NOTICE OF PUBLIC HEARING

The Environmental Protection Division (EPD) of the Georgia Department of Natural Resources will hold a public hearing on proposed additions to the Georgia Rules for Hazardous Site Response (Rules), Chapter 391-3-19, on Monday, May 2, 1994 at 10:00 in Room 401 of the Department of Transportation Building, 2 Capitol Square, Atlanta, Georgia. These Rules are to be considered for promulgation under the authority of the Georgia Hazardous Site Response Act, O.C.G.A. §12-8-90 *et seq.* (the Act), which was enacted by the 1992 Georgia General Assembly.

The rulemaking being proposed today would address the requirement in the Act for promulgation of rules governing investigations and corrective action at sites on the Hazardous Site Inventory, including cleanup standards. (Rules governing procedures for listing a site on the Hazardous Site Inventory were promulgated on January 26, 1994 and became effective February 20, 1994.) Today's proposed rulemaking would also address procedures and criteria for designating a site as needing corrective action, procedures for carrying out the Act's requirements for notices to property records and procedures for removal of sites from the Hazardous Site Inventory.

A package consisting of a summary document, the proposed Rules amendment, and the Act is available for public review and comment from April 1, 1994 through May 2, 1994, from 8:00 - 4:30 at the following locations:

Environmental Protection Division
205 Butler Street, SE
Floyd Towers East, Suite 1154
Atlanta, Georgia 30334

Middle Georgia Regional Office
Environmental Protection Division
2620 Shurling Drive
Macon, Georgia 31202

Southeast Regional Office
Environmental Protection Division
1 Conservation Way
Brunswick, Georgia 31523-8602

Southwest Regional Office
Environmental Protection Division
2024 Newton Road
Albany, Georgia 31708

Northeast Regional Office
Environmental Protection Division
745 Gaines School Road
Athens, Georgia 30605

An exact copy of the proposed Rules amendment will be provided to any person who requests it by calling EPD at (404) 657-8600.

Public involvement in this rulemaking process is essential and important to EPD. Statements and comments may be made orally or in writing at the hearing; lengthy statements or taped messages should be submitted for the record. Written comments may be submitted at any time during the public comment period but must be received by close of business on May 2, 1994 and should be addressed to Harold Reheis, Director, EPD, 205 Butler Street, SE, Suite 1152, Atlanta, Georgia 30334.

The proposed Rules amendment will be considered for adoption by the Board of Natural Resources on June 29, 1994. The meeting, which is open to the public, will be at 9:00 a.m. in the Department of Natural Resources Board Room at 205 Butler Street, Suite 1252, Atlanta, Georgia.

For further information, please contact Jennifer Kaduck, Branch Chief, Hazardous Waste Management Branch, at (404) 656-7802 or Tim Cash, Manager, Hazardous Sites Response Program, Hazardous Waste Management Branch, at (404) 657-8600.

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PROPOSED RULES OF
GEORGIA DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL PROTECTION DIVISION

Chapter 391-3-19: Hazardous Site Response

SUMMARY. Comments are solicited from the public on a proposed rules amendment that would add to the existing Rules for Hazardous Site Response, Chapter 391-3-19. The proposed rules amendment ("the amendment") would address requirements in the Hazardous Site Response Act, O.C.G.A., § 12-8-93(b), for promulgation of rules governing:

- Investigations, cleanups, and other corrective actions at sites where hazardous wastes, hazardous constituents, and hazardous substances have been disposed of or otherwise released;

- Procedures and criteria for making a determination whether property requires corrective action;

- Procedures for removal of sites from the Hazardous Site Inventory; and

- Procedures for the filing in the deed records of the superior courts of additional affidavits concerning property for which an initial affidavit has been filed pursuant to O.C.G.A. § 12-8-97(c).

The amendment only addresses corrective action at sites or properties that are already listed on the Hazardous Site Inventory (HSI). Rules governing procedures for listing a site on the HSI became effective on February 20, 1994 and are found at Rule 391-3-19-.04 and .05. The amendment is wholly in addition to, and has no effect on, any existing rules.

Specifically, the amendment proposes to do the following:

- Modify existing Rule 391-3-19-.02 "Conventions" by adding four new abbreviations to Subrule (1) and three new definitions to Subrule (2);

- Modify existing Rule 391-3-19-.05 "Reporting ... and Listing of Sites on the HSI" by adding Subrule (4), "Removal of sites from the Hazardous Site Inventory";

- Add Rule 391-3-19-.06 "Corrective Action" to provide the administrative procedures for moving a site that is on the HSI through the corrective action process;

- Add Rule 391-3-19-.07 "Risk Reduction Standards" to provide the technical standards that must be met for a corrective action to be complete;

- Add Rule 391-3-19-.08 "Property Notices" to specify the procedures for carrying out the Act's requirement for notices to private and public property records for sites that are designated as needing corrective action; and

- Add Appendix III "Media Target Concentrations and Standard Exposure Assumptions," which consists of Tables 1-3 and which supplements the risk reduction standards.

The proposed rules are presented on the following 29 pages. Within the rules, text has been added to help the reader understand either how the proposed rules will mesh with the existing rules or the origin of certain cleanup standards. All such text is identified by large boldface italics and will be deleted upon promulgation.

It is important to emphasize that these proposed rules relate only to sites listed on the HSI. If a release should occur in the future, the property owner may remediate the release within the timeframe provided for in existing Rules 391-3-19-.04 and -.05 and avoid listing on the HSI.

Nothing in these proposed rules prohibit a site owner or other responsible party from immediately undertaking a voluntary cleanup either prior to or after listing on the HSI. In fact, these rules provide substantial incentives for voluntary cleanups after site listing. If the cleanup reaches certain tangible endpoints within the timeframe allowed by the proposed rules, the site would be removed from the HSI and notices to property records (such as deeds) would not be necessary.

It is proposed to amend Chapter 391-3-19 as follows:

Amend Rule 391-3-19-.02(1) by adding the following abbreviations, to be merged with existing definitions upon promulgation:

391-3-19-.02 Conventions

(1) **Abbreviations**

RAGS, PART A -- "Risk Assessment Guidance for Superfund: Volume 1 - Human Health Evaluation Manual (Part A)," USEPA document EPA/540/1-89/002, December 1989

RAGS, PART B -- "Risk Assessment Guidance for Superfund: Volume 1 - Human Health Evaluation Manual (Part B, Development of Risk-based Preliminary Remediation Goals)," USEPA document EPA/540/R-92/003, December 1991

IRIS -- USEPA's Integrated Risk Information System

HEAST -- USEPA's Health Effects Assessment Summary Tables

Amend Rule 391-3-19-.02(2) by adding the following definitions, to be renumbered and merged with existing definitions upon promulgation:

(2) **Definitions**

(a′) *Non-residential property* means any real property or portion of a property not currently being used for human habitation or for other purposes with a similar potential for human exposure, at which activities have been or are being conducted that can be categorized in one of the 1987 Standard Industrial Classification (SIC) major groups 01-97 inclusive (except the four-digit codes 4941, 8051, 8059, 8062-3, 8069, 8211, 8221-2, 8351, 8661, and 9223). Non-residential property includes all of the contiguous block(s) and lot(s) controlled by the same owner or operator that are vacant land, or that are used in conjunction with such business. For leased properties, non-residential property includes the leasehold and any external tank, surface impoundment, septic system, or any other structure, vessel, contrivance, or unit that provides, or is utilized for the management of regulated substances to or from the leasehold.

(b′) *Residential property* means any property that does not exclusively meet the definition of non-residential property. In addition to recognized residential use, it also includes property used for establishments classified by those SIC codes that are excepted from the definition herein of "non-residential". Also, a portion of non-residential property that is used in part for residential activities, such as a day care center, is defined as residential.

(c') *Responsible party* means any person who has contributed or who is contributing to a release, as defined at O.C.G.A. 12-8-92(9).

