

CSWAB

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May 25, 2012

SENT BY ELECTRONIC MAIL

RE: CSWAB Comments on WDNR Draft Chapter NR 720 – SOIL CLEANUP STANDARDS

Dear Mr. Gordon,

Thank you for the opportunity to comment on the proposed revision to those rules relating to the investigation and cleanup of contaminated properties.

CSWAB was organized in 1990 by neighbors of Badger Army Ammunition Plant when high levels of cancer-causing chemicals were discovered in nearby private drinking water wells. Our goal is to ensure a healthy sustainable future by reducing risks to human health and natural systems, strengthening community-based work for environmental justice, and creating opportunities for the public to have a voice in the debate around the protection of human health and the environment.

Summary:

CSWAB supports many of the additions and clarifications in the proposed revisions to NR 720, particularly new language requiring the assessment of human health risks posed by vapor intrusion of volatile soil contaminants into homes and buildings. However, there are several specific areas within the proposed rule which we believe may not be sufficiently protective of children and expectant mothers for certain routes of exposure such as dermal absorption. Additionally, the definition of risks associated with mixtures is limited to *additive* risks and does not require consideration of synergistic effects or carcinogenic potentiation associated with mixtures such as technical grade DNT (dinitrotoluene). Given the significant potential for uncertainty, contaminant mixtures warrant an *extra* level of protection rather than a compromise in excess cancer risk. This is especially critical in the calculation of risks associated with prenatal exposure to pesticides and endocrine disruptors. For this reason, we strongly recommend that cumulative excess cancer risk for exposure to mixtures be at least or more protective than for individual contaminants or 1×10^{-7} .

Comments:

Please note that CSWAB's recommended changes, additions and comments are in **blue font**. Black text is the WDNR's draft language.

NR 720.01 Purpose. The purpose of this chapter is to establish soil cleanup standards, for the remediation of soil contamination, which result in restoration of the environment and soil productivity to the extent practicable, minimize harmful effects to the air, lands and waters of the state and are protective of public health, safety and welfare, and the environment.

Comment: The phrase “and soil productivity” should be added to the stated purpose of this chapter to encourage the successful and sustainable future use of land including for agriculture.

NR 720.02 Applicability.

Comment: We recommend adding section (e) or a ‘Note’ clarifying that the release of hazardous substances such as pesticides, lead, PCBs, and other environmental toxins to soils and matrixes containing these contaminants (such as dried applied lead-based or PCB-contaminated paint associated with building and/or infrastructure demolition) constitutes an environmental release subject to regulation under this chapter. At the Badger Army Ammunition Plant, the responsible party has argued that such circumstances do not constitute an environmental release.

NR 720.03 Definitions.

(g) Degradation by-products of the hazardous substance.

For the purpose of clarity, “degradation by-products” should be better defined here or listed as a separate entry in this section. The definition should be inclusive of all pathways including contaminants transformed by biological activity (biotransformation), physical means, chemical means, etc. Biotransformation of the explosive dinitrotoluene (DNT) – a common contaminant of concern at Badger Army Ammunition Plant – produces reduction products, metabolites, and degradation products, for example.

~~(3m)~~ “Dermal absorption” means systemic toxicity via skin absorption. However, because dermal toxicity factors are mostly absent, oral-to-dermal extrapolation is done by adjusting for absorption efficiency to represent the toxicity factor in terms of a dermally-absorbed dose.

Comment: We recommend striking the second sentence altogether as irreparable.

As written, the language could result in the underestimation of risk especially to children. When there is no direct information for a specific chemical, the appropriate conservative presumption that is utilized by EPA, and should be applied here, is that contaminants should be presumed to be 10 times more toxic in order to be protective of children. This approach has been most notably applied in the assessment of risk associated with exposure to pesticides. In the case of endocrine-disrupting contaminants, the risk factor associated with chronic low level exposures may rise by 100 fold.

Moreover, risks associated with dermal absorption for virtually all chemical groups are consistently HIGHER than ingestion. If toxicity factors are unavailable, the rule should err on the part of the conservative and the presumption should be that there is MORE rather than LESS absorption. This is particularly true in the case of dioxins where there is nearly 100% absorption for certain forms of dioxin across the gut.

(8m) “Inhalation of vapors” means inhalation by humans of soil contaminants that volatilized into outdoor and indoor air.

