

567—105.206(455H) Site-specific standards.

105.206(1) Purpose. As opposed to statewide standards, site-specific standards are derived by applying exposure and risk assumptions applicable to the conditions at a particular site. Like statewide standards, site-specific standards must always be shown to be protective of public health and safety and the environment. Statewide standards may be used in combination with site-specific standards to address different exposure pathways. Site-specific standards may be required to address exposure pathways that the department determines must be evaluated to be protective of human health, safety and the environment and for which statewide standards have not been established under 567—105.205(455H). Site-specific standards may involve development of target levels for contaminants of concern based on site-specific exposure assumptions for use in lieu of background or statewide standards. Site-specific standards may also include consideration of the actual or potential location where exposure to contaminants occurs or may occur, the likelihood of an exposure occurring, and the overall magnitude and extent of contamination. Site-specific standards may involve use of site-specific target levels for contaminants of concern alone or in conjunction with other site-specific criteria, such as the location where the standard is applied.

105.206(2) General provisions.

a. This rule establishes a minimum protocol that must be met at all enrolled sites that have not established compliance by application of background or statewide standards. Groundwater ingestion and soil ingestion pathway standards under this rule must be evaluated. Surface water and air quality standards under 105.206(8) and 105.206(9) must be met whenever exposure concerns are evident and the participant or the department determines these pathways may present an unacceptable risk for current or future exposures. This rule is not intended to preclude the department or the participant from addressing other exposure pathways, and the department expressly reserves the right to require evaluation of other exposure pathways and compliance with site-specific standards developed for them, such as dermal contact, ingestion of vegetables containing contaminants from soil or irrigation water, migration of contaminants from groundwater or soil into water distribution lines or into air in a confined space, migration of contaminants from soil to groundwater, and migration of contaminants in a nonprotected groundwater source to a protected groundwater source. Participants must establish compliance with standards applicable to all exposure pathways required by the department under this rule in order to qualify for no further action classification under 567—105.211(455H) unless granted a waiver as provided in Iowa Code section 455H.205.

b. Site-specific standards are subject to the approval of the department. Assurances in the form of technological or institutional controls in accordance with 567—105.207(455H) will be required, as needed, to ensure continued protectiveness of site-specific standards.

c. 105.206(3) through 105.206(11) provide options for site-specific standards. The participant may select any of these options, or combinations thereof, for use as site-specific standards.

105.206(3) Site-specific groundwater point of exposure. A site-specific groundwater standard may be an appropriate target level applied at groundwater points of exposure that are limited by technological or institutional controls.

a. A point of exposure for groundwater is a location within the affected area where a well exists or could be placed (potential point of exposure). Where technological or institutional controls are determined to effectively restrict the placement of groundwater wells, the points of exposure apply outside the area of restriction. A sufficient number of points of exposure may be established for determining compliance such that compliance with appropriate target levels at these points will ensure compliance at all points of exposure. A compliance point of exposure will be a location at the boundary of the area restricted by an institutional control where a groundwater well could be installed that would have the highest contaminant concentration, unless otherwise approved by the department. More than one compliance point of exposure must be established due to uncertainties within the environment such as spatial and temporal variabilities in groundwater flow and contaminant occurrence, unless the department approves otherwise.

b. Target levels. The point of exposure target level for drinking water wells is the statewide standard applicable to groundwater ingestion or an alternative site-specific target level approved under 105.206(10) or 105.206(11). The point of exposure target level for non-drinking water wells is the statewide standard applicable to nonprotected groundwater or an alternative site-specific target level

approved under 105.206(10) or 105.206(11). The point of exposure target level for nonused groundwater meeting the conditions in 105.206(5) is the statewide standard for a nonprotected groundwater source.

c. Nonprotected groundwater sources. A nonprotected groundwater source that is affecting or likely to affect an existing drinking water well shall be required to meet the same site-specific standards, including point of exposure target level(s), as applied to a protected groundwater source.

