

## ARTICLE 7. INDIANA SCORING MODEL

### Rule 1. General Provisions; Definitions

#### 329 IAC 7-1-1 Applicability and scope

Authority: IC 13-7-5-3; IC 13-7-7-1; IC 13-7-8.7-2

Affected: IC 13-7-5-3; IC 13-7-5-7; IC 13-7-8.7

Sec. 1. (a) This article applies to hazardous substance response sites not on the National Priorities List (40 C.F.R. 300, Appendix B (1987 Edition)) for which action by the commissioner may be required to:

(1) prevent the release of a hazardous substance or contaminant;

(2) control, contain, isolate, neutralize, remove, store, or dispose of any hazardous substance or contaminant already released into or on the air, land, or waters of this state; or

(3) provide another appropriate response.

(b) Nothing in this article shall be construed to limit the authority of the commissioner to respond to the release or threatened release of a hazardous substance or other contaminant or to take any other action provided for by statute or rule relating to the release or threatened release of a hazardous substance or other contaminant. (*Solid Waste Management Board; 329 IAC 7-1-1; filed Sep 6, 1989, 1:00 p.m.: 13 IR 9; readopted filed Jan 10, 2001, 3:25 p.m.: 24 IR 1535; readopted filed May 14, 2007, 1:53 p.m.: 20070523-IR-329070138BFA*)

#### 329 IAC 7-1-2 Purpose

Authority: IC 13-7-5-3; IC 13-7-7-1; IC 13-7-8.7-2

Affected: IC 13-7-5-3; IC 13-7-5-7; IC 13-7-8.7

Sec. 2. This article sets forth criteria and procedures for establishing a priority ranking by the commissioner of hazardous substance response sites in order that those sites believed to pose the most significant threat to human health or environment are scheduled first for response and for allocation of department resources. (*Solid Waste Management Board; 329 IAC 7-1-2; filed Sep 6, 1989, 1:00 p.m.: 13 IR 10; readopted filed Jan 10, 2001, 3:25 p.m.: 24 IR 1535; readopted filed May 14, 2007, 1:53 p.m.: 20070523-IR-329070138BFA*)

#### 329 IAC 7-1-3 Definitions

Authority: IC 13-7-5-3; IC 13-7-7-1; IC 13-7-8.7-2

Affected: IC 13-7-1; IC 13-7-5-3; IC 13-7-5-7; IC 13-7-8.7

Sec. 3. In addition to the definitions contained in IC 13-7-1 and IC 13-7-5-3, the definitions in this rule shall apply throughout this article. (*Solid Waste Management Board; 329 IAC 7-1-3; filed Sep 6, 1989, 1:00 p.m.: 13 IR 10; readopted filed Jan 10, 2001, 3:25 p.m.: 24 IR 1535; readopted filed May 14, 2007, 1:53 p.m.: 20070523-IR-329070138BFA*)

#### 329 IAC 7-1-3.1 General provisions; "deletion" defined

Authority: IC 13-14-8; IC 13-14-9; IC 13-19-3; IC 13-25-4-7

Affected: IC 13-22-2

Sec. 3.1. "Deletion" means removal from the commissioner's bulletin by agency or petition deletion. (*Solid Waste Management Board; 329 IAC 7-1-3.1; filed Oct 28, 1998, 3:26 p.m.: 22 IR 752; readopted filed Jan 10, 2001, 3:25 p.m.: 24 IR 1535; readopted filed May 14, 2007, 1:53 p.m.: 20070523-IR-329070138BFA*)

#### 329 IAC 7-1-4 "Hazardous substance response site" defined

Authority: IC 13-7-5-3; IC 13-7-7-1; IC 13-7-8.7-2

Affected: IC 13-7-1; IC 13-7-5-3; IC 13-7-5-7; IC 13-7-8.7

Sec. 4. "Hazardous substance response site" or "site" means the location of a release or threat of release of hazardous substances or contaminants. (*Solid Waste Management Board; 329 IAC 7-1-4; filed Sep 6, 1989, 1:00 p.m.: 13 IR 10; readopted filed Jan 10, 2001, 3:25 p.m.: 24 IR 1535; readopted filed May 14, 2007, 1:53 p.m.: 20070523-IR-329070138BFA*)

**329 IAC 7-1-5 "Inordinate cost" defined**

Authority: IC 13-7-5-3; IC 13-7-7-1; IC 13-7-8.7-2

Affected: IC 13-7-1-3; IC 13-7-5-3; IC 13-7-5-7; IC 13-7-8.7

Sec. 5. "Inordinate cost" means costs at a site which are clearly beyond the scope of the hazardous substances response trust fund. (*Solid Waste Management Board; 329 IAC 7-1-5; filed Sep 6, 1989, 1:00 p.m.: 13 IR 10; readopted filed Jan 10, 2001, 3:25 p.m.: 24 IR 1535; readopted filed May 14, 2007, 1:53 p.m.: 20070523-IR-329070138BFA*)

**329 IAC 7-1-6 "Lack of technology" defined**

Authority: IC 13-7-5-3; IC 13-7-7-1; IC 13-7-8.7-2

Affected: IC 13-7-1; IC 13-7-5-3; IC 13-7-5-7; IC 13-7-8.7

Sec. 6. "Lack of technology" means:

(1) conditions at a site such that, in the judgment of the commissioner, an acceptable and affordable technology does not exist to contain or dispose of a contaminant that is released or threatened to be released at the site; or

(2) a facility does not exist that is permitted to properly and safely dispose of the contaminant.

(*Solid Waste Management Board; 329 IAC 7-1-6; filed Sep 6, 1989, 1:00 p.m.: 13 IR 10; readopted filed Jan 10, 2001, 3:25 p.m.: 24 IR 1535; readopted filed May 14, 2007, 1:53 p.m.: 20070523-IR-329070138BFA*)

**329 IAC 7-1-7 Incorporation by reference**

Authority: IC 13-7-5-3; IC 13-7-7-1; IC 13-7-8.7-2

Affected: IC 13-7-5-3; IC 13-7-5-7; IC 13-7-8.7

Sec. 7. (a) For purposes of this article, the board incorporates herein by reference 40 C.F.R. 300 (1987 Edition), National Oil and Hazardous Substance Pollution Contingency Plan (hereinafter "National Contingency Plan").

(b) Copies of the Code of Federal Regulations (C.F.R.) can be obtained from the Government Printing Office, Washington, D.C. 20402. (*Solid Waste Management Board; 329 IAC 7-1-7; filed Sep 6, 1989, 1:00 p.m.: 13 IR 10; readopted filed Jan 10, 2001, 3:25 p.m.: 24 IR 1535; readopted filed May 14, 2007, 1:53 p.m.: 20070523-IR-329070138BFA*)

**Rule 2. Assessment of Hazardous Substance Response Sites**

**329 IAC 7-2-1 Scoring**

Authority: IC 13-7-5-3; IC 13-7-7-1; IC 13-7-8.7-2

Affected: IC 4-21.5; IC 13-7-5-3; IC 13-7-5-7; IC 13-7-8.7

Sec. 1. (a) The department shall utilize an objective method to assess, on the basis of available information, relative potential threat to human health or the environment from hazardous substances response sites. The method used to assess hazardous substance response sites will be called the Indiana Scoring Model (ISM) and is set out in 329 IAC 7-3 through 329 IAC 7-10.

(b) Hazardous substance response sites that are evaluated under the ISM shall be assigned a numerical score. Sufficient information will not be available for most sites to indicate the absolute threat a site poses; therefore, this score will be used as a management tool to assist the commissioner in selecting sites for response.

(c) The ISM is based upon the U.S. EPA Hazard Ranking System as published in 40 C.F.R. 300, Appendix A (1987 Edition), but has been modified to take into consideration additional factors.

(d) The score obtained through the utilization of the ISM is not an order or determination of the commissioner for the purpose of notice or review pursuant to the Administrative Adjudication Act (IC 4-21.5). Rather, the score is intended to be only one (1) of several factors to be considered by the commissioner in the allocation of department resources. (*Solid Waste Management Board; 329 IAC 7-2-1; filed Sep 6, 1989, 1:00 p.m.: 13 IR 10; readopted filed Jan 10, 2001, 3:25 p.m.: 24 IR 1535; readopted filed May 14, 2007, 1:53 p.m.: 20070523-IR-329070138BFA*)

**329 IAC 7-2-2 Rescoring sites**

Authority: IC 13-7-5-3; IC 13-7-7-1; IC 13-7-8.7-2  
Affected: IC 13-7-5-3; IC 13-7-5-7; IC 13-7-8.7

Sec. 2. (a) The scoring of sites utilizing the ISM will be a dynamic process and scores may be subject to change based upon significant changes in site circumstances, receipt of additional information, or other relevant factors. However, the partial implementation of remedial action at sites selected for such action will not be considered alone as a circumstance requiring a reevaluation of the site score.

(b) Factors which may result in the rescoring of a site include:

- (1) any action taken which is verifiable by the department and consistent with the ultimate remedial action appropriate for the site and which significantly controls or reduces the source of the release or threat of release;
- (2) completion of action at a site as determined by the commissioner; or
- (3) receipt of information concerning the actual or imminent release of hazardous substances or contaminants previously believed to be contained or controlled.

(c) Actions taken at the site merely to abate the risk and which do not control, reduce, or eliminate the source of the hazardous substance or contaminant being released or threatened to be released will not be considered alone as a basis for rescoring the site.

(d) Because of the large volume of sites to be scored, score review and rescoring will occur during the site selection process unless the commissioner determines otherwise. (*Solid Waste Management Board; 329 IAC 7-2-2; filed Sep 6, 1989, 1:00 p.m.: 13 IR 11; readopted filed Jan 10, 2001, 3:25 p.m.: 24 IR 1535; readopted filed May 14, 2007, 1:53 p.m.: 20070523-IR-329070138BFA*)

**329 IAC 7-2-3 Assessment of hazardous substance response sites; publication of list of scored sites**

Authority: IC 13-14-8; IC 13-14-9; IC 13-19-3; IC 13-25-4-7  
Affected: IC 13-22-2

Sec. 3. (a) The commissioner shall annually publish, in the policy, nonrule section of the Indiana Register, the names of the sites that have been scored utilizing the ISM, with the most recent available score assigned to each site.

(b) The publication shall also inform the public of the location of the information upon which the score for each site is based and how that information may be reviewed or obtained. An introduction to the publication will give an explanation of the general meaning of the composite of scores.

(c) A copy of the publication with the most recent available scores will be mailed to the county health officer and, as applicable, to the county commissioners and town boards or mayors.

(d) Notice of all newly scored sites shall be semiannually mailed to the officials identified in subsection (c).

(e) The publication referred to in this subsection is entitled the commissioner's bulletin. The bulletin is published annually in the nonrule policy document section of the Indiana Register. (*Solid Waste Management Board; 329 IAC 7-2-3; filed Sep 6, 1989, 1:00 p.m.: 13 IR 11; filed Oct 28, 1998, 3:26 p.m.: 22 IR 753; readopted filed Jan 10, 2001, 3:25 p.m.: 24 IR 1535; readopted filed May 14, 2007, 1:53 p.m.: 20070523-IR-329070138BFA*)

**329 IAC 7-2-4 Selection of sites**

Authority: IC 13-7-5-3; IC 13-7-7-1; IC 13-7-8.7-2  
Affected: IC 13-7-5-3; IC 13-7-5-7; IC 13-7-8.7

Sec. 4. (a) The commissioner shall use the ISM score and additional factors as a basis for prioritizing sites for remedial action. These factors include:

- (1) the department's ability to respond effectively with available resources; and
- (2) demonstrable limitations in model assumptions.

(b) The commissioner's first priority in selection of sites for remedial action shall be to address all sites which score equal to or greater than ten (10) according to the ISM, unless a site can be shown to pose significant threat not reflected by the score.

(c) The commissioner may determine that remedial action is not feasible or practicable at a site because of inordinate cost, a lack of technology, or other pertinent factors, regardless of the ISM score assigned to the site. If remedial action is deemed infeasible or impracticable at a site, the commissioner nonetheless may order or undertake appropriate removal action at the site pursuant to section 5 of this rule.

(d) Those sites viewed as a lower priority or scoring below ten (10) shall be selected as resources allow.

(e) The commissioner may bypass remedial action at hazardous substance response sites that the department is scoring for the National Priorities List or sites that have been scored but are awaiting the next federal nomination for the National Priorities List.

