

# Revised RSR Wave 2 Conceptual Language

## August 7, 2016

Prior to beginning the formal regulation amendment process, the Connecticut Department of Energy and Environmental Protection (DEEP) is presenting revised proposed concepts in this “Revised RSR Wave 2 Conceptual Language” document. Based on the external comments provided to DEEP and internal review on the April 2016 RSR Wave 2 Conceptual Language document, revised language was generated. This concept document is preliminary and informal; it is not a final draft, does not start the formal rulemaking process pursuant to CGS section 4-168, and does not reflect any decisions or approval by DEEP or other parts of state government regarding the amendments that may be proposed. Therefore, some concepts and language presented in this document might not be included in the future proposed amendments. Also, the concepts presented in this document may continue to change or may appear differently when DEEP proposes amendments to the RSRs through the formal process. DEEP will begin the formal public process for adopting revisions to the RSRs.

### Document Organization and Reading Tips:

1. This document is organized to follow the current sequence of the RSRs, but includes only the provisions that have been revised from the April 2016 RSR Wave 2 Conceptual Language document.
2. The concept language and original RSR language are removed for simplicity. Please refer to the April 5<sup>th</sup> document for those pieces.
3. Color scheme:
  - a. Language in red and underlined represents initially proposed language.
  - b. Language in [blue and bracketed] represents original RSR language that would be deleted.
  - c. Language in red and underlined and yellow highlight represents revised proposed language.
  - d. Language in black and yellow highlight represents restored original RSR language.
  - e. Language in red, underlined, strikethrough and blue highlight represents new deletions of initially proposed language.
  - f. Language in [blue and bracketed and blue highlighted] represents additional original RSR language being deleted.

## Section 22a-133k-1

**22a-133k-1(a)(NEW#)**

**(Anthropogenic Origin)**

(PROPOSED LANGUAGE)

(New#) “Anthropogenic origin” means the presence of a substance in environmental media due to the migration or deposition of a substance that is not from any single discernible off-site source and as a result of human activities unrelated to current or historical activities at the subject parcel.

**22a-133k-1(a)(NEW#)**

**(Application of Pesticides)**

(REVISED PROPOSED LANGUAGE)

(New#) “Application of pesticides” means, in the context of 22a-133k-1 through 22a-133k-3, the spraying, spreading, injection, placement or other intentional usage controlled releases of pesticides to the environment for the pesticide’s intended purpose, excluding releases related to handling, mixing, storage, spilling, leaking or disposal, or equipment cleaning or repair.

**22a-133k-1(a)(5)**

**(Background)**

(ORIGINAL PROPOSED LANGUAGE)

(New#) “Background concentration” means the site-specific concentration of a substance in environmental media that would be expected to exist in the absence of any release due to current or historical site-related or nearby activities. A background concentration may result from a combination of naturally occurring conditions and anthropogenic origins.

(REVISED PROPOSED LANGUAGE)

(New#) “Background concentration” means the site-specific concentration of a substance in environmental media that is:

- (A) would be expected to exist in the absence of any release, due to current or historical site-related or nearby activities. A background concentration
- (B) mainly a result of naturally occurring conditions and anthropogenic origins
- (C) minimally affected by off-site human influences below remedial criteria, and
- (D) based on proper characterization with current standards and guidelines.

**22a-133k-1(a)(NEW#)**

**(Building)**

(ORIGINAL PROPOSED LANGUAGE)

(New#) “Building” means any structure enclosed by a roof, structural walls, and building slab(s), which prevents infiltration of precipitation into the polluted soil beneath the building footprint and prevents human contact with such polluted soil.

(REVISED PROPOSED LANGUAGE)

(New#) "Building" means any structure enclosed by a roof and structural walls, and building slab(s), which:

- (A) for the purposes of volatilization criteria, is capable of accumulating vapors from the subsurface if measures to prevent the migration of such vapors were not in place;
- (B) for the purposes of inaccessible soil, includes a concrete floor that prevents human contact with such polluted soil beneath the building footprint; or
- (C) for the purposes of environmentally isolated soil, prevents infiltration of precipitation into the polluted soil beneath the building footprint and.

**22a-133k-1(a)(NEW#)**

**(Diminishing Plume)**

(ORIGINAL PROPOSED LANGUAGE)

(New#) "Diminishing State Groundwater Plume" means a plume in which the concentrations decrease over time, allowing for seasonal variation; in which the breakdown components are not expected to exceed applicable criteria in the future; and where there is no migration or expansion in any direction at concentrations exceeding applicable criteria, as determined by three-dimensional and seasonal characterization of the groundwater plume.

(REVISED PROPOSED LANGUAGE)

(New#) "Diminishing State Groundwater Plume" means a groundwater plume in which the contaminant concentration decreases over time, allowing for seasonal variation; the concentrations of breakdown components of the contaminant are not expected to exceed applicable criteria in the future; and there is limited migration and no expansion of contaminants in any direction; the contaminant concentrations do not exceed applicable criteria; and all based on the three-dimensional and seasonal characterization of the groundwater plume.

**22a-133k-1(a)(16)**

**(Engineered Control)**

(REVISED PROPOSED LANGUAGE)

(16) "Engineered control" means any physical barrier, system, technology or method, that permanently renders polluted [pollution in] soil environmentally isolated or inaccessible, or immobilizes pollution permanently reduces the migration of contaminants, when combined with appropriate long-term inspection, maintenance and [or] monitoring.

**22a-133k-1(a)(18)**

**(Environmentally Isolated)**

(ORIGINAL PROPOSED LANGUAGE)

(18) "Environmentally isolated soil" means [polluted] soil above the seasonal high water table that is not a continuing source of pollution and that is [which]:

- (A)(i) beneath [an existing] a building or other permanent structure existing at the time that

an environmental use restriction is recorded, [or] [(ii) provided [beneath another existing and permanent structure which] the Commissioner has determined in writing that such other permanent structure would prevent the migration of pollutants;[,] or

(ii) beneath or immobilized by an engineered control specifically designed to address exceedances of the pollutant mobility criteria in accordance with section 22a-133k-2(f)(2)(B)(i)(bb); and

[(B)] [not a continuing source of pollution;]

[(C)](B)(i) not polluted with volatile organic substances either in excess of the applicable pollutant mobility criteria;[, or, if it is polluted with such substances or]

(ii) the concentration of such substances has been reduced in concentration, or immobilized, to the maximum extent prudent; or

(iii) beneath an engineered control specifically designed to address vapor migration [; and (D) above the seasonal high water table].

(REVISED PROPOSED LANGUAGE)

(18) "Environmentally isolated soil" means [polluted] soil above the seasonal high water table that is not a continuing source of pollution and that [which] is:

(A)(i) beneath [an existing] a building or other permanent structure existing at the time that the applicable environmental use restriction is recorded, provided that [(ii) beneath another existing and permanent structure which] the Commissioner has determined in writing that such other permanent structure would prevent the migration of pollutants; or

(ii) beneath or immobilized by an engineered control specifically designed to address exceedances of the pollutant mobility criteria in accordance with section 22a-133k-2(f)(2)(B)(i)(bb); and

[(B)] [not a continuing source of pollution;]

[(C)](B) not polluted with volatile organic substances either in excess of the applicable pollutant mobility criteria, or[,] if it is so polluted with such substances, then:

(i) the concentration of such substances has been reduced [in concentration] to the maximum extent prudent;

(ii) such soil has been immobilized to the maximum extent prudent; or

(iii) such soil is beneath an engineered control specifically designed to address vapor migration[ and (D) above the seasonal high water table].

**22a-133k-1(a)(NEW#)**

**(Historically Impacted Materials)**

(PROPOSED LANGUAGE)

(New#) "Historically Impacted Material" means material on a parcel that consists of predominantly fill or soil, which is polluted in excess of remedial criteria only by the presence of wood ash, coal ash, coal fragments, coal slag, coal clinkers, asphalt paving fragments, substances associated with anthropogenic origins, or any combination thereof, provided that the contaminants present above remedial criteria in the material are not the result of a release subsequent to the deposition of the material and the deposition of the material was not prohibited by law at the time of placement.

**22a-133k-1(a)(NEW#)**

**(Immobilization)**

(REVISED PROPOSED LANGUAGE)

(New#) "Immobilization" means the binding of pollution into a solid that is resistant to leaching, including but not limited to, the processes of solidification to physically bind or enclose contaminants within a stabilized mass, stabilization to induce chemical reactions between a stabilizing agent and the contaminated material soil to reduce contaminant mobility, and encapsulation by coating the contaminated material soil.

**22a-133k-1(a)(32)**

**(Inaccessible Soil)**

(REVISED PROPOSED LANGUAGE)

- (32) "Inaccessible soil" means **polluted** soil ~~[which]~~that is:
- (A) more than four feet below the ground surface;
  - (B) more than two feet below **the ground surface that consists of** a paved surface comprised of **either** a minimum of three inches of bituminous concrete or **four inches of reinforced** concrete~~], which two feet may include the depth of any material used as sub-base for the pavement];~~
  - (C) polluted fill beneath a **minimum of three inches of** bituminous concrete or **four inches of reinforced** concrete surface comprised of a minimum of three inches of bituminous concrete or concrete if such fill is:
    - (i) polluted in excess of applicable direct exposure criteria **only by semi-volatile substances or petroleum hydrocarbons that are consistent with normal array of** constituents of bituminous concrete,
    - (ii) polluted by metals in concentrations not in excess of two times the applicable direct exposure criteria, or
    - (iii) any combination of the substances or limits identified in clause (i) or (ii) of this subparagraph~~]; or~~.
  - (D)~~[(i)]~~beneath [an existing] a building or other permanent structure at the time that an the applicable environmental use restriction is recorded, [or (ii) beneath another existing permanent structure] provided a written notice that such other permanent structure will be used to prevent human contact with such has been provided to the Commissioner[,]; or
  - (E) present in a location that is not subject to human contact through the use of an engineered control in accordance with section 22a-133k-2(f)(2)(B) or (D).

**22a-133k-1(a)(NEW#)**

**(MNA)**

(REVISED PROPOSED LANGUAGE)

(New#) "Monitored Natural Attenuation" means monitoring the natural attenuation of a diminishing state groundwater plume to applicable criteria that occurs within a reasonable timeframe from after completion of the remediation of all source areas and determination of a diminishing state groundwater plume.

