



## Errata for the Stage 10 (Omnibus) Amendment to the Contaminated Sites Regulation

### Purpose

The Stage 10 (Omnibus) amendment to the Contaminated Sites Regulation (CSR) updated over 8,500 environmental quality standards. Although every effort was made to ensure that the amended standards were accurate and correct, invariably some typographical, transcription and other errors are inevitable in such a large revision.

This erratum lists currently known errors in the Stage 10 amendment. The errata will be updated and reissued throughout the year of transition as new errors are identified. All errors identified during the year of transition will be corrected in a final “house-keeping” amendment to be made to the regulations immediately prior to the new standards coming into force on November 1, 2017.

Should you identify additional errors, or suspected errors, in addition to those contained in this erratum please notify the Environmental Emergencies and Land Remediation Branch at [site@gov.bc.ca](mailto:site@gov.bc.ca).

### Details of Notice

#### I. Errors related to the Stage 10 (Omnibus) amendment to the CSR

##### CSR Schedule 3.1 Part 1 - Matrix Numerical Soil Standards

1. The CSR matrix for chromium contains transcription errors for the Agricultural land use: Livestock ingesting soil and fodder and Major microbial functional impairment soil standards. A corrected matrix for chromium is provided in Appendix 1.
2. The CSR matrix for lead contains a number of errors related to Provincial 95<sup>th</sup> percentile background soil adjustment of the toxicologically derived matrix soil quality standards for lead. A corrected matrix for lead is provided in Appendix 2.

## CSR Schedule 3.1 Part 2 – Generic Numerical Soil Standards to Protect Human Health

1. CSR Schedule 3.1 Part 2 contains a number of errors related to Provincial 95<sup>th</sup> percentile background soil adjustment of the toxicologically derived soil quality standards for the following substances: aluminium, iron, sulfur and zirconium. A corrected Schedule 3.1 Part 2 for the substances in provided in Appendix 3.

## CSR Schedule 3.1 Part 3 – Generic Numerical Soil Standards to Protect Ecological Health

1. CSR Schedule 3.1 Part 3 contains an error related to Provincial 95<sup>th</sup> percentile background soil adjustment of the toxicologically derived Agricultural land use soil quality standard for sulfur (500 µg/g). The correct Agricultural land use soil quality standard for sulfur is **2 000** µg/g.

## II. Errors related to the consequential amendment to the Organic Matter Recycling Regulation (OMRR)

### OMRR Schedule 10.1 – Soil Substance Concentrations

1. OMRR Table 3 for chromium contains transcription errors for the Agricultural land use: Livestock ingesting soil and fodder and Major microbial functional impairment soil standards. A corrected table for chromium is provided in Appendix 4.
2. OMRR Table 6 for lead contains a number of errors related to Provincial 95<sup>th</sup> percentile background soil adjustment of the toxicologically derived matrix soil quality standards. A corrected table for lead is provided in Appendix 5.

## References

1. [CSR Stage 10 Amendment Update](#)

## Revision History

Oct 27, 2016	AB 4 : Stage 10 (Omnibus) Errata Version 1 - Issued

*For more information, contact the Environmental Emergencies and Land Remediation Branch at [site@gov.bc.ca](mailto:site@gov.bc.ca).*