(f) Nothing in this article should be construed to require the commissioner to address sites in rank order according to score. *(Solid Waste Management Board; 329 IAC 7-2-4; filed Sep 6, 1989, 1:00 p.m.: 13 IR 11; errata filed Sep 25, 1990, 3:25 p.m.: 14 IR 289; readopted filed Jan 10, 2001, 3:25 p.m.: 24 IR 1535; readopted filed May 14, 2007, 1:53 p.m.: 20070523-IR-329070138BFA)*

**329 IAC 7-2-5 Removal**

Authority: IC 13-7-5-3; IC 13-7-7-1; IC 13-7-8.7-2

Affected: IC 13-7-5-3; IC 13-7-5-7; IC 13-7-8.7

Sec. 5. Irrespective of whether a hazardous substance response site has been scored under the Indiana Scoring Model the commissioner may at any time undertake or order removal action at any hazardous substance response site if such action is consistent with the National Contingency Plan. *(Solid Waste Management Board; 329 IAC 7-2-5; filed Sep 6, 1989, 1:00 p.m.: 13 IR 12; readopted filed Jan 10, 2001, 3:25 p.m.: 24 IR 1535; readopted filed May 14, 2007, 1:53 p.m.: 20070523-IR-329070138BFA)*

**329 IAC 7-2-6 Assessment of hazardous substance response sites**

Authority: IC 13-14-8; IC 13-14-9; IC 13-19-3; IC 13-25-4-7

Affected: IC 13-22-2

Sec. 6. A site may be deleted from the commissioner's bulletin through an agency or petition deletion procedure if the site complies with one (1) of the following:

(1) Received a score of ten (10) or less.

(2) A comprehensive site clean-up has been completed so that the site is no longer a significant threat to human health and the environment and one (1) of the following has been issued concerning the site:

(A) A letter from the department's leaking underground storage tank section that states no further action is necessary.

(B) A letter of determination from the department or the United States Environmental Protection Agency that states no further action is necessary for releases of hazardous wastes or hazardous constituents following investigation and remediation performed under the Resource Conservation and Recovery Act.

(C) A certificate of completion and a covenant not to sue from the department's voluntary remediation program section.

(D) A record of decision or declaration of closure from the department's state clean-up program section that states no further action is necessary.

(E) Designation in the United States Environmental Protection Agency's Comprehensive Environmental Response, Compensation, and Liability Act data base of "No Further Remedial Action Planned Priority Assessment".

*(Solid Waste Management Board; 329 IAC 7-2-6; filed Oct 28, 1998, 3:26 p.m.: 22 IR 753; readopted filed Jan 10, 2001, 3:25 p.m.: 24 IR 1535; filed Nov 16, 2001, 4:40 p.m.: 25 IR 1124; readopted filed May 14, 2007, 1:53 p.m.: 20070523-IR-329070138BFA)*

**Rule 3. Indiana Scoring Model (ISM); Methodology**

**329 IAC 7-3-1 Scoring**

Authority: IC 13-7-5-3; IC 13-7-7-1; IC 13-7-8.7-2

Affected: IC 13-7-5-3; IC 13-7-5-7; IC 13-7-8.7

Sec. 1. (a) The ISM combines three (3) scores assigned to a hazardous substance response site as follows:

(1)  $S_M$  reflects the potential for harm to humans or the environment from migration of a hazardous substance away from the facility by routes involving ground water, surface water, or air. It is a composite of separate scores for each of the three (3) routes.

(2)  $S_{FE}$  reflects the potential for harm from substances that can explode or cause fires.

(3)  $S_{DC}$  reflects the potential for harm from direct contact with hazardous substances at the facility, i.e., no migration need be involved.

(b) The score for each hazard mode (migration, fire and explosion, and direct contact) or route is obtained by considering a

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set of factors that characterize the potential of the facility to cause harm. (See comprehensive list to rating factors table below.) Each factor is assigned a numerical value (on a scale of zero (0) to three (3), five (5), or eight (8)) according to prescribed guidelines. This value is then multiplied by a weighting factor yielding the factor score. The factor scores are then combined and scores within a factor category are added. Then the total scores for each factor category are multiplied together to develop a score for ground water, surface water, air, fire and explosion, and direct contact.

COMPREHENSIVE LIST TO RATING FACTORS

HAZARD MODE	FACTOR CATEGORY	FACTORS		
		GROUND WATER ROUTE	SURFACE WATER ROUTE	AIR ROUTE
Migration	Route Characteristics	Depth to Aquifer of Concern	Facility Slope and Intervening Terrain One-Year 24-Hour Rainfall	
		Net Precipitation		Distance to Nearest Surface Water Physical State
	Containment	Permeability of Unsaturated Zone		
		Physical State		
	Waste Characteristics	Containment	Containment	Reactivity/Incompatibility
	Targets	Toxicity/Persistence	Toxicity/Persistence	Toxicity Hazardous Waste Quantity
		Hazardous Waste Quantity	Hazardous Waste Quantity	Land Use
	Ground Water Use	Surface Water Use	Population Within 4-Mile Radius	
	Distance to Nearest Well/Population Served	Distance to Sensitive Environment	Distance to Sensitive Environment	
		Population Served/Distance to Water Intake Downstream		
Fire and Explosion	Containment	Containment		
		Direct Evidence		
	Waste Characteristics	Ignitability		
		Reactivity		
		Incompatibility		
Targets	Hazardous Waste Quantity			
	Distance to Nearest Population			
	Distance to Nearest Building			
	Distance to Nearest Sensitive Environment			
	Land Use			
	Population Within 2-Mile Radius			
	Number of Buildings within 2-Mile Radius			
Direct Contact	Observed Incident	Observed Incident		
	Accessibility	Accessibility of Hazardous Substances		
	Containment	Containment		
	Toxicity	Toxicity		
	Targets	Population Within 1-Mile Radius		
		Distance to Sensitive Environment		

(c) In computing an individual migration route score, the product of its factor category scores is divided by the maximum possible score, and the resulting ratio is multiplied by one hundred (100). The last step puts all route scores on a scale of zero (0) to one hundred (100).

(d) In computing  $S_{FE}$  or  $S_{DC}$ , the product of its factor category divided by the maximum possible score and the resulting ratio is multiplied by ten (10). The last step puts all  $S_{FE}$  or  $S_{DC}$  scores on a scale of zero (0) to ten (10).

(e)  $S_M$  is a composite of the scores for the three (3) possible migration routes:

Where:  $S_M = 1/1.73 (S_{gw})^2 + (S_{sw}) + (S_a)^2$

$S_{gw}$  = ground water route score

$S_{sw}$  = surface water route score

$S_a$  = air route score

(f) The effect of this means of combining the route scores is to emphasize the primary (highest scoring) route in aggregating

route scores while giving some additional consideration to the secondary or tertiary routes if they score high. The factor 1/1.73 is used simply for the purpose of reducing  $S_M$  scores to a one hundred (100) point scale.

(g) The ISM does not quantify the probability of harm from a facility or the magnitude of the harm that could result, although the factors have been selected in order to approximate both those elements of risk. It is a procedure for ranking facilities in terms of the potential threat they pose by describing:

- (1) the manner in which the hazardous substances are contained;
- (2) the route by which they would be released;
- (3) the characteristics and amount of the harmful substances; and
- (4) the likely targets.

(h) The multiplicative combination of factor category scores is an approximation of the more rigorous approach in which one would express the hazard posed by a facility as the product of the probability of a harmful occurrence and the magnitude of the potential damage. (*Solid Waste Management Board; 329 IAC 7-3-1; filed Sep 6, 1989, 1:00 p.m.: 13 IR 12; errata filed Sep 25, 1990, 3:25 p.m.: 14 IR 289; errata filed Jan 30, 1991, 4:15 p.m.: 14 IR 1287; readopted filed Jan 10, 2001, 3:25 p.m.: 24 IR 1535; readopted filed May 14, 2007, 1:53 p.m.: 20070523-IR-329070138BFA*)

#### **Rule 4. Indiana Scoring Model (ISM); General Considerations**

##### **329 IAC 7-4-1 Recording format**

Authority: IC 13-7-5-3; IC 13-7-7-1; IC 13-7-8.7-2  
Affected: IC 13-7-5-3; IC 13-7-5-7; IC 13-7-8.7

Sec. 1. (a) Use of the ISM requires considerable information about the facility, its surroundings, the hazardous substances present, and the geological character of the area down to the aquifers that may be at risk. The ISM cover sheet below, illustrates a format for recording general information regarding the facility being evaluated. It can also serve as a cover sheet for the work sheets used in the evaluation.

Facility name: _____ Location: _____ Person(s) in charge of the facility: _____ _____ _____ Name of reviewer: _____ Date: _____ General description of the facility: (For example: Landfill, surface impoundment, pile, container; types of hazardous substances; location of the facility; contamination route of major concern; types of information needed for rating; agency action, etc.) _____ _____ _____ _____ _____ Scores: $S_M = \begin{pmatrix} S_{gw} = \\ S_{sw} = \\ S_a = \\ S_{FE} = \\ S_{DC} = \end{pmatrix}$ <hr/> <div style="text-align: center;"> <math>ISM_T</math>                      Sum of <math>S_M S_{FE} S_{DC}</math> </div> <hr/> <div style="text-align: center;">                     ISM COVER SHEET                 </div>
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(b) When there are no data for a factor, it should be assigned a value of zero (0). However, if a factor with no data is the only factor in a category, e.g., containment, then the factor is given a score of one (1). If data are lacking for more than one (1) factor in connection with the evaluation of either  $S_{gw}$ ,  $S_{sw}$ ,  $S_a$ ,  $S_{FE}$ , or  $S_{DC}$ , that route score is set at zero (0).

(c) 329 IAC 7-5 through 329 IAC 7-10 give detailed instructions and guidance for rating a facility. Each rule begins with a work sheet designed to conform to the sequence of steps required to perform the rating. Guidance for evaluating each of the factors then follows. If data are missing for more than one (1) factor in connection with the evaluation of a route, then set that route score at zero (0), i.e., there is no need to assign scores to factors in a route that will be set at zero (0). (*Solid Waste Management Board; 329 IAC 7-4-1; filed Sep 6, 1989, 1:00 p.m.: 13 IR 13; errata filed Jan 30, 1991, 4:15 p.m.: 14 IR 1287; readopted filed Jan 10, 2001, 3:25 p.m.: 24 IR 1535; readopted filed May 14, 2007, 1:53 p.m.: 20070523-IR-329070138BFA*)

**Rule 5. Ground Water Migration Route**

**329 IAC 7-5-1 Observed release**

Authority: IC 13-7-5-3; IC 13-7-7-1; IC 13-7-8.7-2  
 Affected: IC 13-7-5-3; IC 13-7-5-7; IC 13-7-8.7

Sec. 1. If there is direct evidence of release of a substance of concern from a facility to ground water, enter a score of forty-five (45) on line 1 of the ground water work sheet below for the ground water route. Do not evaluate route characteristics and containment factors (lines 2 and 3 of the ground water route work sheet below). Direct evidence of release must be analytical. If a contaminant is measured (regardless of frequency) in ground water or in a well in the vicinity of the facility at a significantly (in terms of demonstrating that a release has occurred, not in terms of potential effects) higher level than the background level, then quantitative evidence exists, and a release has been observed. Qualitative evidence of release, e.g., an oily or otherwise objectionable taste or

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smell in well water, constitutes direct evidence only if it can be confirmed that it results from a release at the facility in question. If a release has been observed, proceed to section 4 of this rule, Waste characteristics, to continue scoring. If direct evidence is lacking, enter a value of zero (0) on line 1 of the ground water route work sheet below, and continue the scoring procedure by evaluating route characteristics.