Comment: The definition of “inhalation of vapor” should be expanded to include indoor air; this recommendation is consistent with new EPA guidance, specifically soil vapor intrusion.

(15) (Proposed addition.)

Comment: We recommend adding a definition for the term “remedy” as follows: **(15)** “Remedy” is an action which results in restoration of the environment and soil productivity to the extent practicable, minimizes harmful effects to the air, lands and waters of the state and is protective of public health, safety and welfare, and the environment.

This addition is based on our experiences with Badger Army Ammunition Plant. The responsible party has asked that the installation of a municipal water system be treated by state regulators as a “remedy” for groundwater contamination in and near the facility.

NR 720.05 General.

(3) If all soil contaminant concentrations meet applicable soil cleanup standards after a remedial action is completed, the department may not require further remedial action for soils, unless the department determines that the residual soil contamination:

- (a) Presents a threat to public health, safety or welfare or the environment at the site or facility;
- (b) Will cause a violation of a groundwater quality standard [or Drinking Water Health Advisory Level](#) contained in ch. NR 140;
- (c) Will cause a violation of a surface water quality standard contained in chs. NR 102 to 106; or
- (d) Will cause a violation of an air quality standard contained in chs. NR 400 to 499.

Comment: We strongly recommend the addition of Drinking Water Health Advisory Levels (HALs) as consistent with WDNR Manual Code 4822.1 and other guidance documents which allow the agency to utilize HALs as remedial goals. This addition is especially important at military sites where contaminants may be unique to Department of Defense industry and not commonly detected in the State’s water resources. This clarification affords the department with the authority to require remediation of soil contaminants that pose a risk to nearby residential drinking water wells and public health, and therefore is in the best interest of the State.

Note: For a single contaminant, numeric land use specific residual contaminant levels are determined separately for each exposure or migration pathway of concern at a site where a toxicity value is available. These residual contaminant levels are not the soil cleanup standard for the site. The risks from each exposure shall be additive, such that the soil cleanup standard for the site is determined by selecting the lowest concentration from among from the individual combined-exposure residual contaminant levels determined for each pathway for the contaminant. This combined-exposure level may have to be decreased when other contaminants of concern are present at the site.

Comment: The NR 720.05 (3) note is viewed as irreparable so we strongly recommend deleting the entire note, for the following reasons:

As in a previous section, the language could result in the underestimation of risk especially to children. When there is no direct information for a specific chemical, the appropriate conservative presumption that is utilized by EPA, and should be applied here, is that contaminants should be presumed to be 10 times more toxic in order to be protective of children. This approach has been most notably applied in the calculation of risk associated with exposure to pesticides and endocrine disruptors. In the case of endocrine-disrupting contaminants, the risk factor associated with chronic low level exposures, especially during pregnancy, may rise by 100 fold.

Moreover, the draft language specifies that risks cannot be anything other than additive. The draft stipulates that multiple exposures “shall” be additive however risks associated with mixtures may be synergistic or result in carcinogenic potentiation. These factors would be expected to result in a higher calculated and actual risk to human health (compared to additive risks). In other words, a numerical risk of 1 plus 1 may actually equal 4 or 8, rather than 2.

Additionally, the proposed language in the last sentence also allows for combined-exposure levels to be decreased but not increased.

2. A performance standard determined in accordance with s. NR 720.08.

(c) In addition to meeting the requirements of par. (b), a soil cleanup standard developed under this chapter shall comply with the following requirements:

1. Residual soil contamination at the site or facility shall not adversely affect surface water;
2. Residual soil contamination at the site or facility shall not adversely affect a sensitive environment or biological receptors; and
3. Residual soil contamination at the site or facility shall not concentrate through plant uptake and adversely affect the food chain.
4. Residual soil contamination at the site or facility shall not result in vapor concentrations reaching a substance’s lower explosive exposure limit.

Comment: In order to be consistent with other sections of NR 720, reference to biological receptors is recommended, specifically risks to terrestrial ecosystems and wildlife.

Item 4. Explosive? Should this be exposure?

General comment: Land use classifications need additional clarification. At Badger Army Ammunition Plant, responsible parties have argued that very large parcels of land should be remediated to “industrial” standards when, in fact, the majority of actual land use activity is and will be as wildlife habitat. As a result, soil remedial goals may not be protective of biological receptors including grassland birds and the human food chain through consumption of wildlife that may live and graze on these lands.