Amend Rule 391-3-19-.05 "Reporting of Releases Exceeding Reportable Quantities and Listing of Sites on the Hazardous Site Inventory" by adding Rule 391-3-19-.05(4):

(4) **Removal of sites from the Hazardous Site Inventory.** The Director shall remove a site from the Hazardous Site Inventory if any of the following apply:

(a) The Director determines that the site had not had a release exceeding a reportable quantity at the time of listing the site on the Hazardous Site Inventory.

(b) The Director determines, in accordance with Items 1 or 2 of Rule 391-3-19-.06(6)(b), that the site meets either the Type 1, Type 2, Type 3, or Type 4 risk reduction standards of Rule 391-3-19-.07.

Add the following Rules 391-3-19-.06, -.07, and -.08 in their entirety:

391-3-19-.06 Corrective Action

(1) **Applicability.** The requirements of Rule 391-3-19-.06 apply to any person who is a responsible party at a site listed on the Hazardous Site Inventory. These requirements do not apply to owners and operators of facilities required to perform corrective action pursuant to Rule 391-3-11-.10 of the Rules for Hazardous Waste Management.

(2) **Classification of sites on the Hazardous Site Inventory.** Upon listing a site on the Hazardous Site Inventory, the Director shall designate the site as Class II unless or until he determines that the site should be designated as Class I or Class III pursuant to the following criteria:

(a) A Class I site is any site which meets any of the following criteria:

1. The site includes the source of a release to a groundwater drinking water supply that exceeds a reportable quantity and that has caused, or is likely to cause, human exposure to concentrations of a regulated substance that exceed any of the Type 1 groundwater criteria described in Rule 391-3-19-.07(6)(b).

2. The site has a continuing release as a result of which the site cannot comply with any of the Type 1-5 risk reduction standards described in Rule 391-3-19-.07.

3. The site has a release of a regulated substance that results in or is likely to result in any of the following:

(i) Bioaccumulation of a regulated substance in flora or fauna that causes adverse toxicological effects or that results in the need to recommend that human consumption be limited; or

(ii) Adverse acute or chronic effects to domestic animals, fish, shellfish, or wildlife.

4. The site is an abandoned facility where the potential for exposure to a release is not controlled through on-site management.

5. The site does not meet any other criteria of Rule 391-3-19-.06(2)(a) but the Director has determined that the site nevertheless poses a present or future danger to human health or the environment.

6. The site has been classified as Class I pursuant to Rule 391-3-19-.06(6)(c).

(b) A Class III site is any site which has been listed on the HSI and has been determined by the Director to be in compliance with the Type 5 risk reduction standards of Rule 391-3-19-.07.

(3) **Compliance status report for Class II sites.**

(a) Any person who is a responsible party for a site designated on the Hazardous Site Inventory as a Class II site shall submit to the Director a compliance status report that documents the current status of the site with regard to the risk reduction standards of Rule 391-3-19-.07. The Director shall in writing request the submittal of said report and specify a time frame for submittal, based on a priority for submittal to be determined by the Director.

(b) Unless otherwise stated in writing by the Director, the report required by Rule 391-3-19-.06(3)(a) shall, at a minimum, include:

1. A description of each known source which has contributed or is contributing to a release including:

(i) Source name, number or other descriptor;

(ii) Location of source on a map of scale of 1 inch = 200 feet or less;

(iii) Name of regulated substance(s) released;

(iv) Chronology of each source of a release;

(v) If a source is an engineered structure or a waste management unit, a description of the function, design, dimensions, capacity and operation of the source, including as-built construction drawings where available;

2. If the release involves soil contamination, a complete definition of the horizontal and vertical extent of such soil contamination. Satisfactory evidence of a complete definition of the horizontal and vertical extent of soil contamination shall consist of an appropriate number of data points at sufficient locations with concentrations at background concentrations. An acceptable determination of background concentrations shall be made from data points located in such a manner so as to yield samples that are representative of soil conditions not affected by releases at the site. In support of the definition of the extent of soil contamination the compliance report shall describe the following:

(i) General approach used;

(ii) Analytical parameters selected and rationale for selection;

(iii) Location of all sampling points by sample identification number on a map with scale of 1 inch = 200 feet or less and, where applicable, on vertical cross-sections of appropriate number and scale;

(iv) Sampling and analysis procedures including but not limited to:

(I) Sampling equipment and collection techniques;

(II) Field analytical or measurement techniques including make and model of equipment and calibration schedule and type;

(III) Sample handling and preservation techniques;

(IV) Equipment decontamination procedures;

(V) Chain-of-custody procedures; and

(VI) Laboratory analytical techniques, including references to the analytical methods used, if standard, or in cases where standard analytical techniques do not exist, descriptions of the analytical methods used, including quality assurance and quality control procedures utilized;

(v) A description of any statistical procedures used to evaluate data;

(vi) Procedures used to establish background soil concentrations; and

(vii) Narrative and tabular summary of all field data and of the results of all laboratory analyses including sufficient quality assurance/quality control data to validate the results.

3. If the release involves groundwater contamination, a complete definition of the horizontal and vertical extent of groundwater contamination. Satisfactory definition of the horizontal and vertical extent of groundwater contamination shall consist of an appropriate number of data points at sufficient locations with concentrations at background concentrations. An acceptable determination of background concentrations shall be made from data points located in such a manner so as to yield samples that are representative of groundwater conditions not affected by releases at the site. The compliance status report shall, at a minimum, describe the following:

(i) Analytical parameters selected and rationale for selection;

(ii) A description of the methods used to characterize subsurface geology;

(iii) A description of the methods used to characterize horizontal and vertical groundwater gradients, flow rates, and flow directions;

(iv) A description of the methods used to determine hydraulic conductivities and other pertinent hydrogeological characteristics, including a description of any slug and/or aquifer pumping tests;

(v) A description of groundwater monitoring well locations, and their installation and construction methods, including:

(I) A map with scale of 1 inch = 200 feet or less depicting all existing well locations including a survey of each well's surface reference point and the elevation of its top-of-casing;

(II) Type of well casing material;

(III) Description of well-intake design including screen slot size and length, filter pack materials and length, and method of filter pack emplacement;

(IV) Method used to seal the well from the surface and any other features designed to prevent or minimize downward migration of contaminants along the well annulus; and

(V) Description of the methods and procedures used to develop the wells;

(vi) Description of all sampling and analysis procedures used, including at a minimum:

(I) Procedures and timing for measuring groundwater elevations for each sampling event;

(II) Well evacuation procedures including volume evacuated prior to sampling;

(III) Sample withdrawal techniques, sampling equipment and materials (tubing, rope, pump, etc.);

(IV) Sample handling and preservation techniques;

(V) Procedures for decontaminating sampling equipment between samples and sampling events;

(VI) Chain-of-custody procedures for all phases of sample management; and

(VII) Laboratory analytical techniques, including references to the analytical methods used, if standard, or in cases where standard analytical techniques do not exist, descriptions of the analytical methods used, including quality assurance and quality control procedures utilized;

(vii) A description of procedures used to determine background groundwater quality which is representative of ground water not affected by the release;

(viii) A map with scale of 1 inch = 200 feet or less depicting the horizontal extent of contamination;

(ix) A map with scale of 1 inch = 200 feet or less depicting the potentiometric surface of ground water;

(x) Maps and vertical cross-sections of appropriate scale depicting concentrations and isopleths for all contaminants superimposed upon site stratigraphic features and monitoring wells; and

(xi) Narrative and tabular summary of all field data and of the results of all laboratory analyses, including sufficient quality assurance/quality control data to validate the results.

4. A description of any human or environmental receptors who may have been or could be potentially exposed to a release at the site.

5. A description of all properties which are part of the site including the address and location of such property, its legal description, and the property owner's name, address and telephone number.

6. The name, address and telephone number of any other responsible party for the site and a description of the type and amount of regulated substances such party may have released.

7. A summary of any previous actions taken to eliminate, control, or minimize any potential risk at the site, including actions taken to comply with the risk reduction standards of Rule 391-3-19-.07.