**22a-133k-1(a)(NEW#)**

**(Naturally Occurring Condition)**

(PROPOSED LANGUAGE)

~~(New#) “Naturally occurring condition” means the presence of a substance in environmental media as a result of natural processes.~~

**22a-133k-1(a)(54)**

**(Prudent)**

(REVISED PROPOSED LANGUAGE)

(54) “Prudent” means reasonable, after taking into consideration cost ~~and timeframe for the remedy to achieve compliance or significant reduction of risk~~, in light of the social and environmental benefits.

**22a-133k-1(a)(58)**

**(Residential)**

(REVISED PROPOSED LANGUAGE)

(58) "Residential activity" means any activity related to a (A) residence or dwelling, including but not limited to a house, apartment, condominium, ~~or dormitory;~~ [or] (B) ~~pre-school, primary school, and secondary~~ school, [hospital,] day care center, playground, or outdoor recreational area; ~~or (C) hospital, solely for purposes of volatilization criteria.~~

**22a-133k-1(a)(NEW#)**

**(Volatile Petroleum Substance)**

(REVISED PROPOSED LANGUAGE)

~~(New#) “Volatile petroleum substance” means volatile hydrocarbons found in gasoline, diesel, fuel oil, kerosene, and jet fuel along with volatile substances other than hydrocarbons that may have been used as fuel additives.~~

**22a-133k-1(b)**

**(Applicability - Release Areas)**

(REVISED PROPOSED CHANGES)

**1(b) Applicability.**

(1) Sections 22a-133k-1 through 22a-133k-3, inclusive, of the Regulations of Connecticut State Agencies apply to any action taken to remediate polluted soil, surface water or a ground-water plume at or emanating from a release area which action is required pursuant to Chapter 445, 446k or section 22a-208a(c)(2) of the General Statutes, including but not limited to any such action required to be taken or verified by a licensed environmental professional.

(2) Actions conducted in fulfillment of the requirements of section 22a-133k-1 through 22a-133k-3, inclusive, of the Regulations of Connecticut State Agencies shall be based on appropriate characterization of a release completed in accordance with prevailing standards and guidelines, including based on, but not limited to, the State of Connecticut, Department of Energy and Environmental Protection “Site Characterization Guidance Document”, as amended and approved by the Commissioner.

(3) Exempt Release.

Sections 22a-133k-1 through 22a-133k-3, inclusive, of the Regulations of Connecticut State Agencies do not apply to the detection of pollution resulting from the following, except as provided in the associated regulatory reference or as a result of additional releases into that material:

- (A) “Background concentration” as defined under subsection 1(a)(6)
- (B) Incidental Sources as specified under subparagraphs 2(b)(4)(A), 2(c)(5)(A), and 3(f)(1); and
- (C) [w]Within the zone of influence of a ground-water discharge permitted by the Commissioner under section 22a-430 of the General Statutes. [Any person conducting a remediation in accordance with said sections 22a-133k-1 through 22a-133k-3, inclusive, of the Regulations of Connecticut State Agencies shall obtain all permits and other authorizations required by state, federal and local law and shall comply with all applicable state, federal and local laws, including without limitation the requirements of 40 CFR Part 761. In the event that any provision of sections 22a-133k-1 through 22a-133k-3, inclusive, of the Regulations of Connecticut State Agencies conflicts with any provision of any other statute or regulation, the more stringent provision shall prevail. Nothing in this subsection shall be construed as requiring any further remediation of any release which has been remediated and which remediation has been approved in writing by the Commissioner, unless the Commissioner takes action to require such remediation pursuant to any section of Chapter 446k of the General Statutes.]

(4) Partially-Exempt Release.

The detection of pollution resulting from the following are exempt from the requirement to be remediated to certain criteria, provided they comply with requirements in the associated regulatory references, except for pollution occurring as a result of additional releases into that material.

- (A) Historically Impacted Material, as specified under subparagraph 2(c)(4)(B) for pollutant mobility criteria;
- (B) Widespread polluted fill, as specified under subparagraph 2(f)(1) for pollutant mobility criteria; and
- (C) Pesticides, as specified under subparagraphs 2(b)(4)(B), 2(c)(5)(B), and 3(f)(2), except that, but is not applicable to parcels which are the subject of open enforcement action regarding the presence of pesticides in soil or groundwater, unless otherwise approved by the Commissioner.

- (5) Any person conducting a remediation in accordance with said sections 22a-133k-1 through 22a-133k-3, inclusive, of the Regulations of Connecticut State Agencies shall obtain all permits and other authorizations required by state, federal and local law and shall comply with all applicable state, federal and local laws, including without limitation the requirements of 40 CFR Part 761. In the event that any provision of sections 22a-133k-1 through 22a-133k-3, inclusive, of the Regulations of Connecticut State Agencies conflicts with any provision of any other statute or regulation, the more stringent provision shall prevail. Nothing in this subsection shall be construed as requiring any further remediation of any release which has been remediated and which remediation has been approved in writing by the Commissioner, unless the Commissioner takes action to require such remediation pursuant to any section of Chapter 446k of the General Statutes.

## 22a-133k-1(d)(2)

## (Public Notice)

(REVISED PROPOSED LANGUAGE)

### [(d)](e) Public Participation.

#### (1) Public Notice.

##### (A) General.

- (i) Except for remedial actions conducted in association with an emergency or immediate response required for releases reported under Connecticut General Statutes sections 22a-6u, 22a-450, or other law, prior to commencement of the remedial action for each release area at parcels being remediated pursuant to Connecticut General Statutes sections 22a-133x, 22a-133y, 22a-134a, or 32-769, the person undertaking the remediation and required to make the notice pursuant to said sections shall:
- (aa) submit notice of the remediation on a form prescribed by the Commissioner;
  - (bb) publish notice of the remediation in a newspaper having a substantial circulation in the area affected;
  - (cc) provide notice of the remediation to the director of health of the municipality where the parcel is located; and
  - (dd) either:
    - (1) erect and maintain for at least thirty days in a legible condition a sign not less than six feet by four feet on the parcel, which sign shall be clearly visible from the public highway, and shall include the words "ENVIRONMENTAL CLEAN-UP IN PROGRESS AT THIS SITE. FOR FURTHER INFORMATION CONTACT:" and include a telephone number and an e-mail address for a representative of person responsible undertaking the remediation from which any interested person may obtain additional information about the remediation, and for an additional thirty days upon commencement of any active remedial activities if such activities were not implemented within two years of the previous posting of such a sign, or



(II) mail notice of the remediation to each owner of record of property within 200 feet of the site boundary, at the last-known address of such owner on the last-completed grand list of the municipality where the parcel is located.

(ii) Notices provided under subparagraphs (A)(i)(aa), (ii), (A)(i)(cc) (iii) and (A)(i)(dd)(II) (iv)(bb) shall include the name and address of either the owner of the subject parcel or the person responsible for undertaking the remediation; the location address and/or a description of the location such parcel; Remediation Identification Number(s); a brief description of the general nature of the releases being remediated; proposed remedial actions including a description of any proposed variances, engineered controls, or environmental use restrictions requiring the Commissioner's approval; the approximate time period to initiate and complete the remedial activities; an electronic-mail address and a telephone number for an office from which any interested person may obtain additional information about the remediation; and a brief description of the procedures for providing comments on the proposed remediation and for requesting a hearing.

(iii) Notices provided under subparagraph (A)(i)(bb), shall include the name and address of either the owner of the subject parcel or the person responsible for undertaking the remediation; the location address and/or a description of the location such parcel; Remediation Identification Number(s); a brief description of the general nature of the releases being remediated; proposed remedial actions including a description of any proposed variances, engineered controls, or environmental use restrictions requiring the Commissioner's approval; the approximate time period to initiate and complete the remedial activities; an electronic-mail address and a telephone number for an office from which any interested person may obtain additional information about the remediation; and a brief description of the procedures for providing comments. on the proposed remediation and for requesting a hearing

#### (B) Supplemental Notices.

Supplemental notice shall be provided in accordance with subparagraph (A), excluding subclause (A)(i)(bb), where remedial actions are proposed for a previously noticed release area or one or more additional for any release areas previously noticed, which can be anticipated to address, require a subsequent remedial action plan, and such a remedial action plan is to address greater than two hundred and fifty 200 cubic yards of contaminated soil, or groundwater contamination leaving the site, or will results in surficial site disturbances extending for more than for a duration exceeding ninety days, except that notice for activities authorized by a General Permit under Section 22a-430b of the Connecticut General Statutes or by the Underground Storage Tank Regulations under section 22a-449 (d)-101-113 of the Connecticut General Statutes shall instead be consistent with the requirement of such, supplemental notice shall be provided in accordance with subparagraph (A)

(C) Engineered Controls.

For Engineered Control variance requests, notice of the subject proposal shall be provided by the person responsible for undertaking remediation consistent with sections 22a-133k-1(d)(1), prior to the Commissioner's approval of an engineered control under section 22a-133k-2(f)(2)(A)(iv) or the use of an engineered control under section 22a-133k-2(f)(2)(C). When notice is published, or mailed, it shall also include a brief description of the proposed engineered control. The person undertaking remediation shall verify to the Commissioner in writing on a form prescribed by the Commissioner that notice has been given in accordance with this subsection.

(D) Technical Impracticability Variances.

For Technical Impracticability variances allowed under 22a-133k-3(e)(2), within thirty days of receiving notification from the Commissioner that the request package for the variance is complete, the person requesting the variance shall provide notice to the public consistent with:

- (i) 22a-133k-(1)(e)(1)(A)(i)(aa) and 22a-133k-(1)(e)(1)(A)(ii); and
- (ii) to the chief municipal elected official, and director of health of the municipality, and each the owner of each parcel within the TI Zone. If the Commissioner determines the public interest will be best served thereby, the Commissioner may expand the requirements of such a public notice, including increasing time allowed for public comment and the scope of the mailing of notices, regarding the proposed variance request, and requiring additional public notice for any future modifications to the long-term obligations associated with this variance.

