF	Exposure Frequency (d/yr) Soil Groundwater	250 350	250 350	180 250
ED	Exposure Duration (yr) Soil Groundwater	6 30	N/A N/A	25 25
IngR	Ingestion Rate Soil (mg/day) GW (L/day)	100 2.4	N/A N/A	50 1.2

<i>Term</i>		<i>Residential Systemic¹</i>	<i>Carcinogens^{2,6}</i>	<i>Nonresidential (Onsite Worker)</i>
CF	Conversion Factor Soil (kg/mg) GW (unitless)	1×10^{-6} 1	1×10^{-6} 1	1×10^{-6} 1
TR	Target Risk	N/A	1×10^{-5}	1×10^{-5}
CSF _o	Oral Cancer Slope Factor (mg/kg-day) ⁻¹	N/A	Chemical-specific	Chemical-specific
AT _c	Averaging Time for carcinogens (yr)	N/A	70	70
IFad _j ⁴	Ingestion Factor Soil (mg-yr/kg-day) GW (L-yr/kg day)	N/A	55 1.2	15.6 0.38
AI _{Fadj} ⁵	Combined Age-Dependent Adjustment Factor and Ingestion Factor Soil (mg-yr/kg-day) GW (L-yr/kg-day)	N/A	241 3.45	N/A
CSF _{ok}	TCE oral cancer slope factor for kidney cancer (mg/kg/day) ⁻¹		9.3×10^{-3}	
CSF _{o1}	TCE oral cancer slope factor for non-Hodgkin lymphoma and liver cancer (mg/kg/day) ⁻¹		3.7×10^{-2}	

Notes:

- ¹ Residential exposure to noncarcinogens is based on childhood (ages 1—6) exposure for soil, and adult exposure for groundwater, consistent with USEPA (1991).
- ² Residential exposure to carcinogens is based on combined childhood and adult exposure.
- ³ The oral absorption factor takes into account absorption and bioavailability. In cases where the oral RfD or CSF is based on administered oral dose, the absorption factor would be limited to bioavailability. The default value is 1.
- ⁴ The Ingestion Factor for the residential scenario is calculated using the equation $\text{If adj} = \text{ED}_c \times \text{IR}_c / \text{BW}_c + \text{ED}_a \times \text{IR}_a / \text{BW}_a$, where $\text{ED}_c = 6$ yr, $\text{IR}_c = 100$ mg/day for soils and 1 L/day for groundwater, $\text{BW}_c = 15$ kg, $\text{ED}_a = 24$ yr, $\text{IR}_a = 50$ mg/day for soils and 2.4 L/day for groundwater, and $\text{BW}_a = 80$ kg. The ingestion factor for the nonresidential scenario is calculated using the equation $\text{If adj} = \text{ED} \times \text{IR} / \text{BW}$, where $\text{ED} = 25$ yr, $\text{IR} = 50$ mg/day for soils and 1.2 L/day for groundwater, and $\text{BW} = 80$ kg.
- ⁵ The Combined Age-Dependent Adjustment Factor and Ingestion Factor (AIFadj) for the residential scenario is calculated using the equation $\text{AIFadj} = [(\text{ADAF}_{<2} \times \text{ED}_{<2}) + (\text{ADAF}_{2-6} \times \text{ED}_{2-6})] \times \text{IR}_c / \text{BW}_c + [(\text{ADAF}_{>6-16} \times \text{ED}_{>6-16} + (\text{ADAF}_{>16} \times \text{ED}_{>16})] \times \text{IR}_a / \text{BW}_a$, where $\text{ADAF}_{<2} = 10$, $\text{ED}_{<2} = 2$ yr, $\text{ADAF}_{2-6} = 3$, $\text{ED}_{2-6} = 4$ yr, $\text{IR}_c = 100$ mg/day for soils and 1 L/day for groundwater, $\text{BW}_c = 15$ kg, $\text{ADAF}_{>6-16} = 3$, $\text{ED}_{>6-16} = 10$ yr, $\text{ADAF}_{>16} = 1$, $\text{ED}_{>16} = 14$ yr, $\text{IR}_a = 50$ mg/day for soils and 2.4 L/day for groundwater, and $\text{BW}_a = 80$ kg.
- ⁶ For the equation to calculate the vinyl chloride residential MSC based on the carcinogenic effect, $\text{IR}_c = 100$ mg/day for soils and 1 L/day for groundwater, $\text{BW}_c = 15$ kg.

(e) The residential ingestion numeric value for lead in soil was developed using the Uptake Biokinetic (UBK) Model for Lead (version 0.4) developed by the EPA (U.S. Environmental Protection Agency. (1990) Uptake Biokinetic (UBK) Model for Lead (version 0.4). U.S. EPA/ECAO. August 1990, in lieu of the algorithms presented in subsections (a) and (b). Default input values are identified in Appendix A, Table 7. Because the UBK model is applicable only to children, the nonresidential ingestion numeric value was calculated according to the method developed by the Society for Environmental Geochemistry and Health (Wixson, B. G. (1991)). The Society for Environmental Geochemistry and Health (SEGH) Task Force Approach to the Assessment of Lead in Soil. *Trace Substances in Environmental Health*. (11-20), using the following equations:

$$S = 1000 \frac{\left[\left(\frac{T}{G^n} \right) - B \right]}{\delta}$$

Table 7 identifies each of the variables in this equation.

Authority

The provisions of this § 250.306 amended under sections 104(a) and 303(a) of the Land Recycling and Environmental Remediation Standards Act (35 P.S. §§ 6026.104(a) and 6026.303(a)); and section 1920-A of The Administrative Code of 1929 (71 P.S. § 510-20).

Source

The provisions of this § 250.306 amended January 7, 2011, effective January 8, 2011, 41 Pa.B. 230; corrected March 19, 2011, effective March 5, 2011, 41 Pa.B. 1458; corrected May 16, 2014, effective March 5, 2011, 44 Pa.B. 2975; amended August 26, 2016, effective August 27, 2016, 46 Pa.B. 5655; amended November 19, 2021, effective November 20, 2021, 51 Pa.B. 7173. Immediately preceding text appears at serial pages (382769) to (382773).

Cross References

This section cited in 25 Pa. Code § 250.301 (relating to scope); 25 Pa. Code § 250.304 (relating to MSCs for groundwater); 25 Pa. Code § 250.305 (relating to MSCs for soil); and 25 Pa. Code § 250.310 (relating to minimum threshold MSCs).

§ 250.307. Inhalation numeric values.

(a) For a regulated substance which is a systemic toxicant, the following applies:

(1) For a volatile compound, the numeric value for inhalation from soil shall be calculated using the appropriate residential or nonresidential exposure assumptions from subsection (d) according to the following equation using TF for volatiles:

$$MSC = \frac{THQ \times RfCi \times AT_{nc} \times 365 \text{ days/yr} \times 24 \text{ hr/day} \times TF}{ET \times EF \times ED}$$

(2) For a regulated substance attached to particulates, the numeric value for inhalation from soil was calculated using the appropriate residential or nonresidential exposure assumptions from subsection (d) according to the equation in paragraph (1) using TF for particulates.

(b) For a regulated substance which is a carcinogen, the following apply:

(1) For a volatile compound, the numeric value for inhalation from soil was calculated using the appropriate residential or nonresidential exposure assumptions from subsection (d) according to the following equation using TF for volatiles:

$$MSC = \frac{TR \times AT_c \times 365 \text{ days/year} \times 24 \text{ hr/day} \times TF}{IUR \times ET \times EF \times ED \times CF}$$

(2) For a regulated substance attached to particulates, the numeric value for inhalation from soil was calculated using the appropriate residential or nonresidential exposure assumptions from subsection (d) according to the equation in paragraph (1) using TF for particulates.

(3) For a regulated substance identified in § 250.301(b) (relating to scope) as a mutagen, except for vinyl chloride and trichloroethylene, the numeric value for inhalation from soil was calculated using the appropriate residential or nonresidential exposure assumptions from subsection (d) according to the following equation using the TF for volatiles or particulates:

$$MSC = \frac{TR \times AT_c \times 365 \text{ days/year} \times 24 \text{ hr/day} \times TF}{IUR \times ET \times EF \times AED \times CF}$$

(4) For vinyl chloride, the numeric value for inhalation from soil was calculated using the appropriate residential or nonresidential exposure assumptions from subsection (d) according to the following equation using the TF for volatiles or particulates:

$$MSC = \frac{TR}{[IUR \times ET \times EF \times ED \times CF / (AT_c \times 365 \text{ days/yr} \times 24 \text{ hr/d} \times TF)] + (IUR \times CF \times TF)}$$

(5) For trichloroethylene, the numeric value for inhalation from soil was calculated using the appropriate residential or nonresidential exposure assumptions from subsection (d) according to the following equation using the TF for volatiles:

$$MSC = \frac{TR \times AT_c \times 365 \text{ days/yr} \times 24 \text{ hr/day} \times TF}{(IUR_k \times AED + IUR_l \times ED) \times ET \times EF \times CF}$$

(c) For a regulated substance which is both a systemic toxicant and a carcinogen, the inhalation numeric value is the lower of the two numbers as calculated by the equations in subsections (a) and (b).

(d) The default exposure assumptions used to calculate the inhalation numeric values for soil are as follows:

<i>Term</i>		<i>Residential</i>		<i>Nonresidential (Onsite Worker)</i>
		<i>Systemic¹</i>	<i>Carcinogens²</i>	
THQ	Target Hazard Quotient	1	N/A	1
RfCi	Inhal. Reference Concentration (mg/m ³)	Chemical-specific	N/A	Chemical-specific
AT _{nc}	Averaging Time for systemic toxicants (yr)	30	N/A	25
TF	Transport Factor (mg/kg)/(mg/m ³) Volatilization ³ Particulate ⁴	Chemical-specific 1×10^{10}	Chemical-specific 1×10^{10}	Chemical-specific 1×10^{10}
ET	Exposure Time (hr/day)	24	24	8
EF	Exposure Frequency ⁵ (d/yr)	250	250	180
ED	Exposure Duration (yr)	30	30	25
CF	Conversion Factor	N/A	1000 µg/mg	1000 µg/mg
TR	Target Risk	N/A	1×10^{-5}	1×10^{-5}
IUR	Inhalation Unit Risk (µg/m ³) ⁻¹	N/A	Chemical-specific	Chemical-specific
AT _c	Averaging Time for carcinogens (yr)	N/A	70	70
AED	Combined Age-Dependent Adjustment Factor and Exposure Duration (yr) ⁶	N/A	76	N/A
IUR _k	TCE inhalation unit risk for kidney cancer (µg/m ³) ⁻¹		1×10^{-6}	

	Term	Residential		Nonresidential (Onsite Worker)
		Systemic ¹	Carcinogens ²	
IUR ₁	TCE inhalation unit risk for both non-Hodgkin lymphoma and liver cancer (ug/m ³) ⁻¹		3 × 10 ⁻⁶	

Notes: Modified from USEPA Region III Risk-based Concentration Table, dated October 20, 1995.
N/A = Not Applicable
¹ Residential exposure to systemic toxicants is based on adult exposure, consistent with USEPA (1991).
² Residential exposure to carcinogens is based on combined child and adult exposure.
³ Volatilization transport factor is calculated using $TF = (ER \times DF)^{-1}$, where $DF = 12 \text{ (mg/m}^3\text{)/(m}^2\text{-sec)}$. See soil depth-specific algorithm for the calculation of ER.
⁴ Particulate transfer factor was calculated using $TF = (ER \times DF)^{-1}$, where $ER = 8.25 \times 10^{-12} \text{ (mg/m}^2\text{-sec)/(mg/kg)}$ and $DF = 12\text{(mg/m}^3\text{)/(mg/m}^2\text{-sec)}$.
⁵ Assumes approximately 100 days/yr with the ground being frozen. Exposure to surficial soils when the ground is frozen is considered de minimis. The nonresidential exposure frequency is defined as $5/7 \times 250 \text{ days/yr}$.
⁶ The Combined Age-Dependent Adjustment Factor and Exposure Duration (AED) is calculated using the equation $AED = ADAF_{.2} \times ED_{.2} + ADAF_{2-16} \times ED_{2-16} \times ED_{.16}$, where $ADAF_{.2} = 10$, $ED_{.2} = 2 \text{ yr}$, $ADAF_{2-16} = 3$, $ED_{2-16} = 14 \text{ yr}$, $ADAF_{.16} = 1$, $ED_{.16} = 14 \text{ yr}$.

(e) For the inhalation numeric values in subsections (a) and (b), the TF was calculated by the following equation:

$$TF = (ER \times DF)^{-1}$$

The Dispersion Factor (DF) value of $12 \text{ (mg/m}^3\text{)}/\text{(mg/m}^2\text{/sec)}$ is taken from the default value in the EPA Draft Soil Screening Guidance (U. S. EPA, 1994. *Technical Background Document for Soil Screening Guidance*. Review Draft. Office of Emergency and Remedial Response. EPA-540/R-94/106) and the Emission Rate (ER) is calculated by the following equations (from Jury et al. 1990. *Water Resources Research*, Vol. 26. No. 1. pp. 13-20):

(i) For surficial soils:

$$ER = \frac{1}{T} \int_0^T \left(\frac{C_O}{C_S} \right) (D_E/\pi t)^{0.5} \left[1 - \exp^{(-L^2/(4D_E t))} \right] \bullet (10^3) dt$$

$$D_E = \frac{D_G}{\frac{\rho_b K_d}{H} + \frac{\theta_m}{H} + \theta_a} + \frac{D_L}{\rho_b K_d + \theta_m + \theta_a H}$$

where:

$$D_G = \left(\frac{\theta_a^{10/3}}{\theta^2} \right) D_{ai}$$

$$D_L = \left(\frac{\theta_m^{10/3}}{\theta^2} \right) D_{Li}$$

(ii) For subsurface soils:

$$ER = \frac{1}{T} \int_0^T \left(\frac{C_O}{C_S} \right) (D_E/\pi t)^{0.5} \left[\exp^{(-L^2/(4D_E t))} - \exp^{(-(1+W)^2/(4D_E t))} \right] \bullet (10^3) dt$$

$$D_E = \frac{D_G}{\frac{\rho_b K_d}{H} + \frac{\theta_m}{H} + \theta_a} + \frac{D_L}{\rho_b K_d + \theta_m + \theta_a H}$$

where:

$$D_G = \left(\frac{\theta_a^{10/3}}{\theta^2} \right) D_{ai}$$

$$D_L = \left(\frac{\theta_m^{10/3}}{\theta^2} \right) D_{Li}$$

<i>Parameter</i>	<i>Definition</i>	<i>Unit</i>	<i>Recommended Value⁽¹⁾</i>
ER	Chemical vapor emission rate from surface soil or subsurface soil	mg/m ² -sec per mg/kg	Chemical-specific
C _o	Chemical concentration in soil, C _o = C _s ρ _b	g/m ³	1.8
C _s	Chemical concentration in soil	mg/kg (ppm)	1
D _E	Effective diffusion coefficient	m ² /sec	Chemical-specific
D _{ai}	Air diffusivity for chemical i	m ² /sec	Chemical-specific
D _{Li}	Water diffusivity for chemical i	m ² /sec	Chemical-specific
t	Time	sec	N/A
T	Emission averaging time	sec	Equal to exposure duration
θ	Total soil porosity, θ = θ _a + θ _n	cm ³ /cm ³	0.32 ⁽²⁾
θ _a	Air-filled soil porosity	cm ³ /cm ³	0.12 ⁽²⁾
θ _n	Moisture-filled soil porosity, θ _n = w/ρ _b	cm ³ /cm ³	0.20 ⁽²⁾
w	Moisture content for soil	g water/g soil	0.11
ρ _b	Dry bulk density of soil, ρ _b = (1-θ) ρ	g/cm ³	1.8 ⁽²⁾
(Footnotes on next page)			

<i>Parameter</i>	<i>Definition</i>	<i>Unit</i>	<i>Recommended Value⁽¹⁾</i>
ρ	Soil particle density	g/cm ³	2.65
K_d	Partition coefficient, $K_d = K_{oc}f_{oc}$	cm ³ /g	Chemical-specific
H	Henry's Law constant	dimensionless	Chemical-specific
D_G	Effective gas-phase diffusion coefficient	m ² /sec	Chemical-specific
D_L	effective liquid-phase diffusion coefficient	m ² /sec	Chemical-specific
L	Depth of the contaminated surface soil	m	0.6 ⁽³⁾
I	Depth of the clean soil cover	m	0.6 ⁽³⁾
W	Thickness of the contaminated subsurface soil	m	4.0 ⁽³⁾
K_{OC}	Organic carbon partition coefficient for chemical i	cm ³ /g	Chemical-specific
f_{OC}	Fraction of organic carbon in soil	dimensionless	0.005 ⁽⁴⁾

⁽¹⁾ All default values from USEPA (1994) Draft Soil Screening Guidance, EPA-540/R-94/106, except as noted.

⁽²⁾ Consistent with Standards Subcommittee recommendation.

⁽³⁾ Based on Act 2 SAB-agreed depths.

⁽⁴⁾ The Risk Assessment Subcommittee selected a f_{oc} of 0.005, which falls between f_{oc} 's of 0.006 for surface soil and 0.002 for subsurface soil.

(f) For a regulated substance which is a systemic toxicant and is a volatile compound, the numeric value for the inhalation of volatiles from groundwater was calculated by using the appropriate residential or nonresidential exposure assumptions from subsection (h) according to the following equation:

$$MSC = \frac{THQ \times RfCi \times AT_{nc} \times 365 \text{ days/year} \times 24 \text{ hr/day}}{ET \times EF \times ED \times TF}$$

(g) For a regulated substance which is a carcinogen and is a volatile compound, the numeric value for the inhalation of volatiles from groundwater shall be calculated by using the appropriate residential or nonresidential exposure assumptions from subsection (h) according to the following equations:

(1) For regulated substances not identified as a mutagen in § 250.301(b):

$$MSC = \frac{TR \times AT_c \times 365 \text{ days/year} \times 24 \text{ hr/day}}{IUR \times ET \times EF \times ED \times TF \times CF}$$

(2) For regulated substances identified as a mutagen, except for vinyl chloride and trichloroethylene, in § 250.301(b):

$$MSC = \frac{TR \times AT_c \times 365 \text{ days/year} \times 24 \text{ hr/day}}{IUR \times ET \times EF \times AED \times TF \times CF}$$

(3) For vinyl chloride:

$$MSC = \frac{TR}{[(IUR \times ET \times EF \times ED \times TF \times CF) / (AT_c \times 365 \text{ days/year} \times 24 \text{ hr/day})] + (IUR \times TF \times CF)}$$

(4) For trichloroethylene:

$$MSC = \frac{TR \times AT_c \times 365 \text{ days/yr} \times 24 \text{ hr/day}}{(IUR_k \times AED + IUR_l \times ED) \times ET \times EF \times TF \times CF}$$

(h) The default exposure assumptions used to calculate the inhalation numeric values for the inhalation of volatiles from groundwater are as follows:

<i>Term</i>		<i>Residential</i>		<i>Nonresidential (Onsite Worker)</i>
		<i>Systemic¹</i>	<i>Carcinogens²</i>	
THQ	Target Hazard Quotient	1	N/A	1
RfCi	Inhal. Reference Concentration (mg/m ³)	Chemical-specific	N/A	Chemical-specific
AT _{nc}	Averaging Time for systemic toxicants (yr)	30	N/A	25
ET	Exposure Time (hr/day)	24	24	8
EF	Exposure Frequency (d/yr)	350	350	250
ED	Exposure Duration (yr)	30	30	25
TF	Transfer Factor (L/m ³) ³	0.5	0.5	0.5
CF	Conversion Factor	N/A	1,000 µg/mg	1,000 µg/mg
TR	Target Risk	N/A	1×10^{-5}	1×10^{-5}
IUR	Inhalation Unit Risk (ug/m ³) ⁻¹	N/A	Chemical-specific	Chemical-specific
AT _c	Averaging Time for carcinogens (yr)	N/A	70	70
AED	Combined Age-Dependent adjustment Factor and Exposure Duration (yr) ⁴	N/A	76	N/A
IUR _k	TCE inhalation unit risk for kidney cancer (ug/m ³) ⁻¹		1×10^{-6}	

	Term	Residential		Nonresidential (Onsite Worker)
		Systemic ¹	Carcinogens ²	
IUR ₁	TCE inhalation unit risk for both non-Hodgkin lymphoma and liver cancer (ug/m ³) ¹		3 × 10 ⁻⁶	

Notes: Modified from USEPA Region III Risk-based Concentration Table, dated October 20, 1995.
N/A = Not Applicable
¹ Residential exposure to systemic toxicants is based on adult exposure, consistent with USEPA (1991).
² Residential exposure to carcinogens is based on combined child and adult exposure.
³ Default Transfer Factor is as presented in USEPA's RAGS, Part B.
⁴ The Combined Age-Dependent Adjustment Factor and Exposure Duration (AED) is calculated using the equation $AED = ADAF_{2,2} \times ED_{2,2} + ADAF_{2-16} \times ED_{2-16} + ADAF_{16} \times ED_{16}$ where $ADAF_{2,2} = 10$, $ED_{2,2} = 2$ yr, $ADAF_{2-16} = 3$, $ED_{2-16} = 14$ yr, $ADAF_{16} = 1$, $ED_{16} = 14$ yr.

Authority

The provisions of this § 250.307 amended under sections 104(a) and 303(a) of the Land Recycling and Environmental Remediation Standards Act (35 P.S. §§ 6026.104(a) and 6026.303(a)); and section 1920-A of The Administrative Code of 1929 (71 P.S. § 510-20).

Source

The provisions of this § 250.307 amended January 7, 2011, effective January 8, 2011, 41 Pa.B. 230; corrected March 19, 2011, effective March 5, 2011, 41 Pa.B. 1458; corrected May 16, 2014, effective March 5, 2011, 44 Pa.B. 2975; amended August 26, 2016, effective August 27, 2016, 46 Pa.B. 5655; amended November 19, 2021, effective November 20, 2021, 51 Pa.B. 7173. Immediately preceding text appears at serial pages (382773) to (382780) and (383329) to (383331).

Cross References

This section cited in 25 Pa. Code § 250.301 (relating to scope); 25 Pa. Code § 250.304 (relating to MSCs for groundwater); and 25 Pa. Code § 250.305 (relating to MSCs for soil).

§ 250.308. Soil to groundwater pathway numeric values.

(a) A person may use the soil-to-groundwater pathway numeric values listed in Appendix A, Tables 3B and 4B, as developed using the methods contained in paragraph (1), (2) or (4), may use a concentration in soil at the site which does not produce a leachate in excess of the MSC for groundwater contained in Appendix A, Tables 1 and 2, when subjected to the Synthetic Precipitation Leaching Procedure (Method 1312 of SW-846, Test Methods for Evaluating Solid Waste, promulgated by the U.S. EPA), or may use the soil-to-groundwater pathway soil buffer criteria in subsection (b) or may use the soil-to-groundwater pathway equivalency demonstration in subsection (d).

(1) A value which is 100 times the applicable MSC for groundwater identified in § 250.304(c) or (d) (relating to MSCs for groundwater), expressed as milligrams per kilogram of soil.

(2) For organic compounds, a generic value determined not to produce a concentration in groundwater in the aquifer in excess of the MSC for groundwater as calculated by the equation in paragraph (3).

(i) For soil not in the zone of groundwater saturation, the generic value shall be calculated by the equation in paragraph (3).

(ii) For soil in the zone of groundwater saturation, the generic numeric value is 1/10th of the generic value calculated by the equation in paragraph (3).

(3) The equation referenced in paragraphs (1) and (2) is the following:

$$MSC_S = MSC_{GW} ((K_{oc} * f_{oc}) + \theta_w / \rho_b) DF$$

where: MSC_S (mg/kg) = the generic value for a regulated substance in soil

MSC_{GW} (mg/L) = MSC of a regulated substance in groundwater

K_{oc} (L/kg) = organic carbon partition coefficient for a regulated substance

f_{oc} = fraction of organic carbon in soil (default value = 0.0025)

θ_w = water-filled porosity of soil (default value = 0.2)

ρ_b (kg/L) = dry bulk density of soil (default value = 1.8 kg/l)

DF = dilution factor (default value = 100)

(4) For inorganic regulated substances, a generic value determined not to produce a concentration in groundwater in the aquifer in excess of the MSC for groundwater as calculated by the equation in paragraph (5) and listed in Appendix A, Table 4B.

(i) For soil not in the zone of groundwater saturation, the generic value shall be calculated by the equation in paragraph (5).

(ii) For soil in the zone of groundwater saturation, the standard is 1/10th of the generic value calculated by the equation in paragraph (5).

(5) The equation referenced in paragraph (4) is the following:

$$MSC_S = MSC_{GW} (K_d + \theta_w/\rho_b) DF$$

where: MSC_S (mg/kg) = the generic value for the inorganic regulated substance in soil

MSC_{GW} (mg/L) = MSC of the inorganic regulated substance in groundwater

K_d (L/kg) = soil to water partition coefficient for the inorganic regulated substance

θ_w = water-filled porosity of soil (default value = 0.2)

ρ_b (kg/L) = dry bulk density of soil (default value = 1.8 kg/L)

DF = dilution factor (default value = 100)

(b) The soil-to-groundwater pathway soil buffer is the entire area between the bottom of the area of contamination and the groundwater or bedrock and shall meet the following criteria:

(1) The soil depths established in Appendix A, Tables 3B and 4B for each regulated substance.

(2) The concentration of the regulated substance cannot exceed the limit related to the PQL or background throughout the soil buffer.

(3) No Karst carbonate formation underlies or is within 100 feet of the perimeter of the contaminated soil area.

(c) The soil-to-groundwater pathway soil buffer distances were developed by using the following equations.

(1) The following equations were used iteratively for each layer of soil for each time increment in a total time period of 30 years and pertain to a soil column where the first 4 feet of soil are contaminated with a regulated substance at a concentration of 10,000 mg/kg.

$$C_{\text{soil}(it)} = C_{\text{soil}(i(t-1))} - \frac{(TI)(R)(C_{\text{aq}(i(t-1))} - C_{\text{aq}(i+1)(t-1)})}{(360)(DI)(\rho_b)}$$

$$TI = (360)(DI)(\theta_w)/R$$

$$C_{\text{aq}(i(t-1))} = \frac{(\rho_b)(C_{\text{soil}(i(t-1))})}{(K_d)(\rho_b) + \theta_w}$$

$$C_{\text{aq}(i+1)(t-1)} = \frac{(\rho_b)(C_{\text{soil}(i+1)(t-1)})}{(K_d)(\rho_b) + \theta_w}$$

where: $C_{\text{soil}(it)}$ (mg/kg) = concentration of regulated substance in soil at layer i at time increment TI

$C_{\text{soil}(i(t-1))}$ (mg/kg) = concentration of regulated substance in soil at layer i at time increment immediately preceding TI

$C_{\text{soil}(i+1)(t-1)}$ (mg/kg) = concentration of regulated substance in soil at layer immediately above layer i at time increment immediately preceding TI

R (cm/yr) = recharge rate of water infiltrating soil (default value = 33 cm/yr)

DI (feet) = thickness of each layer i of soil (default value = 1 foot)

ρ_b (kg/L) = dry bulk density of soil (default value = 1.8 kg/L)

360 (month-cm/yr-ft) = conversion factor

TI (months) = time duration of each time increment

θ_w = water-filled porosity (default value = 0.2)

$C_{\text{aq}(i(t-1))}$ (mg/L) = concentration of regulated substance in soil pore water at layer i at time increment immediately preceding TI

$C_{\text{aq}(i+1)(t-1)}$ (mg/L) = concentration of regulated substance in soil pore water at layer immediately above layer i at time increment immediately preceding TI

K_d (L/kg) = soil to water partition coefficient for the regulated substance where five different contaminant-specific values are used: 2.5, 5, 10, 100 and 1,000.

K_d values of organic regulated substances are based on the following equation:

$$K_d = (f_{oc})(K_{oc})$$

where: f_{oc} = fraction of organic carbon in soil (default value = 0.005)

K_{oc} (L/kg) = organic carbon partition coefficient for a regulated substance

(2) The buffer distances listed for regulated substances in Tables 3B and 4B were determined by the Department using these equations to model the distance that the regulated substance travels from the bottom of the first 4 feet of contaminated soil through the soil column in 30 years at a concentration at or above 1 $\mu\text{G/L}$ in the water infiltrating the soil.

(d) For any regulated substance, an equivalency demonstration may be substituted for the soil-to-groundwater numeric value throughout the site and the soil-to-groundwater pathway soil buffer if the groundwater is below the MSC value or the background standard prior to remediation. This equivalency demonstration shall include the following:

(1) Fate and transport analysis of the regulated substance from the deepest point of contamination in the soil through unsaturated zone soil and shall include the use of soil-to-water partition coefficients. The analysis shall demonstrate that the regulated substances will not migrate to bedrock or the groundwater within 30 years at concentrations exceeding the greater of the groundwater MSC or background in groundwater as the endpoint in soil pore water directly under the site.

(2) In addition to sampling required for attainment of the inhalation or ingestion numeric values for soils up to 15 feet, as applicable, reporting and monitoring for eight quarters that shows no exceedances of the greater of the groundwater MSCs or of the background standard for groundwater beneath the contaminated soil and no indications of an increasing trend of concentration over time that may exceed the standard.

Authority

The provisions of this § 250.308 amended under sections 104(a) and 303(a) of the Land Recycling and Environmental Remediation Standards Act (35 P.S. §§ 6026.104(a) and 6026.303(a)); and section 1920-A of The Administrative Code of 1929 (71 P.S. § 510-20).

Source

The provisions of this § 250.308 amended January 7, 2011, effective January 8, 2011, 41 Pa.B. 230; amended November 19, 2021, effective November 20, 2021, 51 Pa.B. 7173. Immediately preceding text appears at serial pages (383331) to (383332) and (355289) to (355290).

Cross References

This section cited in 25 Pa. Code § 250.304 (relating to MSCs for groundwater); 25 Pa. Code § 250.305 (relating to MSCs for soil); 25 Pa. Code § 250.310 (relating to minimum threshold MSCs); 25 Pa. Code § 250.312 (relating to final report); 25 Pa. Code § 250.604 (relating to fate and transport modeling requirements for exposure assessments); and 25 Pa. Code § 271.1 (relating to definitions); and 25 Pa. Code § 287.1 (relating to definitions).

§ 250.309. MSCs for surface water.

(a) Any regulated discharge to surface waters shall comply with the applicable provisions of Chapters 91—96, 97 (reserved), 102, 103 and 105, including antidegradation requirements, and may not cause an exceedance of the applicable water quality standards for the surface water in question.

(b) For point source discharges to surface water, compliance shall be measured at the point of discharge in accordance with limits specified in the NPDES permit.

(c) For purposes of determining compliance with surface water quality standards from a diffuse surface or groundwater discharge, the person shall determine the expected instream regulated substance concentrations, that are attributable to releases at the site, using mass balance techniques for groundwater/surface water mixing at design flow conditions.

(1) If the results indicate that surface water quality standards are being achieved, no action is required.

(2) If results indicate that surface water quality standards are not being achieved, additional sampling may be performed to help evaluate whether surface water quality standards are being achieved.

(3) If the results of the sampling indicate surface water quality standards are being met, no further action is required.

(4) If the results of the modeling, and sampling if any, indicate that surface water quality standards are not being met, the person shall perform further remedial action to attain the surface water quality standards.

(d) Except if an NPDES permit is required, for purposes of complying with surface water quality standards in a spring, the point of compliance is the point of first designated or existing use, as defined in §§ 93.1, 93.4 and 93.9 (relating to definitions; Statewide water uses; and designated water uses and water quality criteria). If the point of first designated or existing use occurs in a surface water into which a spring flows, compliance with surface water quality standards shall be determined in the manner specified in subsection (c).

Cross References

This section cited in 25 Pa. Code § 245.310 (relating to site characterization report); 25 Pa. Code § 250.303 (relating to aquifer determination; current use and currently planned use of aquifer groundwater); and 25 Pa. Code § 250.707 (relating to statistical tests).

§ 250.310. Minimum threshold MSCs.

(a) For regulated substances listed in Appendix A, Table 6 that are found in groundwater, the minimum threshold MSC of 5 micrograms per liter in groundwater, shall be used.

(b) For regulated substances listed in Appendix A, Table 6 that are found in soil, the lowest of one of the following values shall be used as the minimum threshold MSC:

(1) An ingestion numeric value of 100 milligrams per kilogram in soil.

(2) The soil-to-groundwater pathway numeric value throughout the soil column as determined by the methodology in § 250.308 (relating to soil-to-groundwater pathway numeric values), but substituting 5 micrograms per liter in groundwater for the groundwater MSC. The soil-to-groundwater pathway numeric value shall be calculated by using a concentration in soil at the site which does not produce a leachate in excess of the MSC for groundwater or by using a value which is 100 times the MSC for groundwater, expressed in milligrams per kilogram of soil. An equivalency demonstration under § 250.308(d) may be substituted for the soil-to-groundwater numeric value.

(c) The minimum threshold MSC in subsection (a) and the ingestion numeric value in subsection (b)(1) are calculated according to the following exposure assumption and equation: 0.50 ppb dietary intake corresponds to a 1×10^{-6} risk (USFDA Threshold of Regulation Final Rule July 17, 1995) assuming the substance is a carcinogen. Correcting this value (or 5.0 ppb) to the 10^{-5} risk level, in Statewide health standard formulation, the threshold of regulation concentrations are determined by the following exposure assumptions and calculations:

Five $\mu\text{g}/\text{kg}$ (substance of concern) threshold level corresponding to 1×10^{-5} risk

Dietary intake $2 \text{ kg}/\text{day} \times 5 \mu\text{g}/\text{kg}$ (substance) = $10 \mu\text{g}/\text{day}$ (daily intake of substance of concern)

For soil ingestion: $10 \mu\text{g}/100 \text{ mg soil}$ or $100 \text{ mg}/\text{kg}$ = Threshold concentration for soils

For groundwater ingestion: $10 \mu\text{g}/2\text{L water}$ = $5 \mu\text{g}/\text{L}$ = Threshold concentration for water

The 100 mg soil and 2L water factors are the default ingestion rates from § 250.306(c) (relating to ingestion numeric values).

§ 250.311. Evaluation of ecological receptors.

(a) In addition to any protection afforded under other requirements for meeting surface water and air quality standards and MSCs under this chapter, based on the screening process in this section, direct impacts from regulated substances to the following receptors shall be assessed and addressed to implement a remedy that is protective of the environment:

(1) Individuals of threatened or endangered species as designated by the United States Fish and Wildlife Service under the Endangered Species Act (16 U.S.C.A. §§ 1531—1544).

(2) Exceptional value wetlands as defined in § 105.17 (relating to wetlands).

(3) Habitats of concern.

(4) Species of concern.

(b) For purposes of determining impacts on ecological receptors, no additional evaluation is required if the remediation attains a level equal to 1/10th of the value in Appendix A, Tables 3 and 4 or, for substances identified in § 250.305(g) (relating to MSCs for soil), 1/10th of the physical limitation iden-

tified in § 250.305(b), except for constituents of potential ecological concern identified in Table 8, or if the criteria in paragraph (1), (2) or (3) are met. Information that supports a determination that no additional evaluation is required shall be documented in the final report.

(1) Jet fuel, gasoline, kerosene, number two fuel oil or diesel fuel are the only constituents detected onsite.

(2) The area of contaminated soil is less than 2 acres and the area of contaminated sediment is less than 1,000 square feet.

(3) The site has features, such as buildings, parking lots or graveled paved areas, which would obviously eliminate the specific exposure pathways, such as soils exposure.

(c) If none of the criteria in subsection (b) are met and if no Constituents of Potential Ecological Concern (CPECs) associated with the release being addressed as part of an NIR at the site, as identified in Appendix A, Table 8, are detected onsite, an onsite evaluation shall be conducted to document any indications of ecological impact. Ecological impacts requiring more detailed evaluation exist if there are differences of greater than 50% in the density or diversity of species or habitats of concern when compared with nearby reference areas representing equivalent ecological areas without contamination, if available. This evaluation shall also document the presence of threatened and endangered species and exceptional value wetlands. If no ecological impacts requiring further evaluation are identified, and no threatened and endangered species exist within a 2,500-foot radius of the site and no exceptional value wetlands exist on the site, no further evaluation is required and that determination shall be documented in the final report.

(d) If none of the criteria in subsection (b) are met and if CPECs associated with the release being addressed as part of an NIR at the site are detected onsite or ecological impacts requiring more detailed evaluation, threatened and endangered species, or exceptional value wetlands as identified in subsection (c) exist, a detailed onsite evaluation shall be conducted by a person qualified to perform environmental risk assessments to document any substantial ecological impacts. Substantial ecological impacts exist if there are differences of greater than 20% in the density of species of concern or greater than 50% in the diversity and extent of habitats of concern when compared with nearby reference areas representing equivalent ecological areas without contamination, if available. If there are no substantial ecological impacts identified and there are no threatened or endangered species on or within a 2,500-foot radius of the site and no exceptional value wetlands on the site, that determination shall be provided in the final report.

(e) If the person cannot demonstrate that they meet the criteria in subsection (b), and cannot demonstrate that the evaluation performed under subsection (c) identified no ecological impacts requiring more detailed evaluation under subsection (d), or cannot demonstrate that the evaluation performed under subsection (d) identified no substantial ecological impacts, or threatened or endangered species or exceptional value wetlands, one of the following shall be met:

(1) A person shall demonstrate in the final report that attainment of the Statewide health standard MSCs are protective of the ecological receptors.

- (2) If a demonstration cannot be made that the Statewide health standard MSCs are protective of ecological receptors, a person shall demonstrate in the final report that postremedy use will eliminate complete exposure pathways at the time of the final report or in accordance with a postremediation care plan, or that mitigative measures identified in subsection (f) have been instituted and are subject to postremediation care plan requirements as described in § 250.312(b) (relating to final report).
- (3) A person shall demonstrate attainment of the background standard.
- (4) A person shall follow the procedures in §§ 250.402(c) and 250.409 (relating to human health and environmental protection goals; and risk assessment report) and demonstrate attainment of the site-specific standard for protection of ecological receptors.
- (f) Mitigation measures to restore or replace equivalent ecological resources in the local area of the site may be applied if the following are met:
- (1) No exceptional value wetlands have been identified by the screening process.
- (2) No Federal or State laws and regulations prohibit or restrict the elimination of habitats or species identified by the screening process.
- (3) A mitigation measure is selected based on the following hierarchy:
- (i) Restoration onsite of species and habitats identified in the screening process.
- (ii) Replacement onsite of species and habitats identified in the screening process.
- (iii) Replacement on an adjacent area to the site of species and habitats identified in the screening process.
- (iv) Replacement at a location within the municipality where the site is located of species and habitats identified in the screening process.
- (4) The Department will review and approve mitigation measures prior to implementation to ensure that the proposed remedy and intended use of the property minimize the impacts to ecological receptors identified in the screening procedure.
- (5) The postremediation care plan requirements in § 250.312(e) or § 250.411(f) (relating to final report) are implemented.

Source

The provisions of this § 250.311 amended November 23, 2001, effective November 24, 2001, 31 Pa.B. 6395; amended November 19, 2021, effective November 20, 2021, 51 Pa.B. 7173. Immediately preceding text appears at serial pages (355292) to (355294).

Cross References

This section cited in 25 Pa. Code § 245.309 (relating to site characterization); 25 Pa. Code § 245.310 (relating to site characterization report); 25 Pa. Code § 250.303 (relating to aquifer determination; current use and currently planned use of aquifer groundwater); 25 Pa. Code § 250.305 (relating to MSCs for soil); 25 Pa. Code § 250.312 (relating to final report); 25 Pa. Code § 250.402 (relating to human health and environmental protection goals); 25 Pa. Code § 250.411 (relating to final report); and 25 Pa. Code § 250.606 (relating to development of site-specific standards).

§ 250.312. Final report.

(a) For sites remediated under the Statewide health standard, the person conducting the remediation shall submit a final report to the Department which documents attainment of the selected standard. This final report must include site characterization information identified in § 250.204(b)—(e) (relating to final report). The site characterization shall be conducted in accordance with scientifically recognized principles, standards and procedures. The level of detail in the investigation, and the selected methods and analyses, that may include models, must sufficiently define the rate of movement and the present and future extent and fate of contaminants to ensure continued attainment of the remediation standard. The final report must include, as appropriate, an assessment that addresses the vapor intrusion exposure pathway. Interpretations of geologic and hydrogeologic data shall be prepared by a professional geologist licensed in this Commonwealth.

(b) The final report for the Statewide health standard shall include the results of the evaluation of ecological receptors. If a person relies on a postremedy use to eliminate complete exposure pathways that is not implemented at the time of the final report submission, a postremediation care plan shall be submitted to document that the postremedy use is implemented within 1 year from final report approval, unless the Department approves an extension of time. If mitigation measures are implemented under § 250.311 (relating to evaluation of ecological receptors), a postremediation care plan shall be documented in the final report that includes the following:

(1) A plan to maintain the mitigated ecological resource.

(2) Reporting of the ongoing success or failure of the mitigation measure implemented.

(3) Mitigation measures, instituted at the time of the final report, shall be successfully accomplished and sustained up to 5 years from final report approval.

(c) Final reports for the Statewide health standard shall include information on the basis for selecting residential or nonresidential standards and the additional information identified in § 250.204(f)(1)—(5).

(d) The final report for the Statewide health standard shall include all sampling data and descriptions of the sampling methodology and analytical results, including the appropriate statistical methodologies, which pertain to whether the remediation has attained the selected standard, following the requirements of Subchapter G (relating to demonstration of attainment).

(e) If engineering controls are needed to attain or maintain a standard, if institutional controls are needed to maintain a standard, if the fate and transport analysis indicates that the remediation standard, including the solubility limitation in § 250.304(b) (relating to MSCs for groundwater), may be exceeded at the point of compliance in the future, or if the remediation relies on natural attenuation, a postremediation care plan shall be documented in the final report that includes the information identified in § 250.204(g).

(f) If the soil to groundwater pathway soil buffer distances are used, as identified in § 250.308 (relating to soil-to-groundwater pathway numeric values), the following information shall be included in the final report:

(1) Information demonstrating that the actual site soil column thickness below the contaminated soil by the information gathered from soil sample borings conducted during the site characterization is at least the thickness identified in Appendix A, Tables 3 and 4.

