Annex A

TITLE 25. ENVIRONMENTAL PROTECTION

PART I. DEPARTMENT OF ENVIRONMENTAL PROTECTION

Subpart D. ENVIRONMENTAL HEALTH AND SAFETY

ARTICLE VI. GENERAL HEALTH AND SAFETY

CHAPTER 250. ADMINISTRATION OF LAND RECYCLING PROGRAM

Subchapter A. GENERAL PROVISIONS

Editor's Note: Changes at proposed rulemaking are bolded and underscored; deletions are bolded and bracketed. Changes made at final rulemaking are bolded, capitalized and underscored; deletions are bolded, bracketed, and contain strikethroughs. Changes at proposed rulemaking that are deleted at final rulemaking are bolded, underscored, bracketed, and contain strikethroughs.

§ 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.

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

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.

EQL--Estimated quantitation limit.

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.

MSC--Medium-specific concentration.

NIR--Notice of Intent to Remediate.

NPDES--National Pollutant Discharge Elimination System.

PQL--Practical quantitation limit.

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 91-97 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 a boiling point less than 200° centigrade at 1 atmosphere.

§ 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), a[~~A~~]t 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) [~~(relating to aquifer determination; current use and currently planned use of aquifer groundwater)~~]. The notice shall 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.

§ 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, provide:

(1) Public access at convenient locations for document review.

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

(3) 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, it shall be submitted with one of the following:

(1) A remedial investigation report under a site-specific remediation.

(2) A baseline environmental report under an SIA cleanup.

[~~(e) A public involvement plan shall be developed by the person making a precertification determination request under § 250.303(f) (relating to aquifer determination; current use and currently planned use of aquifer groundwater) in conjunction with all municipalities~~

~~serving the proposed nonuse aquifer area. The public involvement plan shall be implemented prior to submission of the precertification request to the Department. The public involvement plan shall contain at a minimum:~~

~~(1) A notice published in a local newspaper of general circulation and provided to the applicable municipality by letter. The notice to the municipality shall be made by the person initiating the request for nonuse aquifer determination. This notice shall provide a brief description of the area for which the nonuse aquifer designation is being requested.~~

~~(2) A public involvement plan with a 90-day comment period. The comment period shall be initiated at the time of the newspaper publication. The nonuse aquifer precertification request may not be submitted to the Department until the conclusion of the 90-day comment period. Comments received during the comment period shall be responded to and provided with the precertification request.~~

~~(3) Public access at convenient locations for document review.~~

~~(4) Designation of a single contact person to address questions from the community.~~

~~(5) A location near the proposed nonuse aquifer designation site for any public hearings and meetings that may be part of the public involvement plan.~~**]**

Subchapter C. STATEWIDE HEALTH STANDARDS

§ 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 **[~~the~~] A** site **IDENTIFIED IN AN NIR,** that groundwater is not used or currently planned to be used, **if**

(i) T[~~t~~]he public participation requirements of § 250.5 [~~and 250.6~~] (relating to public notice by applicant **[~~; and public participation~~]**) are met, and

(ii) I[~~i~~]f 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.

(iii) A NONUSE AQUIFER AREAWIDE CERTIFICATION OBTAINED UNDER SUBSECTION (f) MAY BE USED BY THE REMEDIATOR TO DEMONSTRATE THAT THE REQUIREMENTS OF SUBSECTION (c) ARE MET.

(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 **[or currently planned to be 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) PROVIDE DOCUMENTATION THAT, 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 (I.E., no currently planned future uses) [~~of the groundwater~~] in [~~that~~] THE area SPECIFIED IN SUBSECTION (b)(1)(ii) [~~by any community water supplier or use for agricultural purposes~~].

(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 NON-USE AQUIFER DETERMINATION, OR INCLUDE A POST-REMEDIATION CARE PLAN IN THE FINAL REPORT DETAILING THE ROUTINE PROCESS OF ASSESSING AND REPORTING TO THE DEPARTMENT. COMPLIANCE WITH SECTION 250.303(c). POSTREMEDIATION

CARE PLAN PROVISIONS SHALL BE ACKNOWLEDGED WITHIN THE DEED TO THE REMEDIATED PROPERTY UPON TRANSFER OF OWNERSHIP TO INSURE COMPLIANCE WITH SECTION 250.303(c). 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 PROPERTY BOUNDARY AND ALL POINTS DOWNGRADIENT THEREFROM.

(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) AREAWIDE CERTIFICATION.

(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 REQUIREMENTS ARE MET:

(i) THE MUNICPAL 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.

~~(f)~~ **[~~After receipt of a nonuse aquifer determination request, and receipt of the required public involvement plan, the Department may make a ''precertification'' determination that a specific geographic area meets the conditions of subsection (c). Only municipal authorities and political subdivisions are eligible to request this determination. If a municipal ordinance exists which provides for the fulfillment of all aspects of subsection (c), the person applying for a nonuse aquifer designation may use the existence of such an ordinance to demonstrate that the requirements of subsection (c) have been met. A determination made under this subsection expires after 3 years and may be updated at any time additional relevant information comes to the attention of the Department. At the end of the 3-year period, the applicant may request a renewal of determination from the Department.~~]**

[~~(g) Public participation requirements of §250.6(e) shall be met on all "pre-certification" requests.~~]

§ 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 is the MCL as established by the Department or the EPA (U. S. EPA, 1996. Drinking Water Regulations and Health Advisories. Office of Water. EPA 822-R-96-001). For a regulated substance where no MCL has been established, the MSC is the lifetime health advisory level (HAL) for that compound. For a regulated substance where neither an MCL nor a lifetime HAL is established, the MSC is 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).