(2) COMPLIANCE WITH SOIL CLEANUP STANDARDS.

(b) If a soil contaminant concentration in a sample exceeds the soil cleanup standard at or above the limit of quantitation for that soil contaminant, the soil cleanup standard shall be considered to have been exceeded.

Note: When evaluating the direct contact pathway, it may be possible to average measured soil sample concentrations to determine whether the calculated residual contaminant level has been exceeded or not. If averaging of soil concentrations is being considered, the department recommends seeking DNR approval of the proposed sampling plan and analysis methodology as soon as possible, but prior to submitting a case closure request in order to avoid delays and other potential problems.

Note: Averaging soil concentrations should not be used as the sole method for addressing sites with areas of significant soil contamination. Soil averaging should be not be used to avoid remediation of “hot spots” which are readily accessible or easily remediated.

Comment: We recommend adding the following sentence to the second note: “Soil averaging should be not be used to avoid remediation of “hot spots” which are readily accessible or simply remediated.” Again, this is based on our experiences at Badger where small distinct areas of surface soil contamination,

i.e. “hot spots”, could have been easily remediated when cleanup equipment was mobilized nearby but the responsible party balked at the minor extra effort.

NR 720.09 Procedures for determining residual contaminant levels based on protection of groundwater.

General Comment: In this or another appropriate section, NR 720 should be amended to include language which encourages a soil remedy which will achieve compliance with groundwater standards, public welfare standards, and HALs *within a reasonable timeframe*. In talking with experienced regulators at WDNR, some closed sites may not achieve compliance with the ES for more than 100 years!

We suggest adding a note which says: “Whenever possible, soil remedial actions should be designed to achieve compliance with groundwater standards, public welfare standards, and drinking water health advisory levels in a reasonable time frame, preferably less than 5 years.”

(1) GENERAL. Residual contaminant levels for soil based on protection of groundwater shall be developed using the enforcement standards (ESs) established in ch. NR 140 or using procedures consistent with the methodology in ss. 160.13 and 160.15, Stats., and the criteria in s. NR 722.09 (2) (b) 2. when there is no enforcement standard as the target concentrations in groundwater.

Note: In developing a residual contaminant level, any relevant information shall be considered, including public welfare concerns for groundwater, such as taste and odor [and Drinking Water Health Advisory Levels](#).

Comment: We recommend adding Drinking Water Health Advisory Levels to the end of the Note.

NR 720.11 Procedures for determining residual contaminant levels based on protection of human health from direct con-tact with contaminated soil.

(2) LAND USE CLASSIFICATION. (a) Responsible parties shall identify the current [or anticipated](#) land use and zoning by the time the remedial action is selected, unless otherwise directed by the department.

Comment: We recommend adding “or anticipated” land use. In the case of land parcels at Badger Army Ammunition Plant that are being prepared for transfer to the WDNR and others, the current land use is as an industrial facility however the anticipated land use includes conservation, grazing, hunting, agriculture, and recreation. The proposed language could prohibit the Department from requiring a level of cleanup that is protective of anticipated future uses.

The recommended addition is especially important for federal lands which are *exempted* from local planning and zoning.

(b) Responsible parties shall classify the land use of a site or facility as non-industrial unless all of the following criteria are met:

2. More stringent residual contaminant levels for soil are not necessary to protect public health [and biological receptors](#) on or off the site or facility.

Comment: In order to be consistent with other sections, a reference to biological receptors (terrestrial ecosystems) is important. We recommend adding the phrase “and biological receptors”.

(3) GENERAL REQUIREMENTS. Residual contaminant levels for soil based on protection of human health from direct contact shall be developed using the following criteria:

(a) For individual compounds using an excess cancer risk of 1×10^{-6} and a hazard quotient for non-carcinogens of one; and

(b) The cumulative excess cancer risk will not exceed ~~1×10^{-5}~~ 1×10^{-7} and the hazard index for non-carcinogens will not exceed one for the site or facility.

Comment:

Given the significant potential for uncertainty and the considerable potential for synergistic and carcinogenic potentiation, contaminant mixtures warrant an EXTRA level of protection, not a compromise in excess cancer risk. For this reason, we recommend that cumulative excess cancer risk for exposure to mixtures be at least or more protective than for individual compounds, or 1×10^{-7} .