(2) Information gathered during the field investigation phase and the laboratory analyses conducted on the soil samples.

(3) The boring logs and all other data presented in appropriate maps, cross sections, figures and tables.

(g) If an equivalency demonstration is used under § 250.308(d), the following information shall be included in the final report:

(1) Information describing the actual site soil column below the contaminated soil determined by soil sample borings conducted during the site characterization.

(2) Information gathered during the field investigation phase and the laboratory analyses conducted on the groundwater samples beneath the contaminated soil.

(3) The boring logs and all other data presented in appropriate maps, cross sections, figures and tables.

(4) Sampling data, in a tabular format, that shows no exceedances of groundwater MSCs or the background standard, under § 250.308(d)(2).

(5) A demonstration, submitted in a graphic format, that sampling data indicates no increasing trend of concentration over time that may exceed the standard.

(h) When a person implements a remedy that relies on access to properties owned by third parties, for remediation or monitoring, documentation of cooperation or agreement shall be submitted as part of the final report.

Authority

The provisions of this § 250.312 issued under sections 104(a) and 303(a) of the Land Recycling and Environmental Remediation Standards Act (35 P. S. §§ 6026.104(a) and 6026.303(a)).

Source

The provisions of this § 250.312 amended January 7, 2011, effective January 8, 2011, 41 Pa.B. 230. Immediately preceding text appears at serial pages (233776) to (233777).

Cross References

This section cited in 25 Pa. Code § 245.313 (relating to remedial action completion report); 25 Pa. Code § 250.311 (relating to evaluation of ecological receptors); and 25 Pa. Code § 253.1 (relating to definitions).

Subchapter D. SITE-SPECIFIC STANDARD

Sec.

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Cross References

This subchapter cited in 25 Pa. Code § 250.2 (relating to application of remediation standards); 25 Pa. Code § 250.9 (relating to interaction with other environmental statutes); 25 Pa. Code § 250.602 (relating to risk assessment procedures); 25 Pa. Code § 250.703 (relating to general attainment requirements for soil); 25 Pa. Code § 250.704 (relating to general attainment requirements for groundwater); and 25 Pa. Code § 287.101 (relating to general requirements for permits).

§ 250.401. Scope.

- (a) This subchapter sets forth requirements and procedures for any person selecting the site-specific standards.
- (b) The Department may approve or disapprove a remedial investigation report, a risk assessment report or cleanup plan based on consideration of all subsections in section 304 of the act (35 P.S. § 6026.304).

§ 250.402. Human health and environmental protection goals.

- (a) Site-specific standards shall be developed that meet the human health and environmental protection goals specified in this section. The development of site-specific standards shall be based on a site-specific risk assessment, if required.
- (b) The site-specific standard shall be a protective level that eliminates or reduces any risk to human health in accordance with the following:
 - (1) For known or suspected carcinogens, soil and groundwater cleanup standards shall be established at exposures which represent an excess upper-bound lifetime risk of between 1 in 10,000 and 1 in 1 million. The cumulative excess risk to exposed populations, including sensitive subgroups, may not be greater than 1 in 10,000.
 - (2) For systemic toxicants, soil and groundwater cleanup standards shall represent the level to which the human population could be exposed on a daily basis without appreciable risk of deleterious effect to the exposed population. Where several systemic toxicants affect the same target organ or act by the same method of toxicity, the hazard index may not exceed one.
- (c) In addition to any protection afforded under other requirements for meeting surface water and air quality standards under this chapter, direct impacts resulting from a release of regulated substances to the receptors identified in § 250.311(a) (relating to evaluation of ecological receptors) shall be assessed and addressed in the remedial investigation, risk assessment and cleanup plans.
- (d) If a person is using the site-specific standard to protect ecological receptors under this subchapter or as a result of selecting § 250.311(e)(4) when ecological receptors cannot be evaluated under the Statewide health standard, the following shall be performed:
 - (1) An ecological risk assessment to determine if an impact has occurred or will occur if the release of a regulated substance goes unabated.
 - (2) An ecological risk assessment conducted in accordance with Department-approved EPA or ASTM guidance to establish acceptable remediation levels or alternative remedies based on current and future use that are protective of the ecological receptors.

(3) Implementation of the selected remedy, which may include mitigation measures under § 250.311(f), that is protective of the ecological receptors.

Authority

The provisions of this § 250.402 amended under sections 104(a) and 303(a) of the Land Recycling and Environmental Remediation Standards Act (35 P.S. §§ 6026.104(a) and 6026.303(a)); and section 1920-A of The Administrative Code of 1929 (71 P.S. § 510-20).

Source

The provisions of this § 250.402 amended November 19, 2021, effective November 20, 2021, 51 Pa.B. 7173. Immediately preceding text appears at serial page (380025).

Cross References

This section cited in 25 Pa. Code § 245.310 (relating to site characterization report); 25 Pa. Code § 250.311 (relating to evaluation of ecological receptors); 25 Pa. Code § 250.404 (relating to pathway identification and elimination); 25 Pa. Code § 250.602 (relating to risk assessment procedures); and 25 Pa. Code § 250.606 (relating to development of site-specific standards).

§ 250.403. Use of groundwater.

- (a) Groundwater will not be considered a current or potential source of drinking water where groundwater has a background total dissolved solids concentration greater than 2,500 milligrams per liter.
- (b) Except as provided in subsection (a), current and probable future use of groundwater shall be determined on a site-specific basis.
- (c) Drinking water use of groundwater shall be made suitable by at least meeting the primary and secondary MCLs at all points of exposure identified in § 250.404 (relating to pathway identification and elimination).
- (d) Current drinking water or agricultural uses of groundwater, at the time contamination was discovered, shall be protected.

§ 250.404. Pathway identification and elimination.

- (a) The person shall use Department or Department-approved EPA or ASTM guidance to identify any potential current and future exposure pathways for both human receptors and environmental receptors identified in § 250.402 (relating to human health and environmental protection goals).
- (b) The person shall summarize pathways for current land use and any probable future land use separately in the site-specific remedial investigation report.
- (c) If no exposure pathway exists, and no remedy is required to be proposed and completed, the following apply:
 - (1) The remedial investigation report shall contain information necessary to determine that no current or future exposure pathway exists.
 - (2) A risk assessment, including an ecological risk assessment, and cleanup plan are not required.
 - (3) The remedial investigation report and the final report may be submitted simultaneously.
 - (d) Prior to performing a risk assessment as required in § 250.405 (relating to when to perform a risk assessment), the person may take into account the

effect of engineering and institutional controls in eliminating pathways identified in subsection (b) and include this evaluation in the remedial investigation report.

Authority

The provisions of this § 250.404 amended under sections 104(a) and 303(a) of the Land Recycling and Environmental Remediation Standards Act (35 P.S. §§ 6026.104(a) and 6026.303(a)); and section 1920-A of The Administrative Code of 1929 (71 P.S. § 510-20).

Source

The provisions of this § 250.404 amended November 19, 2021, effective November 20, 2021, 51 Pa.B. 7173. Immediately preceding text appears at serial page (380026).

Cross References

This section cited in 25 Pa. Code § 245.310 (relating to site characterization report); 25 Pa. Code § 250.403 (relating to use of groundwater); and 25 Pa. Code § 250.405 (relating to when to perform a risk assessment).

§ 250.405. When to perform a risk assessment.

(a) Except as specified in subsections (b) and (c), a person who remediates under this subchapter shall develop site-specific standards based on a risk assessment. The person shall conduct the risk assessment according to the procedures specified in Subchapter F (relating to exposure and risk determinations).

(b) The risk assessment report is not required if a fate and transport analysis which takes into account the effects of engineering and institutional controls demonstrates that neither present nor future exposure pathways exist. This demonstration shall follow the procedures described in § 250.404 (relating to pathway identification and elimination).

(c) The baseline risk assessment report is not required if the Department, in its remedial investigation report or cleanup plan approval, determines that a specific remediation measure that eliminates all pathways, other than a no-action remedial alternative, can be implemented to attain the site-specific standard in accordance with the requirements of attainment demonstration as specified in Subchapter G (relating to demonstration of attainment). A baseline risk assessment is that portion of a risk assessment that evaluates a risk in the absence of the proposed site-specific measure.

Cross References

This section cited in 25 Pa. Code § 250.404 (relating to pathway identification and elimination); 25 Pa. Code § 250.409 (relating to risk assessment report); and 25 Pa. Code § 250.602 (relating to risk assessment procedures).

§ 250.406. Relationship to surface water quality requirements.

(a) A regulated discharge to surface waters shall comply with the applicable provisions of Chapters 91—96, 97 (reserved) and 102—105, including antidegradation requirements.

(b) For point source discharges to surface water, compliance shall be measured at the point of discharge in accordance with limits specified in the NPDES permit.

(c) For purposes of determining compliance with surface water quality standards from a diffuse surface or groundwater discharge, the person shall determine the expected instream regulated substance concentrations, that are attributable to releases at the site, using mass balance techniques and appropriate sampling for groundwater/surface water mixing at design flow conditions. If the results indicate that surface water quality standards are being achieved, no action is required. If results indicate that surface water quality standards are not being achieved, additional sampling may be performed to help evaluate whether surface water quality standards are being achieved. If the results of the sampling indicate the surface water quality standards are being met, no further action is required. If the results of the modeling, and sampling if any, indicate the surface water quality standards are not being met, the person shall perform further remedial action to attain the surface water quality standards, unless a waiver of the surface water quality standards is obtained under paragraphs (1) and (2).

(1) In the case of a diffuse surface or groundwater discharge which existed at the time contamination was discovered, the Department may waive any otherwise applicable provisions, including the provisions of Chapter 93 (relating to water quality standards), under section 902(b) of the act (35 P. S. § 6026.902(b)).

(2) An applicant for a waiver of provisions in Chapter 93 shall demonstrate to the Department that the proposed remedial alternative will result in attainment of a concentration in the stream that does not exceed human health criteria and aquatic life criteria under the requirements in Chapter 93. The person may propose the use of alternative site-specific exposure factors or design conditions that will demonstrate attainment of the human health criteria.

(d) Except if an NPDES permit is required, for purposes of complying with surface water quality standards in a spring, the point of compliance is the point of first designated or existing use, as defined in §§ 93.1, 93.4 and 93.9 (relating to definitions; Statewide water uses; and designated water uses and water quality criteria). Where the point of first designated or existing use occurs in a surface water into which a spring flows, compliance with surface water quality standards shall be determined in the manner specified in subsection (c).

Cross References

This section cited in 25 Pa. Code § 245.310 (relating to site characterization report).

§ 250.407. Point of compliance.

(a) For attainment of a site-specific standard in groundwater, the point of compliance is the property boundary that existed at the time the contamination was discovered. Site-specific standards shall be attained at and beyond the point of compliance. The Department may determine in writing a point of compliance beyond the property boundary to be appropriate if one of the following situations is demonstrated:

(1) Structures are located on the property boundary which prohibit internal or external access for a drill rig.

- (2) The property is a small parcel of land with limited space for onsite monitoring wells.
- (3) It is not physically possible to monitor groundwater quality at the property boundary.
- (4) The downgradient property was owned by the same party at the time the contamination was discovered and the use of the groundwater on the downgradient property can be controlled to prevent unacceptable exposure.
- (5) For measuring compliance with secondary contaminants.
- (b) For attainment of a site-specific standard in residential areas for volatilization directly to indoor air, the point of compliance is the point of exposure where there is exposure on the site in a below-grade occupied space.
- (c) For attainment of site-specific soil standards in residential areas, the point of compliance for ingestion and inhalation exposure is up to 15 feet below the existing surface unless bedrock or physical structures are encountered which prevent safe continued remediation.
- (d) For attainment of site-specific soil standards in nonresidential areas, the point of compliance for ingestion, inhalation and volatilization is the point of exposure as identified in an approved risk assessment report, if required.
- (e) For the emission of regulated substances to outdoor air, the point of compliance for the air quality standard shall be as specified in the air quality regulations. See Article III (relating to air resources).

Authority

The provisions of this § 250.407 issued under sections 104(a) and 303(a) of the Land Recycling and Environmental Remediation Standards Act (35 P. S. §§ 6026.104(a) and 6026.303(a)).

Source

The provisions of this § 250.407 amended January 7, 2011, effective January 8, 2011, 41 Pa.B. 230. Immediately preceding text appears at serial pages (285781) to (285782).

Cross References

This section cited in 25 Pa. Code § 250.701 (relating to scope).

§ 250.408. Remedial investigation report.

- (a) Persons electing to remediate a site to the site-specific standard shall submit a remedial investigation report to the Department for review and approval. This report shall include documentation and a description of the procedures and conclusions from the site characterization conducted according to the requirements of subsections (b)—(e). The site characterization shall be conducted in accordance with scientifically recognized principles, standards and procedures. The level of detail in investigation, and the selected methods and analyses, that may include models, shall sufficiently define the rate of movement and the present and future extent and fate of contaminants, to ensure continued attainment of the remediation standard. Interpretations of geologic and hydrogeologic data shall be prepared by a professional geologist licensed in this Commonwealth.
- (b) As directed from specific knowledge of the subject property, historic use of the subject property or regulated substance usage information regarding the

subject property, an appropriate number of sample locations should be investigated from the identified media of concern to characterize the nature and composition of the contaminants including:

- (1) Source characterization or development of a conceptual site model.
 - (2) The vertical and horizontal extent of contamination above the selected standard within each medium of concern.
 - (3) The direction and rate of contaminant movement within each medium of concern.
 - (4) Identification of the appropriate remedial technology options for each medium of concern.
- (c) Descriptions of sampling and decontamination methodologies and analytical quality assurance/quality control procedures should be included within a sampling and analysis plan and quality assurance plan. Copies of soil and geologic boring descriptions and as-built construction drawings of wells used for site characterization should be included in the report. Copies of all laboratory analytical results and applicable laboratory quality control results should be included within the report, including all historical data and data eliminated from consideration based on data validation protocols. Analytical results should be presented within the report in table form.
- (d) If soil is determined to be a medium of concern, the site characterization shall determine the relative location of the soil samples necessary to characterize the horizontal and vertical extent of contamination, and factors which could relate to the movement of the contamination. The horizontal and vertical extent of soil with concentrations of regulated substances above the selected standard shall be defined by an appropriate number of samples inside and outside of the area that exceeds the standard. Soil samples from the area with the anticipated highest levels of contamination shall be obtained, as appropriate, to determine the applicability of the proposed remedial action and handling and disposal requirements for that soil during remediation.
- (e) If groundwater is determined to be a medium of concern, the site characterization shall characterize the effects of a release on groundwater to adequately determine how naturally occurring physical and geochemical characteristics define the movement of groundwater and contaminants beneath the surface, including the delineation of the position of aquifers, as well as geologic units which inhibit groundwater flow. When appropriate, the characterization shall consider the heterogeneity and anisotropy of aquifer materials based on hydraulic conductivity values (measured or published), and the effect of local and regional groundwater flow directions and influence from pumping wells. Defining the horizontal extent of concentrations of regulated substances above the standard shall require more than one round of groundwater sampling from properly constructed and developed monitoring wells taken with a sufficient number of days apart to yield independently valid results. When characterizing the vertical extent of groundwater contamination, the person shall perform more than one round of groundwater sampling and shall consider the specific gravity of the regulated

substances identified in the groundwater in the site, and the potential for naturally occurring or induced downward vertical hydraulic gradients. When characterizing the vertical extent of groundwater contamination, properly constructed monitoring wells or nested monitoring wells should be utilized to focus groundwater sampling in zones of potential contaminant accumulation (that is, directly above a confining layer) and sampling shall be taken with a sufficient number of days apart to yield independently valid results.

(f) The comments obtained as a result of a public involvement plan, if any, and the responses to those public comments shall be included in a remedial investigation report.

§ 250.409. Risk assessment report.

The risk assessment report shall conform to this subchapter and Subchapter F (relating to exposure and risk determinations), and shall include the following unless not required under § 250.405 (relating to when to perform a risk assessment):

- (1) Except when submitted in combination with a remedial investigation report, a risk assessment report that uses site characterization information from an approved remedial investigation report to describe the potential adverse effects, including the evaluation of ecological receptors, under both current and planned future conditions caused by the presence of regulated substances in the absence of any further control, remediation or mitigation measures.
- (2) The development of the site-specific standards risk assessment report that describes the methods used to calculate a concentration level at which human health and the environment are protected.
- (3) The comments obtained as a result of a public involvement plan, if any, and the responses to those public comments.

Authority

The provisions of this § 250.409 amended under sections 104(a) and 303(a) of the Land Recycling and Environmental Remediation Standards Act (35 P.S. §§ 6026.104(a) and 6026.303(a)); and section 1920-A of The Administrative Code of 1929 (71 P.S. § 510-20).

Source

The provisions of this § 250.409 amended November 19, 2021, effective November 20, 2021, 51 Pa.B. 7173. Immediately preceding text appears at serial page (355303).

Cross References

This section cited in 25 Pa. Code § 245.310 (relating to site characterization report); 25 Pa. Code § 250.311 (relating to evaluation of ecological receptors).

§ 250.410. Cleanup plan.

(a) A cleanup plan is required to be submitted to the Department for approval when the site-specific standard is selected as the remediation goal. The cleanup plan shall evaluate the relative abilities of the alternative remedies to achieve the site-specific standard and propose a remedial measure which shall achieve the standard established according to the procedures contained in this subchapter. The

person submitting the plan shall evaluate additional alternative remedies that have been requested for evaluation by the Department in accordance with the act.

(b) Other components of the cleanup plan include:

- (1) Site maps.
- (2) The results of treatability, bench scale or pilot scale studies or other data collected to support the remedial actions.
- (3) Adequate design plans and specifications sufficient to evaluate the proposed remedy.
- (4) The comments obtained as a result of a public involvement plan and the responses to those public comments.
- (5) Documentation of proposed postremediation care requirements if they are needed to maintain the standard.

(c) When a person proposes a remedy that relies on access to properties owned by third parties, for remediation or monitoring, documentation of cooperation or agreement shall be submitted as part of the cleanup plan.

(d) A cleanup plan is required when an institutional or engineering control is used as a remedy to address current and future exposure pathways or exposure pathways that existed prior to submitting an NIR.

(e) A cleanup plan is not required and no remedy is required to be proposed or completed if no current or future exposure pathways exist.

Authority

The provisions of this § 250.410 amended under sections 104(a) and 303(a) of the Land Recycling and Environmental Remediation Standards Act (35 P.S. §§ 6026.104(a) and 6026.303(a)); and section 1920-A of The Administrative Code of 1929 (71 P.S. § 510-20).

Source

The provisions of this § 250.410 amended November 19, 2021, effective November 20, 2021, 51 Pa.B. 7173. Immediately preceding text appears at serial page (355303).

§ 250.411. Final report.

(a) For sites remediated under the site-specific standard, the person conducting the remediation shall submit a final report to the Department which documents attainment of the selected standard.

(b) Final reports shall demonstrate that the remedy has been completed in accordance with an approved cleanup plan.

(c) Final reports shall include the information identified in § 250.204(f)(1)—(5) (relating to final report).

(d) If engineering or institutional controls are needed to maintain a standard, if the fate and transport analysis indicates that the remediation standard may be exceeded at the point of compliance in the future, or, if the remediation relies on natural attenuation, a postremediation care plan shall be documented in the final report that includes the information identified in § 250.204(g).

(e) The comments obtained as a result of a public involvement plan and the responses to those public comments shall be included in a final report.

(f) If mitigation measures are implemented in accordance with § 250.311(f) (relating to evaluation of ecological receptors), a postremediation care plan shall be documented in the final report that includes the following:

- (1) A plan to maintain the mitigated ecological resource.
- (2) Reporting of the ongoing success or failure of the mitigation measure implemented.
- (3) Mitigation measures instituted at the time of the final report which shall be successfully accomplished and sustained up to 5 years from final report approval.

Cross References

This section cited in 25 Pa. Code § 245.313 (relating to remedial action completion report); 25 Pa. Code § 250.311 (relating to evaluation of ecological receptors); and 25 Pa. Code § 253.1 (relating to definitions).

§ 250.412. Combined reports.

A person does not need prior Department approval of a remedial investigation report if the remedial investigation report is submitted together with either a risk assessment report or a cleanup plan.

Authority

The provisions of this § 250.412 added under sections 104(a) and 303(a) of the Land Recycling and Environmental Remediation Standards Act (35 P.S. §§ 6026.104(a) and 6026.303(a)); and section 1920-A of The Administrative Code of 1929 (71 P.S. § 510-20).

Source

The provisions of this § 250.412 added November 19, 2021, effective November 20, 2021, 51 Pa.B. 7173.

Subchapter E. SIA STANDARDS

Sec.

250.501. Scope.

250.502. Eligibility determinations.

250.503. Remediation requirements.

§ 250.501. Scope.

(a) This subchapter sets forth requirements and procedures for any person who conducts remediation activities for property located in an SIA.

(b) A person who conducts remediation activities in an SIA shall comply with the requirements for notifying municipalities, the public and the Department.

§ 250.502. Eligibility determinations.

The person proposing remediation shall demonstrate:

- (1) The property was used for industrial activity.
- (2) The person did not cause or contribute to contamination on the property.
- (3) There is no financially viable responsible person to clean up the contamination; or the property is located within a designated enterprise zone.

§ 250.503. Remediation requirements.

(a) A person proposing remediation of an SIA shall perform a baseline remedial investigation that establishes a reference point for existing contamination.

(b) A work plan shall be prepared that will define the scope of the baseline remedial investigation and shall be submitted to the Department for approval prior to the initiation of the investigation.

(c) At a minimum, a baseline remedial investigation shall include the following:

(1) Identification of the historical regulated substance use, handling and disposal activities on the property and any known or suspected releases associated with these activities by conducting environmental site assessment research and interviews with any person who may have knowledge of the property.

(2) If indicated by the investigation, performance of environmental sampling, within all potential media of concern, to confirm that the releases have occurred.

(3) Identification of potential migration pathways off the property and associated potential receptors of any confirmed releases on the property.

(4) If migration pathways and associated potential receptors have been identified, performance of environmental sampling of groundwater and other media at the downgradient property boundary to determine if regulated substances from the releases on the property have migrated off the property.

(5) Evaluation of exposure conditions within the portion of the property to be reused to identify existing contamination that poses an immediate, direct or imminent threat to public health or the environment which is inconsistent with the intended reuse of that portion of the property.

(d) The results of the baseline remedial investigation shall be included in a baseline environmental report. At a minimum, the baseline environmental report shall include the following:

(1) A description of the location and boundaries of the SIA.

(2) Identification of all areas of contamination.

(3) A description of the intended reuse of the property and exposure patterns.

(4) A remediation plan for the property that addresses all immediate, direct or imminent threats to public health and the environment which would prevent the property from being occupied for its intended purpose and delineates methods of compliance monitoring. At a minimum, immediate, direct or imminent threats will entail:

(i) Containerized wastes not intended in the property reuse, such as wastes in drums, above or below ground tanks and small containers.

(ii) Wastes not contained which present a direct threat to workers or other users or occupants of the property.

(iii) Contaminated soil presenting a direct threat to workers or other users or occupants of the property. The depth of consideration shall be the

first 2 feet from the ground surface, unless reuse of the property presents exposure threats from depths greater than 2 feet.

(iv) Contaminated groundwater, if groundwater use will expose persons on the property to contaminants.

(v) Contaminated surface water and sediments, if use will expose persons on the property to contaminants.

(5) A remediation plan to prevent access to portions of the property containing contaminated media that is not being required to be remediated and that poses unacceptable health risks to trespassers or workers on the site.

(6) A description of the existing or potential public benefits of the reuse of the property, such as employment, housing, open space or recreation.

(7) The comments obtained as a result of a public involvement plan and the responses to these public comments.

(e) A person that changes the use of the property from nonresidential to residential, or changes the use of the property to create substantial changes in exposure conditions to contamination that existed prior to the person's reuse shall notify the Department of the changes and may be required to amend the baseline environmental report and implement a remediation plan to address any new imminent, direct or immediate threats to human health and the environment resulting from the changes.

(f) The baseline environmental report shall include and address any municipal and public comments and the response to those comments as developed by the public involvement plan.

(g) The baseline environmental report shall be submitted to the Department after the date of approval of the baseline remedial investigation work plan, and the public participation period.

Authority

The provisions of this § 250.503 amended under sections 104(a) and 303(a) of the Land Recycling and Environmental Remediation Standards Act (35 P.S. §§ 6026.104(a) and 6026.303(a)); and section 1920-A of The Administrative Code of 1929 (71 P.S. § 510-20).

Source

The provisions of this § 250.503 amended November 19, 2021, effective November 20, 2021, 51 Pa.B. 7173. Immediately preceding text appears at serial pages (355305) to (355306).

Subchapter F. EXPOSURE AND RISK DETERMINATIONS

Sec.

250.601. Scope.

250.602. Risk assessment procedures.

250.603. Exposure factors for site-specific standards.

250.604. Fate and transport modeling requirements for exposure assessments.

250.605. Sources of toxicity information.

250.606. Development of site-specific standards.

Cross References

This subchapter cited in 25 Pa. Code § 245.309 (relating to site characterization); 25 Pa. Code § 250.405 (relating to when to perform a risk assessment); 25 Pa. Code § 271.1 (relating to definitions); and 25 Pa. Code § 287.1 (relating to definitions).

§ 250.601. Scope.

- (a) This subchapter specifies the information and procedures necessary to conduct a risk assessment.
- (b) A risk assessment shall ensure adequate evaluation of the risks associated with human and ecological receptors exposed to regulated substances at contaminated sites.
- (c) A risk assessment may include one or more of the following:
 - (1) A baseline risk assessment.
 - (2) A risk assessment to develop site-specific standards.

§ 250.602. Risk assessment procedures.

- (a) Except as specified in § 250.405 (relating to when to perform a risk assessment), a person shall perform a risk assessment when using a site-specific standard under Subchapter D (relating to site-specific standards) to determine if there are unacceptable exposures to humans or unacceptable exposures to ecological receptors, or both.
- (b) A person who proposes to perform a risk assessment under the site-specific standard shall use the methodologies used to develop the Statewide health standards contained in Subchapter C (relating to Statewide health standards) to conduct the risk assessment. If methodologies are not specified in Subchapter C or this subchapter, the risk assessment shall be conducted in accordance with the methodology specified in EPA or ASTM guidelines approved by the Department.
- (c) A risk assessment for human exposure shall include the following components:
 - (1) Data collection, including source characterization and development of a conceptual site model, and evaluation to identify contaminants of concern.
 - (2) Exposure assessment that considers ingestion, inhalation and volatilization pathways and exposure assumptions based on land use.
 - (3) Toxicity assessment that includes the use of toxicity information from sources identified in § 250.605 (relating to sources of toxicity information).
 - (4) Risk characterization that evaluates if the risks meet the human health protection goals and ecological receptor protection specified in § 250.402 (relating to human health and environmental protection goals).
- (d) An exposure assessment that is based on sampling shall use a data handling methodology that is consistent with the statistical method used to demonstrate attainment.
- (e) When performing an exposure assessment, a person shall use the appropriate exposure factors identified in § 250.603 (relating to exposure factors for site-specific standards) and meet the requirements of § 250.604 (relating to fate and transport modeling requirements for exposure assessments).

(f) The risk assessment report shall discuss the degree of uncertainty associated with the risk assessment.

Cross References

This section cited in 25 Pa. Code § 250.606 (relating to development of site-specific standards).

§ 250.603. Exposure factors for site-specific standards.

(a) A risk assessment for the site-specific standard shall use site-specific exposure factors under the EPA's *Exposure Factors Handbook: 2011 Edition*, 2011 (EPA/600/R-090/052F) or exposure factors used in the development of the Statewide health standards identified in Subchapter C (relating to Statewide health standards).

(b) If a person uses site-specific exposure factors that deviate from the standard exposure factors in Subchapter C, the site-specific exposure factors shall be clearly justified by supporting data. The person shall provide the supporting data in the site-specific risk assessment report.

(c) The exposure factors shall be selected based on the land use of the site with reference to current and currently planned future land use and the effectiveness of institutional or legal controls placed on the future use of the land.

(d) The person shall document in the site-specific risk assessment report the future use of the site.

Authority

The provisions of this § 250.603 amended under sections 104(a) and 303(a) of the Land Recycling and Environmental Remediation Standards Act (35 P.S. §§ 6026.104(a) and 6026.303(a)); and section 1920-A of The Administrative Code of 1929 (71 P.S. § 510-20).

Source

The provisions of this § 250.603 amended November 19, 2021, effective November 20, 2021, 51 Pa.B. 7173. Immediately preceding text appears at serial page (355308).

Cross References

This section cited in 25 Pa. Code § 250.602 (relating to risk assessment procedures); and 25 Pa. Code § 250.606 (relating to development of site-specific standards).

§ 250.604. Fate and transport modeling requirements for exposure assessments.

(a) A person may use the soil-to-groundwater model in § 250.308(a)(2) (relating to soil to groundwater pathway numeric values) to estimate site-specific, soil-to-groundwater leaching potential for organic contaminants if the following conditions are met:

(1) Site-specific values of water-filled soil porosity, dry soil bulk density, dilution factors (DF) and fraction organic carbon in soil beneath the source of contamination (that is, not from top soil) are appropriately justified and the person provides supporting data to the Department.

(2) Koc values as provided in § 250.308(a)(2) are used or site-specific values which are appropriately justified are used and the person provides supporting data to the Department.

- (3) There is no identified separate phase liquid contamination at the site.
- (4) Other processes such as colloidal transport or transport by means of dissolved organic matter (DOM) are not significant at the site.
- (5) The application of the soil-to-groundwater model shall meet the most current EPA or ASTM quality assurance/quality control criteria approved by the Department.
- (b) Except for the soil-to-groundwater model in § 250.308(a)(2), a person planning to use other fate and transport models and methods to estimate exposure concentrations and to develop site-specific standards shall use appropriate models or methods approved by the Department. The application of groundwater models shall meet the most current EPA or ASTM quality assurance/quality control criteria approved by the Department.

Cross References

This section cited in 25 Pa. Code § 250.602 (relating to risk assessment procedures); and 25 Pa. Code § 250.606 (relating to development of site-specific standards).

§ 250.605. Sources of toxicity information.

- (a) For site-specific standards, the person shall use appropriate reference doses, reference concentrations, cancer slope factors and unit risk factors identified in Subchapter C (relating to Statewide health standards), unless the person can demonstrate that published data, available from one of the following sources, provides more current reference doses, reference concentrations, cancer slope factors or unit risk factors:
 - (1) Integrated Risk Information System (IRIS).
 - (2) United States Environmental Protection Agency, National Center for Environmental Assessment (NCEA) Provisional Peer-Reviewed Toxicity Values (PPRTV).
 - (3) Other sources:
 - (i) Health Effects Assessment Summary Tables (HEAST).
 - (ii) Agency for Toxic Substances and Disease Registry (ATSDR) Toxicological Profiles.
 - (iii) California EPA, California Cancer Potency Factors and Chronic Reference Exposure Levels.
 - (iv) EPA criteria documents, including drinking water criteria documents, drinking water health advisory summaries, ambient water quality criteria documents and air quality criteria documents.
 - (v) EPA Human Health Benchmarks for Pesticides (HHBP).
 - (vi) EPA PPRTV Appendix.
- (b) If no toxicity values are available from sources identified in subsection (a), the person may use the background standard or meet one of the following:
 - (1) Develop for the Department's review in the risk assessment report one of the following:
 - (i) Chemical-specific toxicity values in accordance with the methods in the most current EPA guidelines or protocols, approved by the Department, using corroborated peer-reviewed data published in a scientific journal, if they exist.
 - (ii) Toxicity values developed from appropriately justified surrogates.

(2) Use the minimum threshold medium-specific concentration, as the site-specific standard, with an assumed risk of 1×10^{-5} for purposes of calculating cumulative risk for the regulated substances identified in Appendix A, Table 6.

Authority

The provisions of this § 250.605 amended under sections 104(a) and 303(a) of the Land Recycling and Environmental Remediation Standards Act (35 P.S. §§ 6026.104(a) and 6026.303(a)); and section 1920-A of The Administrative Code of 1929 (71 P.S. § 510-20).

Source

The provisions of this § 250.605 amended January 7, 2011, effective January 8, 2011, 41 Pa.B. 230; corrected March 19, 2011, effective March 5, 2011, 41 Pa.B. 1458; amended November 19, 2021, effective November 20, 2021, 51 Pa.B. 7173. Immediately preceding text appears at serial pages (356285) to (356286).

Cross References

This section cited in 25 Pa. Code § 250.602 (relating to risk assessment procedures); and 25 Pa. Code § 250.606 (relating to development of site-specific standards).

§ 250.606. Development of site-specific standards.

(a) If an unacceptable risk is identified by the assessments described in § 250.602 (relating to risk assessment procedures), a person shall perform one of the following:

(1) A remediation that eliminates all current and probable future exposure pathways.

(2) A remediation utilizing a standard developed under a site-specific risk assessment that is protective of human health and the environment.

(b) A person who chooses to use a standard developed under a site-specific risk assessment shall meet the human health and environmental protection requirements identified in § 250.402 (relating to human health and environmental protection goals).

(c) The development of site-specific standards shall be based on the standard in § 250.605(b)(2) (relating to sources of toxicity information) or the components of risk assessment in § 250.602, the appropriate exposure factors identified in § 250.603 (relating to exposure factors for site-specific standards), the fate and transport modeling requirements of § 250.604 (relating to fate and transport modeling requirements for exposure assessments) and the toxicity values of § 250.605 (relating to sources of toxicity information).

(d) The following factors shall be considered in the development of the risk assessment and in the development of site-specific standards:

(1) Groundwater in aquifers.

(i) Natural environmental conditions that affect the fate and transport of contaminants, such as natural attenuation, shall be determined.

(ii) The person shall identify routes of exposure for aquifer groundwater such as human exposure to groundwater by ingestion, human inhalation of regulated substances from volatilization and migration of these substances into buildings or other areas where humans could be exposed, human ingestion of regulated substances in surface water or other site-specific surface water exposure pathways with respect to groundwater discharges or releases to surface water, human inhalation of regulated substances in air, or other

site-specific air exposure pathways with respect to release of regulated substances from groundwater to air.

(2) Nonaquifer groundwater. The persons shall consider current and probable future exposure scenarios, such as human exposure as described in paragraph (1)(ii).

(3) The person shall consider current and probable future exposure scenarios, such as:

(i) Human ingestion of soil when direct contact exposure to the soil may reasonably occur.

(ii) Exposure to groundwater by ingestion with respect to leaching of regulated substances from soils to groundwater.

(iii) Human inhalation of regulated substances from volatilization and migration of these substances into below grade occupied space.

(iv) Human ingestion of regulated substances in surface water or other site-specific surface water exposure pathways with respect to regulated substances migration from soil to surface water.

(v) Human inhalation of regulated substances in air or other site-specific air exposure pathways with respect to the release of regulated substances from soil to air.

(4) If ecological receptors have been identified under § 250.311 (relating to evaluation of ecological receptors) or § 250.402, and are impacted, a remedial activity that eliminates current or future exposure pathways, or a standard, shall be developed to protect the receptors from the direct impacts.

(e) In determining soil and groundwater site-specific standards, the person shall identify the land use of the site with reference to current and currently planned future land use and the effectiveness of institutional or legal controls placed on the future use of the land.

(f) In determining soil and groundwater site-specific standards, the person shall use appropriate statistical techniques, including Monte Carlo simulations as appropriate, to establish statistically valid cleanup standards. The report for a risk assessment to develop site-specific standards shall discuss the degree of uncertainty associated with the risk assessment.

Subchapter G. DEMONSTRATION OF ATTAINMENT

Sec.

250.701. Scope.

250.702. Attainment requirements.

250.703. General attainment requirements for soil.

250.704. General attainment requirements for groundwater.

250.705. Attainment requirements for groundwater in aquifers not used or currently planned to be used.

250.706. Demonstration of attainment of surface water and air quality standards.

250.707. Statistical tests.

250.708. Postremediation care attainment.

Cross References

This subchapter cited in 25 Pa. Code § 245.310 (relating to site characterization report); 25 Pa. Code § 245.313 (relating to remedial action completion report); 25 Pa. Code § 250.202 (relating to establishing background concentrations); 25 Pa. Code § 250.204 (relating to final report); and 25 Pa. Code § 250.405 (relating to when to perform a risk assessment).

§ 250.701. Scope.

(a) This subchapter specifies the information and procedures necessary to demonstrate attainment with one or a combination of the background standard, Statewide health standard, site-specific standard and the minimum threshold standard, when a release of a regulated substance has occurred.

(b) This subchapter applies to persons who undertake a remediation in accordance with the act and this chapter.

(c) For purposes of determining attainment of one or a combination of remediation standards, the concentration of a regulated substance is not required to be less than the limits relating to the PQLs for a regulated substance in accordance with § 250.4 (relating to limits related to PQLs).

(d) Attainment of a standard shall be demonstrated at the point of compliance, as identified in § 250.203, 250.302 or 250.407 (relating to point of compliance), whichever is applicable.

§ 250.702. Attainment requirements.

(a) Attainment of a standard shall be demonstrated with adherence to Data Quality Objectives (DQO) and Data Quality Assessment (DQA) processes as specified by the EPA, as appropriate. Attainment of the Statewide health or site-specific standard will apply to the vertical and horizontal extent of soil identified as contaminated from the release of a regulated substance above the selected standard and of groundwater at the point of compliance and beyond in a site characterization. Attainment of the background standard will apply to the vertical and horizontal extent of soil and water identified as contaminated from the release across the site. Where multiple releases occur on a property which produce distinctly separate zones of contamination, the characterization and subsequent attainment demonstrations apply individually to the separate zones.

(b) Demonstration of attainment in a final report shall include the following:

(1) A demonstration that the analysis of the data, through the application of statistical tests provided for in § 250.707 (relating to statistical tests), indicates that the standard has been met.

(2) For groundwater, a demonstration of a statistical time trend analysis, knowledge of the plume stability or other acceptable method that shows contaminant concentration at the point of compliance will not exceed the selected standard. A statistical analysis shall be applied that indicates continued attainment of the standard.

(3) For the site-specific standard, the following apply:

(i) If pathway elimination is part of the remediation, it shall be demonstrated on the basis of either an engineering or hydrogeologic analysis, or both, which includes fate and transport analysis that some or all of the exposure pathways have been eliminated.

(ii) If pathway elimination is not part of the remediation or it cannot be demonstrated that all pathways have been eliminated, it shall be demonstrated that the calculated numerical site-specific standards for the remaining pathways have been attained in accordance with paragraphs (1) and (2), using the procedures in § 250.707(c) and (d), or that the risk level remaining at a site does not exceed a risk level of 1×10^{-4} and a hazard index of 1, provided for in the act. If separate phase liquids are present, it shall also be demonstrated that calculated site-specific numeric standards are attained within the soil and groundwater directly impacted by the separate phase liquids when those numeric standards are associated with exposure to separate phase liquids.

(4) For the background and Statewide health standards, if separate phase liquids are present, attainment at the point of compliance shall also be demonstrated within the soil and groundwater directly impacted by separate phase liquids.

Cross References

This section cited in 25 Pa. Code § 250.707 (relating to statistical tests).

§ 250.703. General attainment requirements for soil.

(a) For any standard selected, the attainment demonstration for the soil media shall be made at the point of compliance as defined in Subchapters B—D (relating to background standards; Statewide health standards; and site-specific standards)

(b) The soil to which the attainment criteria are applied shall be determined by circumscribing with an irregular surface those concentrations detected during characterization which exceed the selected standard. Where this soil is to be removed from the site, the attainment demonstration applies to the base of the excavation defined by the limit of excavation.

(c) Sampling points for demonstration of attainment of soils shall be selected to be random and representative both horizontally and vertically based on a systematic random sampling as set forth in a Department approved reference. If exceedances of a standard occur in a localized area, the Department may require additional characterization and remediation if three or more adjacent samples exceed the standard by more than ten times.

(d) For statistical methods under § 250.707(b)(1)(i) (relating to statistical tests), the number of sample points required for each distinct area of contamination to demonstrate attainment shall be determined in the following way:

(1) For soil volumes equal to or less than 125 cubic yards, at least eight samples.

(2) For soil volumes up to 3,000 cubic yards, at least 12 sample points.

(3) For each additional soil volume of up to 3,000 cubic yards, an additional 12 sample points.

(4) Additional sampling points may be required based on site-specific conditions.

(e) For statistical methods under § 250.707(b)(1)(ii) and (c), the minimum number of samples required for demonstrating attainment shall be as specified by the documentation of the chosen method.

Source

The provisions of this § 250.703 amended November 23, 2001, effective November 24, 2001, 31 Pa.B. 6395. Immediately preceding text appears at serial pages (233694) to (233695).

Cross References

This section cited in 25 Pa. Code § 250.707 (relating to statistical tests).

§ 250.704. General attainment requirements for groundwater.

(a) For any standard selected, the attainment demonstration for the groundwater media shall be made at the point of compliance as defined in Subchapters B—D (relating to background standards; Statewide health standards; and site-specific standards).

(b) A sufficient number and location of monitoring wells necessary to demonstrate attainment of each plume of contamination shall be installed at the point of compliance for each aquifer based on site-specific conditions. Well locations shall be selected to yield an adequate amount of water to produce statistically valid results.

(c) In cases where the site characterization has determined the groundwater contamination (plume) extends beyond the property boundary, and the concentration of regulated substances beyond the property is above the cleanup levels of the standard selected, then the location and number of wells shall determine compliance:

(1) At and beyond the property boundary.

(2) Within the area of property shown, in the site investigation report, to be contaminated with regulated substances above the selected standard.

(d) For statistical methods under § 250.707(b)(2)(i) (relating to statistical tests), the demonstration of attainment for groundwater shall be based on at least eight consecutive quarters of groundwater data, which may include characterization data. As an alternative, the Department may accept fewer quarterly sampling events with written approval from the Department under the following conditions:

(1) There is adequate spatial monitoring of the plume upgradient which indicates a decreasing concentration trend toward the downgradient property boundary.

(2) Parameters affecting the fate and transport of regulated substances within the plume have been fully evaluated.