Ground Water Route Work Sheet						
Rating Factor	Assigned Value (Circle One)	Multi-plier	Score	Max. Score	Ref. (Section)	
<b>[1]</b> Observed Release	0 <span style="margin-left: 100px;">45</span>	1		45	3.1	
If observed release is given a score of 45, proceed to line <b>[4]</b> . If observed release is given a score of 0, proceed to line <b>[2]</b> .						
<b>[2]</b> Route Characteristics					3.2	
Depth to Aquifer of Concern	.5 1 2 3	2		6		
Net Precipitation	1 2 3	1		3		
Permeability of the Unsaturated Zone	0 1 2 3	1		3		
Physical State	0 1 2 3	1		3		
Total Route Characteristics Score				15		
<b>[3]</b> Containment	0 1 2 3	1		3	3.3	
<b>[4]</b> Waste Characteristics					3.4	
Toxicity/Persistence	0 3 6 9 12 15 18	1		18		
Hazardous Waste Quantity	0 1 2 3 4 5 6 7 8	1		8		
Total Waste Characteristics Score				26		
<b>[5]</b> Targets					3.5	
Ground Water Use	0 1 2 3	3		9		
Distance to Nearest Well/Population Served	0 4 6 8 10 12 16 18 20 24 30 32 35 40	1		40		
Total Targets Score				49		
<b>[6]</b> If line <b>[1]</b> is 45, multiply <b>[1]</b> × <b>[4]</b> × <b>[5]</b>						
If line <b>[1]</b> is 0, multiply <b>[2]</b> × <b>[3]</b> × <b>[4]</b> × <b>[5]</b>				57,330		
<b>[7]</b> Divide line <b>[6]</b> by 57,330 and multiply by 100		$S_{gw} =$				

GROUND WATER ROUTE WORK SHEET

*(Solid Waste Management Board; 329 IAC 7-5-1; filed Sep 6, 1989, 1:00 p.m.: 13 IR 14; readopted filed Jan 10, 2001, 3:25 p.m.: 24 IR 1535; readopted filed May 14, 2007, 1:53 p.m.: 20070523-IR-329070138BFA)*

**329 IAC 7-5-2 Route characteristics**

Authority: IC 13-7-5-3; IC 13-7-7-1; IC 13-7-8.7-2  
 Affected: IC 13-7-5-3; IC 13-7-5-7; IC 13-7-8.7

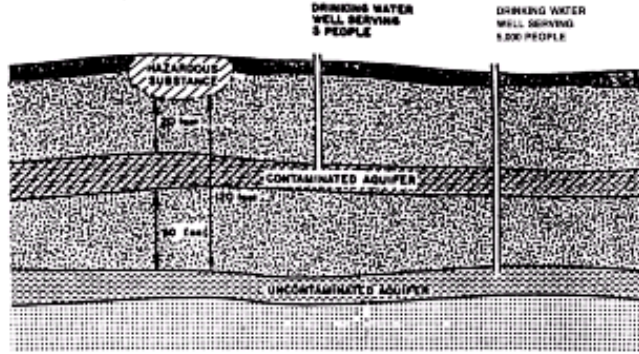
Sec. 2. (a) Depth to aquifer of concern is measured vertically from the lowest point of the hazardous substances to the highest seasonal level of the saturated zone of the aquifer of concern (see figure below). This factor is one (1) indicator of the ease with which a pollutant from the facility could migrate to ground water. Assign a value as follows:



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<u>Distance</u>	<u>Assigned Value</u>
> 150 feet	0.5
76 to 150 feet	1
21 to 75 feet	2
0 to 20 feet	3



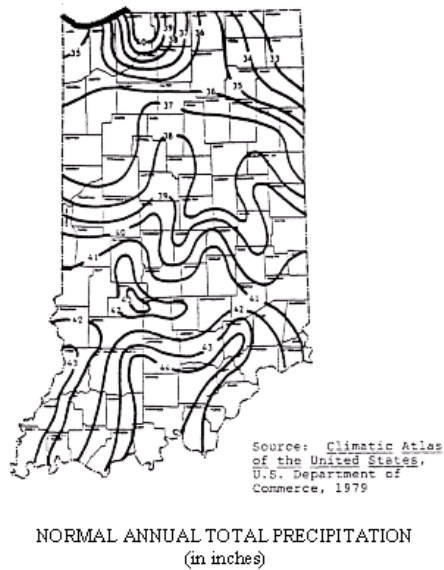
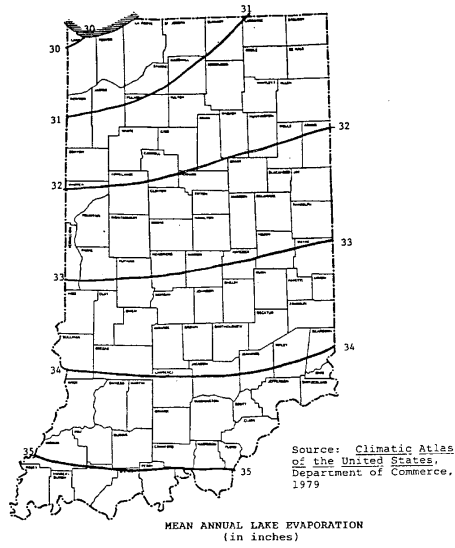
\*Treat target and route characteristics factors consistently. For example, if the upper aquifer is the aquifer of concern, then the "depth to aquifer of concern" is twenty (20) feet and the "population served" is five (5) persons. If the lower aquifer is "of concern", the "depth" is one hundred twenty (120) feet (assuming no known contamination below the indicated "hazardous substance") and the "population" is five thousand (5,000) persons. If the upper aquifer is contaminated and the lower aquifer is "of concern", the "depth" would be eighty (80) feet (vertical distance between hazardous substance and aquifer of concern) and the population would be five thousand (5,000) persons.

DEPTH TO AQUIFER OF CONCERN\*

(b) Net precipitation (precipitation minus evaporation) indicates the potential for leachate generation at the facility. Net seasonal rainfall (seasonal rainfall minus seasonal evaporation) data may be used if available. If net precipitation is not measured in the region in which the facility is located, calculate it by subtracting the mean annual lake evaporation for the region (obtained from mean annual lake evaporation map below) from the mean annual precipitation for the region (obtained from mean annual precipitation map below). Assign a value as follows:

<u>Net Precipitation</u>	<u>Assigned Value</u>
< 5 inches	1
5 to 8 inches	2
> 8 inches	3

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(c) Permeability of unsaturated zone (or intervening geological formations) is an indicator of the speed at which a contaminant could migrate from a facility. Assign a value from permeability of geologic materials table below.

PERMEABILITY OF GEOLOGIC MATERIALS\*

Type of Material	Approximate Range of Hydraulic Conductivity	Assigned Value
Clay, compact till, shale; unfractured metamorphic and igneous rocks	$<10^{-7}$ cm/sec	0
Silt, loess, silty clays, silty loams, clay loams; less permeable limestone, dolomites, and sandstone; moderately permeable till	$10^{-5} - 10^{-7}$ cm/sec	1

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Fine sand and silty sand; sandy loams; loamy sands; moderately permeable limestone, dolomites, and sandstone (no karst); moderately fractured igneous and metamorphic rocks, some coarse till	$10^{-3} - 10^{-5}$ cm/sec	2
Gravel, sand; highly fractured igneous and metamorphic rocks; permeable basalt and lavas; karst limestone and domomite	$>10^{-3}$ cm/sec	3

\*Derived from:

Davis, S.N., Porosity and Permeability of Natural Materials in Flow-Through Porous Media, R.J.M. DeWest Edition, Academic Press, New York, 1969

Freeze, R.A. and J.A. Cherry, Groundwater, Prentice-Hall, Inc., New York, 1979

(d) Physical state refers to the state of the hazardous substances at the time of disposal, except that gases generated by the hazardous substances in a disposal area should be considered in rating this factor. Each of the hazardous substances being evaluated is assigned a value as follows:

<u>Physical State</u>	<u>Assigned Value</u>
Solid, consolidated or stabilized	0
Solid, unconsolidated [ <i>sic.</i> ] or unstabilized	1
Powder or fine material	2
Liquid, sludge or gas	3

*(Solid Waste Management Board; 329 IAC 7-5-2; filed Sep 6, 1989, 1:00 p.m.: 13 IR 15; errata filed Sep 25, 1990, 3:25 p.m.: 14 IR 289; readopted filed Jan 10, 2001, 3:25 p.m.: 24 IR 1535; readopted filed May 14, 2007, 1:53 p.m.: 20070523-IR-329070138BFA)*

**329 IAC 7-5-3 Containment**

Authority: IC 13-7-5-3; IC 13-7-7-1; IC 13-7-8.7-2

Affected: IC 13-7-5-3; IC 13-7-5-7; IC 13-7-8.7

Sec. 3. Containment is a measure of the natural or artificial means that have been used to minimize or prevent a contaminant from entering ground water. Examples include liners, leachate collection systems, and sealed containers. In assigning a value to this rating factor as described in the containment value for ground water route table below, consider all ways in which hazardous substances are stored or disposed at the facility. If the facility involves more than one (1) method of storage or disposal, assign the highest from among all applicable values, e.g., if a landfill has a containment value of one (1), and, at the same location, a surface impoundment has a value of two (2), assign containment a value of two (2).

**CONTAINMENT VALUE FOR GROUND WATER ROUTE**

Assign containment a value of zero (0) if: (1) all the hazardous substances at the facility are underlain by an essentially nonpermeable surface (natural or artificial) and adequate leachate collection systems and diversion systems are present; or (2) there is no ground water in the vicinity. The value zero (0) does not indicate no risk. Rather, it indicates a significantly lower relative risk when compared with more serious sites on a national level. Otherwise, evaluate the containment for each of the different means of storage or disposal at the facility using the following guidance.

**A. Surface Impoundment**

	<u>Assigned Value</u>
Sound run-on diversion structure, essentially nonpermeable liner (natural or artificial) compatible with the waste, and adequate leachate collection system	0
Essentially nonpermeable compatible liner with no leachate collection system or inadequate freeboard	1
Potentially unsound run-on diversion structure or moderately permeable compatible liner	2
Unsound run-on diversion structure, no liner, or incompatible liner	3

**B. Containers**

	<u>Assigned Value</u>
Containers sealed and in sound condition, adequate liner, and adequate leachate collection system	0

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Containers sealed and in sound condition, no liner, or moderately permeable liner	1
Containers leaking, moderately permeable liner	2
Containers leaking and no liner or incompatible liner	3

C. Piles

	<u>Assigned Value</u>
Piles uncovered and waste stabilized or piles covered, waste unstabilized, and essentially nonpermeable liner	0
Piles uncovered, waste unstabilized, moderately permeable liner, and leachate collection system	1
Piles uncovered, waste unstabilized, moderately permeable liner, and no leachate collection system	2
Piles uncovered, waste unstabilized, and no liner	3

D. Landfill

	<u>Assigned Value</u>
Essentially nonpermeable liner, liner compatible with waste, and adequate leachate collection system	0
Essentially nonpermeable compatible liner, no leachate collection system, and landfill surface precludes ponding	1
Moderately permeable, compatible liner, and landfill surface precludes ponding	2
No liner or incompatible liner, moderately permeable compatible liner, landfill surface encourages ponding, no run-on control	3

*(Solid Waste Management Board; 329 IAC 7-5-3; filed Sep 6, 1989, 1:00 p.m.: 13 IR 18; errata filed Sep 25, 1990, 3:25 p.m.: 14 IR 289; readopted filed Jan 10, 2001, 3:25 p.m.: 24 IR 1535; readopted filed May 14, 2007, 1:53 p.m.: 20070523-IR-329070138BFA)*

**329 IAC 7-5-4 Waste characteristics**

Authority: IC 13-7-5-3; IC 13-7-7-1; IC 13-7-8.7-2  
 Affected: IC 13-7-5-3; IC 13-7-5-7; IC 13-7-8.7

Sec. 4. (a) In determining a waste characteristics score, evaluate the most hazardous substances at the facility that could migrate, i.e., if scored, containment is not equal to zero (0), to ground water. Take the substance with the highest score as representative of the potential hazard due to waste characteristics. Note that the substance that may have been observed in the release category can differ from the substance used in rating waste characteristics. Where the total inventory of substances in a facility is known, only those present in amounts greater than the reportable quantity (see CERCLA Section 102 for definition) may be evaluated.

(b) Toxicity and persistence have been combined in the matrix below because of their important relationship. To determine the overall value for this combined factor, evaluate each factor individually as discussed below. Match the individual values assigned with the values in the matrix for the combined rating factor. Evaluate several of the most hazardous substances at the facility independently and enter only the highest score in the matrix on the work sheet.

Value for Toxicity	Value for Persistence			
	0	1	2	3
0	0	0	0	0
1	3	6	9	12
2	6	9	12	15
3	9	12	15	18

(c) Persistence of each hazardous substance is evaluated on its biodegradability as follows:

<u>Substance</u>	<u>Assigned Value</u>
Easily biodegradable compounds	0
Straight chain hydrocarbons	1
Substituted and other ring compounds	2
Metals, polycyclic compounds and halogenated hydrocarbons	3

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More specific information is given in Tables 1 and 2 below.