8. If the responsible party certifies pursuant to Rule 391-3-19-.06(4)(c) that the site is not in compliance with any of the risk reduction standards of Rule 391-3-19-.07, a corrective action plan that describes the corrective action that the responsible party has determined is necessary to achieve compliance with the applicable risk reduction standards of Rule 391-3-19-.07.

9. If the responsible party certifies pursuant to Rule 391-3-19-.06(4)(c) that the site is in compliance with the Type 5 risk reduction standards of Rule 391-3-19-.07, a monitoring and maintenance plan that describes the continuing actions that the responsible party has determined are necessary to maintain compliance with Type 5 risk reduction standards.

10. If the responsible party certifies pursuant to Rule 391-3-19-.06(4)(c) that the site is in compliance with either of the Type 3 or Type 4 risk reduction standards of Rule 391-3-19-.07, a monitoring plan that describes the continuing actions that the responsible party has determined are necessary to maintain compliance with the Type 3 or Type 4 risk reduction standards.

11. Attached to the front of the compliance status report, a concise statement of the findings of the report presented in plain language, immediately followed by the certification required pursuant to Rule 391-3-19-.06(4)(a).

(4) **Certification of compliance with risk reduction standards at Class II sites.**

(a) The compliance status report required by Rule 391-3-19-.06(3) shall include a compliance status certification regarding the responsible party's own determination as to the status of the site's compliance with the applicable risk reduction standards of Rule 391-3-19-.07.

(b) The compliance status certification shall be signed by the applicable person described in Items 1 through 4 of Rule 391-3-19-.03(5)(c).

(c) Any person signing the certification of compliance required under Rule 391-3-19-.06(4) shall make the following certification:

I certify under penalty of law that this report and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Based on my review of the findings of this report with respect to the risk reduction standards of the Rules for Hazardous Site Response, Rule 391-3-19-.07, I have determined that [(choose either of the following statements): 1. This site is in compliance with Type 1, Type 2, Type 3, Type 4, or Type 5 risk reduction standards (specify lowest numbered Type that applies) or *2. This site is not in compliance with any Type risk reduction standards and that the corrective actions described in the plan(s) submitted pursuant to Items 8-10 of Rule 391-3-19-.06(3)(b) will, when implemented, bring this site into compliance with Type 1, Type 2, Type 3, Type 4, or Type 5 risk reduction standards (specify lowest numbered Type that applies)].*

(5) **Public participation.**

(a) Within 5 days of submitting to the Director the compliance status report required pursuant to Rule 391-3-19-.06(3), the responsible party who submits the report shall publish a notice in a major local newspaper of general circulation announcing that such report is available for inspection by the general public. The public notice must include:

1. The name, address and location of the site as it appears on the Hazardous Site Inventory;

2. The following statement: *"The Georgia Environmental Protection Division, Department of Natural Resources, State of Georgia (EPD) has placed this site on the Hazardous Site Inventory pursuant to its authority under the Hazardous Site Response Act and Rules promulgated thereunder. As required by the Rules for Hazardous Site Response, the responsible party for this site was required to investigate the site and submit a compliance status report to EPD summarizing the results of that investigation. EPD is currently reviewing the compliance status report to determine if corrective action is needed for regulated substances that have been released at this site. Before EPD decides whether corrective action is needed, the public has the opportunity to review the compliance status report and provide comments to EPD about the report."*;

3. Announcement of a 30-day public comment period beginning on the date of the published notice, and the name, address and telephone number of an EPD contact person to whom written or oral comments can be made;

4. Name, address and telephone number of the responsible party or its designated contact person; and

5. Location where the report may be viewed and copied.

(b) Within 15 days of publishing the public notice required by Rule 391-3-19-.06(5)(a), the responsible party shall provide the Director with an exact copy of the public notice as it appeared in the paper.

(c) Within 5 days of submitting to the Director the compliance status report required pursuant to Rule 391-3-19-.06(3), the responsible party shall provide to the county government in the county in which the site is located and to the government of any city in whose jurisdictions the site is located a written notice providing the same information required in Rule 391-3-19-.06(5)(a).

(d) Upon making a determination pursuant to Rule 391-3-19-.06(6) or upon determining that a proposed corrective action plan should be approved, the Director shall publish notice of such determination in a major local newspaper of general circulation.

(6) **Determination of the need for corrective action.** Rule 391-3-19-.06(6) applies to any site listed on the Hazardous Site Inventory.

(a) Any site that is classified on the Hazardous Site Inventory as a Class I site pursuant to Rule 391-3-19-.06(2) shall also be designated by the Director as having a known release needing corrective action.

(b) For sites classified on the Hazardous Site Inventory as Class II sites pursuant to Rule 391-3-19-.06(2), the Director shall review the compliance status certification required by Rule 391-3-19-.06(4) and do the following:

1. If the responsible party certifies that the site is in compliance with the Type 1 or Type 2 risk reduction standards of Rule 391-3-19-.07, and the Director concurs with that certification, the Director shall remove the site from the Hazardous Site Inventory in accordance with Rule 391-3-19-.05(4).

2. If the responsible party certifies that the site is in compliance with the Type 3 or Type 4 risk reduction standards of Rule 391-3-19-.07, and the Director concurs with that certification, the Director shall designate the site on the Hazardous Site Inventory as having a known release needing corrective action and shall require the property notices of Rule 391-3-19-.08(1) and (2). Upon compliance with Rule 391-3-19-.08(4), the site shall be removed from the Hazardous Site Inventory in accordance with Rule 391-3-19-.05(4).

3. If the responsible party certifies that the site is in compliance with the Type 5 risk reduction standards of Rule 391-3-19-.07, and the Director concurs with that certification, the Director shall designate the site on the Hazardous Site Inventory as having a known release needing corrective action but shall reclassify the site as Class III, and shall state on the Inventory that corrective action shall consist of those activities needed to maintain compliance with the Type 5 risk reduction standards, including the property notices of Rule 391-3-19-.08(1), (2), and (7).

4. If the responsible party certifies that the site is not in compliance with any of the risk reduction standards of Rule 391-3-19-.07, the Director shall reclassify the site as a Class I site and designate the site on the Hazardous Site Inventory as having a known release needing corrective action, whereupon the property owner shall make the property notices required by Rule 391-3-19-.08(1) and (2).

(c) The Director may reclassify a site on the Hazardous Site Inventory from Class II to Class I, and designate the site as having a known release needing corrective action, if:

1. The responsible party fails to submit the compliance status report within the time specified in Rule 391-3-19-.06(3)(a);

2. The compliance status report is deficient with respect to the requirements of Rule 391-3-19-.06(3)(b); or

3. The responsible party certifies pursuant to Rule 391-3-19-.06(4) that the site is not in compliance with any of the applicable risk reduction standards of Rule 391-3-19-.07.

4. The Director does not concur with the responsible party's certification made pursuant to Rule 391-3-19-.06(4) that the site is in compliance with the applicable risk reduction standards of Rule 391-3-19-.07.

(d) Upon making a determination pursuant to Rule 391-3-19-.06(6)(a)-(c) that the site has a known release needing corrective action, the Director shall provide the responsible party with written notice of such determination, including a statement concerning the requirements of Rule 391-3-19-.08.

(e) If the Director determines that a site listed as Class I on the Hazardous Site Inventory subsequently comes into compliance with the risk reduction standards of Rule 391-3-19-.07, the Director shall reclassify such site in accordance with the provisions of Items 1 through 3 of Rule 391-3-19-.06(6)(b), except that the deed notice provisions of Rule 391-3-19-.08(1) and (2) need not be repeated.

(7) **Response to a determination that a site is Class I.**

(a) Upon making a determination that a site is Class I, the Director shall notify each responsible party for such site of the opportunity to perform corrective action voluntarily in accordance with a consent order entered into with the Director within such time as may be specified by the Director in written correspondence to the responsible party.