d. Unless conditions can be demonstrated to be stable, predictive techniques in accordance with 105.209(4) must be used to determine the future effects of groundwater contamination on existing drinking and non-drinking water wells and to determine the area predicted to exceed the point of exposure target level(s) where wells could be installed. When using predictive techniques, determining the location(s) where the applicable point of exposure target level is expected to be exceeded may involve comparison of the appropriate numerical standard to the predicted contaminant concentration at a passive monitoring well at the groundwater point of exposure. Alternatively, predictive techniques using site-specific models pursuant to 105.209(4) "b" may involve simulation of pumping at a well located at the point of exposure, in which case the pumping rate used in the simulation shall be the rate that is reasonably possible for the area that yields water with the highest contaminant concentration. In absence of site-specific justification for doing otherwise, long-term pumping will be assumed to be at a rate of 100 gallons per day; the sustainable yield, if less than 100 gallons per day; or a reasonable, higher rate, if such a rate results in higher contaminant concentration.

e. Institutional controls. For a protected groundwater source or a nonprotected groundwater source as described in 105.206(3) "b," institutional controls must be shown to effectively prohibit the installation of wells for the period of time in which contaminant concentrations might otherwise be expected to result in an exceedance of the appropriate target levels. For a nonprotected groundwater not described in 105.206(3) "b," a less stringent standard of effectiveness as well as the type of future well installation to be restricted may be utilized for those areas of potential concern. Unless there is a history of usage of what might otherwise be considered nonprotected groundwater or there is uncertainty as to the uniformity in the hydraulic characteristics of the nonprotected groundwater source, notice to the authority responsible for permitting private wells under 567—Chapters 39 and 49 may be adequate, especially if combined with a municipal or county ordinance prohibiting installation of private wells based on the availability of a public water supply.

105.206(4) *Site-specific groundwater point of compliance.* A site-specific standard may be established for a site-specific groundwater point of compliance that is different from a compliance point of exposure. A site-specific groundwater point of compliance must be used in conjunction with all groundwater compliance points of exposure pursuant to 105.206(3) to provide an alternative monitoring location. Target levels for contaminants of concern at a site-specific groundwater point of compliance must be established using predictive techniques as specified in 105.209(4). A target level established for a groundwater point of compliance must ensure that the appropriate target level at the groundwater compliance points of exposure will be achieved. A groundwater point of compliance shall be located on the contaminant migration path from the contaminant source to the point of exposure to the maximum extent practicable.

105.206(5) *Nonused groundwater in a protected water source.*

a. Statewide standards for groundwater in a nonprotected groundwater source, pursuant to 105.205(4) "b," may be used as target levels for contaminants in an otherwise protected groundwater source when groundwater in the affected area is not used and is not likely to be used in the future in accordance with the following. It must be demonstrated to the satisfaction of the department that contaminants from the enrolled site do not currently, and likely will not in the future, have an impact on any existing water supply well. Any detection, or predicted detection above the practical quantification limit, of a chemical that can be attributed to a release from the enrolled site will be considered to constitute an impact. In addition, it must be demonstrated to the satisfaction of the department that the impacted or potentially impacted aquifer is not a locally significant water resource. Factors that will go into this determination may include but are not limited to:

1. Existence of a nonimpacted public water supply in the potentially affected area;
2. General availability of other water resources in the vicinity;

3. Plans for development of public water supplies in the vicinity;
 4. Potential for use of the impacted aquifer as a water supply (e.g., yield, natural water quality); and
 5. Identification of the aquifer(s) commonly used for water supply in the vicinity.
- b. A local ordinance prohibiting installation of private drinking water wells or notification to the local water utility and water permitting authority, or both, may constitute acceptable institutional controls for site-specific standards under this subrule.
- c. The target levels that may be used in accordance with this subrule are based solely on groundwater ingestion. Compliance with this site-specific standard will not guarantee that contaminants in groundwater may not cause unacceptable exposure via other pathways (e.g., groundwater to air in a confined space, groundwater to surface water, or groundwater to a water distribution line).

