

COMPARISON OF THE PROPOSED CLEANUP CRITERIA RULES WITH THE 2013 RULES

This document provides a summary of the changes in the August 2017 proposed rules as compared to the existing promulgated rules that were last updated in 2013. The proposed rules incorporate the following bulleted items (all items in this document) which contrast them from the 2013 promulgated rules. The first group of revisions was incorporated in the May 2016 rules package and remains in the August 2017 rules package.

- Comprehensive update of all **chemical-specific information** in accordance with the Criteria Stakeholders Advisory Group (CSA) recommended decision frameworks:
 - Chemical-physical parameters.
 - Toxicity values.
 - All related information is presented in separate chemical update worksheets for each hazardous substance to assure transparency of the selections.

- Comprehensive update of **generic exposure assumptions**:
 - Most were updated under MDEQ contract by SRC, Inc., using the CSA recommended decision framework which includes a data quality objective analysis. Extensive technical support documents written by SRC are separately available for all of the parameters.
 - Michigan-specific data were used where available and they represented the best available information:
 - ✓ Residential exposure frequency for the dermal component of the soil direct contact pathway.
 - ✓ Nonresidential exposure frequency for the dermal component of the soil direct contact pathway.
 - ✓ Soil type and soil temperature for the vapor intrusion pathway (for details see bullet for the vapor intrusion pathway).
 - ✓ Michigan-specific meteorological data were used to estimate the dispersion factors (Q/C) for the volatilization and particulate soil inhalation pathways.
 - The selected source of 5-year meteorological data for the proposed rules is Flint, MI based on data from 2010-2014.
 - The source of 5-year meteorological data for the 2013 rules is South Bend, IN based on data from 1987-1991.

- **Child plus adult is the generic residential receptor** for the drinking water and soil direct contact pathways
 - The child plus adult receptor is more protective of exposures to children than an adult only receptor.
 - For the Regional Screening Levels, the USEPA uses a child only residential receptor which has been adopted by the other Region V states.
 - The inhalation based pathways use toxicity values that do not require the differentiation of child vs adult exposure assumptions.
 - The 2013 Rules use of a child plus adult receptor was limited to the residential soil direct contact pathway.

- Addresses **mutagenic carcinogens**
 - Use of age-dependent adjustment factors (ADAFs) for 11 hazardous substances which have been identified by the USEPA as chemicals causing cancer via a mutagenic mode of action.
 - The ADAFs address the greater sensitivity of young children to the effects of mutagenic carcinogens.
 - The associated mutagenic equations are presented in the proposed rules.
 - Mutagenic carcinogens are not addressed in the 2013 rules.

- MDEQ process for addressing **developmental toxicants**
 - Developmental toxicants were addressed in the 2013 rules, 21 hazardous substances are identified as developmental toxicants (i.e., with the DD footnote).
 - The CSA recommended that the department develop a process to address developmental toxicants using existing rule provisions that allow the MDEQ to protect sensitive subpopulations from developmental and reproductive toxicants on a chemical specific basis.
 - ✓ The proposed developmental toxicity process is built upon the methodology used in the 2013 rules and is explained in detail in the separate Toxics Steering Group Developmental Report.
 - ✓ 61 hazardous substances are proposed as developmental toxicants (the DD footnote was removed from 5 and added to 45 hazardous substances).

- When **soil-type** inputs are utilized for a pathway, sand is used as the generic soil type.
 - Soil type can be modified to one of 12 United States Department of Agriculture (USDA) soil types using identified Department approved values.
 - ✓ No further approval of the inputs is required.
 - ✓ No modification of the generic soil type or generic input values is required even if the soil type is not sand.
 - ✓ The USDA is the only soil type classification that has all 11 generic input values identified for each of the 12 soil types that may be encountered in Michigan.
 - The 2013 Rules did not identify a generic soil type, and soil type inputs did not reflect current best available information.

- A **new tiered process for vapor intrusion** has been developed as recommended by the CSA.
 - The Soil and Groundwater Volatilization to Indoor Air Criteria (SVIIC or GVIIC) in the 2013 rules are replaced by the Volatilization to Indoor Air Screening Levels and Criteria in the proposed rules.
 - The proposed Volatilization to Indoor Air Screening Levels and Criteria protect for chronic exposures, in general, but also protect for acute toxicity for those volatile hazardous substances that have short-term health effects (9 substances).
 - The tiered approach will reduce the number of site-specific evaluations that require a Department review by providing “off-ramps” at each tier.
 - ✓ VI Tier 1:
 - Initial generic screening levels that a person may use as criteria.
 - Exceedances do not result in facility status.
 - The Department can’t use this Tier to require remedial action.
 - If exceeded, proceed through the tiered process.
 - Applicable to a wide range of sites.
 - Does not require Department approval to implement.