**Appendix 1.**

**Corrected CSR Schedule 3.1 Part 1**

**Matrix 9 - Numerical Soil Standards for Chromium**

NB. Corrected values appear in **red** text

**MATRIX 9 - NUMERICAL SOIL STANDARDS<sup>1,2</sup>**  
**CHROMIUM (CHEMICAL ABSTRACT SERVICE NUMBER 7440-47-3)**

COLUMN I	COLUMN II	COLUMN III	COLUMN IV	COLUMN V	COLUMN VI	COLUMN VII	COLUMN VIII	COLUMN IX	Note
Site-specific Factor	Wildlands Natural (WL <sub>N</sub> )	Wildlands Reverted (WL <sub>R</sub> )	Agricultural (AL)	Urban Park (PL)	Residential Low Density (RL <sub>LD</sub> )	Residential High Density (RL <sub>HD</sub> )	Commercial (CL)	Industrial (IL)	3
<b>HUMAN HEALTH PROTECTION</b>									
Intake of contaminated soil	250	250	100	250	100	250	750	20 000	4,5
Groundwater used for drinking water	60 > 1 000 mg/g	60 > 1 000 mg/g	60 > 1 000 mg/g	60 > 1 000 mg/g	60 > 1 000 mg/g	60 > 1 000 mg/g	60 > 1 000 mg/g	60 > 1 000 mg/g	6,7 8
<b>ENVIRONMENTAL PROTECTION</b>									
Toxicity to soil invertebrates and plants	100	200	200	200	200	250	250	250	5
Livestock ingesting soil and fodder			150 <del>50</del> 60						6 8
Major microbial functional impairment			<del>50</del> 60						9
Groundwater flow to surface water used by aquatic life									
Freshwater	60 300 000	60 300 000	60 300 000	60 300 000	60 300 000	60 300 000	60 300 000	60 300 000	6,7 8
Marine	60 > 1 000 mg/g	60 > 1 000 mg/g	60 > 1 000m g/g	60 > 1 000 mg/g	60 > 1 000 mg/g	60 > 1 000 mg/g	60 > 1 000 mg/g	60 > 1 000 mg/g	6,7 8
Groundwater used for livestock watering			60 150 000						6,7 8
Groundwater used for irrigation			60 15 000	60 15 000	60 15 000	60 15 000			6,7 8

**Notes**

1. All values in µg/g unless otherwise stated. Substances must be analyzed using methods specified in: the 2015 British Columbia Environmental Laboratory Manual, as updated from time to time, a director's protocol, or alternate methods acceptable to the director.
2. Analytical results for chromium (all species) in soil may be used to demonstrate compliance with the standards of this matrix. Where the standards cannot be met based on analytical results for chromium (all species), determination of chromium, trivalent and chromium, hexavalent concentrations in soil may be necessary.
3. The site-specific factors of human intake of contaminated soil and toxicity to soil invertebrates and plants specified in this matrix apply at all sites. The high density residential land use standards of this matrix assume the prohibition of the use of the land (a) to grow plants for human consumption, and (b) as a children's playground, sports field, picnic area or any other use that promotes frequent contact by children. Consult a director for further advice.
4. Intake pathway of exposure modelled is inadvertent ingestion of soil.
5. Standard is based on chromium (all species).
6. Standard is for chromium, hexavalent.
7. Standard has been adjusted based on 2016 reference Provincial background soil concentration for the substance.
8. Standard is for chromium, trivalent.
9. Standard is set equal to 1999 Canadian Council of Ministers of the Environment, "Nutrient and energy cycling check value".

## **Appendix 2.**

### **Corrected CSR Schedule 3.1 Part 1**

#### **Matrix 9 - Numerical Soil Standards for Lead**

NB. Corrected values appear in **red** text



pH 7.0 - < 7.5	45 000	45 000	45 000	45 000	45 000	45 000	45 000	45 000	4,7
pH ≥ 7.5	50 000	50 000	50 000	50 000	50 000	50 000	50 000	50 000	4,7
Marine									4,7
pH < 5.0									
pH 5.0 - < 5.5	<del>35</del>	<del>35</del>	<del>35</del>	<del>35</del>	<del>35</del>	<del>35</del>	<del>35</del>	<del>35</del>	
<b>pH &lt; 5.5</b>	<b>65</b>	<b>65</b>	<b>65</b>	<b>65</b>	<b>65</b>	<b>65</b>	<b>65</b>	<b>65</b>	4
pH 5.5 - < 6.0	<b>120</b>	<b>120</b>	<b>120</b>	<b>120</b>	<b>120</b>	<b>120</b>	<b>120</b>	<b>120</b>	4
pH 6.0 - < 6.5	300	300	300	300	300	300	300	300	<b>4,5</b>
pH 6.5 - < 7.0	1 500	1 500	1 500	1 500	1 500	1 500	1 500	1 500	4
pH ≥ 7.0	6 500	6 500	6 500	6 500	6 500	6 500	6 500	6 500	4
	15 000	15 000	15 000	15 000	15 000	15 000	15 000	15 000	4
Groundwater used for livestock watering									4
pH < 5.0			150						
pH 5.0 - < 5.5			350						4
pH 5.5 - < 6.0			1 500						4
pH 6.0 - < 6.5			8 000						4
pH 6.5 - < 7.0			35 000						4
pH 7.0 - < 7.5			75 000						4
pH ≥ 7.5			85 000						4
Groundwater used for irrigation									4
pH < 5.0			350	350	350	350	350	350	4
pH 5.0 - < 5.5			650	650	650	650	650	650	4
pH 5.5 - < 6.0			3 000	3 000	3 000	3 000	3 000	3 000	4
pH 6.0 - < 6.5			15 000	15 000	15 000	15 000	15 000	15 000	4
pH 6.5 - < 7.0			65 000	65 000	65 000	65 000	65 000	65 000	4
pH ≥ 7.0			150 000	150 000	150 000	150 000	150 000	150 000	4