TABLE 1 WASTE CHARACTERISTICS VALUES FOR SOME COMMON CHEMICALS				
	Toxicity <sup>1</sup>	Persistence <sup>2</sup>	Ignitability <sup>3</sup>	Reactivity <sup>3</sup>
CHEMICAL/COMPOUND				
Acetaldehyde	3	0	3	2
Acetic Acid	3	0	2	1
Acetone	2	0	3	0
Aldrin	3	3	1	0
Ammonia, Anhydrous	3	0	1	0
Aniline	3	1	2	0
Benzene	3	1	3	0
Carbon Tetrachloride	3	3	0	0
Chlordane	3	3	0*	0*
Chlorobenzene	2	2	3	0
Chloroform	3	3	0	0
Cresol-o	3	1	2	0
Cresol-M&P	3	1	1	0
Cyclohexane	2	2	3	0
Endrin	3	3	1	0
Ethyl Benzene	2	1	3	0
Formaldehyde	3	0	2	0
Formic Acid	3	0	2	0
Hydrochloric Acid	3	0	0	0
Isopropyl Ether	3	1	3	1
Lindane	3	3	1	0
Methane	1	1	3	0
Methyl Ethyl Ketone	2	0	3	0
Methyl Parathion in Xylene Solution	3	0 <sup>a</sup>	3	2
Naphthalene	2	1	2	0
Nitric Acid	3	0	0	0
Parathion	3	0 <sup>a</sup>	1	2
PCB	3	3	0 <sup>a</sup>	0 <sup>a</sup>
Petroleum, Kerosene (Fuel Oil No. 1)	3	1	2	0
Phenol	3	1	2	0
Sulfuric Acid	3	0	0	2
Toluene	2	1	3	0
Trichlorobenzene	2	3	1	0
∞-Trichloroethane	2	2	1	0
Xylene	2	1	3	0

<sup>1</sup>Sax, N. I., Dangerous Properties of Industrial Materials, Van Nostrand Rheinhold Co., New York, 4<sup>th</sup> ed., 1975. The highest rating listed under each chemical is used.

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<sup>2</sup> JRB Associates, Inc., <u>Methodology for Rating the Hazard Potential of Waste Disposal Sites</u> , May 5, 1980.
<sup>3</sup> National Fire Protection Association, <u>National Fire Codes</u> , Vol. 13, No. 49, 1977.
*Professional judgment based on information contained in the U.S. Coast Guard CHRIS Hazardous Chemical Data, 1978.
<sup>a</sup> Professional judgment based on existing literature.

TABLE 2  
PERSISTENCE (BIODEGRADABILITY) OF  
SOME ORGANIC COMPOUNDS\*

VALUE - 3 HIGHLY PERSISTENT COMPOUNDS	
aldrin	heptachlor
benzopyrene	heptachlor epoxide
benzothiazole	1,2,3,4,5,7,7- heptachloronorbornene
benzothiophene	hexachlorobenzene
benzyl butyl phthalate	hexachloro-1,3-butadiene
bromochlorobenzene	hexachlorocyclohexane
bromoform butanal	hexachloroethane
bromophenyl phynyl ether	methyl benzothiazole
chlordane	pentachlorobiphenyl
chlorohydroxy benzephenone	pentachlorophenol
bis-chloroisopropyl ether	1,1,3,3-tetrachloroacetone
n-chloronitrobenzene	tetrachlorobiphenyl
DDE	thiomethylbenzothiazole
DDT	trichlorobenzene
dibromobenzene	trichlorobiphenyl
dibutyl phthalate	trichlorofluoromethane
1, 4-dichlorobenzene	2,4,6-trichlorophenol
dichlorodifluoroethane	triphenyl phosphate
dieldrin	bromodichloromethane
diethyl phthalate	bromoform
di(2-ethylhexyl) phthalate	carbon tetrachloride
dihexyl phthalate	chloroform
di-isobutyl phthalate	chloromochloromethane
dimethyl phthalate	dibromodichloroethane
4,6-dinitro-2-aminophenol	tetrachloroethane
dipropyl phthalate	1,1,2-trichloroethane
endrin	

VALUE - 2 PERSISTENT COMPOUNDS
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acenaphthylene	cis-2-ethyl-4-methyl-1,3-dioxolane
atrazine	trans-2-ethyl-4-methyl-1,3-dioxolane
(diethyl) atrazine	guaiacol
barbital	2-hydroxyadiponitrile
borneol	isophorone
bromobenzene	indene
camphor	isoborneol
chlorobenzene	isopropenyl-r-ispopropyl benzene
1,2-bis-chloroethoxy ethane	2-methoxy biphenyl
b-chloroethyl methyl ether	methyl biphenyl
chloromethyl ether	methyl chloride
chloromethyl ethyl ether	methylindane
3-chloropyridine	methylene chloride
di-t-butyl-p-benzoquinone	nitroanisoole
dichloroethyl ether	nitrobenzene
dihydrocarvone	1,1,2-trichloroethylene
dimethyl sulfoxide	trimethyl-trioxo-hexahydro-triazine
2,6-dinitrotoluene	iosmer

VALUE - 1 SOMEWHAT PERSISTENT COMPOUNDS	
acetylene dichloride	limonene
behenic acid, methyl ester	methyl ester of lignoceric acid
benzene	methane
benzene sulfonic acid	2-methyl-5-ethyl-pyridine
butyl benzene	methyl naphthalene
butyl bromide	methyl palmitate
e-caprolactam	methyl phenyl carbinol
carbon-disulfide	methyl stearate
o-cresol	naphthalene
decane	nonane
1,2-dichloroethane	octane
1,2-dimethoxy benzene	octyl chloride
1,3-dimethyl naphthalene	pentane
1,4-dimethyl phenol	phenyl benzoate
dioctyl adipate	phthalic anhydride
n-dodecane	propylbenzene
ethyl benzene	l-terpineol
2-ethyl-n-hexane	toluene
o-ethyltoluene	vinyl benzene
isodecane	xylene
isoprophyl benzene	

VALUE - 0 NONPERSISTENT COMPOUNDS
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acetaldehyde	methyl benzoate
acetic acid	3-methyl butanol
acetone	methyl ethyl ketone
acetophenone	2-methylpropanol
benzoic acid	octadecane
di-isobutyl carbinol	pentadecane
docosane	pentanol
eicosane	propanol
ethanol	propylamine
ethylamine	tetradecane
hexadecane	n-tridecane
methanol	n-undecane

(d) Toxicity of each hazardous substance being evaluated is given a value using the rating scheme of Sax (Table 3), or the National Fire Protection Association (NFPA) (Table 4), and the following guidance:

<u>Toxicity</u>	<u>Assigned Value</u>
Sax level 0 or NFPA level 0	0
Sax level 1 or NFPA level 1	1
Sax level 2 or NFPA level 2	2
Sax level 3 or NFPA level 3 or 4	3

Table 1 in subsection (c), presents values for some common compounds.

TABLE 3

SAX TOXICITY RATINGS

**0—No Toxicity\* (None)\* \***

This designation is given to materials which fall into one (1) of the following categories:

- (1) Materials which cause no harm under any conditions of normal use.
- (2) Materials which produce toxic effects on humans only under the most unusual conditions or by overwhelming dosage.

**1—Slight Toxicity\* (Low)\* \***

- (A) Acute local. Materials which on single exposures lasting seconds, minutes, or hours cause only slight effects on the skin or mucous membranes regardless of the extent of the exposure.
- (B) Acute systemic. Materials which can be absorbed into the body by inhalation, ingestion, or through the skin and which produce only slight effects following single exposures lasting seconds, minutes, or hours, or following ingestion of a single dose, regardless of the quantity absorbed or the extent of exposure.
- (C) Chronic local. Materials which on continuous or repeated exposures extending over periods of days, months, or years cause only slight and usually reversible harm to the skin or mucous membranes. The extent of exposure may be great or small.
- (D) Chronic systemic. Materials which can be absorbed into the body by inhalation, ingestion, or through the skin and which produce only slightly usually reversible effects extending over days, months, or years. The extent of the exposure may be great or small.

In general, those substances classified as having "slight toxicity" produce changes in the human body which are readily reversible and which will disappear following termination of exposure, either with or without medical treatment.

**2—Moderate Toxicity\* (Mod)\* \***

- (A) Acute local. Materials which on single exposure lasting seconds, minutes, or hours cause moderate effects on the skin or mucous membranes. These effects may be the result of intense exposure for a matter of seconds or moderate exposure for a matter of hours.
- (B) Acute systemic. Materials which can be absorbed into the body by inhalation, ingestion, or through the skin and produce moderate effects following single exposure lasting seconds, minutes, or hours, or following ingestion of a single dose.
- (C) Chronic local. Materials which on continuous or repeated exposures extending over periods of days, months, or years cause moderate harm to the skin or mucous membranes.
- (D) Chronic systemic. Materials which can be absorbed into the body by inhalation, ingestion, or through the skin and which produce moderate effects following continuous or repeated exposures extending over periods of days, months, or years.



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Those substances classified as having "moderate toxicity" may produce irreversible as well as reversible changes in the human body. These changes are not of such severity as to threaten life or to produce serious physical impairment.

3-Severe Toxicity\* (High)\* \*

- (A) Acute local. Materials which on single exposure lasting seconds or minutes cause injury to skin or mucous membranes of sufficient severity to threaten life or to cause permanent physical impairment or disfigurement.
- (B) Acute systemic. Materials which can be absorbed into the body by inhalation, ingestion, or through the skin and which can cause injury of sufficient severity to threaten life following a single exposure lasting seconds, minutes, or hours, or following ingestion of a single dose.
- (C) Chronic local. Materials which on continuous or repeated exposures extending over periods of days, months, or years can cause injury to skin or mucous membranes of sufficient severity to threaten life or cause permanent impairment, which disfigurement, or irreversible change.
- (D) Chronic systemic. Materials which can be absorbed into the body by inhalation, ingestion, or through the skin and which can cause death or serious physical impairment following continuous or repeated exposures to small amounts extending over periods of days, months, or years.

\*Sax, N.I., *Dangerous Properties of Industrial Materials*, Van Nostrand Rheinhold Company, New York, 4th Edition, 1975.

\*\*Sax, N.I., *Dangerous Properties of Industrial Materials*, Van Nostrand Rheinhold Company, New York, 5th Edition, 1979.

TABLE 4  
NFPA TOXICITY RATINGS\*

0	Materials which on exposure under fire conditions would offer no health hazard beyond that of ordinary combustible material.
1	Materials only slightly hazardous to health. It may be desirable to wear self-contained breathing apparatus.
2	Materials hazardous to health, but areas may be entered freely with self-contained breathing apparatus.
3	Materials extremely hazardous to health, but areas may be entered with extreme care. Full protective clothing, including self-contained breathing apparatus, rubber gloves, boots and bands around legs, arms, and waist should be provided. No skin surface should be exposed.
4	A few whiffs of the gas or vapor could cause death, or the gas, vapor, or liquid could be fatal on penetrating the fire fighters' normal full protective clothing which is designed for resistance to heat. For most chemicals having a Health 4 rating, the normal full protective clothing available to the average fire department will not provide adequate protection against skin contact with these materials. Only special protective clothing designed to protect against the specific hazard should be worn.

\*National Fire Protection Association. *National Fire Codes*, Vol. 13, No. 49, 1977.

(e) Hazardous waste quantity includes all hazardous substances at a facility (as received) except that with a containment value of zero (0). Do not include amounts of contaminated soil or water. In such cases, the amount of contaminating hazardous substances may be estimated. The hazardous waste quantity at a site may be reduced by documentation of an appropriate and verifiable removal action. It may be necessary to convert data to a common unit to combine them. In such cases, one (1) ton equals one (1) cubic yard equals four (4) drums, and for the purposes of converting bulk storage, one (1) drum equals fifty (50) gallons. Assign a value as follows:

<u>Tons/Cubic Yards</u>	<u>No. of Drums</u>	<u>Assigned Value</u>
0	0	0
>0-10	>0-40	1
11-62	41-250	2
63-125	251-500	3
126-250	501-1,000	4
251-625	1,001-2,500	5
626-1,250	2,501-5,000	6
1,251-2,500	5,001-10,000	7
>2,500	>10,000	8

*(Solid Waste Management Board; 329 IAC 7-5-4; filed Sep 6, 1989, 1:00 p.m.: 13 IR 19; errata filed Sep 25, 1990, 3:25 p.m.: 14 IR 289; readopted filed Jan 10, 2001, 3:25 p.m.: 24 IR 1535; readopted filed May 14, 2007, 1:53 p.m.: 20070523-IR-329070138BFA)*

**329 IAC 7-5-5 Targets**

Authority: IC 13-7-5-3; IC 13-7-7-1; IC 13-7-8.7-2

Affected: IC 13-7-5-3; IC 13-7-5-7; IC 13-7-8.7

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Sec. 5. (a) Ground water use indicates the nature of the use made of ground water drawn from the aquifer of concern within three (3) miles of the hazardous substance, including the geographical extent of the measurable concentration in the aquifer. Assign a value using the following guidance:

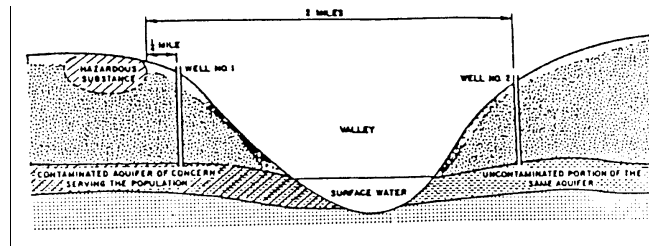
Ground Water Use	Assigned Value
Unusable, e.g., extremely saline aquifer, extremely low yield, etc.	0
Commercial, industrial, or irrigation and another water source presently available; not used, but usable	1
Drinking water with municipal water from alternate unthreatened sources presently available, i.e., minimal hookup requirements; or commercial, industrial or irrigation with no other water source presently available	2
Drinking water; no municipal water from alternate unthreatened sources presently available	3

(b) Distance to nearest well and population served have been combined in the matrix below to better reflect the important relationship between the distance of a population from hazardous substances and the size of the population served by ground water that might be contaminated by those substances. To determine the overall value for this combined factor, score each individually as discussed below. Match the individual values assigned with the values in the matrix for the total score.