- (3) Concentrations of regulated substances in the plume at the point of compliance monitoring wells along the downgradient property boundary are all less than or equal to the groundwater standard or the limit relating to the PQL, whichever is higher, in all samples collected during the quarters of monitoring.
- (4) One of the following requirements are met:
- (i) The age of the plume is sufficiently well known to permit a judgment to be made regarding its stability.
 - (ii) The remediation includes source removal or containment actions which would reduce the chemical flux into the plume.
- (e) For statistical methods under § 250.707(b)(2)(ii) and (c), the minimum number of samples required for demonstrating attainment shall be as specified by the documentation of the chosen method.

Authority

The provisions of this § 250.704 issued under sections 104(a) and 303(a) of the Land Recycling and Environmental Remediation Standards Act (35 P. S. §§ 6026.104(a) and 6026.303(a)).

Source

The provisions of this § 250.704 amended January 7, 2011, effective January 8, 2011, 41 Pa.B. 230. Immediately preceding text appears at serial pages (285793) to (285794).

Cross References

This section cited in 25 Pa. Code § 250.707 (relating to statistical tests).

§ 250.705. Attainment requirements for groundwater in aquifers not used or currently planned to be used.

In addition to sampling and statistical analyses that apply to attainment of the Statewide health standards for groundwater in this subchapter, attainment of the MSC for aquifers not used or currently planned to be used shall include the following:

- (1) A scientifically valid and applicable fate and transport analysis, based on sufficient sampling and monitoring data to calibrate the model.
- (2) Based on the fate and transport analysis in paragraph (1), a demonstration that the MSC for groundwater in an aquifer used or currently planned for use is not exceeded at and beyond all points on a radius of 1,000 feet, downgradient from the property boundary within a period of no more than 30 years.

§ 250.706. Demonstration of attainment of surface water and air quality standards.

A person shall demonstrate attainment within the surface water and the air media by demonstrating compliance with the applicable State and Federal laws and regulations.

§ 250.707. Statistical tests.

(a) For regulated substances which are naturally occurring, the person shall compare the analytical results of background reference samples, that are representative of naturally occurring concentrations of regulated substances on the site, with the analytical results of the medium of concern onsite. For nonnaturally occurring regulated substances for which a known background condition exists, the person shall compare the analytical results of background reference samples, which are related to the migration of contaminants onto the site, with the analytical results of the medium of concern onsite. In addition, application of statistical tests for the background standard shall be as follows:

(1) Soil. For soil, a person shall use one of the following statistical methods in subparagraphs (i)—(iii) and conditions relating to subparagraphs (i)—(iii) as described in subparagraphs (iv)—(vi) to demonstrate attainment of the background standard:

(i) The person shall demonstrate that the highest measurement from the area of concern is not greater than the highest measurement from the background area. The Department may accept insignificant variances in numbers. The minimum number of samples to be collected is ten from the background reference population and ten from each distinct area of contamination.

(ii) The Department may accept the use of a combination of the Wilcoxon rank-sum test (equivalent to the Mann-Whitney U test) and the quantile test for data from two populations. The application of these tests shall meet the criteria in subparagraphs (iv) and (vi).

(iii) The Department may accept other appropriate statistical methods that meet the requirements of subparagraphs (iv)—(vi).

(iv) For nonparametric and parametric methods under subparagraphs (ii) and (iii), the false-positive rate for a set of data applied to a statistical test may not be greater than 0.20. The minimum number of samples to be collected is ten from the background population and ten from each distinct area of contamination.

(v) For parametric methods under subparagraph (iii), the censoring level for each nondetect (ND) shall be the assigned value randomly generated that is between zero and the limit related to the PQL.

(vi) For nonparametric and parametric methods under subparagraphs (ii) and (iii), the application of a statistical method shall meet the criteria in subsection (d).

(2) Groundwater for known upgradient release of a regulated substance.

(i) The Department may accept the use of the nonparametric tolerance intervals that are applied in accordance with the procedures in subparagraphs (ii)—(vi) and (viii)—(x).

(ii) The upgradient concentration shall be determined by sampling in a background reference well shown on the basis of characterization to exhibit

the highest concentration and by demonstrating that the groundwater is representative of concentrations in groundwater that are migrating onto the site.

(iii) The background reference well shall be sampled over a period of eight quarters to provide eight samples.

(iv) From these eight samples, the highest concentration for each regulated substance shall be selected as the upper tolerance limit.

(v) In each onsite well, eight samples shall also be collected during the same eight-quarter period.

(vi) The upper tolerance limit shall be met in each onsite well. The maximum of data collected from each onsite well shall be at or below the upper tolerance limit.

(vii) In lieu of subparagraphs (iv)—(vi), the Department may accept a retesting strategy using nonparametric prediction limit in accordance with current EPA guidance (EPA, Office of Solid Waste Management Division. “Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities;” Addendum to Interim Final Guidance, EPA, Washington, D. C. June 1992). For each regulated substance, the highest concentration of the eight background reference samples shall be selected as the upper prediction limit, as determined by the most current EPA guidance.

(viii) The application of a statistical method for groundwater background standard shall meet the criteria in subsection (d).

(ix) For parametric methods, the censoring level for each nondetect (ND) shall be the assigned value randomly generated that is between zero and the limit related to the PQL.

(x) In lieu of eight-quarter sampling in subparagraphs (iii) and (v), the Department may allow the eight samples to be taken during a period of four quarters, or less with written approval from the Department if the following criteria can be met:

(A) There is adequate spatial monitoring of the plume upgradient of the property on which the release occurred which indicates a stable plume condition.

(B) Parameters affecting the fate and transport of regulated substances within the plume have been fully evaluated.

(C) Coefficient of variation for the eight samples collected over a 4-quarter period may not exceed 1.0 for metals and 2.0 for organic compounds.

(D) The age of the plume is sufficiently well known to permit a judgment to be made regarding its stability and remediation of the source associated with the upgradient contamination is not currently or has not recently occurred.

(3) Background groundwater conditions due to naturally occurring or area-wide contamination.

(i) To use this subparagraph for areawide contamination, the person performing remediation shall demonstrate to the Department, in writing, that the site conditions are due to areawide contamination and shall obtain the Department's approval to use this subsection.

(ii) A minimum of 12 samples shall be collected from any combination of monitoring wells, including upgradient locations, if all data collected is used in determination of background concentrations.

(iii) The same number of samples shall be collected within and representative of the area of groundwater contamination (plume) onsite as were collected in the upgradient sampling for each sampling event.

(iv) The samples from the upgradient wells and the wells in the plume onsite shall be collected during the same sampling event.

(v) Sampling may be accelerated so that all sampling events occur in as short a period of time as possible so as not to result in serial correlation in the data.

(vi) The resulting values may be used with appropriate nonparametric or parametric methods to compare the two populations.

(vii) The sampling results in the plume onsite may not exceed the sum of the background arithmetic average and three times the standard deviation calculated for the background area.

(viii) The application of a statistical method for groundwater background standard shall meet the criteria in subsection (d).

(ix) For parametric methods, the censoring level for each nondetect (ND) shall be the assigned value randomly generated that is between zero and the limit related to the PQL.

(b) The following statistical tests may be accepted by the Department to demonstrate attainment of the Statewide health standard. The statistical test for soil shall apply to each distinct area of contamination. The statistical test for groundwater will apply to each compliance monitoring well. Testing shall be performed individually for each regulated substance identified in the final report site investigation as being present at the site for which a person wants relief from liability under the act. The application of a statistical method must meet the criteria in subsection (d).

(1) For soil attainment determination at each distinct area of contamination, subparagraph (i), (ii) or (iii) shall be met in addition to the attainment requirements in §§ 250.702 and 250.703 (relating to attainment requirements; and general attainment requirements for soil).

(i) Seventy-five percent of all samples, which shall be randomly collected in a single event from the site, shall be equal to or less than the Statewide health standard or the limit related to PQLs with no individual sample exceeding ten times the Statewide health standard.

(ii) As applied in accordance with EPA approved methods on statistical analysis of environmental data, as identified in subsection (e), the 95% UCL of the arithmetic mean shall be at or below the MSC.

(iii) For sites with a petroleum release where full site characterization, as defined in § 250.204(b) (relating to final report), has not been done in association with an excavation remediation, attainment of the Statewide health standard shall be demonstrated using the following procedure:

(A) For sites regulated under Chapter 245 (relating to administration of the storage tank and spill prevention program) where there is localized contamination as defined in the document "Closure Requirements for Underground Storage Tank Systems" (DEP technical document 2530-BK-DEP2008), samples shall be taken in accordance with that document.

(B) For sites not covered by clause (A), including all sites being remediated under an NIR under this chapter, samples shall be taken from the bottom and sidewalls of the excavation in a biased fashion that concentrates on areas where any remaining contamination above the Statewide health standard would most likely be found. The samples shall be taken from these suspect areas based on visual observation and the use of field instruments. If a sufficient number of samples has been collected from all suspect locations and the minimum number of samples has not been collected, or if there are no suspect areas, the locations to meet the minimum number of samples shall be based on a random procedure. The number of sample points required shall be determined in the following way:

(I) For 250 cubic yards or less of excavated contaminated soil, five samples shall be collected.

(II) For each additional 100 cubic yards of excavated contaminated soil, one sample shall be collected.

(III) For excavations involving more than 1,000 cubic yards of contaminated soil, the remediator shall identify the number and locations of samples in a confirmatory sampling plan submitted to the Department. The remediator shall obtain the Department's approval of the confirmatory sampling plan prior to conducting attainment sampling.

(IV) Where water is encountered in the excavation and no obvious contamination is observed or indicated, soil samples collected just above the soil/water interface shall be equal to or less than the applicable Statewide health MSC determined by § 250.308(a)(2)(ii) (relating to soil to groundwater pathway numeric values).

(V) Where water is encountered in the excavation and no obvious contamination is observed or indicated, a minimum of two samples shall be collected from the water surface in the excavation.

(VI) For sites where there is a release to surface soils resulting in excavation of 50 cubic yards or less of contaminated soil, samples shall be collected as described in this clause, except that two samples shall be collected.

(C) All sample results shall be equal to or less than the applicable Statewide health MSC as determined using Tables 1—4 and 6 in Appendix A.

(D) A vapor intrusion analysis is not necessary if the requirements of § 250.707(b)(1)(iii) are met in addition to the following:

(I) At least one soil sample is collected on the sidewall nearest an inhabited building within the appropriate proximity distance to a potential vapor intrusion source and there are not substantially higher field instrument readings elsewhere.

(II) Observations of obvious contamination and the use of appropriate field screening instruments verify that contamination has not contacted or penetrated the foundation of an inhabited building.

(III) Groundwater contamination has not been identified as a potential vapor intrusion concern.

(2) For groundwater attainment determination at each compliance monitoring well, subparagraph (i) or (ii) shall be met in addition to the attainment requirements in § 250.702 and § 250.704 (relating to general attainment requirements for groundwater).

(i) Seventy-five percent of all samples collected within each monitoring well over time shall be equal to or less than the Statewide health standard or the limit related to PQLs with no individual sample exceeding both of the following:

(A) Ten times the Statewide health standard on the property.

(B) Two times the Statewide health standard beyond the property boundary.

(ii) As applied in accordance with EPA approved methods on statistical analysis of environmental data, as identified in subsection (e), the 95% UCL level of the arithmetic mean shall be at or below the Statewide health standard.

(3) In addition to the statistical tests identified in paragraphs (1) and (2), a person may use a statistical test that meets the requirements of subsection (d) to demonstrate attainment.

(c) To demonstrate attainment of the site-specific standard, a person may use a statistical test identified in subsection (b)(1)(ii) and (2)(ii) where the 95% UCL of the arithmetic mean is below the site-specific standard or a statistical test that meets the requirements of subsection (d). The attainment test and the methodology used in the risk assessment to evaluate exposure concentrations shall be the same.

(d) Except for the statistical methods identified in subsections (a)(1)(i) and (b)(1)(i) and (2)(i), a demonstration of attainment of one or a combination of remediation standards shall comply with the following:

(1) When statistical methods are to be used for demonstration of attainment of Statewide health or site-specific standards, the null hypotheses (Ho) shall be

that the true site arithmetic average concentration is at or above the cleanup standard, and the alternative hypothesis (H_a) shall be that the true site arithmetic average concentration is below the cleanup standard. When statistical methods are to be used to determine that the background standard is exceeded, the null hypothesis (H_o) shall be that the background standard is achieved and the alternative hypothesis (H_a) shall be that the background standard is not achieved.

(2) A statistical method chosen shall comply with the following performance standards:

(i) The underlying assumptions of the statistical method shall be met, such as data distribution.

(ii) The statistical method shall be recommended for this use in Department-approved guidance or regulation and shall be generally recognized as appropriate for the particular remediation implemented at the site.

(iii) Compositing cannot be used with nonparametric methods or for volatile organic compounds.

(iv) For parametric methods, the censoring level for each nondetect shall be the assigned value randomly generated that is between zero and the limit related to the PQL.

(v) Tests shall account for seasonal and spatial variability as well as temporal correlation of data, unless otherwise approved by the Department.

(vi) Tests used to determine that the background standard is exceeded shall maintain adequate power to detect contamination in accordance with current EPA guidances, regulations or protocols.

(vii) For the limits relating to the PQLs, Statewide health and site-specific standards, the false-positive rate for a statistical test may not be greater than 0.20 for nonresidential and 0.05 for residential.

(viii) Statistical testing shall be done individually for each regulated substance present at the site.

(3) The following information shall be documented in a final report when a statistical method is applied:

(i) A description of the statistical method.

(ii) A clear statement of the applicable decision rule in the form of statistical hypotheses for each spatial unit and temporal boundary including the applicable statistical parameter of interest and the specific cleanup standard.

(iii) A description of the underlying assumptions of the method.

(iv) Documentation showing that the sample data set meets the underlying assumptions of the method and demonstrating that the method is appropriate to apply to the data.

(v) Specification of false positive rates and, in addition for the background standard, specification of false negative rates.

(vi) Documentation of input and output data for the statistical test, presented in tables or figures, or both, as appropriate.

- (vii) An interpretation and conclusion of the statistical test.
- (e) The references identified in subsection (b)(1)(ii) and (2)(ii) are as follows:
- (1) EPA, Office of Policy, Planning and Evaluation, *Methods for Evaluating the Attainment of Cleanup Standards*, Volume 1: Soils and Solid Media, EPA 230/02-89-042, Washington, D. C. 1989.
 - (2) EPA, Office of Solid Waste Management Division, *Test Methods for Evaluating Solid Waste*, SW-846 Volume II: Field Methods, EPA, November 1985, Third Edition.
 - (3) EPA, Office of Solid Waste Management Division, *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities*, Interim Final Guidance, EPA, Washington, D.C., April, 1989.
 - (4) EPA, Office of Solid Waste Management Division, *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities*, Addendum to Interim Final Guidance, EPA, Washington, D.C., June, 1992.
 - (5) 40 CFR 264 and 265 (relating to standards for owners and operators of hazardous waste treatment, storage, and disposal facilities; and interim status standards for owners and operators of hazardous waste treatment, storage, and disposal facilities).

Authority

The provisions of this § 250.707 amended under sections 104(a) and 303(a) of the Land Recycling and Environmental Remediation Standards Act (35 P.S. §§ 6026.104(a) and 6026.303(a)); and section 1920-A of The Administrative Code of 1929 (71 P.S. § 510-20).

Source

The provisions of this § 250.707 amended November 23, 2001, effective November 24, 2001, 31 Pa.B. 6395; amended January 7, 2011, effective January 8, 2011, 41 Pa.B. 230; amended November 19, 2021, effective November 20, 2021, 51 Pa.B. 7173. Immediately preceding text appears at serial pages (355316) to (355320) and (356287) to (356288).

Cross References

This section cited in 25 Pa. Code § 250.702 (relating to attainment requirements); 25 Pa. Code § 250.703 (relating to general attainment requirements for soil); 25 Pa. Code § 250.703 (relating to general attainment requirements for soil); and 25 Pa. Code § 250.704 (relating to general attainment requirements for groundwater).

§ 250.708. Postremediation care attainment.

(a) After engineering controls are in place and the groundwater concentration levels have stabilized following any effects from the remediation, a statistical test shall be used to demonstrate that regulated substances in groundwater do not exceed the selected standard at the point of compliance. A statistical trend analysis, knowledge of the plume stability, or other acceptable method shall be used to demonstrate that contaminant concentration at the point of compliance will not exceed the selected standard in the future.

(b) If engineering or institutional controls are utilized at a site to maintain the nonresidential Statewide health standard or the site-specific standard, a postremediation care program shall be implemented to protect human health and the environment.

(c) A person implementing engineering controls shall ensure the ongoing achievement of the performance standards in order to maintain attainment.

(d) A person shall implement a postremediation care plan, as identified in an approved final report.

(e) A person may terminate postremediation care as approved in the final report if the person can demonstrate attainment under this chapter without the engineering controls in place, and document a fate and transport analysis that shows the standard will not be exceeded in the future.

Appendix A
Table 1—Medium-Specific Concentrations (MSCs) for Organic Regulated Substances in Groundwater

Regulated Substance	CASRN	Used Aquifers				Nonuse Aquifers			
		TDS ≤ 2500 mg/L		TDS > 2500 mg/L		R		NR	
		R	NR	R	NR	R	NR	R	NR
ACENAPHTHENE	83-32-9	2,100 G	3,800 S	3,800 S	3,800 S	3,800 S	3,800 S	3,800 S	3,800 S
ACENAPHTHYLENE	208-96-8	2,100 G	5,800 S	16,000 S	16,000 S	16,000 S	16,000 S	16,000 S	16,000 S
ACEPHATE	30560-19-1	42 G	120 G	4,200 G	12,000 G	42 G	120 G	42 G	120 G
ACETALDEHYDE	75-07-0	19 N	79 N	1,900 N	7,900 N	19 N	79 N	19 N	79 N
ACETONE	67-64-1	31,000 G	88,000 G	3,100,000 G	8,800,000 G	310,000 G	880,000 G	310,000 G	880,000 G
ACETONITRILE	75-05-8	130 N	530 N	13,000 N	53,000 N	1,300 N	5,300 N	1,300 N	5,300 N
ACETOPHENONE	98-86-2	3,500 G	9,700 G	350,000 G	970,000 G	3,500 G	9,700 G	3,500 G	9,700 G
ACETYLAMINOFLOURENE, 2- (2AAF)	53-96-3	0.17 G	0.72 G	17 G	72 G	170 G	720 G	170 G	720 G
ACROLEIN	107-02-8	0.042 N	0.18 N	4.2 N	18 N	0.42 N	1.8 N	0.42 N	1.8 N
ACRYLAMIDE	79-06-1	0.19 N	2.5 N	19 N	250 N	0.19 N	2.5 N	0.19 N	2.5 N
ACRYLIC ACID	79-10-7	2.1 N	8.8 N	210 N	880 N	210 N	880 N	210 N	880 N
ACRYLONITRILE	107-13-1	0.72 N	3.7 N	72 N	370 N	72 N	370 N	72 N	370 N
ALACHLOR	15972-60-8	2 M	2 M	200 M	200 M	2 M	2 M	2 M	2 M
ALDICARB	116-06-3	3 M	3 M	300 M	300 M	3,000 M	3,000 M	3,000 M	3,000 M
ALDICARB SULFONE	1646-88-4	2 M	2 M	200 M	200 M	2 M	2 M	2 M	2 M
ALDICARB SULFOXIDE	1646-87-3	4 M	4 M	400 M	400 M	4 M	4 M	4 M	4 M
ALDRIN	309-00-2	0.038 G	0.16 G	3.8 G	16 G	20 S	20 S	20 S	20 S
ALLYL ALCOHOL	107-18-6	0.21 N	0.88 N	21 N	88 N	21 N	88 N	21 N	88 N
AMETRYN	834-12-8	60 H	60 H	6,000 H	6,000 H	60 H	60 H	60 H	60 H
AMINOBIIPHENYL, 4-	92-67-1	0.031 G	0.13 G	3.1 G	13 G	31 G	130 G	31 G	130 G
AMITROLE	61-82-5	0.69 G	2.9 G	69 G	290 G	690 G	2,900 G	690 G	2,900 G
AMMONIA	7664-41-7	30,000 H	30,000 H	3,000,000 H	3,000,000 H	30,000 H	30,000 H	30,000 H	30,000 H
AMMONIUM SULFAMATE	7773-06-0	2,000 H	2,000 H	200,000 H	200,000 H	2,000 H	2,000 H	2,000 H	2,000 H
ANILINE	62-53-3	2.1 N	8.8 N	210 N	880 N	2.1 N	8.8 N	2.1 N	8.8 N
ANTHRACENE	120-12-7	66 S	66 S	66 S	66 S	66 S	66 S	66 S	66 S
ATRAZINE	1912-24-9	3 M	3 M	300 M	300 M	3 M	3 M	3 M	3 M
AZINPHOS-METHYL (GUTHION)	86-50-0	52 G	150 G	5,200 G	15,000 G	52 G	150 G	52 G	150 G
BAYGON (PROPOXUR)	114-26-1	3 H	3 H	300 H	300 H	300 H	300 H	300 H	300 H
BENOMYL	17804-35-2	270 G	1,100 G	2,000 S	2,000 S	270 G	270 G	270 G	270 G
BENTAZON	25057-89-0	200 H	200 H	20,000 H	20,000 H	200 H	200 H	200 H	200 H
BENZENE	71-43-2	5 M	5 M	500 M	500 M	500 M	500 M	500 M	500 M
BENZIDINE	92-87-5	0.0092 G	0.012 G	0.092 G	1.2 G	0.92 G	12 G	0.92 G	12 G

All concentrations in µg/L

M = Maximum Contaminant Level

N = Inhalation

R = Residential

H = Lifetime health advisory level

S = Aqueous solubility cap

NR = Non-Residential

G = Ingestion

THMs—The values listed for trihalomethanes (THMs) are the total for all THMs combined.

HAAs—The values listed for haloacetic acids (HAAs) are the total for all HAAs combined.

PFOA and PFOS values listed are for individual or total combined.

Appendix A
Table 1—Medium-Specific Concentrations (MSCs) for Organic Regulated Substances in Groundwater

Regulated Substance	CASRN	Used Aquifers						Nonuse Aquifers			
		TDS ≤ 2500 mg/L			TDS > 2500 mg/L						
		R	NR	R	R	NR	R	R	NR		
BENZO[<i>a</i>]ANTHRACENE	56-55-3	0.3 G	3.9 G	11 S	11 S	11 S	11 S	11 S	NR		
BENZO[<i>a</i>]PYRENE	50-32-8	0.2 M	0.2 M	3.8 S	3.8 S	3.8 S	3.8 S	3.8 S			
BENZO[<i>b</i>]FLUORANTHENE	205-99-2	0.18 G	1.2 S	1.2 S	1.2 S	1.2 S	1.2 S	1.2 S			
BENZO[<i>ghi</i>]PERYLENE	191-24-2	0.26 S	0.26 S	0.26 S	0.26 S	0.26 S	0.26 S	0.26 S			
BENZO[<i>k</i>]FLUORANTHENE	207-08-9	0.18 G	0.55 S	0.55 S	0.55 S	0.55 S	0.55 S	0.55 S			
BENZOIC ACID	65-85-0	140,000 G	390,000 G	2,700,000 S	2,700,000 S	2,700,000 S	140,000 G	390,000 G			
BENZOTRICHLORIDE	98-07-7	0.05 G	0.21 G	5 G	5 G	21 G	5 G	21 G			
BENZYL ALCOHOL	100-51-6	3,500 G	9,700 G	350,000 G	970,000 G	970,000 G	3,500 G	9,700 G			
BENZYL CHLORIDE	100-44-7	1 N	5.1 N	100 N	510 N	510 N	100 N	510 N			
BETA PROIOLACTONE	57-57-8	0.012 N	0.063 N	1.2 N	6.3 N	6.3 N	0.63 N	6.3 N			
BHC, ALPHA-	319-84-6	0.1 G	0.43 G	10 G	43 G	43 G	100 G	430 G			
BHC, BETA-	319-85-7	0.36 G	1.5 G	36 G	100 S	100 S	100 S	100 S			
BHC, GAMMA (LINDANE)	58-89-9	0.2 M	0.2 M	20 M	20 M	20 M	200 M	200 M			
BIPHENYL, 1,1'-	92-52-4	0.84 N	3.5 N	84 N	350 N	350 N	84 N	350 N			
BIS(2-CHLOROETHOXY)METHANE	111-91-1	100 G	290 G	10,000 G	29,000 G	29,000 G	100 G	290 G			
BIS(2-CHLOROETHYL)ETHER	111-44-4	0.15 N	0.76 N	15 N	76 N	76 N	15 N	76 N			
BIS(2-CHLOROISOPROPYL)ETHER	108-60-1	300 H	300 H	30,000 H	30,000 H	30,000 H	30,000 H	30,000 H			
BIS(CHLOROMETHYL)ETHER	542-88-1	0.00079 N	0.004 N	0.079 N	0.4 N	0.4 N	0.079 N	0.4 N			
BIS(2-ETHYLHEXYL) PHTHALATE	117-81-7	6 M	6 M	290 S	290 S	290 S	290 S	290 S			
BISPHENOL A	80-05-7	1,700 G	4,900 G	120,000 S	120,000 S	120,000 S	120,000 S	120,000 S			
BROMACIL	314-40-9	70 H	70 H	7,000 H	7,000 H	7,000 H	70 H	70 H			
BROMOBENZENE	108-86-1	0.06 H	0.06 H	6 H	6 H	6 H	0.06 H	0.06 H			
BROMOCHLOROMETHANE	74-97-5	90 H	90 H	9,000 H	9,000 H	9,000 H	90 H	90 H			
BROMODICHLOROMETHANE (THM)	75-27-4	80 M	80 M	8,000 M	8,000 M	8,000 M	80 M	80 M			
BROMOMETHANE	74-83-9	10 H	10 H	1,000 H	1,000 H	1,000 H	1,000 H	1,000 H			
BROMOXNYL	1689-84-5	6.3 G	26 G	630 G	2,600 G	2,600 G	6.3 G	26 G			
BROMOXNYL OCTANOATE	1689-99-2	6.3 G	26 G	630 S	80 S	80 S	80 S	80 S			
BUTADIENE, 1,3-	106-99-0	1.1 G	4.5 G	110 G	450 G	450 G	110 G	450 G			
BUTYL ALCOHOL, N-	71-36-3	3,500 G	9,700 G	350,000 G	970,000 G	970,000 G	35,000 G	97,000 G			
BUTYLATE	2008-41-5	400 H	400 H	40,000 H	40,000 H	40,000 H	400 H	400 H			
BUTYLBENZENE, N-	104-51-8	1,700 G	4,900 G	15,000 S	15,000 S	15,000 S	1,700 G	4,900 G			
BUTYLBENZENE, SEC-	135-98-8	3,500 G	9,700 G	17,000 S	17,000 S	17,000 S	3,500 G	9,700 G			

All concentrations in µg/L
 R = Residential
 NR = Non-Residential
 M = Maximum Contaminant Level
 H = Lifetime health advisory level
 G = Ingestion
 THMs—The values listed for trihalomethanes (THMs) are the total for all THMs combined.
 HAAs—The values listed for haloacetic acids (HAAs) are the total for all HAAs combined.
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Appendix A
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Regulated Substance	CASRN	Used Aquifers						Nonuse Aquifers	
		TDS ≤ 2500 mg/L			TDS > 2500 mg/L				
		R	NR	R	NR	R	NR	R	NR
BUTYLBENZENE, TERT-	98-06-6	3,500 G	9,700 G	30,000 S	30,000 S	3,500 G	9,700 G	3,500 G	9,700 G
BUTYLBENZYL PHTHALATE	85-68-7	340 G	1,400 G	2,700 S	2,700 S	2,700 S	2,700 S	2,700 S	2,700 S
CAPTAN	133-06-2	280 G	500 S	500 S	500 S	500 S	500 S	500 S	500 S
CARBARYL	63-25-2	3,500 G	9,700 G	120,000 S	120,000 S	120,000 S	120,000 S	120,000 S	120,000 S
CARBAZOLE	86-74-8	33 G	140 G	1,200 S	1,200 S	33 G	140 G	33 G	140 G
CARBOFURAN	1563-66-2	40 M	40 M	4,000 M	4,000 M	40 M	40 M	40 M	40 M
CARBON DISULFIDE	75-15-0	1,500 N	6,200 N	150,000 N	620,000 N	1,500 N	6,200 N	1,500 N	6,200 N
CARBON TETRACHLORIDE	56-23-5	5 M	5 M	500 M	500 M	50 M	50 M	50 M	50 M
CARBOXIN	5234-68-4	700 H	700 H	70,000 H	70,000 H	700 H	700 H	700 H	700 H
CHLORAMBEN	133-90-4	100 H	100 H	10,000 H	10,000 H	100 H	100 H	100 H	100 H
CHLORDANE	57-74-9	2 M	2 M	56 S	56 S	56 S	56 S	56 S	56 S
CHLORO-1,1-DIFLUOROETHANE, 1-	75-68-3	110,000 N	440,000 N	1,400,000 S	1,400,000 S	110,000 N	440,000 N	110,000 N	440,000 N
CHLORO-1-PROPENE, 3-(ALLYL CHLORIDE)	107-05-1	2.1 N	8.8 N	210 N	880 N	210 N	880 N	210 N	880 N
CHLOROACETALDEHYDE	107-20-0	2.4 G	10 G	240 G	1,000 G	2.4 G	10 G	2.4 G	10 G
CHLOROANILINE, P-	106-47-8	3.3 G	14 G	330 G	1,400 G	3.3 G	14 G	3.3 G	14 G
CHLOROBENZENE	108-90-7	100 M	100 M	10,000 M	10,000 M	10,000 M	10,000 M	10,000 M	10,000 M
CHLOROBENZILATE	510-15-6	5.9 G	25 G	590 G	2,500 G	590 G	2,500 G	590 G	2,500 G
CHLOROBUTANE, 1-	109-69-3	1,400 G	3,900 G	140,000 G	390,000 G	1,400 G	3,900 G	1,400 G	3,900 G
CHLORODIBROMOMETHANE (THM)	124-48-1	80 M	80 M	8,000 M	8,000 M	8,000 M	8,000 M	8,000 M	8,000 M
CHLORODIFLUOROMETHANE	75-45-6	110,000 N	440,000 N	2,900,000 S	2,900,000 S	110,000 N	440,000 N	110,000 N	440,000 N
CHLOROETHANE	75-00-3	21,000 N	88,000 N	2,100,000 N	5,700,000 S	2,100,000 N	5,700,000 S	2,100,000 N	5,700,000 S
CHLOROFORM (THM)	67-66-3	80 M	80 M	8,000 M	8,000 M	800 M	800 M	800 M	800 M
CHLORONAPHTHALENE, 2-	91-58-7	2,800 G	7,800 G	12,000 S	12,000 S	2,800 G	7,800 G	2,800 G	7,800 G
CHLORONITROBENZENE, P-	100-00-5	4.2 N	18 N	420 N	1,800 N	4.2 N	18 N	4.2 N	18 N
CHLOROPHENOL, 2-	95-57-8	40 H	40 H	4,000 H	4,000 H	40 H	40 H	40 H	40 H
CHLOROPRENE	126-99-8	0.16 N	0.83 N	16 N	83 N	16 N	83 N	16 N	83 N
CHLOROPROPANE, 2-	75-29-6	210 N	880 N	21,000 N	88,000 N	210 N	880 N	210 N	880 N
CHLOROTHALONIL	1897-45-6	38 G	160 G	600 S	600 S	38 G	160 G	38 G	160 G
CHLOROTOLUENE, O-	95-49-8	100 H	100 H	10,000 H	10,000 H	100 H	100 H	100 H	100 H
CHLOROTOLUENE, P-	106-43-4	100 H	100 H	10,000 H	10,000 H	100 H	100 H	100 H	100 H
CHLOROPYRIFOS	2921-88-2	2 H	2 H	200 H	200 H	2 H	2 H	2 H	2 H
CHLORSULFURON	64902-72-3	690 G	1,900 G	69,000 G	190,000 G	690 G	1,900 G	690 G	1,900 G

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Table 1—Medium-Specific Concentrations (MSCs) for Organic Regulated Substances in Groundwater

Regulated Substance	CASRN	Used Aquifers						Nonuse Aquifers			
		TDS ≤ 2500 mg/L			TDS > 2500 mg/L						
		R	NR	R	R	NR	R	R	NR		
CHLORTHAL-DIMETHYL (DACP)	1861-32-1	70 H	70 H	500 S	500 S	500 S	500 S	500 S	500 S		
CHRYSENE	218-01-9	1.8 G	1.9 S	1.9 S	1.9 S	1.9 S	1.9 S	1.9 S	1.9 S		
CRESOL(S)	1319-77-3	1,300 N	5,300 N	130,000 N	530,000 N	530,000 N	130,000 N	130,000 N	530,000 N		
CRESOL, DINITRO-O-4,6-	534-52-1	2.8 G	7.8 G	280 G	780 G	780 G	280 G	280 G	780 G		
CRESOL, O- (METHYLPHENOL, 2-)	95-48-7	1,700 G	4,900 G	170,000 G	490,000 G	490,000 G	170,000 G	170,000 G	490,000 G		
CRESOL, M (METHYLPHENOL, 3-)	108-39-4	1,700 G	4,900 G	170,000 G	490,000 G	490,000 G	170,000 G	170,000 G	490,000 G		
CRESOL, P (METHYLPHENOL, 4-)	106-44-5	170 G	480 G	17,000 G	49,000 G	49,000 G	17,000 G	17,000 G	49,000 G		
CRESOL, P-CHLORO-M-	59-50-7	3,500 G	9,700 G	350,000 G	970,000 G	970,000 G	3,500 G	3,500 G	9,700 G		
CROTONALDEHYDE	4170-30-3	0.34 G	1.4 G	34 G	140 G	140 G	34 G	34 G	140 G		
CROTONALDEHYDE, TRANS-	123-73-9	0.34 G	1.4 G	34 G	140 G	140 G	34 G	34 G	140 G		
CUMENE (ISOPROPYL BENZENE)	98-82-8	840 N	3,500 N	50,000 S	50,000 S	50,000 S	50,000 S	50,000 S	50,000 S		
CYANAZINE	21725-46-2	1 H	1 H	100 H	100 H	100 H	1 H	1 H	1 H		
CYCLOHEXANE	110-82-7	13,000 N	53,000 N	55,000 S	55,000 S	55,000 S	13,000 N	13,000 N	53,000 N		
CYCLOHEXANONE	108-94-1	1,500 N	6,200 N	150,000 N	620,000 N	620,000 N	1,500 N	1,500 N	6,200 N		
CYFLUTHRIN	68359-37-5	1 S	1 S	1 S	1 S	1 S	1 S	1 S	1 S		
CYROMAZINE	66215-27-8	17,000 G	49,000 G	1,700,000 G	4,900,000 G	4,900,000 G	17,000 G	17,000 G	49,000 G		
DDD, 4,4'-	72-54-8	2.7 G	11 G	160 S	160 S	160 S	160 S	160 S	160 S		
DDE, 4,4'-	72-55-9	1.9 G	8 G	40 S	40 S	40 S	40 S	40 S	40 S		
DDT, 4,4'-	50-29-3	1.9 G	5.5 S	5.5 S	5.5 S	5.5 S	5.5 S	5.5 S	5.5 S		
DI(2-ETHYLHEXYL)ADIPATE	103-23-1	400 M	400 M	40,000 M	40,000 M	40,000 M	200,000 S	200,000 S	200,000 S		
DIALATE	2303-16-4	11 G	45 G	1,100 G	4,500 G	4,500 G	11,000 G	11,000 G	40,000 S		
DIAMINOTOLUENE, 2,4-	95-80-7	0.16 G	0.68 G	16 G	68 G	68 G	160 G	160 G	680 G		
DIAZINON	333-41-5	1 H	1 H	100 H	100 H	100 H	1 H	1 H	1 H		
DIBENZO(A,H)ANTHRACENE	53-70-3	0.052 G	0.6 S	0.6 S	0.6 S	0.6 S	0.6 S	0.6 S	0.6 S		
DIBENZOFURAN	132-64-9	35 G	97 G	3,500 G	4,500 G	4,500 G	3,500 G	3,500 G	4,500 S		
DIBROMO-3-CHLOROPROPANE, 1,2-	96-12-8	0.2 M	0.2 M	20 M	20 M	20 M	20 M	20 M	20 M		
DIBROMOBENZENE, 1,4-	106-37-6	350 G	970 G	20,000 S	20,000 S	20,000 S	350 G	350 G	970 G		
DIBROMOETHANE, 1,2- (ETHYLENE DIBROMIDE)	106-93-4	0.05 M	0.05 M	5 M	5 M	5 M	5 M	5 M	5 M		
DIBROMOMETHANE	74-95-3	8.4 N	35 N	840 N	3,500 N	3,500 N	840 N	840 N	3,500 N		
DIBUTYL PHTHALATE, N-	84-74-2	3,500 G	9,700 G	350,000 G	400,000 S	400,000 S	400,000 S	400,000 S	400,000 S		
DICAMBA	1918-00-9	4,000 H	4,000 H	400,000 H	400,000 H	400,000 H	4,000 H	4,000 H	4,000 H		
DICHLOROACETIC ACID (HAA)	79-43-6	60 M	60 M	6,000 M	6,000 M	6,000 M	60 M	60 M	60 M		

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Regulated Substance	CASRN	Used Aquifers				Nonuse Aquifers			
		TDS ≤ 2500 mg/L		TDS > 2500 mg/L		R		NR	
		R	NR	R	NR	R	NR	R	NR
DICHLORO-2-BUTENE, 1,4-	784-41-0	0.012 N	0.06 N	1.2 N	6 N	0.012 N	0.06 N	0.012 N	0.06 N
DICHLORO-2-BUTENE, TRANS-1,4-	110-57-6	0.012 N	0.06 N	1.2 N	6 N	0.012 N	0.06 N	0.012 N	0.06 N
DICHLOROBENZENE, 1,2-	95-50-1	600 M	600 M	60,000 M	60,000 M	60,000 M	60,000 M	60,000 M	60,000 M
DICHLOROBENZENE, 1,3-	541-73-1	600 H	600 H	60,000 H	60,000 H	60,000 H	60,000 H	60,000 H	60,000 H
DICHLOROBENZENE, P-	106-46-7	75 M	75 M	7,500 M	7,500 M	7,500 M	7,500 M	7,500 M	7,500 M
DICHLOROBENZIDINE, 3,3'-	91-94-1	1.4 G	6 G	140 G	600 G	1,400 G	3,100 G	1,400 G	3,100 G
DICHLORODIFLUOROMETHANE (FREON 12)	75-71-8	1,000 H	1,000 H	100,000 H	100,000 H	100,000 H	100,000 H	100,000 H	100,000 H
DICHLOROETHANE, 1,1-	75-34-3	31 N	180 N	3,100 N	16,000 N	310 N	1,800 N	310 N	1,800 N
DICHLOROETHANE, 1,2-	107-06-2	5 M	5 M	500 M	500 M	50 M	50 M	50 M	50 M
DICHLOROETHYLENE, 1,1-	75-35-4	7 M	7 M	700 M	700 M	70 M	70 M	70 M	70 M
DICHLOROETHYLENE, CIS-1,2-	156-59-2	70 M	70 M	7,000 M	7,000 M	700 M	700 M	700 M	700 M
DICHLOROETHYLENE, TRANS-1,2-	156-60-5	100 M	100 M	10,000 M	10,000 M	1,000 M	1,000 M	1,000 M	1,000 M
DICHLOROMETHANE (METHYLENE CHLORIDE)	75-09-2	5 M	5 M	500 M	500 M	500 M	500 M	500 M	500 M
DICHLOROPHENOL, 2,4-	120-83-2	20 H	20 H	2,000 H	2,000 H	20,000 H	20,000 H	20,000 H	20,000 H
DICHLOROPHENOXYACETIC ACID, 2,4-(2,4-D)	94-75-7	70 M	70 M	7,000 M	7,000 M	70,000 M	70,000 M	70,000 M	70,000 M
DICHLOROPROPANE, 1,2-	78-87-5	5 M	5 M	500 M	500 M	50 M	50 M	50 M	50 M
DICHLOROPROPENE, 1,3-	542-75-6	6.5 G	27 G	650 G	2,700 G	650 G	2,700 G	650 G	2,700 G
DICHLOROPROPIONIC ACID, 2,2-(DALAPON)	75-99-0	200 M	200 M	20,000 M	20,000 M	20,000 M	20,000 M	20,000 M	20,000 M
DICHLORVOS	62-73-7	2.2 G	9.4 G	220 G	940 G	2.2 G	9.4 G	2.2 G	9.4 G
DICYCLOPENTADIENE	77-73-6	0.63 N	2.6 N	63 N	260 N	0.63 N	2.6 N	0.63 N	2.6 N
DIELDRIN	60-57-1	0.041 G	0.17 G	4.1 G	17 G	41 G	170 G	41 G	170 G
DIETHYL PHTHALATE	84-66-2	28,000 G	78,000 G	1,100,000 S	1,100,000 S	1,100,000 S	1,100,000 S	1,100,000 S	1,100,000 S
DIFLUBENZURON	35367-38-5	200 S	200 S	200 S	200 S	200 S	200 S	200 S	200 S
DIISOPROPYL METHYLPHOSPHONATE	1445-75-6	600 H	600 H	60,000 H	60,000 H	600 H	600 H	600 H	600 H
DIMETHOATE	60-51-5	76 G	210 G	7,600 G	21,000 G	76,000 G	210,000 G	76,000 G	210,000 G
DIMETHOXYBENZIDINE, 3,3'-	119-90-4	0.41 G	1.7 G	41 G	170 G	410 G	1,700 G	410 G	1,700 G
DIMETHRIN	70-38-2	36 S	36 S	36 S	36 S	36 S	36 S	36 S	36 S
DIMETHYLAMINOAZOBENZENE, P-	60-11-7	0.14 G	0.59 G	14 G	59 G	140 G	590 G	140 G	590 G
DIMETHYLANILINE, N,N-	121-69-7	24 G	100 G	2,400 G	10,000 G	2,400 G	10,000 G	2,400 G	10,000 G
DIMETHYLBENZIDINE, 3,3'-	119-93-7	0.059 G	0.25 G	5.9 G	25 G	59 G	250 G	59 G	250 G
DIMETHYL METHYLPHOSPHONATE	756-79-6	100 H	100 H	10,000 H	10,000 H	100 H	100 H	100 H	100 H
DIMETHYLPHENOL, 2,4-	105-67-9	690 G	1,900 G	69,000 G	190,000 G	690,000 G	1,900,000 G	690,000 G	1,900,000 G