105.206(6) *Site-specific soil standards based on land use and soil depth.* Site-specific soil standards based on land use and soil depth in conjunction with institutional controls may be used. Predetermined site-specific soil exposures based on land use and soil depth are provided in the following paragraphs. Lists of resulting site-specific soil standards for individual contaminants for these land-use and soil-depth categories will be maintained by the department in a guidance document and made readily available to the public. Use of these site-specific soil standards must be supported by appropriate institutional controls. Site-specific soil standards based on land use and soil depth, as described herein, address ingestion of and dermal contact with soil. Compliance with these standards will not guarantee that contaminants in soils may not cause unacceptable exposure via other pathways (e.g., ecological exposure, soil to groundwater, subsurface movement of vapors from soil to indoor air). In addition, the risk factors that form the bases for site-specific soil standards for individual contaminants, with the exception of some Group C chemicals, are the same as acceptable cumulative risk factors allowed for exposure to multiple contaminants in the same medium and multiple media. Therefore, compliance with site-specific soil standards for individual contaminants may not result in compliance with cumulative risk requirements pursuant to 567—105.210(455H).

a. *Deep soil in a residential land-use area.* Site-specific soil standards for deep soils equaling ten times the statewide standard for soils, except for lead, may be used. The site-specific standard for lead in deep soil in a residential land-use area shall be calculated using the EPA's Exposure Model for Assessing Risk Associated with Adult Exposures to Lead in Soil (U.S. EPA, 1996). Soils at a depth of ten feet and greater will normally be classified as deep soils. The department may deny the use of a deep soil standard associated with a residential land use or require a modification to the standard due to site-specific considerations including topography, development potential, and actual development plans. The use of a site-specific standard for deep soil in a residential land-use area shall be supported by an institutional control that permanently records the existence of contaminants above statewide standards in deep soils and restricts excavation resulting in deep soils being placed on the surface.

b. *Nonresidential land use.* The nonresidential land-use designation will be applicable to areas that are not classified as residential. Site-specific soil standards, except for lead, for nonresidential areas may be based on Formula I using the risk and exposure factors shown in Table III. A value of 1,100 mg/kg may be used as a site-specific soil standard for lead in soils less than 2 feet deep in a nonresidential land-use area. In lieu of this default site-specific lead standard, a site-specific standard for lead in soil less than 2 feet deep may be calculated using the EPA's Exposure Model for Assessing Risk Associated with Adult Exposures to Lead in Soil (U.S. EPA, 1996). The site-specific standard for lead in soils greater than 2 feet deep in a nonresidential land-use area shall be calculated using the EPA's Exposure Model for Assessing Risk Associated with Adult Exposures to Lead in Soil (U.S. EPA, 1996). The use of a nonresidential land-use classification must be supported by an environmental protection easement that prevents a change in land use to residential.

Table III
Input Variables for Site-Specific Soil Standards for Individual
Contaminants for Nonresidential Area Land-Use Designation

Parameter	Units	Cancer Group	Soil Depth (ft.)	
			≤2	≥2
TR	unitless	A, B	1×10^{-4}	1×10^{-4}

Parameter	Units	Cancer Group	Soil Depth (ft.)	
			≤ 2	≥ 2
SF (oral)	$[(\text{mg/kg/day})^{-1}]$	A, B, C*	Chem.-spec.	Chem.-spec.
SF (dermal)	$[(\text{mg/kg/day})^{-1}]$	A, B, C*	Chem.-spec.	Chem.-spec.
THQ	unitless	C*	0.1/1	0.1/1
		D, E	1	1
RfD (oral)	(mg/kg)/day	C, D, E	Chem.-spec.	Chem.-spec.
RfD (dermal)	(mg/kg)/day	C, D, E	Chem.-spec.	Chem.-spec.
AT	years	A, B	70	70
		C, D, E	1	1
Abs (oral)	unitless	A - E	1	1
Abs (dermal)	unitless	A - E	Chem.-spec.	Chem.-spec.
ER _c	mg/day	A - E	0	0
EF _c	days/yr	A - E	0	0
ED _c	years	A - E	0	0
BW _c	kg	A - E	15	15
ER _a (oral)	mg/day	A, B	100	330
		C, D, E	330	330
ER _a (dermal)	mg/day	A, B	660**	990**
		C, D, E	660**	990**
EF _a	days/yr	A, B	225	200
		C, D, E	200	200
ED _a	years	A, B	25	1
		C, D, E	1	1
BW _a	kg	A - E	70	70
CF	kg/mg	A - E	10 ⁻⁶	10 ⁻⁶

NOTE: Oral and dermal factors are the same unless otherwise noted.