Value for Population Served	Value for Distance to Nearest Well				
	0	1	2	3	4
0	0	0	0	0	0
1	0	4	6	8	10
2	0	8	12	16	20
3	0	12	18	24	30
4	0	16	24	32	35
5	0	20	30	35	40

(c) Distance to nearest well is measured from the hazardous substance (not the facility boundary) to the nearest well that draws water from the aquifer of concern. If the actual distance to the nearest well is unknown, use the distance between the hazardous substance and the nearest occupied building not served by a public water supply, e.g., a farmhouse. If a discontinuity in the aquifer occurs between the hazardous substance and all wells, give this factor a score of zero (0), except where it can be shown that the contaminant is likely to migrate beyond the discontinuity. The illustration below shows how the distance should be measured. Assign a value as follows:

Distance	Assigned Value
>3 miles	0
2 to 3 miles	1
1 to 2 miles	2
2,001 feet to 1 mile	3
<2,000 feet	4



In the situation depicted above, the distance between the hazardous substance and the nearest well (No. 1) is one-fourth (1/4) mile. If well No. 1 did not exist, the distance to well No. 2 would be immaterial since there is a discontinuity in the aquifer (surface water) between it and the hazardous substance. Under such circumstances, the factor score would be zero (0). However, if it could be demonstrated that the contaminant had bridged the discontinuity, then the distance to the nearest well would be two (2) miles (assuming well No. 1 does not exist).

(d) Population served by ground water is an indicator of the population at risk, which includes residents as well as others who would regularly use the water such as workers in factories or offices and students. Include employees in restaurants, motels, or campgrounds but exclude customers and travelers passing through the area in autos, buses, or trains. If aerial photography is used,

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and residents are known to use ground water, assume each dwelling unit has three and eight-tenths (3.8) residents. Where ground water is used for irrigation, convert to population by assuming one and five-tenths (1.5) persons per acre of irrigated land. The well or wells of concern must be within three (3) miles of the hazardous substances, including the area of known aquifer contamination, but the "population served" need not be. Likewise, people within three (3) miles who do not use water from the aquifer of concern are not to be counted. Assign a value as follows:

<u>Population</u>	<u>Assigned Value</u>
0	0
1-100	1
101-1,000	2
1,001-3,000	3
3,001-10,000	4
>10,000	5

*(Solid Waste Management Board; 329 IAC 7-5-5; filed Sep 6, 1989, 1:00 p.m.: 13 IR 22; errata filed Sep 25, 1990, 3:25 p.m.: 14 IR 289; readopted filed Jan 10, 2001, 3:25 p.m.: 24 IR 1535; readopted filed May 14, 2007, 1:53 p.m.: 20070523-IR-329070138BFA)*

**Rule 6. Surface Water Route**

**329 IAC 7-6-1 Observed release**

Authority: IC 13-7-5-3; IC 13-7-7-1; IC 13-7-8.7-2

Affected: IC 13-7-5-3; IC 13-7-5-7; IC 13-7-8.7

Sec. 1. Direct evidence of release to surface water must be quantitative evidence that the facility is releasing contaminants into surface water. Quantitative evidence could be the measurement of levels of contaminants from a facility in surface water, either at the facility or downhill from it, that represents a significant (in terms of demonstrating that a release has occurred, not in terms of potential effects) increase over background levels. If direct evidence of release has been obtained (regardless of frequency), enter a value of forty-five (45) on line 1 of the surface water route work sheet below, and omit the evaluation of the route characteristics and containment factors. If direct evidence of release is lacking, enter a value of zero (0) on line 1 and continue with the scoring procedure.

Surface Water Route Work Sheet						
Rating Factor	Assigned Value (Circle One)	Multiplier	Score	Max. Score	Ref. (Section)	
<b>1</b> Observed Release	0      45	1		45	4.1	
If observed release is given a value of 45, proceed to line <b>4</b> . If observed release is given a value of 0, proceed to line <b>2</b> .						
<b>2</b> Route Characteristics					4.2	
Facility Slope and Intervening Terrain	0 1 2 3	1		3		
1-yr. 24-hr. Rainfall	1 2 3	1		3		
Distance to Nearest Surface Water	0 1 2 3	2		6		
Physical State	0 1 2 3	1		3		
	<b>Total Route Characteristics Score</b>			15		
<b>3</b> Containment	0 1 2 3	1		3	4.3	
<b>4</b> Waste Characteristics					4.4	
Toxicity/Persistence	0 3 6 9 12 15 18	1		18		
Hazardous Waste Quantity	0 1 2 3 4 5 6 7 8	1		8		
	<b>Total Waste Characteristics Score</b>			26		

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5	Targets		4.5
	Surface Water Use	1 2 3	3 9
	Distance to a Sensitive Environment	0 1 2 3	2 6
	Population Served/Distance to Water Intake Downstream	0 4 6 8 10 12 16 18 20 24 30 32 36 40	1 40
	Total Targets Score		55
6	If line 1 is 45, multiply 1 × 4 × 5		
	If line 1 is 0, multiply 2 × 3 × 4 × 5		
7	Divide line 6 by 64,360 and multiply by 100		$S_{sw} =$

SURFACE WATER ROUTE WORK SHEET

*(Solid Waste Management Board; 329 IAC 7-6-1; filed Sep 6, 1989, 1:00 p.m.: 13 IR 23; readopted filed Jan 10, 2001, 3:25 p.m.: 24 IR 1535; readopted filed May 14, 2007, 1:53 p.m.: 20070523-IR-329070138BFA)*

**329 IAC 7-6-2 Route characteristics**

Authority: IC 13-7-5-3; IC 13-7-7-1; IC 13-7-8.7-2  
 Affected: IC 13-7-5-3; IC 13-7-5-7; IC 13-7-8.7

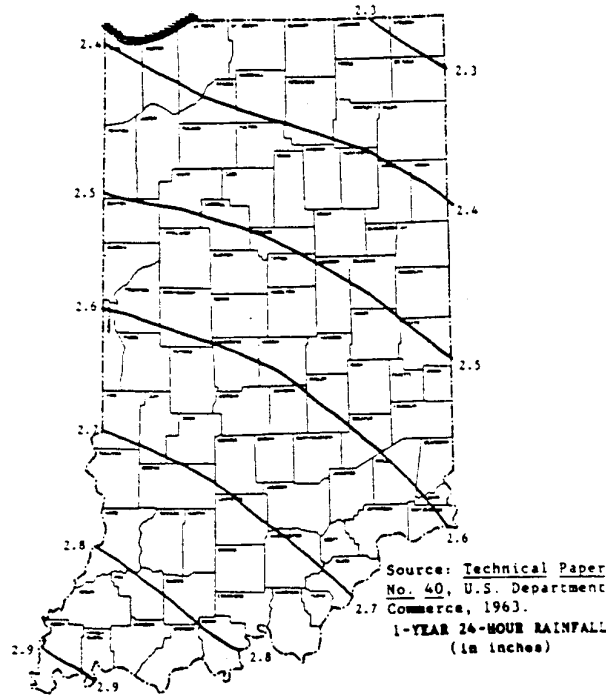
Sec. 2. (a) Facility slope and intervening terrain are indicators of the potential for contaminated runoff or spills at a facility to be transported to surface water. The facility slope is an indicator of the potential for runoff or spills to leave the facility. Intervening terrain refers to the average slope of the shortest path which would be followed by runoff between the facility boundary and the nearest downhill surface water. This rating factor can be assessed using topographic maps. The following table shows values assigned to various facility conditions.

Facility Slope	Intervening Terrain				
	Terrain Average Slope ≤ 3%; or Site Separated from Water Body by Areas of Higher Elevation	Terrain Average Slope 3-5%	Terrain Average Slope 5-8%	Terrain Average Slope >8%	Site in Surface Water
Facility is closed basin	0	0	0	0	3
Facility has average slope ≤3%	0	1	1	2	3
Average slope 3-5%	0	1	2	2	3
Average slope 5-8%	0	2	2	3	3
Average slope >8%	0	2	3	3	3

VALUES FOR FACILITY SLOPE AND INTERVENING TERRAIN

(b) One (1) year twenty-four (24) hour rainfall (obtained from the one (1) year twenty-four (24) hour rainfall map) indicates the potential for area storms to cause surface water contamination as a result of runoff, erosion, or flow over dikes. Assign a value as follows:

<u>Amount of Rainfall</u>	<u>Assigned Value</u>
(inches) <2.4	1
2.4-2.7	2
>2.7	3



(c) Distance to the nearest surface water is the shortest distance from the hazardous substance, (not the facility or property boundary) to the nearest downhill body of surface water, e.g., lake or stream, that is on the course that runoff can be expected to follow and that at least occasionally contains water. Do not include manmade ditches which do not connect with other surface water bodies. In areas having less than twenty (20) inches of normal annual precipitation (see 329 IAC 7-5-2(b), normal annual total precipitation map), consider intermittent streams. This factor indicates the potential for pollutants flowing overland and into surface water bodies. Assign a value as follows:

<u>Distance</u>	<u>Assigned Value</u>
>2 miles	0
1 to 2 miles	1
1,000 feet to 1 miles	2
<1,000 feet	3

(d) Physical state is assigned a value using the procedures in 329 IAC 7-5-2. (Solid Waste Management Board; 329 IAC 7-6-2; filed Sep 6, 1989, 1:00 p.m.: 13 IR 25; readopted filed Jan 10, 2001, 3:25 p.m.: 24 IR 1535; readopted filed May 14, 2007, 1:53 p.m.: 20070523-IR-329070138BFA)

**329 IAC 7-6-3 Containment**

Authority: IC 13-7-5-3; IC 13-7-7-1; IC 13-7-8.7-2  
Affected: IC 13-7-5-3; IC 13-7-5-7; IC 13-7-8.7

Sec. 3. Containment is a measure of the means that have been taken to minimize the likelihood of a contaminant entering surface water either at the facility or beyond the facility boundary. Examples of containment are diversion structures and the use of sealed containers. If more than one (1) type of containment is used at a facility, evaluate each separately as established in the containment values for surface water route table below. Assign the highest score.

**CONTAINMENT VALUES FOR SURFACE WATER ROUTE**

Assign containment a value of zero (0) if: (1) all the waste at the site is surrounded by diversion structures that are in sound

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condition and adequate to contain all runoff, spills, or leaks from the waste; or (2) intervening terrain precludes runoff from entering surface water. Otherwise, evaluate the containment for each of the different means of storage or disposal at the site and assign a value as follows:

<u>Surface Impoundment</u>	<u>Assigned Value</u>
Sound diking or diversion structure, adequate freeboard, and no erosion evident	0
Sound diking or diversion structure, but inadequate freeboard	1
Diking not leaking, but potentially unsound	2
Diking unsound, leaking, or in danger of collapse	3

Containers

Containers sealed, in sound condition, and surrounded by sound diversion or containment system	0
Containers sealed and in sound condition, but not surrounded by sound diversion or containment system	1
Containers leaking and diversion or containment structures potentially unsound	2
Containers leaking, and no diversion or containment structures or diversion structures leaking or in danger of collapse	3

Waste Piles

Piles are covered and surrounded by sound diversion or containment system	0
Piles covered, wastes unconsolidated, diversion or containment system not adequate	1
Piles not covered, wastes unconsolidated, and diversion or containment system potentially unsound	2
Piles not covered, wastes unconsolidated, and no diversion or containment or diversion system leaking or in danger of collapse	3

Landfill

Landfill slope precludes runoff, landfill surrounded by sound diversion system, or landfill has adequate cover material	0
Landfill not adequately covered and diversion system sound	1
Landfill not covered and diversion system potentially unsound	2
Landfill not covered and no diversion system present, or diversion system unsound	3

*(Solid Waste Management Board; 329 IAC 7-6-3; filed Sep 6, 1989, 1:00 p.m.: 13 IR 26; errata filed Sep 25, 1990, 3:25 p.m.: 14 IR 289; readopted filed Jan 10, 2001, 3:25 p.m.: 24 IR 1535; readopted filed May 14, 2007, 1:53 p.m.: 20070523-IR-329070138BFA)*

**329 IAC 7-6-4 Waste characteristics**

Authority: IC 13-7-5-3; IC 13-7-7-1; IC 13-7-8.7-2  
 Affected: IC 13-7-5-3; IC 13-7-5-7; IC 13-7-8.7

Sec. 4. Evaluate waste characteristics for the surface water route with the procedures described in 329 IAC 7-5-4, for the ground water route. *(Solid Waste Management Board; 329 IAC 7-6-4; filed Sep 6, 1989, 1:00 p.m.: 13 IR 27; readopted filed Jan 10, 2001, 3:25 p.m.: 24 IR 1535; readopted filed May 14, 2007, 1:53 p.m.: 20070523-IR-329070138BFA)*

**329 IAC 7-6-5 Targets**

Authority: IC 13-7-5-3; IC 13-7-7-1; IC 13-7-8.7-2  
 Affected: IC 13-7-5-3; IC 13-7-5-7; IC 13-7-8.7

Sec. 5. (a) Surface water use brings into the rating process the use being made of surface water downstream from the facility. The use or uses of interest are those associated with water taken from surface waters within a distance of three (3) miles from the location of the hazardous substance. Assign a value as follows:

<u>Surface Water Use</u>	<u>Assigned Value</u>
Commercial, industrial or not currently used	1
Irrigation, economically important resources, e.g., shellfish, commercial food preparation, or recreation, e.g., fishing, boating, swimming	2

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Drinking water

3

(b) Distance to a sensitive environment refers to the distance from the hazardous substance (not the facility boundary) to an area containing an important biological resource or to a fragile nature setting that could suffer an especially severe impact from contamination. The values for sensitive environment table below, provides guidance on assigning a value to this rating factor.