(E) Environmental Use Restrictions Recording on Land Records

- (i) The owner of the property which is the subject of a proposed environmental use restriction shall, except as specified in clause (iii) of this subparagraph, publish in at least one newspaper of general circulation in the area affected by the proposed environmental use restriction, notice of intent to record an environmental use restriction. Such notice shall include the name and address of such owner, the address of the property or a brief description of its location, a brief description of the purpose of the proposed environmental use restriction, the name and address of an individual from whom interested persons may obtain a copy of the proposed use restriction, and a statement that public comments on the proposed environmental use restriction may be submitted in writing for thirty days after the date of publication of the notice to:
  - (aa) for an environmental land use restriction, the Commissioner of Energy and Environmental Protection, CARE/OF ENVIRONMENTAL LAND USE RESTRICTION COORDINATOR, 79 Elm Street, Hartford, CT 06106; or
  - (bb) for a notice of activity and use limitation, the owner of the land and the LEP who will approve the notice of activity and use limitation, or the Commissioner as applicable who will approve the notice of activity and use

limitation pursuant to section 22a-133q(#);

- (ii) Public notice of a proposed environmental use restriction notice of activity and use limitation need not be published if:
  - (aa) such limitation provides solely that the use of the subject property or portion thereof is limited to industrial or commercial activities, and
  - (bb) the municipal zoning of such property limits the property to such use.
- (iii) Public notice is required in accordance with subparagraph (E) of this subsection when a notice of activity and use limitation is amended in accordance with section 22a-133q.

(F) Nothing in this subsection shall prohibit the combining of multiple public notices where applicable and feasible.

(G) Any public notice published or mailed pursuant to subsection 1(d)(1) shall provide that comments on the proposed remediation may be submitted to the person undertaking remediation within thirty days of last of the date(s) of the public notice(s) under subparagraph (A)(i) through (A)(iv).

(H) The person undertaking remediation at the subject parcel shall submit to the Commissioner a written summary of all such comments and a written response to each prior to implementing the remediation.

#### [1](2) Public Hearing on Remediation.

(A) If the Commissioner determines that there is substantial public interest in any remediation proposed pursuant to Chapter 445, Chapter 446k or section 22a-208a(c) of the General Statutes, the Commissioner [he] may hold a hearing on such proposed remediation, and the Commissioner [he] shall hold a hearing upon receipt of a petition signed by twenty-five or more persons. Notice of any such hearing shall be published in a newspaper of substantial circulation in the area of the proposed remediation at least thirty days prior to such hearing. Such hearing need not be conducted pursuant to the provisions of Chapter 54 of the General Statutes.

[(2) Comment Procedures. Any public notice published or mailed pursuant to section 22a-133x, 22a-133y or 22a-134a of the General Statutes shall provide that comments on the proposed remediation may be submitted to the Commissioner within forty-five days of the publication or mailing of such notice.]

(B) If a public hearing is held in accordance with subsection (3), t[T]he Commissioner shall forward a copy of [all comments received by the date specified in the public notice and] all comments made at a public hearing to the owner of the subject parcel and, if different, the person undertaking remediation at such parcel.

(C) Prior to commencing remedial action and [The person undertaking remediation at the subject parcel shall,] within sixty days of receiving such public hearing comments, the person undertaking remediation at the subject parcel shall submit to the Commissioner a written summary of all such comments and a written response to each such comment. The

Commissioner shall review such summary and responses and shall adopt it as his own, adopt it with modifications, or reject it and prepare a response to each such comment. The Commissioner shall send a copy of the initial summary and responses and of his action with respect thereto to each person who submitted comments on the remediation proposal.

## 22a-133k-1(NEW)

## (Financial Assurance)

(REVISED PROPOSED LANGUAGE)

### (f) Financial Assurance

(1) Financial assurance shall be established and appropriately maintained in a form prescribed by the Commissioner for the duration of the period that the engineered control or Technical Impracticability variance will be used to achieve compliance with the RSRs. Such financial assurance shall be available to the Commissioner in the event that the Commissioner must act to perform such compliance measures due to inaction by the property owner;

(2) Consistent with subparagraphs (5) and (6) of this subsection, the amount of financial assurance shall:

(A) For an engineered control, be sufficient to operate, maintain, and monitor existing controls;

(B) For a Technical Impracticability variance, be sufficient to perform all actions in the plan approved under subsection 3(f)(2)(B)(vii), to perform five-year review reports under subsection 3(f)(2)(G)(ii), and if required by the Commissioner under subsection 3(f)(2)(B)(vi), to perform future corrective measures;

(3) With respect to any release area subject to any of the requirements of section 22a-209-4(i) or section 22a-449(c)-100 through 110 of the Regulations of Connecticut State Agencies, all such requirements shall be satisfied;

(4) With respect to a release area that is not subject to any such regulations referenced in subdivision (3) of this subsection, the property owner of the subject parcel shall demonstrate to the Commissioner that the property owner has posted, or another party has posted on their behalf, a surety in a form and amount either approved in writing by the Commissioner or, for engineered controls subject to certification by a licensed environmental professional, in a manner allowed under clause 2(f)(2)(D)(vii), prior to the release area being determined to be in full compliance with 22a-133k and no later than:

(A) for an engineered control, within one year of its installation;

(B) for a Technical Impracticability variance, within one year of its approval;  
or

(C) as otherwise approved by the Commissioner;

(5) Such surety shall be initially established in an amount equal to the cost of twenty percent of thirty years of maintenance, monitoring, and other reasonably anticipated

repairs, which amount shall be maintained in effect for as long as the long-term obligations associated with the engineered control or Technical Impracticability variance remains in effect;

- (6) Such surety shall be adjusted to reflect annual inflationary costs by adjusting for inflation at each five-year interval of the anniversary date of the establishment of the financial instrument used to comply with subdivision (4) of this subsection. The adjustment shall be made by using an inflation factor derived from the most recent Implicit Price Deflator for Gross National Product published by the U.S. Department of Commerce in its *Survey of Current Business* and multiplying the latest adjusted surety estimate for the site by that five-year inflation factor;
- (7) Such surety may be adjusted, subject to the Commissioner's approval, to reflect recalculating the maximum costs of maintenance, monitoring, and other reasonably anticipated repairs in current dollars;
- (8) No financial assurance is required for any total surety amount value less than 5,000 \$10,000, unless the Commissioner requires a financial assurance for such lesser amount; and
- (9) Such financial assurance shall be one or more of the following instruments from a financial institution: Trust Fund; Irrevocable Standby Letter of Credit; Financial Guarantee "Payment" Bond; Performance Bond; Certificate of Insurance; or as otherwise approved by the Commissioner in writing. A cover letter signed by the property owner shall be submitted along with the Irrevocable Standby Letter of Credit, in accordance with Section 40 CFR 264.143(d)(4).

## **22a-133k-1(i)**

## **(Transition)**

### **[(g)](i) Transition Language**

#### **(ORIGINAL PROPOSED LANGUAGE)**

- (i) Remediation of any release area may continue to utilize any provision of sections 22a-133k-1 through 22a-133k-3, inclusive, of the Regulations of Connecticut State Agencies, as adopted on June 27, 2013, with the exception of (B) of this subsection and provided that:
- (A) Prior to the effective date of the 2016 amendments to sections 22a-133k-1 through 22a-133k-3, inclusive, of the Regulations of Connecticut State Agencies:
- (i) such remediation has been initiated as documented by the submittal of a Remedial Action Plan and the date such remediation was initiated; and
- (ii) notice of such remediation has been published, if required, pursuant to Chapter 445 or any other applicable chapter of the Connecticut General Statutes;
- (B) On or before twenty-four months after the effective date of the 2016 amendments to sections 22a-133k-1 through 22a-133k-3, inclusive, of the Regulations of Connecticut State Agencies, remediation at such release area has been completed pursuant to

sections 22a-133k-1 through 22a-133k-3, inclusive, of the Regulations of Connecticut State Agencies, as adopted on June 27, 2013 sufficient to support a final site closure, verification, or interim verification pursuant to Connecticut General Statutes 22a-134 (19) and (28); and

(C) The following provisions of this regulation are not subject to the twenty-four month transition period in subsection (B):

- (i) 2(c)(4)(C) Soils Subject to Infiltration,
- (ii) 3(b)(3)(A)(iii) Alternative surface-water protection criteria – inland watercourse dilution calculation,
- (iii) 3(b)(3)(B)(iii) Alternative surface-water protection criteria – coastal watercourse dilution calculation, and
- (iv) 3(c)(3)(B) Volatilization criteria.

(REVISED PROPOSED LANGUAGE)

**[(g)](i) Transition Language**

**(1) Public Notice Transition**

Public notice of a remedial action plan prior to the effective date of these regulations is not subject to public notice requirements pursuant to §22a-133k-1(e)(1), except Supplemental Notice §22a-133k-1(e)(1)(B).

**(2) Lead, Volatilization and Inaccessible Soil Transition**

All provisions of this regulation, 22a-133k-1 through 22a-133k-3, become effective immediately upon the effective date of the amendments with the exception of the following.

**(A) [Remediation of ]Soils Polluted with Lead[.]**

Soil polluted with lead may be remediated to a concentration of 500 milligrams per kilogram in compliance with subsection 22a-133k-2(b) provided that:

**[(1)](i) Prior to June 27, 2013 [the effective date of this subsection]:**

**[(A)](aa) Such remediation has been initiated; or**

**[(B)](bb) A remedial action plan has been completed for such release area;[ and]**

**[(2)](ii) On or before June 27, 2015, [twenty-four months after the effective date of this subsection] such remediation has been completed[.]; and**

**(iii) Unless otherwise approved by the Commissioner in writing, a verification or interim verification, pursuant to Connecticut General Statutes §22a-134 (19) and (28), is submitted prior to any statutorily required timeframe or prior to June 27, 2020, whichever comes first.**

(B) Volatilization

The fifteen-foot applicability for volatilization criteria in accordance with §22a-133k-3(c)(1) and, in their entirety, the groundwater and soil vapor volatilization criteria in Appendix E and Appendix F of the RSRs, as adopted on June 27, 2013, may continue to be used for a release area provided that:

- (i) Prior to the effective date these regulations:
  - (aa) such remediation, as documented by the submittal of a Remedial Action Plan, has been initiated; and
  - (bb) if required, public notice of such remediation has been published, pursuant to Chapter 445 or any other applicable chapter of the Connecticut General Statutes; and
- (ii) (aa) on or before twenty-four months after the effective date of these regulations, remediation at such release area has been completed, sufficient to support a final site closure or a verification pursuant to Connecticut General Statutes 22a-134 (19) and (28); and
  - (bb) such verification is submitted prior to any statutorily required timeframe or within five years after the effective date of this subsection, whichever comes first, unless otherwise approved by the Commissioner in writing.