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Regulated Substance	CASRN	Used Aquifers						Nonuse Aquifers					
		TDS ≤ 2500 mg/L			TDS > 2500 mg/L			R			NR		
		R	NR	H	R	NR	H	R	NR	H	R	NR	H
DINITROBENZENE, 1,3-	99-65-0		1	H			100	H			1,000	H	
DINITROPHENOL, 2,4-	51-28-5	69	G		6,900	G	19,000	G	69,000	G	190,000	G	
DINITROTOLUENE, 2,4-	121-14-2	2.1	G		210	G	880	G	2,100	G	8,800	G	
DINITROTOLUENE, 2,6- (2,6-DNT)	606-20-2	0.43	G		43	G	180	G	430	G	1,800	G	
DIOSEB	88-85-7	7	M		700	M	7,000	M	7,000	M	7,000	M	
DIOXANE, 1,4-	123-91-1	6.5	G		650	G	2,700	G	65	G	270	G	
DIPHENAMID	957-51-7	200	H		20,000	H	20,000	H	200	H	200	H	
DIPHENYLAMINE	122-39-4	3,500	G		300,000	G	300,000	G	300,000	G	300,000	G	
DIPHENYLHYDRAZINE, 1,2-	122-66-7	0.22	N		22	N	110	N	22	N	110	N	
DIOQUAT	85-00-7	20	M		2,000	M	2,000	M	20	M	20	M	
DISULFOTON	298-04-4	0.7	H		70	H	70	H	700	H	700	H	
DITHIANE, 1,4-	505-29-3	80	H		8,000	H	8,000	H	80	H	80	H	
DIURON	330-54-1	69	G		6,900	G	19,000	G	69	G	190	G	
ENDOSULFAN	115-29-7	210	G		480	S	480	S	480	S	480	S	
ENDOSULFAN I (ALPHA)	959-98-8	210	G		500	S	500	S	210	G	500	S	
ENDOSULFAN II (BETA)	33213-65-9	210	G		450	S	450	S	210	G	450	S	
ENDOSULFAN SULFATE	1031-07-8	120	S		120	S	120	S	120	S	120	S	
ENDOTHALL	145-73-3	100	M		10,000	M	10,000	M	100	M	100	M	
ENDRIN	72-20-8	2	M		200	M	200	M	2	M	2	M	
EPICHLOROHYDRIN	106-89-8	2.1	N		210	N	880	N	210	N	880	N	
ETHEPHON	16672-87-0	170	G		490	G	17,000	G	170	G	490	G	
ETHION	563-12-2	17	G		850	S	850	S	17	G	49	G	
ETHOXYETHANOL, 2- (EGEE)	110-80-5	420	N		1,800	N	42,000	N	42,000	N	180,000	N	
ETHYL ACETATE	141-78-6	150	N		620	N	15,000	N	15,000	N	62,000	N	
ETHYL ACRYLATE	140-88-5	14	G		57	G	1,400	G	1,400	G	5,700	G	
ETHYL BENZENE	100-41-4	700	M		70,000	M	70,000	M	70,000	M	70,000	M	
ETHYL DIPROPYLTHIOCARBAMATE, S- (EPTC)	759-94-4	1,700	G		170,000	G	370,000	G	1,700	G	4,900	G	
ETHYL ETHER	60-29-7	6,900	G		690,000	G	1,900,000	G	6,900	G	19,000	G	
ETHYL METHACRYLATE	97-63-2	630	N		63,000	N	260,000	N	630	N	2,600	N	
ETHYLENE CHLORHYDRIN	107-07-3	690	G		69,000	G	190,000	G	690	G	1,900	G	
ETHYLENE GLYCOL	107-21-1	14,000	H		1,400,000	H	1,400,000	H	1,400,000	H	1,400,000	H	
ETHYLENE THIOUREA (ETU)	96-45-7	2.8	G		280	G	780	G	2,800	G	7,800	G	

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		TDS ≤ 2500 mg/L		TDS > 2500 mg/L		R		NR	
		R	NR	R	NR	R	NR	R	NR
ETHYL-P-NITROPHENYL PHENYLPHOSPHOROTHIOATE	2104-64-5	0.35 G	0.97 G	35 G	97 G	0.35 G	0.97 G	0.35 G	0.97 G
FENAMIPHOS	22224-92-6	0.7 H	0.7 H	70 H	70 H	0.7 H	0.7 H	0.7 H	0.7 H
FENVALERATE (PYDRIN)	51630-58-1	85 S	85 S	85 S	85 S	85 S	85 S	85 S	85 S
FLUMETURON	2164-17-2	90 H	90 H	9,000 H	9,000 H	90 H	90 H	90 H	90 H
FLUORANTHENE	206-44-0	260 S	260 S	260 S	260 S	260 S	260 S	260 S	260 S
FLUORENE	86-73-7	1,400 G	1,900 S	1,900 S	1,900 S	1,900 S	1,900 S	1,900 S	1,900 S
FLUOROTRICHLOROMETHANE (FREON 11)	75-69-4	2,000 H	2,000 H	200,000 H	200,000 H	200,000 H	200,000 H	200,000 H	200,000 H
FONOFOS	944-22-9	10 H	10 H	1,000 H	1,000 H	10 H	10 H	10 H	10 H
FORMALDEHYDE	50-00-0	1,000 H	1,000 H	100,000 H	100,000 H	100,000 H	100,000 H	100,000 H	100,000 H
FORMIC ACID	64-18-6	0.63 N	2.6 N	63 N	260 N	6.3 N	26 N	6.3 N	26 N
FOSETYL-AL	39148-24-8	87,000 G	240,000 G	8,700,000 G	24,000,000 G	87,000 G	240,000 G	87,000 G	240,000 G
FURAN	110-00-9	35 G	97 G	3,500 G	9,700 G	3,500 G	9,700 G	3,500 G	9,700 G
FURFURAL	98-01-1	19 G	78 G	1,900 G	7,800 G	19 G	78 G	19 G	78 G
GLYPHOSATE	1071-83-6	700 M	700 M	70,000 M	70,000 M	700 M	700 M	700 M	700 M
HEPTACHLOR EPOXIDE	76-44-8	0.4 M	0.4 M	40 M	40 M	40 M	40 M	40 M	40 M
HEPTACHLOROCYCLOPENTADIENE	1024-57-3	0.2 M	0.2 M	20 M	20 M	20 M	20 M	20 M	20 M
HEXACHLOROBENZENE	118-74-1	1 M	1 M	6 S	6 S	6 S	6 S	6 S	6 S
HEXACHLOROBUTADIENE	87-68-3	8.4 G	35 G	840 G	2,900 G	840 G	2,900 G	840 G	2,900 G
HEXACHLOROCYCLOPENTADIENE	77-47-4	50 M	50 M	1,800 S	1,800 S	1,800 S	1,800 S	1,800 S	1,800 S
HEXACHLOROETHANE	67-72-1	1 H	1 H	100 H	100 H	100 H	100 H	100 H	100 H
HEXANE	110-54-3	1,500 N	5,800 G	9,500 S	9,500 S	1,500 N	5,800 G	1,500 N	5,800 G
HEXAZINONE	51235-04-2	400 H	400 H	40,000 H	40,000 H	400 H	400 H	400 H	400 H
HEXYTHIAZOX (SAVEY)	78587-05-0	500 S	500 S	500 S	500 S	500 S	500 S	500 S	500 S
HMX	2691-41-0	400 H	400 H	5,000 S	5,000 S	400 H	400 H	400 H	400 H
HYDRAZINE/HYDRAZINE SULFATE	302-01-2	0.01 N	0.051 N	1 N	5.1 N	0.1 N	0.51 N	0.1 N	0.51 N
HYDROQUINONE	123-31-9	11 G	45 G	1,100 G	4,500 G	1,100 G	4,500 G	1,100 G	4,500 G
INDENOF1,2,3-CDIPYRENE	193-39-5	0.18 G	2.3 G	18 G	62 S	18 G	62 S	18 G	62 S
IPRODIONE	36734-19-7	15 G	62 G	1,500 G	6,200 G	15 G	62 G	15 G	62 G
ISOBUTYL ALCOHOL	78-83-1	10,000 G	29,000 G	1,000,000 G	2,900,000 G	1,000,000 G	2,900,000 G	1,000,000 G	2,900,000 G
ISOPHORONE	78-59-1	100 H	100 H	10,000 H	10,000 H	10,000 H	10,000 H	10,000 H	10,000 H
ISOPROPYL METHYLPHOSPHONATE	1832-54-8	700 H	700 H	70,000 H	70,000 H	700 H	700 H	700 H	700 H
KEPONE	143-50-0	0.065 G	0.27 G	6.5 G	27 G	65 G	270 G	65 G	270 G

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Appendix A
Table 1—Medium-Specific Concentrations (MSCs) for Organic Regulated Substances in Groundwater

Regulated Substance	CASRN	Used Aquifers						Nonuse Aquifers			
		TDS ≤ 2500 mg/L			TDS > 2500 mg/L			R		NR	
		R	NR	R	R	NR					
MALATHION	121-75-5	500 H	500 H	50,000 H	50,000 H	140,000 S	140,000 S	NR			
MALEIC HYDRAZIDE	123-33-1	4,000 H	4,000 H	400,000 H	400,000 H	4,000 H	4,000 H	4,000 H			
MANEB	12427-38-2	11 G	45 G	1,100 G	4,500 G	11 G	45 G	45 G			
MERPHOS OXIDE	78-48-8	17 G	49 G	1,700 G	2,300 G	17 G	49 G	49 G			
METHACRYLONITRILE	126-98-7	3.5 G	9.7 G	350 G	970 G	3.5 G	9.7 G	9.7 G			
METHAMIDOPHOS	10265-92-6	1.7 G	4.9 G	170 G	490 G	1.7 G	4.9 G	4.9 G			
METHANOL	67-56-1	42,000 N	180,000 N	4,200,000 N	18,000,000 N	4,200,000 N	18,000,000 N	18,000,000 N			
METHOMYL	16752-77-5	200 H	200 H	20,000 H	20,000 H	200 H	200 H	200 H			
METHOXYCHLOR	72-43-5	40 M	40 M	45 S	45 S	45 S	45 S	45 S			
METHOXYETHANOL, 2-	109-86-4	42 N	180 N	4,200 N	18,000 N	420 N	1,800 N	1,800 N			
METHYL ACETATE	79-20-9	35,000 G	97,000 G	3,500,000 G	9,700,000 G	35,000 G	97,000 G	97,000 G			
METHYL ACRYLATE	96-33-3	42 N	180 N	4,200 N	18,000 N	4,200 N	18,000 N	18,000 N			
METHYL CHLORIDE	74-87-3	30 H	30 H	3,000 H	3,000 H	3,000 H	3,000 H	3,000 H			
METHYL ETHYL KETONE	78-93-3	4,000 H	4,000 H	400,000 H	400,000 H	400,000 H	400,000 H	400,000 H			
METHYL HYDRAZINE	60-34-4	0.042 N	0.18 N	4.2 N	18 N	0.42 N	1.8 N	1.8 N			
METHYL ISOBUTYL KETONE	108-10-1	2,800 G	7,800 G	280,000 G	780,000 G	280,000 G	780,000 G	780,000 G			
METHYL ISOCYANATE	624-83-9	2.1 N	8.8 N	210 N	880 N	2.1 N	8.8 N	8.8 N			
METHYL N-BUTYL KETONE	591-78-6	63 N	260 N	6,300 N	26,000 N	63 N	260 N	260 N			
METHYL METHACRYLATE	80-62-6	1,500 N	6,200 N	150,000 N	620,000 N	150,000 N	620,000 N	620,000 N			
METHYL METHANESULFONATE	66-27-3	6.6 G	27 G	660 G	2,700 G	6.6 G	27 G	27 G			
METHYL PARATHION	298-00-0	1 H	1 H	100 H	100 H	1,000 H	1,000 H	1,000 H			
METHYL STYRENE (MIXED ISOMERS)	25013-15-4	84 N	350 N	8,400 N	35,000 N	84 N	350 N	350 N			
METHYL TERT-BUTYL ETHER (MTBE)	1634-04-4	20	20	2,000	2,000	200	200	200			
METHYLCHLOROPHENOXACETIC ACID (MCPA)	94-74-6	30 H	30 H	3,000 H	3,000 H	30,000 H	30,000 H	30,000 H			
METHYLENE BIS(2-CHLOROANILINE), 4,4'-	101-14-4	2.1 G	27 G	210 G	2,700 G	2.1 G	27 G	27 G			
METHYLNAPHTHALENE, 2-	91-57-6	6.3 N	26 N	630 N	2,600 N	6.3 N	26 N	26 N			
METHYLSTYRENE, ALPHA	98-83-9	2,400 G	6,800 G	240,000 G	560,000 S	2,400 G	6,800 G	6,800 G			
METOLACHLOR	51218-45-2	700 H	700 H	70,000 H	70,000 H	700 H	700 H	700 H			
METRIBUZIN	21087-64-9	70 H	70 H	7,000 H	7,000 H	70 H	70 H	70 H			
MEVINPHOS	7786-34-7	0.87 G	2.4 G	87 G	240 G	0.87 G	2.4 G	2.4 G			
MONOCHLOROACETIC ACID (HAA)	79-11-8	60 H	60 H	6,000 H	6,000 H	60 H	60 H	60 H			
NAPHTHALENE	91-20-3	100 H	100 H	10,000 H	10,000 H	10,000 H	10,000 H	10,000 H			

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		TDS ≤ 2500 mg/L			TDS > 2500 mg/L				
		R	NR	R	R	NR	R	R	NR
NAPHTHYLAMINE, 1-	134-32-7	0.36 G	1.5 G	36 G	36 G	150 G	36 G	36 G	150 G
NAPHTHYLAMINE, 2-	91-59-8	0.36 G	1.5 G	36 G	36 G	150 G	360 G	360 G	1500 G
NAPROPAMIDE	15299-99-7	4,200 G	12,000 G	70,000 S	70,000 S	70,000 S	4,200 G	4,200 G	12,000 G
NITROANILINE, O-	88-74-4	0.11 N	0.44 N	11 N	11 N	44 N	0.11 N	0.11 N	0.44 N
NITROANILINE, P-	100-01-6	33 G	140 G	3,300 G	3,300 G	14,000 G	33 G	33 G	140 G
NITROBENZENE	98-95-3	1.2 N	6.3 N	120 N	120 N	630 N	120 N	120 N	630 N
NITROGUANIDINE	556-88-7	700 H	700 H	70,000 H	70,000 H	70,000 H	700 H	700 H	700 H
NITROPHENOL, 2-	88-75-5	280 G	780 G	28,000 G	28,000 G	78,000 G	28,000 G	28,000 G	78,000 H
NITROPHENOL, 4-	100-02-7	60 H	60 H	6,000 H	6,000 H	6,000 H	6,000 H	6,000 H	6,000 H
NITROPROPANE, 2-	79-46-9	0.083 N	0.083 N	1.8 N	1.8 N	9.3 N	0.18 N	0.18 N	0.93 N
NITROSODIETHYLAMINE, N-	55-18-5	0.0045 N	0.0058 N	0.045 N	0.045 N	0.58 N	0.0045 N	0.0045 N	0.058 N
NITROSODIMETHYLAMINE, N-	62-75-9	0.0014 N	0.018 N	0.14 N	0.14 N	1.8 N	0.014 N	0.014 N	0.18 N
NITROSODI-N-BUTYLAMINE, N-	924-16-3	0.031 N	0.16 N	3.1 N	3.1 N	16 N	3.1 N	3.1 N	16 N
NITROSODI-N-PROPYLAMINE, N-	621-64-7	0.025 N	0.13 N	2.5 N	2.5 N	13 N	0.25 N	0.25 N	1.3 N
NITROSODIPHENYLAMINE, N-	86-30-6	19 N	96 N	1,900 N	1,900 N	9,600 N	1,900 N	1,900 N	9,600 N
NITROSO-N-ETHYLUREA, N-	759-73-9	0.0079 G	0.1 G	0.79 G	0.79 G	10 G	7.9 G	7.9 G	100 G
OCTYL PHTHALATE, DIN-	117-84-0	350 G	970 G	3,000 S	3,000 S	3,000 S	3,000 S	3,000 S	3,000 S
OXAMYL (VYDATE)	23135-22-0	200 M	200 M	20,000 M	20,000 M	20,000 M	200 M	200 M	200 M
PARAQUAT	1910-42-5	30 H	30 H	3,000 H	3,000 H	3,000 H	30 H	30 H	30 H
PARATHION	56-38-2	1 G	2.9 G	100 G	100 G	290 G	1 G	1 G	2.9 G
PCBS, TOTAL (POLYCHLORINATED BIPHENYLS) (AROCLOBS)	1336-36-3	0.5 M	0.5 M	50 M	50 M	50 M	0.5 M	0.5 M	0.5 M
PCB-1016 (AROCLOL)	12674-11-2	2.4 G	6.8 G	240 G	240 G	250 S	2.4 G	2.4 G	6.8 G
PCB-1221 (AROCLOL)	11104-28-2	0.33 G	1.4 G	33 G	33 G	140 G	0.33 G	0.33 G	1.4 G
PCB-1232 (AROCLOL)	11141-16-5	0.33 G	1.4 G	33 G	33 G	140 G	0.33 G	0.33 G	1.4 G
PCB-1242 (AROCLOL)	53469-21-9	0.33 G	1.4 G	33 G	33 G	100 S	0.33 G	0.33 G	1.4 G
PCB-1248 (AROCLOL)	12672-29-6	0.33 G	1.4 G	33 G	33 G	54 S	0.33 G	0.33 G	1.4 G
PCB-1254 (AROCLOL)	11097-69-1	0.69 G	1.9 G	57 S	57 S	57 S	0.69 G	0.69 G	1.9 G
PCB-1260 (AROCLOL)	11096-82-5	0.33 G	1.4 G	33 G	33 G	80 S	0.33 G	0.33 G	1.4 G
PEBULATE	1114-71-2	1,700 G	4,900 G	92,000 S	92,000 S	92,000 S	1,700 G	1,700 G	4,900 G
PENTACHLOROBENZENE	608-93-5	28 G	78 G	740 S	740 S	740 S	740 S	740 S	740 S
PENTACHLOROETHANE	76-01-7	7.2 G	30 G	720 G	720 G	3,000 G	7.2 G	7.2 G	30 G
PENTACHLORONITROBENZENE	82-68-8	2.5 G	10 G	250 G	250 G	440 S	440 S	440 S	440 S

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		TDS ≤ 2500 mg/L			TDS > 2500 mg/L			R			NR		
		R	NR	1 M	R	NR	1 M	R	NR	1 M	R	NR	1 M
PENTACHLOROPHENOL	87-86-5			1 M			1 M			1 M			1,000 M
PERFLUOROBUTANE SULFONATE (PFBS)	375-73-5	10 G	29 G		1,000 G		1,000 G			2,900 G			10 G
PERFLUOROOCTANE SULFONATE (PFOS)	1763-23-1		0.07 H				0.07 H			7 H			0.07 H
PERFLUOROOCTANOIC ACID (PFOA)	335-67-1		0.07 H				0.07 H			7 H			0.07 H
PHENACETIN	62-44-2	300 G	1,200 G		30,000 G		30,000 G			300,000 G			760,000 S
PHENANTHRENE	85-01-8	1,100 S	1,100 S		1,100 S		1,100 S			1,100 S			1,100 S
PHENOL	108-95-2	2,000 H	2,000 H		200,000 H		200,000 H			200,000 H			200,000 H
PHENYL MERCAPTAN	108-98-5	35 G	97 G		3,500 G		3,500 G			97,000 G			35 G
PHENYLENEDIAMINE, M-	108-45-2	210 G	580 G		21,000 G		21,000 G			58,000 G			210,000 G
PHENYLPHENOL, 2-	90-43-7	340 G	1,400 G		34,000 G		34,000 G			140,000 G			340,000 G
PHORATE	298-02-2	6.9 G	19 G		690 G		690 G			1,900 G			6.9 G
PHTHALIC ANHYDRIDE	85-44-9	42 N	180 N		4,200 N		4,200 N			18,000 N			18,000 N
PICLORAM	1918-02-1	500 M	500 M		50,000 M		50,000 M			500 M			500 M
PROMETON	1610-18-0	400 H	400 H		40,000 H		40,000 H			400 H			400 H
PRONAMIDE	23950-58-5	2,600 G	7,300 G		15,000 S		15,000 S			15,000 S			7,300 G
PROPACHLOR	1918-16-7	0.1 H	0.1 H		10 H		10 H			10 H			10 H
PROPANIL	709-98-8	170 G	490 G		17,000 G		17,000 G			49,000 G			170 G
PROPANOL, 2- (ISOPROPYL ALCOHOL)	67-63-0	420 N	1,800 N		42,000 N		42,000 N			180,000 N			420 N
PROPAGINE	139-40-2	10 H	10 H		1,000 H		1,000 H			1,000 H			10 H
PROPHAM	122-42-9	100 H	100 H		10,000 H		10,000 H			10,000 H			100 H
PROPYLBENZENE, N-	103-65-1	2,100 N	8,800 N		52,000 S		52,000 S			52,000 S			8,800 N
PROPYLENE OXIDE	75-58-9	2.7 G	11 G		270 G		270 G			1,100 G			2.7 G
PYRENE	129-00-0	130 S	350 S		130 S		130 S			350 S			130 S
PYRETHRUM	8003-34-7	350 S	350 S		350 S		350 S			350 S			350 S
PYRIDINE	110-86-1	35 G	97 G		3,500 G		3,500 G			97,000 G			350 G
QUINOLINE	91-22-5	0.22 G	0.91 G		22 G		22 G			91 G			220 G
QUICALOFOP (ASSURE)	76578-14-8	300 S	300 S		300 S		300 S			300 S			300 S
RDX	121-82-4	2 H	2 H		200 H		200 H			200 H			2 H
RESORCINOL	108-46-3	69,000 G	190,000 G		6,900,000 G		6,900,000 G			19,000,000 G			190,000 G
RONNEL	298-84-3	1,700 G	4,900 G		40,000 S		40,000 S			40,000 S			1,700 G
SIMAZINE	122-34-9	4 M	4 M		400 M		400 M			400 M			4 M
STRYCHNINE	57-24-9	10 G	29 G		1,000 G		1,000 G			2,900 G			10,000 G
													29,000 G

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		R	NR	R	NR						
STYRENE	100-42-5	100 M	100 M	10,000 M	10,000 M	10,000 M	10,000 M	10,000 M	10,000 M	10,000 M	10,000 M
TEBUTHIURON	34014-18-1	500 H	500 H	50,000 H	50,000 H	50,000 H	500 H	500 H	500 H	500 H	500 H
TERRACIL	5902-51-2	90 H	90 H	9,000 H	9,000 H	9,000 H	90 H	90 H	90 H	90 H	90 H
TERRUFOS	13071-79-9	0.4 H	0.4 H	40 H	40 H	40 H	0.4 H	0.4 H	0.4 H	0.4 H	0.4 H
TETRACHLOROBENZENE, 1,2,4,5-	95-94-3	10 G	29 G	580 S	580 S	580 S	580 S	580 S	580 S	580 S	580 S
TETRACHLOROBENZOP-DIOXIN, 2,3,7,8- (TCDD)	1746-01-6	0.00003 M	0.00003 M	0.00003 M	0.0003 M	0.003 M	0.019 S	0.019 S	0.019 S	0.019 S	0.019 S
TETRACHLOROETHANE, 1,1,1,2-	630-20-6	70 H	70 H	7,000 H	7,000 H	7,000 H	7,000 H	7,000 H	7,000 H	7,000 H	7,000 H
TETRACHLOROETHANE, 1,1,2,2-	79-34-5	0.84 N	4.3 N	84 N	430 N	430 N	84 N	84 N	84 N	430 N	430 N
TETRACHLOROETHYLENE (PCE)	127-18-4	5 M	5 M	500 M	500 M	500 M	50 M	50 M	50 M	50 M	50 M
TETRACHLOROPHENOL, 2,3,4,6-	58-90-2	1,000 G	2,900 G	100,000 G	180,000 G	180,000 G	180,000 S	180,000 S	180,000 S	180,000 S	180,000 S
TETRAETHYL LEAD	78-00-2	0.0035 G	0.0097 G	0.35 G	0.35 G	0.97 G	3.5 G	3.5 G	3.5 G	9.7 G	9.7 G
TETRAETHYLDITHIOPYROPHOSPHATE	3689-24-5	17 G	49 G	1,700 G	4,900 G	4,900 G	17 G	17 G	17 G	49 G	49 G
TETRAHYDROFURAN	109-99-9	25 N	130 N	2,500 N	13,000 N	13,000 N	25 N	25 N	25 N	130 N	130 N
THIOFANOX	39196-18-4	10 G	29 G	1,000 G	2,900 G	2,900 G	10 G	10 G	10 G	29 G	29 G
THIRAM	137-26-8	520 G	1,500 G	30,000 S	30,000 S	30,000 S	520 G	520 G	520 G	1,500 G	1,500 G
TOLUENE	106-88-3	1,000 M	1,000 M	100,000 M	100,000 M	100,000 M	100,000 M	100,000 M	100,000 M	100,000 M	100,000 M
TOLUIDINE, M-	108-44-1	41 G	170 G	4,100 G	17,000 G	17,000 G	41 G	41 G	41 G	170 G	170 G
TOLUIDINE, O	95-53-4	41 G	170 G	4,100 G	17,000 G	17,000 G	41,000 G	41,000 G	41,000 G	170,000 G	170,000 G
TOLUIDINE, P-	106-49-0	22 G	91 G	2,200 G	9,100 G	9,100 G	22 G	22 G	22 G	91 G	91 G
TOXAPHENE	8001-35-2	3 M	3 M	300 M	300 M	300 M	3 M	3 M	3 M	3 M	3 M
TRIALLATE	2303-17-5	0.91 G	3.8 G	91 G	380 G	380 G	0.91 G	0.91 G	0.91 G	3.8 G	3.8 G
TRIBROMOMETHANE (BROMOFORM) (THM)	75-25-2	80 M	80 M	8,000 M	8,000 M	8,000 M	8,000 M	8,000 M	8,000 M	8,000 M	8,000 M
TRICHLORO-1,2,2-TRIFLUOROETHANE, 1,1,2-	76-13-1	11,000 N	44,000 N	170,000 S	170,000 S	170,000 S	170,000 S	170,000 S	170,000 S	170,000 S	170,000 S
TRICHLOROACETIC ACID (HAA)	76-03-9	60 M	60 M	6,000 M	6,000 M	6,000 M	60 M	60 M	60 M	60 M	60 M
TRICHLOROBENZENE, 1,2,4-	120-82-1	70 M	70 M	7,000 M	7,000 M	7,000 M	7,000 M	7,000 M	7,000 M	7,000 M	7,000 M
TRICHLOROBENZENE, 1,3,5-	108-70-3	40 H	40 H	4,000 H	4,000 H	4,000 H	40 H	40 H	40 H	40 H	40 H
TRICHLOROETHANE, 1,1,1-	71-55-6	200 M	200 M	20,000 M	20,000 M	20,000 M	2,000 M	2,000 M	2,000 M	2,000 M	2,000 M
TRICHLOROETHANE, 1,1,2-	79-00-5	5 M	5 M	500 M	500 M	500 M	50 M	50 M	50 M	50 M	50 M
TRICHLOROETHYLENE (TCE)	79-01-6	5 M	5 M	500 M	500 M	500 M	50 M	50 M	50 M	50 M	50 M
TRICHLOROPHENOL, 2,4,5-	95-95-4	3,500 G	9,700 G	35,000 G	97,000 G	97,000 G	1,000,000 S	1,000,000 S	1,000,000 S	1,000,000 S	1,000,000 S
TRICHLOROPHENOL, 2,4,6-	88-06-2	35 G	97 G	3,500 G	9,700 G	9,700 G	35,000 G	35,000 G	35,000 G	97,000 G	97,000 G
TRICHLOROPHENOXACETIC ACID, 2,4,5- (2,4,5-T)	93-76-5	70 H	70 H	7,000 H	7,000 H	7,000 H	70,000 H	70,000 H	70,000 H	70,000 H	70,000 H

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		R	NR	R	NR						
TRICHLOROPHENOXYPROPIONIC ACID, 2,4,5- (2,4,5-TP)	93-72-1	50 M	50 M	5,000 M	5,000 M	49,000 G	170 G	50 M	50 M	490 G	50 M
TRICHLOROPROPANE, 1,1,2-	598-77-6	170 G	490 G	17,000 G	49,000 G	4,000 H	4,000 H	4,000 H	4,000 H	4,000 H	4,000 H
TRICHLOROPROPANE, 1,2,3-	96-18-4	40 H	40 H	4,000 H	4,000 H	2.6 N	63 N	260 N	2.6 N	2.6 N	2.6 N
TRICHLOROPROPENE, 1,2,3-	96-19-5	0.63 N	2.6 N	63 N	260 N	15 N	62 N	15 N	62 N	62 N	62 N
TRIETHYLAMINE	121-44-8	69,000 G	190,000 G	6,900,000 G	19,000,000 G	10 H	1,000 H	10 H	1,000 H	10 H	1,000 H
TRIETHYLENE GLYCOL	112-27-6	130 N	530 N	13,000 N	53,000 N	530 N	13,000 N	49,000 S	130 N	530 N	530 N
TRIFLURALIN	1582-09-8	5 H	5 H	500 H	500 H	2 H	200 H	200 H	2 H	2 H	2 H
TRIMETHYLBENZENE, 1,3,4- (TRIMETHYLBENZENE, 1,2,4-)	95-63-6	130 N	530 N	13,000 N	49,000 S	18,000 N	42,000 N	180,000 N	420 N	1,800 N	1,800 N
TRIMETHYLBENZENE, 1,3,5-	108-67-8	1.5 N	7.8 N	150 N	780 N	2 M	200 M	200 M	15 N	78 N	78 N
TRINITROGLYCEROL (NITROGLYCERIN)	55-63-0	2 M	2 M	200 M	200 M	2 M	200 M	2,900 G	20 M	20 M	20 M
TRINITROTOLUENE, 2,4,6-	118-96-7	10 G	29 G	1,000 G	2,900 G	10,000 M	180,000 S	10,000 S	10,000 G	17,000 S	17,000 S
VINYL ACETATE	108-05-4	10,000 M	10,000 M	180,000 S	180,000 S	10,000 S	10,000 S	180,000 S	180,000 S	180,000 S	180,000 S
VINYL BROMIDE (BROMOETHENE)	593-60-2	1,700 G	4,900 G	10,000 S	10,000 S	1,700 G	4,900 G	1,700 G	4,900 G	4,900 G	4,900 G
VINYL CHLORIDE	75-01-4	10,000 M	10,000 M	180,000 S	180,000 S	10,000 M	180,000 S	10,000 M	180,000 S	180,000 S	180,000 S
WARFARIN	81-81-2	10 G	29 G	1,000 G	2,900 G	10,000 M	180,000 S	10,000 M	180,000 S	180,000 S	180,000 S
XYLENES (TOTAL)	1330-20-7	10,000 M	10,000 M	180,000 S	180,000 S	10,000 M	180,000 S	10,000 M	180,000 S	180,000 S	180,000 S
ZINEB	12122-67-7	1,700 G	4,900 G	10,000 S	10,000 S	1,700 G	4,900 G	1,700 G	4,900 G	4,900 G	4,900 G

All concentrations in µg/L
 R = Residential
 NR = Non-Residential
 THMs—The values listed for trihalomethanes (THMs) are the total for all THMs combined.
 HAA5—The values listed for haloacetic acids (HAAs) are the total for all HAAs combined.
 PFOA and PFOS values listed are for individual or total combined.

M = Maximum Contaminant Level
 H = Lifetime health advisory level
 G = Ingestion
 N = Inhalation
 S = Aqueous solubility cap

Appendix A
Table 2—Medium-Specific Concentrations (MSCs) for Inorganic Regulated Substances in Groundwater

Regulated Substance	CASRN	Used Aquifers						Nonuse Aquifers					
		TDS ≤ 2500 mg/L			TDS > 2500 mg/L			TDS ≤ 2500 mg/L			TDS > 2500 mg/L		
		R	NR	R	NR	R	NR	R	NR	R	NR	R	NR
ANTIMONY	7440-38-0	6 M	6 M	6 M	6 M	600 M	600 M	600 M	600 M	6,000 M	6,000 M	6,000 M	NR
ARSENIC	7440-38-2	10 M	10 M	10 M	10 M	1,000 M	1,000 M	1,000 M	1,000 M	10,000 M	10,000 M	10,000 M	10,000 M
ASBESTOS (fibers/L)	12001-29-5	7,000,000 M	7,000,000 M	7,000,000 M	7,000,000 M	7,000,000 M	7,000,000 M	7,000,000 M	7,000,000 M	7,000,000 M	7,000,000 M	7,000,000 M	7,000,000 M
BARIUM AND COMPOUNDS	7440-39-3	2,000 M	2,000 M	2,000 M	2,000 M	200,000 M	200,000 M	200,000 M	200,000 M	2,000,000 M	2,000,000 M	2,000,000 M	2,000,000 M
BERYLLIUM	7440-41-7	4 M	4 M	4 M	4 M	400 M	400 M	400 M	400 M	4,000 M	4,000 M	4,000 M	4,000 M
BORON AND COMPOUNDS	7440-42-8	6,000 H	6,000 H	6,000 H	6,000 H	600,000 H	600,000 H	600,000 H	600,000 H	6,000,000 H	6,000,000 H	6,000,000 H	6,000,000 H
CADMIUM	7440-43-9	5 M	5 M	5 M	5 M	500 M	500 M	500 M	500 M	5,000 M	5,000 M	5,000 M	5,000 M
CHROMIUM (TOTAL)	7440-47-3	100 M	100 M	100 M	100 M	10,000 M	10,000 M	10,000 M	10,000 M	100,000 M	100,000 M	100,000 M	100,000 M
COBALT	7440-48-4	10 G	10 G	29 G	29 G	1,000 G	1,000 G	2,900 G	2,900 G	10,000 G	10,000 G	29,000 G	29,000 G
COPPER	7440-50-8	1,000 M	1,000 M	1,000 M	1,000 M	100,000 M	100,000 M	100,000 M	100,000 M	1,000,000 M	1,000,000 M	1,000,000 M	1,000,000 M
CYANIDE, FREE	57-12-5	200 M	200 M	200 M	200 M	20,000 M	20,000 M	20,000 M	20,000 M	200,000 M	200,000 M	200,000 M	200,000 M
FLUORIDE	16984-48-8	4,000 M	4,000 M	4,000 M	4,000 M	400,000 M	400,000 M	400,000 M	400,000 M	4,000,000 M	4,000,000 M	4,000,000 M	4,000,000 M
LEAD	7439-92-1	5 M	5 M	5 M	5 M	500 M	500 M	500 M	500 M	5,000 M	5,000 M	5,000 M	5,000 M
LITHIUM	7439-93-2	69 G	69 G	190 G	190 G	6,900 G	6,900 G	19,000 G	19,000 G	69,000 G	69,000 G	190,000 G	190,000 G
MANGANESE	7439-96-5	300 H	300 H	300 H	300 H	30,000 H	30,000 H	30,000 H	30,000 H	300,000 H	300,000 H	300,000 H	300,000 H
MERCURY	7439-97-6	2 M	2 M	2 M	2 M	200 M	200 M	200 M	200 M	2,000 M	2,000 M	2,000 M	2,000 M
MOLYBDENUM	7439-98-7	40 H	40 H	40 H	40 H	4,000 H	4,000 H	4,000 H	4,000 H	40,000 H	40,000 H	40,000 H	40,000 H
NICKEL	7440-02-0	100 H	100 H	100 H	100 H	10,000 H	10,000 H	10,000 H	10,000 H	100,000 H	100,000 H	100,000 H	100,000 H
NITRATE NITROGEN	14797-55-8	10,000 M	10,000 M	10,000 M	10,000 M	1,000,000 M	1,000,000 M	1,000,000 M	1,000,000 M	10,000,000 M	10,000,000 M	10,000,000 M	10,000,000 M
NITRITE NITROGEN	14797-85-0	1,000 M	1,000 M	1,000 M	1,000 M	100,000 M	100,000 M	100,000 M	100,000 M	1,000,000 M	1,000,000 M	1,000,000 M	1,000,000 M
PERCHLORATE	7790-98-9	15 H	15 H	15 H	15 H	1,500 H	1,500 H	1,500 H	1,500 H	15,000 H	15,000 H	15,000 H	15,000 H
SELENIUM	7782-49-2	50 M	50 M	50 M	50 M	5,000 M	5,000 M	5,000 M	5,000 M	50,000 M	50,000 M	50,000 M	50,000 M
SILVER	7440-22-4	100 H	100 H	100 H	100 H	10,000 H	10,000 H	10,000 H	10,000 H	100,000 H	100,000 H	100,000 H	100,000 H
STRONTIUM	7440-24-6	4,000 H	4,000 H	4,000 H	4,000 H	400,000 H	400,000 H	400,000 H	400,000 H	4,000,000 H	4,000,000 H	4,000,000 H	4,000,000 H
THALLIUM	7440-28-0	2 M	2 M	2 M	2 M	200 M	200 M	200 M	200 M	2,000 M	2,000 M	2,000 M	2,000 M
TIN	7440-31-5	21,000 G	58,000 G	21,000 G	58,000 G	2,100,000 G	5,800,000 G	2,100,000 G	5,800,000 G	21,000,000 G	58,000,000 G	21,000,000 G	58,000,000 G
VANADIUM	7440-62-2	170 G	170 G	490 G	490 G	17,000 G	17,000 G	49,000 G	49,000 G	170,000 G	170,000 G	490,000 G	490,000 G
ZINC AND COMPOUNDS	7440-66-6	2,000 H	2,000 H	2,000 H	2,000 H	200,000 H	200,000 H	200,000 H	200,000 H	2,000,000 H	2,000,000 H	2,000,000 H	2,000,000 H

All concentrations in µg/L (except asbestos)

M = Maximum Contaminant Level

H = Lifetime Health Advisory Level

SMCL = Secondary Maximum Contaminant Level

G = Ingestion

N = Inhalation

PA State MCL adopted as MSC for Copper and Lead

R = Residential

NR = Nonresidential

Appendix A
Table 2—Medium-Specific Concentrations (MSCs) for Inorganic Regulated Substances in Groundwater

SECONDARY CONTAMINANTS				
REGULATED SUBSTANCE	CASRN	SMCL	UNITS	
ALUMINUM	7429-90-5	200	µg/L	
CHLORIDE	7647-14-5	250,000	µg/L	
IRON	7439-89-6	300	µg/L	
SULFATE	7757-82-6	250,000	µg/L	

All concentrations in µg/L (except asbestos)
M = Maximum Contaminant Level
H = Lifetime Health Advisory Level
SMCL = Secondary Maximum Contaminant Level
G = Ingestion
N = Inhalation
PA State MCL adopted as MSC for Copper and Lead

R = Residential
NR = Nonresidential

Appendix A
Table 3—Medium-Specific Concentrations (MSCs) for Organic Regulated Substances in Soil
A. Direct Contact Numeric Values

REGULATED SUBSTANCE	CASRN	Residential 0—15 feet	Nonresidential	
			Surface Soil 0—2 feet	Subsurface Soil 2—15 feet
ACENAPHTHENE	83-32-9	13,000 G	190,000 C	190,000 C
ACENAPHTHYLENE	208-96-8	13,000 G	190,000 C	190,000 C
ACEPHATE	30560-19-1	260 G	3,800 G	190,000 C
ACETALDEHYDE	75-07-0	170 N	710 N	820 N
ACETONE	67-64-1	10,000 C	10,000 C	10,000 C
ACETONITRILE	75-05-8	1,100 N	4,700 N	5,500 N
ACETOPHENONE	98-86-2	10,000 C	10,000 C	10,000 C
ACETYLAMINOFLUORENE, 2- (2AAF)	53-96-3	4.9 G	24 G	190,000 C
ACROLEIN	107-02-8	0.38 N	1.6 N	1.8 N
ACRYLAMIDE	79-06-1	1.7 N	22 N	25 N
ACRYLIC ACID	79-10-7	19 N	79 N	91 N
ACRYLONITRILE	107-13-1	6.5 N	33 N	37 N
ALACHLOR	15972-60-8	330 G	1,600 G	190,000 C
ALDICARB	116-06-3	220 G	3,200 G	190,000 C
ALDICARB SULFONE	1646-88-4	220 G	3,200 G	190,000 C
ALDICARB SULFOXIDE	1646-87-3	220 G	3,200 G	190,000 C
ALDRIN	309-00-2	1.1 G	5.4 G	190,000 C
ALLYL ALCOHOL	107-18-6	1.9 N	7.9 N	9.1 N
AMETRYN	834-12-8	2,000 G	29,000 G	190,000 C
AMINOBIIPHENYL, 4-	92-87-1	0.89 G	4.3 G	190,000 C
AMITROLE	61-82-5	20 G	97 G	190,000 C
AMMONIA	7664-41-7	9,600 N	10,000 C	10,000 C
AMMONIUM SULFAMATE	7773-06-0	44,000 G	190,000 C	190,000 C
ANILINE	62-53-3	19 N	79 N	90 N
ANTHRACENE	120-12-7	66,000 G	190,000 C	190,000 C
ATRAZINE	1912-24-9	81 G	400 G	190,000 C
AZINPHOS-METHYL (GUTHION)	86-50-0	330 G	4,800 G	190,000 C
BAYGON (PROPOXUR)	114-26-1	880 G	13,000 G	190,000 C
BENOMYL	17804-35-2	7,800 G	38,000 G	190,000 C
BENTAZON	25057-89-0	6,600 G	96,000 G	190,000 C
BENZENE	71-43-2	57 N	280 N	330 N
BENZIDINE	92-87-5	0.018 G	0.4 G	190,000 C
BENZO[A]ANTHRACENE	56-55-3	6.1 G	130 G	190,000 C
BENZO[A]PYRENE	50-32-8	4.2 G	91 G	190,000 C
BENZO[B]FLUORANTHENE	205-99-2	3.5 G	76 G	190,000 C
BENZO[GHI]PERYLENE	191-24-2	13,000 G	190,000 C	190,000 C
BENZO[K]FLUORANTHENE	207-08-9	3.5 G	76 G	190,000 C
BENZOIC ACID	65-85-0	190,000 C	190,000 C	190,000 C
BENZOTRICHLORIDE	98-07-7	1.4 G	7 G	10,000 C
BENZYL ALCOHOL	100-51-6	10,000 C	10,000 C	10,000 C
BENZYL CHLORIDE	100-44-7	9 N	45 N	52 N
BETA PROPIOLACTONE	57-57-8	0.11 N	0.55 N	0.63 N
BHC, ALPHA	319-84-6	3 G	14 G	190,000 C
BHC, BETA-	319-85-7	10 G	51 G	190,000 C
BHC, GAMMA (LINDANE)	58-89-9	17 G	83 G	190,000 C
BIPHENYL, 1,1-	92-52-4	8.2 N	34 N	40 N
BIS(2-CHLOROETHOXY)METHANE	111-91-1	660 G	9,600 G	10,000 C
BIS(2-CHLOROETHYL)ETHER	111-44-4	1.3 N	6.7 N	7.6 N
BIS(2-CHLORO-ISOPROPYL)ETHER	108-60-1	44 N	220 N	250 N
BIS(CHLOROMETHYL)ETHER	542-88-1	0.0071 N	0.036 N	0.041 N
BIS[2-ETHYLHEXYL] PHTHALATE	117-81-7	1,300 G	6,500 G	10,000 C
BISPHENOL A	80-05-7	11,000 G	160,000 G	190,000 C