- ✓ VI Tier 2:
 - Incorporates facility-specific geologic and hydrogeological conditions (depth to groundwater, 12 USDA soil types, and soil temperature).
 - Compliance with VI Tier 2 criteria results in unrestricted residential closure.
 - Exceedances result in facility status.
 - If exceeded, may proceed to VI Tier 3A.
 - Does not require department approval to implement.
 - ✓ VI Tier 3A:
 - Incorporates land use and building-specific information (e.g., building size, air exchange rate, type of foundation, etc.) for generic criteria.
 - Identifies the need for response activity or a site-specific evaluation completed in VI Tier 3B.
 - Compliance may only require a land and or resource use restriction.
 - Does not require department approval to implement.
 - ✓ VI Tier 3B:
 - Site-specific alternative approach.
 - Requires Department approval to implement.
 - Exceedances require response activity.
 - Compliance generally requires restrictions.
- For greater transparency, all **equations are presented** in the proposed rules.
 - The Csat equation is now presented in Rule 18.
 - The Soil Water Partitioning Value equation is now presented in Rule 22.
 - The emission due to wind equation, which is a component of the particulate soil inhalation pathway, is now presented in Rule 26.
 - Some **text** within the existing rules was **reorganized** to consolidate similar or related information. Some examples are:
 - Proposed Rule 4(6) regarding obligations for exceedance of Csat was moved from Rule 6(2).
 - Proposed Rule 4(7) regarding obligations for exceedance of flammability and explosivity screening level was moved from Rule 6(1).
 - Proposed Rule 6(4) regarding state drinking water standards was moved from Rule 10(3).
 - The **reference sources** for all chemical-specific data (chemical-physical and toxicity) are identified in the proposed Rule 50 tables to increase transparency.
 - Proposed rules have three tables of chemical-specific information
 - ✓ Table 1: Toxicological data with references
 - ✓ Table 2: Chemical-specific data with references
 - ✓ Table 3: Chemical-physical data with references
 - The reference sources are also identified in the separate chemical update worksheets
 - The **bases for all criteria** are noted in the cleanup criteria tables (i.e., the toxicological bases are noncancer (nc); cancer (can), mutagenic carcinogen (mut), and developmental (dev)).
 - Non-toxicological bases for the criteria, such as solubility (sol), are also noted

Revisions incorporated from comments and stakeholder discussions on the May 2016 rules package:

- **Nonresidential exposure time** for the inhalation-based criteria is 12 hours per day in the proposed rules; the 2013 rules do not identify a work day exposure time.
- The **finite volatile soil inhalation criteria equations** were modified resulting in a revision to the criteria for 2 and 5 meter sources.
- The **volatilization to indoor air assumptions regarding shallow groundwater** were modified resulting in revisions to the screening levels.
- Criteria that are based on **state drinking water standards and national secondary drinking water regulation aesthetic values** were revised to match the same number of significant digits as the promulgated values in the respective drinking water programs.
- **Toxicity values** that previously relied upon draft values were further reviewed and values and/or sources were replaced such that no draft toxicity values are proposed.
- **Developmental toxicants** were reviewed and formaldehyde was deleted from this classification.

Revisions incorporated from comments and stakeholders discussions on the October 2016 rules package:

- The criteria for **vinyl chloride** have been revised based on the USEPA Regional Screening Level vinyl chloride-specific equations, resulting in revisions to the vinyl chloride criteria.
- The **nonresidential lead direct contact criterion** has been revised using the USEPA updates for the adult lead model inputs.
- The **lead drinking water criteria** may be adjusted on a site-specific basis based on the relationship to on-site soil concentrations.
- The emissions due to **vehicle traffic** component was removed from the particulate soil inhalation pathway, this results in higher (i.e., less restrictive) PSIC values.
 - The 2013 rules assume that roadways on contaminated property are unpaved.
 - The proposed rules assume all roadways are paved.
 - ✓ If roadways are not paved, site-specific criteria will have to be developed.
- The **GSI criteria** and soil criteria protective of GSI are not promulgated values under these rules and have been removed from the criteria tables in the proposed rules along with the associated language.
 - The Water Quality Standards are the GSI criteria pursuant to the statute (Section 20120e).
 - GSI criteria will be included in an on-line version of the criteria tables as a customer service.

- **Target detection limit (TDL)** values are not promulgated values under these rules and have been removed from the proposed criteria tables.
 - The TDLs are published and revised by the department pursuant to the statute [Section 20101(1)(bbb)]
 - The 2013 rules identify the TDL value where the health-based value is less than the TDL.
 - The proposed rules/criteria tables report the health-based values even when they are lower than the respective TDLs; the TDLs are no longer presented in the criteria tables; however, the (M) footnote remains after the health-based value.
 - The TDLs will be provided with an on-line version of the criteria tables as a customer service.
- Health-based drinking water values have been replaced in the proposed criteria tables with the associated **aesthetic values** where there is an inconsistency with the statute.
 - The following hazardous substances were affected:

Hazardous Substance	Lowest Health-based Value (ppb)	Aesthetic Value (ppb)
Copper	30	1,000
Ethylbenzene	66	74
Fluorine	1,200	2,000
Silver	5.5	100
Toluene	470	790
1,2,3-Trimethylbenzene	60	130
1,2,4-Trimethylbenzene	60	63
1,3,5-Trimethylbenzene	60	72
Zinc	1,800	5,000

- All criteria based on **state drinking water standards** and national secondary drinking water regulations are presented in units of ppm (mg/L) rather than ppb. All other groundwater criteria are presented in units of ppb ($\mu\text{g/L}$). Soil criteria are presented in units of ppb ($\mu\text{g/kg}$).
- Revisions were made to clarify that **surface water sediment criteria** may be nonnumeric site-specific criteria.
- Revisions were made to clarify the use of **USDA soil types** and the resulting facility-specific inputs.
- Revisions were made to address **VIAP concerns**:
 - The **volatile definition** was revised to use USEPA's definition of volatile hazardous substances.
 - The **nonresidential air exchange rates** were further reviewed and modified.
 - **Petroleum vertical separation distances** are now specifically included.