*The risk-based concentration using Formula I for Cancer Group C chemicals that have an SF value established per 105.205(3) "c" will be the larger of a value based on the risk factor for protection from noncancer health risks with a THQ = 0.1 or the risk factor for protection from cancer health risks. Risk-based concentrations using Formula I for Cancer Group C chemicals that do not have an SF value established per 105.205(3) "c" will be a value based on the risk factor for protection from noncancer health risks with a THQ = 1.

**Dermal exposure rate is based on 3,300 cm² of exposed skin on an adult with 0.2 mg/cm² of shallow soil adhering to the skin and 0.3 mg/cm² of deep soil adhering to the skin per each dermal exposure event. A dermal exposure event is assumed to be one event per day of exposure.

105.206(7) *Site-specific cumulative risk for residential exposures to soil.* A cumulative risk standard may be used as a site-specific standard for soil in lieu of statewide standards that are provided in 105.205(5) for individual chemicals and soil. Cumulative risk will be determined using the toxicity values and exposure factors (i.e., the input variables less TR and THQ) from Table II in 105.205(5). Criteria for compliance with the cumulative risk standard are specified in 105.210(7). No institutional control will be required with the use of this site-specific standard.

105.206(8) *Site-specific surface water standards.* The department will establish site-specific surface water standards at the request of the participant. The participant shall provide the department with information necessary to make this determination upon request from the department. Site-specific surface water standards will be generally equivalent to effluent limitations under a National Pollutant Discharge Elimination System (NPDES) permit pursuant to 567—Chapter 62. Mixing zones and allocation of contaminant loads in a surface water body will be considerations in attainment of in-stream water quality standards. If the site-specific surface water quality standards are met, best practical control technology currently available will not be imposed.

105.206(9) *Site-specific air standards.* If there are air quality concerns at a site, they will be addressed with site-specific standards until such time as ambient air quality or source-specific standards are adopted for hazardous air pollutants, unless an alternative method is approved by the department.

a. *Explosivity.* In no case shall contaminants from the enrolled site cause an explosivity level in a confined space of greater than 10 percent of the lower explosivity limit.

b. *Background.* In addition to the establishment of a background standard pursuant to 567—105.204(455H), a site-specific air standard may be set at twice the typical background level based on published information for a comparable setting, if approved by the department.

c. *Health risk.* Site-specific standards for air in a confined space shall be risk-based using the chemical-specific toxicity values of inhalation unit risk (UR) and inhalation reference concentration (RfC) determined in accordance with 105.205(3)“c.” Formulas II and III shall be used to calculate risk-based, site-specific air standards based on carcinogenic and noncarcinogenic effects, respectively, where C is the risk-based contaminant concentration in air. If a value for both RfC and UR exists for a compound, the risk-based site-specific standard will be the smaller of C resulting from Formulas II and III.

(Formula II)

$$C = AF \times TR \div UR$$

(Formula III)

$$C = AF \times RfC$$

The UR and RfC toxicity values are based on a continuous exposure of 20 cubic meters per day by a 70 kg adult. The adjustment factor (AF) in Formulas II and III may be used to adjust for site-specific exposure conditions. A target cancer risk (TR) of 10^{-4} shall be used unless another value is approved by the department.

d. *Institutional or technological controls.* Institutional or technological controls may be used to prevent future exposure to contaminants in air in confined spaces and will be required to prevent residential use of the affected area when a nonresidential air standard is used.

105.206(10) *Site-specific standards based on site-specific factors.* Numerical site-specific standards (i.e., target levels) for groundwater or soil may be established using site-specific exposure factors in Formula I. Site-specific pumping rates greater than specified in 105.206(3)“d” herein may be used when approved by the department. Site-specific exposure factors must be approved by the department. For the department to approve any such site-specific factor there must be well documented rationale for doing so and appropriate institutional or technological controls must be provided.

105.206(11) *Site-specific standards or approaches not anticipated by this rule.* Nothing in this rule precludes the use of site-specific standards derived in some way not anticipated by this rule, provided that the rationale is adequately presented and the approach is both approved by the department and provides a level of protection comparable to standards set forth under this rule.

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