All concentrations in mg/kg

G—Ingestion

N—Inhalation

C—Cap

Appendix A
Table 3—Medium-Specific Concentrations (MSCs) for Organic Regulated Substances in Soil
A. Direct Contact Numeric Values

REGULATED SUBSTANCE	CASRN	Residential 0—15 feet	Nonresidential	
			Surface Soil 0—2 feet	Subsurface Soil 2—15 feet
BROMACIL	314-40-9	22,000 G	190,000 C	190,000 C
BROMOBENZENE	108-86-1	1,100 N	4,700 N	5,400 N
BROMOCHLOROMETHANE	74-97-5	760 N	3,200 N	3,600 N
BROMODICHLOROMETHANE	75-27-4	12 N	60 N	69 N
BROMOMETHANE	74-83-9	95 N	400 N	460 N
BROMOXYNIL	1689-84-5	180 G	880 G	190,000 C
BROMOXYNIL OCTANOATE	1689-99-2	180 G	880 G	190,000 C
BUTADIENE, 1,3-	106-99-0	15 N	74 N	85 N
BUTYL ALCOHOL, N-	71-36-3	10,000 C	10,000 C	10,000 C
BUTYLATE	2008-41-5	10,000 C	10,000 C	10,000 C
BUTYLBENZENE, N-	104-51-8	10,000 C	10,000 C	10,000 C
BUTYLBENZENE, SEC-	135-98-8	10,000 C	10,000 C	10,000 C
BUTYLBENZENE, TERT-	98-06-6	10,000 C	10,000 C	10,000 C
BUTYLBENZYL PHTHALATE	85-68-7	9,800 G	10,000 C	10,000 C
CAPTAN	133-06-2	8,100 G	40,000 G	190,000 C
CARBARYL	63-25-2	22,000 G	190,000 C	190,000 C
CARBAZOLE	86-74-8	930 G	4,600 G	190,000 C
CARBOFURAN	1563-66-2	1,100 G	16,000 G	190,000 C
CARBON DISULFIDE	75-15-0	10,000 C	10,000 C	10,000 C
CARBON TETRACHLORIDE	56-23-5	75 N	370 N	430 N
CARBOXIN	5234-68-4	22,000 G	190,000 C	190,000 C
CHLORAMBEN	133-90-4	3,300 G	48,000 G	190,000 C
CHLORDANE	57-74-9	53 G	260 G	190,000 C
CHLORO-1,1-DIFLUOROETHANE, 1-	75-68-3	10,000 C	10,000 C	10,000 C
CHLORO-1-PROPENE, 3- (ALLYL CHLORIDE)	107-05-1	19 N	80 N	92 N
CHLOROACETALDEHYDE	107-20-0	69 G	340 G	10,000 C
CHLOROACETOPHENONE, 2-	532-27-4	190,000 C	190,000 C	190,000 C
CHLOROANILINE, P-	106-47-8	93 G	460 G	190,000 C
CHLOROBENZENE	108-90-7	950 N	3,900 N	4,500 N
CHLOROBENZILATE	510-15-6	170 G	830 G	190,000 C
CHLOROBUTANE, 1-	109-69-3	8,800 G	10,000 C	10,000 C
CHLORODIBROMOMETHANE	124-48-1	220 G	1,100 G	10,000 C
CHLORODIFLUOROMETHANE	75-45-6	10,000 C	10,000 C	10,000 C
CHLOROETHANE	75-00-3	10,000 C	10,000 C	10,000 C
CHLOROFORM	67-66-3	19 N	96 N	110 N
CHLORONAPHTHALENE, 2-	91-58-7	18,000 G	190,000 C	190,000 C
CHLORONITROBENZENE, P-	100-00-5	39 N	160 N	180 N
CHLOROPHENOL, 2-	95-57-8	1,100 G	10,000 C	10,000 C
CHLOROPRENE	126-99-8	1.5 N	7.4 N	8.5 N
CHLOROPROPANE, 2-	75-29-6	1,900 N	7,900 N	9,100 N
CHLOROTHALONIL	1897-45-6	1,100 G	5,400 G	190,000 C
CHLOROTOLUENE, O-	95-49-8	4,400 G	10,000 C	10,000 C
CHLOROTOLUENE, P-	106-43-4	4,400 C	10,000 C	10,000 C
CHLORPYRIFOS	2921-88-2	220 G	3,200 G	190,000 C
CHLORSULFURON	64902-72-3	4,400 G	64,000 G	190,000 C
CHLOROTHAL-DIMETHYL (DACTHAL) (DCPA)	1861-32-1	2,200 G	32,000 G	190,000 C
CHRYSENE	218-01-9	35 G	760 G	190,000 C
CRESOL(S)	1319-77-3	10,000 C	10,000 C	10,000 C
CRESOL, 4,6-DINITRO-O-	534-52-1	18 G	260 G	190,000 C
CRESOL, O- (2-METHYLPHENOL)	95-48-7	11,000 G	160,000 G	190,000 C
CRESOL, M- (3-METHYLPHENOL)	108-39-4	10,000 C	10,000 C	10,000 C
CRESOL, P- (4-METHYLPHENOL)	106-44-5	1,100 G	16,000 G	190,000 C

All concentrations in mg/kg

G—Ingestion

N—Inhalation

C—Cap

Appendix A
Table 3—Medium-Specific Concentrations (MSCs) for Organic Regulated Substances in Soil
A. Direct Contact Numeric Values

REGULATED SUBSTANCE	CASRN	Residential 0—15 feet	Nonresidential	
			Surface Soil 0—2 feet	Subsurface Soil 2—15 feet
CRESOL, P-CHLORO-M-	59-50-7	22,000 G	190,000 G	190,000 C
CROTONALDEHYDE	4170-30-3	9.8 G	48 G	10,000 C
CROTONALDEHYDE, TRANS-	123-73-9	9.8 G	48 G	10,000 C
CUMENE (ISOPROPYL BENZENE)	98-82-8	7,600 N	10,000 C	10,000 C
CYANAZINE	21725-46-2	22 G	110 G	190,000 C
CYCLOHEXANE	110-82-7	10,000 C	10,000 C	10,000 C
CYCLOHEXANONE	108-94-1	10,000 C	10,000 C	10,000 C
CYFLUTHRIN	68359-37-5	5,500 G	80,000 G	190,000 C
CYROMAZINE	66215-27-8	110,000 G	190,000 C	190,000 C
DDD, 4,4'-	72-54-8	78 G	380 G	190,000 C
DDE, 4,4'-	72-55-9	55 G	270 G	190,000 C
DDT, 4,4'-	50-29-3	55 G	270 G	190,000 C
DI(2-ETHYLHEXYL)ADIPATE	103-23-1	10,000 C	10,000 C	10,000 C
DIALATE	2303-16-4	300 G	1,500 G	10,000 C
DIAMINOTOLUENE, 2,4-	95-80-7	4.7 G	23 G	190,000 C
DIAZINON	333-41-5	150 G	2,200 G	10,000 C
DIBENZO[A,H]ANTHRACENE	53-70-3	1 G	22 G	190,000 C
DIBENZOFURAN	132-64-9	220 G	3,200 G	190,000 C
DIBROMO-3-CHLOROPROPANE, 1,2-	96-12-8	0.029 N	0.37 N	0.42 N
DIBROMOBENZENE, 1,4-	106-37-6	2,200 G	32,000 G	190,000 C
DIBROMOETHANE, 1,2- (ETHYLENE DIBROMIDE)	106-93-4	0.74 N	3.7 N	4.2 N
DIBROMOMETHANE	74-95-3	76 N	310 N	360 N
DIBUTYL PHTHALATE, N-	84-74-2	10,000 C	10,000 C	10,000 C
DICAMBA	1918-00-9	6,600 G	96,000 G	190,000 C
DICHLOROACETIC ACID	76-43-6	370 G	1,800 G	10,000 C
DICHLORO-2-BUTENE, 1,4-	764-41-0	0.11 N	0.52 N	0.6 N
DICHLORO-2-BUTENE, TRANS-1,4-	110-57-6	0.11 N	0.52 N	0.6 N
DICHLOROBENZENE, 1,2-	95-50-1	3,800 N	10,000 C	10,000 C
DICHLOROBENZENE, 1,3-	541-73-1	10,000 C	10,000 C	10,000 C
DICHLOROBENZENE, P-	106-46-7	40 N	200 N	230 N
DICHLOROBENZIDINE, 3,3'-	91-94-1	41 G	200 G	190,000 C
DICHLORODIFLUOROMETHANE (FREON 12)	75-71-8	1,900 N	8,000 N	9,100 N
DICHLOROETHANE, 1,1-	75-34-3	280 N	1,400 N	1,600 N
DICHLOROETHANE, 1,2-	107-06-2	17 N	85 N	98 N
DICHLOROETHYLENE, 1,1-	75-35-4	3,800 N	10,000 C	10,000 C
DICHLOROETHYLENE, CIS-1,2-	156-59-2	440 G	6,400 G	10,000 C
DICHLOROETHYLENE, TRANS-1,2-	156-60-5	4,400 G	10,000 C	10,000 C
DICHLOROMETHANE (METHYLENE CHLORIDE)	75-09-2	1,300 G	10,000 C	10,000 C
DICHLOROPHENOL, 2,4-	120-83-2	660 G	9,600 G	190,000 C
DICHLOROPHENOXYACETIC ACID, 2,4- (2,4-D)	94-75-7	2,200 G	32,000 G	190,000 C
DICHLOROPROPANE, 1,2-	78-87-5	0.12 N	0.6 N	0.69 N
DICHLOROPROPENE, 1,3-	542-75-6	110 N	550 N	640 N
DICHLOROPROPIONIC ACID, 2,2- (DALAPON)	75-99-0	6,600 G	10,000 C	10,000 C
DICHLORVOS	62-73-7	64 G	310 G	10,000 C
DICYCLOPENTADIENE	77-73-6	5.7 N	24 N	27 N
DIELDRIN	60-57-1	1.2 G	5.7 G	190,000 C
DIETHANOLAMINE	111-42-2	440 G	6,400 G	10,000 C
DIETHYL PHTHALATE	84-66-2	10,000 C	10,000 C	10,000 C
DIFLUBENZURON	35367-38-5	4,400 G	64,000 G	190,000 C
DIISOPROPYL METHYLPHOSPHONATE	1445-75-6	10,000 C	10,000 C	10,000 C
DIMETHOATE	60-51-5	480 G	7,000 G	190,000 C
DIMETHOXYBENZIDINE, 3,3'-	119-90-4	12 G	57 G	190,000 C

All concentrations in mg/kg

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Appendix A
Table 3—Medium-Specific Concentrations (MSCs) for Organic Regulated Substances in Soil
A. Direct Contact Numeric Values

REGULATED SUBSTANCE	CASRN	Residential 0—15 feet	Nonresidential	
			Surface Soil 0—2 feet	Subsurface Soil 2—15 feet
DIMETHRIN	70-38-2	66,000 G	190,000 C	190,000 C
DIMETHYLAMINOAZOBENZENE, P-	60-11-7	4 G	20 G	190,000 C
DIMETHYLANILINE, N,N-	121-69-7	440 G	3,400 G	10,000 C
DIMETHYLBENZIDINE, 3,3-	119-93-7	1.7 G	8.3 G	190,000 C
DIMETHYL METHYLPHOSPHONATE	756-79-6	10,000 C	10,000 C	10,000 C
DIMETHYLPHENOL, 2,4-	105-67-9	4,400 G	10,000 C	10,000 C
DINITROBENZENE, 1,3-	99-65-0	22 G	320 G	190,000 C
DINITROPHENOL, 2,4-	51-28-5	440 G	6,400 G	190,000 C
DINITROTOLUENE, 2,4-	121-14-2	60 G	290 G	190,000 C
DINITROTOLUENE, 2,6- (2,6-DNT)	606-20-2	12 G	61 G	190,000 C
DINOSEB	88-85-7	220 G	3,200 G	190,000 C
DIOXANE, 1,4-	123-91-1	89 N	440 N	510 N
DIPHENAMID	957-51-7	6,600 G	96,000 G	190,000 C
DIPHENYLAMINE	122-39-4	22,000 G	190,000 C	190,000 C
DIPHENYLHYDRAZINE, 1,2-	122-66-7	2.1 N	10 N	12 N
DIQUAT	85-00-7	480 G	7,000 G	190,000 C
DISULFOTON	298-04-4	8.8 G	130 G	10,000 C
DITHIANE, 1,4-	505-29-3	2,200 G	32,000 G	190,000 C
DIURON	330-54-1	440 G	6,400 G	190,000 C
ENDOSULFAN	115-29-7	1,300 G	19,000 G	190,000 C
ENDOSULFAN I (ALPHA)	959-98-8	1,300 G	19,000 G	190,000 C
ENDOSULFAN II (BETA)	33213-65-9	1,300 G	19,000 G	190,000 C
ENDOSULFAN SULFATE	1031-07-8	1,300 G	19,000 G	190,000 C
ENDOTHALL	145-73-3	4,400 G	64,000 G	190,000 C
ENDRIN	72-20-8	66 G	960 G	190,000 C
EPICHLOROXYDRIN	106-89-8	19 N	79 N	91 N
ETHEPHON	16672-87-0	1,100 G	16,000 G	190,000 C
ETHION	563-12-2	110 G	1,600 G	10,000 C
ETHOXYETHANOL, 2- (EGEE)	110-80-5	3,800 N	10,000 C	10,000 C
ETHYL ACETATE	141-78-6	1,300 N	5,500 N	6,300 N
ETHYL ACRYLATE	140-88-5	150 N	630 N	720 N
ETHYL BENZENE	100-41-4	180 N	880 N	1,000 N
ETHYL DIPROPYLTHIOCARBAMATE, S- (EPTC)	759-94-4	10,000 C	10,000 C	10,000 C
ETHYL ETHER	60-29-7	10,000 C	10,000 C	10,000 C
ETHYL METHACRYLATE	97-63-2	5,700 N	10,000 C	10,000 C
ETHYLENE CHLORHYDRIN	107-07-3	4,400 G	10,000 C	10,000 C
ETHYLENE GLYCOL	107-21-1	7,600 N	10,000 C	10,000 C
ETHYLENE THIOUREA (ETU)	96-45-7	18 G	260 G	190,000 C
ETHYLP-NITROPHENYL PHENYLPHOSPHOROTHIOATE	2104-64-5	2.2 G	32 G	190,000 C
FENAMIPHOS	22224-92-6	55 G	800 G	190,000 C
FENVALERATE (PYDRIN)	51630-58-1	5,500 G	10,000 C	10,000 C
FLUOMETURON	2164-17-2	2,900 G	42,000 G	190,000 C
FLUORANTHENE	206-44-0	8,800 G	130,000 G	190,000 C
FLUORENE	86-73-7	8,800 G	130,000 G	190,000 C
FLUOROTRICHLOROMETHANE (FREON 11)	75-69-4	10,000 C	10,000 C	10,000 C
FONOFOS	944-22-9	440 G	6,400 G	10,000 C
FORMALDEHYDE	50-00-0	34 N	170 N	200 N
FORMIC ACID	64-18-6	5.7 N	24 N	27 N
FOSETYL-AL	39148-24-8	190,000 C	190,000 C	190,000 C
FURAN	110-00-9	220 G	3,200 G	10,000 C
FURFURAL	98-01-1	530 G	2,600 G	4,500 N

All concentrations in mg/kg

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Appendix A
Table 3—Medium-Specific Concentrations (MSCs) for Organic Regulated Substances in Soil
A. Direct Contact Numeric Values

REGULATED SUBSTANCE	CASRN	Residential 0—15 feet	Nonresidential	
			Surface Soil 0—2 feet	Subsurface Soil 2—15 feet
GLYPHOSATE	1071-83-6	22,000 G	190,000 C	190,000 C
HEPTACHLOR	76-44-8	4.1 G	20 G	190,000 C
HEPTACHLOR EPOXIDE	1024-57-3	2 G	10 G	190,000 C
HEXACHLOROBENZENE	118-74-1	12 G	57 G	190,000 C
HEXACHLOROBUTADIENE	87-68-3	220 G	1,200 G	10,000 C
HEXACHLOROCYCLOPENTADIENE	77-47-4	1,300 G	10,000 C	10,000 C
HEXACHLOROETHANE	67-72-1	46 N	230 N	270 N
HEXANE	110-54-3	10,000 C	10,000 C	10,000 C
HEXAZINONE	51235-04-2	7,300 G	110,000 G	190,000 C
HEXYTHIAZOX (SAVEY)	78587-05-0	5,500 G	80,000 G	190,000 C
HMX	2691-41-0	11,000 G	160,000 G	190,000 C
HYDRAZINE/HYDRAZINE SULFATE	302-01-2	0.091 N	0.45 N	0.52 N
HYDROQUINONE	123-31-9	310 G	1,500 G	190,000 C
INDENO[1,2,3-CD]PYRENE	193-39-5	3.5 G	76 G	190,000 C
IPRODIONE	36734-19-7	420 G	2,100 G	190,000 C
ISOBUTYL ALCOHOL	78-83-1	10,000 C	10,000 C	10,000 C
ISOPHORONE	78-59-1	10,000 C	10,000 C	10,000 C
ISOPROPYL METHYLPHOSPHONATE	1832-54-8	10,000 C	10,000 C	10,000 C
KEPONE	143-50-0	1.9 G	9.1 G	190,000 C
MALATHION	121-75-5	4,400 G	10,000 C	10,000 C
MALEIC HYDRAZIDE	123-33-1	110,000 G	190,000 C	190,000 C
MANEB	12427-38-2	310 G	1,500 G	190,000 C
MERPHOS OXIDE	78-48-8	110 G	1,600 G	10,000 C
METHACRYLONITRILE	126-98-7	22 G	320 G	2,700 N
METHAMIDOPHOS	10265-92-6	11 G	160 G	190,000 C
METHANOL	67-56-1	10,000 C	10,000 C	10,000 C
METHOMYL	16752-77-5	5,500 G	80,000 G	190,000 C
METHOXYCHLOR	72-43-5	1,100 G	16,000 G	190,000 C
METHOXYETHANOL, 2-	109-86-4	380 N	1,600 N	1,800 N
METHYL ACETATE	79-20-9	10,000 C	10,000 C	10,000 C
METHYL ACRYLATE	96-33-3	380 N	1,600 N	1,800 N
METHYL CHLORIDE	74-87-3	250 N	1,200 N	1,400 N
METHYL ETHYL KETONE	78-93-3	10,000 C	10,000 C	10,000 C
METHYL HYDRAZINE	60-34-4	0.38 N	1.6 N	1.8 N
METHYL ISOBUTYL KETONE	108-10-1	10,000 C	10,000 C	10,000 C
METHYL ISOCYANATE	624-83-9	19 N	79 N	91 N
METHYL N-BUTYL KETONE (2-HEXANONE)	591-78-6	570 N	2,400 N	2,700 N
METHYL METHACRYLATE	80-62-6	10,000 C	10,000 C	10,000 C
METHYL METHANESULFONATE	66-27-3	190 G	920 G	10,000 C
METHYL PARATHION	298-00-0	55 G	800 G	190,000 C
METHYL STYRENE (MIXED ISOMERS)	25013-15-4	760 N	3,100 N	3,600 N
METHYL TERT-BUTYL ETHER (MTBE)	1634-04-4	1,700 N	8,500 N	9,800 N
METHYLCHLOROPHOXYACETIC ACID (MCPA)	94-74-6	110 G	1,600 C	190,000 C
METHYLENE BIS(2-CHLOROANILINE), 4,4'-	101-14-4	42 G	910 G	190,000 C
METHYLNAPHTHALENE, 2-	91-57-6	57 N	240 N	270 N
METHYLSTYRENE, ALPHA	98-83-9	10,000 C	10,000 C	10,000 C
METOLACHLOR	51218-45-2	10,000 C	10,000 C	10,000 C
METRIBUZIN	21087-64-9	5,500 G	80,000 G	190,000 C
MEVINPHOS	7786-34-7	5.5 G	80 G	190,000 C
MONOCHLOROACETIC ACID	79-11-8	440 G	6,400 G	190,000 C
NAPHTHALENE	91-20-3	13 N	66 N	77 N
NAPHTHYLAMINE, 1-	134-32-7	10 G	51 G	190,000 C

All concentrations in mg/kg

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Appendix A
Table 3—Medium-Specific Concentrations (MSCs) for Organic Regulated Substances in Soil
A. Direct Contact Numeric Values

REGULATED SUBSTANCE	CASRN	Residential 0—15 feet	Nonresidential	
			Surface Soil 0—2 feet	Subsurface Soil 2—15 feet
NAPHTHYLAMINE, 2-	91-59-8	10 G	51 G	190,000 C
NAPROPAMIDE	15299-99-7	26,000 G	190,000 C	190,000 C
NITROANILINE, O-	88-74-4	0.95 N	3.9 N	4.5 N
NITROANILINE, P-	100-01-6	880 G	4,600 G	190,000 C
NITROBENZENE	98-95-3	11 N	55 N	63 N
NITROGUANIDINE	556-88-7	22,000 G	190,000 C	190,000 C
NITROPHENOL, 2-	88-75-5	1,800 G	26,000 G	190,000 C
NITROPHENOL, 4-	100-02-7	1,800 G	26,000 G	190,000 C
NITROPROPANE, 2-	79-46-9	0.16 N	0.82 N	0.94 N
NITROSODIETHYLAMINE, N-	55-18-5	0.0041 N	0.051 N	0.059 N
NITROSODIMETHYLAMINE, N-	62-75-9	0.012 N	0.16 N	0.18 N
NITROSO-DI-N-BUTYLAMINE, N-	924-16-3	0.28 N	1.4 N	1.6 N
NITROSODI-N-PROPYLAMINE, N-	621-64-7	0.22 N	1.1 N	1.3 N
NITROSODIPHENYLAMINE, N-	86-30-6	170 N	860 N	990 N
NITROSO-N-ETHYLUREA, N-	759-73-9	0.16 G	3.4 G	190,000 C
OCTYL PHTHALATE, DI-N-	117-84-0	2,200 G	10,000 C	10,000 C
OXAMYL (VYDATE)	23135-22-0	5,500 G	80,000 G	190,000 C
PARAQUAT	1910-42-5	990 G	14,000 G	190,000 C
PARATHION	56-38-2	6.6 G	96 G	10,000 C
PCBS, TOTAL (POLYCHLORINATED BIPHENYLS) (AROCLORS)	1336-36-3	9.3 G	46 G	190,000 C
PCB-1016 (AROCLOR)	12674-11-2	15 G	220 G	10,000 C
PCB-1221 (AROCLOR)	11104-28-2	4.7 N	23 N	27 N
PCB-1232 (AROCLOR)	11141-16-5	9.3 G	46 G	10,000 C
PCB-1242 (AROCLOR)	53469-21-9	9.3 G	46 G	10,000 C
PCB-1248 (AROCLOR)	12672-29-6	9.3 G	46 G	10,000 C
PCB-1254 (AROCLOR)	11097-69-1	4.4 G	64 G	10,000 C
PCB-1260 (AROCLOR)	11096-82-5	9.3 G	46 G	190,000 C
PEBULATE	1114-71-2	10,000 C	10,000 C	10,000 C
PENTACHLORO BENZENE	608-93-5	180 G	2,600 G	190,000 C
PENTACHLOROETHANE	76-01-7	210 G	1,000 G	10,000 C
PENTACHLORONITROBENZENE	82-68-8	72 G	350 G	190,000 C
PENTACHLOROPHENOL	87-86-5	47 G	230 G	190,000 C
PERFLUOROBUTANE SULFONATE (PFBS)	375-73-5	66 G	960 G	10,000 C
PERFLUOROOCTANE SULFONATE (PFOS)	1763-23-1	4.4 G	64 G	190,000 C
PERFLUOROOCTANOIC ACID (PFOA)	335-67-1	4.4 G	64 G	190,000 C
PHENACETIN	62-44-2	8,500 G	41,000 G	190,000 C
PHENANTHRENE	85-01-8	66,000 G	190,000 C	190,000 C
PHENOL	108-95-2	3,800 N	16,000 N	18,000 N
PHENYL MERCAPTAN	108-98-5	220 G	3,200 G	10,000 C
PHENYLENEDIAMINE, M-	108-45-2	1,300 G	19,000 G	190,000 C
PHENYLPHENOL, 2-	90-43-7	9,600 G	47,000 G	190,000 C
PHORATE	298-02-2	44 G	640 G	10,000 C
PHTHALIC ANHYDRIDE	85-44-9	380 N	1,600 N	1,800 N
PICLORAM	1918-02-1	15,000 G	190,000 C	190,000 C
PROMETON	1610-18-0	3,300 G	48,000 G	190,000 C
PRONAMIDE	23950-58-5	17,000 G	190,000 C	190,000 C
PROPACHLOR	1918-16-7	2,900 G	42,000 G	190,000 C
PROPANIL	709-98-8	1,100 G	16,000 G	190,000 C
PROPANOL, 2- (ISOPROPYL ALCOHOL)	67-63-0	3,800 N	10,000 C	10,000 C
PROPAZINE	139-40-2	4,400 G	10,000 C	10,000 C
PROPHAM	122-42-9	4,400 G	64,000 G	190,000 C

All concentrations in mg/kg

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Table 3—Medium-Specific Concentrations (MSCs) for Organic Regulated Substances in Soil
A. Direct Contact Numeric Values

REGULATED SUBSTANCE	CASRN	Residential 0—15 feet	Nonresidential	
			Surface Soil 0—2 feet	Subsurface Soil 2—15 feet
PROPYLBENZENE, N-	103-65-1	10,000 C	10,000 C	10,000 C
PROPYLENE OXIDE	75-56-9	78 G	380 G	690 N
PYRENE	129-00-0	6,600 G	96,000 G	190,000 C
PYRETHRUM	8003-34-7	220 G	3,200 G	10,000 C
PYRIDINE	110-86-1	220 G	3,200 G	10,000 C
QUINOLINE	91-22-5	6.2 G	30 G	10,000 C
QUIZALOFOP (ASSURE)	76578-14-8	2,000 G	29,000 G	190,000 C
RDX	121-82-4	230 G	1,100 G	190,000 C
RESORCINOL	108-46-3	190,000 C	190,000 C	190,000 C
RONNEL	299-84-3	11,000 G	160,000 G	190,000 C
SIMAZINE	122-34-9	160 G	760 G	190,000 C
STRYCHNINE	57-24-9	66 G	960 G	190,000 C
STYRENE	100-42-5	10,000 C	10,000 C	10,000 C
TEBUTHIURON	34014-18-1	15,000 G	190,000 C	190,000 C
TERBACIL	5902-51-2	2,900 G	42,000 G	190,000 C
TERBUFOS	13071-79-9	5.5 G	80 G	10,000 C
TETRACHLOROBENZENE, 1,2,4,5-	95-94-3	66 G	960 G	190,000 C
TETRACHLORODIBENZO-P-DIOXIN, 2,3,7,8- (TCDD)	1746-01-6	0.00014 G	0.0007 G	190,000 C
TETRACHLOROETHANE, 1,1,1,2-	630-20-6	60 N	300 N	340 N
TETRACHLOROETHANE, 1,1,2,2-	79-34-5	7.6 N	38 N	44 N
TETRACHLOROETHYLENE (PCE)	127-18-4	760 N	3,200 N	3,600 N
TETRACHLOROPHENOL, 2,3,4,6-	58-90-2	6,600 G	96,000 G	190,000 C
TETRAETHYL LEAD	78-00-2	0.022 G	0.32 G	10,000 C
TETRAETHYLDITHIOPYROPHOSPHATE	3689-24-5	110 G	1,600 G	10,000 C
TETRAHYDROFURAN	109-99-9	230 N	1,100 N	1,300 N
THIOFANOX	39196-18-4	66 G	960 G	190,000 C
THIRAM	137-26-8	3,300 G	48,000 G	190,000 C
TOLUENE	108-88-3	10,000 C	10,000 C	10,000 C
TOLUIDINE, M-	108-44-1	1,200 G	5,700 G	10,000 C
TOLUIDINE, O-	95-53-4	1,200 G	5,700 G	10,000 C
TOLUIDINE, P-	106-49-0	620 G	3,000 G	190,000 C
TOXAPHENE	8001-35-2	17 G	83 G	190,000 C
TRIALATE	2303-17-5	26 G	130 G	10,000 C
TRIBROMOMETHANE (BROMOFORM)	75-25-2	400 N	2,000 N	2,300 N
TRICHLORO-1,2,2-TRIFLUOROETHANE, 1,1,2-	76-13-1	10,000 C	10,000 C	10,000 C
TRICHLOROACETIC ACID	76-03-9	270 G	1,300 G	190,000 C
TRICHLOROBENZENE, 1,2,4-	120-82-1	39 N	160 N	190 N
TRICHLOROBENZENE, 1,3,5-	108-70-3	46 N	190 N	230 N
TRICHLOROETHANE, 1,1,1-	71-55-6	10,000 C	10,000 C	10,000 C
TRICHLOROETHANE, 1,1,2-	79-00-5	3.8 N	16 N	18 N
TRICHLOROETHYLENE (TCE)	79-01-6	38 N	160 N	180 N
TRICHLOROPHENOL, 2,4,5-	95-95-4	22,000 G	190,000 C	190,000 C
TRICHLOROPHENOL, 2,4,6-	88-06-2	220 G	3,200 G	190,000 C
TRICHLOROPHENOXYACETIC ACID, 2,4,5- (2,4,5-T)	93-76-5	2,200 G	32,000 G	190,000 C
TRICHLOROPHENOXYPROPIONIC ACID, 2,4,5- (2,4,5-TP)(SILVEX)	93-72-1	1,800 G	26,000 G	190,000 C
TRICHLOROPROPANE, 1,1,2-	598-77-6	1,100 G	10,000 C	10,000 C
TRICHLOROPROPANE, 1,2,3-	96-18-4	0.14 G	3.0 G	27 N
TRICHLOROPROPENE, 1,2,3-	96-19-5	5.7 N	24 N	27 N
TRIETHYLAMINE	121-44-8	130 N	550 N	630 N
TRIETHYLENE GLYCOL	112-27-6	10,000 C	10,000 C	10,000 C
TRIFLURALIN	1582-09-8	1,700 G	12,000 G	190,000 C

All concentrations in mg/kg

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Appendix A
Table 3—Medium-Specific Concentrations (MSCs) for Organic Regulated Substances in Soil
A. Direct Contact Numeric Values

REGULATED SUBSTANCE	CASRN	Residential 0—15 feet	Nonresidential	
			Surface Soil 0—2 feet	Subsurface Soil 2—15 feet
TRIMETHYLBENZENE, 1,3,4- (TRIMETHYLBENZENE, 1,2,4-)	95-63-6	1,100 N	4,700 N	5,400 N
TRIMETHYLBENZENE, 1,3,5-	108-67-8	1,100 N	4,700 N	5,400 N
TRINITROGLYCEROL (NITROGLYCERIN)	55-63-0	22 G	320 G	10,000 C
TRINITROTOLUENE, 2,4,6-	118-96-7	110 G	1,600 G	190,000 C
VINYL ACETATE	108-05-4	3,800 N	10,000 C	10,000 C
VINYL BROMIDE (BROMOETHENE)	593-60-2	14 N	70 N	80 N
VINYL CHLORIDE	75-01-4	0.93 G	61 G	290 N
WARFARIN	81-81-2	66 G	960 G	190,000 C
XYLENES (TOTAL)	1330-20-7	1,900 N	7,900 N	9,100 N
ZINEB	12122-67-7	11,000 G	160,000 G	190,000 C

All concentrations in mg/kg
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Appendix A
Table 3—Medium-Specific Concentrations (MSCs) for Organic Regulated Substances in Soil
B. Soil to Groundwater Numeric Values¹

REGULATED SUBSTANCE	CASRN	Used Aquifers						Nonuse Aquifers						Soil Buffer Distance (feet)		
		TDS ≤ 2500 mg/L			TDS > 2500 mg/L			Residential			Nonresidential					
		Residential		Nonresidential	Residential		Nonresidential	Residential		Nonresidential	Residential		Nonresidential			
		100 X GW MSC	Generic Value	100 X GW MSC	100 X GW MSC	Generic Value	100 X GW MSC	100 X GW MSC	Generic Value	100 X GW MSC	100 X GW MSC	Generic Value	100 X GW MSC		Generic Value	
ACENAPHTHENE	83-32-9	210	2,600 E	380	4,700 E	380	4,700 E	380	4,700 E	380	4,700 E	380	4,700 E	380	4,700 E	15
ACENAPHTHYLENE	208-96-8	210	2,400 E	580	6,600 E	1,600	18,000 E	1,600	18,000 E	1,600	18,000 E	1,600	18,000 E	1,600	18,000 E	15
ACEPHATE	30560-19-1	4.2	0.5 E	12	1.4 E	420	50 E	1,200	140 E	4.2	0.5 E	12	1.4 E	4.2	0.5 E	12
ACETALDEHYDE	75-07-0	1.9	0.23 E	7.9	0.96 E	190	23 E	790	96 E	1.9	0.23 E	7.9	0.96 E	1.9	0.23 E	7.9
ACETONE	67-64-1	3,100	350 E	8,800	980 E	10,000	10,000 C	10,000	10,000 C	10,000	10,000 C	10,000	10,000 C	10,000	10,000 C	NA
ACETONITRILE	75-05-8	13	1.5 E	53	6 E	1,300	150 E	5,300	600 E	13	1.5 E	53	60 E	13	1.5 E	53
ACETOPHENONE	98-86-2	350	190 E	970	520 E	10,000	10,000 C	10,000	10,000 C	350	190 E	970	520 E	350	190 E	970
ACETYLAMINOFLORENE, 2-(2AAPF)	53-96-3	0.017	0.07 E	0.072	0.3 E	1.7	7 E	7.2	30 E	17	70 E	72	300 E	20	70 E	72
ACROLEIN	107-02-8	0.0042	0.00047 E	0.018	0.002 E	0.42	0.047 E	1.8	0.2 E	0.42	0.047 E	1.8	0.02 E	0.42	0.047 E	0.18
ACRYLAMIDE	79-06-1	0.019	0.033 E	0.25	0.043 E	1.9	0.33 E	25	4.3 E	0.19	0.033 E	25	0.25	0.033 E	0.25	0.043 E
ACRYLIC ACID	79-10-7	0.21	0.039 E	0.88	0.16 E	21	3.9 E	88	16 E	21	3.9 E	88	16 E	21	3.9 E	88
ACRYLONITRILE	107-13-1	0.072	0.01 E	0.37	0.051 E	7.2	1 E	37	5.1 E	7.2	1 E	37	5.1 E	7.2	1 E	37
ALACHLOR	15972-60-8	0.2	0.077 E	0.2	0.077 E	20	7.7 E	20	7.7 E	20	7.7 E	20	0.2	0.077 E	0.2	0.077 E
ALDICARB	116-06-3	0.3	0.05 E	0.3	0.05 E	30	5 E	30	5 E	30	5 E	30	50 E	30	50 E	30
ALDICARB SULFONE	1846-88-4	0.2	0.027 E	0.2	0.027 E	20	2.7 E	20	2.7 E	20	2.7 E	20	0.2	0.027 E	0.2	0.027 E
ALDRIN	309-00-2	0.0038	0.046 E	0.016	1.9 E	0.38	46 E	1.6	190 E	0.38	46 E	1.6	0.045 E	0.38	0.045 E	0.38
ALLYL ALCOHOL	107-18-6	0.021	0.0025 E	0.088	0.01 E	2.1	0.25 E	8.8	1 E	2.1	0.25 E	8.8	1 E	2.1	0.25 E	8.8
AMETRYN	834-12-8	6	6.5 E	6	6.5 E	600	650 E	600	650 E	6	6.5 E	600	65 E	6	6.5 E	600
AMINOBIPHENYL 4-	92-67-1	0.0031	0.0012 E	0.013	0.005 E	0.31	0.12 E	1.3	0.5 E	0.31	0.12 E	1.3	1.2	0.31	1.2	0.5 E
AMITROLE	61-82-5	0.069	0.028 E	0.29	0.12 E	6.9	2.8 E	29	12 E	6.9	2.8 E	29	12 E	6.9	2.8 E	29
AMMONIA	7664-41-7	3,000	360 E	3,000	360 E	10,000	10,000 C	10,000	10,000 C	3,000	360 E	3,000	360 E	3,000	360 E	NA
AMMONIUM SULFAMATE	7773-06-0	200	24 E	200	24 E	20,000	2,400 E	20,000	2,400 E	200	24 E	20,000	2,400 E	200	24 E	NA
ANILINE	62-53-3	0.21	0.12 E	0.88	0.52 E	21	12 E	88	52 E	0.21	0.12 E	0.88	0.52 E	0.21	0.12 E	0.88
ANTHRACENE	120-12-7	6.6	350 E	6.6	350 E	6.6	350 E	6.6	350 E	6.6	350 E	6.6	350 E	6.6	350 E	10
ATRAZINE	1912-24-9	0.3	0.13 E	0.3	0.13 E	30	13 E	30	13 E	0.3	0.13 E	30	0.3	0.13 E	0.3	0.13 E
AZINPHOS-METHYL (GUTHION)	86-50-0	5.2	5.9 E	15	17 E	520	590 E	1,500	1,700 E	5.2	5.9 E	15	17 E	5.2	5.9 E	15
BAYGON® (PROFOXUR)	114-26-1	0.3	0.057 E	0.3	0.057 E	30	5.7 E	30	5.7 E	30	5.7 E	30	57 E	30	57 E	30
BENOMYL	17804-35-2	27	130 E	110	530 E	200	970 E	200	970 E	27	130 E	110	530 E	27	130 E	110
BENTAZON	25057-89-0	20	2.9 E	20	2.9 E	2,000	290 E	2,000	290 E	20	2.9 E	2,000	290 E	20	2.9 E	2,000
BENZENE	71-43-2	0.5	0.13 E	0.5	0.13 E	50	13 E	50	13 E	50	13 E	50	13 E	50	13 E	50

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		TDS ≤ 2500 mg/L					TDS > 2500 mg/L					Residential					Nonresidential					
		Residential		Nonresidential			Residential		Nonresidential			Residential		Nonresidential			Residential		Nonresidential			
		100 X GW MSC	Generic Value	100 X GW MSC	Generic Value	100 X GW MSC	100 X GW MSC	Generic Value	100 X GW MSC	Generic Value	100 X GW MSC	100 X GW MSC	Generic Value	100 X GW MSC	Generic Value	100 X GW MSC	100 X GW MSC	Generic Value	100 X GW MSC	Generic Value		
BENZIDINE	92-87-5	0.0000	0.12 E	0.001	1.6 E	0.0092	12 E	0.12	160 E	0.092	120 E	1.2	1,600 E	5								
BENZO[A]ANTHRACENE	56-55-3	0.03	26 E	0.39	340 E	1.1	960 E	1.1	960 E	1.1	960 E	1.1	960 E	5								
BENZO[A]PYRENE	50-32-8	0.02	46 E	0.02	46 E	0.38	860 E	0.38	860 E	0.38	860 E	0.38	860 E	5								
BENZO[B]FLUORANTHENE	205-99-2	0.018	25 E	0.12	170 E	0.12	170 E	0.12	170 E	0.12	170 E	0.12	170 E	5								
BENZO[G]HIOPERYLENE	191-24-2	0.026	180 E	0.026	180 E	0.026	180 E	0.026	180 E	0.026	180 E	0.026	180 E	5								
BENZO[K]FLUORANTHENE	207-08-9	0.018	200 E	0.055	610 E	0.055	610 E	0.055	610 E	0.055	610 E	0.055	610 E	5								
BENZOIC ACID	65-85-0	14.000	2,700 E	39.00	7,500 E	190.00	52,000 E	190.00	52,000 E	14.000	2,700 E	39.000	7,500 E	NA								
BENZOTRICHLORIDE	98-07-7	0.005	0.012 E	0.021	0.051 E	0.5	12 E	2.1	5.1 E	0.5	12 E	2.1	5.1 E	30								
BENZYL ALCOHOL	100-51-6	350	130 E	970	350 E	10.000	10,000 C	10.000	10,000 C	350	130 E	970	350 E	NA								
BENZYL CHLORIDE	100-44-7	0.1	0.059 E	0.51	0.3 E	10	5.9 E	51	30 E	10	5.9 E	51	30 E	NA								
BETA PROIOLACTONE	57-57-8	0.0012	0.00015 E	0.006	0.0007 E	0.12	0.015 E	0.63	0.076 E	0.012	0.0015 E	0.063	0.0076 E	NA								
BHC, ALPHA	319-84-6	0.01	0.046 E	0.043	0.2 E	1	4.6 E	4.3	20 E	10	46 E	43	200 E	20								
BHC, BETA-	319-85-7	0.036	0.21 E	0.15	0.88 E	3.6	21 E	10	59 E	10	59 E	10	59 E	15								
BHC, GAMMA (LINDANE)	58-89-9	0.02	0.072 E	0.02	0.072 E	2	7.2 E	2	7.2 E	20	72 E	20	72 E	20								
BIPHENYL, 1,1-	92-52-4	0.084	0.37 E	0.35	1.5 E	8.4	37 E	35	150 E	8.4	37 E	35	150 E	20								
BIS(2-CHLOROETHOXY) METHANE	111-91-1	10	2.6 E	29	7.6 E	1,000	260 E	2,900	760 E	10	2.6 E	29	7.6 E	NA								
BIS(2- CHLOROETHYL)ETHER	111-44-4	0.015	0.0045 E	0.076	0.023 E	1.5	0.45 E	7.6	2.3 E	1.5	0.45 E	7.6	2.3 E	NA								
BIS(2-CHLORO- ISOPROPYL)ETHER	108-60-1	30	8 E	30	8 E	3,000	800 E	3,000	800 E	3,000	800 E	3,000	800 E	NA								
BISCHLOROMETHYL)ETHER	542-88-1	0.0000	0.000012 E	0.0004	0.0000 E	0.0079	0.0012 E	0.04	0.006 E	0.0079	0.0012 E	0.04	0.006 E	NA								
BIS(2-ETHYLHEXYL) PHTHALATE	117-81-7	79	0.6	130 E	0.6	130 E	29	6,300 E	29	6,300 E	29	6,300 E	29	6,300 E	10							
BISPHENOL A	80-05-7	170	660 E	490	1,900 E	12,000	46,000 E	12,000	46,000 E	12,000	46,000 E	12,000	46,000 E	20								
BROMACIL	314-40-9	7	1.8 E	7	1.8 E	700	180 E	700	180 E	7	1.8 E	7	1.8 E	NA								
BROMOBENZENE	108-86-1	0.006	0.0047 E	0.006	0.0047 E	0.6	0.47 E	0.6	0.47 E	0.006	0.0047 E	0.006	0.0047 E	NA								
BROMOCHLOROMETHANE	74-97-5	9	1.6 E	9	1.6 E	900	160 E	900	160 E	9	1.6 E	9	1.6 E	NA								
BROMODICHLORO METHANE (THM)	75-27-4	8	2.7 E	8	2.7 E	800	270 E	800	270 E	8	2.7 E	8	2.7 E	NA								
BROMOMETHANE	74-83-9	1	0.54 E	1	0.54 E	100	54 E	100	54 E	100	54 E	100	54 E	NA								

¹ For other options see § 250.308 (relating to soil to groundwater pathway numeric values).