(C) Inaccessible Soil with Concrete

Remediation of any release area using a concrete surface to render soil inaccessible does not require use of four inches of reinforced concrete in accordance with §22a-133k-1(32), provided that:

- (i) Prior to the effective date these regulations:
  - (aa) Such remediation, as documented by the submittal of a Remedial Action Plan, has been initiated; and
  - (bb) If required, public notice of such remediation has been published, pursuant to Chapter 445 or any other applicable chapter of the Connecticut General Statutes; and
- (ii) (aa) On or before twenty-four months after the effective date of these regulations, remediation at such release area has been completed, sufficient to support a final site closure, a verification, or an interim verification pursuant to Connecticut General Statutes 22a-134 (19) and (28); and
  - (bb) such verification is submitted prior to any statutorily required timeframe or within five years after the effective date of this subsection, whichever comes first, unless otherwise approved by the Commissioner in writing.

(3) Inland Watercourse Dilution

Use of the Q99 will replace the use of the 7Q10 in clause 22a-133k-3(A)(i), subparagraph 22a-133-3(D), and Appendix G once the Q99 is adopted in the Water Quality Standards.

## 22a-133k-2 Standards for Soil Remediation

### 22a-133k-2(a)

### (Background)

(REVISED PROPOSED LANGUAGE)

#### (a) General.

Unless otherwise specified in sections 22a-133k-1 through 22a-133k-3, inclusive, of the Regulations of Connecticut State Agencies, polluted soil at a release area shall be remediated to a concentration which meets **either**:

- (1) (A) the direct exposure criteria set forth in subsection (b) of this section or alternative direct exposure criteria established in accordance with 22a-133k-2(d)(2) and subdivision (2) or subdivision (7) of subsection (d) of this section; and  
(B) the pollutant mobility criteria set forth in subsection (c) of this section or alternative pollutant mobility criteria established in accordance with subdivision (3), [or] (5), or (8) of subsection (d) of this section; [or]

- (2) the background concentration for soil provided **that** notice has been submitted to the Commissioner **[which notice shall be submitted]** on a form **prescribed**[furnished] by the Commissioner and shall include:

- (A) a brief description of the subject release area and of the general characteristics of soils in the vicinity of such release area;
- (B) a map showing the location of such release area[,] and, based on reasonable inquiry, of other release areas in the vicinity thereof, and of all soil samples taken for the purpose of characterizing background concentration for soil;
- (C) the results of all laboratory analyses of such samples, and
- (D) the background concentration for soil:
  - (i) of similar texture and composition;
  - (ii) outside the subject release area and in the general vicinity of such release area; and
  - (iii) not affected by another release of the same substance or another release having an effect on affecting the same substance, except that of anthropogenic origin for atmospheric deposition from off site; or

**[provided notice has been submitted to the Commissioner which notice shall be submitted on a form furnished by the Commissioner and shall include a brief description of the subject release area and of the general characteristics of soils in the vicinity of such release area; a map showing the location of such release area, and based on reasonable inquiry of other release areas in the vicinity thereof, and of all soil samples taken for the purpose of characterizing background concentration for soil; and the results of all laboratory analyses of such samples.]**

- (3) for releases which occur into Historically Impacted Material, as described in subparagraph 2(c)(4)(B), or Widespread Polluted Fill, as described in subdivision 2(f)(1), the concentration of such substance that is representative of such exempt soils into which the release occurred, provided that compliance with subsection 2(b) of this section is demonstrated for such soil.



## 22a-133k-2(b) Direct Exposure Criteria

### 22a-133k-2(b)(4)

### (Pesticides)

(REVISED PROPOSED LANGUAGE)

#### (4) Incidental Sources and Pesticides.

- (A) “The direct exposure criteria ... do not apply to metals, petroleum hydrocarbons, or semi-volatile substances in soil provided such pollution is the result of:
- [(A)](i) An incidental release due to the normal operation of motor vehicles, not including refueling, repair or maintenance of a motor vehicle; or
  - [(B)](ii) Normal paving and maintenance of a consolidated bituminous concrete surface provided such bituminous concrete surface has been maintained for its intended purpose.
- (B) The direct exposure criteria do not apply to pesticides in soil resulting from application of pesticides in accordance with accepted practices at the time of use and which are uniformly distributed, provided that:
- (i) a plan is implemented, which is acceptable to the Commissioner in consultation with the Commissioner of the Department of Public Health, to limit human exposure on non-agricultural based on land use, including:
    - (aa) short-term measures to limit human exposure;
    - (bb) a long-term maintenance plan program to ensure that such soils will not be exposed as a result of erosion, excavation, demolition or other activities and that any vegetative cover which is necessary to prevent exposure to such soil is maintained in good condition; and
    - (cc) provisions to update the long-term maintenance plan program is to be updated in accordance with changes in land use;
  - (ii) written notice is provided to the Commissioner on a form prescribed by the Commissioner, to the local director of health, and to the owners of adjacent parcels; and
  - (iii) notice of the presence of pesticide-impacted soil an appropriate environmental use restriction is in effect on the municipal land records for the parcel on a form provided by the Commissioner, including but not limited to:
    - (aa) a map depicting the nature and extent of pesticides; and
    - (bb) a description of the nature and extent of pesticides and measures implemented to limit human exposure; and
    - (cc) reference to the long-term soil management plan program.

## 22a-133k-2(c) Pollutant Mobility Criteria

22a-133k-2(c)(4)

(PMC Exemptions and Variances)

(ORIGINAL PROPOSED LANGUAGE)

(B) Historically Impacted Material.

- (i) The pollutant mobility criteria do not apply to Historically Impacted Material [polluted fill] on a parcel if:
- (i)(aa) such material [fill] is polluted in excess of remedial criteria only due to the presence of [only with] coal ash, wood ash, coal fragments, coal slag, coal clinkers, asphalt paving fragments, deposition from anthropogenic origin, or any combination thereof;
  - (bb) such material [fill] is not polluted with any volatile organic substance which exceeds an applicable pollutant mobility criterion, or applicable soil vapor volatilization criteria under an engineered control, building, or other permanent structure approved by the Commissioner;
  - (iii)(cc) [the concentration of each substance in any such fill is consistent] compliance with the requirements established in subsection (b) of this section is achieved;
  - (iv)(dd) such substance is not affecting and will not affect the quality of an existing or potential public water supply resource or an existing private drinking water supply;
  - (v)(ee) a public water supply distribution system is available within 200 feet of such parcel and all parcels adjacent thereto; and
  - (vi)(ff) the placement of the material [fill] was not prohibited by law at the time of placement.

(REVISED PROPOSED LANGUAGE)

2(c)(4)(B) Historically Impacted Material.

- (i) The pollutant mobility criteria do not apply to Historically Impacted Material that consists of predominantly polluted fill [on a parcel if:] (i)(aa)[such material [fill] is polluted] or soil, which is polluted in excess of remedial criteria only due to the presence of [only with] coal ash, wood ash, coal fragments, coal slag, coal clinkers, asphalt paving fragments, deposition from anthropogenic origin, or any combination thereof, provided that the contaminants present above remedial criteria in the material are not the result of a release following the placement of the material, if:
- (bbaa) such material [fill] is not polluted with any volatile organic substance which exceeds an applicable pollutant mobility criterion, or applicable soil vapor volatilization criteria under an engineered control, building, or other permanent structure approved by the Commissioner;

- [(iii)](eebb) [the concentration of each substance in any such fill is consistent] compliance with the requirements established in subsection (b) of this section is achieved;
- [(iv)](decc) such substance is not affecting and will not affect the quality of an existing or potential public water supply resource or an existing private drinking water supply;
- [(v)](eedd) a public water supply distribution system is available within 200 feet of such parcel and all parcels adjacent thereto; and
- [(vi)](fee) the placement of the material [fill] was not prohibited by law at the time of placement.

## 22a-133k-2(c)(4)(C)

(80% rule)

(REVISED PROPOSED LANGUAGE)

### (C) Soils Subject to Infiltration.

The pollutant mobility criteria do not apply to substances, other than volatile substances, in soil at a release area provided:

#### (i) Such release area:

[(D)](aa) Is located in an area in which at least eighty percent of the release area [and] has been subject to infiltration, and infiltration has not been obstructed by manmade [anthropogenic] features, for a minimum of five years; and

(I) at least eighty percent of the of the contamination mass has not been obstructed by manmade features, for a minimum of five years of in the release area at the time of a final site closure, verification or interim verification, pursuant to Connecticut General Statutes 22a-134 (19) and (28), or as otherwise approved by the Commissioner; or

(II) if §22a-133k-2(c)(4)(C)(aa)(I) cannot be achieved, soils not subject to infiltration have been rendered environmentally isolated, including recording an environmental land use restriction; or

[(II)](bb) Has been determined by the Commissioner, in writing, to have been subject to sufficient infiltration of precipitation such that the concentration of the substance and the areal extent of the ground-water plume will not likely increase if any obstruction to infiltration is removed in the future;[and]

#### (ii) The analytical results of four ground-water sampling events, which reflect seasonal variability on a quarterly basis, were performed within two years prior to the most current sampling event [consecutive quarterly samples of ground water] for such substance[:]; and

[(D)](aa) For a GA area or for an aquifer protection area or other ground-water area used as a source of either private or public drinking water supply located in a GB area, such results are all less than the ground-water protection criterion listed in Appendix C or calculated using Appendix G and surface-water protection criterion listed in Appendix D or calculated using Appendix G or, if required, the lower of the human

health or aquatic life criteria contained in Table 3 of the most recent Water Quality Standards [and the ground-water protection criterion]; or

[(II)](bb) For a GB area, such results are all less than the surface-water protection criterion listed in Appendix D or calculated using Appendix G or, if required, the lower of the human health or aquatic life criteria contained in Table 3 of the most recent Water Quality Standards;[and]

- (iii) The ground-water sampling locations are representative of the areal extent of the ground-water plume and demonstrate a diminishing state ground-water plume [the areal extent of such ground-water plume which exceeds an applicable remedial criterion is not increasing over time];
- (iv) Except for seasonal variations, the concentration of the subject substance is not increasing at any point over time; and
- (v) The ground-water samples are collected at locations where ground water is most likely to have been impacted by such substance from the release area.