VALUES FOR SENSITIVE ENVIRONMENT (SURFACE WATER)

Assigned Value =	0	1	2	3
<b><u>DISTANCE TO WETLANDS*</u></b>				
(5 acre minimum)				
Fresh Water	>2 miles	1-2 miles	¼ to 1 mile	<¼ mile
<b><u>DISTANCE TO CRITICAL HABITAT</u></b>				
(of endangered, threatened, special concern, and extirpated wildlife)**				

\* Wetland is defined by the U.S. EPA in 40 C.F.R. 230.

\*\* Endangered, threatened, special concern, and extirpated wildlife as defined in 310 IAC 3-3-6.11 [310 IAC 3 was repealed filed Dec 2, 1987, 2:19 p.m.: 11 IR 1160.].

(c) Population served by surface water with water intake within three (3) miles downstream from facility (or one (1) mile in static surface water such as a lake) is a rough indicator of the potential hazard exposure of the nearby population served by potentially contaminated surface water. Measure the distance from the probable point of entry to surface water following the surface water flow (stream miles). The population includes residents as well as others who would regularly use the water such as workers in factories or offices and students. Include employees in restaurants, motels, or campgrounds but exclude customers and travelers passing through the area in autos, buses, and trains. The distance is measured from the hazardous substance including observations in stream or sediment samples, regardless of facility boundaries. Where only residential houses can be counted, e.g., from an aerial photograph, and residents are known to be using surface water, assume three and eight-tenths (3.8) individuals per dwelling unit. Where surface water is used for irrigation, convert to population by assuming one and five-tenths (1.5) persons per acre of land irrigated. Assign a value as follows:

Population	Distance to Surface Water					
	>3 miles	2-3 miles	1-2 miles	2,001 feet to 1 mile	0-2,000 feet	
0	0	0	0	0	0	0
1-100	0	4	6	8	10	10
101-1,000	0	8	12	16	20	20
1,001-3,000	0	12	18	24	30	30
3,001-10,000	0	16	24	32	35	35
>10,000	0	20	30	35	40	40

(Solid Waste Management Board; 329 IAC 7-6-5; filed Sep 6, 1989, 1:00 p.m.: 13 IR 27; readopted filed Jan 10, 2001, 3:25 p.m.: 24 IR 1535; readopted filed May 14, 2007, 1:53 p.m.: 20070523-IR-329070138BFA)

**Rule 7. Air Route**

**329 IAC 7-7-1 Observed release**

Authority: IC 13-7-5-3; IC 13-7-7-1; IC 13-7-8.7-2

Affected: IC 13-7-5-3; IC 13-7-5-7; IC 13-7-8.7

Sec. 1. The only acceptable evidence of release for the air route is data that show levels of a contaminant at or in the vicinity of the facility that significantly exceed background levels, regardless of the frequency of occurrence. If such evidence exists, enter a value of forty-five (45) on line 1 of the air route work sheet below. If not, assign line 1 a zero (0) value and then  $S_a = 0$ . Record the date, location, and the sampling protocol for monitoring data on the work sheet. Data based on transitory conditions due to facility disturbance by investigative personnel are not acceptable.

Air Route Work Sheet					
Rating Factor	Assigned Value (Circle One)	Multiplier	Score	Max. Score	Ref. (Section)

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1	Observed Release	0	45	1	45	5.1
Date and Location:						
Sampling Protocol:						
If line 1 is 0, the $S_a = 0$ . Enter on line 5						
If line 1 is 45, then proceed to line 2						
2	Waste Characteristics					5.2
	Reactivity and Incompatibility	0 1 2 3		1		3
	Toxicity	0 1 2 3		3		9
	Hazardous Waste Quantity	0 1 2 3 4 5 6 7 8		1		8
					Total Waste Characteristics Score	20
3	Targets					5.3
	Population Within 4-Mile Radius	0 9 12 15 18 21 24 27 30		1		30
	Distance to Sensitive Environment	0 1 2 3		2		6
	Land Use	0 1 2 3		1		3
					Total Targets Score	39
4	Multiply 1 × 2 × 3					35,100
5	Divide line 4 by 35,100 and multiply by 100					$S_a =$

AIR ROUTE WORK SHEET

*(Solid Waste Management Board; 329 IAC 7-7-1; filed Sep 6, 1989, 1:00 p.m.: 13 IR 28; readopted filed Jan 10, 2001, 3:25 p.m.: 24 IR 1535; readopted filed May 14, 2007, 1:53 p.m.: 20070523-IR-329070138BFA)*

**329 IAC 7-7-2 Waste characteristics**

Authority: IC 13-7-5-3; IC 13-7-7-1; IC 13-7-8.7-2  
 Affected: IC 13-7-5-3; IC 13-7-5-7; IC 13-7-8.7

Sec. 2. (a) The hazardous substance that was observed for scoring the release category may be different from the substance used to score waste characteristics.

(b) Reactivity and incompatibility, measures of the potential for sudden releases of concentrated air pollutants, are evaluated independently, and the highest value for either is recorded on the work sheet.

(c) Reactivity provides a measure of the fire/explosion threat at a facility. Assign a value based on the reactivity classification used by NFPA (see NFPA reactivity ratings table below). Reactivity ratings for a number of common compounds are given in 329 IAC 7-5-4(c), Table 1.

NFPA REACTIVITY RATINGS

	NFPA LEVEL	Assigned Value
0	Materials which are normally stable even under fire exposure conditions and which are not reactive with water.	0
1	Materials which in themselves are normally stable but which may become unstable at elevated temperatures and pressures or which may react with water with some release of energy but not violently.	1
2	Materials which in themselves are normally unstable and readily undergo violent chemical change but do not detonate. Includes materials which can undergo chemical change with rapid release of energy at normal temperatures and pressures or which can undergo violent chemical change at elevated temperatures and pressures. Also includes those materials which may react violently with water or which may form potentially explosive mixtures with water.	2



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3	Materials which in themselves are capable of detonation or of explosive decomposition or of explosive reaction but which requires a strong initiating source or which must be heated under confinement before initiation. Includes materials which are sensitive to thermal or mechanical shock at elevated temperatures and pressures or which react explosively with water without requiring heat or confinement.	3
4	Materials which in themselves are readily capable of detonation or of explosive decomposition or explosive reaction at normal temperatures and pressures. Includes materials which are sensitive to mechanical or localized thermal shock.	3

(d) Incompatibility provides a measure of the increased hazard when hazardous substances are mixed under uncontrolled conditions, leading to production of heat, pressure, fire, explosion, violent reaction, toxic dusts, mists, fumes or gases, or flammable fumes or gases. The following table provides examples of incompatible combinations of materials. Additional information can be obtained from A Method for Determining the Compatibility of Hazardous Wastes, H. K. Hatayama, et al., EPA-600/2-80-076 (1980). Assign a value as follows:

<u>Incompatibility</u>	<u>Assigned Value</u>
No incompatible substances are present	0
Present but do not pose a hazard	1
Present and may pose a future hazard	2
Present and posing an immediate hazard	3

**INCOMPATIBLE MATERIALS**

In the lists below, the mixing of a Group A material with a Group B material may have the potential consequence as noted.

Group 1-A	Group 1-B	
Acetylene sludge	Acid sludge	
Alkaline caustic liquids	Acid and water	
Alkaline cleaner	Battery acid	
Alkaline corrosive liquids	Chemical cleaners	
Alkaline corrosive battery fluid	Electrolyte acid	
Caustic wastewater	Etching acid liquid or solvent	
Lime sludge and other corrosive alkalis	Pickling liquor and other corrosive acids	
Lime wastewater	Spent acid	
Lime and water	Spent mixed acid	
Spent caustic	Spent sulfuric acid	
Potential consequences: Heat generation; violent reaction.		
Group 2-A	Group 2-B	
Aluminum	Any waste in Group 1-A or 1-B	
Beryllium		
Calcium		
Lithium		
Potassium		
Sodium		
Zinc powder		
Other reactive metals and metal hydrides		
Potential consequences: Fire or explosion; generation of flammable hydrogen gas.		
Group 3-A	Group 3-B	
Alcohols	Any concentrated waste in Groups 1-A or 1-B	
Water		
		Calcium
		Lithium
	Metal hydrides	

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	Potassium SO <sub>2</sub> Cl <sub>2</sub> , SOCl <sub>2</sub> , PCl <sub>2</sub> , CH <sub>3</sub> , SiCl <sub>3</sub> Other water-reactive waste
Potential consequences: Fire, explosion, or heat generation; generation of flammable or toxic gases.	
Group 4-A	Group 4-B
Alcohols	Concentrated Group 1-A or 1-B wastes
Aldehydes	Group 2-A wastes
Halogenated hydrocarbons	
Nitrated hydrocarbons	
Unsaturated hydrocarbons	
Other reactive organic compounds and solvents	
Potential consequences: Fire, explosion, or violent reaction.	
Group 5-A	Group 5-B
Spent cyanide and sulfide solutions	Group 1-B wastes
Potential consequences: Generation of toxic hydrogen cyanide or hydrogen sulfide gas.	
Group 6-A	Group 6-B
Chlorates	Acetic acid and other organic acids
Chlorine	Concentrated mineral acids
Chlorites	Group 2-A wastes
Chromic acid	Group 4-A wastes
Hyphochlorites	Other flammable and combustible wastes
Nitrates	
Nitric acid, fuming	
Perchlorates	
Permanganates	
Peroxides	
Other strong oxidizers	

Potential consequences: Fire, explosion, or violent reaction.

Source: Hazardous Waste Management Law, Regulations, and Guidelines for the Handling of Hazardous Waste. California Department of Health, Sacramento, California, February 1975.

(e) Toxicity should be rated for the most toxic of the substances that can reasonably be expected to be transported away from the facility via the air route. Using the information given in 329 IAC 7-5-4(c), Table 1, and 329 IAC 7-5-4(d), Table 3 and Table 4, assign values as follows:

<u>Toxicity</u>	<u>Assigned Value</u>
Sax level 0 or NFPA level 0	0
Sax level 1 or NFPA level 1	1
Sax level 2 or NFPA level 2	2
Sax level 3 or NFPA levels 3 or 4	3

(f) Assign hazardous waste quantity a value as described in 329 IAC 7-5-4. (*Solid Waste Management Board; 329 IAC 7-7-2; filed Sep 6, 1989, 1:00 p.m.: 13 IR 29; errata filed Sep 25, 1990, 3:25 p.m.: 14 IR 289; readopted filed Jan 10, 2001, 3:25 p.m.: 24 IR 1535; readopted filed May 14, 2007, 1:53 p.m.: 20070523-IR-329070138BFA*)

**329 IAC 7-7-3 Targets**

Authority: IC 13-7-5-3; IC 13-7-7-1; IC 13-7-8.7-2

Affected: IC 13-7-5-3; IC 13-7-5-7; IC 13-7-8.7

Sec. 3. (a) Population within a four (4) mile radius is an indicator of the population which may be harmed should hazardous

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substances be released to the air.