(b) If a responsible party fails or refuses to enter into a consent order issued pursuant to Rule 391-3-19-.06(7)(a) within the period of time specified by the Director, the Director may issue an administrative order directed to such responsible party. The order may direct that necessary corrective action be taken within a reasonable time to be prescribed in the order.

(c) Any person subject to an order issued pursuant to Rule 391-3-19-.06(7) shall, at a minimum, do the following within a time to be prescribed in such order:

1. Provide to the Director the information required under Items 1 through 11 under Rule 391-3-19-.06(3)(b), if such information has not already been provided to the Director pursuant to Rule 391-3-19-.06(3).

2. Implement a corrective action plan, upon the Director's approval, which describes a program sufficient to achieve compliance with Type 1, 2, 3, 4, or 5 risk reduction standards of Rule 391-3-19-.07.

391-3-19-.07 Risk Reduction Standards

(1) **Purpose and Scope.** Rule 391-3-19-.07 specifies the information and procedures necessary to demonstrate compliance with requirements under HSRA for corrective action. Compliance with these requirements does not preclude the requirement to comply with any stricter standards that may be applicable under other state or federal laws or regulations. These risk reduction standards may be applicable, relevant, or appropriate requirements for remedial actions under the NCP.

(2) [reserved]

(3) **Completion of corrective action.** A required corrective action shall be considered complete when it is demonstrated that the site meets any or a combination of the applicable risk reduction standards described in Rule 391-3-19-.07. All risk reduction standards will, when adequately carried out, assure adequate protection of human health and the environment from potential exposure to land-based releases of regulated substances.

(4) **Essential features of acceptable corrective actions.** For corrective action to be in compliance with these standards, the following common elements are required:

(a) The corrective action shall, at a minimum, provide for the removal or decontamination of nonaqueous phase liquids from groundwater zones to the extent practicable.

(b) The corrective action shall not allow exposure to concentrations which would cause food chain contamination, damage to soils or to biota in the soils which could impair the use of soils for agricultural or silvicultural purposes, adverse effects on vegetation or wildlife, or the accumulation of vapors in buildings or other structures which pose a threat to human health or the environment.

(c) The corrective action shall protect waters of the State from releases that would cause surface water to experience concentrations of regulated substances in excess of any general criterion specified in the Georgia Rules and Regulations for Water Quality Control at 391-3-6-.03(5) or, if concentration values are not provided in said Rules, concentrations at levels that exhibit acute toxicity to aquatic life as demonstrated pursuant to protocols established by the Director.

(d) If the detection limit and/or the background concentration for a regulated substance is greater than the concentration specified in any risk reduction standard, the greater of the detection limit or background shall be used for determining compliance with the applicable risk reduction standard. "Detection limit" in this context implies the non-fraudulent use of an approved analytical test method that is appropriate for the particular application. Background shall be determined from samples taken from media that are unaffected by the release.

(5) **Types of risk reduction standards.** [reserved]

(6) **Criteria for Type 1 standards.**

(a) Type 1 standards provide for regulated substance concentrations that pose no significant risk on the basis of standardized exposure assumptions and defined risk levels for the residential scenario. To comply with these standards, all source materials must be removed or decontaminated to Type 1 media criteria.

(b) Criteria for ground water. At all points within any ground water that has been affected by the release, non-aqueous phase liquids shall not exist, and groundwater sample concentrations shall not exceed concentrations given in Table 1 of Appendix III or, for those substances not listed, the background or detection limit concentration. If more than one regulated organic compound are present in ground water, their sum in a single sample shall not exceed 10 mg/L if the Table 1 value for each compound is less than 5 mg/L, or, where at least one compound has a Table 1 value greater than or equal to 5 mg/L, the sum of the concentrations shall not exceed the maximum Table 1 value for a detected compound plus 10 mg/L.

(c) Criteria for soil. Concentrations at all points above the water table in the soil that have been affected by the release shall not exceed the concentrations given in Table 2 of Appendix III or, for those substances not listed, the least of the concentrations from Items 1 through 3 below:

1. Concentrations which will not cause contamination of ground water at levels which exceed Type 1 groundwater criteria, as determined using the following options:

(i) Multiplication of the Type 1 groundwater concentration criteria by a factor of 100; or

(ii) Demonstration through use of the Toxicity Characteristic Leaching Procedure, SW-846 Method 1311, or other method approved by the Director that a concentration in soil will not generate leachate concentrations that exceed Type 1 groundwater concentration criteria.

2. Concentrations which are unlikely to result in any noncancer toxic effects on human health via soil ingestion along with inhalation of volatiles and particulates, determined using Equation 7 of RAGS, Part B, and standard residential exposure assumptions in Table 3 of Appendix III.

3. Concentrations for which the upper bound on the estimated excess cancer risk is less than or equal to 10^{-5} (10^{-4} for Class C carcinogens) via soil ingestion along with inhalation of volatiles and particulates, determined using Equation 6 of RAGS, Part B, and standard residential exposure assumptions in Table 3 of Appendix III.

(7) **Criteria for Type 2 standards.**

(a) Type 2 standards provide for regulated substance concentrations that pose no significant risk on the basis of a site-specific risk assessment for the residential scenario. To comply with these standards, all source materials must be removed or decontaminated to Type 2 media criteria.

(b) Criteria for ground water. The Type 2 criteria for ground water shall be identical to the Type 1 criteria for ground water.

(c) Criteria for soil. Concentrations at all points above the water table in the soil that have been affected by the release shall not exceed the least of the following concentrations:

1. Concentrations which will not cause contamination of ground water at levels which exceed Type 1 groundwater criteria, as determined by any laboratory test and/or fate-and transport model approved by USEPA and the Director, at a point of exposure defined as any point at which a drinking water well could be installed.

2. Concentrations which are unlikely to result in any noncancer toxic effects on human health via soil ingestion along with inhalation of volatiles and particulates, determined using Equation 7 from RAGS, Part B, and site-specific exposure factors for the residential use scenario.

3. Concentrations for which the upper bound on the estimated excess cancer risk is less than or within the range 10^{-6} to 10^{-4} via soil ingestion along with inhalation of volatiles and particulates, determined using Equation 6 from RAGS, Part B, and site-specific exposure factors for the residential use scenario.

(d) The exposure assessments under Items 2 and 3 of Rule 391-3-19-.07(7)(c) above shall be conducted in a manner consistent with USEPA's "Guidelines for Exposure Assessment" (57 FR 104:22888-22938; May 29, 1992). The Director shall determine which cancer risk level shall apply within the range provided in Item 3 of Rule 391-3-19-.07(7)(c) above.

(8) **Criteria for Type 3 standards.**

(a) Type 3 standards provide for regulated substance concentrations that pose no significant risk on the basis of standardized exposure assumptions and defined risk levels for the non-residential use scenario. To comply with Type 3 standards, all source materials must be removed or decontaminated to Type 3 media criteria.

(b) Type 3 standards are not applicable to residential exposure scenarios. Type 3 standards are applicable where the responsible party documents that the activities being conducted on the property satisfy the definition for non-residential property at Rule 391-3-19-.02(2) and documents that a monitoring program will assure continued compliance with the Type 3 standards.

(c) Criteria for ground water. The ground water criteria for Type 3 are distinguished from the groundwater criteria for Type 1 only by the status of nonaqueous phase liquids within the property boundary. For Type 3, residual nonaqueous phase liquids may be present but must have been removed or decontaminated to the extent practicable. Type 3 criteria for concentrations in groundwater samples, and for nonaqueous phase liquids beyond the property boundary, are the same as for Type 1.

(d) Criteria for soils.

1. No soil remaining in place shall exhibit the hazardous waste characteristics of ignitability, corrosivity, reactivity, or toxicity as defined in 40 CFR 261 Subpart C. The sum of concentrations of the volatile organic compounds in soil air shall not exceed 1000 parts per million by weight or volume, as measured by USEPA Test Method 8015 or calculated by using soil concentrations and Henry's Law constants.