## **22a-133k-2(f)(1)**

**(WSPF)**

(REVISED PROPOSED LANGUAGE)

(1) Widespread Polluted Fill.

(A) The Commissioner may grant a variance from [any of the requirements of subsection (c) of this section upon the written request of the owner of the subject parcel if the Commissioner determines that (A)] pollutant mobility criteria for geographically extensive polluted fill [is] present at [such] a parcel, [and at other parcels in the vicinity of the subject parcel;] provided that:

[B](i) such fill is not polluted with volatile organic substances in excess of the applicable pollutant mobility criteria;

(ii) such fill is not polluted by other releases subsequent to the placement of the fill at concentrations in excess of either:

(aa) the applicable pollutant mobility criteria or,

(bb) a background concentration for such substances in the polluted fill that exceeds the applicable pollutant mobility criteria;

[C](iii) such fill is not affecting and will not affect the quality of an existing or potential public water supply resource or an existing private drinking water supply;

[D](iv) the concentration of each substance in such fill is consistent with the requirements of Direct Exposure Criteria subsection (b) of this section and groundwater at the parcel is in compliance with Ground-water Section 22a-133k-3; and

[E](v) the placement of such fill was not prohibited by law at the time of placement; and

(vi) an environmental use restriction is in effect which provides notice that a variance from pollutant mobility criteria due to geographically extensive polluted fill on the parcel has been granted.

(B) The Commissioner may approve a request for a variance under section (A), to pollutant mobility criteria based on factors including: [In determining whether to grant or deny such a

variance, the Commissioner may consider]

- (i) availability of a public water supply distribution system to all areas between the plume and the downgradient surface water discharge point;
- (ii) the relative cost of compliance with pollutant mobility criteria subsection (c) of this section[.];
- (iii) the degree to which such fill exceeds pollutant mobility criteria;
- (iv) the proportion of such fill on the subject parcel that extends below the water table;
- (v) how extensive the polluted fill is[.];
- (vi) what relative proportion of such fill occurs on the subject parcel[.];
- (vii) whether the fill was related to a municipal, commercial, or industrial waste landfill;
- (viii) the existing surface water quality; [and]
- (ix) whether the person requesting the variance or the owner of the parcel subject to the variance is affiliated with any person responsible for such placement through any direct or indirect familial relationship or any contractual, corporate or financial relationship other than that by which such person's interest in such parcel is to be conveyed or financed; and
- (x) any other information the Commissioner reasonably deems necessary to evaluate such request.

(C) A variance to pollutant mobility criteria under section (A) does not require the Commissioner's approval if the following conditions are also met:

- (i) such fill is located within the coastal boundary mapped in accordance with Connecticut General Statutes section 22a-94 and is within an area with a groundwater classification of GB;
- (ii) such fill extends over an area of **ten five** acres or greater;
- (iii) a public water supply distribution system is available to all areas between the plume and the downgradient surface water discharge point;
- (iv) demonstration has been made that the fill was not related to hazardous waste as specified in §22a-449(c)-101, 104 or -105 **of the** RCSA; and
- (v) except in the case of a municipality, state, or federal agency, the person performing the remediation and the owner of the parcel subject to the exemption did not place the fill on the subject parcel and is not affiliated with any person responsible for such placement through any direct or indirect familial relationship or any contractual, corporate or financial relationship other than that by which such person's interest in such parcel is to be conveyed or financed.

**22a-133k-2(f)(2)**

**(Engineered Control)**

(REVISED PROPOSED LANGUAGE)

**(2) Engineered Control **[of Polluted Soils]**.**

(A) Provided that an engineered control of polluted soils is implemented pursuant to either of subparagraphs (E) and (B) [and] or (D)[(C)] of this subsection, the requirements of subsections (a) through (e) of this section do not apply if:

- (i) the Commissioner authorized the disposal of solid waste or polluted soil at the subject release area;
- (ii) the soil at such release area is polluted with a substance for which remediation is not technically practicable;
- (iii) the Commissioner, in consultation with the Commissioner of Public Health, has determined that the removal of such substance or substances from such release area would create an unacceptable risk to human health; or
- (iv) either the Commissioner [has determined], or a Licensed Environmental Professional as allowed under subparagraph (C) of this subsection, [after providing notice and an opportunity for a public hearing,] has determined that a proposal by the owner of the subject parcel to use an engineered control is acceptable because:
  - (aa) public notice of the subject proposal has been provided by the owner of the subject parcel in accordance with section 22a-133k-1(e)(1)(C), along with an opportunity for public hearing in accordance with section 22a-133k-1(e)(2);
  - (bb) the cost of remediating the polluted soil at such release area is significantly greater than the cost of installing and maintaining an engineered control for such soil and conducting ground-water monitoring at such release area in accordance with subsection (g) of section 22a-133k-3; and
  - (cc) that the significantly greater cost outweighs the risk to the environment and human health if the engineered control fails to prevent the mobilization of a substance in the soil or human exposure to such substance.

[the cost of remediating the polluted soil at such release area is significantly greater than the cost of installing and maintaining an engineered control for such soil and conducting ground-water monitoring at such release area in accordance with subsection (g) of section 22a-133k-3, and (bb) that the significantly greater cost outweighs the risk to the environment and human health if the engineered control fails to prevent the mobilization of a substance in the soil or human exposure to such substance. The Commissioner may hold a public hearing pursuant to this section if in his discretion the public interest will be best served thereby, and he shall hold a hearing upon receipt of a petition signed by at least twenty-five persons. Notice of the subject proposal shall be provided by the owner of the subject parcel in two of the three following manners: (i) by publication in a newspaper of substantial circulation in the affected area; (ii) by placing and maintaining on the subject parcel, for at least thirty days, in a legible condition a sign which shall be not less than six feet by four feet which sign shall be clearly visible from the public highway; or (iii) by mailing notice to the owner of record of each property abutting the subject parcel at his address on the most recent grand tax list of the municipality or municipalities in which such properties are located. When notice is published or mailed, it shall include the name and address of owner of the subject parcel; the location address and/or a description of the location such parcel; a brief description of the nature of the pollution on the subject parcel; a brief description of the proposed engineered control; and a brief description of the procedures for requesting a hearing. When notice is provided by posting a sign, the sign shall include the words “Environmental remediation is proposed for this site. For further information contact...” and shall include the name and telephone number of an individual from whom any interested person may obtain information about the

remediation. The owner of the subject parcel shall verify to the Commissioner in writing on a form furnished by him that notice has been given in accordance with this subsection.]

(B) [A request to use] An application on a form prescribed by the Commissioner requesting the use of an engineered control [shall be] submitted to the Commissioner [in writing and], or notice on a form prescribed by the Commissioner submitted to the Commissioner of the intent to use an engineered control under the provisions of subsection (D), shall be accompanied by a detailed written report and plan, signed and sealed by a licensed environmental professional, which demonstrates [that]:

(i)

[I](aa) if the engineered control to is address exceedances of the direct exposure criteria, the proposed engineered control has been designed and will be constructed to physically isolate polluted soil by rendering it inaccessible;  
[or]

[if the engineered control is to address exceedances of the pollutant mobility criteria, the proposed engineered control has been designed and will be constructed to minimize migration of liquids through soil and have a permeability of less than  $10^{-6}$  cm/sec or, unless otherwise specified by the Commissioner in writing, to have the permeability specified in a closure plan implemented under sections 22a-209-1 et seq of the Regulations of Connecticut State Agencies for a release area which is a lawfully authorized solid waste disposal area; and]

[II](bb) if the engineered control is to address exceedances of the pollutant mobility criteria, the proposed engineered control is either:

(I) adequate to environmentally isolate the soil with such exceedances and has been designed and will be constructed to minimize migration of liquids through soil, either by capping to achieve [and have] a permeability of less than  $10^{-6}$  cm/sec or by the use of immobilization to reduce the permeability of the impacted soil to a permeability approved by the Commissioner, or

[unless otherwise specified by the Commissioner in writing, to have the permeability specified in a closure plan implemented under sections 22a-209-1 et seq of the Regulations of Connecticut State Agencies for a release area which is a lawfully authorized solid waste disposal area; or]

(II) adequate to otherwise immobilize contaminants in the soil exceeding the pollutant mobility criteria to achieve compliance with applicable groundwater criteria; and

(cc) if the engineered control is to address an ongoing residual source of pollution below the water table, the proposed engineered control has been designed and will be constructed to reduce the migration of contaminants from the pollution source by immobilization to achieve compliance with applicable groundwater criteria; and

(ii) for all engineered controls, the proposed engineered control has been designed and will be constructed to function with minimum maintenance, to promote drainage

and minimize erosion of or other damage to such control, and to accommodate settling and subsidence of the underlying soil so as to maintain the control's functional integrity;

- (iii) The design of any proposed or existing paved surface or hardscape proposed for use as an engineered controls shall include specifications signed and sealed by a professional engineer indicating that the surface and sub-base materials are suitable for the intended use and are able to function with minimal maintenance and repair for fifteen years and shall be signed and sealed by a professional engineer;
- (iv) for engineered controls proposed under subparagraphs (B)(i)(bb) or (B)(i)(cc), plans for ground-water monitoring at the subject release area, as approved in writing by the Commissioner, are adequate to ensure that any substance migrating therefrom will be detected;
- (v) plans for inspection and maintenance of the subject release area are adequate to ensure that the structural integrity, design permeability, and effectiveness of the engineered control will be maintained; such plans shall include without limitation measures to evaluate the continued effectiveness of the engineered control, prevent run-on and run-off of storm water from eroding or otherwise damaging the engineered control and measures to repair such control to correct the effects of any settling, subsidence, erosion or other damaging events or conditions;
- (vi) an environmental [land] use restriction is or will be in effect with respect to the parcel at which [the subject release area] the engineered control is located, which environmental use restriction ensures that such parcel will not be used in a manner that could disturb the engineered control or the polluted soil;
- (vii) any other information that the Commissioner reasonably deems necessary; and
- (ix) Financial assurance associated with an engineered control shall meet the requirements of subsection 1(f) of these regulations. [with respect to any release area subject to any of the requirements of section 22a-209-4(i) or section 22a-449(c)-100 through 110 of the Regulations of Connecticut State Agencies, all such requirements are or will be satisfied. With respect to a release area which is not subject to any such regulations, the owner of the subject parcel shall demonstrate that he or she has posted or will post a surety in a form and amount approved in writing by the Commissioner, which surety during the first year after installation of the engineered control, shall be equal to the cost of one year's maintenance and monitoring of the engineered control, and which in each subsequent year shall be increased in amount by adding an amount equal to the cost of one year's maintenance and monitoring, until the total amount of such surety is equal to the cost of five year's of maintenance and monitoring, which amount shall be maintained in effect for the next twenty-five years or for such other period as may be required by the Commissioner].