#### Notes

1. All values in µg/g unless otherwise stated. Substances must be analyzed using methods specified in: the 2015 British Columbia Environmental Laboratory Manual, as updated from time to time, a director's protocol, or alternate methods acceptable to the director.
2. The site-specific factors of human intake of contaminated soil and toxicity to soil invertebrates and plants specified in this matrix apply at all sites. The high density residential land use standards of this matrix assume the prohibition of the use of the land (a) to grow plants for human consumption, and (b) as a children's playground, sports field, picnic area of any other use that promotes frequent contact by children. Consult a director for further advice.
3. Intake pathway of exposure modelled is inadvertent ingestion of soil. **Standards for: WL<sub>N</sub>, WL<sub>R</sub>, AL, PL, RL<sub>LD</sub> and RL<sub>HD</sub> have been adjusted based on 2016 reference Provincial background soil concentration for the substance.**
4. The pH is the pH of the soil at a site.
5. Standards have been adjusted based on 2016 reference Provincial background soil concentration for the substance.
6. Standard is set equal to 1999 Canadian Council of Ministers of the Environment, Nutrient and energy cycling check value.
7. Standard varies with receiving water hardness (H). H = 100 to < 200 mg/L as CaCO<sub>3</sub> is assumed. Consult director for further advice.



## **Appendix 3.**

### **Corrected CSR Schedule 3.1 Part 2**

#### **Generic Numerical Soil Standards to Protect Human Health**

NB. Corrected values appear in **red** text



## **Appendix 4.**

### **Corrected OMRR Schedule 10.2 – Soil Substance Concentrations**

#### **Table 3 - Numerical Soil Standards for Chromium**

NB. Corrected values appear in **red** text

**TABLE 3 – CHROMIUM (CAS # 7440-47-3)<sup>1,2</sup>**

COLUMN I	COLUMN II	COLUMN III	COLUMN IV	COLUMN V	COLUMN VI	COLUMN VII	COLUMN VIII	COLUMN IX	Note
Site-specific Factor	Wildlands Natural (WL <sub>N</sub> )	Wildlands Reverted (WL <sub>R</sub> )	Agricultural (AL)	Urban Park (PL)	Residential Low Density (RL <sub>LD</sub> )	Residential High Density (RL <sub>HD</sub> )	Commercial (CL)	Industrial (IL)	3
<b>HUMAN HEALTH PROTECTION</b>									
Intake of contaminated soil	250	250	100	250	100	250	750	20 000	4,5
Groundwater used for drinking water	60 > 1 000 mg/g	60 > 1 000 mg/g	60 > 1 000 mg/g	60 > 1 000 mg/g	60 > 1 000 mg/g	60 > 1 000 mg/g	60 > 1 000 mg/g	60 > 1 000 mg/g	6,7 8
<b>ENVIRONMENTAL PROTECTION</b>									
Toxicity to soil invertebrates and plants	100	200	200	200	200	250	250	250	5
Livestock ingesting soil and fodder			150 <del>50</del> 60						6 8
Major microbial functional impairment			<del>50</del> 60						9
Groundwater flow to surface water used by aquatic life									
Freshwater	60 300 000	60 300 000	60 300 000	60 300 000	60 300 000	60 300 000	60 300 000	60 300 000	6,7 8
Marine	60 > 1 000 mg/g	60 > 1 000 mg/g	60 > 1 000m g/g	60 > 1 000 mg/g	60 > 1 000 mg/g	60 > 1 000 mg/g	60 > 1 000 mg/g	60 > 1 000 mg/g	6,7 8
Groundwater used for livestock watering			60 150 000						6,7 8
Groundwater used for irrigation			60 15 000	60 15 000	60 15 000	60 15 000			6,7 8