2. Concentrations at all points above the water table in the soil that has been affected by the release shall not exceed concentrations described in Item 1 of Rule 391-3-19-.07(6)(c).

3. Concentrations in surface soil (soil within 2 feet of the land surface) shall not exceed the lower of the concentrations defined below. In no event shall compliance with the surface soil criteria be achieved by applying two feet of clean soil onto the original land surface.

(i) Concentrations which are unlikely to result in any noncancer toxic effects on human health due to ingestion of soil and inhalation of particulates and volatiles, determined using

Equation 7 of RAGS, Part B, and standard nonresidential exposure assumptions in Table 3 of Appendix III.

(ii) Concentrations for which the upper bound on the estimated excess cancer risk is less than or equal to 10^{-5} (10^{-4} for Class C carcinogens) for human ingestion of soil and inhalation of particulates and volatiles, determined using Equation 6, RAGS, Part B, and standard nonresidential exposure assumptions in Table 3 of Appendix III.

(9) **Criteria for Type 4 standards.**

(a) Type 4 standards provide for regulated substance concentrations that pose no significant risk on the basis of a site-specific risk assessment for the non-residential use scenario. To comply with Type 4 standards, all source materials must be removed or decontaminated to Type 4 media criteria.

(b) Type 4 standards are not applicable to residential exposure scenarios. Type 4 standards are applicable where the responsible party documents that the activities being conducted on the property satisfy the definition for non-residential property at Rule 391-3-19-.02(2) and documents that a monitoring program will assure continued compliance with the Type 4 standards.

(c) Criteria for ground water. The responsible party must be able to demonstrate that the quality of any ground water that has been affected by the release meets Type 1 criteria at and beyond the property boundary. Within the property boundary, non-aqueous phase liquids must have been removed or decontaminated to the extent practicable. Concentrations of regulated substances in groundwater samples must not exceed, at all points within the property boundaries, the lesser of the values from Items 1 and 2 below or, for those substances for which neither calculation can be made, the detection limit.

1. Concentrations which are unlikely to result in any noncancer toxic effects on human health via ingestion of, or inhalation of volatiles from, ground water, determined using Equation 2 from RAGS, Part B, and site-specific exposure factors for the non-residential use scenario.

2. Concentrations for which the upper bound on the estimated excess cancer risk is less than or within the range 10^{-6} to 10^{-4} via ingestion of, and inhalation of volatiles from, ground water, determined using Equation 1 from RAGS, Part B, and site-specific exposure factors for the non-residential use scenario.

(d) Criteria for soil. Concentrations at all points above the water table in soil that has been affected by the release shall not exceed the least of the following concentrations:

1. Concentrations which will not cause contamination of ground water at levels which exceed Type 4 groundwater concentration criteria, as determined by any laboratory test and/or fate-and-transport model approved by USEPA and the Director, at a point of exposure defined as any point at which a drinking water well could be installed.

2. Concentrations which are unlikely to result in any noncancer toxic effects on human health via soil ingestion along with inhalation of volatiles and particulates, determined using Equation 7 from RAGS, Part B, and site-specific exposure factors for the non-residential use scenario.

3. Concentrations for which the upper bound on the estimated excess cancer risk is less than or within the range 10^{-5} to 10^{-4} via soil ingestion along with inhalation of volatiles and particulates.

determined using Equation 6 from RAGS, Part B, and site-specific exposure factors for the non-residential use scenario.

(e) The exposure assessments under Rule 391-3-19-.07(9)(c) and (d) above shall be conducted in a manner consistent with USEPA's "Guidelines for Exposure Assessment" (57 FR 104:22888-22938; May 29, 1992). The Director shall determine which cancer risk level shall apply within the range provided in Item 2 of Rule 391-3-19-.07(9)(c) and Item 3 of Rule 391-3-19-.07(9)(d) above.

(10) **Criteria for Type 5 Standards**

(a) Type 5 standards allow, in those instances where immediate remediation to Type 1-4 standards is not appropriate, the use of measures to control the regulated substances or the property where the regulated substances are located. Such measures may consist of engineering controls such as construction of a fence, placement of a cap, installation of a slurry wall, or stabilization/ solidification/fixation of the waste or waste residues. Under Type 5 standards, removal or decontamination are used where appropriate to remove the principal threats at a site. Where removal or decontamination is not appropriate, treatment methods are used to significantly reduce the mobility, toxicity, and/or volume of the waste and waste residues to address the principal threats at a site. Treatment may be used in combination with on-site containment measures to reduce present and future threats from the site. The responsible party has the burden of being able to demonstrate that the particular mix of removal, decontamination, and/or control measures is the optimal blend to eliminate or abate present and future threats to human health and the environment. Institutional controls should not substitute for active remedial measures unless such active measures are determined to not be practicable.

(b) Compliance with Type 5 standards requires longterm monitoring and maintenance, as appropriate for all implemented remedial measures, plus a restrictive covenant provided in accordance with Rule 391-3-19-.08(7).

(c) Compliance with Type 5 standards requires that either Type 1, 2, 3, or 4 risk reduction standards, as applicable, be met beyond the boundary of the area for which compliance with Type 5 standards are sought whenever implementation of remedial measures is complete.

(d) Remedial measures designed to achieve compliance with Type 5 standards shall be consistent with the general requirements in Item (a) above and meet all the following performance criteria:

1. Carcinogens. For carcinogens, the measures shall be expected to permanently prevent exposures which exceed the upper bound on an estimated excess cancer risk of 10^{-5} (10^{-4} for Class C carcinogens) for individual carcinogenic substances and individual exposure pathways. The cumulative excess cancer risk for multiple carcinogenic substances and exposure pathways shall not be greater than 10^{-4}.

2. Systemic toxicants. For systemic toxicants, the measures shall be expected to permanently prevent exposures which exceed the dose to which the human population (including sensitive subgroups) could be exposed on a daily basis without appreciable risk of deleterious effect during a lifetime. Exposures shall not exceed a hazard quotient or a hazard index of one. The hazard quotient is the ratio of a single systemic toxicant exposure level for a specified time period to a reference dose for that systemic toxicant derived from the same time period. The hazard index is the sum of the hazard quotients for a single or multiple systemic toxicants which affect the same

target organ, or which act by the same method of toxicity through single or multiple media exposure pathways.

3. Air. The measures shall be expected to permanently assure that any emission from the contamination being addressed under these rules does not cause ambient atmospheric concentrations to exceed the lowest of the following concentrations:

(i) NESHAP and NAAQ Standards, and other applicable federal and state standards and guidelines of the USEPA and EPD.

(ii) For residential exposure conditions, concentrations that satisfy Items 1 and 2 of Rule 391-3-19-.07(10)(d) above at exposure points located both at the property boundary and within the contaminated area.

(iii) For non-residential exposure conditions, either OSHA permissible exposure limits, threshold limit values or other criteria applicable to an industrial exposure setting within the property boundaries, and concentrations that satisfy Items 1 and 2 of Rule 391-3-19-.07(10)(d) at the property boundary.

4. Ground Water. The measures shall be expected to permanently assure that groundwater concentrations shall not exceed Type 1-4 criteria, as applicable. The applicable groundwater criterion shall be achieved throughout the entire plume of contaminated ground water, except where the remedial measure provides for soil being left in place with concentrations in excess of applicable soil criteria under Types 1-4, in which case the Director may exclude from this requirement that portion of the plume that lies directly under the contaminated soil, as long as continuing releases to ground water from the soil and continued vertical migration of the release within ground water are eliminated by approved control measures. At a minimum, for all Type 5 cases, non-aqueous phase liquids in groundwater shall be removed or decontaminated to the extent practicable.

5. Soil. The measures shall not leave, beyond the effective control of engineering control measures, concentrations of regulated substances in soil that exceed the soil criteria for Type 1-4 standards, as applicable.

(e) More stringent criteria may be established for a site than are specified under 391-3-19-.07(10)(d) if the Director or the responsible party determines that it is necessary to protect human or environmental receptors.