(b) The distance is measured from the location of the hazardous substances, not from the facility boundary. The population to be counted includes persons residing within the four (4) mile radius as well as transients such as workers in factories, offices, restaurants, motels, or students. It excludes travelers passing through the area. If aerial photography is used in making the count, assume three and eight-tenths (3.8) individuals per dwelling unit. Select the highest value for this rating factor as follows:

Population	Distance to Population from Hazardous Substance			
	0-4 miles	0-1 mile	0-½ mile	0-¼ mile
0	0	0	0	0
1-100	9	12	15	18
101-1,000	12	15	18	21
1,001-3,000	15	18	21	24
3,001-10,000	18	21	24	27
>10,000	21	24	27	30

(c) Distance to sensitive environment is an indicator of the likelihood that a region that contains important biological resources or that is a fragile natural setting would suffer serious damage if hazardous substances were to be released from the facility. Assign a value from 329 IAC 7-6-5(b).

(d) Land use indicates the nature and level of human activity in the vicinity of a facility. Assign highest applicable value from the values for land use table below.

VALUES FOR LAND USE (AIR ROUTE)

ASIGNED [sic.] VALUE =	0	1	2	3
Distance to Commercial– Industrial	>1 mile	½-1 mile	¼-½ mile	<¼ mile
Distance to National/State Parks, Forests, Wildlife Reserves, and Residential Areas	>2 miles	1-2 miles	¼-1 mile	<¼ mile
Distance to Agricultural Lands (in production within 5 years)				
Ag Land	>1 mile	½-1 mile	¼-½ mile	<¼ mile
Prime Ag Land*	>2 miles	1-2 miles	½-1 mile	<½ mile
Distance to Historic/Landmark Sites (National Register of Historic Places and National Natural Landmarks)				within view of site or if site is subject to significant impacts

\*Defined in 7 C.F.R. 657.5, 1981.

(Solid Waste Management Board; 329 IAC 7-7-3; filed Sep 6, 1989, 1:00 p.m.: 13 IR 31; readopted filed Jan 10, 2001, 3:25 p.m.: 24 IR 1535; readopted filed May 14, 2007, 1:53 p.m.: 20070523-IR-329070138BFA)

**Rule 8. Computing the Migration Hazard Mode Score,  $S_M$**

**329 IAC 7-8-1 Migration hazard mode score**

Authority: IC 13-7-5-3; IC 13-7-7-1; IC 13-7-8.7-2

Affected: IC 13-7-5-3; IC 13-7-5-7; IC 13-7-8.7

Sec. 1. To compute  $S_M$ , complete the work sheet for computing  $S_M$  below, using the values of  $S_{gw}$ ,  $S_{sw}$ , and  $S_a$  obtained from the previous sections.

	S	$S^2$
Ground Water Route Score ( $S_{gw}$ )		
Surface Water Route Score ( $S_{sw}$ )		
Air Route Score ( $S_a$ )		

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$S_{gw}^2 + S_{sw}^2 + S_a^2$		
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2}$		
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2} / 1.73 = S_M =$		

WORKSHEET FOR COMPUTING  $S_M$

*(Solid Waste Management Board; 329 IAC 7-8-1; filed Sep 6, 1989, 1:00 p.m.: 13 IR 32; readopted filed Jan 10, 2001, 3:25 p.m.: 24 IR 1535; readopted filed May 14, 2007, 1:53 p.m.: 20070523-IR-329070138BFA)*

**Rule 9. Fire and Explosion**

**329 IAC 7-9-1 Computation**

Authority: IC 13-7-5-3; IC 13-7-7-1; IC 13-7-8.7-2

Affected: IC 13-7-5-3; IC 13-7-5-7; IC 13-7-8.7

Sec. 1. Compute a score for the fire and explosion hazard mode,  $S_{FE}$ , when either a state or local fire marshal has certified that the facility presents a significant fire and explosion threat to the public or to sensitive environments or there is a demonstrated fire and explosion threat based on field observations, e.g., combustible gas indicator readings. Document the threat. *(Solid Waste Management Board; 329 IAC 7-9-1; filed Sep 6, 1989, 1:00 p.m.: 13 IR 32; readopted filed Jan 10, 2001, 3:25 p.m.: 24 IR 1535; readopted filed May 14, 2007, 1:53 p.m.: 20070523-IR-329070138BFA)*

**329 IAC 7-9-2 Containment**

Authority: IC 13-7-5-3; IC 13-7-7-1; IC 13-7-8.7-2

Affected: IC 13-7-5-3; IC 13-7-5-7; IC 13-7-8.7

Sec. 2. Containment is an indicator of the measures that have been taken to minimize or prevent hazardous substances at the facility from catching fire or exploding. Normally it will be given a value of three (3) on the fire and explosion work sheet below. If no hazardous substances that are individually ignitable or explosive are present and those that may be hazardous in combination are segregated and isolated so that they cannot come together to form incompatible mixtures, assign this factor a value of one (1).

Fire and Explosion Work

Rating Factor	Assigned Value (Circle One)	Multiplier	Score	Max. Score	Ref. (Section)
<b>1</b> Containment	1      3	1		3	7.1
<b>2</b> Waste Characteristics					7.2
Direct Evidence	0   3	1		3	
Ignitability	0 1 2 3	1		3	
Reactivity	0 1 2 3	1		3	
Incompatibility	0 1 2 3	1		3	
Hazardous Waste Quantity	0 1 2 3 4 5 6 7 8	1		8	
<b>Total Waste Characteristics Score</b>				<b>20</b>	
<b>3</b> Targets					7.3
Distance to Nearest Population	0 1 2 3 4 5	1		5	
Distance to Nearest Building	0 1 2 3	1		3	
Distance to Sensitive Environment	0 1 2 3	1		3	

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Land Use	0 1 2 3	1	3
Population Within 2-Mile Radius	0 1 2 3 4 5	1	5
Buildings Within 2-Mile Radius	0 1 2 3 4 5	1	5
Total Targets Score			24
<div style="border: 1px solid black; padding: 2px;">                 4 Multiply <span style="border: 1px solid black; padding: 0 2px;">1</span> × <span style="border: 1px solid black; padding: 0 2px;">2</span> × <span style="border: 1px solid black; padding: 0 2px;">3</span> </div>			1,440
<div style="border: 1px solid black; padding: 2px;">                 5 Divide line <span style="border: 1px solid black; padding: 0 2px;">4</span> by 1,440 and multiply by <u>10</u>                      S<sub>FE</sub> =             </div>			

*(Solid Waste Management Board; 329 IAC 7-9-2; filed Sep 6, 1989, 1:00 p.m.: 13 IR 32; readopted filed Jan 10, 2001, 3:25 p.m.: 24 IR 1535; readopted filed May 14, 2007, 1:53 p.m.: 20070523-IR-329070138BFA)*

**329 IAC 7-9-3 Waste characteristics**

Authority: IC 13-7-5-3; IC 13-7-7-1; IC 13-7-8.7-2  
 Affected: IC 13-7-5-3; IC 13-7-5-7; IC 13-7-8.7

Sec. 3. (a) Direct evidence of ignitability or explosion potential may exist in the form of measurements with appropriate instruments. If so, assign this factor a value of three (3). If not, assign a value of zero (0).

(b) Ignitability is an indicator of the threat of fire at a facility and the accompanying potential for release of air contaminants. Assign this rating factor a value based on the NFPA classification scheme (see NFPA ignitability levels and assigned values table below). 329 IAC 7-5-4(c), Table 1, gives values for a number of common compounds. Assign values as follows:

Ignitability	Assigned Value
Flashpoint 200°F, or NFPA level 0	0
Flashpoint 140°F to 200°F or NFPA level 1	1
Flashpoint 80°F to 140°F or NFPA level 2	2
Flashpoint 80°F or NFPA levels 3 or 4	3

NFPA IGNITABILITY LEVELS AND ASSIGNED VALUES

	NFPA LEVEL	ASSIGNED VALUE
4	Very flammable gases, very volatile flammable liquids, and materials that in the form of dusts or mists readily form explosive mixtures when dispersed in air.	3
3	Liquids which can be ignited under all normal temperature conditions. Any material that ignites spontaneously at normal temperatures in air.	
2	Liquids which must be moderately heated before ignition will occur and solids that readily give off flammable vapors.	2
1	Materials that must be preheated before ignition can occur. Most combustible solids have a flammability rating of 1.	1
0	Materials that will not burn.	0

(c) Reactivity. Assign values as in 329 IAC 7-7-2.

(d) Incompatibility. Assign values as in 329 IAC 7-7-2.

(e) Hazardous waste quantity. Assign values as in 329 IAC 7-5-4. *(Solid Waste Management Board; 329 IAC 7-9-3; filed Sep 6, 1989, 1:00 p.m.: 13 IR 34; errata filed Sep 25, 1990, 3:25 p.m.: 14 IR 289; readopted filed Jan 10, 2001, 3:25 p.m.: 24 IR 1535; readopted filed May 14, 2007, 1:53 p.m.: 20070523-IR-329070138BFA)*

**329 IAC 7-9-4 Targets**

Authority: IC 13-7-5-3; IC 13-7-7-1; IC 13-7-8.7-2  
 Affected: IC 13-7-5-3; IC 13-7-5-7; IC 13-7-8.7

Sec. 4. (a) Distance to nearest population is the distance from the hazardous substance to the nearest building or area in which one (1) or more persons are likely to be located either for residential, educational, business, occupational, or recreational purposes.

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It is an indicator of the potential for harm to humans from fire and explosion. The building or area need not be off-site. Assign values as follows:

<u>Distance</u>	<u>Assigned Value</u>
>2 miles	0
1 mile-2 miles	1
½ mile-1 mile	2
201 feet-½ mile	3
51 feet-200 feet	4
0-50 feet	5

(b) Distance to nearest building is an indicator of the potential for property damage as a result of fire or explosion. Assign a value as follows:

<u>Distance</u>	<u>Assigned Value</u>
>½ mile	0
201 feet-½ mile	1
51-200 feet	2
0-50 feet	3

(c) Distance to nearest sensitive environment is measured from the hazardous substances, not from the facility boundary. It is an indicator of potential harm to a sensitive environment from fire or explosion at the facility. Select the highest value using the guidance provided in the values for sensitive environments table below, except assign a value of three (3) where fire could be expected to spread to a sensitive environment even though that environment is more than one hundred (100) feet from the hazardous substance.

VALUES FOR SENSITIVE ENVIRONMENT (FIRE AND EXPLOSION)

ASSIGNED VALUE =	0	1	2	3
Distance to Wetlands*	>100 feet	–	–	<100 feet
Distance to Critical Habitat**	>½ mile	1,000 feet-½ mile	100-1,000 feet	<100 feet

\* Wetland is defined by the U.S. EPA 40 C.F.R. 230, Appendix A, 1980.

\*\* Designated by the U.S. Fish and Wildlife Service.

(d) Land use. Assign values as in 329 IAC 7-7-3.

(e) Population within two (2) mile radius (measured from the location of the hazardous substance, not from the facility boundary) is a rough indicator of the population at risk in the event of fire or explosion at a facility. The population to be counted includes those residing within the two (2) mile radius as well as people regularly in the vicinity such as workers in factories, offices, or students. It does not include travelers passing through the area. If aerial photography is used in making the count, assume three and eight-tenths (3.8) individuals per dwelling. Assign values as follows:

<u>Population</u>	<u>Assigned Value</u>
0	0
1-100	1
101-1,000	2
1,001-3,000	3
3,001-10,000	4
>10,000	5

(f) Number of buildings within two (2) mile radius (measured from the hazardous substance, not from the facility boundary) is a rough indicator of the property damage that could result from fire and explosion at a facility. Assign values to this factor as follows:

<u>Number of Buildings</u>	<u>Assigned Value</u>
0	0
1-26	1
27-260	2
261-790	3

INDIANA SCORING MODEL

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791-2,600                                     4  
 >2,600   5

(Solid Waste Management Board; 329 IAC 7-9-4; filed Sep 6, 1989, 1:00 p.m.: 13 IR 34; readopted filed Jan 10, 2001, 3:25 p.m.: 24 IR 1535; readopted filed May 14, 2007, 1:53 p.m.: 20070523-IR-329070138BFA)

**Rule 10. Direct Contact**

**329 IAC 7-10-1 General**

Authority: IC 13-7-5-3; IC 13-7-7-1; IC 13-7-8.7-2  
 Affected: IC 13-7-5-3; IC 13-7-5-7; IC 13-7-8.7

Sec. 1. The direct contact hazard mode refers to the potential for injury by direct contact with hazardous substances at the facility. (Solid Waste Management Board; 329 IAC 7-10-1; filed Sep 6, 1989, 1:00 p.m.: 13 IR 35; readopted filed Jan 10, 2001, 3:25 p.m.: 24 IR 1535; readopted filed May 14, 2007, 1:53 p.m.: 20070523-IR-329070138BFA)

**329 IAC 7-10-2 Observed incident**

Authority: IC 13-7-5-3; IC 13-7-7-1; IC 13-7-8.7-2  
 Affected: IC 13-7-5-3; IC 13-7-5-7; IC 13-7-8.7

Sec. 2. If there is a confirmed instance in which contact with hazardous substances at a facility has caused injury, illness, or death to humans or domestic or wild animals, enter a value of forty-five (45) on line 1 of the direct contact work sheet below, and proceed to line 4 (toxicity). Document the incident giving the date, location, and pertinent details. If no such instance is known, enter zero (0) on line 1 and proceed to line 2.