All concentrations in mg/kg

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		TDS ≤ 2500 mg/L					TDS > 2500 mg/L					Residential					Nonresidential					
		Residential		Nonresidential		100 X GW MSC	Residential		Nonresidential		100 X GW MSC	Residential		Nonresidential		100 X GW MSC	Residential		Nonresidential			
		Generic Value	100 X GW MSC	Generic Value	100 X GW MSC		Generic Value	100 X GW MSC	Generic Value	100 X GW MSC		Generic Value	100 X GW MSC	Generic Value	100 X GW MSC		Generic Value	100 X GW MSC	Generic Value	100 X GW MSC		
BROMOXNYL	1689-84-5	0.63	0.54 E	2.6	2.2 E	63	54 E	260	220 E	0.63	0.54 E	2.6	2.2 E	NA	NA	NA	NA	NA	NA	NA	NA	
BROMOXNYL OCTANOATE	1689-99-2	0.63	28 E	2.6	120 E	8	360 E	8	360 E	8	360 E	8	360 E	15	15	15	15	15	15	15	15	
BUTADIENE, 1,3-	106-99-0	0.11	0.045 E	0.45	0.19 E	11	4.5 E	45	19 E	11	4.5 E	45	19 E	NA	NA	NA	NA	NA	NA	NA	NA	
BUTYL ALCOHOL, N-	71-36-3	350	42 E	970	120 E	10,000	4,200 E	10,000	4,200 E	10,000	4,200 E	3,500	420 E	9,700	1,200 E	NA	NA	NA	NA	NA	NA	
BUTYLATE	2008-41-5	40	58 E	40	58 E	4,000	5,800 E	4,000	5,800 E	40	58 E	40	58 E	30	30	30	30	30	30	30	30	
BUTYLBENZENE, N-	104-51-8	170	1,100 E	490	3,100 E	1,500	9,500 E	1,500	9,500 E	170	1,100 E	490	3,100 E	15	15	15	15	15	15	15	15	
BUTYLBENZENE, SEC-	135-98-8	350	820 E	970	2,300 E	1,700	4,000 E	1,700	4,000 E	350	820 E	970	2,300 E	30	30	30	30	30	30	30	30	
BUTYLBENZENE, TERT-	98-06-6	350	630 E	970	1,800 E	3,000	5,400 E	3,000	5,400 E	350	630 E	970	1,800 E	10	10	10	10	10	10	10	10	
BUTYLBENZYL PHTHALATE	85-68-7	34	2,900 E	140	10,000 C	270	10,000 C	270	10,000 C	270	10,000 C	270	10,000 C	10	10	10	10	10	10	10	10	
CAPTAN	133-06-2	28	17 E	50	31 E	50	31 E	50	31 E	50	31 E	50	31 E	NA	NA	NA	NA	NA	NA	NA	NA	
CARBARYL	63-25-2	350	210 E	970	570 E	12,000	7,000 E	12,000	7,000 E	12,000	7,000 E	12,000	7,000 E	NA	NA	NA	NA	NA	NA	NA	NA	
CARBAZOLE	86-74-8	3.3	21 E	14	89 E	120	760 E	120	760 E	3.3	21 E	14	89 E	15	15	15	15	15	15	15	15	
CARBOFURAN	1563-66-2	4	0.87 E	4	0.87 E	400	87 E	400	87 E	4	0.87 E	4	0.87 E	NA	NA	NA	NA	NA	NA	NA	NA	
CARBON DISULFIDE	75-15-0	150	130 E	620	530 E	10,000	10,000 C	10,000	10,000 C	150	130 E	620	530 E	NA	NA	NA	NA	NA	NA	NA	NA	
CARBON TETRACHLORIDE	56-23-5	0.5	0.26 E	0.5	0.26 E	50	26 E	50	26 E	5	2.6 E	5	2.6 E	NA	NA	NA	NA	NA	NA	NA	NA	
CARBOXIN	5234-68-4	70	53 E	70	53 E	7,000	5,300 E	7,000	5,300 E	70	53 E	70	53 E	NA	NA	NA	NA	NA	NA	NA	NA	
CHLORAMBEN	133-90-4	10	1.6 E	10	1.6 E	1,000	160 E	1,000	160 E	10	1.6 E	10	1.6 E	NA	NA	NA	NA	NA	NA	NA	NA	
CHLORDANE	57-74-9	0.2	49 E	0.2	49 E	5.6	1,400 E	5.6	1,400 E	5.6	1,400 E	5.6	1,400 E	10	10	10	10	10	10	10	10	
CHLORO-1,1- DIFLUOROETHANE, 1-	75-68-3	10,000	1,800 E	10,000	7,300 E	10,000	10,000 C	10,000	10,000 C	10,000	1,800 E	10,000	7,300 E	NA	NA	NA	NA	NA	NA	NA	NA	
CHLORO-1-PROPENE, 3- (ALLYL CHLORIDE)	107-05-1	0.21	0.049 E	0.88	0.2 E	21	4.9 E	88	20 E	21	4.9 E	88	20 E	NA	NA	NA	NA	NA	NA	NA	NA	
CHLOROACETALDEHYDE	107-20-0	0.24	0.029 E	1	0.12 E	24	2.9 E	100	12 E	24	0.29 E	1	0.12 E	NA	NA	NA	NA	NA	NA	NA	NA	
CHLOROANILINE, P-	106-47-8	0.33	0.42 E	1.4	1.8 E	33	42 E	140	180 E	0.33	0.42 E	1.4	1.8 E	NA	NA	NA	NA	NA	NA	NA	NA	
CHLOROBENZENE	108-90-7	10	6.1 E	10	6.1 E	1,000	610 E	1,000	610 E	1,000	610 E	1,000	610 E	NA	NA	NA	NA	NA	NA	NA	NA	
CHLOROBENZILATE	510-15-6	0.59	3.9 E	2.5	17 E	59	390 E	250	1,700 E	590	390 E	250	1,700 E	15	15	15	15	15	15	15	15	
CHLOROBUTANE, 1-	109-69-3	140	220 E	390	610 E	10,000	10,000 C	10,000	10,000 C	140	220 E	390	610 E	30	30	30	30	30	30	30	30	
CHLORODIBROMO METHANE (THM)	124-48-1	8	2.5 E	8	2.5 E	800	250 E	800	250 E	800	250 E	800	250 E	NA	NA	NA	NA	NA	NA	NA	NA	
CHLORODIFLUORO METHANE (THM)	75-45-6	10,000	2,800 E	10,000	10,000 C	10,000	10,000 C	10,000	10,000 C	10,000	2,800 E	10,000	2,800 E	NA	NA	NA	NA	NA	NA	NA	NA	
CHLOROETHANE	75-00-3	2,100	450 E	8,800	1,900 E	10,000	10,000 C	10,000	10,000 C	10,000	450 E	8,800	1,900 E	NA	NA	NA	NA	NA	NA	NA	NA	
CHLOROFORM (THM)	67-68-3	8	2 E	8	2 E	800	200 E	800	200 E	800	200 E	800	200 E	NA	NA	NA	NA	NA	NA	NA	NA	
CHLORONAPHTHALENE 2-	91-58-7	280	6,000 E	1,200	17,000 E	1,200	26,000 E	1,200	26,000 E	1,200	6,000 E	280	6,000 E	15	15	15	15	15	15	15	15	

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		Generic Value	100 X GW MSC	100 X GW Value	Generic Value	100 X GW MSC	100 X GW Value	Generic Value	100 X GW MSC	100 X GW Value	Generic Value	100 X GW MSC	100 X GW Value	Generic Value	100 X GW MSC	100 X GW Value	Generic Value	100 X GW MSC		
CHLORONITROBENZENE, P-	100-00-5	0.42	1.8	2.4	E	42	55	E	180	240	E	1.8	2.4	E	1.8	2.4	E	NA		
CHLOROPHENOL, 2-	95-57-8	4	4.4	E	4	4.4	E	400	440	E	400	440	E	4	4.4	E	4	4.4	NA	
CHLOROPRENE	126-59-8	0.016	0.0038	E	0.083	0.02	E	1.6	0.38	E	8.3	2	E	1.6	0.38	E	8.3	2	NA	
CHLOROPROPANE, 2-	75-29-6	21	16	E	88	67	E	2,100	1,600	E	8,800	6,700	E	21	16	E	88	67	NA	
CHLOROTHALONIL	1897-45-6	3.8	9.7	E	16	41	E	60	150	E	60	150	E	3.8	9.7	E	16	41	30	
CHLOROTOLUENE, O-	95-49-8	10	20	E	10	20	E	1,000	2,000	E	1,000	2,000	E	10	20	E	10	20	30	
CHLOROTOLUENE, P-	108-43-4	10	10	E	10	10	E	1,000	1,000	E	1,000	1,000	E	10	10	E	10	10	NA	
CHLORPYRIFOS	2821-68-2	0.2	2.3	E	0.2	2.3	E	20	230	E	20	230	E	0.2	2.3	E	0.2	2.3	15	
CHLORSULFURON	64902-72-3	69	9.6	E	190	26	E	6,900	960	E	19,000	2,600	E	69	9.6	E	190	26	NA	
CHLORTHAL-DIMETHYL (DCTA)	1861-32-1	7	110	E	7	110	E	50	820	E	50	820	E	50	820	E	50	820	15	
CHRYSENE	218-01-9	0.18	220	E	0.19	230	E	0.19	230	E	0.19	230	E	0.19	230	E	0.19	230	5	
CRESOL(S)	1319-77-3	130	23	E	530	92	E	10,000	2,300	E	10,000	2,300	E	130	23	E	530	92	NA	
CRESOL, 4,6-DINITRO-O-	534-52-1	0.28	0.21	E	0.78	0.59	E	28	21	E	78	59	E	28	21	E	78	59	NA	
CRESOL, O-(2-METHYLPHENOL)	95-48-7	170	28	E	490	81	E	17,000	2,800	E	49,000	8,100	E	17,000	2,800	E	49,000	8,100	NA	
CRESOL, M-(3-METHYLPHENOL)	108-39-4	170	34	E	490	97	E	10,000	3,400	E	10,000	3,400	E	10,000	3,400	E	10,000	3,400	NA	
CRESOL, P-(4-METHYLPHENOL)	108-44-5	17	4	E	49	11	E	1,700	400	E	4,900	1,100	E	17,000	4,000	E	49,000	11,000	NA	
CRESOL, P-CHLORO-M-	59-50-7	350	720	E	970	2,000	E	35,000	72,000	E	97,000	190,000	E	350	720	E	970	2,000	30	
CROTONALDEHYDE	4170-30-3	0.034	0.0043	E	0.14	0.018	E	3.4	0.43	E	14	1.8	E	3.4	0.43	E	14	1.8	NA	
CROTONALDEHYDE, TRANS-	123-73-9	0.034	0.0043	E	0.14	0.018	E	3.4	0.43	E	14	1.8	E	3.4	0.43	E	14	1.8	NA	
CUMENE (ISOPROPYL BENZENE)	98-62-8	84	600	E	350	2,500	E	5,000	10,000	E	5,000	10,000	E	5,000	10,000	E	5,000	10,000	15	
CYANAZINE	21725-46-2	0.1	0.081	E	0.1	0.081	E	10	6.1	E	10	6.1	E	0.1	0.081	E	0.1	0.081	NA	
CYCLOHEXANE	110-82-7	1,300	1,700	E	5,300	6,900	E	5,500	7,200	E	5,500	7,200	E	1,300	1,700	E	5,300	6,900	NA	
CYCLOHEXANONE	108-94-1	150	41	E	620	170	E	10,000	4,100	E	10,000	4,100	E	150	41	E	620	170	NA	
CYFLUTHRIN	68359-37-5	0.1	33	E	0.1	33	E	0.1	33	E	0.1	33	E	0.1	33	E	0.1	33	10	
CYROMAZINE	66215-27-8	1,700	5,300	E	4,900	15,000	E	170,000	190,000	E	190,000	190,000	E	1,700	5,300	E	4,900	15,000	20	
DDD, 4,4'-	72-54-8	0.27	30	E	1.1	120	E	16	1,800	E	16	1,800	E	16	1,800	E	16	1,800	10	
DDE, 4,4'-	72-55-9	0.19	41	E	0.8	170	E	4	870	E	4	870	E	4	870	E	4	870	10	
DDT, 4,4'-	50-29-3	0.19	110	E	0.55	330	E	0.55	330	E	0.55	330	E	0.55	330	E	0.55	330	5	

¹ For other options see § 250.308 (relating to soil to groundwater pathway numeric values).

All concentrations in mg/kg

E—Number calculated by the soil to groundwater equation in § 250.308

C—Cap

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N/A—Soil to groundwater values cannot be calculated for these compounds

Appendix A
Table 3—Medium-Specific Concentrations (MSCs) for Organic Regulated Substances in Soil
B. Soil to Groundwater Numeric Values¹

REGULATED SUBSTANCE	CASRN	Used Aquifers												Nonuse Aquifers								Soil Buffer Distance (feet)				
		TDS ≤ 2500 mg/L						TDS > 2500 mg/L						Residential				Nonresidential								
		Residential			Nonresidential			Residential			Nonresidential			100 X GW MSC		Generic Value		100 X GW MSC		Generic Value			100 X GW MSC		Generic Value	
		100 X GW MSC	Generic Value	100 X GW MSC	Generic Value	100 X GW MSC	Generic Value	100 X GW MSC	Generic Value	100 X GW MSC	Generic Value	100 X GW MSC	Generic Value	100 X GW MSC	Generic Value	100 X GW MSC	Generic Value	100 X GW MSC	Generic Value	100 X GW MSC	Generic Value		100 X GW MSC	Generic Value		
DID(2-ETHYLHEXYLDIPATE	103-23-1	40	10,000	C	40	10,000	C	40	10,000	C	4,000	10,000	C	4,000	10,000	C	10,000	C	10,000	C	10,000	C	10,000	C	5	
DIALMATE	2303-16-4	1.1	0.64	E	4.5	2.6	E	110	64	E	450	260	E	1,100	640	E	4,000	2,300	E	NA	NA	NA	NA	NA		
DIAMINOTOLUENE 2,4-	95-80-7	0.016	0.0032	E	0.068	0.014	E	1.6	0.32	E	6.8	1.4	E	16	3.2	E	68	14	E	NA	NA	NA	NA	NA		
DIAZINON	333-41-5	0.1	0.14	E	0.1	0.14	E	10	14	E	10	14	E	0.1	0.14	E	0.1	0.14	E	30	30	30	30	30		
DIBENZO(A,H)ANTHRACENE	53-70-3	0.0052	23	E	0.06	270	E	0.06	270	E	0.06	270	E	0.06	270	E	0.06	270	E	0.06	270	E	0.06	270	5	
DIBENZOFURAN	132-64-9	3.5	90	E	97	250	E	350	9,000	E	450	12,000	E	350	9,000	E	450	12,000	E	15	15	15	15	15		
DIBROMO-3- CHLOROPROPANE 1,2-	96-12-8	0.02	0.0092	E	0.02	0.0092	E	2	0.92	E	2	0.92	E	2	0.92	E	2	0.92	E	NA	NA	NA	NA	NA		
DIBROMOBENZENE 1,4-	106-37-6	35	140	E	97	400	E	2,000	8,200	E	2,000	8,200	E	35	140	E	97	400	E	20	20	20	20	20		
DIBROMOMETHANE 1,2- (ETHYLENE DIBROMIDE)	106-93-4	0.005	0.0012	E	0.005	0.0012	E	0.5	0.12	E	0.5	0.12	E	0.5	0.12	E	0.5	0.12	E	NA	NA	NA	NA	NA		
DIBROMOMETHANE	74-95-3	0.84	0.32	E	3.5	1.4	E	84	32	E	350	140	E	84	32	E	350	140	E	NA	NA	NA	NA	NA		
DIBUTYL PHTHALATE, N-	84-74-2	350	1,400	E	970	4,000	E	10,000	10,000	E	10,000	10,000	E	10,000	10,000	E	10,000	10,000	E	20	20	20	20	20		
DICAMBA	1918-00-9	400	45	E	400	45	E	40,000	4,500	E	40,000	4,500	E	400	45	E	400	45	E	NA	NA	NA	NA	NA		
DICHLOROACETIC ACID (HAA)	76-43-6	6	0.79	E	6	0.79	E	600	79	E	600	79	E	6	0.79	E	6	0.79	E	NA	NA	NA	NA	NA		
DICHLORO-2-BUTENE, 1,4-	764-41-0	0.0012	0.00067	E	0.006	0.0034	E	0.12	0.067	E	0.6	0.34	E	0.0012	0.0006	E	0.006	0.0034	E	NA	NA	NA	NA	NA		
DICHLORO-2-BUTENE, TRANS-1,4-	110-57-6	0.0012	0.00078	E	0.006	0.0039	E	0.12	0.078	E	0.6	0.39	E	0.0012	0.0007	E	0.006	0.0039	E	NA	NA	NA	NA	NA		
DICHLOROBENZENE, 1,2-	95-50-1	60	59	E	60	59	E	6,000	5,900	E	6,000	5,900	E	6,000	5,900	E	6,000	5,900	E	NA	NA	NA	NA	NA		
DICHLOROBENZENE, 1,3-	541-73-1	60	61	E	60	61	E	6,000	6,100	E	6,000	6,100	E	6,000	6,100	E	6,000	6,100	E	NA	NA	NA	NA	NA		
DICHLOROBENZENE, P-	106-46-7	7.5	10	E	7.5	10	E	750	1,000	E	750	1,000	E	750	1,000	E	750	1,000	E	30	30	30	30	30		
DICHLOROBENZIDINE, 3,3'-	91-94-1	0.14	7.7	E	0.6	33	E	14	770	E	60	3,300	E	140	7,700	E	310	17,000	E	10	10	10	10	10		
DICHLORODIFLUORO- METHANE (FREON 12)	75-71-8	100	100	E	100	100	E	10,000	10,000	E	10,000	10,000	E	10,000	10,000	E	10,000	10,000	E	NA	NA	NA	NA	NA		
DICHLOROETHANE 1,1-	75-34-3	3.1	0.75	E	16	3.9	E	310	75	E	1,600	390	E	31	7.5	E	160	39	E	NA	NA	NA	NA	NA		
DICHLOROETHANE 1,2-	107-06-2	0.5	0.1	E	0.5	0.1	E	50	10	E	50	10	E	5	1	E	5	1	E	NA	NA	NA	NA	NA		
DICHLOROETHYLENE 1,1-	75-35-4	0.7	0.19	E	0.7	0.19	E	70	19	E	70	19	E	7	1.9	E	7	1.9	E	NA	NA	NA	NA	NA		
DICHLOROETHYLENE, CIS- 1,2-	156-59-2	7	1.6	E	7	1.6	E	700	160	E	700	160	E	70	16	E	70	16	E	NA	NA	NA	NA	NA		
DICHLOROETHYLENE, TRANS-1,2-	156-60-5	10	2.3	E	10	2.3	E	1,000	230	E	1,000	230	E	100	23	E	100	23	E	NA	NA	NA	NA	NA		
DICHLOROMETHANE (METHYLENE CHLORIDE)	75-09-2	0.5	0.076	E	0.5	0.076	E	50	7.6	E	50	7.6	E	50	7.6	E	50	7.6	E	NA	NA	NA	NA	NA		

¹ For other options see § 250.308 (relating to soil to groundwater pathway numeric values).

All concentrations in mg/kg

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Appendix A
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REGULATED SUBSTANCE	CASRN	Used Aquifers										Nonuse Aquifers										Soil Buffer Distance (feet)
		TDS ≤ 2500 mg/L					TDS > 2500 mg/L					Residential					Nonresidential					
		Residential		Nonresidential		100 X GW MSC	Residential		Nonresidential		100 X GW MSC	Residential		Nonresidential		100 X GW MSC	Residential		Nonresidential			
		Generic Value	MSC	Generic Value	MSC		Generic Value	MSC	Generic Value	MSC		Generic Value	MSC	Generic Value	MSC		Generic Value	MSC	Generic Value	MSC		
DICHLOROPHENOL, 2,4- DICHLOROPHENOL ACETIC ACID, 2,4-(2,4-D)	120-83-2 94-75-7	2 7	1 E 1.8 E	2 7	1 E 1.8 E	200 700	100 E 180 E	200 700	100 E 700	200 700	100 E 700	180 E 700	200 700	100 E 700	200 700	100 E 700	180 E 700	200 700	100 E 700	1,000 1,800	E E	NA NA
DICHLOROPROPANE, 1,3- DICHLOROPROPENE, 1,2- DICHLOROPROPIONIC ACID, 2,2-(DALAPON)	78-87-5 542-75-6 75-99-0	0.5 0.65 20	0.11 E 0.12 E 5.3 E	0.5 2.7 20	0.11 E 0.48 E 5.3 E	50 65 2,000	11 E 270 530 E	50 65 2,000	11 E 270 530 E	50 65 2,000	11 E 270 530 E	50 65 2,000	11 E 270 530 E	50 65 2,000	11 E 270 530 E	50 65 2,000	11 E 270 530 E	50 65 2,000	11 E 270 530 E	50 65 2,000	11 E 270 530 E	NA NA NA
DICHLORVOS DICYCLOPENTADIENE DIELDRIN DIETHYL PHTHALATE	62-73-7 77-73-6 60-57-1 84-66-2	0.22 0.063 0.0041 2.800	0.052 E 0.13 E 0.11 E 0.47 E	0.94 0.26 0.017 2.400	0.22 E 0.56 E 0.41 E 0.40 E	22 6.3 0.41 10,000	5.2 13 E 11 E 10,000	94 26 1.7 10,000	22 E 13 E 1.7 10,000	5.2 6.3 0.41 10,000	94 26 1.7 10,000	22 E 13 E 1.7 10,000	5.2 6.3 0.41 10,000	94 26 1.7 10,000	22 E 13 E 1.7 10,000	5.2 6.3 0.41 10,000	94 26 1.7 10,000	0.94 0.13 4.1 10,000	0.22 E 0.56 E 17 470	0.22 E 0.56 E 17 470	0.22 E 0.56 E 17 470	NA 30 15 C
DIFLUBENZURON DISOPROPYL METHYLPHOSPHONATE	35367-38-5 1445-75-6	35367-38-5 60	880 E 8.2 E	7,800 60	2,400 E 8.2 E	10,000 6,000	10,000 820 E	10,000 6,000	10,000 820 E	10,000 6,000	10,000 820 E	10,000 6,000	10,000 820 E	10,000 6,000	10,000 820 E	10,000 6,000	10,000 820 E	10,000 6,000	10,000 820 E	10,000 6,000	10,000 820 E	NA NA NA
DIMETHOATE DIMETHOXYBENZIDINE, 3,3'- DIMETHRIN DIMETHYLAMINOAZO BENZENE, P-	60-51-5 119-90-4 70-38-2 60-11-7	7.6 0.041 3.6 0.014	2.9 E 0.14 E 240 E 0.037 E	21 0.17 3.6 0.059	8.1 E 0.57 E 240 E 0.15 E	760 4.1 3.6 1.4	290 14 E 240 E 5.9	2,100 17 3.6 5.9	2,100 17 3.6 5.9	2,100 17 3.6 5.9	2,100 17 3.6 5.9	2,100 17 3.6 5.9	2,100 17 3.6 5.9	2,100 17 3.6 5.9	2,100 17 3.6 5.9	2,100 17 3.6 5.9	2,100 17 3.6 5.9	2,100 17 3.6 5.9	2,100 17 3.6 5.9	2,100 17 3.6 5.9	2,100 17 3.6 5.9	NA E E E
DIMETHYLANILINE, N,N- DIMETHYLPHENOL, 2,4- DINITROBENZENE, 1,3- DINITROBENZENE, 2,4- DINITROTOLUENE, 2,4- DINITROTOLUENE, 2,6-(2,6- DNI)	121-59-7 105-67-9 99-65-0 51-28-5 121-14-2 606-20-2	2.4 69 0.1 6.9 0.21 0.043	1.3 E 30 E 0.049 E 0.78 E 0.05 E 0.013 E	10 190 0.1 19 0.88 0.18	5.6 E 83 E 0.049 E 2.1 E 0.21 E 0.053 E	240 690 10 680 21 4.3	130 3,000 4.9 78 E 5 18	1,000 10,000 10 1,900 210 18	1,000 10,000 4.9 1,900 210 18	1,000 10,000 4.9 1,900 210 18	1,000 10,000 4.9 1,900 210 18	1,000 10,000 4.9 1,900 210 18	1,000 10,000 4.9 1,900 210 18	1,000 10,000 4.9 1,900 210 18	1,000 10,000 4.9 1,900 210 18	1,000 10,000 4.9 1,900 210 18	1,000 10,000 4.9 1,900 210 18	1,000 10,000 4.9 1,900 210 18	1,000 10,000 4.9 1,900 210 18	1,000 10,000 4.9 1,900 210 18	1,000 10,000 4.9 1,900 210 18	C NA NA NA NA NA
DIOXEB DIOXANE, 1,4- DIPHENAMID DIPHENYLAMINE DIPHENYLHYDRAZINE, 1,2- DICUAT	88-85-7 123-91-1 957-511-7 122-39-4 122-66-7 85-00-7	0.7 0.65 20 350 0.022 2	0.29 E 0.085 E 12 E 210 E 0.039 E 0.24 E	0.7 2.7 20 970 0.11 2.4	0.29 E 0.35 E 12 E 570 E 0.19 E 0.24 E	70 65 2,000 30,000 2.2 200	29 E 8.5 E 1,200 E 18,000 E 3.9 E 24 E	70 35 E 2,000 E 30,000 E 11 24 E	29 E 35 E 2,000 E 18,000 E 11 24 E	70 35 E 2,000 E 30,000 E 11 24 E	29 E 35 E 2,000 E 18,000 E 11 24 E	70 35 E 2,000 E 30,000 E 11 24 E	70 35 E 2,000 E 18,000 E 11 24 E	70 35 E 2,000 E 30,000 E 11 24 E	70 35 E 2,000 E 30,000 E 11 24 E	70 35 E 2,000 E 30,000 E 11 24 E	70 35 E 2,000 E 30,000 E 11 24 E	70 35 E 2,000 E 30,000 E 11 24 E	70 35 E 2,000 E 30,000 E 11 24 E	70 35 E 2,000 E 30,000 E 11 24 E	70 35 E 2,000 E 30,000 E 11 24 E	E E NA NA NA NA

¹ For other options see § 250.308 (relating to soil to groundwater pathway numeric values).

All concentrations in mg/kg

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		TDS ≤ 2500 mg/L					TDS > 2500 mg/L					Residential					Nonresidential						
		Residential		Nonresidential		Generic Value	Residential		Nonresidential		Generic Value	100 X GW MSC		Residential		Nonresidential		Generic Value	100 X GW MSC				
		100 X GW MSC	Generic Value	100 X GW MSC	Generic Value		100 X GW MSC	Generic Value	100 X GW MSC	Generic Value		100 X GW MSC	Generic Value	100 X GW MSC									
		DISULFOTON	298-04-4	0.07	0.18	E	0.07	0.18	E	7	18	E	7	18	E	7	18	E	70	180	E		70
DITHIANE, 1,4-	505-29-3	8	1.3	E	8	1.3	E	800	130	E	800	130	E	8	1.3	E	8	1.3	E	8	1.3	E	NA
DIURON	330-54-1	6.9	5.9	E	19	16	E	690	590	E	1,900	1,600	E	6.9	5.9	E	19	16	E	19	16	E	NA
ENDOSULFAN	115-29-7	21	110	E	48	250	E	48	250	E	48	250	E	48	250	E	48	250	E	48	250	E	15
ENDOSULFAN (ALPHA)	959-98-8	21	110	E	50	260	E	50	260	E	50	260	E	21	110	E	50	260	E	21	110	E	15
ENDOSULFAN II (BETA)	33213-65-9	21	120	E	45	260	E	45	260	E	45	260	E	21	120	E	45	260	E	21	120	E	15
ENDOSULFAN SULFATE	1031-07-8	12	70	E	12	70	E	12	70	E	12	70	E	12	70	E	12	70	E	12	70	E	15
ENDOTHALL	145-73-3	10	4.1	E	10	4.1	E	1,000	410	E	1,000	410	E	10	4.1	E	10	4.1	E	10	4.1	E	NA
ENDURIN	72-20-8	0.2	5.5	E	0.2	5.5	E	20	550	E	20	550	E	0.2	5.5	E	0.2	5.5	E	0.2	5.5	E	15
EPICHLORHYDRIN	106-69-8	0.21	0.042	E	0.88	0.17	E	21	4.2	E	88	17	E	21	4.2	E	88	17	E	21	4.2	E	NA
ETHEPHON	16672-87-0	17	2	E	49	5.7	E	1,700	200	E	4,900	570	E	17	2	E	49	5.7	E	17	2	E	NA
ETHION	563-12-2	1.7	37	E	4.9	110	E	85	1,900	E	85	1,900	E	1.7	37	E	4.9	110	E	1.7	37	E	15
ETHOXYETHANOL, 2- (EGEE)	110-80-5	42	5.9	E	180	25	E	4,200	590	E	10,000	2,500	E	42	5.9	E	180	25	E	42	5.9	E	NA
ETHYL ACETATE	141-78-6	15	3.9	E	62	16	E	1,500	390	E	6,200	1,600	E	15	3.9	E	62	16	E	15	3.9	E	NA
ETHYL ACRYLATE	140-88-5	1.4	0.54	E	5.7	2.2	E	140	54	E	570	220	E	140	54	E	570	220	E	140	54	E	NA
ETHYL BENZENE	100-41-4	70	46	E	70	46	E	7,000	4,600	E	7,000	4,600	E	70	46	E	7,000	4,600	E	70	46	E	NA
ETHYL DIPROPYL THIOCARBAMATE, S- (EPTC)	759-94-4	170	120	E	490	350	E	10,000	10,000	C	10,000	10,000	C	170	120	E	490	350	E	170	120	E	NA
ETHYL ETHER	60-29-7	690	190	E	1,900	530	E	10,000	10,000	C	10,000	10,000	C	690	190	E	1,900	530	E	690	190	E	NA
ETHYL METHACRYLATE	97-53-2	63	10	E	260	43	E	6,300	1,000	E	10,000	4,300	E	63	10	E	260	43	E	63	10	E	NA
ETHYLENE CHLORHYDRIN	107-07-3	69	7.9	E	190	22	E	6,900	790	E	10,000	2,200	E	69	7.9	E	190	22	E	69	7.9	E	NA
ETHYLENE GLYCOL	107-21-1	1,400	170	E	1,400	170	E	10,000	10,000	C	10,000	10,000	C	1,400	170	E	10,000	10,000	C	1,400	170	E	NA
ETHYLENE THIOUREA (ETU)	96-45-7	0.28	0.031	E	0.78	0.087	E	28	3.1	E	78	8.7	E	28	3.1	E	78	8.7	E	28	3.1	E	NA
ETHYLP-NITROPHENYL PHENYLPHOSPHORO THIOATE	2104-64-5	0.035	0.11	E	0.097	0.3	E	3.5	11	E	9.7	30	E	0.035	0.11	E	9.7	30	E	0.035	0.11	E	20
FENAMIPHOS	22224-92-6	0.07	0.06	E	0.07	0.06	E	7	6	E	7	6	E	7	6	E	7	6	E	7	6	E	NA
FENVALERATE (PYDRIN)	51630-58-1	8.5	94	E	8.5	94	E	8.5	94	E	8.5	94	E	8.5	94	E	8.5	94	E	8.5	94	E	15
FLUOMETURON	2164-17-2	9	2.5	E	9	2.5	E	900	250	E	900	250	E	9	2.5	E	900	250	E	9	2.5	E	NA
FLUORANTHENE	206-44-0	26	3,200	E	26	3,200	E	26	3,200	E	26	3,200	E	26	3,200	E	26	3,200	E	26	3,200	E	10
FLUORENE	86-73-7	140	2,800	E	190	3,800	E	190	3,800	E	190	3,800	E	190	3,800	E	190	3,800	E	190	3,800	E	15
FLUOROTRICHORO METHANE (FREON 11)	75-69-4	200	87	E	200	87	E	10,000	8,700	E	10,000	8,700	E	200	87	E	10,000	8,700	E	200	87	E	NA

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		TDS ≤ 2500 mg/L						TDS > 2500 mg/L											
		Residential			Nonresidential			Residential			Nonresidential			Residential			Nonresidential		
		100 X GW MSC	Generic Value	100 X GW MSC	100 X GW Value	Generic Value	100 X GW MSC	100 X GW Value	Generic Value	100 X GW MSC	100 X GW Value	Generic Value	100 X GW MSC	100 X GW Value	Generic Value	100 X GW MSC			
FORMALDEHYDE	50-00-0	1	2.9	E	1	2.9	E	100	290	E	100	290	E	1	2.9	E	20		
FORMIC ACID	64-18-6	0.063	0.0071	E	0.26	0.029	E	6.3	0.71	E	26	2.9	E	0.63	0.071	E	2.6	NA	
FOSETYL-AL	39148-24-8	8.700	7.700	E	24.00	21.000	E	190.00	190.00	C	190.00	190.00	C	8.700	7.700	E	24.000	NA	
FURAN	110-00-9	3.5	1.5	E	9.7	4.2	E	350	150	E	970	420	E	350	150	E	970	NA	
FURFURAL	98-01-1	19	0.24	E	7.8	0.99	E	190	24	E	780	98	E	19	0.24	E	7.8	NA	
GLYPHOSATE	1071-83-6	70	620	E	70	620	E	7,000	62,000	E	7,000	62,000	E	70	620	E	70	15	
HEPTACHLOR	76-44-8	0.04	0.68	E	0.04	0.68	E	4	68	E	4	68	E	18	310	E	18	15	
HEPTACHLOR EPOXIDE	1024-57-3	0.02	1.1	E	0.02	1.1	E	2	110	E	2	110	E	20	1,100	E	20	10	
HEXACHLOROBENZENE	118-74-1	0.1	0.96	E	0.1	0.96	E	0.6	5.8	E	0.6	5.8	E	0.6	5.8	E	0.6	15	
HEXACHLOROBUTADIENE	87-68-3	0.84	10	E	3.5	42	E	84	1,000	E	290	3,400	E	290	3,400	E	290	15	
HEXACHLOROCYCLO PENTADIENE	77-47-4	5	91	E	5	91	E	180	3,300	E	180	3,300	E	180	3,300	E	180	15	
HEXACHLOROETHANE	67-72-1	0.1	0.56	E	0.1	0.56	E	10	56	E	10	56	E	10	56	E	10	15	
HEXANE	110-54-3	150	1,400	E	580	5,300	E	950	8,700	E	950	8,700	E	150	1,400	E	580	15	
HEXAZINONE	51235-04-2	40	8.5	E	40	8.5	E	4,000	850	E	4,000	850	E	40	8.5	E	40	NA	
HEXYTHIAZOX (SAVEY)	78587-05-0	50	820	E	50	820	E	50	820	E	50	820	E	50	820	E	50	15	
HMX	2691-41-0	40	4.8	E	40	4.8	E	500	60	E	500	60	E	40	4.8	E	40	NA	
HYDRAZINE/HYDRAZINE SULFATE	302-01-2	0.001	0.00011	E	0.0051	0.0005	E	0.1	0.011	E	0.51	0.057	E	0.01	0.0011	E	0.051	NA	
HYDROQUINONE	123-31-9	1.1	0.15	E	4.5	0.61	E	110	15	E	450	61	E	110	15	E	450	NA	
INDENO[1,2,3-CD]PYRENE	193-39-5	0.018	1,400	E	0.23	18,000	E	1.8	140.00	E	6.2	190.00	C	6.2	190.00	C	6.2	5	
IPRODIONE	36734-19-7	1.5	4.3	E	6.2	18	E	150	430	E	620	1,800	E	1.5	4.3	E	6.2	20	
ISOBUTYL ALCOHOL	78-83-1	1,000	260	E	2,900	760	E	10,000	10,000	C	10,000	10,000	C	10,000	10,000	C	10,000	NA	
ISOPHORONE	78-59-1	10	1.9	E	10	1.9	E	1,000	190	E	1,000	190	E	100	1,900	E	100	NA	
ISOPROPYL METHYLPHOSPHONATE	1832-54-8	70	8.1	E	70	8.1	E	7,000	810	E	7,000	810	E	70	8.1	E	70	NA	
KEPONE	143-50-0	0.0065	0.89	E	0.027	3.7	E	0.65	89	E	2.7	370	E	6.5	890	E	27	10	
MALATHION	121-75-5	50	170	E	50	170	E	5,000	10,000	C	5,000	10,000	C	10,000	10,000	C	10,000	20	
MALEIC HYDRAZIDE	123-33-1	400	47	E	400	47	E	40,000	4,700	E	40,000	4,700	E	400	47	E	400	NA	
MANEB	12427-38-2	1.1	0.12	E	4.5	0.51	E	110	12	E	450	51	E	1.1	0.12	E	4.5	NA	
MERPHOS OXIDE	78-48-8	1.7	230	E	4.9	650	E	170	10,000	C	230	10,000	C	1.7	230	E	4.9	10	

¹ For other options see § 250.308 (relating to soil to groundwater pathway numeric values).