391-3-19-.08 Property Notices

(1) **Notices to private property instruments.** This Rule applies to the owner of any property that is listed on the Hazardous Site Inventory and has been designated as needing corrective action pursuant to Rule 391-3-19-.06(6).

(a) From and after the date any owner receives written notice from the Director under Rule 391-3-19-.06(6)(d) that property of such owner that is listed on the Hazardous Site Inventory has been designated as needing corrective action, the owner of any such property shall include the following notice in any warranty deed, mortgage, security deed, lease, rental agreement, or other instrument that

is thereafter given or caused to be given by the property owner which creates an interest in or grants a use of the property:

> *"This property has been listed on the state's hazardous site inventory and has been designated as needing corrective action due to the presence of hazardous wastes, hazardous constituents, or hazardous substances regulated under state law. Contact the property owner or the Georgia Environmental Protection Division for further information concerning this property. This notice is provided in compliance with the Georgia Hazardous Site Response Act."*
>
> [Note: The term "instrument that is thereafter given or caused to be given by the property owner which creates an interest in or grants a use of the property" does not include options or contracts to purchase real property.]

(b) Rule 391-3-19-.08(1)(a) shall not apply after filing of the affidavit referred to in Rule 391-3-19-.08(6).

(2) **Affidavit in county deed records.** No later than forty five (45) days from the date the Director issues the written notice pursuant to Rule 391-3-19-.06(6)(d) that a property or part thereof listed on the Hazardous Site Inventory has been designated as needing corrective action, the owner of any such property shall cause to be prepared an affidavit of such fact in recordable form as set forth in O.C.G.A. § 44-2-20 and shall file such affidavit with the clerk of the superior court of each county in which the real property or any part thereof lies. Such affidavit shall be recorded in the clerk's deed records pursuant to O.C.G.A. § 44-2-20. Such affidavit shall include the statement provided in Rule 391-3-19-.08(1).

(3) **Petitions for hearing.** The notices required by Rule 391-3-19-.08(1) and (2) shall be stayed if the property owner files a petition for a hearing in accordance with O.C.G.A. 12-8-73 within thirty (30) days of the date the Director issues the written notice pursuant to Rule 391-3-19-.06(6)(d) that the site upon which the property is located needs corrective action.

(4) **Documentation of property notices.** Within thirty (30) days after the recorded affidavit required by Rule 391-3-19-.08(2) is returned by the county clerk to the property owner, the property owner shall submit a copy of such recorded affidavit to EPD.

(5) **Director's affidavit in county deed records.** Where ownership or control of any real property at a site subject to Rule 391-3-19-.08(1) and (2) is involuntarily acquired by a unit of state or local government through bankruptcy, tax delinquency, abandonment, or other circumstances in which the government involuntarily acquires title by virtue of its function as sovereign, the Director shall give thirty (30) days notice to any person who owned, operated, or otherwise controlled activities at the property immediately beforehand that the property is subject to the requirements of Rule 391-3-19-.08 and that, barring said person's contest under Rule 391-3-19-.08(3), the Director shall prepare and file the notice referenced in Rule 391-3-19-.08(2).

(6) **Subsequent affidavits.** If, subsequent to the filing of the initial affidavit referenced in Rule 391-13-19-.08(2), the Director determines that no further action is needed, and the property is removed from the Hazardous Site Inventory pursuant to Rule 391-3-19-.05(4), the Director shall notify the property owner in writing of such determination whereupon the property owner may file an additional affidavit with the clerk of superior court attaching a copy of such determination, which shall be restricted to the following declaration:

"This property was listed on the state's hazardous site inventory and was designated as needing corrective action due to the presence of hazardous wastes, hazardous constituents, or hazardous substances regulated under state law. However, this property has since been designated as needing no further action and has been removed from the state's hazardous site inventory. A copy of that determination is attached hereto. The notice requirements of O.C.G.A. § 12-8-97 no longer apply to this property and prior notices given under this code section are no longer in effect. The property owner or the Georgia Environmental Protection Division may be contacted for further information concerning this property. This notice is provided in compliance with the Georgia Hazardous Site Response Act."

(7) **Restrictive covenants.** The owner of any property where the Type 5 risk reduction standards of Rule 391-3-19-.07(10) are being used shall, upon the request of the Director, execute a restrictive covenant for such property. The covenant shall be recorded with the clerk of superior court for the county in which the property is located, and a copy shall be provided to any zoning or land use planning authority that has jurisdiction over the property. Such restrictions shall run with the land and be binding on the owner's successors and assigns. The restrictive covenant shall be prepared by the Director and may include, but not necessarily be limited to, provisions to accomplish the following:

(a) Prohibit activities on the property that may interfere with a remedial action, operation and maintenance, long term monitoring, or other measures necessary to ensure the integrity of the remedial action.

(b) Prohibit activities that may result in human exposures above those specified for residential scenarios in Rule 391-3-19-.07(6) and (7) or for non-residential scenarios at Rule 391-3-19-.07(8) and (9), whichever scenario is applicable, and activities that would result in the release of a regulated substance which has been remedied in accordance with Rule 391-3-19-.07(10).

(c) Allow the Director to enforce the restrictions set forth in the covenant by legal action in a court of appropriate jurisdiction.

(d) Require the installation and maintenance of a permanent marker on each side of the site which delineates the restricted area.

(e) Describe uses of the property that are prohibited.

Add Appendix III in its entirety:

APPENDIX III

MEDIA TARGET CONCENTRATIONS AND STANDARD EXPOSURE ASSUMPTIONS

Table 1. Groundwater Criteria

CAS Number	Regulated Substance/Analyte	Concentration (mg/L)
83329	Acenaphthene	2
67641	Acetone	4
75058	Acetonitrile	0.2
98862	Acetophenone	4
107028	Acrolein	0.7
79061	Acrylamide	0.0001 (a)
107131	Acrylonitrile	0.0006 (a)
116063	Aldicarb	0.007
309002	Aldrin	0.00002 (a)
7664417	Ammonia	30
7773060	Ammonium sulfamate	2
62533	Aniline	0.006 (a)
7440360	Antimony	0.006 (a)
140578	Aramite	0.001 (a)
7440382	Arsenic	0.05
1332214	Asbestos [fibers longer than 10 μm]	7 million/liter
7440393	Barium	2
56553	Benz(a)anthracene	0.0001
71432	Benzene	0.005
92875	Benzidine	0.0000002 (a)
50328	Benzo(a)pyrene	0.0002
205992	Benzo(b)fluoranthene	0.0002
100447	Benzyl chloride	0.0002 (a)
7440417	Beryllium	0.001
111444	Bis(2-chloroethyl) ether	0.00003 (a)

CAS Number	Regulated Substance/Analyte	Concentration (mg/L)
75252	Bromoform	see Trihalomethanes
85687	Butyl benzyl phthalate	0.1
7440439	Cadmium	0.005
63252	Carbaryl	0.7
1563662	Carbofuran	0.04
75150	Carbon disulfide	4
56235	Carbon tetrachloride	0.005
57749	Chlordane	0.002
126998	Chloro-1,3-butadiene, 2-	0.7
106478	Chloroaniline, p-	0.1
108907	Chlorobenzene	0.1
510156	Chlorobenzilate	0.7
124481	Chlorodibromomethane	see Trihalomethanes
67663	Chloroform	see Trihalomethanes
95578	Chlorophenol, 2-	0.04
107051	Chloropropene, 3-	0.002
2921882	Chlorpyrifos	0.02
7440473	Chromium	0.1
218019	Chrysene	0.0002 (a)
7440508	Copper	1.3
57125	Cyanide	0.2
72548	DDD	0.0001
72559	DDE	0.0001
50293	DDT	0.0001
75990	Dalapon	0.2
117840	Di-n-octyl phthalate	0.7
2303164	Diallate	0.0006 (a)
95807	Diaminotoluene, 2,4-	0.00001
333415	Diazinon	0.0006
53703	Dibenz(a,h)anthracene	0.0003
96128	Dibromochloropropane	0.0002
84742	Dibutyl phthalate	4