[(D)](C) When the Commissioner approves a request pursuant to this subsection to use an engineered control he may require that such control incorporate any measures which he deems necessary to protect human health and the environment.

(D) A licensed environmental professional may, in lieu of Commissioner approval certify the use of certain engineered controls, specified in this subdivision (D), is compliant with the requirements of subparagraph (B)(i)(aa) of this subsection, that all other provisions of subparagraph (A), (B), (E), (F) and (G) are met, and that there are no PCB present in excess of 1 mg/kg. Such engineered controls shall meet the following:

- (i) for non-paved surfaces, consisting of shallow rooted vegetation, mulch, or gravel:
  - (aa) a minimum of one foot of material not exceeding applicable criteria underlain by a demarcation layer,
  - (bb) inspections accompanied by appropriate repair shall be conducted on a semi-annual basis and after significant storm events,
  - (cc) annual reports shall be submitted to the Commissioner, and
  - (dd) areas with such existing mature lawns are exempt from the need to install a demarcation layer, but shall be inspected and repaired quarterly;
  
- (ii) for non-paved surfaces, consisting of shrubbery:
  - (aa) a minimum of eighteen inches of material not exceeding applicable criteria underlain by a demarcation layer suitable to inhibit root penetration,
  - (bb) inspections accompanied by appropriate repair shall be conducted on a semi-annual basis and after significant storm events,
  - (cc) annual reports shall be submitted to the Commissioner, and
  - (dd) areas with such existing mature shrubs are exempt from the need to install a demarcation layer, but shall be inspected and repaired quarterly;
  
- (iii) for non-paved surfaces, consisting of hardscape:
  - (aa) a minimum of nine inches as a combined thickness of hardscape and suitably engineered sub-base consisting of material not exceeding applicable criteria and a demarcation layer,
  - (bb) inspections accompanied by appropriate repair shall be conducted each spring and after significant storm events,
  - (cc) annual reports shall be submitted to the Commissioner, and
  - (dd) areas with such existing hardscapes are exempt from the need to install a demarcation layer, but shall be inspected and repaired semi-annually;
  
- (iv) for paved surfaces:
  - (aa) a demarcation layer under either:
    - (I) a minimum of two and one-half (2.5) inches of bituminous concrete or three inches of reinforced concrete, and with a minimum of six inches of suitably engineered sub-base consisting of material that does not exceed applicable criteria or is in compliance with section 1(a)(32)(C), or
    - (II) a layer of or four inches of reinforced concrete that is suitably engineered for the intended load,



134 (19) and (28), and continuing each year thereafter, on a form prescribed by the Commissioner; and

- (iv) Nothing in this subdivision shall preclude the Commissioner from taking any action he deems necessary to protect human health or the environment if an approved engineered control fails to prevent the migration of pollutants from the release area or human exposure to such pollutants.

(F) No person shall disturb or interfere with the engineered control without prior approval by the Commissioner, except as allowed under 22a-133q. The property owner, shall inspect and maintain the engineered control as set forth in plans pursuant to (B)(iv) of this subsection.

## **22a-133k-2(g) (Removal of Non-aqueous Phase Liquids)**

(REVISED PROPOSED LANGUAGE)

- (1) Removal of [light] non-aqueous phase liquids from soil and ground water [shall be conducted in accordance with] that is required pursuant to sections 22a-449(d)-(1), 22a-449(d)-106, and 25-54cc-5 of the Regulations of Connecticut State Agencies and section 22a-467 of the Connecticut General Statutes shall be conducted in accordance with section 22a-449(d)-106(f) of the Regulations of Connecticut State Agencies.
- (2) Any other non-aqueous phase liquids shall be contained or removed from soil and ground water as follows: [to the maximum extent prudent.]
- (A) Migrating non-aqueous phase liquids shall be removed from the soil and groundwater to the extent that such non-aqueous phase liquids do not migrate;
- (B) Non-aqueous phase liquids that are not migrating shall be removed from the soil and groundwater to the maximum extent prudent or contained, provided that such containment is approved by the Commissioner as a long-term remedy; and
- (C) The presence of nNon-aqueous phase liquids resulting from a release that is are allowed to remain in place as the result of a maximum extent prudent determination is are required to:
- (i) Result in compliance with applicable water quality criteria and soil vapor volatilization criteria; and
- (ii) Be recorded on the land records with an appropriate environmental use restriction to ensure such non-aqueous phase liquids will not be disturbed, and where applicable, be rendered inaccessible and not be subject to infiltration environmentally isolated.

## 22a-133k-3 Groundwater

22a-3(b)

(Alternative SWPC)

(REVISED PROPOSED LANGUAGE)

(b) Surface-water protection criteria.

(1) General Requirements.

Except as provided in subdivision (2) of this subsection, remediation of a ground-water plume [which]that discharges to a surface water body shall result in the reduction of each substance therein to a concentration [which is consistent with subdivision (2)(C) of subsection (g) of this section and] [which]that is equal to or less than the surface-water protection criterion or an alternative surface-water protection criterion established in accordance with subdivision (3) of this subsection.

(2) Where a groundwater plume discharges to surface water bodies that have limited dilution, [if a ground-water plume]

(A) defined as either:

[(A)](i) [discharges to] a tidal flat, wetland, or an intermittent [stream] watercourse, or

[(B)](ii) [discharges at] a location where the areal extent of such ground-water plume occupies more than 0.5%, or other percentage [which]that is approved in writing by the Commissioner, of the upstream drainage basin of the [stream] water body to which such plume discharges measured from the intersection of the [stream] water body and such ground-water plume[.,];

[(C)](B) each substance [therein] in such plume shall be remediated to a concentration equal to or less than the lower of the human health or applicable aquatic life criteria contained in Table 3 [Appendix D] of the most recent Water Quality Standards, or equal to or less than an alternative water quality criterion adopted by the Commissioner in accordance with Water Quality Standards [section 22a-426 of the General Statutes and paragraph 12b of the Water Quality Standards effective May 15, 1992].

## 22a-3(b)(3)(C)

## (Alternative SWPC -Aquifer Dilution)

(REVISED PROPOSED LANGUAGE)

### (B) Alternative Surface-water Protection Criteria – aquifer dilution calculation

For a plume that does not achieve the surface-water protection criteria, or aquatic life criteria, as applicable, an alternative criteria may be calculated provided that:

- (aa) within fifty feet downgradient of the source area of the groundwater plume, the concentration must decrease by a factor equal to or greater than five. This factor is calculated by dividing the groundwater concentration within the source area by the groundwater concentration within fifty feet downgradient of the source area; and
- (bb) the applicable criteria is multiplied by a dilution factor of five if the surface-water discharge point is greater than five hundred feet from the most downgradient groundwater sampling point used for compliance, with an increase in the dilution factor by one. An additional value of one dilution factor to be applied for each additional one hundred feet between the most downgradient groundwater sampling point used for compliance and the surface water discharge point, with a maximum allowable not to exceed a dilution factor ratio of ten.

## 22a-133k-3(c)(1)&(2)(Volatilization Criteria Applicability & Requirements)

(REVISED PROPOSED LANGUAGE)

(1) Except as specified in subdivisions (2), (3), and (4) [and (5)] of this subsection,

(A) all ground water polluted with a volatile petroleum substance within 15 feet or other volatile organic substance within [15] 30 feet of the ground surface or from the lowest level of a building or potentially occupied structure, shall be remediated such that the concentration of each such substance is equal to or less than the applicable residential volatilization criterion for ground water[.];

[2](B) if ground water polluted with a volatile organic substance is below a parcel [building] or portion thereof used solely for industrial or commercial activity, such ground water [shall] may be remediated such that the concentration of such substance is equal to or less than the applicable industrial/commercial volatilization criterion for ground water, provided that an environmental [land] use restriction is in effect with respect to the parcel or portion thereof [upon which such building is located], which environmental use restriction ensures that the parcel or portion thereof will not be used for any residential purpose in the future and that any future use of the parcel or portion thereof is limited to industrial or commercial activity; and

- (C) if ground water polluted with a volatile organic substance, other than a volatile petroleum substance, exceeding the applicable volatilization criterion is within 30 feet of the ground surface and within 30 feet laterally from a building potentially-occupied structure, the potential for a complete vapor intrusion pathway into such building potentially-occupied structure shall be evaluated.

## 22a-133k-3(c)(3)(B)

## (Vapor Mitigation Requirements)

(REVISED PROPOSED LANGUAGE)

**[(3)](2)** **[(A)]** Remediation of a volatile organic substance to the volatilization criterion for ground water shall not be required if the concentration of such substance in soil vapors below a building is equal to or less than (i) the residential volatilization criterion for soil vapor or (ii) the industrial/commercial volatilization criterion for soil vapor, if such building is solely used for industrial or commercial activity and, an environmental land use restriction is in effect with respect to the parcel or portion thereof upon which such building is located, which restriction ensures that the parcel or portion thereof will not be used for any residential purpose in the future and that any future use of the parcel or portion thereof is limited to industrial or commercial activity.

**[(B)](3)** The requirements of subdivision (1)[,] and (2)[, and (3)] of this subsection do not apply if:

- (i)** measures acceptable to the Commissioner have been taken to prevent the migration of such substance into any overlying building or potentially-occupied structure[:];
- (ii)** a program is implemented to maintain and monitor all such measures[:], and
- (iii)** notice of such measures has been submitted to the Commissioner on a form furnished by him which notice includes:
  - (aa)** a brief description of the areal extent of the ground-water plume and of the area which exceeds any such volatilization or soil vapor criterion;
  - (bb)** a brief description of the method of controlling the migration of such substance into any overlying building or potentially-occupied structure;
  - (cc)** a plan for the monitoring and maintenance of such control method; and
  - (dd)** a map showing all existing buildings or potentially-occupied structures, the areal extent of the ground-water plume, and the location of such control method[:];
- (iv)** an environmental use restriction is in effect requiring such measures to remain in operation.