All concentrations in mg/kg

E—Number calculated by the soil to groundwater equation in § 250.308

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REGULATED SUBSTANCE	CASRN	Used Aquifers						Nonuse Aquifers						Soil Buffer Distance (feet)
		TDS ≤ 2500 mg/L			TDS > 2500 mg/L			Residential			Nonresidential			
		Residential		Nonresidential	Residential		Nonresidential	Residential		Nonresidential	Residential		Nonresidential	
		100 X GW MSC	Generic Value	100 X GW MSC	100 X GW Value	Generic Value	100 X GW MSC	100 X GW Value	Generic Value	100 X GW MSC	100 X GW Value	Generic Value	100 X GW MSC	
METHACRYLONITRILE	126-98-7	0.35	0.057 E	0.97	0.16 E	35	5.7 E	97	16 E	0.35	0.057 E	0.97	0.16 E	NA
METHANIDOPHOS	10265-92-6	0.17	0.021 E	0.49	0.061 E	17	2.1 E	49	6.1 E	0.17	0.021 E	0.49	0.061 E	NA
METHANOL	67-56-1	4,200	500 E	10,000	2,100 E	10,000	10,000 C	10,000	10,000 C	10,000	10,000 C	10,000	10,000 C	NA
METHONYL	16752-77-5	20	3.2 E	20	3.2 E	2,000	320 E	2,000	320 E	20	3.2 E	20	3.2 E	NA
METHOXYCHLOR	72-43-5	4	630 E	4	630 E	45	710 E	45	710 E	45	710 E	45	710 E	10
METHOXYETHANOL 2-	109-86-4	42	0.48 E	18	2 E	420	48 E	1,800	200 E	42	4.8 E	180	20 E	NA
METHYL ACETATE	79-20-9	3,500	650 E	9,700	1,800 E	10,000	10,000 C	10,000	10,000 C	3,500	650 E	9,700	1,800 E	NA
METHYL ACRYLATE	96-53-3	42	1 E	18	4.5 E	420	100 E	1,800	450 E	420	100 E	1,800	450 E	NA
METHYL CHLORIDE	74-87-3	3	0.38 E	3	0.38 E	300	38 E	300	38 E	300	38 E	300	38 E	NA
METHYL ETHYL KETONE	78-93-3	400	76 E	400	76 E	10,000	7,600 E	10,000	7,600 E	400	76 E	10,000	7,600 E	NA
METHYL HYDRAZINE	60-34-4	0.0042	0.00048 E	0.018	0.002 E	0.42	0.048 E	1.8	0.2 E	0.042	0.0048 E	0.18	0.02 E	NA
METHYL ISOBUTYL KETONE	108-10-1	280	43 E	780	120 E	10,000	4,300 E	10,000	4,300 E	280	43 E	10,000	4,300 E	NA
METHYL ISOCYANATE	624-83-9	0.21	0.029 E	0.88	0.12 E	21	2.9 E	88	12 E	0.21	0.029 E	0.88	0.12 E	NA
METHYL N-BUTYL KETONE (2-HEXANONE)	591-78-6	63	1.6 E	26	6.4 E	630	160 E	2,600	640 E	6.3	1.6 E	26	6.4 E	NA
METHYL METHACRYLATE	80-62-6	150	20 E	620	84 E	10,000	2,000 E	10,000	8,400 E	10,000	2,000 E	10,000	8,400 E	NA
METHANESULFONATE	66-27-3	0.66	0.082 E	2.7	0.34 E	66	8.2 E	270	34 E	0.66	0.082 E	2.7	0.34 E	NA
METHYL PARATHION	298-00-0	0.1	0.21 E	0.1	0.21 E	10	21 E	10	21 E	100	210 E	100	210 E	30
METHYL STYRENE (MIXED ISOMERS)	25013-15-4	84	47 E	35	200 E	840	4,700 E	3,500	10,000 C	8.4	47 E	35	200 E	15
METHYL TERT-BUTYL ETHER (MTBE)	1634-04-4	2	0.28 E	2	0.28 E	200	28 E	200	28 E	20	2.8 E	20	2.8 E	NA
METHYLCHLOROPHENOXACETIC ACID (MCPA)	94-74-6	3	1.2 E	3	1.2 E	300	120 E	300	120 E	3,000	1,200 E	3,000	1,200 E	NA
METHYLENE BIS(2- CHLOROANILINE) 4,4'-	101-14-4	0.21	1.6 E	2.7	21 E	21	160 E	270	2,100 E	0.21	1.6 E	2.7	21 E	15
METHYLNAPHTHALENE 2-	91-57-6	0.63	25 E	2.6	100 E	63	2,500 E	260	10,000 E	0.63	25 E	2.6	100 E	15
METHYLSTYRENE ALPHA	98-83-9	240	420 E	680	1,200 E	10,000	10,000 C	10,000	10,000 C	240	420 E	680	1,200 E	30
METOLACHLOR	51218-45-2	70	40 E	70	40 E	7,000	4,000 E	7,000	4,000 E	70	40 E	70	40 E	NA
METRIBUZIN	21087-64-9	7	2.4 E	7	2.4 E	700	240 E	700	240 E	7	2.4 E	7	2.4 E	NA
MEVINPHOS	7786-34-7	0.087	0.019 E	0.24	0.053 E	8.7	1.9 E	24	5.3 E	0.087	0.019 E	0.24	0.053 E	NA
MONOCHLOROACETIC ACID (MCA)	79-11-8	6	0.67 E	6	0.67 E	600	67 E	600	67 E	6	0.67 E	6	0.67 E	NA
NAPHTHALENE	91-20-3	10	25 E	10	25 E	1,000	2,500 E	1,000	2,500 E	1,000	2,500 E	1,000	2,500 E	30

¹ For other options see § 250.308 (relating to soil to groundwater pathway numeric values).

All concentrations in mg/kg

E—Number calculated by the soil to groundwater equation in § 250.308

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REGULATED SUBSTANCE	CASRN	Used Aquifers												Nonuse Aquifers												Soil Buffer Distance (feet)
		TDS ≤ 2500 mg/L						TDS > 2500 mg/L																		
		Residential			Nonresidential			Residential			Nonresidential			Residential			Nonresidential									
		100 X GW MSC	Generic Value	100 X GW MSC	Generic Value	100 X GW MSC	Generic Value	100 X GW MSC	Generic Value	100 X GW MSC	Generic Value	100 X GW MSC	Generic Value	100 X GW MSC	Generic Value	100 X GW MSC	Generic Value									
NAPHTHYLAMINE, 1-	134-32-7	0.036	0.29 E	0.15	1.2 E	3.6	29 E	15	120 E	3.6	29 E	15	120 E	3.6	29 E	15	120 E	15								
NAPHTHYLAMINE, 2-	91-59-8	0.036	0.012 E	0.15	0.049 E	3.6	1.2 E	15	4.9 E	3.6	12 E	150	49 E	3.6	12 E	150	49 E	NA								
NAPROFAMIDE	15299-99-7	420	970 E	1,200	2,800 E	7,000	16,000 E	7,000	16,000 E	420	970 E	1,200	2,800 E	420	970 E	1,200	2,800 E	30								
NITROANILINE, O-	88-74-4	0.011	0.002 E	0.044	0.0079 E	1.1	0.2 E	4.4	0.79 E	0.011	0.002 E	0.044	0.0079 E	0.011	0.002 E	0.044	0.0079 E	NA								
NITROANILINE, P-	100-01-6	3.3	0.49 E	14	2.1 E	330	49 E	1,400	210 E	3.3	0.49 E	14	2.1 E	3.3	0.49 E	14	2.1 E	NA								
NITROBENZENE	98-95-3	0.12	0.052 E	0.63	0.27 E	12	5.2 E	63	27 E	12	5.2 E	63	27 E	12	5.2 E	63	27 E	NA								
NITROGUANIDINE	556-88-7	70	7.8 E	70	7.8 E	7,000	780 E	7,000	780 E	70	7.8 E	7,000	780 E	70	7.8 E	7,000	780 E	NA								
NITROPHENOL, 2-	88-75-5	28	5.7 E	78	16 E	2,800	570 E	7,800	1,600 E	28	5.7 E	780	160 E	28	5.7 E	780	160 E	NA								
NITROPHENOL, 4-	100-02-7	6	4.1 E	6	4.1 E	600	410 E	600	410 E	6	4.1 E	600	410 E	600	410 E	600	410 E	NA								
NITROPROPANE, 2-	79-46-9	0.0018	0.00029 E	0.0093	0.0015 E	0.18	0.029 E	0.93	0.15 E	0.018	0.0029 E	0.093	0.015 E	0.018	0.0029 E	0.093	0.015 E	NA								
NITROSODIETHYLAMINE, N-	55-18-5	0.000	0.000007 E	0.0005	0.0001 E	0.0045	0.00079 E	0.058	0.01 E	0.00045	0.00007 E	0.0058	0.01 E	0.00045	0.00007 E	0.0058	0.001 E	NA								
NITROSODIMETHYLAMINE, N-	62-75-9	0.00014	0.000019 E	0.0018	0.0002 E	0.014	0.0019 E	0.18	0.024 E	0.0014	0.000019 E	0.018	0.0024 E	0.0014	0.000019 E	0.018	0.0024 E	NA								
NITROSO-DI-N-BUTYLAMINE, N-	924-16-3	0.0031	0.0038 E	0.016	0.02 E	0.31	0.38 E	1.6	2 E	0.31	0.38 E	1.6	2 E	0.31	0.38 E	1.6	2 E	NA								
NITROSODI-N-PROPYLAMINE, N-	621-64-7	0.0025	0.00035 E	0.013	0.0018 E	0.25	0.035 E	1.3	0.18 E	0.025	0.0035 E	0.13	0.018 E	0.025	0.0035 E	0.13	0.018 E	NA								
NITROSODIPHENYLAMINE, N-	86-30-6	1.9	3 E	9.6	15 E	190	300 E	960	1,500 E	190	300 E	960	1,500 E	190	300 E	960	1,500 E	30								
NITROSODIETHYLUREA, N-	759-73-9	0.00079	0.000091 E	0.01	0.0012 E	0.079	0.0091 E	1	0.12 E	0.079	0.0091 E	1	0.12 E	0.079	0.0091 E	1	0.12 E	NA								
OCTYL PHTHALATE, D,N-	117-64-0	35	10,000 C	97	10,000 C	300	10,000 C	300	10,000 C	35	10,000 C	300	10,000 C	300	10,000 C	300	10,000 C	5								
OXAMYL (HYDANT)	23135-22-0	20	2.6 E	20	2.6 E	2,000	260 E	2,000	260 E	20	2.6 E	2,000	260 E	20	2.6 E	2,000	260 E	NA								
PARAQUAT	1910-42-5	3	120 E	3	120 E	300	12,000 E	300	12,000 E	3	120 E	300	12,000 E	3	120 E	300	12,000 E	15								
PARATHION	56-38-2	0.1	0.59 E	0.29	1.7 E	10	59 E	29	170 E	0.1	0.59 E	29	170 E	0.1	0.59 E	29	170 E	15								
PCBS, TOTAL (POLYCHLORINATED BIPHENYLS) (AROCLORS)	1336-36-3	0.05	9.8 E	0.05	9.8 E	5	980 E	5	980 E	0.05	9.8 E	5	980 E	0.05	9.8 E	5	980 E	10								
PCB-1016 (AROCLOR)	12674-11-2	0.24	66 E	0.68	190 E	24	6,600 E	25	6,900 E	0.24	66 E	190 E	24	6,600 E	25	6,900 E	190 E	10								
PCB-1221 (AROCLOR)	11104-28-2	0.033	0.16 E	0.14	0.68 E	3.3	16 E	3.3	16 E	0.033	0.16 E	0.14	0.68 E	0.033	0.16 E	0.14	0.68 E	20								
PCB-1232 (AROCLOR)	11141-16-5	0.033	0.13 E	0.14	0.54 E	3.3	13 E	14	54 E	0.033	0.13 E	0.14	0.54 E	0.033	0.13 E	0.14	0.54 E	20								
PCB-1242 (AROCLOR)	53469-21-9	0.033	4 E	0.14	17 E	3.3	400 E	10	1,200 E	0.033	4 E	0.14	17 E	0.033	4 E	0.14	17 E	10								
PCB-1248 (AROCLOR)	12672-29-6	0.033	16 E	0.14	67 E	3.3	1,600 E	5.4	2,600 E	0.033	16 E	0.14	67 E	0.033	16 E	0.14	67 E	10								
PCB-1254 (AROCLOR)	11097-69-1	0.069	140 E	0.19	380 E	5.7	10,000 C	5.7	10,000 C	0.069	140 E	0.19	380 E	0.069	140 E	0.19	380 E	5								
PCB-1260 (AROCLOR)	11096-82-5	0.033	150 E	0.14	630 E	3.3	15,000 E	8	36,000 E	0.033	150 E	0.14	630 E	0.033	150 E	0.14	630 E	5								

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		Residential		Nonresidential	Residential		Nonresidential	Residential		Nonresidential	Residential		Nonresidential	
		100 X GW MSC	Generic Value	100 X GW MSC	Generic Value	100 X GW MSC	Generic Value	100 X GW MSC	Generic Value	100 X GW MSC	Generic Value	100 X GW MSC	Generic Value	
PETBULATE	1114-71-2	170	290 E	490	830 E	9,200	10,000 C	9,200	10,000 C	170	290 E	490	830 E	30
PENTACHLOROBENZENE	608-93-5	2.8	220 E	7.8	620 E	74	5,900 E	74	5,900 E	74	5,900 E	74	5,900 E	10
PENTACHLOROETHANE	76-01-7	0.72	3.5 E	3	15 E	72	350 E	300	1,500 E	0.72	3.5 E	3	15 E	20
PENTACHLORO NITROBENZENE	82-68-8	0.25	5 E	1	20 E	25	500 E	44	870 E	44	870 E	44	870 E	15
PENTACHLOROPHENOL	87-86-5	0.1	5 E	0.1	5 E	10	500 E	10	500 E	100	5,000 E	100	5,000 E	10
PERFLUOROBUTANE SULFONATE (PFBS)	375-73-5	1	N/A	2.9	N/A	100	N/A	290	N/A	1	N/A	2.9	N/A	NA
PERFLUOROOCTANE SULFONATE (PFOS)	1763-23-1	0.007	N/A	0.007	N/A	0.7	N/A	0.7	N/A	0.007	N/A	0.007	N/A	NA
PERFLUOROOCTANOIC ACID (PFCA)	335-67-1	0.007	N/A	0.007	N/A	0.7	N/A	0.7	N/A	0.007	N/A	0.007	N/A	NA
PHENACETIN	62-44-2	30	12 E	120	46 E	3,000	1,200 E	12,000	4,600 E	30,000	12,000 E	76,000	29,000 E	NA
PHENANTHRENE	85-01-8	110	10,000 E	110	10,000 E	110	10,000 E	110	10,000 E	110	10,000 E	110	10,000 E	10
PHENOL	108-95-2	200	33 E	200	33 E	20,000	3,300 E	20,000	3,300 E	20,000	3,300 E	20,000	3,300 E	NA
PHENYL MERCAPTAN	108-98-5	3.5	5.3 E	9.7	15 E	350	530 E	970	1,500 E	3.5	5.3 E	9.7	15 E	30
PHENYLENEDIAMINE M-	108-45-2	21	3 E	58	8.2 E	2,100	300 E	5,800	820 E	21,000	3,000 E	58,000	8,200 E	NA
PHENYLPHENOL 2-	90-43-7	34	490 E	140	2,000 E	3,400	49,000 E	14,000	190,000 C	34,000	190,000 C	70,000	190,000 C	15
PHORATE	298-02-2	0.69	1.5 E	1.9	4.1 E	69	150 E	190	410 E	0.69	1.5 E	1.9	4.1 E	30
PHthalic ANHYDRIDE	85-44-9	4.2	1.3 E	18	5.6 E	420	130 E	1,800	560 E	420	130 E	1,800	560 C	NA
PICLORAM	1918-02-1	50	7.4 E	50	7.4 E	5,000	740 E	5,000	740 E	50	7.4 E	50	7.4 E	NA
PROMETON	1610-18-0	40	39 E	40	39 E	4,000	3,900 E	4,000	3,900 E	40	39 E	40	39 E	NA
PRONAMIDE	23950-58-5	260	160 E	730	450 E	1,500	920 E	1,500	920 E	260	160 E	730	450 E	NA
PROFACHLOR	1918-16-7	0.01	0.0046 E	0.01	0.0046 E	1	0.46 E	1	0.46 E	1	0.46 E	1	0.46 E	NA
PROPANIL	709-98-8	17	8.7 E	49	25 E	1,700	870 E	4,900	2,500 E	17	8.7 E	49	25 E	NA
PROPANOL 2- (ISOPROPYL ALCOHOL)	67-83-0	42	7.3 E	180	31 E	4,200	730 E	10,000	3,100 E	42	7.3 E	180	31 E	NA
PROFAZINE	139-40-2	1	0.5 E	1	0.5 E	100	50 E	100	50 E	1	0.5 E	1	0.5 E	NA
PROPHAM	122-42-9	10	2.4 E	10	2.4 E	1,000	240 E	1,000	240 E	10	2.4 E	10	2.4 E	NA
PROPYLBENZENE N-	103-65-1	210	400 E	880	1,700 E	5,200	9,900 E	5,200	9,900 E	210	400 E	880	1,700 E	30
PROPYLENE OXIDE	75-66-9	0.27	0.047 E	1.1	0.19 E	27	4.7 E	110	19 E	0.27	0.047 E	1.1	0.19 E	NA
PYRENE	129-00-0	13	2,200 E	13	2,200 E	13	2,200 E	13	2,200 E	13	2,200 E	13	2,200 E	10
PYRETHRUM	8003-34-7	35	4.4 E	35	4.4 E	35	4.4 E	35	4.4 E	35	4.4 E	35	4.4 E	NA

¹ For other options see § 250.308 (relating to soil to groundwater pathway numeric values).

All concentrations in mg/kg

E—Number calculated by the soil to groundwater equation in § 250.308

C—Cap

NA—The soil buffer distance option is not available for this substance

N/A—Soil to groundwater values cannot be calculated for these compounds

Appendix A
Table 3—Medium-Specific Concentrations (MSCs) for Organic Regulated Substances in Soil
B. Soil to Groundwater Numeric Values¹

REGULATED SUBSTANCE	CASRN	Used Aquifers												Nonuse Aquifers												Soil Buffer Distance (feet)			
		TDS ≤ 2500 mg/L						TDS > 2500 mg/L						Residential						Nonresidential									
		Residential			Nonresidential			Residential			Nonresidential			100 X GW MSC			Generic Value			100 X GW MSC			Generic Value				100 X GW MSC		
		100 X GW MSC	Generic Value	100 X GW MSC	100 X GW MSC	Generic Value	100 X GW MSC	100 X GW MSC	Generic Value	100 X GW MSC	100 X GW MSC	Generic Value	100 X GW MSC	100 X GW MSC	Generic Value	100 X GW MSC	100 X GW MSC	Generic Value	100 X GW MSC	100 X GW MSC	Generic Value	100 X GW MSC	100 X GW MSC	Generic Value	100 X GW MSC				
		100 X GW MSC	Generic Value	100 X GW MSC	100 X GW MSC	Generic Value	100 X GW MSC	100 X GW MSC	Generic Value	100 X GW MSC	100 X GW MSC	Generic Value	100 X GW MSC	100 X GW MSC	Generic Value	100 X GW MSC	100 X GW MSC	Generic Value	100 X GW MSC	100 X GW MSC	Generic Value	100 X GW MSC	100 X GW MSC	Generic Value	100 X GW MSC				
PYRIDINE	110-86-1	3.4	0.39 E	9.7	1.1 E	350	39	E	970	110	E	35	3.9 E	97	11	E	NA												
QUINOLINE	91-22-5	0.022	0.074 E	0.091	0.31 E	2.2	7.4	E	9.1	31	E	22	74 E	91	310	E	20												
QUINALOOP (ASSURE)	76578-14-8	30	47	E	30	47	E	30	47	E	30	47	E	30	47	E	30												
RDX	121-82-4	0.2	0.057 E	0.2	0.057 E	20	5.7	E	20	5.7	E	20	5.7	E	20	5.7	E	NA											
RESORCINOL	108-46-3	6,900	800 E	19,000	2,200 E	190,000	80,000	E	190,000	80,000	E	190,000	80,000	E	190,000	80,000	E	NA											
RONNEL	299-84-3	170	270 E	490	760 E	4,000	6,200	E	4,000	6,200	E	4,000	6,200	E	4,000	6,200	E	30											
SINAZINE	122-34-9	0.4	0.15 E	0.4	0.15 E	40	15	E	40	15	E	40	15	E	40	15	E	30											
STRYCHNINE	57-24-9	1	0.81 E	2.9	2.4 E	100	81	E	290	240	E	1,000	240	E	1,000	240	E	NA											
STYRENE	100-42-5	10	24	E	10	24	E	1,000	240	E	1,000	240	E	1,000	240	E	30												
TETRATHURON	34014-18-1	50	83	E	50	83	E	5,000	8,300	E	5,000	8,300	E	5,000	8,300	E	30												
TERBACIL	5902-51-2	9	2.2 E	9	2.2 E	900	220	E	900	220	E	900	220	E	900	220	E	30											
TERBUFOS	13071-79-9	0.04	0.055 E	0.04	0.055 E	4	5.5	E	4	5.5	E	4	5.5	E	4	5.5	E	30											
TETRACHLOROBENZENE, 1,2,4,5-	95-94-3	1	4.6 E	2.9	13	E	58	270	E	58	270	E	58	270	E	58	270	E	30										
TETRACHLORODIBENZO-P- DIOXIN, 2,3,7,8- (TCDD)	1746-01-6	0.0000	0.032 E	0.000	0.032 E	0.0003	3.2	E	0.0003	3.2	E	0.0003	3.2	E	0.0003	3.2	E	5											
TETRACHLOROETHANE, 1,1,1,2-	630-20-6	7	18 E	7	18 E	700	180	E	700	180	E	700	180	E	700	180	E	30											
TETRACHLOROETHANE, 1,1,2,2-	79-34-5	0.084	0.026 E	0.43	0.13 E	8.4	2.6	E	43	13	E	8.4	2.6	E	43	13	E	NA											
TETRACHLOROETHYLENE (PCE)	127-18-4	0.5	0.43 E	0.5	0.43 E	50	43	E	50	43	E	50	43	E	50	43	E	NA											
TETRACHLOROPHENOL, 2,3,4,6-	58-90-2	100	1,600 E	290	4,500 E	10,000	160,000	E	18,000	160,000	E	18,000	160,000	E	18,000	160,000	E	15											
TETRAETHYL LEAD	78-00-2	0.0003	0.0043 E	0.000	0.012 E	0.035	0.43	E	0.035	0.43	E	0.035	0.43	E	0.035	0.43	E	15											
TETRAETHYL DITHIO PYROPHOSPHATE	3689-24-5	1.7	2.5 E	4.9	7.3 E	170	250	E	490	730	E	1.7	2.5 E	4.9	7.3 E	170	250	E	30										
TETRAHYDROFURAN	109-99-9	2.5	0.55 E	13	2.8 E	250	55	E	1,300	280	E	2.5	0.55 E	13	2.8 E	250	55	E	NA										
THIOFANOX	39198-18-4	1	0.11 E	2.9	0.32 E	100	11	E	290	32	E	1	0.11 E	2.9	0.32 E	100	11	E	NA										
THIRAM	137-26-8	52	140 E	150	390 E	3,000	7,800	E	3,000	7,800	E	52	140 E	150	390 E	3,000	7,800	E	20										
TOLUENE	108-88-3	100	44	E	100	44	E	10,000	440	E	10,000	440	E	10,000	440	E	20												
TOLUIDINE, M-	108-44-1	4.1	1.9 E	17	7.8 E	410	190	E	1,700	780	E	4.1	1.9 E	17	7.8 E	410	190	E	NA										
TOLUIDINE, O-	95-53-4	4.1	4.7 E	17	19 E	410	470	E	1,700	1,900	E	4.1	4.7 E	17	19 E	410	470	E	NA										

¹ For other options see § 250.308 (relating to soil to groundwater pathway numeric values).

All concentrations in mg/kg.

E—Number calculated by the soil to groundwater equation in § 250.308

C—Cap

NA—The soil buffer distance option is not available for this substance

N/A—Soil to groundwater values cannot be calculated for these compounds

Appendix A
Table 3—Medium-Specific Concentrations (MSCs) for Organic Regulated Substances in Soil
B. Soil to Groundwater Numeric Values¹

REGULATED SUBSTANCE	CASRN	Used Aquifers										Nonuse Aquifers										Soil Buffer Distance (feet)				
		TDS < 2500 mg/L					TDS > 2500 mg/L					Residential					Nonresidential									
		Residential		Nonresidential		100 X GW MSC	Residential		Nonresidential		100 X GW MSC	Residential		Nonresidential		100 X GW MSC	Residential		Nonresidential							
		Generic Value	100 X GW MSC	Generic Value	100 X GW MSC		Generic Value	100 X GW MSC	Generic Value	100 X GW MSC		Generic Value	100 X GW MSC	Generic Value	100 X GW MSC		Generic Value	100 X GW MSC								
TOLUIDINE, P-	106-49-0	2.2	2	9.1	8.3	E	220	200	E	910	830	E	2.2	2	E	9.1	8.3	E	2.2	2	E	9.1	8.3	E	NA	
TOXAPENE	8001-35-2	0.3	1.2	E	0.3	1.2	E	30	120	E	30	120	E	0.3	1.2	E	0.3	1.2	E	0.3	1.2	E	0.3	1.2	E	20
TRIALATE	2303-17-5	0.091	0.47	E	0.38	1.9	E	9.1	47	E	38	190	E	0.091	0.47	E	0.38	1.9	E	0.38	1.9	E	0.38	1.9	E	15
TRIBROMOMETHANE (BROMOFORM) (THM)	75-25-2	8	3.5	E	8	3.5	E	800	350	E	800	350	E	800	350	E	800	350	E	800	350	E	800	350	E	NA
TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	1,100	3,400	E	4,400	10,000	C	10,000	10,000	C	10,000	10,000	C	10,000	10,000	C	10,000	10,000	C	10,000	10,000	C	10,000	10,000	C	20
TRICHLOROACETIC ACID (HAA)	76-03-9	6	0.97	E	6	0.97	E	600	97	E	600	97	E	600	97	E	6	0.97	E	6	0.97	E	6	0.97	E	NA
TRICHLOROBENZENE, 1,2,4-	120-82-1	7	27	E	7	27	E	700	2,700	E	700	2,700	E	700	2,700	E	700	2,700	E	700	2,700	E	700	2,700	E	20
TRICHLOROBENZENE, 1,3,5-	108-70-3	4	31	E	4	31	E	400	3,100	E	400	3,100	E	4	31	E	4	31	E	4	31	E	4	31	E	15
TRICHLOROETHANE, 1,1,1-	71-55-6	20	7.2	E	20	7.2	E	2,000	720	E	2,000	720	E	200	72	E	200	72	E	200	72	E	200	72	E	NA
TRICHLOROETHANE, 1,1,2-	79-00-5	0.5	0.15	E	0.5	0.15	E	50	15	E	50	15	E	5	1.5	E	5	1.5	E	5	1.5	E	5	1.5	E	NA
TRICHLOROETHYLENE (TCE)	79-01-6	0.5	0.17	E	0.5	0.17	E	50	17	E	50	17	E	5	1.7	E	5	1.7	E	5	1.7	E	5	1.7	E	NA
TRICHLOROPHENOL, 2,4,5-	95-95-4	350	2,100	E	970	5,900	E	35,000	190,000	C	97,000	190,000	C	100,000	190,000	C	100,000	190,000	C	100,000	190,000	C	100,000	190,000	C	15
TRICHLOROPHENOL, 2,4,6-	88-06-2	3.5	10	E	9.7	28	E	350	1,000	E	970	2,800	E	3,500	10,000	E	9,700	28,000	E	20	70,000	E	20	70,000	E	NA
ACETIC ACID, 2,4,5- (2,4,5-T)	93-76-5	7	1.5	E	7	1.5	E	700	150	E	700	150	E	7,000	1,500	E	7,000	1,500	E	NA	1,500	E	NA	1,500	E	NA
TRICHLOROPHENOXYPROPIONIC ACID, 2,4,5- (2,4,5-TP/SILVEX)	93-72-1	5	22	E	5	22	E	500	2,200	E	500	2,200	E	5	22	E	5	22	E	5	22	E	5	22	E	20
TRICHLOROPROPANE, 1,1,2-	598-77-6	17	2.9	E	49	8.4	E	1,700	290	E	4,900	840	E	17	2.9	E	49	8.4	E	NA	840	E	NA	840	E	NA
TRICHLOROPROPANE, 1,2,3-	96-18-4	4	3.2	E	4	3.2	E	400	320	E	400	320	E	400	320	E	400	320	E	NA	320	E	NA	320	E	NA
TRICHLOROPROPENE, 1,2,3-	96-19-5	0.063	0.037	E	0.26	0.15	E	6.3	3.7	E	26	15	E	0.063	0.037	E	0.26	0.15	E	NA	0.037	E	NA	0.037	E	NA
TRIETHYLAMINE	121-44-8	1.5	0.36	E	6.2	1.5	E	150	36	E	620	150	E	1.5	0.36	E	6.2	1.5	E	NA	0.36	E	NA	0.36	E	NA
TRIETHYLENE GLYCOL	112-27-6	6,900	870	E	10,000	2,400	E	10,000	10,000	C	10,000	10,000	C	10,000	10,000	C	6,900	870	E	10,000	2,400	E	10,000	2,400	E	NA
TRIFLURALIN	1582-09-8	1	1.9	E	1	1.9	E	100	190	E	100	190	E	1	1.9	E	1	1.9	E	1	1.9	E	1	1.9	E	30
TRIMETHYLBENZENE, 1,3,4- (TRIMETHYLBENZENE, 1,2,4-)	95-63-6	13	73	E	53	300	E	1,300	7,300	E	5,300	10,000	C	13	73	E	53	300	E	15	7,300	E	5,300	10,000	C	15
TRIMETHYLBENZENE, 1,3,5-	108-67-8	13	23	E	53	93	E	1,300	2,300	E	4,900	8,600	E	13	23	E	53	93	E	30	8,600	E	4,900	8,600	E	30
TRINITROGLYCEROL (NITROGLYCERIN)	55-63-0	0.5	0.2	E	0.5	0.2	E	50	20	E	50	20	E	50	20	E	50	20	E	50	20	E	50	20	E	NA
TRINITROTOLUENE, 2,4,6-	118-96-7	0.2	0.023	E	0.2	0.023	E	20	2.3	E	20	2.3	E	20	2.3	E	0.2	0.023	E	0.2	0.023	E	0.2	0.023	E	NA

¹ For other options see § 250.308 (relating to soil to groundwater pathway numeric values).

All concentrations in mg/kg.

E—Number calculated by the soil to groundwater equation in § 250.308

C—Cap

NA—The soil buffer distance option is not available for this substance

N/A—Soil to groundwater values cannot be calculated for these compounds

Appendix A
Table 3—Medium-Specific Concentrations (MSCs) for Organic Regulated Substances in Soil
B. Soil to Groundwater Numeric Values¹

REGULATED SUBSTANCE	CASRN	Used Aquifers												Nonuse Aquifers						Soil Buffer Distance (feet)
		TDS ≤ 2500 mg/L						TDS > 2500 mg/L												
		Residential			Nonresidential			Residential			Nonresidential			Residential			Nonresidential			
		100 X GW MSC	Generic Value	100 X GW MSC	Generic Value	100 X GW MSC	Generic Value	100 X GW MSC	Generic Value	100 X GW MSC	Generic Value	100 X GW MSC	Generic Value	100 X GW MSC	Generic Value	100 X GW MSC	Generic Value			
VINYL ACETATE	108-05-4	42	5	E	180	21	E	4,200	500	E	10,000	2,100	E	42	5	E	180	21	E	NA
VINYL BROMIDE (BROMOETHENE)	593-60-2	0.15	0.073	E	0.78	0.38	E	15	7.3	E	78	38	E	1.5	0.73	E	7.8	3.8	E	NA
VINYL CHLORIDE	75-01-4	0.2	0.027	E	0.2	0.027	E	20	2.7	E	20	2.7	E	2	0.27	E	2	0.27	E	NA
WARFARIN	81-81-2	1	2.4	E	2.9	6.9	E	100	240	E	290	690	E	1,000	2,400	E	1,700	4,100	E	30
XYLENES (TOTAL)	1330-20-7	1,000	990	E	1,000	990	E	10,000	10,000	C	10,000	10,000	C	10,000	10,000	C	10,000	10,000	C	NA
ZINEB	12122-67-7	170	27	E	490	78	E	1,000	160	E	1,000	160	E	170	27	E	490	78	E	NA

¹ For other options see § 250.308 (relating to soil to groundwater pathway numeric values).

All concentrations in mg/kg

E—Number calculated by the soil to groundwater equation in § 250.308

C—Cap

NA—The soil buffer distance option is not available for this substance

N/A—Soil to groundwater values cannot be calculated for these compounds

Appendix A
Table 4—Medium-Specific Concentrations (MSCs) for Inorganic Regulated Substances in Soil
A. Direct Contact Numeric Values

REGULATED SUBSTANCE	CASRN	Residential MSC 0—15 feet	Nonresidential MSCs			
			Surface Soil 0—2 feet		Subsurface Soil 2—15 feet	
ALUMINUM	7429-90-5	190,000	C	190,000	C	190,000
ANTIMONY	7440-36-0	88	G	1,300	G	190,000
ARSENIC	7440-38-2	12	G	61	G	190,000
BARIUM AND COMPOUNDS	7440-39-3	44,000	G	190,000	C	190,000
BERYLLIUM	7440-41-7	440	G	6,400	G	190,000
BORON AND COMPOUNDS	7440-42-8	44,000	G	190,000	C	190,000
CADMIUM	7440-43-9	110	G	1,600	G	190,000
CHROMIUM III	16065-83-1	190,000	C	190,000	C	190,000
CHROMIUM VI	18540-29-9	37	G	180	G	140,000
COBALT	7440-48-4	66	G	960	G	190,000
COPPER	7440-50-8	7,200	G	100,000	G	190,000
CYANIDE, FREE	57-12-5	130	G	1,900	G	190,000
FLUORIDE	16984-48-8	8,800	G	130,000	G	190,000
IRON	7439-89-6	150,000	G	190,000	C	190,000
LEAD	7439-92-1	500	U	1,000	S	190,000
LITHIUM	7439-93-2	440	G	6,400	G	190,000
MANGANESE	7439-96-5	31,000	G	190,000	C	190,000
MERCURY	7439-97-6	35	G	510	G	190,000
MOLYBDENUM	7439-98-7	1,100	G	16,000	G	190,000
NICKEL	7440-02-0	4,400	G	64,000	G	190,000
PERCHLORATE	7790-98-9	150	G	2,200	G	190,000
SELENIUM	7782-49-2	1,100	G	16,000	G	190,000
SILVER	7440-22-4	1,100	G	16,000	G	190,000
STRONTIUM	7440-24-6	130,000	G	190,000	C	190,000
THALLIUM	7440-28-0	2.2	G	32	G	190,000
TIN	7440-31-5	130,000	G	190,000	C	190,000
VANADIUM	7440-62-2	1,100	G	16,000	G	190,000
ZINC	7440-66-6	66,000	G	190,000	C	190,000

All concentrations in mg/kg
 G—Ingestion
 N—Inhalation
 C—Cap
 U—UBK Model
 S—SEGH Model

Appendix A
Table 4—Medium-Specific Concentrations (MSCs) for Inorganic Regulated Substances in Soil
B. Soil to Groundwater Numeric Values¹

REGULATED SUBSTANCE	CASRN	Used Aquifers										Nonuse Aquifers						Soil Buffer Distance (feet)
		TDS ≤ 2500 mg/L					TDS > 2500 mg/L											
		R		NR		Generic Value	R		NR		Generic Value	R		NR		Generic Value		
		100 X GW MSC	Generic Value	100 X GW MSC	Generic Value		100 X GW MSC	Generic Value	100 X GW MSC	Generic Value		100 X GW MSC	Generic Value					
ANTIMONY	7440-36-0	0.6	27	0.6	27	27	60	2,700	60	2,700	60	27,000	600	27,000	600	27,000	15	
ARSENIC	7440-38-2	1	29	1	29	29	100	2,900	100	2,900	100	29,000	1,000	29,000	1,000	29,000	15	
BARIUM AND COMPOUNDS	7440-39-3	200	8,200	200	8,200	8,200	20,000	190,000	20,000	190,000	20,000	190,000	190,000	190,000	190,000	190,000	15	
BERYLLIUM	7440-41-7	0.4	320	0.4	320	320	40	32,000	40	32,000	40	32,000	400	190,000	400	190,000	10	
BORON AND COMPOUNDS	7440-42-8	600	1,900	600	1,900	1,900	60,000	190,000	60,000	190,000	60,000	190,000	190,000	190,000	190,000	190,000	30	
CADMIUM	7440-43-9	0.5	38	0.5	38	38	50	3,800	50	3,800	50	3,800	500	38,000	500	38,000	15	
CHROMIUM (III)	16065-83-1	10	190,000	10	190,000	190,000	1,000	190,000	1,000	190,000	1,000	190,000	10,000	190,000	10,000	190,000	5	
CHROMIUM (VI)	18540-29-9	10	190	10	190	190	1,000	19,000	1,000	19,000	1,000	19,000	10,000	190,000	10,000	190,000	15	
COBALT	7440-48-4	1	45	2.9	130	130	100	4,500	290	13,000	1,000	45,000	2,900	130,000	2,900	130,000	15	
COPPER	7440-50-8	100	43,000	100	43,000	43,000	10,000	190,000	10,000	190,000	10,000	190,000	100,000	190,000	100,000	190,000	10	
CYANIDE, FREE	57-12-5	20	200	20	200	200	2,000	20,000	2,000	20,000	2,000	20,000	20,000	190,000	20,000	190,000	20	
FLUORIDE	16984-48-8	400	44	400	44	44	40,000	4,400	40,000	4,400	4,400	190,000	44,000	190,000	44,000	190,000	NA	
LEAD	7439-92-1	0.5	450	0.5	450	450	50	45,000	50	45,000	50	45,000	500	190,000	500	190,000	10	
LITHIUM	7439-93-2	6.9	2,100	19	5,700	5,700	690	190,000	1,900	190,000	1,900	190,000	6,900	190,000	19,000	190,000	10	
MANGANESE	7439-96-5	30	2,000	30	2,000	2,000	3,000	190,000	3,000	190,000	3,000	190,000	30,000	190,000	30,000	190,000	15	
MERCURY	7439-97-6	0.2	10	0.2	10	10	20	1,000	20	1,000	20	1,000	200	10,000	200	10,000	15	
MOLYBDENUM	7439-98-7	4	650	4	650	650	400	65,000	400	65,000	400	65,000	4,000	190,000	4,000	190,000	15	
NICKEL	7440-02-0	10	650	10	650	650	1,000	65,000	1,000	65,000	1,000	65,000	10,000	190,000	10,000	190,000	15	
PERCHLORATE	7790-98-9	1.5	0.17	1.5	0.17	0.17	150	17	150	17	150	170	1,500	170	1,500	170	NA	
SELENIUM	7782-49-2	5	26	5	26	26	500	2,600	500	2,600	500	2,600	5,000	26,000	5,000	26,000	20	
SILVER	7440-22-4	10	84	10	84	84	1,000	8,400	1,000	8,400	1,000	8,400	10,000	84,000	10,000	84,000	20	
STRONTIUM	7440-24-6	400	44	400	44	44	40,000	4,400	40,000	4,400	4,400	190,000	44,000	190,000	44,000	190,000	NA	
THALLIUM	7440-28-0	0.2	14	0.2	14	14	20	1,400	20	1,400	20	1,400	200	14,000	200	14,000	15	
TIN	7440-31-5	2,100	190,000	5,800	190,000	190,000	190,000	190,000	190,000	190,000	190,000	190,000	190,000	190,000	190,000	190,000	10	
VANADIUM	7440-62-2	17	17,000	49	49,000	49,000	1,700	190,000	4,900	190,000	4,900	190,000	17,000	190,000	49,000	190,000	5	
ZINC	7440-66-6	200	12,000	200	12,000	12,000	20,000	190,000	20,000	190,000	20,000	190,000	190,000	190,000	190,000	190,000	15	

¹For other options see § 250.308 (relating to soil to groundwater pathway numeric values).

All concentrations in mg/kg

R—Residential

NR—Non-Residential

NA—Not Applicable

Aqueous solubility references are keyed to the numbered list found at § 250.304(f) (relating to MSCs for groundwater). Where there are multiple sources cited, The table value is the median of the values in the individual

O = EPA Office of Pesticide Programs Human Health Benchmarks for Pesticides
P = EPA Provisional Peer-Reviewed Toxicity Value
TE = EPA ITER Peer-Reviewed Value
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Appendix A
Table 5—Physical and Toxicological Properties
A. Organic Regulated Substances

[illegible]

Aqueous solubility references are keyed to the numbered list found at § 250.304(f) (relating to MSCs for groundwater). Where there are multiple sources cited, the table value is the median of the values in the individual

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System (IRIS)
W = EPA Drinking Water Regulations and Health Advisories

S¹ Acenaphthene surrogate
S² Trans-Crotonaldehyde surrogate
S³ Endosulfan surrogate
S⁴ Naphthalene surrogate
S⁵ 2-Naphthylamine surrogate
S⁶ 4-Nitrophenol surrogate
S⁷ Total PCBs surrogate
S⁸ Anthracene surrogate
S⁹ O-Toluidine surrogate
S¹⁰ 1,2,4-Trichlorobenzene surrogate

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Appendix A
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Regulated Substance	CAS	RfDo (mg/kg-d)	CSFo (mg/kg-d) ¹	RCd (mg/m ³)	IUR (μg/m ³) ¹	Koc	VOC?	Aqueous Sol (mg/L)	Aqueous Sol Reference ²	TF Vol from Surface Soil	TF Vol from Subsurface Soil	Organic Liquid	Boiling Point (degrees C)	Degradation Coefficient (L/d, yr ¹)
DICHLOROPHENOL, 2,4- (2,4-D)	120-83-2 94-75-7	0.003 0.01	I I					160 59	4600 677	1 4,5,6,7,10			210 215	5.88 1.38
DICHLOROPHENOXYACETIC ACID, 2,4-														
DICHLOROPROPANE, 1,2-	78-87-5	0.04	P	0.037	P	47	X	2700	1.3	13016		X	96	0.10
DICHLOROPROPANE, 1,3-	542-75-6	0.03	I	0.1	I	27	X	2700	6	13038		X	108	22.38
DICHLOROPROPIONIC ACID, 2,2-	75-89-0	0.03	I			62	X	500000	5	12349		X	190	2.11
DICHLOROS	62-73-7	0.0095	I	0.29	I	50		10000	2.45			X	234	
DICYCLOPENTADIENE	77-73-6	0.008	P	0.0035	X	810	X	40	5	12957			167	
DIELDRIN	60-57-1	0.00005	I	18	I	11000		1000000	2.3			X	385	0.12
DIETHANOLAMINE	111-42-2	0.002	P		P	4		1000000	4.5			X	269	2.25
DIETHYL PHTHALATE	84-66-2	0.8	I			81		1080	4.5			X	268	
DIMETHYLAMINE	124-40-3	0.001	I			1000		160000	6	12978		X	160	
DIMETHOXY METHYLPHOSPHONATE	1445-26-6	0.08	I			110	X	25000	4				361	2.26
DIMETHOXYBENZIDINE, 3,3-	60-51-5	0.0022	O			1300		60	9				331	0.69
DIMETHIRIN	119-90-4			1.6	P	27000		0.098	13				353	
DIMETHYLAMINOXOBENZENE, P-	70-38-2	0.3	M			1000		13.5	5.6	12944		X	335	4.50
DIMETHYLAMINE	60-31-7	0.002	I	0.02	G	1000	X	1300	5.6	12944		X	300	18.07
DIMETHYLBENZIDINE, 3,3-	119-93-7					22,000		1300	10				181	
DIMETHYL METHYLPHOSPHONATE	756-79-6	0.08	P	0.017	P	5	X	1000000	14	12568		X	211	18.07
DIMETHYLPHENOL, 2,4-	105-67-9	0.02	I			130		7869	1.4				291	0.69
DINITROBENZENE, 1,3-	99-65-0	0.0001	I			150		523	3.5				302	0.69
DINITROBENZENE, 1,4-	152-55-6	0.0001	I			0.5		230	4.6				300	0.69
DINITROTOLUENE, 2,4-	121-44-3	0.002	I			51		200	6				300	0.69
DINITROTOLUENE, 2,6- (2,6-DNT)	608-20-2	0.0003	X	1.3	P	74		200	6				223	1.03
DINOSER	88-85-7	0.001	I			120		50	5				101	0.69
DIOXANE, 1,4-	123-81-1	0.03	I	0.1	I	7.8	X	1000000	5	12566		X	210	4.50
DIPHENAMID	957-51-7	0.03	I			200		280	5				309	0.69
DIPHENYLAMINE	122-66-7	0.1	O			660	X	700000	8	13375			309	0.69
DIPHENYLDIAZINE, 1,2-														
DICUAT	85-00-7	0.0022	I	0.8	I	2.6		700000	5			X	355	6.02
DISULFOTON	289-04-4	0.00004	I			1000		25	4.5				332	6.02
DITHIANE, 1,4-	505-29-3	0.01	I			22.7	X	3000	15	12976			199	
DURON	338-56-7	0.002	I			200		42	2.4				254	
ENDOSULFAN	1417-87-0	0.001	I			2000		0.5	6				401	2.78
ENDOSULFAN (ALPHA)	859-98-8	0.008	S ¹			2000		0.5	6				401	

¹Aqueous solubility references are keyed to the numbered list found at § 250.304(f) (relating to MSCs for groundwater). Where there are multiple sources cited, the table value is the median of the values in the individual sources.