CAS Number	Regulated Substance/Analyte	Concentration (mg/L)
1918009	Dicamba	0.2
541731	Dichlorobenzene, m-	0.6
95501	Dichlorobenzene, o-	0.6
106467	Dichlorobenzene, p-	0.075
91941	Dichlorobenzidine, 3,3'-	0.00008 (a)
75274	Dichlorobromomethane	see Trihalomethanes
75718	Dichlorodifluoromethane	1
75343	Dichloroethane, 1,1-	4
107062	Dichloroethane, 1,2-	0.005
75354	Dichloroethylene, 1,1-	0.007
156605	Dichloroethylene, trans-1,2-	0.1
108601	Dichloroisopropyl ether	0.3
120832	Dichlorophenol, 2,4-	0.02
94757	Dichlorophenoxyacetic acid, 2,4-	0.07
78875	Dichloropropane, 1,2-	0.005
542756	Dichloropropene, 1,3-	0.002
60571	Dieldrin	0.00002 (a)
84662	Diethyl phthalate	5
123911	Diethylene dioxide, 1,4-	0.07 (a)
117817	Diethylhexyl phthalate	0.006
56531	Diethylstilbestrol	7
60515	Dimethoate	0.007
119904	Dimethoxybenzidine, 3,3'-	0.003 (a)
131113	Dimethyl phthalate	400
57976	Dimethylbenz(a)anthracene, 7,12-	0.000001 (a)
119937	Dimethylbenzidine, 3,3'-	0.000004 (a)
105679	Dimethylphenol, 2,4-	0.7
99650	Dinitrobenzene, m-	0.001 (a)
51285	Dinitrophenol, 2,4-	0.07
121142	Dinitrotoluene, 2,4-	0.00005 (a)
88857	Dinoseb	0.007
122394	Diphenylamine	0.2

CAS Number	Regulated Substance/Analyte	Concentration (mg/L)
122667	Diphenylhydrazine, 1,2-	0.00004 (a)
2764729	Diquat	0.02
85007	Diquat dibromide	0.02
298044	Disulfoton	0.0003
330541	Diuron	0.01
115297	Endosulfan (mixed isomers)	0.002
145733	Endothall	0.1
72208	Endrin	0.002
106898	Epichlorohydrin	0.04
110805	Ethoxyethanol, 2-	10
60297	Ethyl ether	7
97632	Ethyl methacrylate	3
62500	Ethyl methanesulfonate	0.000001 (a)
100414	Ethylbenzene	0.7
106934	Ethylene dibromide	0.00005
52857	Famphur	0.001
22224926	Fenamiphos	0.002
206440	Fluoranthene	1
86737	Fluorene	1
16984488	Fluoride	4
944229	Fonofos	0.01
50000	Formaldehyde	1
64186	Formic acid	70
76448	Heptachlor	0.0004
1024573	Heptachlor epoxide	0.0002
118741	Hexachlorobenzene	0.001
87683	Hexachlorobutadiene	0.001 (a)
319846	Hexachlorocyclohexane (alpha)	0.000006 (a)
319857	Hexachlorocyclohexane (beta)	0.00002 (a)
77474	Hexachlorocyclopentadiene	0.05
67721	Hexachloroethane	0.001 (a)
70304	Hexachlorophene	0.01

CAS Number	Regulated Substance/Analyte	Concentration (mg/L)
193395	Indeno(1,2,3-cd)pyrene	0.0004
78831	Isobutyl alcohol	10
78591	Isophorone	0.1
143500	Kepone	0.000002 (a)
7439921	Lead	0.015
58899	Lindane	0.0002
121755	Malathion	0.2
123331	Maleic hydrazide	4
7439976	Mercury (inorganic)	0.002
126987	Methacrylonitrile	0.004 (a)
67561	Methanol	20 (a)
16752775	Methomyl	0.2
72435	Methoxychlor	0.04
74839	Methyl bromide	0.01
74873	Methyl chloride	0.003
78933	Methyl ethyl ketone	2
80626	Methyl methacrylate	3
298000	Methyl parathion	0.002
74953	Methylene bromide	0.4
75092	Methylene chloride	0.05
108101	Methylisobutylketone	2
924163	N-Nitrosodi-n-butylamine	0.000006 (a)
621647	N-Nitrosodi-n-propylamine	0.000005 (a)
55185	N-Nitrosodiethylamine	0.0000002 (a)
62759	N-Nitrosodimethylamine	0.0000007 (a)
10595956	N-Nitrosomethylethylamine	0.000002 (a)
100754	N-Nitrosopiperidine	0.000008 (a)
930552	N-Nitrosopyrrolidine	0.00002 (a)
91203	Naphthalene	0.02
91598	Naphthylamine, 2-	0.00004 (a)
7440020	Nickel	0.1
98953	Nitrobenzene	0.02

CAS Number	Regulated Substance/Analyte	Concentration (mg/L)
55630	Nitroglycerin	0.005
100027	Nitrophenol, p-	0.06
79469	Nitropropane, 2-	0.000004 (a)
152169	Octamethylpyrophosphoramide	0.07
1336363	PCBs	0.0005
1910425	Paraquat	0.03
56382	Parathion	0.2
608935	Pentachlorobenzene	0.03
82688	Pentachloronitrobenzene	0.0001
87865	Pentachlorophenol	0.001
108952	Phenol	4
298022	Phorate	0.007
7723140	Phosphorus, elemental	0.0001
23950585	Pronamide	0.05
129000	Pyrene	1
110861	Pyridine	0.04
94597	Safrole	0.0001 (a)
7782492	Selenium	0.05
7440224	Silver	0.1
93721	Silvex	0.05
57249	Strychnine and salts	0.01
100425	Styrene	0.1
1746016	TCDD, 2,3,7,8- [Dioxin]	3×10^{-8} (a)(b)
13071799	Terbufos	0.0009
95943	Tetrachlorobenzene, 1,2,4,5-	0.01
630206	Tetrachloroethane, 1,1,1,2-	0.01
79345	Tetrachloroethane, 1,1,2,2-	0.0002 (a)
127184	Tetrachloroethylene	0.005
58902	Tetrachlorophenol, 2,3,4,6-	1
3689245	Tetraethyldithiopyrophosphate	0.02
7440280	Thallium	0.002 (a)
108883	Toluene	1

CAS Number	Regulated Substance/Analyte	Concentration (mg/L)
823405	Toluenediamine, 2,6-	7
95534	Toluidine, o-	0.0001 (a)
106490	Toluidine, p-	0.0002 (a)
8001352	Toxaphene	0.003
76131	Trichloro-1,2,2-trifluoroethane, 1,1,2-	1000
120821	Trichlorobenzene, 1,2,4-	0.07
71556	Trichloroethane, 1,1,1-	0.2
79005	Trichloroethane, 1,1,2-	0.003
79016	Trichloroethylene	0.005
75694	Trichlorofluoromethane	2
95954	Trichlorophenol, 2,4,5-	4
88062	Trichlorophenol, 2,4,6-	0.03
93765	Trichlorophenoxyacetic acid, 2,4,5-	0.07
96184	Trichloropropane, 1,2,3-	0.04
	Trihalomethanes, total	0.1
99354	Trinitrobenzene, 1,3,5-	0.002 (a)
126727	Tris(2,3-dibromopropyl)phosphate	0.00003 (a)
7440622	Vanadium	0.02
75014	Vinyl chloride	0.002
1330207	Xylenes (total)	10
7440666	Zinc	2

(a) The health-based drinking water criterion for this substance/analyte is lower than the lowest currently achievable and available detection limit. According to Rule 391-3-19.-07(4)(d), the detection limit or background will be the Type 1 groundwater concentration criterion for this substance/analyte.