**Notes**

1. All values in µg/g unless otherwise stated. Substances must be analyzed using methods specified in: the 2015 British Columbia Environmental Laboratory Manual, as updated from time to time, a director's protocol, or alternate methods acceptable to the director.
2. Analytical results for chromium (all species) in soil may be used to demonstrate compliance with the standards of this matrix. Where the standards cannot be met based on analytical results for chromium (all species), determination of chromium, trivalent and chromium, hexavalent concentrations in soil may be necessary.
3. The site-specific factors of human intake of contaminated soil and toxicity to soil invertebrates and plants specified in this matrix apply at all sites. The high density residential land use standards of this matrix assume the prohibition of the use of the land (a) to grow plants for human consumption, and (b) as a children's playground, sports field, picnic area or any other use that promotes frequent contact by children. Consult a director for further advice.
4. Intake pathway of exposure modelled is inadvertent ingestion of soil.
5. Standard is based on chromium (all species).
6. Standard is for chromium, hexavalent.
7. Standard has been adjusted based on 2016 reference Provincial background soil concentration for the substance.
8. Standard is for chromium, trivalent.
9. Standard is set equal to 1999 Canadian Council of Ministers of the Environment, "Nutrient and energy cycling check value".

**Appendix 5.**

**Corrected OMRR Schedule 10.2 - Soil Substance Concentrations**

**Table 6 - Numerical Soil Standards for Lead**

NB. Corrected values appear in **red** text



pH 7.0 - < 7.5	45 000	45 000	45 000	45 000	45 000	45 000	45 000	45 000	4,7
pH ≥ 7.5	50 000	50 000	50 000	50 000	50 000	50 000	50 000	50 000	4,7
Marine									
pH < 5.0	35	35	35	35	35	35	35	35	4
pH 5.0 - < 5.5	65	65	65	65	65	65	65	65	4
<b>pH &lt; 5.5</b>	<b>120</b>	<b>120</b>	<b>120</b>	<b>120</b>	<b>120</b>	<b>120</b>	<b>120</b>	<b>120</b>	<b>4,5</b>
pH 5.5 - < 6.0	300	300	300	300	300	300	300	300	4
pH 6.0 - < 6.5	1 500	1 500	1 500	1 500	1 500	1 500	1 500	1 500	4
pH 6.5 - < 7.0	6 500	6 500	6 500	6 500	6 500	6 500	6 500	6 500	4
pH ≥ 7.0	15 000	15 000	15 000	15 000	15 000	15 000	15 000	15 000	4
Groundwater used for livestock watering									
pH < 5.0			150						4
pH 5.0 - < 5.5			350						4
pH 5.5 - < 6.0			1 500						4
pH 6.0 - < 6.5			8 000						4
pH 6.5 - < 7.0			35 000						4
pH 7.0 - < 7.5			75 000						4
pH ≥ 7.5			85 000						4
Groundwater used for irrigation									
pH < 5.0			350	350	350	350			4
pH 5.0 - < 5.5			650	650	650	650			4
pH 5.5 - < 6.0			3 000	3 000	3 000	3 000			4
pH 6.0 - < 6.5			15 000	15 000	15 000	15 000			4
pH 6.5 - < 7.0			65 000	65 000	65 000	65 000			4
pH ≥ 7.0			150 000	150 000	150 000	150 000			4

#### Notes

- All values in µg/g unless otherwise stated. Substances must be analyzed using methods specified in the 2015 British Columbia Environmental Laboratory Manual, as updated from time to time, a director's protocol, or alternate methods acceptable to the director.
- The site-specific factors of human intake of contaminated soil and toxicity to soil invertebrates and plants specified in this table apply at all sites. The high density residential land use standards of this table assume the prohibition of the use of the land (a) to grow plants for human consumption, and (b) as a children's playground, sports field, picnic area of any other use that promotes frequent contact by children. Consult a director for further advice.
- Intake pathway of exposure modelled is inadvertent ingestion of soil. **Standards for:  $WL_N$ ,  $WL_R$ ,  $AL$ ,  $PL$ ,  $RL_{LD}$  and  $RL_{HD}$  have been adjusted based on 2016 reference Provincial background soil concentration for the substance.**
- The pH is the pH of the soil at a site.
- Standards have been adjusted based on 2016 reference Provincial background soil concentration for the substance.
- Standard is set equal to 1999 Canadian Council of Ministers of the Environment, "Nutrient and energy cycling check value".
- Standard varies with receiving water hardness (H).  $H = 100$  to  $< 200$  mg/L as  $CaCO_3$  is assumed. Consult director for further advice.