## 22a-133k-3(c)(4)

## (Alternative Volatilization Criteria)

(REVISED PROPOSED LANGUAGE)

### (4) Site-specific and alternative volatilization criteria.

[(A) Site-specific residential volatilization criteria for ground water or soil vapor may be calculated using the equations in Appendix G to sections 22a-133k-1 through 22a-133k-3 of the Regulations of Connecticut State Agencies.]

[(B)] For a substance at a particular release area [T] the Commissioner may approve site-specific volatilization criterion or an alternative volatilization criterion for ground water or for soil vapor which may be calculated using the equations in Appendix G to sections 22a-133k-1 through 22a-133k-3 of the Regulations of Connecticut State Agencies [to be applied to a substance at a particular release area]. The Commissioner shall not approve any site-specific volatilization criterion or alternative criterion under this subparagraph unless it has been demonstrated that such criterion will ensure that volatile organic substances from such ground water or soil do not accumulate in the air of any building potentially occupied structure used for residential activities] at a concentration which,

[(i)](A) for any carcinogenic substance creates a risk to human health in excess of a  $10^{-6}$  excess lifetime cancer risk level, and for any non-carcinogenic substance does not exceed a hazard index of 1[.]; or

[(ii)](B) for a ground-water plume polluted with multiple volatile organic substances does not exceed a cumulative excess cancer risk level of  $10^{-5}$  for carcinogenic substances, and for non-carcinogenic substances with the same target organ, the cumulative hazard index does not exceed 1.

## 22a-133k-3(c)(5)

## (Volatilization Downgradient Exception)

(REVISED PROPOSED LANGUAGE)

### (5) Exemption from volatilization criteria.

(A) The volatilization criteria do not apply to ground water polluted with volatile organic substances, where the water table is less than fifteen feet below the ground surface, if no building or potentially occupied structure exists over the ground water polluted with volatile organic substances at a concentration above the applicable volatilization criteria, and (i) it has been documented that best efforts have been made to ensure that each owner of any parcel of land or portion thereof overlying such polluted ground water records an environmental [land] use restriction is in effect which ensures that no building is constructed over such polluted ground water; or (ii) the Commissioner has approved in writing a request demonstrating that no building or potentially occupied structure can reasonably be expected to be constructed over the subject ground water or that natural attenuation or other methods of remediation will, within five years, reduce the concentration of volatile organic substances in such ground water to a concentration equal to or less than the applicable volatilization criteria.

- (B) The volatilization criteria for ground water underlying an existing building ~~or potentially occupied structure~~ do not apply to ground water polluted with volatile organic substances where the Commissioner has approved in writing and there have been implemented an indoor air monitoring program and measures to control the level of any such volatile organic substances in the air of the subject building ~~or potentially occupied structure~~.
- (i) Any person seeking the Commissioner's approval of an indoor air monitoring program shall submit to him: a detailed written plan describing the proposed indoor air monitoring program, including but not limited to a description of the distribution and concentration of volatile organic compounds beneath the building ~~or potentially occupied structure~~, the location of proposed monitoring points, the proposed frequency of monitoring, the parameters to be monitored, and a description of proposed actions to be taken in the event such monitoring indicates that the monitored parameters exceed proposed specified concentrations and a proposed schedule for reporting to the Commissioner on the results of such monitoring for as long as monitoring is conducted at the site.
- (ii) In approving any indoor air monitoring program pursuant to this subdivision, the Commissioner may impose any additional conditions he deems necessary to ensure that the program adequately protects human health. In the event that the Commissioner approves an indoor air monitoring program pursuant to this subparagraph, any person implementing such program shall perform all actions specified in the approved plan, and any additional measures specified by the Commissioner in his approval of such plan.

**22a-133k-3(d)(4)(New)**

**(Alternative GWPC)**

(REVISED PROPOSED LANGUAGE)

(4) Alternative Ground-water Protection Criteria.

Alternative groundwater protection criteria may be used if all requirements of subparagraph (A) and (B) are met and either an alternative groundwater protection criteria is calculated in accordance with subparagraph (C) or is approved in writing by the Commissioner in accordance with subparagraph (D) of this subsection:

- (A) Groundwater may be remediated to a concentration for each substance therein equal to or less than the alternative groundwater protection criterion for each such substance provided that:
- (i) the subject plume is located within the area defined on the current ~~Department's~~ Potential Alternative Groundwater Protection Criteria Map;
- (ii) there is no current use of the water resource, as evidenced by the following:



- (aa) a public water supply distribution system is available within the area defined by the Potential Alternative Groundwater Protection Criteria Map two hundred feet of the subject parcel, parcels adjacent thereto, and any parcel within the areal extent of such portion of the groundwater plume that exceeds background groundwater concentration,
  - (bb) a public water supply distribution system is available to all areas between the groundwater plume and the downgradient surface water discharge point, and
  - (cc) no private water supply wells are in use for drinking purposes;
  - (iii) releases to soil that constitute a source of pollution resulting in the subject groundwater plume have been remediated so there is no longer an ongoing source in soil impacting groundwater;
  - (iv) this alternative groundwater protection criteria is not used in conjunction with subsection (2)(d) alternative pollutant mobility criteria for the same substance;
  - (v) groundwater monitoring has been completed in accordance with 22a-133k-3(g)(1) for any groundwater plume and for any remediated release area;
  - (vi) the subject groundwater plume is a diminishing state groundwater plume;
  - (vii) the groundwater complies with applicable surface water protection criteria and volatilization criteria; and
  - (viii) any groundwater plume located within a bedrock aquifer does not exceed the ground-water protection criteria.
- (B) Notice of the proposed use of an alternative groundwater protection criteria shall be provided on a form prescribed by the Commissioner, including:
- (i) documentation that the requirements of subparagraph (A) are met, including but not limited to a well receptor survey;
  - (ii) a map of the areal extent of such groundwater plume exceeding applicable criteria, and
  - (iii) demonstration of a diminishing state groundwater plume including but not limited to well construction diagrams, documentation of plume trends, and indicator parameters.
- (C) Alternative ground-water protection criteria is calculated for volatile organic substances using subdivision (i) and for semi-volatile organic substances, inorganics and pesticides using subdivision (ii). The alternative ground-water protection criteria shall not exceed one hundred times the Groundwater Protection Criteria listed in Appendix C, or calculated in Appendix G nor fifty percent of the applicable Volatilization Criteria listed in Appendix E, or calculated in Appendix G.
- (i) For volatile organic substances, the following equation shall be used to calculate the alternative ground-water protection criterion:

$$\text{Alternative GWPC} = \frac{\text{TAC} \times \text{HV} \times \text{ER} \times \text{MC}}{f \times \text{WHF}}$$

Terms	Description	Units	Value
<u>TAC</u>	<u>Target Indoor Air Concentration in Appendix G or additional TAC as approved by the Commissioner</u>	<u>(ug/m<sup>3</sup>)</u>	<u>Substance-specific</u>
<u>Alternative GWPC</u>	<u>Concentration in groundwater as alternative to groundwater protection criteria</u>	<u>ug/L</u>	<u>Calculated</u>
<u>f</u>	<u>fraction volatilized</u>	<u>unitless</u>	<u>0.5</u>
<u>HV</u>	<u>House Volume</u>	<u>m<sup>3</sup></u>	<u>1,000</u>
<u>ER</u>	<u>air exchange rate per day as a time weighted average</u>	<u>times per day</u>	<u>5.6</u>
<u>MC</u>	<u>mixing coefficient</u>	<u>unitless</u>	<u>0.5</u>
<u>WHF</u>	<u>Water Flow Rate</u>	<u>L/day</u>	<u>3,183</u>

- (ii) For Semi-Volatile Organic Compounds, Inorganic and Pesticides, the following equation shall be used to calculate the alternative ground-water protection criterion:

$$\text{Alternative GWPC} = \text{WSF} \times \text{RSC} \times \text{DEC} \times \text{UCF}$$

Terms	Description	Units	Value
<u>WSF</u>	<u>water to soil concentration factor based upon accumulation of arsenic in soil</u>	<u>(mg/L)/(mg/kg)</u>	<u>0.02</u>
<u>RSC</u>	<u>relative source contribution to account for other background contributions to semi-volatile organic compounds in soil</u>	<u>Unitless</u>	<u>0.2</u>
<u>DEC</u>	<u>Residential Direct Exposure Criterion</u>	<u>mg/kg</u>	<u>Substance-specific</u>
<u>UCF</u>	<u>Unit Conversion Factor</u>	<u>ug/mg</u>	<u>1,000</u>
<u>Alternative GWPC</u>	<u>Concentration in groundwater as alternative to GWPC</u>	<u>ug/L</u>	<u>Calculated</u>

(D) Commissioner Approval

A person may apply to The Commissioner for may approve the to use of an alternative groundwater protection criterion, for plumes that are not located within the Potential Alternative Groundwater Protection Criteria Map, pursuant to the following:

- (i) public water has become is available to all surrounding areas that were not previously mapped on the Potential Alternative Groundwater Protection Criteria Map. within two hundred feet of the subject parcel, parcels adjacent thereto, and any parcel within the areal extent of such portion of the groundwater plume that exceeds background groundwater concentrations. In such circumstance, the applicant shall provide to the Commissioner on a form prescribed by the Commissioner:
- (aa) all requirements in §22a-133k-3(d)(4), except §22a-133k-3(d)(4)(A)(i);
  - (bb) provide documentation from the water utility that public water is

available, including an updated public water service area map indicating the area where public water is now available; and  
(cc) any other requirements determined by the Commissioner; or

(ii) site and area specific geologic information documenting that the texture, depth and saturated thickness of surficial materials indicates that the aquifer is not suitable for development of a significant public water supply. In such circumstance, the applicant shall provide to the Commissioner on a form prescribed by the Commissioner:

(aa) all requirements in §22a-133k-3(d)(4), except §22a-133k-3(d)(4)(A)(i):

(bb) documentation that:

(I) there is less than 20 feet of saturated sand or sand and gravel; or

(II) pumping more than 15 gallons per minute is not sustainable;

(bb) cross-sectional map showing the nature and distribution of surficial materials; and

(cc) any other requirements determined by the Commissioner.