(b) For the purposes of Rule 391-3-19-.07, all polychlorinated dibenzodioxins and dibenzofurans, are collectively considered as one substance, expressed as an equivalent concentration of 2,3,7,8-tetrachlorodibenzo-p-dioxin, based either upon the Toxicity Equivalency Factor approach described in "Interim Procedures for Estimating Risks Associated with Exposures to Mixtures of Chlorinated Dibenzo-p-Dioxins and Dibenzofurans," U.S. Environmental Protection Agency, March 1989, or by consulting the Director to determine an appropriate method for determining 2,3,7,8-TCDD equivalents.

[The following boldfaced text is not a part of the proposed rules amendment and is provided to enhance the reviewer's understanding of Table 1]:

To derive Table 1, EPD first identified the following health-based drinking water criteria:

> *Maximum Contaminant Levels (MCLs) as promulgated under the Georgia Rules for Safe Drinking Water, Chapter 391-3-5;*
>
> *Lifetime health advisories for 70-kg adult (Lifetime HA) as given in: USEPA, 1993. Drinking Water Regulations and Health Advisories. May 1993. Office of Water, 202-260-7571. Washington, D.C.: U.S. Environmental Protection Agency.*
>
> *Health advisories for a cancer risk of 1 in 10,000 (Cancer HA 10^{-4}) as given in Drinking Water Regulations and Health Advisories (referenced above); and*
>
> *RCRA Health-Based Levels (HBLs) as given in: USEPA, 1992. Docket Report on Health-Based Levels and Solubilities Used in the Evaluation of Delisting Petitions, Submitted Under 40 CFR §260.20 and §260.22. July 1992. Prepared for Delisting Section, Waste Identification Branch, Office of Solid Waste under Contract No. 68-W9-0091 by Science Applications International Corporation, 7600-A Leesburg Pike, Falls Church, VA 22043. Washington, D.C.: U.S. Environmental Protection Agency.*

EPD established for each of as many regulated substances and indicator analytes as possible a single health-based drinking water criterion in the following hierarchical manner:

(1) Where an MCL was available for a particular substance or group of substances, the MCL was used as the criterion. In the cases of lead and copper, action levels were substituted for the MCLs.

(2) EPD calculated a cancer risk of 1 in 100,000 (Cancer HA 10^{-5}) by dividing the referenced Cancer HA 10^{-4} values by 10. This operation was done to make the Cancer HA more consistent with risk levels represented in the MCLs and RCRA HBLs.

(3) Where an MCL was not available for the substance, EPD used the Lifetime HA or the calculated Cancer HA 10^{-5} value if either was available, or the most conservative value if both were available.

(4) If neither MCL, Lifetime HA, nor Cancer HA 10^{-5} were available, EPD then used the RCRA HBL value if it existed.

(5) If no health-based drinking water criteria were available for a regulated substance or indicator analyte, the substance/analyte was not listed in Table 1.

By incorporating the health-based drinking water criteria into the Table 1 standards, EPD also adopted the assumptions and uncertainties associated with those data. EPD believes this approach is sound in that the drinking water criteria are widely-accepted as being protective of human health. Furthermore, the approach ensures that the Table 1 criteria are consistent with criteria being used by other programs, both at the state and national levels. A potential downside is the difficulty in incorporating changes made to the criteria sources in a timely fashion. EPD will examine the data sources periodically and update the criteria through rules amendments as needed.

[end of Table 1 insert]

Table 2. Type 1 Soil Criteria

Regulated Substance/Analyte	Concentration (mg/kg)
Antimony	4
Arsenic	20
Barium	1000
Beryllium	2
Cadmium	2
Chromium	100
Cobalt	20
Copper	100
Lead	75
Mercury	0.5
Nickel	50
Selenium	2
Silver	2
Thallium	2
Vanadium	100
Zinc	100

[Beginning of Table 2 insert]

The concentrations in Table 2 are based largely on these metals' naturally-occurring background concentrations in soils statewide. EPD believes these concentrations are indicative of those occurring toward the upper end of the range of naturally-occurring background concentrations, but it acknowledges that higher concentrations may occur naturally in special circumstances. In the case of thallium and antimony, practically no soil data are available. For these two elements, regulatory precedence and knowledge of their occurrence in rocks, sediments and mineral deposits of the state were used in the derivation of the concentration criteria. [end of Table 2 insert]

Table 3: Parameters, Definitions and Standard Assumptions*, to be used in Equations 1, 2, 6, and 7 in RAGS, Part B

Parameters	Definitions (Units)	Values
C	Concentration in soil (mg/kg) or water (mg/L)	chemical-specific
TR	Target excess individual lifetime cancer risk (unitless)	10^{-5} for Class A and B carcinogens; 10^{-4} for Class C carcinogens
THI	Target hazard index (unitless)	1
SF_o**	Oral cancer slope factor ((mg/kg-day)$^{-1}$)	chemical-specific
SF_i**	Inhalation cancer slope factor ((mg/kg-day)$^{-1}$)	chemical-specific
RfD_o**	Oral chronic reference dose (mg/kg-day)	chemical-specific
RfD_i**	Inhalation chronic reference dose (mg/kg-day)	chemical-specific
BW	Adult body weight (kg)	70 kg
AT	Averaging time (yr)	70 yr carcinogens (Equals ED for systemic toxicants)
EF	Exposure frequency (days/yr)	350 residential 250 worker
ED	Exposure duration (yr)	30 yr residential 25 yr worker
IR_w	Daily water ingestion rate (liter/day)	2 L/day residential 1 L/day worker
IR_{soil}	Soil ingestion rate (mg/day)	114 mg/day residential 50 mg/day worker
IR_{air}	Daily inhalation rate (m^3/day)	15 m^3/day residential 20 m^3/day worker
PEF	Particulate emission factor (m^3/kg)	4.63 X 10^9 m^3/kg
VF	Soil-to-air volatilization factor (m^3/kg)	see derivation below
K	Water-to-air volatilization factor (L/m^3)	0.5

*Standard assumptions are required for Type 1 and Type 3 risk reduction standards.

**Values are to be taken from the current version of IRIS or, if not listed in IRIS, from the current version of HEAST. Where data are not available from IRIS or HEAST and appropriate, peer-reviewed data are otherwise available, values may be derived using the procedures described in RAGS, Part A and in consultation with EPD. If a value for only one of the two variables in a variable pair (RfD_o/RfD_i or SF_o/SF_i) is not available for a particular chemical, the term containing that variable in an equation can be ignored or equated to zero. If neither value is available for a variable pair, a concentration cannot be calculated with the equation.

[Continuation of Table 3]

Derivation of VF values (Soil-to-Air Volatilization Factor)

$$VF(m^3/kg) = \frac{(LS \times V \times DH)}{A} \times \frac{(\pi \times \alpha \times T)^{1/2}}{(2 \times D_{ei} \times E \times K_{as} \times 10^{-3}\ kg/g)}$$

WHERE:

LS	length of side of contaminated area (m)	= 45
V	wind speed in mixing zone (m/s)	= 2.25
DH	diffusion height (m)	= 2
A	area of contamination (cm^2)	= 2.03×10^7 (= 0.5 acre)
π	pi	= 3.14
α	(cm^2/s)	$= \frac{(D_{ei} \times E)}{E + (\rho_s)\ (1-E)/K_{as}}$
T	exposure interval (s)	= 7.9×10^8 (= 25 yr)
ρ_s	density of soil solids (g/cm^3)	= 2.65
OC	soil organic carbon content fraction (unitless)	= 0.02
D_{ei}	effective diffusivity (cm^2/s)	$= D_i \times E^{0.33}$
D_i	molecular diffusivity (cm^2/s)	(chemical-specific)
E	total soil porosity (unitless)	= 0.35
K_{as}	soil/air partition coefficient (g soil/cm^3 air)	$= (H/K_d) \times 41$
H	Henry's law constant (atm-m^3/mol)	(chemical specific)
K_d	soil-water partition coefficient (cm^3/g)	$= K_{oc} \times OC$ (or chemical specific)
K_{oc}	organic carbon partition coefficient (cm^3/g)	(chemical specific)