Attachment 3
TABLE 2A
Leaching-Based Basic Comparison Levels (LBCLs) for Inorganics

Parameter of Interest	Chemical[5]	Kd Distribution coefficient (L/kg)	H' Henry's Law constant (unitless)	RBGC [1] (mg/L)	NDEP Worker BCL (mg/kg)	LBCL (DAF=1) (mg/kg)	LBCL (DAF=20) (mg/kg)	Generic or Adjusted LBCL [2, 3, 4] (DAF=20) (mg/kg)
Metals	**Aluminum**	1.5E+03	--	**3.7E+01**	1.0E+05	7.5E+01	1.5E+03	>100% wt/wt
	Antimony	4.5E+01	--	6.0E-03	4.5E+02	3.0E-01	6.0E+00	NC
	Arsenic	3.1E+01	--	1.0E-02	1.8E+00	1.0E+00	2.0E+01	NC
	Barium	5.2E+01	--	2.0E+00	1.0E+05	8.2E+01	1.6E+03	NC
	Beryllium	1.0E+05	--	4.0E-03	2.0E+03	3.0E+00	6.0E+01	NC
	Boron	3.0E+00	--	7.3E+00	1.0E+05	2.3E+01	4.7E+02	NC
	Cadmium	4.3E+03	--	5.0E-03	5.5E+02	4.0E-01	8.0E+00	NC
	Chromium (Total)	8.5E+02	--	1.0E-01	4.1E+02	2.0E+00	4.0E+01	NC
	Chromium (VI)	1.4E+01	--	1.0E-01	4.1E+02	2.0E+00	4.0E+01	NC
	Cobalt	4.5E+01	--	**1.1E-02**	3.3E+02	3.3E+01	6.6E+02	**9.9E+00**
	Copper	3.5E+01	--	**1.3E+00**	4.2E+04	3.5E+01	7.0E+02	**9.2E+02**
	Iron	2.5E+01	--	**2.6E+01**	1.0E+05	7.6E+00	1.5E+02	**1.3E+04**
	Lead	9.0E+02	--	1.5E-02	8.0E+02	NE	NE	2.7E+02
	Magnesium	4.5E+00	--	**2.1E+02**	1.0E+05	6.5E+02	1.3E+04	**1.9E+04**
	Manganese	6.5E+01	--	**5.1E-01**	1.4E+04	3.3E+00	6.5E+01	**6.7E+02**
	Mercury	1.0E+01	4.7E-01	2.0E-03	1.8E+02	1.0E-01	2.1E+00	NC
	Molybdenum	2.0E+01	--	1.8E-01	5.7E+03	3.6E+00	7.3E+01	NC
	Nickel	1.9E+03	--	7.3E-01	2.0E+04	7.0E+00	1.4E+02	NC
	Selenium	2.2E+00	--	5.0E-02	5.7E+03	3.0E-01	6.0E+00	NC
	Silver	1.1E+02	--	**1.8E-01**	5.7E+03	2.0E+00	4.0E+01	**3.1E+01**
	Strontium	3.5E+01	--	2.2E+01	1.0E+05	NE	NE	1.5E+04
	Thallium	9.6E+01	--	2.0E-03	8.0E+01	4.0E-01	8.0E+00	NC
	Tin	2.5E+02	--	2.2E+01	1.0E+05	NE	NE	1.1E+05
	Titanium	1.0E+03	--	1.5E+02	1.0E+05	1.5E+05	>100% wt/wt	NC
	Tungsten	1.5E+02	--	2.7E-01	8.5E+03	4.1E+01	8.2E+02	NC
	Uranium	4.5E+02	--	3.0E-02	3.4E+03	1.4E+01	2.7E+02	NC
	Vanadium	1.0E+03	--	1.8E-01	5.7E+03	3.0E+02	6.0E+03	NC
	Zinc	5.3E+02	--	1.1E+01	1.0E+05	6.2E+02	1.2E+04	NC

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Parameter of Interest	Chemical[5]	Kd Distribution coefficient (L/kg)	H' Henry's Law constant (unitless)	RBGC [1] (mg/L)	NDEP Worker BCL (mg/kg)	LBCL (DAF=1) (mg/kg)	LBCL (DAF=20) (mg/kg)	Generic or Adjusted LBCL [2, 3, 4] (DAF=20) (mg/kg)
Perchlorate	Perchlorate	2.8E-07	--	1.8E-02	7.9E+02	NE	NE	7.2E-02

Notes

1 - Hierarchy of values used for adjusted RBGCs as follows: 1) Primary Federal (USEPA) MCL, 2) NDEP tap water basic comparison levels (NDEP, 2009 BCLs), and 3) Secondary USEPA MCLs (NDEP meeting minutes for February 12 and 17, 2010). All MCLs from http://www.epa.gov/safewater/consumer/pdf/mcl.pdf and are primary MCLs unless otherwise noted.

2 - Leaching-based, basic comparison levels (LBCLs) are calculated as follows: $LBCL = RBGC * DAF * (K_d + (\Theta_w + \Theta_a * H')/\rho_b)$

3 - Generic leaching-based basic comparison levels are calculated for chemicals for which NDEP did not establish LBCLs, using literature values for chemical properties and NDEP default values for soil properties (water-filled porosity, θ_w=0.3; air-filled porosity, θ_a=0.13; and dry bulk density, ρ_b=1.5 kg/L).

4 - Adjusted LBCLs are calculated for chemicals in **bold** type using modified hierarchy of values for RBGCs for leaching evaluation, as discussed with NDEP (NDEP meeting minutes for February 12, and 17, 2010).

5 - Chemicals without a RBGC and chemicals with no Site detects are not shown in this table.

SYMBOLS

K_d (L_W/kg_S) = soil-water partition coefficient

θ_w (L_W/L_T) = water-filled porosity

ρ_b (kg_S/L_T) = dry bulk density (default value from USEPA, 1996; page 36)

θ_a (L_A/L_T) = air-filled porosity (default value from USEPA, 1996; page 36)

H' (L_W/L_A) = dimensionless Henry's constant

DAF = dilution-attenuation factor

LBCL = Leaching-based comparison level

RBGC = Risk-based groundwater concentrations; values in **bold** type used to calculate adjusted LBCLs.

NE = Value not established

UNITS

kg = kilograms

mg = milligrams

L_W = liters of water

L_A = liters of air

L_T = liters of total bulk soil (soil air, soil water, and soil)

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Evaluation of Soil Leaching to Groundwater
Tronox LLC, Henderson, Nevada