Toxicity Value Sources:
C = California EPA
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D = ATSDR Minimal Risk Level
M = EPA Peer-Reviewed Toxicity Value
TE = TERA ITER Peer-Reviewed Toxicity Value
Summary Table (HEAST)
I = Integrated Risk Information System (IRIS)
P = EPA Peer-Reviewed Toxicity Value Appendix
Regulations and Health Advisories

S¹ Acenaphthene surrogate
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Appendix A
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A. Organic Regulated Substances

Regulated Substance	CAS	RfDo (mg/kg-d)	CSFo (mg/kg-d) ¹	RfC (mg/m ³)	IUR (µg/m ³) ¹	Koc	VOC? ²	Aqueous Sol (mg/L)	Aqueous Sol Reference ³	TF Vol from Surface Soil	TF Vol from Subsurface Soil	Organic Liquid	Boiling Point (degrees C)	Degradation Coefficient [D] (yr ⁻¹)
ENDOSULFAN II (BETA)	33213-85-9	0.006 S ⁴				2300		0.45	6				390	
ENDOSULFAN SULFATE	10545-68-3	0.005 S ⁴				2300		0.45	6				390	
ENDOSULFAN SULFATE	145-72-3	0.002 I				2300		0.45	6				390	
ENDOSULFAN SULFATE	145-72-3	0.003 I				11000		0.23	4.67.9				245	
EPICHLORHYDRIN	106-89-8	0.005 P	0.0059 I	0.001 I	0.0000012 I	35	X	65000	1.34	12972		X	116	4.50
ETHOPHOS	16672-87-0	0.005 I				8700		1240000	12				201	
ETHION	553-12-2	0.005 I				8700		10000	4.59	13100		X	415	4.50
ETHANOL, 2- (EGEE)	140-68-5	0.005 P		0.07 P		56		50000	1.234.6	12953		X	71	18.07
ETHYL ACETATE	141-78-6	0.005 P	0.048 H			110	X	15000	1.26	12951		X	100	18.07
ETHYL BENZENE	100-41-4	0.1 I	0.011 C	1 I	0.0000025 C	220	X	161	1.34	13004		X	136	1.11
ETHYL DIPROPYLTHIOCARBAMATE, S-	759-84-4	0.05 O				240	X	365	2	13056		X	127	
ETHYL ETHER	60-29-7	0.2 I				68	X	6400	1	12982		X	35	
ETHYL METHACRYLATE	87-63-2	0.09 H		0.3 P		22	X	4635.5	9.10	12981		X	117	
ETHYLENE CHLORHYDRIN	107-07-3	0.02 P				1	X	1000000	9	13006		X	128	
ETHYLENE GLYCOL	107-21-1	2 I		0.4 C		4.4	X	1000000	2	13004		X	198	10.54
ETHYLENE THIOUREA (ETU)	89-45-7	0.00098 I	0.045 C		0.000013 C	0.23		20000	2				347	4.50
ETHYLENE THIOUREA (ETU)	2104-64-5	0.00001 I				1.200		3.1	4				215	
ETHYLPHOSPHORIC THIOATE														
FENAMIPHOS	22224-92-6	0.00025 I				300		329	2				350	
FENVALERATE (PYDRIN)	51630-85-1	0.025 I				4400		0.085				X	300	
FENVALERATE (PYDRIN)	51630-85-1	0.025 I				4400		0.085				X	300	
FLUORANTHENE	208-44-6	0.04 I				49000		0.78	2.5.5.5				375	0.29
FLUORENE	86-73-7	0.04 I				7900	X	1.9	1.6	20155		25294	298	2.11
FLUOROTRICHLOROMETHANE (FREON 11)	75-69-4	0.3 I		0.7 H		130	X	1090	14.5.6	13107		X	24	0.35
FORMALDEHYDE	50-00-0	0.002 I	0.021 C	0.009 C	0.000013 I	1100		13	5.8			X	324	
FORMIC ACID	64-18-6	0.9 P		0.0003 X		3.6	X	50000	1	13046		X	21	18.07
FOSETHYL-AL	38-148-24-8	2.5 O				310	X	120000	2	12940		X	101	18.07
FURAN	110-00-9	0.001 I				130	X	10000		13019		X	31	2.25
FURFURAL	89-01-1	0.003 I	0.0349 O	0.05 H		63	X	91000	12.3	12988		X	162	
HEPTACHLOR	107-06-6	0.0005 I	4.5 I		0.0013 I	6800		0.18	4.67				310	46.84
HEPTACHLOR EPOXIDE	1024-57-3	0.000013 I	9.1 I		0.0026 I	21000		0.311	4.67.9				341	0.23

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C = California EPA
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H = Health Hazard
I = Integrated Risk Information System (IRIS)
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S⁴ = EPA Provisional Peer-Reviewed Toxicity Value
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Value Appendix
Regulations and Health Advisories

S¹ Acenaphthene surrogate
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Appendix A
Table 5—Physical and Toxicological Properties
A. Organic Regulated Substances

Regulated Substance	CAS	RfDo (mg/kg-d)	CSFo (mg/kg-d) ¹	RCF (mg/m ³)	IUR (μg/m ³) ¹	Koc	VOC?	Aqueous Sol (mg/L)	Aqueous Sol Reference ²	TF for Surface Soil	TF from Subsurface Soil	Organic Liquid	Boiling Point (degrees C)	Degradation Coefficient (L ₁₀ yr ⁻¹)
HEXACHLOROBENZENE	118-74-1	0.0008	I	1.6	I	3600		0.005	1.45				319	0.06
HEXACHLOROCYCLOPENTADIENE	74-83-3	0.001	P	0.078	I	7000		2.18	4.57			X	215	0.50
HEXACHLOROCYCLOHEPTADIENE	77-49-3	0.008	I	0.00022	I	4000		0.18	5.6			X	235	4.50
HEXACHLOROTHANE	67-72-1	0.0007	I	0.0002	I	2200	X	50	1	14825	17421	X	187	0.69
HEXANE	110-54-3	0.06	H	0.7	I	3600	X	9.5	13.05	15056		X	69	
HEXAZINONE	51235-04-2	0.003	I			41		33000	1.2				408	
HEXTHIAZOX (SAVE)	78587-05-0	0.005	I			6500		0.5	2				539	
HYDRAZINEHYDRAZINE SULFATE	302-01-2	0.05	I			100000							112	
HYDROQUINONE	123-31-9	0.04	P	0.0003	P	0.0063	X	100000	2	13026	14952	X	112	18.07
INDENOL 2,3-DIPIRENE	193-39-5	1.2	C			10		7000	2.5	5			285	18.07
IPRODIONE	36734-19-7	0.04	I	0.0011	C	31000000		0.082	5				536	0.17
ISOBUTYL ALCOHOL	78-53-1	0.3	I			1,100		13	2				545	
ISOPROPYL ALCOHOL	67-63-2	0.0005	I			60	X	81000	1,3,4,5	12954	14956	X	108	17.57
ISOPROPYL METHYLPHOSPHONATE	1832-54-8	0.1	I	2	C	500		5000	13			X	230	4.9
KEPONE	143-50-0	0.0003	I	0.0046	C	55000		7.6	4			X	350	0.17
MALATHION	121-75-5	0.02	I			1300		143		4		X	351	2.46
MALEIC HYDRAZIDE	123-33-1	0.5	I			2.8		6000	4				260	
MALIC ACID	147-82-6	0.001	I			100		2.3	8				251	
METHACRYLONITRILE	126-98-7	0.005	D			53,000		23	8,10,12				382	
METHAMIDOPHOS	10265-92-6	0.0005	I	0.03	P	21	X	25700	1	12584	14625	X	90	
METHANOL	67-56-1	2	I			5		200000	5				223	
METHOXYMOL	15752-77-5	0.005	I	20	I	2.8	X	100000	2	13026	14954	X	65	36.14
METHOXETHANOL 2-	108-28-9	0.005	P			20		5000	4.5				228	
METHOXETHANOL 2-	109-86-4	0.005	P	0.02	I	6300		100000	2	13143	15115	X	129	0.69
METHYL ACRYLATE	96-33-3	0.03	H			30	X	243500	4.5,6	12982	14908	X	57	4.50
METHYL CHLORIDE	74-87-3	0.013	H	0.02	P	55	X	52000	1,2,5	12971	14892	X	70	18.07
METHYL ETHYL KETONE	78-93-3	0.6	I	0.000018	H	6	X	6180	1,2,3,4,5	13103	15038	X	24	4.50
METHYL ETHYL KETONE	78-93-3	0.0005	P			32	X	275000	1,2,3,4,5	12974	14897	X	80	2.97
METHYL ISOBUTYL KETONE	108-10-1	0.08	H	0.001	X	17	X	106500	1,2,4,5	12983	14910	X	117	18.07
METHYL ISOCYANATE	624-83-9	0.001	C	0.001	C	10	X	100000	7	13021	14955	X	40	
METHYL N-BUTYL KETONE (2-	581-78-6	0.005	I	0.03	I	54	X	17500	1	12955	14895	X	128	
HEXANONE	80-62-6	1.4	I			10	X	15600	1	13001	14934	X	109	4.50
METHYL METHACRYLATE	96-27-3	0.009	C	0.7	I	52		20000	2				203	

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I = Integrated Risk Information System (IRIS)
L = Lowest Observed Adverse Effect Level
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Regulated Substance	CAS	RfDo (mg/kg-d)	CSFo (mg/kg-d) ¹	RCd (mg/m ³)	IUR (µg/m ³) ¹	Koc	VOC?	Aqueous Sol Reference ³	TF Vol from Surface Soil	TF Vol from Subsurface Soil	Organic Liquid	Boiling Point (degrees C)	Degradation Coefficient [D] (yr ⁻¹)
METHYL PARATHION	298-00-0	0.00025	I										
METHYL PARATHION (ISOMERS)	298-00-0	0.005	H	0.64	H	790		4.56	12645	14853	X	348	3.61
METHYL TERBUTYL ETHER (MTBE)	2834-34-4					2,282	X	1,248	13074	14853	X	152	0.69
METHYLCHLOROPHENOXACETIC ACID (MCPA)	94-74-6	0.0005	I	3	I	112	X	5,63.9		14853		287	1.39
METHYLENE BIS(2-CHLOROANILINE)	101-14-4	0.002	P			3,000		10				379	
METHYLARITHALENE 2-	91-57-6	0.004	I	0.003	S ¹	16000	X	1	12955	14870	X	241	
METHYLSTYRENE ALPHA	98-93-9	0.07	H			660	X	9	12942	14850	X	163	
METOLACHLOR	51218-45-2	0.15	I			182	X	15	13035	14853	X	100	
METRIBUZIN	21087-64-9	0.025	I			95	X	1200	15	14853		367	
METVINPHOS	7789-34-7	0.00025	O			44	X	60000	6	12947			
METHYLCHLOROPHENOXACETIC ACID	94-74-6	0.00025	H			0.4	X	85000	3	13094		169	
NAPHTHALENE	91-20-3	0.02	I	0.003	I	950	X	30	15323	15323		218	0.98
NAPHTHYLAMINE 1-	134-32-7	0.12	I	0.003	I	3200	X	1690	2	15517		301	0.69
NAPHTHYLAMINE 2-	91-59-8	0.12	O			87		6.4	6	18366		306	0.69
NAPROPAMIDE	15299-99-7	0.01	X			860		70	2			399	
NITROANILINE O	86-74-8	0.001	X	0.0005	X	2	X	1200	2	14866		264	
NITROANILINE P	100-02-7	0.002	P	0.003	P	2		5	12967			211	
NITROBENZENE	98-96-3	0.002	I	0.009	I	130	X	2000	2	12940	X	231	0.64
NITROGUANIDINE	556-88-7	0.1	I			0.13		4400	9				
NITROPHENOL 2-	88-75-5	0.008	S ¹			37	X	2100	1,2,3,4,5,6	12956		215	9.01
NITROPHENOL 4-	100-02-7	0.008	M			230	X	16000	2	12960		279	25.81
NITROPHENOL 6-	100-02-7	0.008	M			26	X	93000	10	12974	X	170	0.69
NITROSCODIETHYLAMINE N-	62-75-9	0.000008	P	0.02	I	85	X	100000	2	13001	X	154	0.69
NITROSCODIMETHYLAMINE N-	62-75-9	0.000008	P	0.00004	X	85	X	100000	2	13001	X	154	0.69
NITROSCODIN-BUTYLAMINE N-	924-16-3	5.4	I			450	X	1200	9, 10, 11	13008	X	235	0.69
NITROSCODIN-PROPYLAMINE N-	621-64-7	0.002	C			11	X	9900	6	12966	X	206	0.69
NITROSCODIPHENYLAMINE N-	86-30-6	0.049	I			580	X	35	1	13148	X	269	3.72
NITROSCODIPHENYLAMINE N-	78-22-9	0.000028	C			580	X	35	1	13148	X	269	3.72
OCTYL PHTHALATE CHA	117-84-0	0.01	P			98000000		3	5		X	234	0.69
OXAMYL (VTDAT)	23135-22-0	0.025	I			7.1		280000	2			334	
PARAQUAT	1910-42-5	0.0045	I			16200		660000	6.8			352	
PARATHION	56-38-2	0.00003	O			2300		20	2,4,5,6,7		X	375	
PENTACHLOROPOLYBUTYLENE BIS(2,4,6-TRICHLOROPHENOXY) BIS(2,4,6-TRICHLOROPHENOXY) PCB-1016 (AROCLORE)	1336-36-3					78100		0.6095	10.13			360	
PCB-1016 (AROCLORE)	12674-11-2	0.00007	I			110000		0.25	5		X	325	

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Value Appendix
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S² Trans-Crotonaldehyde surrogate
S³ 1,2-Dichloroethane surrogate
S⁴ Naphthalene surrogate
S⁵ 2-Naphthylamine surrogate
S⁶ 4-Nitrophenol surrogate
S⁷ 4-Nitrophenol surrogate
S⁸ Anthracene surrogate
S⁹ O-Toluidine surrogate
S¹⁰ 1,2,4-Trichlorobenzene surrogate

Appendix A
Table 5—Physical and Toxicological Properties
A. Organic Regulated Substances

Regulated Substance	CAS	RfDo (mg/kg-d)	CSFo ¹ (mg/kg-d) ¹	RfC (mg/m ³)	IUR (µg/m ³) ¹	Koc	VOC ²	Aqueous Sol Reference ³	TF Vol from Surface Soil	TF Vol from Subsurface Soil	Organic Liquid	Boiling Point (degrees C)	Degradation Coefficient [D] (yr ⁻¹)
PCB-121 (AROCLO)	11104-28-2		2 S ⁴		0.0001 S ⁵	1900	X	0.59		16032	X	275	
PCB-122 (AROCLO)	11104-29-9		2 S ⁴		0.0001 S ⁵	4800		0.15			X	270	
PCB-123 (AROCLO)	15469-31-5		2 S ⁴		0.0001 S ⁵	4800		0.15			X	320	
PCB-124 (AROCLO)	12672-28-6		2 S ⁴		0.0001 S ⁵	190000		0.054			X	340	
PCB-124 (AROCLO)	11097-89-1	0.0002 I			0.0001 S ⁵	810000		0.057			X	365	
PCB-125 (AROCLO)	11096-82-5		2 S ⁴		0.0001 S ⁵	1800000		0.08			X	385	
PERFLUOROPOLYETHER	11147-71-2	0.05 H				630		92			X	303	
PENTACHLOROBENZENE	68896-84-5	0.0058 I				1905		1.51			X	280	0.37
PENTACHLOROBENZENE	82-68-8	0.003 I	0.09 P			7900	X	0.44		15102	X	328	0.36
PENTACHLORONITROBENZENE	87-86-5	0.005 I	0.28 H			20000		1.4				310	0.17
PERFLUOROBUTANE SULFONATE	375-73-5	0.0003 P			0.0000051 C	617		56600			X	211	
PERFLUOROOCTANE SULFONATE (PFOS)	1763-23-1	0.00002 M	0.07 M			2.57		680				258	
PERFLUOROOCTANOIC ACID (PFOA)	335-67-1	0.00002 M				2.06		9500				192	
PHENACETIN	62-44-2		0.0022 C		0.0000063 C	763		763				341	4.50
PHENANTHRENE	85-91-8	0.3 S ⁴				38000	X	1.1		70721		341	0.63
PHENYL MERCAPTAN	108-98-5	0.001 P		0.2 C		8430	X	1.43		15189		170	26.14
PHENYLENEDIAMINE, M-	108-45-2	0.006 I				562	X	1.25		14869	X	170	
PHENYLPHENOL, 2-	90-43-7	0.006 I				351000		3				286	4.50
PHOSPHATE	298-02-2	0.0002 O	0.0194 H			700		5			X	260	18.07
PICOLINIC ACID	124-42-9	0.07 I				810		50				319	
PICLORAM	1918-02-9	0.07 I				15	X	1.5		13018		275	
PROMETON	1610-18-0	0.015 I		0.02 C		346		750		14565		347	
PRONAMIDE	23950-58-5	0.075 I				200		15				321	
PROPACHLOR	1918-16-7	0.013 I				139	X	2		12952		110	1.73
PROPYLALCOHOL	709-88-8	0.005 I				225		2		14865		385	
PROPYLALCOHOL, 2- (ISOPROPYLALCOHOL)	67-58-5	0.02 I		0.2 P		1000	X	1.5		14908	X	316	
PROPYLALCOHOL, 2- (ISOPROPYLALCOHOL)	139-40-2	0.02 I				165		8.6				257	
PROPYLAMINE	122-42-9	0.02 I				51		250				257	
PROPYLBENZENE, N-	103-65-1	0.1 X		1 X		720	X	52		14891	X	159	
PROPYLENE OXIDE	75-56-9	0.001 O	0.24 I	0.03 I	0.0000037 I	25		405000		15057	X	34	
PYRENE	229-30-0	0.03 I				6800		0.132				393	0.07
PYRIMIDINE	80-06-7	0.001 I				13	X	1			X	216	
PYRIDINE	110-58-1	0.001 I				0.0066 X		100000		15114	X	115	18.07

¹Aqueous solubility references are keyed to the numbered list found at § 250.304(f) (relating to MSCs for groundwater). Where there are multiple sources cited, the table value is the median of the values in the individual sources.

Toxicity Value Sources:
C = California EPA
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S⁴ = EPA Provisional Peer-Reviewed Toxicity Value
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S¹ Acenaphthene surrogate
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S⁹ O-Toluidine surrogate
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Appendix A
Table 5—Physical and Toxicological Properties
A. Organic Regulated Substances

Regulated Substance	CAS	RfDo (mg/kg-d)	CSFo (mg/kg-d) ¹	RfC (mg/m ³)	IUR (µg/m ³) ¹	Koc	VOC? ²	Aqueous Sol Reference ³	TF Vol from Surface Soil	TF Vol from Subsurface Soil	Organic Liquid	Boiling Point (degrees C)	Degradation Coefficient (D ₅₀ yr ⁻¹)
QUINOLINE	91-22-5		3	I		1,300		60000	1.3		X	238	12.65
NOZALOP (ASSURE)	7657-24-8	0.059	I			500		100	2			230	
NOZALOP	187-42-2	0.004	I			20		49.3	1.9			245	
RESORCINOL	108-46-3	2	TE			2		717000				280	
RONNEL	289-84-3	0.05	H			580		40	5			349	
SIMAZINE	122-34-9	0.005	I	0.12	H	110		5	2			225	
STRYCHNINE	57-24-9	0.0003	I			280		143				270	4.50
TERBUTHION	100-91-5	0.01	I			620	X	2500	2	12942	X	354	1.20
TERBUTHION	34014-18-1	0.07	I	1		620		2500	2			396	
TERBACIL	5902-51-2	0.013	I			53		710	2			332	
TERBUTHION	13071-79-9	0.00025	H			510		5	6		X	245	0.69
TETRACHLOROBENZENE 1,2,4,5-	95-94-3	0.0003	I			1,800		0.0683	15.67			412	0.21
TETRACHLOROBENZOP-D-DIOXIN,	1746-016	0.000000007	I	0.00000004	C	4300000		0.000183	6				
TETRACHLOROETHANE 1,1,1,2-	630-20-6	0.03	I	0.0000074	I	980	X	1100	1	12960	X	131	3.79
TETRACHLOROETHANE 1,1,2,2-	79-34-5	0.02	I	0.000056	I	79	X	2860	2	12957	X	147	0.56
TETRACHLOROETHYLENE (PCE)	127-18-4	0.006	I	0.0000026	I	300	X	162	1.3, 4.5	13017	X	121	0.03
TETRACHLOROPHENOL 2,3,4,6-	58-90-2	0.03	I			6200		183	6			269	0.69
TETRAETHYLTHIOPYROPHOSPHATE	369-24-5	0.0005	I			590		25	2		X	349	4.50
TETRAHYDROFURAN	109-99-9	0.009	I	0.00000194	I	43	X	300000	1.67	12970	X	66	
THIOANOX	391-95-18-4	0.0003	H	0.0022		1000		5200	9			260	
THIAM	137-26-8	0.015	O			30		30	4			339	
TOLUENE	108-88-3	0.08	I	5	I	130	X	532.4	1.2, 3.4	13016	X	111	9.01
TOLUENE M	108-88-3	0.016	S ¹			1000		1000	2		X	111	
TOLUENE O	95-53-4	0.018	P	0.000051	S	410		15000	1.3		X	203	18.07
TOLUENE P	95-53-4	0.018	P	0.000051	C	410		15000	1.3		X	203	18.07
TOXAPHENE	8001-35-2	0.004	X	0.0032	I	320		7410	1.3			200	
TRALLATE	2303-17-5	0.0009	P	1.1	I	1500		3	2.4, 5			432	
TRICHLOROETHANE (BROMOFORM)	75-55-2	0.02	O	0.000011	I	2,000	X	3900	1.2, 3.4	12942	X	343	0.65
TRICHLORO-1,2,2-TRIFLUOROETHANE, 1,1,2-	76-15-1	0.02	I	5	P	1,200	X	170	1	13064	X	48	0.35
TRICHLOROACETIC ACID	76-03-9	0.02	I			20	X	1200000	2.3, 5.9	13291		166	
TRICHLOROBENZENE 1,2,4-	120-82-1	0.01	I	0.002	P	1500		44.4	1.4, 6.7	13217	X	213	0.69
TRICHLOROBENZENE 1,3,5-	108-76-3	0.05	M	0.02	S ¹	3100	X	148	1.4, 5	13671	X	209	0.05
TRICHLOROBENZENE 1,3,5-	108-76-3	0.05	M	0.02	S ¹	3100	X	148	1.4, 5	13671	X	209	0.05
TRICHLOROETHANE 1,1,2-	79-30-5	0.004	I	0.0002	X	76	X	4420	1	12982	X	114	0.03

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C = California EPA
O = EPA Office of Pesticide Programs Human Health Benchmarks for Pesticides
D = ATSDR Minimal Risk Level
H = Health Hazard
M = Moderate Hazard
P = EPA Provisional Peer-Reviewed Toxicity Value
S¹ = Summary Table (HEAST)
I = Integrated Risk Information System (IRIS)
R = EPA Provisional Peer-Reviewed Toxicity Value Appendix
Regulations and Health Advisories

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Appendix A
Table 5—Physical and Toxicological Properties
A. Organic Regulated Substances

Regulated Substance	CAS	RfDo (mg/kg-d)	CSFo (mg/kg-d) ¹	RfC (mg/m ³)	IUR (µg/m ³) ¹	Koc	VOC? ²	Aqueous Sol Reference ³	TF Vol from Surface Soil	TF Vol from Subsurface Soil	Organic Liquid	Boiling Point (degrees C)	Degradation Coefficient [D] (yr ⁻¹)
TRICHLOROETHYLENE (TCE)	79-016	0.0005	I	0.002	I	83	X	1100	1	13070	X	87	0.02
TRICHLOROETHYLENE, 2,4,6-	88-461	0.001	I			2400		850	1.4			246	0.14
TRICHLOROPHENOL	88-063	0.001	P			1400		850	1.4			246	0.14
TRICHLOROPHENOXACETIC ACID, 2,4,5- (2,4,5-T)	83-76-5	0.01	I		0.000033	43		278	24.5			278	1.38
TRICHLOROPHENOXYPROPIONIC ACID, 2,4,5- (2,4,5-T) SILEX ⁴	93-72-1	0.008	I			1700		140	2			353	
TRICHLOROPROPANE, 1,1,1-	598-77-8	0.005	I										
TRICHLOROPROPANE, 1,1,2-	598-77-8	0.004	I			24	X	2700	14	13145	X	117	
TRICHLOROPROPENE, 1,2,3-	96-18-4	0.003	X			260	X	1886	14.6	12974	X	157	0.35
TRIETHYLAMINE	121-44-8			0.003	P	190	X	2700	14	13047	X	142	
TRIETHYLENE GLYCOL	112-27-6	2	P	0.007	I	51	X	65000	1.4	12951	X	90	
TRIMETHYLENE GLYCOL	109-63-8	0.001	I			7		100000	2.5	12951	X	285	
TRIMETHYLBENZENE, 1,3,4-	95-93-8	0.01	I	0.06	I	2,200	X	58	1	12978	X	165	4.50
TRIMETHYLBENZENE, 1,2,4-	108-67-8	0.01	I			660	X	48.9	1	12951	X	165	
TRINITROGLYCEROL	55-63-0	0.0001	P	0.017	P	116	X	1800	2.35	12941	X	190	18.07
TRINITROTOLUENE, 2,4,6-	118-96-7	0.0005	I										
VINYL ACETATE	108-05-4	1	H	0.2	I	1		100	2			240	
VINYL BROMIDE (BROMOETHENE)	593-60-2			0.03	I	2.8	X	20000	1	13017	X	73	
VINYL CHLORIDE	75-01-4	0.003	I	0.000032	H	150	X	4180	12	13086	X	16	0.09
VINYL CYCLOHEXANE	75-01-4	0.003	I	0.1	I	10	X	2700	1	13109	X	-13	0.09
XYLENES (TOTAL)	1330-50-2	0.003	I	0.1	I	300	X	176	43	12982	X	358	6.50
ZINCER	12122-87-7	0.05	I			18		10	4			474	0.93

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S¹⁰ 1,2,4-Trichlorobenzene surrogate

Appendix A
Table 5—Physical and Toxicological Properties
B. Inorganic Regulated Substances

<i>Regulated Substance</i>	<i>CAS</i>	<i>RfDo</i> (mg/kg-d)		<i>CSFo</i> (mg/kg-d) ⁻¹		<i>RfCi</i> (mg/m ³)		<i>IUR</i> (ug/m ³) ⁻¹		<i>Kd</i>
ALUMINUM	7429-90-5	1	P			0.005	P			9.9
ANTIMONY	7440-36-0	0.0004	I							45
ARSENIC	7440-38-2	0.0003	I	1.5	I	0.000015	C	0.0043	I	29
BARIUM AND COMPOUNDS	7440-39-3	0.2	I			0.0005	H			41
BERYLLIUM	7440-41-7	0.002	I			0.00002	I	0.0024	I	790
BORON AND COMPOUNDS	7440-42-8	0.2	I			0.02	H			3
CADMIUM	7440-43-9	0.0005	I			0.00001	D	0.0018	I	75
CHROMIUM III	16065-83-1	1.5	I							1,800,000
CHROMIUM VI	18540-29-9	0.003	I	0.5	C	0.000008	I	0.012	I	19
COBALT	7440-48-4	0.0003	P			0.000006	P	0.009	P	45
COPPER	7440-50-8	0.0325	H							430
CYANIDE, FREE	57-12-5	0.0006	I			0.0008	I			9.9
FLUORIDE	16984-48-8	0.04	C			0.013	C			
IRON	7439-89-6	0.7	P							25
LEAD	7439-92-1			0.0085	C			0.000012	C	900
LITHIUM	7439-93-2	0.002	P							300
MANGANESE	7439-96-5	0.14	I			0.00005	I			65
MERCURY	7439-97-6	0.00016	C			0.0003	I			52
MOLYBDENUM	7439-98-7	0.005	I			0.002	D			20
NICKEL	7440-02-0	0.02	I			0.00009	D	0.00024	Is	65
NITRATE NITROGEN	14797-55-8	1.6	I							
NITRITE NITROGEN	14797-65-0	0.1	I							
PERCHLORATE	7790-98-9	0.0007	I							0
SELENIUM	7782-49-2	0.005	I			0.02	C			5
SILVER	7440-22-4	0.005	I							8.3
STRONTIUM	7440-24-6	0.6	I							
THALLIUM	7440-28-0	0.00001	X							71
TIN	7440-31-5	0.6	H							250
VANADIUM	7440-62-2	0.005	Id			0.0001	D			1,000
ZINC	7440-66-6	0.3	I							62

Toxicity Value Sources:

C = California EPA Cancer Potency Factor

D = ATSDR Minimal Risk Level

H = Health Effects Assessment Summary Table (HEAST)

I = Integrated Risk Information System (IRIS)

P = EPA Provisional Peer-Reviewed Toxicity Value

X = EPA Provisional Peer-Reviewed Toxicity Value Appendix

Id = IRIS derived—Value derived from the IRIS oral RfD for Vanadium Pentoxide (0.009 mg/kg-day). Vanadium constitutes 56% of the molecular weight of the Vanadium Pentoxide molecule. 0.009 mg/kg-day × 0.56 = 0.005 mg/kg-day.

Appendix A
Table 6—Threshold of Regulation Compounds

REGULATED SUBSTANCE	CASRN	ALL AQUIFER GROUNDWATER MSC (µg/L)	Residential Soil MSC (mg/kg) 0—15 feet	Non-Residential Soil MSCs		Soil to Groundwater ¹ (mg/kg)
				Surface Soil (mg/kg) 0—2 feet	Subsurface Soil (mg/kg) 2—15 feet	
ACETIC ACID	64-19-7	5	100	100	100	0.5
ACETIC ANHYDRIDE	108-24-7	5	100	100	100	0.5
AMYL ACETATE, N-	628-63-7	5	100	100	100	0.5
AMYL ACETATE, SEC-	626-38-0	5	100	100	100	0.5
ANTU (ALPHA-NAPHTHYLTHIOUREA)	86-88-4	5	100	100	100	0.5
BHC, DELTA	319-86-8	5	100	100	100	0.5
BROMOPHENYL PHENYL ETHER, 4-	101-55-3	5	100	100	100	0.5
BUTYL ACETATE, N-	123-86-4	5	100	100	100	0.5
BUTYL ACETATE, SEC-	105-46-4	5	100	100	100	0.5
BUTYL ACETATE, TERT-	540-88-5	5	100	100	100	0.5
BUTYLAMINE, N-	109-73-9	5	100	100	100	0.5
CALCIUM CHROMATE	13765-19-0	5	100	100	100	0.5
CALCIUM CYANAMIDE	156-62-7	5	100	100	100	0.5
CARBONYL FLUORIDE	353-50-4	5	100	100	100	0.5
CATECHOL	120-80-9	5	100	100	100	0.5
CHLOROETHYL VINYL ETHER, 2-	110-75-8	5	100	100	100	0.5
CHLOROPHENYL PHENYLETHER, 4-	7005-72-3	5	100	100	100	0.5
DECABORANE	17702-41-9	5	100	100	100	0.5
DIETHYLAMINE	109-89-7	5	100	100	100	0.5
DIGLYCIDYL ETHER (DGE)	2238-07-5	5	100	100	100	0.5
DIMETHYL PHTHALATE	131-11-3	5	100	100	100	0.5
DIMETHYL SULFATE	77-78-1	5	100	100	100	0.5
DIMETHYLPHENETHYLAMINE, ALPHA, ALPHA-	122-09-8	5	100	100	100	0.5
DIOXATHION	78-34-2	5	100	100	100	0.5
ETHYL METHANESULFONATE	62-50-0	5	100	100	100	0.5
ETHYLAMINE	75-04-7	5	100	100	100	0.5
FAMPHUR	52-85-7	5	100	100	100	0.5
FENSULFOTHION	115-90-2	5	100	100	100	0.5

Appendix A
Table 6—Threshold of Regulation Compounds

REGULATED SUBSTANCE	CASRN	ALL AQUIFER GROUNDWATER MSC (µg/L)	Residential Soil MSC (mg/kg) 0—15 feet	Non-Residential Soil MSCs		Soil to Groundwater ¹ (mg/kg)
				Surface Soil (mg/kg) 0—2 feet	Subsurface Soil (mg/kg) 2—15 feet	
HEXACHLOROPROPENE	1888-71-7	5	100	100	100	0.5
IODOMETHANE	74-88-4	5	100	100	100	0.5
ISOAMYL ACETATE	123-92-2	5	100	100	100	0.5
ISOBUTYL ACETATE	110-19-0	5	100	100	100	0.5
ISODRIN	465-73-6	5	100	100	100	0.5
ISOPHORONE DIISOCYANATE	4098-71-9	5	100	100	100	0.5
ISOSAFROLE	120-58-1	5	100	100	100	0.5
LITHIUM HYDRIDE	7580-67-8	5	100	100	100	0.5
MANGANESE CYCLOPENTADIENYL TRICARBONYL	12079-65-1	5	100	100	100	0.5
METHYL ISOAMYL KETONE	110-12-3	5	100	100	100	0.5
METHYL MERCAPTAN	74-93-1	5	100	100	100	0.5
METHYLAMINE	74-89-5	5	100	100	100	0.5
MONOCROTAPHOS	6923-22-4	5	100	100	100	0.5
NAPHTHOQUINONE, 1,4-	130-15-4	5	100	100	100	0.5
NITRIC ACID	7697-37-2	5	100	100	100	0.5
NITROQUINOLINE-1-OXIDE, 4-	56-57-5	5	100	100	100	0.5
OSMIUM TETROXIDE	20816-12-0	5	100	100	100	0.5
PENTABORANE	19624-22-7	5	100	100	100	0.5
PERCHLOROMETHYL MERCAPTAN	594-42-3	5	100	100	100	0.5
PICOLINE, 2-	109-06-8	5	100	100	100	0.5
PROPANOL, 1-	71-23-8	5	100	100	100	0.5
PROPIONIC ACID	79-09-4	5	100	100	100	0.5
PROPIONITRILE (ETHYL CYANIDE)	107-12-0	5	100	100	100	0.5
PROPYLENE IMINE	75-55-8	5	100	100	100	0.5
QUINONE (p-BENZOQUINONE)	106-51-4	5	100	100	100	0.5
SELENIUM HEXAFLUORIDE	7783-79-1	5	100	100	100	0.5
SODIUM BISULFITE	7631-90-5	5	100	100	100	0.5
SULFIDE	18496-25-8	5	100	100	100	0.5

Appendix A
Table 6—Threshold of Regulation Compounds

REGULATED SUBSTANCE	CASRN	ALL AQUIFER GROUNDWATER MSC (µg/L)	Residential Soil MSC (mg/kg) 0—15 feet	Non-Residential Soil MSCs		Soil to Groundwater ¹ (mg/kg)
				Surface Soil (mg/kg) 0—2 feet	Subsurface Soil (mg/kg) 2—15 feet	
SULFUR MONOCHLORIDE	10025-67-9	5	100	100	100	0.5
SULFURIC ACID	7664-93-9	5	100	100	100	0.5
TELLURIUM	13494-80-9	5	100	100	100	0.5
TELLURIUM HEXAFLUORIDE	7783-80-4	5	100	100	100	0.5
TEPP (TETRAETHYL PYROPHOSPHATE)	107-49-3	5	100	100	100	0.5
TETRANITROMETHANE	509-14-8	5	100	100	100	0.5
THIONAZIN	297-97-2	5	100	100	100	0.5
TRIETHYLPHOSPHOROTHIOATE, O ₃ O ₂	126-68-1	5	100	100	100	0.5

¹ The value in the table is 100 times the groundwater MSC.

The option to use the SPLP is also available to calculate the soil to groundwater numeric value (See § 250.310 (relating to minimum threshold MSCs))

Appendix A			
Table 7—Default Values for Calculating Medium-Specific Concentrations for Lead			
<i>Input Values Used in UBK Model for Lead (for residential exposure scenario)</i>			
Geometric Standard Deviation (GSD)	1.42 (default)	Drinking water intake	Model default
Outdoor air lead concentration	0.2 µg/m ³ (default)	Soil lead level	495 µg/g
Indoor air lead concentration (% of outdoor)	30	Indoor dust lead level	495 µg/g
Time spent outdoors	Model default	Soil/dust ingestion weighting factor (%)	45
Ventilation rate	Model default	Paint lead intake	Model default
Lung absorption	Model default	Maternal contribution method	Infant model
Dietary lead intake	Model default	Mother's blood lead at birth	7.5 µg/dL blood (model default)
GI method/bioavailability	Non-linear	Target blood lead level	10 µg/dL blood
Lead concentration in drinking water	4.00 µg/L (default)		

<i>Input Values Used in SEGH Equation (for nonresidential exposure scenario)</i>	
Concentration of lead in soil (S)	987 µg/g
Target blood lead level in adults (T)	20 µg/dL blood
Geometric standard deviation of blood lead distribution (G)	1.4
Baseline blood lead level in target population (B)	4 µg/dL blood
Number of standard deviations corresponding to degree of protection required for the target population (n)	1.645 (for 95% of population)
Slope of blood lead to soil lead relationship (δ)	7.5 µg/dL blood per µg/g soil

REFERENCE

WIXSON, B.G. (1991). *The Society for Environmental Geochemistry and Health (SEGH) Task Force Approach to the Assessment of Lead in Soil. Trace Substances in Environmental Health. 11—20.*

TABLE 8
CONSTITUENTS OF POTENTIAL ECOLOGICAL CONCERN

<i>METALS</i>	<i>ORGANICS</i>
Arsenic III	Dichlorobenzene,1,3-
Arsenic V	Dichlorobenzene,1,4-
Barium	Dieldrin
Beryllium	Diethyl phthalate
Cadmium	Di-n-butyl phthalate
Chromium III	Endosulfan (mixed isomers)
Chromium VI	Endosulfan, alpha
Cobalt	Endosulfan, beta
Copper	Endrin
Iron	Ethylbenzene
Lead	Fluoranthene
Manganese	Fluorene
Mercury, inorganic	Heptachlor
Mercury, methyl	Hexachloroethane
Molybdenum	Hexachlorocyclohexane (Lindane)
Nickel	Kepone *
Selenium	Malathion
Vanadium	Methoxychlor
Zinc	Mirex *
Cyanide	Naphthalene
	Pentachlorobenzene
<i>ORGANICS</i>	Pentachlorophenol
Acenaphthene	Polynuclear aromatic hydrocarbons
Aldrin *	Polychlorinated biphenyls (PCB)
Benzene	Phenanthrene
Benzo(a)pyrene	Pyrene
Biphenyl	Tetrachloroethane,1,1,2,2-
Bis(2-ethylhexyl)phthalate	Tetrachloroethylene
Bromophenyl phenyl ether,4-	Tetrachloromethane
Butylbenzyl phthalate	Toluene
Chlordane *	Toxaphene
Chlorobenzene	Tribromomethane
DDT (and metabolites)	Trichlorobenzene,1,2,4-
Diazinon	Trichloroethane,1,1,1-
Dibenzofuran	Trichloroethylene
Dichlorobenzene,1,1-	Xylenes
Dichlorobenzene,1,2-	

Authority

The provisions of this Appendix A amended under sections 104(a) and 303(a) of the Land Recycling and Environmental Remediation Standards Act (35 P.S. §§ 6026.104(a) and 6026.303(a)); and section 1920-A of The Administrative Code of 1929 (71 P.S. § 510-20).

Source

The provisions of this Appendix A amended November 23, 2001, effective November 24, 2001, 31 Pa.B. 6395; amended January 7, 2011, effective January 8, 2011, 41 Pa.B. 230; corrected February 11, 2011, effective January 8, 2011, 41 Pa.B. 840; corrected March 19, 2011, effective March 5, 2011, 41 Pa.B. 1458; corrected May 16, 2014, effective March 5, 2011, 44 Pa.B. 2975; corrected May 30, 2014, effective February 2, 2002, 44 Pa.B. 3235; amended August 26, 2016, effective August 27, 2016, 46 Pa.B. 5655; amended March 16, 2018, effective March 17, 2018, 48 Pa.B. 1503; amended November 19, 2021, effective November 20, 2021, 51 Pa.B. 7173; amended November 10, 2023, effective November 11, 2023, 53 Pa.B. 6998. Immediately preceding text appears at serial pages (407386) to (407441).

Cross References

This appendix cited in 25 Pa. Code § 250.301 (relating to scope); 25 Pa. Code § 250.304 (relating to MSCs for groundwater); 25 Pa. Code § 250.305 (relating to MSCs for soil); 25 Pa. Code § 250.306 (relating to ingestion numeric values); 25 Pa. Code § 250.308 (relating to soil to groundwater pathway numeric values); 25 Pa. Code § 250.310 (relating to minimum threshold MSCs); 25 Pa. Code § 250.311 (relating evaluation of ecological receptors); 25 Pa. Code § 250.312 (relating to final report); 25 Pa. Code § 250.605 (relating to sources of toxicity information); and 25 Pa. Code § 250.707 (relating to statistical tests).

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