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

T1/2—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 **[following]** references **in subsection (g),** which are keyed to the numbers in Table 5**[:]**. **The following procedure was used to determine the appropriate solubility value for each regulated substance: where multiple sources are cited in 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) Howard, P. H. 1991. *Handbook of Environmental Fate and Exposure Data for Organic Chemicals. Vol. III, Pesticides*. Lewis Publishers.

(2) Lyman, W. J., W. F. Reehl, and D. H. Rosenblatt. 1982. *Handbook of Chemical Property Estimation Methods*. McGraw-Hill Book Co. N. Y.

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

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

(5) Montgomery, J. H. 1991. *Groundwater Chemicals Desk Reference*. Vol. II. Lewis Publishers.

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

(7) Montgomery, J. H. 1993. *Agrochemicals Desk Reference, Environmental Data.* Lewis Publishers.

(8) National Library of Medicine (Grateful Med). *Hazardous Substances Databank*.

(9) Nirmalakhandan, N. N., and R. E. Speece. 1988a. *Prediction of Aqueous Solubility of Organic Chemicals Based on Molecular Structure*. ES&T 22:328-337.

(10) Nirmalakhandan, N. N., and R. E. Speece. 1988b. *Prediction of Aqueous Solubility of Organic Chemicals Based on Molecular Structure. 2. Application to PNAS, PCBs, PCDDs, etc.* ES&T. 23:708-713.

(11) Sax, N. I. 1989. *Dangerous Properties of Industrial Materials.* Seventh Edition. Vol. 1-3, Van Nostrand Reinhold.

(12) Environmental Protection Agency. Undated. *IRIS--The Integrated Risk Information System.*

(13) Environmental Protection Agency. 1985. *Physical/Chemical Properties and Characterization of RCRA Wastes According to Volatility. Office of Air Quality and Planning and Standards*. EA 450/3-85-007.

(14) Environmental Protection Agency. 1989. *Database of Chemical Properties for SARA. Section 313 Chemicals.*

(15) Environmental Protection Agency. 1992. *Handbook of RCRA Groundwater Monitoring Constituents: Chemical & Physical Properties*. 40 CFR Part 264, Appendix IX. Office of Solid Waste. Permits and State Programs Division. EPA 530-R-92-022.

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

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

(18) Windholz, M., ed. 1976. *The Merck Index.* 9th Ed. Merck and Co.]

(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) Montgomery, J. H. 1993. *Agrochemicals Desk Reference, Environmental Data.* Lewis Publishers.]~~

§ 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, 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** **[~~a~~]** **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.

Subchapter G. DEMONSTRATION OF ATTAINMENT

§ 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 **~~[volume] [LOCATION of]~~** soil to which the attainment criteria [~~is~~] **ARE** applied shall be determined by circumscribing with an irregular surface those concentrations detected during characterization which exceed the selected standard. **Where [~~SUCH~~] THIS soil is to be removed from the site, the attainment DEMONSTRATION applies to the [~~base of the excavation outlined~~] IRREGULAR SURFACE DEFINED by [~~that irregular surface~~] 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.

§ 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 four-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 areawide 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 shall 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 Statewide health standard

(iii) **[For sites that qualify as localized contamination sites under the document entitled ''Closure Requirements for Underground Storage Tank Systems'' (DEP Technical Guidance Document No. 2530-BK-DEP2008), where samples are taken in accordance with that document that result in fewer samples being taken than otherwise required in this section, no sample may exceed the Statewide health standard.]** **For sites with a petroleum release where full site characterization, AS DEFINED IN SECTION 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 excavation involving more than 1,000 cubic yards of contaminated soil, the Department will approve the confirmatory sampling plan.

(IV) Where water is encountered in the excavation and obvious contamination is observed or indicated, soil samples collected just above the soil/water interface shall [~~meet~~] BE EQUAL TO OR LESS THAN THE APPLICABLE STATEWIDE HEALTH [~~the~~] MSC determined by SECTION 250.308(a)(2)(ii) (RELATING TO SOIL TO GROUNDWATER PATHWAY NUMERIC VALUES) [~~using the saturated soil component of the soil-to-groundwater numeric value~~].

(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.

(C) All sample results shall [~~meet~~] BE EQUAL TO OR LESS THAN the APPLICABLE Statewide health [~~standard~~] MSC AS DETERMINED USING TABLES 1 THROUGH 4 AND 6 IN APPENDIX A.

(iv) 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 subparagraph (iii)(B), except that two samples shall be collected.

(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 (Ha) 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 (Ho) shall be that the background standard is achieved and the alternative hypothesis (Ha) 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).