## **22a-133k-3(g)(1)**

## **(Monitored Natural Attenuation)**

(REVISED PROPOSED LANGUAGE)

### (1) Ground-water Monitoring.

Monitoring shall be designed to determine:

(A) The effectiveness of any soil remediation to prevent the pollution of ground water by substances from the release area;

(B) The effectiveness of any measures to render soil environmentally isolated;

(C) The effectiveness of any remediation taken to eliminate or minimize health or safety risks associated with such release or identified in any risk assessment conducted in accordance with subsection (e)(2) of this section or otherwise identified;

(D) Whether a substance in ground water in a GA area or an aquifer protection area meets the background concentration or ground-water protection criteria, as applicable, in accordance with the provisions of subdivision (2) of this subsection;

(E) Whether a substance in ground water meets the surface-water protection criteria and the applicable volatilization criteria in accordance with the provisions of subdivision (2) of this subsection; [and]

(F) Whether a ground-water plume in a GB area interferes with any existing use of the ground water for a drinking water supply or with any other existing use of the ground water, including but not limited to, industrial, agricultural or commercial purposes[.]; and

(G) Whether natural attenuation is occurring in groundwater to achieve criteria within a reasonable timeframe if the groundwater remedy relies upon **monitored natural attenuation**.

**22a-133k-3(g)(4)(New)**

**(Upgradient Policy)**

(REVISED PROPOSED LANGUAGE)

(4) **Upgradient Groundwater Plume.**

A downgradient parcel owner is not responsible for remediating a dissolved groundwater plume migrating onto his or her parcel from an upgradient parcel, provided that:

- (A) (i) such dissolved plume is present solely as a result of off-site source(s); or  
(ii) any on-site release to soil that may contribute to such plume has been remediated to applicable soil criteria and such plume has decreased to the either the upgradient concentration or applicable groundwater criteria; and
- (B) any exposure pathways to drinking water in supply wells or from volatilization into buildings are eliminated or mitigated to the extent necessary to protect human health on such downgradient parcel, and, for a commingled plume where an on-site source caused an exceedance of applicable groundwater criteria, on all downgradient parcels; and
- (C) notice is submitted to the Commissioner on a form prescribed by the Commissioner.

## Appendix E and F

## (Volatilization Criteria)

(CONCEPT)

*In the recent Discussion Document on Volatilization Criteria in the RSRs, it was discussed that the current volatilization criteria may not be protective of human health for most of the 30 volatile substances in Appendices E and F of the RSRs. The chosen option shown in the table below represents a change to the fate and transport of the substances in the subsurface using the revised J&E model, along with limited changes to the toxicity assumptions represented by the TACs (based on the understanding of substance toxicity used in 2003). This option was chosen because it should be the most familiar to the regulated community, since these criteria have been published on DEEP's website since 2003 and many parties have used these criteria as additional polluting substances/alternative criteria when completing remediation at their sites. The chosen option below includes no changes to BTEX and MTBE (leaving them at the 1996 levels). Appendix E and F are updated below with the proposed volatilization criteria.*

Appendix E to  
Sections 22a-133k-1 through 22a-133k-3 of the Regulations of Connecticut State Agencies  
Volatilization Criteria for Ground[W]water

Volatile Substance	Residential Volatilization Criteria for Ground[ ]water in parts per billion	Industrial/Commercial Volatilization Criteria for Ground[ ]water in parts per billion
Acetone	50000	50000
Benzene	215	530
Bromoform	75 [920]	2300 [3800]
2-Butanone (MEK)	50000	50000
Carbon Tetrachloride	5.3 [16]	14 [40]
Chlorobenzene	1800	23000 [6150]
Chloroform	26 [287]	62 [710]
1,2-Dichlorobenzene	5100 [30500]	50000
1,3-Dichlorobenzene	4300 [24200]	50000
1,4-Dichlorobenzene	1400 [50000]	3400 [50000]
1,1-Dichloroethane	3000 [34600]	4100 [50000]
1,2-Dichloroethane	6.5 [21]	68 [90]
1,1-Dichloroethylene	190 [1]	920 [6]

<b>Volatile Substance</b>	<b>Residential Volatilization Criteria for Ground[ ]water in parts per billion</b>	<b>Industrial/Commercial Volatilization Criteria for Ground[ ]water in parts per billion</b>
1,2-Dichloropropane	7.4 [14]	58 [60]
1,3-Dichloropropene	11 [6]	360 [25]
Ethyl benzene	50000	50000
Ethylene dibromide (EDB)	0.30 [4]	11 [16]
Methyl-tert-butyl-ether	50000	50000
Methyl isobutyl ketone	13000 [50000]	50000
Methylene chloride	160 [50000]	2200 [50000]
Styrene	3100 [580]	42000 [2065]
1,1,1,2-Tetrachloroethane	2 [12]	64 [50]
1,1,2,2-Tetrachloroethane	1.8 [23]	54 [100]
Tetrachloroethylene	340 [1500]	810 [3820]
Toluene	23500	50000
1,1,1-Trichloroethane	6500 [20400]	16000 [50000]
1,1,2-Trichloroethane	200 [8000]	2900 [19600]
Trichloroethylene	220 [219]	2900 [540]
Vinyl chloride	1.6 [2]	52 [2]
Xylenes	21300	50000

Appendix F to  
Sections 22a-133k-1 through 22a-133k-3 of the Regulations of Connecticut State Agencies  
Volatilization Criteria for Soil Vapor

Volatile Substance	Residential Volatilization Criteria for Soil Vapor in parts per million	Residential Volatilization Criteria for Soil Vapor in milligrams per cubic meter	Industrial/ Commercial Volatilization Criteria for Soil Vapor in parts per million	Industrial/ Commercial Volatilization Criteria for Soil Vapor in milligrams per cubic meter
Acetone	57 [2400]	140 [5701]	290 [8250]	690 [19597]
Benzene	1	3	113	361
Bromoform	0.04 [1.5]	0.42 [16]	0.98 [6]	10 [62]
2-Butanone (MEK)	130 [2400]	376 [7078]	230 [8285]	690 [24434]
Carbon Tetrachloride	0.06 [1]	0.38 [6]	0.12 [2.7]	0.75 [17]
Chlorobenzene	6.1 [31]	28 [143]	60 [106]	280 [488]
Chloroform	0.078 [4.5]	0.38 [22]	0.14 [10.4]	0.69 [51]
1,2-Dichlorobenzene	9.2 [240]	55 [1443]	95 [818]	570 [4918]
1,3-Dichlorobenzene	9.2 [240]	55 [1443]	95 [818]	570 [4918]
1,4-Dichlorobenzene	3 [950]	18 [5712]	5.5 [3270]	33 [19661]
1,1-Dichloroethane	14 [850]	58 [3440]	150 [3037]	600 [12292]
1,2-Dichloroethane	0.013 [1]	0.053 [4]	0.11 [1]	0.43 [4]
1,1-Dichloroethylene	1.9 [1]	7.6 [4]	7 [1]	28 [4]
1,2-Dichloropropane	0.021 [1]	0.098 [5]	0.13 [1]	0.58 [5]
1,3-Dichloropropene	0.035 [1]	0.16 [5]	0.89 [1]	4.0 [5]
Ethyl benzene	1650	7165	5672	24629
Ethylene dibromide (EDB)	0.0005 [1]	0.0056 [8]	0.007 [1]	0.053 [8]
Methyl-tert-butyl-ether	1000	3605	3415	12312
Methyl isobutyl ketone	6.8 [140]	28 [574]	68 [480]	280 [1966]
Methylene chloride	0.65 [1200]	2.3 [4168]	6.8 [2907]	24 [10098]

<b>Volatile Substance</b>	<b>Residential Volatilization Criteria for Soil Vapor in parts per million</b>	<b>Residential Volatilization Criteria for Soil Vapor in milligrams per cubic meter</b>	<b>Industrial/ Commercial Volatilization Criteria for Soil Vapor in parts per million</b>	<b>Industrial/ Commercial Volatilization Criteria for Soil Vapor in milligrams per cubic meter</b>
Styrene	9.3 [8]	39 [34]	95 [28]	400 [119]
1,1,1,2-Tetrachloroethane	0.009 [1]	0.062 [7]	0.22 [1.5]	1.5 [10]
1,1,2,2- Tetrachloroethane	0.0012 [1]	0.0083 [7]	0.028 [1]	0.19 [7]
Tetrachloroethylene	0.56 [11]	3.8 [75]	1 [27]	6.9 [183]
Toluene	760	2864	2615	9855
1,1,1-Trichloroethane	70 [1310]	380 [7148]	130 [4520]	690 [24662]
1,1,2-Trichloroethane	0.31 [40]	1.7 [218]	3.1 [93]	17 [507]
Trichloroethylene	0.14 [7]	0.76 [38]	0.26 [16]	1.4 [86]
Vinyl chloride	0.041 [1]	0.11 [3]	1	2.6 [3]
Xylenes	500	2192	1702	7461



## 22a-133k-Appendix H

## (Alternative PMC)

(CONCEPT)

The organic carbon-water partition coefficient ( $K_{oc}$ ) and Henry's constant ( $H'$ ) values for three chemicals have been added or updated as shown in the table below. Additionally, the values for one substance (pentachlorobenzene) have been removed since it is not one of the RSR substances with a default PMC. All other values remain the same as were posted in the April Conceptual Language Document and are not included here to save space.

Soil Organic Carbon-Water Partition Coefficient ( $K_{oc}$ ) and Henry's Constant ( $H'$ ) Values:  
Organics

<u>Substance</u>	<u><math>K_{oc}</math> (L/kg)</u>	<u><math>H'</math> (Dimensionless)</u>
<u>Alachlor</u>	<u>310</u>	<u>4.30E-07</u>
<u>Di-n-octyl phthalate</u>	<u>140,000</u>	<u>2.74E-03</u>
<u>Pentachlorophenol</u>	<u>7,960</u>	<u>1.00E-06</u>