As the vast majority of contaminated sites throughout the State have multiple contaminants, the draft language for mixtures is a significant short-coming in the proposed rule. As proposed, it appears that a site with a large number of chemicals could pose a greater risk to human health than a simple site with only one contaminant. As cited earlier in our comments, this approach does not allow for known synergistic and other non-additive risks associated with exposure to mixtures.

As is noted in the proposed rule, there is limited toxicological information on the potential human health risks and implications associated with mixtures however, in cases where there is no direct information for a specific mixture, the appropriate conservative presumption that is utilized by EPA, and should be applied here, is that mixtures should be presumed to be 10 times *more* toxic in order to be protective of children and infants. In the case of endocrine-disrupting contaminants, the risk factor may rise by 100 fold for chronic low level exposures, especially during pregnancy. This precautionary approach has been most notably applied by EPA in the assessment of risks associated with exposure to pesticides.¹ State environmental regulations are required to be as protective as federal rules and policies.

Children are at a greater risk for some pesticides for a number of reasons. Children's internal organs are still developing and maturing and their enzymatic, metabolic, and immune systems may provide less natural protection than those of an adult. There are "critical periods" in human development when exposure to a toxin can permanently alter the way an individual's biological system operates.²

This recommended additional protection is further warranted as certain Wisconsin communities and neighborhoods are already at greater health risk due to factors beyond regulatory control such as poverty.

(c) Risks for carcinogens and for non-carcinogens are presumed to be additive within each category, unless there is specific information that demonstrates that an alternative approach is more appropriate.

Comment: As stated in previous sections, consideration of only additive risks is limiting and therefore may not be protective of human health, especially children and expectant mothers. If any assumption is made it should be MORE, not less protective.

¹ U.S. Environmental Protection Agency, *Guidance for Conducting Health Risk Assessment of Chemical Mixtures, External Scientific Peer Review Draft, NCEA-C-0148*, April 1999.

² U.S. Environmental Protection Agency, Fact Sheet: Children Are at Greater Risks from Pesticide Exposure, January, 2002.

NR 720.13 Other pathways of concern. Responsible parties shall consider human food chain, surface water quality and terrestrial eco-system pathways of exposure, when those pathways of exposure are of concern at a site or facility.

Note: In some cases, the potential for contaminant migration or exposure to contamination through other pathways may be of concern at a site or facility. These situations could include contaminated soil in close proximity to a surface water where the potential for runoff from the site or facility to cause an impact on surface water quality exists or contaminated soil where potential for bioaccumulation [and uptake](#) through the food chain resulting in adverse impacts to human health or terrestrial ecosystems exists. This section requires responsible parties to establish appropriate residual contaminant levels protective of these pathways when necessary.

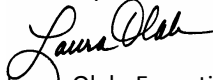
Comment: Recommend adding “and uptake” as certain contaminants may bioconcentrate or biomagnify but may not meet all criteria as bioaccumulative.

General Comment: Large sections of the proposed rule appear to be derived from the U.S. EPA exposure factors handbook of which there are 2 – one is specific for children. If this is the case, specific reference should be made to these handbooks in the rule to allow for updates and consistency with future EPA policy. The final rule should stipulate where and how and why these particular documents were chosen. Both specifics and reference to national guidance documents are recommended for clarity and consistency.

General Comment: The proposed rule should be amended to include references to Groundwater Preventative Action Limits (PALs) found in other rules such as NR 140 for consistency and to encourage early proactive responses to environmental releases BEFORE an exceedance of a groundwater ES occurs. Restoration of groundwater is very often an exceedingly expensive and technically difficult task to accomplish and as a result, the State’s groundwater resources are at increasing risk for long term impairment. The “caution light” approach afforded by the PAL allows regulators to work with responsible parties to reduce costs and future liabilities by encouraging early deliberate actions to prevent groundwater exceedances and subsequent enforcement action. The PALs are an important tool that serves both the responsible party and the State so reference in the text is recommended.

Thank you in advance for your consideration of our comments. Dr. Peter deFur of Environmental Stewardship Concepts provided technical support and guidance in the preparation of CSWAB’s formal comments.

Sincerely,



Laura Olah, Executive Director