



Ministry of  
Environment and  
Climate Change Strategy

# ***PROTOCOL 4*** ***FOR CONTAMINATED SITES***

## Establishing Background Concentrations in Soil

Prepared pursuant to Section 64 of the  
*Environmental Management Act*

**Version 10**

Approved: Kevin Butterworth  
Director of Waste Management

January 09, 2019  
Date

**Table 1. Regional estimates for background concentrations in soil for inorganic substances<sup>1,2,3,4</sup>**

Substance	Region 1 Vancouver Island	Region 2 Lower Mainland	Metro Vancouver <sup>7</sup>	Region 3/8 Thompson/Nicola/ Okanagan	Region 4 Kootenay <sup>8</sup>	Region 5 Cariboo	Region 6 Skeena	Region 7 Omineca/ Peace
aluminum	55 000	35 000	35 000	30 000	25 000	25 000	40 000	40 000
antimony	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)
arsenic	(4)	8.5	8.5	15	(4)	10	10	10
barium	250	150	90	200	350	250	300	500
beryllium	0.7	0.7	0.7	0.5	0.8	0.3	0.6	1
boron	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
cadmium	0.95	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)
chromium <sup>5</sup>	65	55	50	70	35	100	40	50
cobalt	30	15	15	20	15	20	15	25
copper	100	75	150	75	35	60	50	70
iron	70 000	30 000	30 000	30 000	30 000	30 000	30 000	40 000
lead	40	200	300	15	120	15	20	25
manganese	5 000	900	1 000	1 000	2 000	850	1 500	1 500
mercury <sup>6</sup>	0.15	0.3	0.35	0.075	0.085	0.09	0.15	0.09
molybdenum	(1)	4	6	2	(1)	(1)	3	3
nickel	50	75	40	85	50	200	40	60
selenium	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)
silver	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
strontium	100	60	55	250	150	250	100	70
sulfur	1 000	2 000	3 000	550	950	800	2 500	450
tin	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)
vanadium	200	80	75	85	40	75	85	95
zinc	150	100	90	100	200	85	150	150

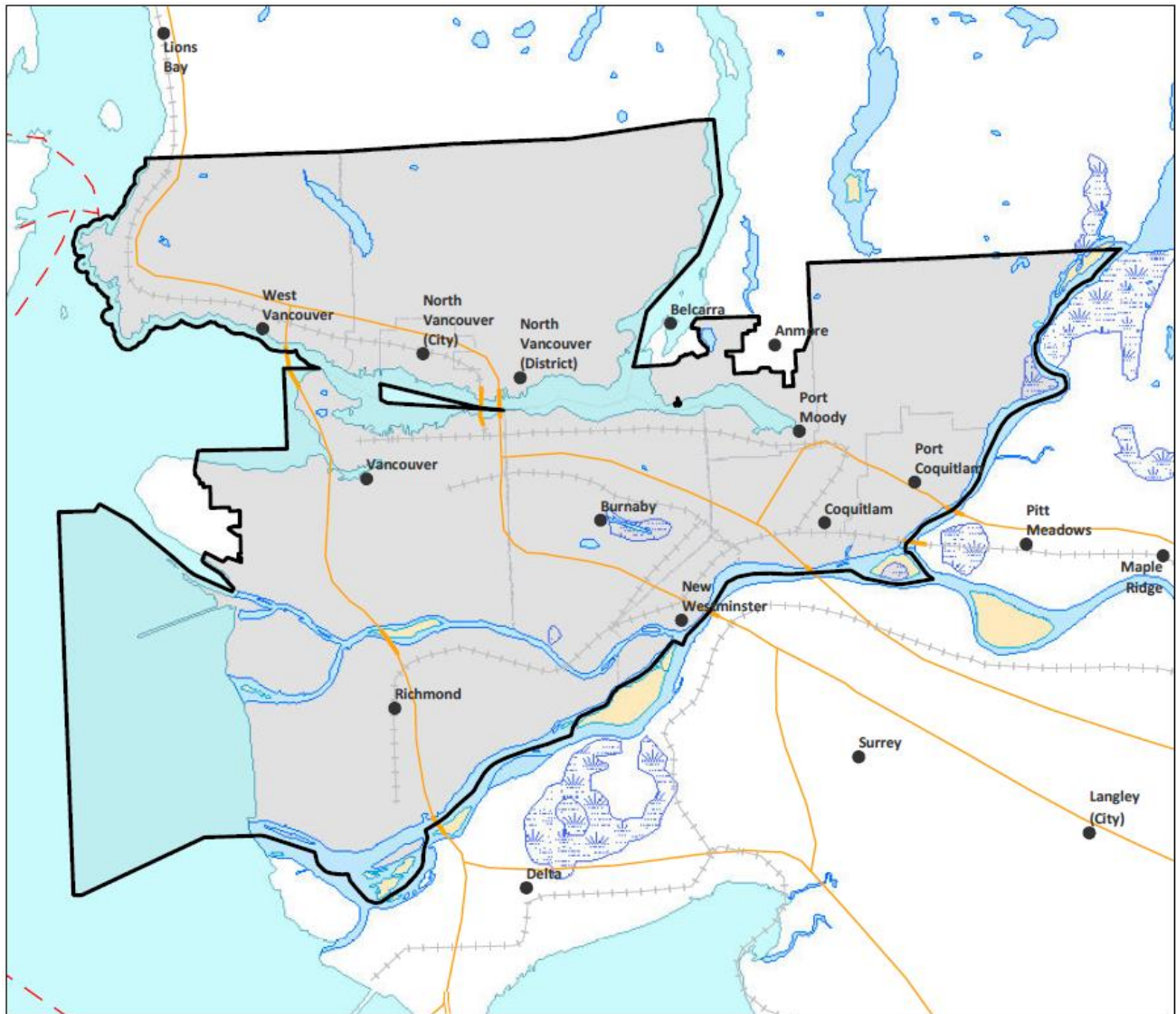
**Footnotes:**

1. All values are in µg/g unless otherwise stated. All values have been rounded in accordance with Contaminated Sites Taskgroup rounding rule. Values in brackets indicate that greater than 50% of values were less than the mean detection concentration (MDC) for the substance, consequently tabled regional estimate is one-half the MDC.
2. Each estimate represents the 95<sup>th</sup> percentile value obtained for a substance in the region or area.
3. All soil samples were subject to the strong acid leachable metals (SALM) method summarized in the *British Columbia Environmental Laboratory Manual*.
4. ND - no data available.
5. Chromium = total chromium
6. Mercury = inorganic mercury
7. Listed estimates for background concentrations in soil may be used within the Metro Vancouver area only. The Metro Vancouver area (see Figure 3) includes the University of British Columbia, Stanley Park, Queen Elizabeth Park, Richmond West, Richmond Central, Burnaby Lake Regional Park, Burnaby North, North Vancouver, New Westminster, and Coquitlam.
8. All results from Castlegar and Trail locales were removed from the data set as they are related to point source contamination. The regional estimate for lead is based on a Director's decision.

Figure 2. Regional boundaries for background soil determinations



Figure 3. Geographic limits for Metro Vancouver area



Revision History

Approval Date	Effective Date	Document Version	Notes
Nov. 1, 2017	Nov. 1, 2017	Version 9	Stage 11 CSR amendment
Jan. 9, 2019	Jan. 9, 2019	Version 10	Change to Section 4.0