Direct Contact Work Sheet					
Rating Factor	Assigned Value (Circle One)	Multiplier	Score	Max. Score	Ref. (Section)
<u>1</u> Observed Incident	0            45	1		45	8.1
If line <u>1</u> is 45, proceed to line <u>4</u> If line <u>1</u> is 0, proceed to line <u>2</u>					
<u>2</u> Accessibility	0 1 2 3	1		3	8.2
<u>3</u> Containment	0 15	1		15	8.3
<u>4</u> Waste Characteristics Toxicity	0 1 2 3	5		15	8.4
<u>5</u> Targets					8.5
Population Within 1-Mile Radius	0 1 2 3 4 5	4		20	
Distance to a Sensitive Environment	0 1 2 3 4 5	4		20	
<span style="border: 1px solid black; padding: 2px;">Total Targets Score</span>				40	
<u>6</u> If line <u>1</u> is 45, multiply <span style="border: 1px solid black; padding: 2px;">1</span> × <span style="border: 1px solid black; padding: 2px;">4</span> × <span style="border: 1px solid black; padding: 2px;">5</span> If line <u>1</u> is 0, multiply <span style="border: 1px solid black; padding: 2px;">2</span> × <span style="border: 1px solid black; padding: 2px;">3</span> × <span style="border: 1px solid black; padding: 2px;">4</span> × <span style="border: 1px solid black; padding: 2px;">5</span>				27,000	
<u>7</u> Divide line <u>6</u> by 27,000 and multiply by 10 $S_{DC} =$					

DIRECT CONTACT WORKSHEET

(Solid Waste Management Board; 329 IAC 7-10-2; filed Sep 6, 1989, 1:00 p.m.: 13 IR 35; readopted filed Jan 10, 2001, 3:25 p.m.: 24 IR 1535; readopted filed May 14, 2007, 1:53 p.m.: 20070523-IR-329070138BFA)

**329 IAC 7-10-3 Accessibility**

Authority: IC 13-7-5-3; IC 13-7-7-1; IC 13-7-8.7-2  
 Affected: IC 13-7-5-3; IC 13-7-5-7; IC 13-7-8.7

Sec. 3. Accessibility to hazardous substance refers to the measures taken to limit access by humans or animals to hazardous substances. Assign a value using the following guidance:

<u>Barrier</u>	<u>Assigned Value</u>
A 24-hour surveillance system, e.g., television monitoring or surveillance by guards or facility personnel, which continuously monitors and controls entry onto the facility	0
or	
an artificial or natural barrier, e.g., a fence combined with a cliff, which completely surrounds the facility; and a means to control entry, at all times, through the gates or other entrances to the facility, e.g., an attendant, television monitors, locked entrances, or controlled roadway access to the facility.	
Security guard, but no barrier	1
A barrier, but no separate means to control entry	2
Barriers do not completely surround the facility	3
<i>(Solid Waste Management Board; 329 IAC 7-10-3; filed Sep 6, 1989, 1:00 p.m.: 13 IR 36; errata filed Sep 25, 1990, 3:25 p.m.: 14 IR 289; readopted filed Jan 10, 2001, 3:25 p.m.: 24 IR 1535; readopted filed May 14, 2007, 1:53 p.m.: 20070523-IR-329070138BFA)</i>	

**329 IAC 7-10-4 Containment**

Authority: IC 13-7-5-3; IC 13-7-7-1; IC 13-7-8.7-2  
 Affected: IC 13-7-5-3; IC 13-7-5-7; IC 13-7-8.7

Sec. 4. Containment indicates whether the hazardous substance itself is accessible to direct contact. For example, if the hazardous substance at the facility is in surface impoundments, containers (sealed or unsealed), piles, tanks, or landfills with a cover depth of less than two (2) feet, or has been spilled on the ground or other surfaces easily contacted, e.g., the bottom of shallow pond or creek, assign this rating factor a value of fifteen (15). Otherwise, assign a value of zero (0). *(Solid Waste Management Board; 329 IAC 7-10-4; filed Sep 6, 1989, 1:00 p.m.: 13 IR 37; readopted filed Jan 10, 2001, 3:25 p.m.: 24 IR 1535; readopted filed May 14, 2007, 1:53 p.m.: 20070523-IR-329070138BFA)*

**329 IAC 7-10-5 Waste characteristics**

Authority: IC 13-7-5-3; IC 13-7-7-1; IC 13-7-8.7-2  
 Affected: IC 13-7-5-3; IC 13-7-5-7; IC 13-7-8.7

Sec. 5. Toxicity. Assign a value as in 329 IAC 7-5-4. *(Solid Waste Management Board; 329 IAC 7-10-5; filed Sep 6, 1989, 1:00 p.m.: 13 IR 37; readopted filed Jan 10, 2001, 3:25 p.m.: 24 IR 1535; readopted filed May 14, 2007, 1:53 p.m.: 20070523-IR-329070138BFA)*

**329 IAC 7-10-6 Targets**

Authority: IC 13-7-5-3; IC 13-7-7-1; IC 13-7-8.7-2  
 Affected: IC 13-7-5-3; IC 13-7-5-7; IC 13-7-8.7

Sec. 6. Population within one (1) mile radius is a rough indicator of the population including transients that could be involved in direct contact incidents at an uncontrolled facility. Assign a value as follows:

<u>Population</u>	<u>Assigned Value</u>
0	0
1 - 100	1
101 - 1,000	2
1,001 - 3,000	3
3,001 - 10,000	4
>10,000	5



*(Solid Waste Management Board; 329 IAC 7-10-6; filed Sep 6, 1989, 1:00 p.m.: 13 IR 37; readopted filed Jan 10, 2001, 3:25 p.m.: 24 IR 1535; readopted filed May 14, 2007, 1:53 p.m.: 20070523-IR-329070138BFA)*

**329 IAC 7-10-7 Distance to sensitive environment**

Authority: IC 13-7-5-3; IC 13-7-7-1; IC 13-7-8.7-2  
 Affected: IC 13-7-5-3; IC 13-7-5-7; IC 13-7-8.7

Sec. 7. Distance to a sensitive environment refers to the distance from the hazardous substance (not the facility boundary) to an area containing an important biological resource or to a fragile or unique natural setting that could suffer an impact from contamination. These areas include but are not limited to:

- National Lakeshores
- National Forests
- National Wildlife Refuges
- State Park and Recreation Areas
- State Forests
- State Reservoirs
- State Fish and Wildlife Areas
- State Nature Preserves
- Wildlife Habitat Trust Areas
- Wetland Conservation Areas
- County Parks
- County Wildlife Areas
- City Parks
- City Wildlife Areas

<u>Distance</u>	<u>Assigned Value</u>
>2 mile	0
1 ½ to 2 mile	1
1 to 1½ mile	2
½ to 1 mile	3
¼ to ½ mile	4
<¼ mile	5

*(Solid Waste Management Board; 329 IAC 7-10-7; filed Sep 6, 1989, 1:00 p.m.: 13 IR 37; readopted filed Jan 10, 2001, 3:25 p.m.: 24 IR 1535; readopted filed May 14, 2007, 1:53 p.m.: 20070523-IR-329070138BFA)*

**Rule 11. Deletion Procedures; Agency and Petition Deletions**

**329 IAC 7-11-1 Deletion procedure agency deletion**

Authority: IC 13-14-8; IC 13-14-9; IC 13-19-3; IC 13-25-4-7  
 Affected: IC 13-22-2

Sec. 1. Procedures for deleting sites from the commissioner's bulletin by agency deletion are as follows:

- (1) Sites must have been evaluated using the Indiana Scoring Model and received a score of ten (10) or less or be eligible for deletion under 329 IAC 7-2-6(2).
- (2) The commissioner shall notice the local or county health or environmental agency of the proposed agency deletion. The notice shall include the following:
  - (A) Name.
  - (B) Location.
  - (C) Property legal description.
  - (D) Current owners or operators.
  - (E) Property ownership.
  - (F) Operation history.

- (G) A comprehensive summary that includes:
  - (i) the current site conditions; and
  - (ii) an explanation that these current site conditions do not pose a significant environmental concern.
- (3) The commissioner shall solicit a correspondence regarding the proposed agency deletion from the:
  - (A) local officials;
  - (B) county health department; or
  - (C) environmental agency.
- (4) The commissioner shall provide the following as necessary:
  - (A) Answers to any public comments received.
  - (B) A forum for public meetings.
- (5) The commissioner will consider comments received from the:
  - (A) public;
  - (B) county commissioners;
  - (C) town board; or
  - (D) mayor's office.
- (6) Forty-five (45) days after initiation of agency deletion procedures, the commissioner will notify interested parties, if the site will be deleted from the commissioner's bulletin.

*(Solid Waste Management Board; 329 IAC 7-11-1; filed Oct 28, 1998, 3:26 p.m.: 22 IR 753; readopted filed Jan 10, 2001, 3:25 p.m.: 24 IR 1535; filed Nov 16, 2001, 4:40 p.m.: 25 IR 1124; readopted filed May 14, 2007, 1:53 p.m.: 20070523-IR-329070138BFA)*

**329 IAC 7-11-2 Deletion procedures; petition deletion**

Authority: IC 13-14-8; IC 13-14-9; IC 13-19-3; IC 13-25-4-7  
 Affected: IC 13-22-2

Sec. 2. Procedures for deleting sites from the commissioner's bulletin by petition deletions are as follows:

- (1) Sites must have been evaluated using the Indiana Scoring Model and received a score of ten (10) or less or be eligible for deletion under 329 IAC 7-2-6(2).
- (2) The commissioner must receive a petition for deleting a site from the commissioner's bulletin. The petition correspondence must include the following:
  - (A) Name.
  - (B) Location.
  - (C) Property legal description.
  - (D) Current owners or operators.
  - (E) Property ownership.
  - (F) Operational history records relating to the hazardous waste activities.
  - (G) A comprehensive summary that includes:
    - (i) the current site conditions; and
    - (ii) an explanation that these current site conditions do not pose a significant environmental concern.
  - (H) Correspondence from the:
    - (i) local officials;
    - (ii) county health department; or
    - (iii) environmental agency;
 delineating their position on the proposed deletion.
- (3) The commissioner shall provide the following as necessary with petitioner's participation:
  - (A) Public hearings.
  - (B) Public meetings.
  - (C) Information necessary to answer public comments.
- (4) The commissioner will consider comments received from the:
  - (A) public;
  - (B) county commissioners;
  - (C) town board; or

(D) mayor's office.

(5) The commissioner will notify all interested parties, within forty-five (45) days after complete and adequate petition correspondence is received by the commissioner, if the site will be deleted from the commissioner's bulletin.

*(Solid Waste Management Board; 329 IAC 7-11-2; filed Oct 28, 1998, 3:26 p.m.: 22 IR 753; readopted filed Jan 10, 2001, 3:25 p.m.: 24 IR 1535; filed Nov 16, 2001, 4:40 p.m.: 25 IR 1125; readopted filed May 14, 2007, 1:53 p.m.: 20070523-IR-329070138BFA)*

**329 IAC 7-11-3 Deletion procedures: site relisted**

Authority: IC 13-14-8; IC 13-14-9; IC 13-19-3; IC 13-25-4-7

Affected: IC 13-22-2

Sec. 3. Sites may be deleted from the commissioner's bulletin if the site scores a score of ten (10) or less or is eligible for deletion under 329 IAC 7-2-6(2). Sites that are deleted, which subsequently receive a score higher than ten (10), may be relisted on the commissioner's bulletin if new information becomes available to indicate that site conditions have changed and the site warrants reevaluation. *(Solid Waste Management Board; 329 IAC 7-11-3; filed Oct 28, 1998, 3:26 p.m.: 22 IR 754; readopted filed Jan 10, 2001, 3:25 p.m.: 24 IR 1535; filed Nov 16, 2001, 4:40 p.m.: 25 IR 1125; readopted filed May 14, 2007, 1:53 p.m.: 20070523-IR-329070138BFA)*

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